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Contents

- 1.1 jcommander-library 1.72**
 - 1.1.1 Available under license
- 1.2 micronaut-test 3.1.1**
 - 1.2.1 Available under license
- 1.3 jackson-module--guice 2.13.4**
 - 1.3.1 Available under license
- 1.4 javax-annotation-api 1.3.2**
 - 1.4.1 Available under license
- 1.5 protocol-buffers-[bom] 3.17.2**
 - 1.5.1 Available under license
- 1.6 jackson-core 2.13.4**
 - 1.6.1 Available under license
- 1.7 jakarta-annotations-api 2.1.1**
 - 1.7.1 Available under license
- 1.8 stringtemplate4 4.3**
 - 1.8.1 Available under license
- 1.9 vavr 0.10.2**
 - 1.9.1 Available under license
- 1.10 opentelemetry 1.16.0**
 - 1.10.1 Available under license
- 1.11 antlr 2.7.7**
 - 1.11.1 Available under license
- 1.12 rxjava 1.3.8**
 - 1.12.1 Available under license
- 1.13 apache-avro 1.11.1**
 - 1.13.1 Available under license

- 1.14 jackson-xc 2.13.4**
 - 1.14.1 Available under license
- 1.15 logback-core 1.2.11**
 - 1.15.1 Available under license
- 1.16 byte-buddy byte-buddy-1.9.10**
 - 1.16.1 Available under license
- 1.17 okio 2.8.0**
 - 1.17.1 Available under license
- 1.18 jmes-path-query-library 1.12.300**
 - 1.18.1 Available under license
- 1.19 micronaut-r2dbc 2.1.0**
 - 1.19.1 Available under license
- 1.20 jackson-datatype-jsr310 2.13.4**
 - 1.20.1 Available under license
- 1.21 micronaut-sql-libraries 4.2.3**
 - 1.21.1 Available under license
- 1.22 metrics-integration-with-jmx 4.0.5**
 - 1.22.1 Available under license
- 1.23 antlr 3.5.2**
 - 1.23.1 Available under license
- 1.24 guava 31.1-jre**
 - 1.24.1 Available under license
- 1.25 launchdarkly-sdk-for-java 5.7.1**
 - 1.25.1 Available under license
- 1.26 jackson-databind 2.13.4.2**
 - 1.26.1 Available under license
- 1.27 apache-httpcomponents-core 4.4.13**
 - 1.27.1 Available under license
- 1.28 mockito 2.27.0**
 - 1.28.1 Available under license
- 1.29 io-projectreactor 3.4.23**
 - 1.29.1 Available under license
- 1.30 objenesis 2.6**
 - 1.30.1 Available under license
- 1.31 metrics-health-checks 4.0.5**
 - 1.31.1 Available under license
- 1.32 metrics-integration-for-apache-httpasyncclient 4.0.5**
 - 1.32.1 Available under license
- 1.33 jul-to-slf4j-bridge 1.7.26**

- 1.33.1 Available under license
- 1.34 reactive-relational-database-connectivity-bill-of-materials Arabba-SR11**
 - 1.34.1 Available under license
- 1.35 micronaut-rxjava-2 1.2.1**
 - 1.35.1 Available under license
- 1.36 jackson-integration-for-metrics 4.0.5**
 - 1.36.1 Available under license
- 1.37 cloudevents---core 2.2.0**
 - 1.37.1 Available under license
- 1.38 apache-log4j-slf4j-binding 2.17.1**
 - 1.38.1 Available under license
- 1.39 caffeine-cache 2.8.0**
 - 1.39.1 Available under license
- 1.40 vavr-match 0.10.2**
 - 1.40.1 Available under license
- 1.41 project-lombok 1.18.8**
 - 1.41.1 Available under license
- 1.42 error_prone_annotations 2.11.0**
 - 1.42.1 Available under license
- 1.43 kotlin 1.6.21**
 - 1.43.1 Available under license
- 1.44 micronaut-coherence 3.0.1**
 - 1.44.1 Available under license
- 1.45 metrics-utility-servlets 4.0.5**
 - 1.45.1 Available under license
- 1.46 rxjava 2.2.14**
 - 1.46.1 Available under license
- 1.47 micrometer-metrics/micrometer 1.9.0**
 - 1.47.1 Available under license
- 1.48 micronaut-views 3.2.0**
 - 1.48.1 Available under license
- 1.49 zstd-jni 1.4.9-1**
 - 1.49.1 Available under license
- 1.50 open-telemetry/opentelemetry-java 1.16.0**
 - 1.50.1 Available under license
- 1.51 software-amazon-ion-ion-java 1.0.2**
 - 1.51.1 Available under license
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1.54.1 Available under license

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1.55.1 Available under license

1.56 micronaut-problem-json 2.2.3

1.56.1 Available under license

1.57 j2objc-annotations 1.3

1.57.1 Available under license

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1.58.1 Available under license

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1.59.1 Available under license

1.60 io.grpc:grpc-bom 1.39.0

1.60.1 Available under license

1.61 json-p 1.0.4

1.61.1 Available under license

1.62 jdbc3-bom 3.20.1

1.62.1 Available under license

1.63 asm-analysis 7.2

1.63.1 Available under license

1.64 micronaut 3.7.3

1.64.1 Available under license

1.65 testcontainers-bom 1.16.2

1.65.1 Available under license

1.66 bom 4.1.77.Final

1.66.1 Available under license

1.67 jackson-datatype-jdk8 2.13.4

1.67.1 Available under license

1.68 commons-logging 1.2

1.68.1 Available under license

1.69 google-guice 4.2.2

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1.70 micronaut-cache 3.3.0

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1.71 profiler 1.0.2

1.71.1 Available under license

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- 1.72.1 Available under license
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 - 1.74.1 Available under license
- 1.75 azure-java-sdk-bom-(bill-of-materials) 1.1.1**
 - 1.75.1 Available under license
- 1.76 netty-project 4.1.84.Final**
 - 1.76.1 Available under license
- 1.77 metrics-core 4.0.5**
 - 1.77.1 Available under license
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 - 1.78.1 Available under license
- 1.79 abegocore 1.0.3**
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- 1.80 jakarta-dependency-injection 2.0.1**
 - 1.80.1 Available under license
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 - 1.82.1 Available under license
- 1.83 jackson-dataformats-binary 2.13.4**
 - 1.83.1 Available under license
- 1.84 findbugs-jsr305 3.0.2**
 - 1.84.1 Available under license
- 1.85 okhttp 4.9.3**
 - 1.85.1 Available under license
- 1.86 javabeans-activation-framework-api 1.2.2**
 - 1.86.1 Available under license
- 1.87 asm 7.2**
 - 1.87.1 Available under license
- 1.88 testng 6.14.3**
- 1.89 jackson-annotations 2.13.4**
 - 1.89.1 Available under license
- 1.90 asm-tree 7.2**
 - 1.90.1 Available under license
- 1.91 spock-framework---bill-of-materials 2.0-groovy-3.0**
 - 1.91.1 Available under license
- 1.92 apache-commons-lang 3.9**

- 1.92.1 Available under license
- 1.93 jym-integration-for-metrics 4.0.5**
 - 1.93.1 Available under license
- 1.94 jackson-dataformat-yaml 2.13.4**
 - 1.94.1 Available under license
- 1.95 micronaut-kubernetes 3.4.0**
 - 1.95.1 Available under license
- 1.96 micronaut-redis 5.2.0**
 - 1.96.1 Available under license
- 1.97 micronaut-tracing 4.1.1**
 - 1.97.1 Available under license
- 1.98 micronaut-oracle-cloud 2.1.3**
 - 1.98.1 Available under license
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- 1.101 micronaut-aws 3.2.3**
 - 1.101.1 Available under license
- 1.102 micronaut-mongodb 4.1.0**
 - 1.102.1 Available under license
- 1.103 cloudevents---kafka-transport-binding 2.2.0**
 - 1.103.1 Available under license
- 1.104 resilience4j 1.7.1**
 - 1.104.1 Available under license
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 - 1.105.1 Available under license
- 1.106 guava-internalfuturefailureaccess-and-internalfutures 1.0.1**
 - 1.106.1 Available under license
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 - 1.109.1 Available under license
- 1.110 zip4j 2.10.0**
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1.129.1 Available under license

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1.130.1 Available under license

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- 1.131.1 Available under license
- 1.132 rocksdb-jni 7.0.3**
 - 1.132.1 Available under license
- 1.133 netty-transport-native-unix-common 4.1.84.Final**
 - 1.133.1 Available under license
- 1.134 aop-alliance 1.0**
 - 1.134.1 Available under license
- 1.135 byte-buddy-agent 1.9.10**
 - 1.135.1 Available under license
- 1.136 jackson-datatype-guava 2.13.4**
 - 1.136.1 Available under license
- 1.137 junit-5-bill-of-materials 5.8.2**
 - 1.137.1 Available under license
- 1.138 jacoco 0.8.5**
 - 1.138.1 Available under license
- 1.139 jackson-jaxrs-base 2.13.4**
 - 1.139.1 Available under license
- 1.140 micronaut-azure 3.2.3**
 - 1.140.1 Available under license
- 1.141 cloudevents---api 2.2.0**
 - 1.141.1 Available under license
- 1.142 micronaut-servlet 3.2.2**
 - 1.142.1 Available under license
- 1.143 micronaut-micrometer 4.3.0**
 - 1.143.1 Available under license
- 1.144 micronaut-rxjava-3 2.2.1**
 - 1.144.1 Available under license
- 1.145 commons-compress 1.21**
 - 1.145.1 Available under license
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 - 1.146.1 Available under license
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 - 1.147.1 Available under license
- 1.148 asm-commons 7.2**
 - 1.148.1 Available under license
- 1.149 apache-log4j-api 2.17.1**
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* /opt/cola/permits/1009978799_1649800662.98/0/jcommander-1-72-sources-jar/com/beust/jcommander/internal/Sets.java
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* /opt/cola/permits/1009978799_1649800662.98/0/jcommander-1-72-sources-jar/com/beust/jcommander/converters/StringConverter.java
* /opt/cola/permits/1009978799_1649800662.98/0/jcommander-1-72-sources-jar/com/beust/jcommander/ParametersDelegate.java
* /opt/cola/permits/1009978799_1649800662.98/0/jcommander-1-72-sources-jar/com/beust/jcommander/converters/LongConverter.java
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* /opt/cola/permits/1009978799_1649800662.98/0/jcommander-1-72-sources-jar/com/beust/jcommander/converters/PathConverter.java
* /opt/cola/permits/1009978799_1649800662.98/0/jcommander-1-72-sources-jar/com/beust/jcommander/defaultprovider/PropertyFileDefaultProvider.java
* /opt/cola/permits/1009978799_1649800662.98/0/jcommander-1-72-sources-jar/com/beust/jcommander/Parameters.java
* /opt/cola/permits/1009978799_1649800662.98/0/jcommander-1-72-sources-jar/com/beust/jcommander/converters/InetAddressConverter.java
* /opt/cola/permits/1009978799_1649800662.98/0/jcommander-1-72-sources-jar/com/beust/jcommander/IStringConverterFactory.java
* /opt/cola/permits/1009978799_1649800662.98/0/jcommander-1-72-sources-jar/com/beust/jcommander/converters/BigDecimalConverter.java
* /opt/cola/permits/1009978799_1649800662.98/0/jcommander-1-72-sources-jar/com/beust/jcommander/ParameterException.java
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* /opt/cola/permits/1009978799_1649800662.98/0/jcommander-1-72-sources-jar/com/beust/jcommander/MissingCommandException.java
* /opt/cola/permits/1009978799_1649800662.98/0/jcommander-1-72-sources-jar/com/beust/jcommander/converters/URICConverter.java
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* /opt/cola/permits/1009978799_1649800662.98/0/jcommander-1-72-sources-jar/com/beust/jcommander/converters/URLConverter.java
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* /opt/cola/permits/1009978799_1649800662.98/0/jcommander-1-72-sources-jar/com/beust/jcommander/internal/DefaultConverterFactory.java

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jar/com/beust/jcommander/converters/DoubleConverter.java
* /opt/cola/permits/1009978799_1649800662.98/0/jcommander-1-72-sources-
jar/com/beust/jcommander/converters/CharArrayConverter.java
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- * /opt/cola/permits/1331474237_1653506865.917328/0/micronaut-test-junit5-3-1-1-sources-jar/io/micronaut/test/extensions/junit5/MicronautJunit5Extension.java
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- * Small optimizations to Python serialization.

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- * VI syntax highlighting tweaks.
- * Fix compiler to not make output executable.

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- * Heuristic detection of sub-messages when printing unknown fields in text format.

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- * Added @Override annotation to generated Java code where appropriate.

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- * Tru64 support.

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- * Slicing support for repeated scalar fields for the Python API.

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- * MS Visual Studio error format option.
- * Detect unordered_map in stl_hash.m4.

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- * gzip/zlib I/O support.

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- * Fixed warnings about generated constructors not explicitly initializing all fields (only present with certain compiler settings).
- * Added generation of field number constants.

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- * Fixed initialization ordering problem in logging code.

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- * Small patch improving performance of in Python serialization.

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- * Emacs mode for Protocol Buffers (editors/protobuf-mode.el).

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- * Added Swap(), SwapElements(), and RemoveLast() to Reflection interface.

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- * HPUX support.

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- * Detect whether zlib is new enough in configure script.
- * Fixes for Solaris 10 32/64-bit confusion.

Evan Jones <evanj@mit.edu>

- * Optimize Java serialization code when writing a small message to a stream.
- * Optimize Java serialization of strings so that UTF-8 encoding happens only once per string per serialization call.
- * Clean up some Java warnings.
- * Fix bug with permanent callbacks that delete themselves when run.

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- * Added CodedInputStream.getTotalBytesRead().

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- * Fixed m4/acx_pthread.m4 problem for some Linux distributions.

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- * Fixed detection of sched_yield on Solaris.
- * Added atomicops for Solaris

Andrew Paprocki <andrew@ishiboo.com>

- * Fixed minor IBM xLC compiler build issues
- * Added atomicops for AIX (POWER)

1.6 jackson-core 2.13.4

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Jackson JSON processor

Jackson is a high-performance, Free/Open Source JSON processing library.

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1.8 stringtemplate4 4.3

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1.10 opentelemetry 1.16.0

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1.11 antlr 2.7.7

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1.12 rxjava 1.3.8

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* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/util/unsafe/Pow2.java

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- * /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/schedulers/GenericScheduledExecutorService.java
- * /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/functions/ActionN.java
- * /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/exceptions/OnErrorNotImplementedException.java
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- * /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/functions/Action4.java
- * /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/operators/CompletableOnSubscribeConcat.java
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- * /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/Observer.java
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- * /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/plugins/RxJavaErrorHandler.java

* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/operators/OperatorZip.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/util/RxRingBuffer.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/operators/OperatorToObservableList.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/observers/Observers.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/operators/CompletableOnSubscribeConcatArray.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/operators/CompletableOnSubscribeMergeIterable.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/subscriptions/Subscriptions.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/subscriptions/BooleanSubscription.java
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* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/operators/CompletableOnSubscribeMergeDelayErrorArray.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/operators/OperatorIgnoreElements.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/operators/CompletableOnSubscribeMergeDelayErrorIterable.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/operators/BufferUntilSubscriber.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/schedulers/TrampolineScheduler.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/subscriptions/MultipleAssignmentSubscription.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/operators/NotificationLite.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/operators/OperatorAsObservable.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/operators/OnSubscribeToObservableFuture.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/operators/OperatorAll.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/operators/OperatorMerge.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/operators/OnSubscribeDefer.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/operators/OperatorTakeUntilPredicate.java

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* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/subscriptions/SequentialSubscription.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/operators/SingleOnSubscribeMap.java
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jar/rx/exceptions/OnCompletedFailedException.java
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This package contains code that relies on sun.misc.Unsafe. Before using it you MUST assert
UnsafeAccess.isUnsafeAvailable() == true

Much of the code in this package comes from or is inspired by the JCTools project:
<https://github.com/JCTools/JCTools>

JCTools has now published artifacts (<https://github.com/JCTools/JCTools/issues/17>) so RxJava could add JCTools as a "shadow" dependency (<https://github.com/ReactiveX/RxJava/issues/1735>). RxJava has a "zero dependency" policy for the core library, so if we do add it as a dependency, it won't be an externally visible dependency that results in a separate jar.

The license for the JCTools code is <https://github.com/JCTools/JCTools/blob/master/LICENSE>

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Found in path(s):

* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/util/unsafe/README.md

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* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/operators/SingleTimeout.java

* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/operators/OnSubscribeOnAssemblySingle.java

* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/observers/package-info.java

* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/operators/SingleFromObservable.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/util/ObserverSubscriber.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/observers/AssertableSubscriberObservable.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/util/ActionSubscriber.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/plugins/RxJavaSingleExecutionHook.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/operators/SingleFromCallable.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/operators/OnSubscribeLift.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/annotations/package-info.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/observers/AsyncCompletableSubscriber.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/plugins/RxJavaCompletableExecutionHook.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/operators/SingleOnErrorReturn.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/operators/OnSubscribeDetach.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/operators/SingleTakeUntilCompletable.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/exceptions/package-info.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/operators/OnSubscribeFlattenIterable.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/functions/Cancellable.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/operators/SingleTakeUntilObservable.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/Emitter.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/operators/EmptyObservableHolder.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/operators/SingleDoOnUnsubscribe.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/exceptions/AssemblyStackTraceException.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/util/ActionNotificationObserver.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/subscriptions/package-info.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/schedulers/SchedulePeriodicHelper.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-

jar/rx/internal/util/InternalObservableUtils.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-
jar/rx/internal/operators/OnSubscribeOnAssemblyCompletable.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/observables/package-
info.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-
jar/rx/BackpressureOverflow.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-
jar/rx/internal/operators/SingleObserveOn.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-
jar/rx/internal/operators/OnSubscribeOnAssembly.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-
jar/rx/plugins/RxJavaHooks.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/functions/package-
info.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-
jar/rx/internal/operators/SingleFromFuture.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/plugins/package-
info.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-
jar/rx/internal/operators/SingleLiftObservableOperator.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/subjects/package-
info.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-
jar/rx/internal/operators/SingleToObservable.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-
jar/rx/internal/operators/SingleFromEmitter.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-
jar/rx/internal/operators/SingleDelay.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-
jar/rx/internal/schedulers/SchedulerWhen.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-
jar/rx/internal/operators/OnSubscribeThrow.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-
jar/rx/internal/util/ActionObserver.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-
jar/rx/internal/subscriptions/CancellableSubscription.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-
jar/rx/internal/operators/SingleTakeUntilSingle.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-
jar/rx/internal/subscriptions/Unsubscribed.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-
jar/rx/internal/operators/SingleDoOnSubscribe.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-
jar/rx/internal/operators/NeverObservableHolder.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-
jar/rx/observers/AssertableSubscriber.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-

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jar/rx/observers/SafeCompletableSubscriber.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-
jar/rx/internal/operators/CompletableFlatMapSingleToCompletable.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/singles/package-
info.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-
jar/rx/internal/operators/OnSubscribeCreate.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-
jar/rx/plugins/RxJavaSingleExecutionHookDefault.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-
jar/rx/internal/schedulers/GenericScheduledExecutorServiceFactory.java
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core/src/main/java/org/jctools/queues/atomic/SpscUnboundedAtomicArrayQueue.java
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```

Found in path(s):

```
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-
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* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/util/unsafe/ConcurrentCircularArrayQueue.java

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* Modified from <http://www.javacodegeeks.com/2013/08/simple-and-lightweight-pool-implementation.html>

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*/

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* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-

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core/src/main/java/org/jctools/queues/QueueProgressIndicators.java
 */
```

Found in path(s):

`/opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/util/unsafe/QueueProgressIndicators.java`

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`/opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/operators/DeferredScalarSubscriberSafe.java`

`/opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-`

jar/rx/internal/util/SuppressAnimalSniffer.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-
jar/rx/internal/operators/OnSubscribeFromCallable.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-
jar/rx/internal/schedulers/SchedulerLifecycle.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-
jar/rx/internal/util/ExceptionsUtils.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-
jar/rx/internal/operators/OnSubscribeReduceSeed.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-
jar/rx/internal/operators/OnSubscribeConcatMap.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-
jar/rx/internal/operators/DeferredScalarSubscriber.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-
jar/rx/internal/operators/SingleOperatorOnErrorResumeNext.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-
jar/rx/internal/operators/SingleOnSubscribeUsing.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-
jar/rx/internal/operators/OnSubscribeReduce.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-
jar/rx/internal/operators/SingleOperatorZip.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-
jar/rx/internal/operators/OnSubscribeTakeLastOne.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-
jar/rx/internal/operators/OnSubscribePublishMulticast.java
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* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-
jar/rx/internal/producers/QueuedProducer.java

* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-
jar/rx/internal/producers/SingleProducer.java

```
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-
jar/rx/internal/operators/BackpressureUtils.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-
jar/rx/internal/producers/ProducerArbiter.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-
jar/rx/internal/producers/SingleDelayedProducer.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-
jar/rx/internal/producers/QueuedValueProducer.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-
jar/rx/internal/producers/ProducerObserverArbiter.java
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core/src/main/java/org/jctools/queues/MpmcArrayQueue.java
*/
```

```
Found in path(s):
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-
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* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/operators/OnSubscribeFlatMapSingle.java

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* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/operators/OperatorBufferWithSingleObservable.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/operators/OnSubscribeTimerOnce.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/schedulers/ExecutorScheduler.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/operators/OperatorWindowWithObservable.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/operators/OperatorDistinctUntilChanged.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/operators/OperatorMulticast.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/operators/OnSubscribeDelaySubscription.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/operators/OperatorRetryWithPredicate.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/operators/OperatorMapPair.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/operators/OperatorPublish.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/operators/OnSubscribeSkipTimed.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/operators/OperatorDelayWithSelector.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/schedulers/ScheduledAction.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/operators/OperatorTakeTimed.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/operators/OperatorBufferWithTime.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/operators/OnSubscribeRefCount.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/util/atomic/SpSCLinkedListArrayQueue.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/operators/OperatorDistinct.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/operators/OperatorDebounceWithSelector.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/operators/OperatorDebounceWithTime.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/operators/OnSubscribeDelaySubscriptionWithSelector.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/schedulers/NewThreadWorker.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/operators/OperatorBufferWithSize.java

* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/operators/OperatorWindowWithStartEndObservable.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/operators/SingleOnSubscribeDelaySubscriptionOther.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/util/PlatformDependent.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/util/RxThreadFactory.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/operators/OperatorBufferWithStartEndObservable.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/operators/OperatorDoAfterTerminate.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/operators/OperatorSwitch.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/operators/OperatorWithLatestFrom.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/operators/OnSubscribeDelaySubscriptionOther.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/operators/OperatorWindowWithSize.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/operators/OperatorSampleWithObservable.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/operators/OperatorOnBackpressureLatest.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/operators/OperatorEagerConcatMap.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/operators/OperatorWindowWithObservableFactory.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/operators/OperatorSampleWithTime.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/operators/OperatorWindowWithTime.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/functions/Actions.java
* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/operators/OperatorSkipUntil.java

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libraries/source/browse/guava/src/com/google/common/annotations/Beta.java

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core/src/main/java/org/jctools/queues/atomic/AtomicReferenceArrayQueue.java

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* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/util/atomic/AtomicReferenceArrayQueue.java

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* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/observables/AsyncOnSubscribe.java

* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/operators/SingleDoAfterTerminate.java

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jar/rx/internal/operators/CompletableFromEmitter.java

* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-

jar/rx/CompletableSubscriber.java

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[core/src/main/java/org/jctools/queues/SpscLinkedQueue.java](https://github.com/JCTools/JCTools/blob/master/jctools-core/src/main/java/org/jctools/queues/SpscLinkedQueue.java)

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* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-
jar/rx/internal/util/atomic/SpSCExactAtomicArrayQueue.java

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 */
/**
 * This plugin class provides 2 ways to customize {@link Scheduler} functionality
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 * the 3 methods that return Scheduler (io(), computation(), newThread()).
 * 2. You may wrap/decorate an {@link Action0}, before it is handed off to a Scheduler. The system-
 * supplied Schedulers (Schedulers.ioScheduler, Schedulers.computationScheduler,
 * Scheduler.newThreadScheduler) all use this hook, so it's a convenient way to
 * modify Scheduler functionality without redefining Schedulers wholesale.
 *
 * Also, when redefining Schedulers, you are free to use/not use the onSchedule decoration hook.
 * <p>
 * See {@link RxJavaPlugins} or the RxJava GitHub Wiki for information on configuring plugins:
 * <a
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 */
```

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```
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*/

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* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/util/unsafe/SpSCUnboundedArrayQueue.java
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Found in path(s):

* /opt/ws_local/PERMITS_SQL/1014221113_1591382734.95/0/rxjava-1-3-8-sources-jar/rx/internal/util/atomic/LinkedQueueNode.java

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1.14 jackson-xc 2.13.4

1.14.1 Available under license :

Jackson JSON processor

Jackson is a high-performance, Free/Open Source JSON processing library.
It was originally written by Tatu Saloranta (tatu.saloranta@iki.fi), and has
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It is currently developed by a community of developers, as well as supported
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1.15 logback-core 1.2.11

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```
/**
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 *
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 */
```

Found in path(s):

```
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/spi/ContextAwareImpl.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/ConsoleAppender.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/joran/spi/InterpretationContext.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/pattern/color/BoldBlueCompositeConverter.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/pattern/ConverterUtil.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/rolling/helper/FileNamePattern.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/status/InfoStatus.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/joran/action/ParamAction.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/net/SyslogAppenderBase.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/joran/event/stax/EndEvent.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/encoder/EchoEncoder.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/rolling/helper/ArchiveRemover.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/net/ssl/ConfigurableSSLServerSocketFactory.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
```

jar/ch/qos/logback/core/joran/node/ComponentNode.java
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jar/ch/qos/logback/core/util/LocationUtil.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/subst/Parser.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/pattern/PatternLayoutBase.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/pattern/parser/FormattingNode.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/joran/action/TimestampAction.java
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jar/ch/qos/logback/core/encoder/NonClosableInputStream.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/subst/Tokenizer.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/net/server/ServerSocketListener.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/net/AutoFlushingObjectWriter.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/joran/action/AbstractEventEvaluatorAction.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/joran/event/EndEvent.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/joran/action/AppenderAction.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/net/ssl/SSLConfigurable.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/pattern/FormattingConverter.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/net/SyslogConstants.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/net/server/SSLServerSocketAppenderBase.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
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* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
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jar/ch/qos/logback/core/sift/AbstractDiscriminator.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
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* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
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* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/spi/PropertyContainer.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/sift/SiftingJoranConfiguratorBase.java
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* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
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* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/rolling/helper/PeriodicityType.java
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* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
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* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
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* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
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* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/pattern/util/IEscapeUtil.java
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* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/read/ListAppender.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-

jar/ch/qos/logback/core/rolling/RollingPolicyBase.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/encoder/Encoder.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/pattern/color/BlackCompositeConverter.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/joran/event/stax/StaxEventRecorder.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/status/Status.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/joran/spi/XMLUtil.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/rolling/TimeBasedFileNamingAndTriggeringPolicy.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/joran/conditional/PropertyWrapperForScripts.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/joran/action/ImplicitAction.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/sift/AbstractAppenderFactoryUsingJoran.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/status/OnErrorConsoleStatusListener.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/util/OptionHelper.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/joran/action/ConversionRuleAction.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/helpers/CyclicBuffer.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/joran/GenericConfigurator.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/joran/event/stax/StartEvent.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/net/ssl/SSL.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/rolling/TimeBasedFileNamingAndTriggeringPolicyBase.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/spi/ContextAware.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/joran/action/ActionUtil.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/net/ssl/SSLComponent.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/subst/Token.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/util/CachingDateFormatter.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/joran/action/IncludeAction.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-

jar/ch/qos/logback/core/util/ExecutorServiceUtil.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/net/server/RemoteReceiverServerListener.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/joran/action/NOPAction.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/joran/spi/DefaultNestedComponentRegistry.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/hook/DelayingShutdownHook.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/net/server/RemoteReceiverServerRunner.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/joran/action/AppenderRefAction.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/net/ssl/SSLNestedComponentRegistryRules.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/joran/event/StartEvent.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/read/CyclicBufferAppender.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/rolling/RollingPolicy.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/rolling/helper/CompressionMode.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/rolling/helper/IntegerTokenConverter.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/spi/ContextAwareBase.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/spi/LifeCycle.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/rolling/helper/FileStoreUtil.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/util/CloseUtil.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/helpers/Transform.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/joran/conditional/ThenAction.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/util/StatusPrinter.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/boolex/EvaluationException.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/status/StatusListener.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/pattern/util/AlmostAsIsEscapeUtil.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/FileAppender.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-

jar/ch/qos/logback/core/joran/JoranConfiguratorBase.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/net/ssl/KeyManagerFactoryFactoryBean.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/rolling/helper/Compressor.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/net/ssl/SecureRandomFactoryBean.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/joran/spi/ActionException.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/pattern/color/YellowCompositeConverter.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/rolling/TimeBasedRollingPolicy.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/sift/AppenderTracker.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/pattern/color/BoldRedCompositeConverter.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/spi/PreSerializationTransformer.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/joran/spi/ElementSelector.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/AsyncAppenderBase.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/joran/action/NestedBasicPropertyIA.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/joran/action/IADataForBasicProperty.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/joran/action/Action.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/rolling/helper/RenameUtil.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/joran/action/NestedComplexPropertyIA.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/spi/DeferredProcessingAware.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/joran/event/SaxEventRecorder.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/util/IncompatibleClassException.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/pattern/util/RestrictedEscapeUtil.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/encoder/EncoderBase.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/joran/spi/NoAutoStart.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/pattern/parser/Token.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-

jar/ch/qos/logback/core/boolex/EventEvaluatorBase.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/util/AggregationType.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/joran/conditional/ThenOrElseActionBase.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/status/OnConsoleStatusListener.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/pattern/Converter.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/pattern/parser/TokenStream.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/util/ContentTypeUtil.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/Layout.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/pattern/color/BoldCyanCompositeConverter.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/joran/conditional/ElseAction.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/net/server/ConcurrentServerRunner.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/joran/spi/ConfigurationWatchList.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/pattern/parser/CompositeNode.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/helpers/NOPAppender.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/joran/spi/DefaultClass.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/property/ResourceExistsPropertyDefiner.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/status/ViewStatusMessagesServletBase.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/subst/NodeToStringTransformer.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/net/server/Client.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/pattern/color/BoldMagentaCompositeConverter.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/joran/spi/RuleStore.java
* /opt/cola/permits/1337069885_1654119262.0130525/0/logback-core-1-2-11-sources-3-
jar/ch/qos/logback/core/joran/action/PropertyAction.java

1.16 byte-buddy byte-buddy-1.9.10

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License: Public Domain

JSR-250 Common Annotations for the Java™ Platform
(<http://jcp.org/aboutJava/communityprocess/final/jsr250/index.html>) javax.annotation:jsr250-api:jar:1.0
License: COMMON DEVELOPMENT AND DISTRIBUTION LICENSE (CDDL) Version 1.0
<https://glassfish.java.net/public/CDDLv1.0.html> (lib/jsr250-api.license)

CDI APIs (<http://www.seamframework.org/Weld/cdi-api>) javax.enterprise:cdi-api:jar:1.0
License: Apache License, Version 2.0 <http://www.apache.org/licenses/LICENSE-2.0> (lib/cdi-api.license)

Maven Aether Provider (<http://maven.apache.org/ref/3.2.5/maven-aether-provider>) org.apache.maven:maven-aether-
provider:jar:3.2.5
License: Apache License, Version 2.0 <http://www.apache.org/licenses/LICENSE-2.0.txt> (lib/maven-aether-
provider.license)

Maven Artifact (<http://maven.apache.org/ref/3.2.5/maven-artifact>) org.apache.maven:maven-artifact:jar:3.2.5
License: Apache License, Version 2.0 <http://www.apache.org/licenses/LICENSE-2.0.txt> (lib/maven-
artifact.license)

Maven Compat (<http://maven.apache.org/ref/3.2.5/maven-compat>) org.apache.maven:maven-compat:jar:3.2.5
License: Apache License, Version 2.0 <http://www.apache.org/licenses/LICENSE-2.0.txt> (lib/maven-
compat.license)

Maven Core (<http://maven.apache.org/ref/3.2.5/maven-core>) org.apache.maven:maven-core:jar:3.2.5
License: Apache License, Version 2.0 <http://www.apache.org/licenses/LICENSE-2.0.txt> (lib/maven-core.license)

Maven Embedder (<http://maven.apache.org/ref/3.2.5/maven-embedder>) org.apache.maven:maven-
embedder:jar:3.2.5
License: Apache License, Version 2.0 <http://www.apache.org/licenses/LICENSE-2.0.txt> (lib/maven-

embedder.license)

Maven Model (<http://maven.apache.org/ref/3.2.5/maven-model>) org.apache.maven:maven-model:jar:3.2.5
License: Apache License, Version 2.0 <http://www.apache.org/licenses/LICENSE-2.0.txt> (lib/maven-model.license)

Maven Model Builder (<http://maven.apache.org/ref/3.2.5/maven-model-builder>) org.apache.maven:maven-model-builder:jar:3.2.5
License: Apache License, Version 2.0 <http://www.apache.org/licenses/LICENSE-2.0.txt> (lib/maven-model-builder.license)

Maven Plugin API (<http://maven.apache.org/ref/3.2.5/maven-plugin-api>) org.apache.maven:maven-plugin-api:jar:3.2.5
License: Apache License, Version 2.0 <http://www.apache.org/licenses/LICENSE-2.0.txt> (lib/maven-plugin-api.license)

Maven Repository Metadata Model (<http://maven.apache.org/ref/3.2.5/maven-repository-metadata>) org.apache.maven:maven-repository-metadata:jar:3.2.5
License: Apache License, Version 2.0 <http://www.apache.org/licenses/LICENSE-2.0.txt> (lib/maven-repository-metadata.license)

Maven Settings (<http://maven.apache.org/ref/3.2.5/maven-settings>) org.apache.maven:maven-settings:jar:3.2.5
License: Apache License, Version 2.0 <http://www.apache.org/licenses/LICENSE-2.0.txt> (lib/maven-settings.license)

Maven Settings Builder (<http://maven.apache.org/ref/3.2.5/maven-settings-builder>) org.apache.maven:maven-settings-builder:jar:3.2.5
License: Apache License, Version 2.0 <http://www.apache.org/licenses/LICENSE-2.0.txt> (lib/maven-settings-builder.license)

Apache Maven Wagon :: Providers :: File Provider (<http://maven.apache.org/wagon/wagon-providers/wagon-file>) org.apache.maven.wagon:wagon-file:jar:2.8
License: Apache License, Version 2.0 <http://www.apache.org/licenses/LICENSE-2.0.txt> (lib/wagon-file.license)

Apache Maven Wagon :: Providers :: HTTP Provider (<http://maven.apache.org/wagon/wagon-providers/wagon-http>) org.apache.maven.wagon:wagon-http:jar:2.8
License: Apache License, Version 2.0 <http://www.apache.org/licenses/LICENSE-2.0.txt> (lib/wagon-http.license)

Apache Maven Wagon :: Providers :: HTTP Shared Library (<http://maven.apache.org/wagon/wagon-providers/wagon-http-shared>) org.apache.maven.wagon:wagon-http-shared:jar:2.8
License: Apache License, Version 2.0 <http://www.apache.org/licenses/LICENSE-2.0.txt> (lib/wagon-http-shared.license)

Apache Maven Wagon :: API (<http://maven.apache.org/wagon/wagon-provider-api>) org.apache.maven.wagon:wagon-provider-api:jar:2.8
License: Apache License, Version 2.0 <http://www.apache.org/licenses/LICENSE-2.0.txt> (lib/wagon-provider-api.license)

Aether API (<http://www.eclipse.org/aether/aether-api/>) org.eclipse.aether:aether-api:jar:1.0.0.v20140518
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Aether Connector Basic (<http://www.eclipse.org/aether/aether-connector-basic/>) org.eclipse.aether:aether-connector-basic:jar:1.0.0.v20140518
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Aether Transport Wagon (<http://www.eclipse.org/aether/aether-transport-wagon/>) org.eclipse.aether:aether-transport-wagon:jar:1.0.0.v20140518
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Aether Utilities (<http://www.eclipse.org/aether/aether-util/>) org.eclipse.aether:aether-util:jar:1.0.0.v20140518
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org.eclipse.sisu.inject (<http://www.eclipse.org/sisu/org.eclipse.sisu.inject/>)
org.eclipse.sisu:org.eclipse.sisu.inject:eclipse-plugin:0.3.0.M1
License: Eclipse Public License, Version 1.0 <http://www.eclipse.org/legal/epl-v10.html>
(lib/org.eclipse.sisu.inject.license)

org.eclipse.sisu.plexus (<http://www.eclipse.org/sisu/org.eclipse.sisu.plexus/>)
org.eclipse.sisu:org.eclipse.sisu.plexus:eclipse-plugin:0.3.0.M1
License: Eclipse Public License, Version 1.0 <http://www.eclipse.org/legal/epl-v10.html>
(lib/org.eclipse.sisu.plexus.license)

jsoup (<http://jsoup.org/>) org.jsoup:jsoup:jar:1.7.2
License: The MIT License <http://jsoup.com/license> (lib/jsoup.license)

SLF4J API Module (<http://www.slf4j.org>) org.slf4j:slf4j-api:jar:1.7.5
License: MIT License <http://www.opensource.org/licenses/mit-license.php> (lib/slf4j-api.license)

SLF4J Simple Binding (<http://www.slf4j.org>) org.slf4j:slf4j-simple:jar:1.7.5
License: MIT License <http://www.opensource.org/licenses/mit-license.php> (lib/slf4j-simple.license)

Plexus Cipher: encryption/decryption Component (<http://spice.sonatype.org/plexus-cipher>)
org.sonatype.plexus:plexus-cipher:jar:1.7
License: Apache Public License 2.0 <http://www.apache.org/licenses/LICENSE-2.0> (lib/plexus-cipher.license)

Plexus Security Dispatcher Component (<http://spice.sonatype.org/plexus-sec-dispatcher>)
org.sonatype.plexus:plexus-sec-dispatcher:jar:1.3

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```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML+RDFa 1.0//EN"
"http://www.w3.org/MarkUp/DTD/xhtml-rdfa-1.dtd">
<html xmlns="http://www.w3.org/1999/xhtml" xml:lang="en" version="XHTML+RDFa 1.0" dir="ltr">

<head profile="http://www.w3.org/1999/xhtml/vocab">
  <meta http-equiv="Content-Type" content="text/html; charset=utf-8" />
  <link rel="shortcut icon" href="http://opensource.org/files/garland_favicon.png" type="image/png" />
  <link rel="shortlink" href="/node/66" />
  <link rel="canonical" href="/licenses/MIT" />
  <meta name="Generator" content="Drupal 7 (http://drupal.org)" />
  <title>The MIT License (MIT) | Open Source Initiative</title>
  <link type="text/css" rel="stylesheet" href="http://opensource.org/files/css/css_xE-rWrJf-
fncB6ztZfd2huxqgxu4WO-qwma6Xer30m4.css" media="all" />
  <link type="text/css" rel="stylesheet" href="http://opensource.org/files/css/css_2ATB4XKGEvmoUk_p62PwI-
o2aW47EqqS0nD2dmPZoV4.css" media="all" />
  <link type="text/css" rel="stylesheet" href="http://opensource.org/files/css/css_2wI77kyP-
rJKVpFW5M3KFcj7Cb99lZalmubKIwWwsmU.css" media="all" />
  <link type="text/css" rel="stylesheet"
href="http://opensource.org/files/css/css_k3snrbsthqot7V7ccRZHS9OkCZkwBv4adtNieIVlbeU.css" media="print"
/>

  <!--[if lt IE 7]>
  <link type="text/css" rel="stylesheet" href="http://opensource.org/themes/garland/fix-ie.css?fnb7pm" media="all"
  />
  <![endif]-->
  <script type="text/javascript"
src="http://opensource.org/files/js/js_xAPI0qIk9eowy_is9tNkCWXLUVoat94SQT48UBCFkyQ.js"></script>
  <script type="text/javascript">
  <!--/--><![CDATA[//><!--
jQuery.extend(Drupal.settings,
  {"basePath":"\/","pathPrefix":"","ajaxPageState":{"theme":"garland","theme_token":"meUjjBBfr6QFJv5kp0oKi152
l673C3xJMLGIQzbH9g0"},"js":{"misc\/jquery.js":1,"misc\/jquery.once.js":1,"misc\/drupal.js":1},"css":{"modules\/s
ystem\/system.base.css":1,"modules\/system\/system.menus.css":1,"modules\/system\/system.messages.css":1,"mod
ules\/system\/system.theme.css":1,"modules\/aggregator\/aggregator.css":1,"modules\/comment\/comment.css":1,"m
odules\/field\/theme\/field.css":1,"sites\/all\/modules\/mollom\/mollom.css":1,"modules\/node\/node.css":1,"modules
\/search\/search.css":1,"modules\/user\/user.css":1,"themes\/garland\/style.css":1,"themes\/garland\/print.css":1,"the
mes\/garland\/fix-ie.css":1}}});
  /--><![]]>
</script>
</head>
<body class="html not-front not-logged-in one-sidebar sidebar-first page-node page-node- page-node-66 node-type-
page fluid-width" >
  <div id="skip-link">
    <a href="#main-content" class="element-invisible element-focusable">Skip to main content</a>
  </div>
```

```

<div id="wrapper">
  <div id="container" class="clearfix">

    <div id="header">
      <div id="logo-floater">
        <div id="branding"><strong><a href="/">
          
          <span>Open Source Initiative</span>      </a></strong></div>
        </div>

      </div> <!-- /#header -->

      <div id="sidebar-first" class="sidebar">
        <div class="region region-sidebar-first">
          <div id="block-search-form" class="block block-search clearfix">

            <h2 class="title">Search this site:</h2>

            <div class="content">
              <form action="/licenses/mit-license.php" method="post" id="search-block-form" accept-charset="UTF-
8"><div><div class="container-inline">
                <div class="form-item form-type-textfield form-item-search-block-form">
                  <label class="element-invisible" for="edit-search-block-form--2">Search </label>
                  <input title="Enter the terms you wish to search for." type="text" id="edit-search-block-form--2"
name="search_block_form" value="" size="15" maxlength="128" class="form-text" />
                </div>
                <div class="form-actions form-wrapper" id="edit-actions"><input type="submit" id="edit-submit" name="op"
value="Search" class="form-submit" /></div><input type="hidden" name="form_build_id" value="form-
MyBqFtDvdzOmaSnCHKIG9yhm0ofMr7fNMG5Vy76N_uk" />
                <input type="hidden" name="form_id" value="search_block_form" />
              </div>
            </div></form> </div>
          </div>
          <div id="block-system-navigation" class="block block-system block-menu clearfix">

            <h2 class="title">Navigation</h2>

            <div class="content">
              <ul class="menu"><li class="first collapsed"><a href="/about" title="About the Open Source Initiative">About
the OSI</a></li>
              <li class="collapsed"><a href="/osd" title="The actual OSD defining what constitutes an Open Source licence">The
Open Source Definition</a></li>
              <li class="collapsed"><a href="/licenses">Open Source Licenses</a></li>
              <li class="leaf"><a href="/working_groups">Working Groups</a></li>
              <li class="leaf"><a href="/faq" title="Frequently Asked Questions about open source and about the
OSI.">FAQ</a></li>
              <li class="collapsed"><a href="/trademark" title="Information about trademark and logo usage">Trademark and

```



```

Logo Usage</a></li>
<li class="collapsed"><a href="/osr-intro" title="Open Standards Requirement for Software">Open
Standards</a></li>
<li class="leaf"><a href="/osi-open-source-education" title="OSI&#039;s Open Source Education Initiative and
Activities">Open Source Education</a></li>
<li class="collapsed"><a href="/lists" title="The virtual committees where the OSI&#039;s work gets
done">Mailing lists</a></li>
<li class="collapsed"><a href="/help" title="Resources for questions and further exploration">Getting
Help</a></li>
<li class="collapsed"><a href="http://opensource.org/donate" title="">Donate to the OSI</a></li>
<li class="leaf"><a href="/members">OSI Individual Membership</a></li>
<li class="leaf"><a href="/store">OSI Store</a></li>
<li class="collapsed"><a href="/affiliates" title="Home page for OSI&#039;s membership scheme for non-profits
and not-for-profits">OSI Affiliate Membership</a></li>
<li class="leaf"><a href="/contact" title="">Contact OSI</a></li>
<li class="leaf"><a href="/ToS" title="Rules for posting content on this site">Terms of Service</a></li>
<li class="last leaf"><a href="/support">OSI Corporate Support</a></li>
</ul> </div>
</div>
</div>
</div>

```

```

<div id="center"><div id="squeeze"><div class="right-corner"><div class="left-corner">
<h2 class="element-invisible">You are here</h2><div class="breadcrumb"><a href="/">Home</a></div>
<a id="main-content"></a>
<div id="tabs-wrapper" class="clearfix">
<h1 class="with-tabs">The MIT License
(MIT)</h1>
</div>
<div class="clearfix">
<div class="region region-content">
<div id="block-system-main" class="block block-system clearfix">

```

```

<div class="content">
<div id="node-66" class="node node-page">

```

```

<div class="content clearfix">

<div class="field field-name-body field-type-text-with-summary field-label-hidden"><div class="field-
items"><div class="field-item even"><p>The MIT License (MIT)</p>
<p>Copyright (c) &lt;year&gt; &lt;copyright holders&gt;</p>
<p>Permission is hereby granted, free of charge, to any person obtaining a copy<br />
of this software and associated documentation files (the "Software"), to deal<br />
in the Software without restriction, including without limitation the rights<br />

```

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```
<!-- <rdf:RDF xmlns="http://web.resource.org/cc/" xmlns:dc="http://purl.org/dc/elements/1.1/"
xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#" xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#">
  <Work rdf:about="">
    <license rdf:resource="http://creativecommons.org/licenses/by/3.0/" />
  </Work>
  <License rdf:about="http://creativecommons.org/licenses/by/3.0/"><permits
rdf:resource="http://web.resource.org/cc/Reproduction"/><permits
rdf:resource="http://web.resource.org/cc/Distribution"/><requires
rdf:resource="http://web.resource.org/cc/Notice"/><requires
rdf:resource="http://web.resource.org/cc/Attribution"/><permits
rdf:resource="http://web.resource.org/cc/DerivativeWorks"/></License></rdf:RDF>
-->
```

| Terms of Service

```
</p>
</div>
</div>
<div id="block-block-7" class="block block-block clearfix">
```

```
<div class="content">
  <script src="http://www.google-analytics.com/urchin.js" type="text/javascript">
<!--/--><![CDATA[// ><!--
```

```
//--><![>
</script><script type="text/javascript">
<!--/--><![CDATA[// ><!--
```

```
_uacct = "UA-3916956-1";
urchinTracker();
```

```
//--><![>
</script> </div>
</div>
</div>
  </div></div></div></div> <!-- /.left-corner, /.right-corner, /#squeeze, /#center -->
```

```
</div> <!-- /#container -->
</div> <!-- /#wrapper -->
</body>
</html>
```

=====
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```
<!DOCTYPE html PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN">
```

```
<html>
```

```
<head>
```

```
<meta http-equiv="content-type"
content="text/html; charset=ISO-8859-1">
```

```
<title>CDDL ver. 1.0</title>
```

```
<meta name="author" content="Cliff Allen">
```

```
</head>
```

```
<body>
```

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</body>

</html>

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<html>

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<title>jsoup License</title>

<meta name="keywords" content="license, open source, mit">

<meta name="description" content="jsoup is licensed under the MIT open source license">

<link type="text/css" rel="stylesheet" href="/rez/style.css">

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<script type="text/javascript">
  var _gaq = _gaq || [];
  _gaq.push(['_setAccount', 'UA-89734-10']);
  _gaq.push(['_setDomainName', 'jsoup.org']);
  _gaq.push(['_trackPageview']);

  (function() {
    var ga = document.createElement('script'); ga.type = 'text/javascript'; ga.async = true;
    ga.src = ('https:' == document.location.protocol ? 'https://ssl' : 'http://www') + '.google-analytics.com/ga.js';
    var s = document.getElementsByTagName('script')[0]; s.parentNode.insertBefore(ga, s);
  })();
</script>
</head>
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<div class="nav-sections">
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<li class="n1-news"><a href="/news/">News</a></li>
<li class="n1-bugs"><a href="/bugs">Bugs</a></li>
<li class="n1-discussion"><a href="/discussion">Discussion</a></li>
<li class="n1-download"><a href="/download">Download</a></li>
<li class="n1-api"><a href="/apidocs/">API Reference</a></li>
<li class="n1-cookbook"><a href="/cookbook/">Cookbook</a></li>
<li class="n1-try"><a href="http://try.jsoup.org/">Try jsoup</a></li>
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<span class="seperator">&raquo;</span> jsoup License
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<div class="content">
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</div>
<!-- /col1 -->
<div class="col2">
</div>
<!-- /col2 -->
</div>
<!-- /content-->
<div class="footer">
<b>jsoup HTML parser</b> &copy; 2009 - 2014
<a href="http://jhy.io/" rel="author"><b>Jonathan Hedley</b></a>
</div>
</div>
<!-- /wrap -->
<script src="/rez/prettify.js"></script>
<script>prettyPrint();</script>
</body>
</html>
<?xml version="1.0" encoding="ISO-8859-1" ?>
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
<html xmlns="http://www.w3.org/1999/xhtml">

<head>
<meta http-equiv="Content-Type" content="text/html; charset=ISO-8859-1" />
<title>Eclipse Public License - Version 1.0</title>
<style type="text/css">
body {
size: 8.5in 11.0in;
margin: 0.25in 0.5in 0.25in 0.5in;
tab-interval: 0.5in;
}
p {
margin-left: auto;
margin-top: 0.5em;
margin-bottom: 0.5em;
}
p.list {
margin-left: 0.5in;
margin-top: 0.05em;
margin-bottom: 0.05em;
}
</style>
```

</head>

<body lang="EN-US">

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d) If a facility in the modified Library refers to a function or a table of data to be supplied by an application program that uses the facility, other than as an argument passed when the facility is invoked, then you must make a good faith effort to ensure that, in the event an application does not supply such function or table, the facility still operates, and performs whatever part of its purpose remains meaningful.

(For example, a function in a library to compute square roots has a purpose that is entirely well-defined independent of the application. Therefore, Subsection 2d requires that any application-supplied function or table used by this function must be optional: if the application does not supply it, the square root function must still compute square roots.)

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This option is useful when you wish to copy part of the code of the Library into a program that is not a library.

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If distribution of object code is made by offering access to copy from a designated place, then offering equivalent access to copy the source code from the same place satisfies the requirement to distribute the source code, even though third parties are not compelled to copy the source along with the object code.

5. A program that contains no derivative of any portion of the Library, but is designed to work with the Library by being compiled or linked with it, is called a "work that uses the Library". Such a work, in isolation, is not a derivative work of the Library, and therefore falls outside the scope of this License.

However, linking a "work that uses the Library" with the Library creates an executable that is a derivative of the Library (because it contains portions of the Library), rather than a "work that uses the library". The executable is therefore covered by this License. Section 6 states terms for distribution of such executables.

When a "work that uses the Library" uses material from a header file that is part of the Library, the object code for the work may be a derivative work of the Library even though the source code is not. Whether this is true is especially significant if the work can be linked without the Library, or if the work is itself a library. The threshold for this to be true is not precisely defined by law.

If such an object file uses only numerical parameters, data structure layouts and accessors, and small macros and small inline functions (ten lines or less in length), then the use of the object file is unrestricted, regardless of whether it is legally a derivative work. (Executables containing this object code plus portions of the Library will still fall under Section 6.)

Otherwise, if the work is a derivative of the Library, you may

distribute the object code for the work under the terms of Section 6. Any executables containing that work also fall under Section 6, whether or not they are linked directly with the Library itself.

6. As an exception to the Sections above, you may also combine or link a "work that uses the Library" with the Library to produce a work containing portions of the Library, and distribute that work under terms of your choice, provided that the terms permit modification of the work for the customer's own use and reverse engineering for debugging such modifications.

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b) Use a suitable shared library mechanism for linking with the Library. A suitable mechanism is one that (1) uses at run time a copy of the library already present on the user's computer system, rather than copying library functions into the executable, and (2) will operate properly with a modified version of the library, if the user installs one, as long as the modified version is interface-compatible with the version that the work was made with.

c) Accompany the work with a written offer, valid for at least three years, to give the same user the materials specified in Subsection 6a, above, for a charge no more than the cost of performing this distribution.

d) If distribution of the work is made by offering access to copy from a designated place, offer equivalent access to copy the above specified materials from the same place.

- e) Verify that the user has already received a copy of these materials or that you have already sent this user a copy.

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<signature of Ty Coon>, 1 April 1990
Ty Coon, President of Vice

That's all there is to it!

```
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN">
<html lang="en">
<head>
  <title>Apache License, Version 2.0</title>
```

```
<meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
<meta property="og:image" content="http://www.apache.org/images/asf_logo.gif" />

<link rel="stylesheet" type="text/css" media="screen" href="/css/style.css">
<link rel="stylesheet" type="text/css" media="screen" href="/css/code.css">

<script type="text/javascript" src="/js/jquery.js"></script>
<script type="text/javascript" src="/js/apache_boot.js"></script>
```

```
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permissions and limitations under the License. -->
</head>
```

```
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  <div id="header" class="grid_8">
    
    <h1>The Apache Software Foundation</h1>
    <h2>Apache License, Version 2.0</h2>
  </div>
  <div id="nav" class="grid_8">
    <ul>
      <!-- <li><a href="/" title="Welcome!">Home</a></li> -->
      <li><a href="/foundation/" title="The Foundation">Foundation</a></li>
      <li><a href="http://projects.apache.org" title="The Projects">Projects</a></li>
      <li><a href="http://people.apache.org" title="The People">People</a></li>
      <li><a href="/foundation/getinvolved.html" title="Get Involved">Get Involved</a></li>
      <li><a href="/dyn/closer.cgi" title="Download">Download</a></li>
      <li><a href="/foundation/sponsorship.html" title="Support Apache">Support Apache</a></li>
    </ul>
    <p><a href="/">Home</a> &nbsp;&raquo;&nbsp;&nbsp;<a href="/licenses/">Licenses</a></p>
    <form name="search" id="search" action="http://www.google.com/search" method="get">
      <input value="apache.org" name="sitesearch" type="hidden">
      <input type="text" name="q" id="query">
      <input type="submit" id="submit" value="Search">
    </form>
  </div>
  <div class="clear"></div>
```

<div id="content" class="grid_16"><div class="section-content"><p>Apache License
</br>Version 2.0,
January 2004
</br>

http://www.apache.org/licenses/ </p>

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</pre></div></div></div>

<div class="clear"></div>

</div>

<div id="footer" class="container_16">

<div class="links grid_16">

<div class="grid_3">

<h4>Projects</h4>

HTTP Server

Abdera

Accumulo

ACE

ActiveMQ

Airavata

- Allura
- Ambari
- Ant
- Any23
- APR
- Archiva
- Aries
- Avro
- Axis
- Bigtop
- Bloodhound
- Buildr
- BVal
- Camel
- Cassandra
- Cayenne
- Chemistry
- Chukwa
- Clerezza
- CloudStack
- Cocoon
- Commons
- Continuum
- Cordova
- CouchDB
- Creadur
- Crunch
- cTAKES
- Curator
- CXF
- DB
- Deltacloud
- DeltaSpike
- <a href="http://directmemory.apache.org/" title="An off-heap cache for the Java Virtual

Machine">DirectMemory

- Directory
- Empire-db
- Etch
- Felix
- Flex
- Flume
- Forrest
- Geronimo
- Giraph
- Gora
- Gump
- Hadoop
- Hama
- HBase
- Helix
- Hive
- HttpComponents
- Isis
- Jackrabbit
- James
- jclouds
- Jena
- JMeter
- JSPWiki
- jUDDI
- Kafka
- Karaf
- Knox
- Lenya
- Libcloud
- Logging
- Lucene
-

users.">Lucene.Net

Lucy

Mahout

ManifoldCF

Marmotta

Maven

Mesos

MINA

MRUnit

MyFaces

Nutch

ODE

OFBiz

Olingo

Oltu

Onami

OODT

Oozie

Open Climate Workbench

OpenJPA

OpenMeetings

OpenNLP

OpenOffice

OpenWebBeans

PDFBox

Perl

Pig

Pivot

POI

Portals

Qpid

Rave

River

Roller

Santuario

ServiceMix
Shindig
Shiro
SIS
Sling
SpamAssassin
Spark
Sqoop
Stanbol
STeVe
Storm
Struts
Subversion
Synapse
Syncope
Tajo
Tapestry
Tcl
Tez
Thrift
Tika
Tiles
Tomcat
TomEE
Traffic Server
Turbine
Tuscany
UIMA
VCL
Velocity
VXQuery
Web Services
Whirr

- [Wicket](http://wicket.apache.org/ "Component-based Java Web Application Framework")
- [Wink](http://wink.apache.org/ "RESTful Web services Framework")
- [Wookie](http://wookie.apache.org/ "Widgets for Applications")
- [Xalan](http://xalan.apache.org/ "XSLT processors in Java and C++")
- [Xerces](http://xerces.apache.org/ "XML parsers in Java, C++ and Perl")
- [XMLBeans](http://xmlbeans.apache.org/ "XML-Java binding tool")
- [XML Graphics](http://xmlgraphics.apache.org/ "Conversion from XML to graphical output")
- [ZooKeeper](http://zookeeper.apache.org/ "Centralized service for maintaining configuration information")

Foundation

- [FAQ](/foundation/faq.html)
- [Glossary](/foundation/glossary.html)
- [Licenses](/licenses/ "Overview of the Apache Licenses")
- [Trademarks](/foundation/marks/ "Apache marks policies and listing")
- [News](/foundation/news.html "Official news feed of Foundation announcements")
- [Press Inquiries](/press/ "Press, Media, and Analyst contact")
- [Public Records](/foundation/records/ "Formal corporate records and board meeting minutes")
- [Mailing Lists](/foundation/maillinglists.html "Mailing lists and Apache")
- [Sponsorship](/foundation/sponsorship.html "Sponsor the Foundation")
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- [Conferences](/foundation/conferences.html "Meetings of developers and users")
- [Community Development](http://community.apache.org/ "Helping newcomers to the ASF")
- [Incubator](http://incubator.apache.org/ "Shepherd for new projects")
- [Infrastructure](/dev/ "ASF Infrastructure: Operations and howto documents for PMCs and contributors")
- [Labs](http://labs.apache.org/ "The Innovation Laboratories of the Apache Software Foundation")
- [Legal Affairs](/legal/ "Legal Affairs")
- [Public Relations](/press/ "Public Relations")
- [Security](/security/ "Security")

```
<li><a href="/travel/" title="Travel Assistance">Travel Assistance</a></li>
</ul>
</div>

<div class="grid_3">
  <h4>Community</h4>
  <ul>
    <li><a href="http://people.apache.org/" title="Apache committer homepages">People</a></li>
    <li><a href="/memorials/" title="In memoriam of past committers">Memorials</a></li>
    <li><a href="http://feathercast.apache.org/" title="Apache Podcasts">Feathercast</a></li>
    <li><a href="http://blogs.apache.org/" title="Apache Project Blogs">Project Blogs</a></li>
    <li><a href="http://planet.apache.org/committers/" title="Apache Committers' Blogs">PlanetApache</a></li>

  </ul>
</div>
<div class="grid_3">
  <h4>How It Works</h4>
  <ul>
    <li><a href="/foundation/how-it-works.html">Introduction</a></li>
    <li><a href="/foundation/how-it-works.html#meritocracy">Meritocracy</a></li>
    <li><a href="/foundation/how-it-works.html#structure">Structure</a></li>
    <li><a href="/foundation/how-it-works.html#roles">Roles</a></li>
    <li><a href="/foundation/how-it-works.html#management">Collaboration</a></li>
    <li><a href="/foundation/how-it-works.html#incubator">Incubator</a></li>
    <li><a href="/foundation/how-it-works.html#other">Other entities</a></li>
    <li><a href="/foundation/glossary.html">Glossary</a></li>
    <li><a href="/foundation/voting.html">Voting</a></li>
  </ul>
</div>
</div>
<div class="clear"></div>

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* /opt/cola/permits/1274700344_1645235023.94/0/okio-2-8-0-sources-jar/jvmMain/okio/Buffer.kt
* /opt/cola/permits/1274700344_1645235023.94/0/okio-2-8-0-sources-jar/jvmMain/okio/Source.kt
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- * /opt/cola/permits/1274700344_1645235023.94/0/okio-2-8-0-sources-jar/commonMain/okio/-Util.kt
- * /opt/cola/permits/1274700344_1645235023.94/0/okio-2-8-0-sources-jar/commonMain/okio/internal/ByteString.kt
- * /opt/cola/permits/1274700344_1645235023.94/0/okio-2-8-0-sources-jar/commonMain/okio/-Platform.kt
- * /opt/cola/permits/1274700344_1645235023.94/0/okio-2-8-0-sources-jar/jvmMain/okio/-Platform.kt
- * /opt/cola/permits/1274700344_1645235023.94/0/okio-2-8-0-sources-jar/commonMain/okio/internal/-Utf8.kt
- * /opt/cola/permits/1274700344_1645235023.94/0/okio-2-8-0-sources-jar/commonMain/okio/ByteString.kt

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Found in path(s):

- * /opt/cola/permits/1274700344_1645235023.94/0/okio-2-8-0-sources-jar/jvmMain/okio/-DeprecatedUpgrade.kt
- * /opt/cola/permits/1274700344_1645235023.94/0/okio-2-8-0-sources-jar/jvmMain/okio/-DeprecatedUtf8.kt
- * /opt/cola/permits/1274700344_1645235023.94/0/okio-2-8-0-sources-jar/commonMain/okio/PeekSource.kt
- * /opt/cola/permits/1274700344_1645235023.94/0/okio-2-8-0-sources-jar/jvmMain/okio/-DeprecatedOkio.kt
- * /opt/cola/permits/1274700344_1645235023.94/0/okio-2-8-0-sources-jar/jvmMain/okio/Throttler.kt

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- * /opt/cola/permits/1274700344_1645235023.94/0/okio-2-8-0-sources-jar/jvmMain/okio/HashingSink.kt

* /opt/cola/permits/1274700344_1645235023.94/0/okio-2-8-0-sources-jar/jvmMain/okio/Pipe.kt
* /opt/cola/permits/1274700344_1645235023.94/0/okio-2-8-0-sources-jar/jvmMain/okio/HashingSource.kt
* /opt/cola/permits/1274700344_1645235023.94/0/okio-2-8-0-sources-jar/commonMain/okio/Options.kt

1.18 jmes-path-query-library 1.12.300

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Found in path(s):

* /opt/cola/permits/1473594315_1668734254.2778468/0/jmespath-java-1-12-300-jar/META-INF/maven/com.amazonaws/jmespath-java/pom.xml

1.19 micronaut-r2dbc 2.1.0

1.19.1 Available under license :

mcr.microsoft.com/mssql/server:2017-CU12

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1.20 jackson-datatype-jsr310 2.13.4

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1.21 micronaut-sql-libraries 4.2.3

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1.22 metrics-integration-with-jmx 4.0.5

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Manifest-Version: 1.0

Bnd-LastModified: 1545938260836

Build-Jdk: 1.8.0_191

Built-By: artem

Bundle-Description: A set of classes which allow you to report metrics via JMX.

Bundle-License: <http://www.apache.org/licenses/LICENSE-2.0.html>

Bundle-ManifestVersion: 2

Bundle-Name: Metrics Integration with JMX

Bundle-SymbolicName: io.dropwizard.metrics.jmx

Bundle-Version: 4.0.5

Created-By: Apache Maven Bundle Plugin

Export-Package: com.codahale.metrics.jmx;uses:="com.codahale.metrics,javax.management";version="4.0.5"

Implementation-Title: Metrics Integration with JMX

Implementation-URL: <http://metrics.dropwizard.io/metrics-jmx>

Implementation-Vendor-Id: io.dropwizard.metrics

Implementation-Version: 4.0.5

Import-Package: org.slf4j;version="[1.6.0,2.0.0)",com.codahale.metrics;version="[4.0,5)",javax.management

Require-Capability: osgi.ee;filter="(&(osgi.ee=JavaSE)(version=1.8))"

Tool: Bnd-3.3.0.201609221906

Found in path(s):

* /opt/cola/permits/1274704779_1648835825.49/0/metrics-jmx-4-0-5-jar/META-INF/MANIFEST.MF

1.23 antlr 3.5.2

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 */

@outputFile.imports() ::= <<
<@super.imports()>

<if(!TREE_PARSER)>
<! tree parser would already have imported !>
using Antlr.Runtime.Tree;
using RewriteRuleITokenStream = Antlr.Runtime.Tree.RewriteRuleTokenStream;
<endif>
>>

@genericParser.members() ::= <<
<@super.members()>
<parserMembers()>
>>
```



```

parserCtorBody() ::= <%
<super.parserCtorBody()><\n>
TreeAdaptor =
<if(actions.(actionScope).treeAdaptorInitializer)>
<actions.(actionScope).treeAdaptorInitializer>
<else>
new <actions.(actionScope).treeAdaptorType; null="CommonTreeAdaptor">()
<end>
;
%>

/** Add an adaptor property that knows how to build trees */
parserMembers() ::= <<
private <treeAdaptorType()> adaptor;

public <treeAdaptorType()> TreeAdaptor
{
get
{
return adaptor;
}

set
{
this.adaptor = value;
<grammar.directDelegates: {g|<g.delegateName()>.TreeAdaptor = this.adaptor;}>
}
}
>>

treeAdaptorType() ::= <<
<actions.(actionScope).treeAdaptorType; null="ITreeAdaptor">
>>

ruleReturnBaseType() ::= <%
Ast<if(TREE_PARSER)>Tree<else>Parser<endif>RuleReturnScope\<<ASTLabelType>, <labelType>>
%>

/** Add a variable to track rule's return AST */
ruleDeclarations() ::= <<
<super.ruleDeclarations()>
<ASTLabelType> root_0 = default(<ASTLabelType>);<\n>
>>

ruleLabelDefs() ::= <<
<super.ruleLabelDefs()>
<[ruleDescriptor.tokenLabels,ruleDescriptor.wildcardTreeLabels,ruleDescriptor.wildcardTreeListLabels]

```

```

: {it|<ASTLabelType> <it.label.text>_tree = default(<ASTLabelType>);}; separator="\n">
<ruleDescriptor.tokenListLabels: {it|<ASTLabelType> <it.label.text>_tree = default(<ASTLabelType>);};
separator="\n">
<ruleDescriptor.allTokenRefsInAltsWithRewrites
: {it|RewriteRule<rewriteElementType>Stream stream_<it>=new
RewriteRule<rewriteElementType>Stream(adaptor,"token <it>");}; separator="\n">
<ruleDescriptor.allRuleRefsInAltsWithRewrites
: {it|RewriteRuleSubtreeStream stream_<it>=new RewriteRuleSubtreeStream(adaptor,"rule <it>");};
separator="\n">
>>

/** When doing auto AST construction, we must define some variables;
* These should be turned off if doing rewrites. This must be a "mode"
* as a rule could have both rewrite and AST within the same alternative
* block.
*/
@alt.declarations() ::= <<
<if(autoAST)>
<if(outerAlt)>
<if(!rewriteMode)>
root_0 = (<ASTLabelType>)adaptor.Nil();
<endif>
<endif>
<endif>
>>

// Tracking Rule Elements

/** ID and track it for use in a rewrite rule */
tokenRefTrack(token,label,elementIndex,terminalOptions={}) ::= <<
<tokenRefBang(...)> <! Track implies no auto AST construction!>
<if(backtracking)>if (<actions.(actionScope).synpredgate>) <endif>stream_<token>.Add(<label>);<\n>
>>

/** ids+=ID and track it for use in a rewrite rule; adds to ids *and*
* to the tracking list stream_ID for use in the rewrite.
*/
tokenRefTrackAndListLabel(token,label,elementIndex,terminalOptions={}) ::= <<
<tokenRefTrack(...)>
<listLabelElem(elem=label,elemType=labelType,...)>
>>

/** ^(ID ...) track for rewrite */
tokenRefRuleRootTrack(token,label,elementIndex,terminalOptions={}) ::= <<
<tokenRefBang(...)>
<if(backtracking)>if (<actions.(actionScope).synpredgate>) <endif>stream_<token>.Add(<label>);
>>

```

```

/** Match ^(label+=TOKEN ...) track for rewrite */
tokenRefRuleRootTrackAndListLabel(token,label,elementIndex,terminalOptions={}) ::= <<
<tokenRefRuleRootTrack(...)>
<listLabelElem(elem=label,elemType=labelType,...)>
>>

/** rule when output=AST and tracking for rewrite */
ruleRefTrack(rule,label,elementIndex,args,scope) ::= <<
<super.ruleRef(...)>
<if(backtracking)>if (<actions.(actionScope).synpredgate>) <endif>stream_<rule.name>.Add(<label>.Tree);
>>

/** x+=rule when output=AST and tracking for rewrite */
ruleRefTrackAndListLabel(rule,label,elementIndex,args,scope) ::= <<
<ruleRefTrack(...)>
<listLabelElem(elem={<label>.Tree},elemType=ASTLabelType,...)>
>>

/** ^(rule ...) rewrite */
ruleRefRuleRootTrack(rule,label,elementIndex,args,scope) ::= <<
<ruleRefRuleRoot(...)>
<if(backtracking)>if (<actions.(actionScope).synpredgate>) <endif>stream_<rule>.Add(<label>.Tree);
>>

/** ^(x+=rule ...) rewrite */
ruleRefRuleRootTrackAndListLabel(rule,label,elementIndex,args,scope) ::= <<
<ruleRefRuleRootTrack(...)>
<listLabelElem(elem={<label>.Tree},elemType=ASTLabelType,...)>
>>

// R e w r i t e

rewriteCode(
alts, description,
referencedElementsDeep, // ALL referenced elements to right of ->
referencedTokenLabels,
referencedTokenListLabels,
referencedRuleLabels,
referencedRuleListLabels,
referencedWildcardLabels,
referencedWildcardListLabels,
rewriteBlockLevel, enclosingTreeLevel, treeLevel) ::= <<
<\n>{
// AST REWRITE
// elements: <referencedElementsDeep; separator=", ">
// token labels: <referencedTokenLabels; separator=", ">
// rule labels: <referencedRuleLabels; separator=", ">
// token list labels: <referencedTokenListLabels; separator=", ">

```

```

// rule list labels: <referencedRuleListLabels; separator=", ">
// wildcard labels: <[referencedWildcardLabels,referencedWildcardListLabels]; separator=", ">
<if(backtracking)>
if (<actions.(actionScope).synpredgate>) {
<endif>
<prevRuleRootRef(>).Tree = root_0;
<rewriteCodeLabels(>
root_0 = (<ASTLabelType>)adaptor.Nil();
<alts:rewriteAlt(> separator="else ">
<! if tree parser and rewrite=true !>
<if(TREE_PARSER&&rewriteMode)>
<prevRuleRootRef(>).Tree = (<ASTLabelType>)adaptor.RulePostProcessing(root_0);
if (<prevRuleRootRef(>).Tree != null)
input.ReplaceChildren(adaptor.GetParent(retval.Start), adaptor.GetChildIndex(retval.Start),
adaptor.GetChildIndex(_last), retval.Tree);
<endif>
<! if parser or tree-parser && rewrite!=true, we need to set result !>
<if(!TREE_PARSER||!rewriteMode)>
<prevRuleRootRef(>).Tree = root_0;
<endif>
<if(backtracking)>
}
<endif>
}
>>

rewriteCodeLabels() ::= <<
<referencedTokenLabels
:{it|RewriteRule<rewriteElementType>Stream stream_<it>=new
RewriteRule<rewriteElementType>Stream(adaptor,"token <it>",<it>)};
separator="\n"
>
<referencedTokenListLabels
:{it|RewriteRule<rewriteElementType>Stream stream_<it>=new
RewriteRule<rewriteElementType>Stream(adaptor,"token <it>",<it>)};
separator="\n"
>
<referencedWildcardLabels
:{it|RewriteRuleSubtreeStream stream_<it>=new RewriteRuleSubtreeStream(adaptor,"wildcard <it>",<it>)};
separator="\n"
>
<referencedWildcardListLabels
:{it|RewriteRuleSubtreeStream stream_<it>=new RewriteRuleSubtreeStream(adaptor,"wildcard <it>",<it>)};
separator="\n"
>
<referencedRuleLabels
:{it|RewriteRuleSubtreeStream stream_<it>=new RewriteRuleSubtreeStream(adaptor,"rule

```

```

<it>",<it>!=null?<it>.Tree:null);};
    separator="\n"
>
<referencedRuleListLabels
  :{it|RewriteRuleSubtreeStream stream_<it>=new RewriteRuleSubtreeStream(adaptor,"token <it>",<it>);};
  separator="\n"
>
>>

/** Generate code for an optional rewrite block; note it uses the deep ref'd element
 * list rather shallow like other blocks.
 */
rewriteOptionalBlock(
  alt,rewriteBlockLevel,
  referencedElementsDeep, // all nested refs
  referencedElements, // elements in immediately block; no nested blocks
  description) ::=
<<
// <fileName>:<description>
if (<referencedElementsDeep:{el | stream_<el>.HasNext}; separator="||">)
{
  <alt>
}
<referencedElementsDeep:{el | stream_<el>.Reset();<\n>}>
>>

rewriteClosureBlock(
  alt,rewriteBlockLevel,
  referencedElementsDeep, // all nested refs
  referencedElements, // elements in immediately block; no nested blocks
  description) ::=
<<
// <fileName>:<description>
while ( <referencedElements:{el | stream_<el>.HasNext}; separator="||"> )
{
  <alt>
}
<referencedElements:{el | stream_<el>.Reset();<\n>}>
>>

rewritePositiveClosureBlock(
  alt,rewriteBlockLevel,
  referencedElementsDeep, // all nested refs
  referencedElements, // elements in immediately block; no nested blocks
  description) ::=
<<
if (!(<referencedElements:{el | stream_<el>.HasNext}; separator="||">))
{

```

```

    throw new RewriteEarlyExitException();
  }
  while ( <referencedElements:{el | stream_<el>.HasNext}; separator="||"> )
  {
    <alt>
  }
  <referencedElements:{el | stream_<el>.Reset();<\n>}>
>>

rewriteAlt(a) ::= <<
// <a.description>
<if(a.pred)>
if (<a.pred>)
{
  <a.alt>
}
<else>
{
  <a.alt>
}
<endif>
>>

/** For empty rewrites: "r : ... -> ;" */
rewriteEmptyAlt() ::= "root_0 = null;"

rewriteTree(root,children,description,enclosingTreeLevel,treeLevel) ::= <<
// <fileName>:<description>
{
  <ASTLabelType> root_<treeLevel> = (<ASTLabelType>)adaptor.Nil();
  <root:rewriteElement()>
  <children:rewriteElement()>
  adaptor.AddChild(root_<enclosingTreeLevel>, root_<treeLevel>);
}<\n>
>>

rewriteElementList(elements) ::= "<elements:rewriteElement()>"

rewriteElement(e) ::= <%
<@pregen()>
DebugLocation(<e.line>, <e.pos>);<\n>
<e.el>
%>

/** Gen ID or ID[args] */
rewriteTokenRef(token,elementIndex,args,terminalOptions={}) ::= <<
adaptor.AddChild(root_<treeLevel>, <createRewriteNodeFromElement(...)>);<\n>
>>

```

```

/** Gen $label ... where defined via label=ID */
rewriteTokenLabelRef(label,elementIndex) ::= <<
adaptor.AddChild(root_<treeLevel>, stream_<label>.NextNode());<\n>
>>

/** Gen $label ... where defined via label+=ID */
rewriteTokenListLabelRef(label,elementIndex) ::= <<
adaptor.AddChild(root_<treeLevel>, stream_<label>.NextNode());<\n>
>>

/** Gen ^($label ...) */
rewriteTokenLabelRefRoot(label,elementIndex) ::= <<
root_<treeLevel> = (<ASTLabelType>)adaptor.BecomeRoot(stream_<label>.NextNode(), root_<treeLevel>);<\n>
>>

/** Gen ^($label ...) where label+=... */
rewriteTokenListLabelRefRoot ::= rewriteTokenLabelRefRoot

/** Gen ^(ID ...) or ^(ID[args] ...) */
rewriteTokenRefRoot(token,elementIndex,args,terminalOptions={ }) ::= <<
root_<treeLevel> = (<ASTLabelType>)adaptor.BecomeRoot(<createRewriteNodeFromElement(...)>,
root_<treeLevel>);<\n>
>>

rewriteImaginaryTokenRef(args,token,elementIndex,terminalOptions={ }) ::= <<
adaptor.AddChild(root_<treeLevel>, <createImaginaryNode(tokenType=token, ...)>);<\n>
>>

rewriteImaginaryTokenRefRoot(args,token,elementIndex,terminalOptions={ }) ::= <<
root_<treeLevel> = (<ASTLabelType>)adaptor.BecomeRoot(<createImaginaryNode(tokenType=token, ...)>,
root_<treeLevel>);<\n>
>>

/** plain -> {foo} action */
rewriteAction(action) ::= <<
root_0 = <action>;<\n>
>>

/** What is the name of the previous value of this rule's root tree? This
* let's us refer to $rule to mean previous value. I am reusing the
* variable 'tree' sitting in retval struct to hold the value of root_0 right
* before I set it during rewrites. The assign will be to retval.tree.
*/
prevRuleRootRef() ::= "retval"

rewriteRuleRef(rule) ::= <<
adaptor.AddChild(root_<treeLevel>, stream_<rule>.NextTree());<\n>

```

```

>>

rewriteRuleRefRoot(rule) ::= <<
root_<treeLevel> = (<ASTLabelType>)adaptor.BecomeRoot(stream_<rule>.NextNode(), root_<treeLevel>);<\n>
>>

rewriteNodeAction(action) ::= <<
adaptor.AddChild(root_<treeLevel>, <action>);<\n>
>>

rewriteNodeActionRoot(action) ::= <<
root_<treeLevel> = (<ASTLabelType>)adaptor.BecomeRoot(<action>, root_<treeLevel>);<\n>
>>

/** Gen $ruleLabel ... where defined via ruleLabel=rule */
rewriteRuleLabelRef(label) ::= <<
adaptor.AddChild(root_<treeLevel>, stream_<label>.NextTree());<\n>
>>

/** Gen $ruleLabel ... where defined via ruleLabel+=rule */
rewriteRuleListLabelRef(label) ::= <<
adaptor.AddChild(root_<treeLevel>, stream_<label>.NextTree());<\n>
>>

/** Gen ^($ruleLabel ...) where ruleLabel=rule */
rewriteRuleLabelRefRoot(label) ::= <<
root_<treeLevel> = (<ASTLabelType>)adaptor.BecomeRoot(stream_<label>.NextNode(), root_<treeLevel>);<\n>
>>

/** Gen ^($ruleLabel ...) where ruleLabel+=rule */
rewriteRuleListLabelRefRoot(label) ::= <<
root_<treeLevel> = (<ASTLabelType>)adaptor.BecomeRoot(stream_<label>.NextNode(), root_<treeLevel>);<\n>
>>

rewriteWildcardLabelRef(label) ::= <<
adaptor.AddChild(root_<treeLevel>, stream_<label>.NextTree());<\n>
>>

createImaginaryNode(tokenType,args,terminalOptions={ }) ::= <%
<if(terminalOptions.node)>
<! new MethodNode(IDLabel, args) !>
new <terminalOptions.node><(tokenType><if(args)>, <args; separator=", "><endif>)
<else>
(<ASTLabelType>)adaptor.Create(<tokenType>, <args; separator=", "><if(!args)>"<tokenType>"<endif>)
<endif>
%>

createRewriteNodeFromElement(token,args,terminalOptions={ }) ::= <%

```



```

<if(terminalOptions.node)>
new <terminalOptions.node>(stream_<token>.NextToken())<if(args)>, <args; separator=", "><endif>
<else>
<if(args)> <! must create new node from old !>
adaptor.Create(<token>, <args; separator=", ">)
<else>
stream_<token>.NextNode()
<endif>
<endif>
%>

```

Found in path(s):

```
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-
jar/org/antlr/codegen/templates/CSharp2/AST.stg
```

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Found in path(s):

```
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-
jar/org/antlr/codegen/templates/Python3/Dbg.stg
```

```
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-
jar/org/antlr/codegen/templates/Python/AST.stg
```

```
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-
jar/org/antlr/codegen/templates/Python/Dbg.stg
```

```
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-
jar/org/antlr/codegen/templates/Python3/AST.stg
```

```
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-
jar/org/antlr/codegen/templates/Java/ASTParser.stg
```

```
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/tool/serialize.g
```

```
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-
jar/org/antlr/codegen/templates/ActionScript/ASTParser.stg
```

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```
/*
```

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*/

```
scalaTypeInitMap ::= [  
  "Int": "0",  
  "Long": "0",  
  "Float": "0.0f",  
  "Double": "0.0",  
  "Boolean": "false",  
  "Byte": "0",  
  "Short": "0",  
  "Char": "0",  
  default: "null" // anything other than an atomic type  
]
```

```
/** The overall file structure of a recognizer; stores methods for rules  
 * and cyclic DFAs plus support code.
```

```
*/
```

```
outputFile(LEXER,PARSER,TREE_PARSER, actionScope, actions,  
  docComment, recognizer,  
  name, tokens, tokenNames, rules, cyclicDFAs,  
  bitsets, buildTemplate, buildAST, rewriteMode, profile,  
  backtracking, synpreds, memoize, numRules,  
  fileName, ANTLRVersion, generatedTimestamp, trace,  
  scopes, superClass, literals) ::=
```

```

<<
// $ANTLR <ANTLRVersion> <fileName> <generatedTimestamp>
<actions.(actionScope).header>

<@imports>
import org.antlr.runtime._
<if(TREE_PARSER)>
import org.antlr.runtime.tree._
<endif>
<@end>

<docComment>
<recognizer>
>>

lexer(grammar, name, tokens, scopes, rules, numRules, filterMode, labelType="CommonToken",
    superClass="Lexer") ::= <<
object <grammar.recognizerName> {
    <tokens:{it | val <it.name> = <it.type>}; separator="\n">

    <cyclicDFAs:cyclicDFA()> <! dump tables for all DFA !>
}

class <grammar.recognizerName>(input: CharStream, state<grammar.delegators:{g|, <g.recognizerName>
<g.delegateName()>}: RecognizerSharedState) extends <@superClassName><superClass><@end>(input,
state<grammar.delegators:{g|, <g.recognizerName> <g.delegateName()>}>) {
    import <grammar.recognizerName>._
    <actions.lexer.members>

    // delegates
    <grammar.delegates:
        {g|<g.recognizerName> <g.delegateName()>}; separator="\n">
    // delegators
    <grammar.delegators:
        {g|<g.recognizerName> <g.delegateName()>}; separator="\n">
    <last(grammar.delegators):{g|public <g.recognizerName> gParent;}>

    <scopes:{it | <if(it.isDynamicGlobalScope)><globalAttributeScope()><endif>}>

    def this(input<grammar.delegators:{g|, <g.recognizerName> <g.delegateName()>}: CharStream) =
        this(input, new RecognizerSharedState()<grammar.delegators:{g|, <g.delegateName()>}>)

    <if(memoize)>
    <if(grammar.grammarIsRoot)>
        state.ruleMemo = new Array[java.util.Map[_,_]](<numRules>+1)<\n> <! index from 1..n !>
    <endif>
    <endif>

    <grammar.directDelegates:

```

```

    {g|<g:delegateName()> = new <g.recognizerName>(input, state<trunc(g.delegators):{p|,
<p:delegateName()>>, this}); separator="\n">
    <grammar.delegators:
    {g|this.<g:delegateName()> = <g:delegateName()>}; separator="\n">
    <last(grammar.delegators):{g|gParent = <g:delegateName()>}>

override def getGrammarFileName = "<fileName>"

<if(filterMode)>
    <filteringNextToken()>
<endif>
    <rules; separator="\n\n">

    <synpreds:{p | <lexerSynpred(p)>}>
    <cyclicDFAs:{dfa | private val dfa<dfa.decisionNumber> = new
<grammar.recognizerName>.DFA<dfa.decisionNumber>(this)}; separator="\n">
}
>>

/** A override of Lexer.nextToken() that backtracks over mTokens() looking
 * for matches. No error can be generated upon error; just rewind, consume
 * a token and then try again. backtracking needs to be set as well.
 * Make rule memoization happen only at levels above 1 as we start mTokens
 * at backtracking==1.
 */
filteringNextToken() ::= <<
override def nextToken(): Token = {
    while (true) {
        if ( input.LA(1)==CharStream.EOF ) {
            var eof: Token = new CommonToken((CharStream)input,Token.EOF,
                Token.DEFAULT_CHANNEL,
                input.index(),input.index())
            eof.setLine(getLine())
            eof.setCharPositionInLine(getCharPositionInLine())
            return eof
        }
        state.token = null
state.channel = Token.DEFAULT_CHANNEL
state.tokenStartCharIndex = input.index()
state.tokenStartCharPositionInLine = input.getCharPositionInLine()
state.tokenStartLine = input.getLine()
state.text = null
try {
    val m = input.mark()
    state.backtracking=1 <! means we won't throw slow exception !>
    state.failed=false
    mTokens()
    state.backtracking=0

```

```

    <! mTokens backtracks with synpred at backtracking==2
      and we set the synpredgate to allow actions at level 1. !>
    if ( state.failed ) {
      input.rewind(m)
      input.consume() <! advance one char and try again !>
    }
    else {
      emit()
      return state.token
    }
  }
}
catch {
  case re: RecognitionException =>
    // shouldn't happen in backtracking mode, but...
    reportError(re)
    recover(re)
  }
}
}

override def memoize(input: IntStream,
  ruleIndex: Int,
  ruleStartIndex: Int) = {
if ( state.backtracking>1 ) super.memoize(input, ruleIndex, ruleStartIndex)
}

override def alreadyParsedRule(input: IntStream, ruleIndex: Int):Boolean {
if ( state.backtracking>1 ) return super.alreadyParsedRule(input, ruleIndex)
return false
}
}
>>

actionGate() ::= "state.backtracking==0"

filteringActionGate() ::= "state.backtracking==1"

/** How to generate a parser */
genericParser(grammar, name, scopes, tokens, tokenNames, rules, numRules,
  bitsets, inputStreamType, superClass,
  labelType, members, rewriteElementType,
  filterMode, ASTLabelType="Object") ::= <<
object <grammar.recognizerName> {
<if(grammar.grammarIsRoot)>
  val tokenNames = Array(
    "\<invalid>", "\<EOR>", "\<DOWN>", "\<UP>", <tokenNames; separator=", ">
  )<\n>
<endif>

```

```

<tokens:{it | val <it.name> = <it.type>}; separator="\n">

<cyclicDFAs:cyclicDFA()> <! dump tables for all DFA !>

<bitsets:{it | <bitset(name={FOLLOW_<it.name>_in_<it.inName><it.tokenIndex>},
    words64=it.bits)>>
}

class <grammar.recognizerName>(input: <inputStreamType>, state<grammar.delegators:{g|, <g.recognizerName>
<g.delegateName()>>: RecognizerSharedState) extends <@superClassName><superClass><@end>(input, state) {
import <grammar.recognizerName>._
// delegates
<grammar.delegators:
    {g|public <g.recognizerName> <g.delegateName()>}; separator="\n">
// delegators
<grammar.delegators:
    {g|public <g.recognizerName> <g.delegateName()>}; separator="\n">
<last(grammar.delegators):{g|public <g.recognizerName> gParent;}>

<scopes:{it | <if(it.isDynamicGlobalScope)><globalAttributeScope()><endif>>}>

<@members>
<! WARNING. bug in ST: this is cut-n-paste into Dbg.stg !>
def this(input<grammar.delegators:{g|, <g.recognizerName> <g.delegateName()>>: <inputStreamType>) =
    this(input, new RecognizerSharedState()<grammar.delegators:{g|, <g.delegateName()>>))

    <parserCtorBody()>
    <grammar.directDelegates:
        {g|<g.delegateName()> = new <g.recognizerName>(input, state<trunc(g.delegators):{p|,
<p:delegateName()>>}, this)}; separator="\n">
        <grammar.indirectDelegates:{g | <g.delegateName()> = <g.delegator:delegateName()>.<g.delegateName()>};
separator="\n">
        <last(grammar.delegators):{g|gParent = <g.delegateName()>}>
    <@end>

    override def getTokenNames: Array[String] = tokenNames
    override def getGrammarFileName = "<fileName>"

<members>

<rules; separator="\n\n">

<! generate rule/method definitions for imported rules so they
appear to be defined in this recognizer. !>
// Delegated rules
<grammar.delegatedRules:{ruleDescriptor|
    @throws(classOf[RecognitionException])
    def <ruleDescriptor.name>(<ruleDescriptor.parameterScope:parameterScope()>): <returnType()> = \{

```

```

<if(ruleDescriptor.hasReturnValue)>return
<endif><ruleDescriptor.grammar:delegateName()>.<ruleDescriptor.name><ruleDescriptor.parameterScope.attributes: {a|<a.name>; separator=", "> \}}; separator="\n">

    <synpreds: {p | <synpred(p)>}>

    <cyclicDFAs: {dfa | private val dfa<dfa.decisionNumber> = new
<grammar.recognizerName>.DFA<dfa.decisionNumber>(this); separator="\n">
    }
>>

parserCtorBody() ::= <<
<if(memoize)>
<if(grammar.grammarIsRoot)>
this.state.ruleMemo = new Array[java.util.Map[_,_]](<length(grammar.allImportedRules)>+1)<\n> <! index from
1..n !>
<endif>
<endif>
<grammar.delegators:
{g|this.<g:delegateName()> = <g:delegateName()>}; separator="\n">
>>

parser(grammar, name, scopes, tokens, tokenNames, rules, numRules, bitsets,
    ASTLabelType="Object", superClass="Parser", labelType="Token",
    members={<actions.parser.members>}) ::= <<
<genericParser(inputStreamType="TokenStream", rewriteElementType="Token", ...)>
>>

/** How to generate a tree parser; same as parser except the input
 * stream is a different type.
 */
treeParser(grammar, name, scopes, tokens, tokenNames, globalAction, rules,
    numRules, bitsets, filterMode, labelType={<ASTLabelType>}, ASTLabelType="Object",
superClass={<if(filterMode)><if(buildAST)>TreeRewriter<else>TreeFilter<endif><else>TreeParser<endif>},
members={<actions.treeparser.members>}
    ) ::= <<
<genericParser(inputStreamType="TreeNodeStream", rewriteElementType="Node", ...)>
>>

/** A simpler version of a rule template that is specific to the imaginary
 * rules created for syntactic predicates. As they never have return values
 * nor parameters etc..., just give simplest possible method. Don't do
 * any of the normal memoization stuff in here either; it's a waste.
 * As predicates cannot be inlined into the invoking rule, they need to
 * be in a rule by themselves.
 */
synpredRule(ruleName, ruleDescriptor, block, description, nakedBlock) ::=
<<

```

```

// $ANTLR start <ruleName>
@throws(classOf[RecognitionException])
def <ruleName>_fragment(<ruleDescriptor.parameterScope:parameterScope(>): Unit = {
    <ruleLabelDefs(>
<if(trace)>
    traceIn("<ruleName>_fragment", <ruleDescriptor.index>)
    try {
        <block>
    }
    finally {
        traceOut("<ruleName>_fragment", <ruleDescriptor.index>);
    }
<else>
    <block>
<endif>
}
// $ANTLR end <ruleName>
>>

```

```

synpred(name) ::= <<
final def <name>(): Boolean = {
    state.backtracking+=1
    <@start(>
    val start = input.mark()
    try {
        <name>_fragment() // can never throw exception
    } catch {
        case re: RecognitionException =>
            System.err.println("impossible: "+re)
    }
    val success = !state.failed
    input.rewind(start)
    <@stop(>
    state.backtracking-=1
    state.failed=false
    success
}<\n>
>>

```

```

lexerSynpred(name) ::= <<
<synpred(name)>
>>

```

```

ruleMemoization(name) ::= <<
<if(memoize)>
if ( state.backtracking>0 && alreadyParsedRule(input, <ruleDescriptor.index> ) ) { return <ruleReturnValue(> }
<endif>
>>

```



```

/** How to test for failure and return from rule */
checkRuleBacktrackFailure() ::= <<
<if(backtracking)>if (state.failed) return <ruleReturnValue()><endif>
>>

/** This rule has failed, exit indicating failure during backtrack */
ruleBacktrackFailure() ::= <<
<if(backtracking)>if (state.backtracking>0) {state.failed=true; return <ruleReturnValue()>}<endif>
>>

/** How to generate code for a rule. This includes any return type
 * data aggregates required for multiple return values.
 */
rule(ruleName,ruleDescriptor,block,emptyRule,description,exceptions,finally,memoize) ::= <<
<ruleAttributeScope(scope=ruleDescriptor.ruleScope)>
<returnScope(scope=ruleDescriptor.returnScope)>

// $ANTLR start "<ruleName>"
// <fileName>:<description>
@throws(classOf[RecognitionException])
final def <ruleName>(<ruleDescriptor.parameterScope:parameterScope()>): <returnType()> = {
  <if(trace)>traceIn("<ruleName>", <ruleDescriptor.index>)<endif>
  <ruleScopeSetUp()>
  <ruleDeclarations()>
  <ruleLabelDefs()>
  <ruleDescriptor.actions.init>
  <@preamble()>
  try {
    <ruleMemoization(name=ruleName)>
    <block>
    <ruleCleanUp()>
    <(ruleDescriptor.actions.after):execAction()>
  }
  <if(exceptions)>
    <exceptions:{e|<catch(decl=e.decl,action=e.action)><\n>}>
  <else>
  <if(!emptyRule)>
  <if(actions.(actionScope).rulecatch)>
    <actions.(actionScope).rulecatch>
  <else>
    catch {
      case re: RecognitionException =>
        reportError(re)
        recover(input,re)
    }
  <@setErrorReturnValue()>
  }<\n>
  <endif>
}

```

```

<endif>
<endif>
  finally {
    <if(trace)>traceOut("<ruleName>", <ruleDescriptor.index>);<endif>
    <memoize()>
    <ruleScopeCleanUp()>
    <finally>
  }
  <@postamble()>
  return <ruleReturnValue()>
}
// $ANTLR end "<ruleName>"
>>

catch(decl,action) ::= <<
catch (<e.decl>) {
  <e.action>
}
>>

ruleDeclarations() ::= <<
<if(ruleDescriptor.hasMultipleReturnValues)>
val retval = new <returnType()>()
retval.start = input.LT(1)<\n>
<else>
<ruleDescriptor.returnScope.attributes: { a |
var <a.name>: <a.type> = <if(a.initValue)><a.initValue><else><initValue(a.type)><endif>
}>
<endif>
<if(memoize)>
val <ruleDescriptor.name>_startIndex = input.index()
<endif>
>>

ruleScopeSetUp() ::= <<
<ruleDescriptor.useScopes: {it | <it>_stack.push(new <it>_scope()); separator="\n">
<ruleDescriptor.ruleScope: {it | <it.name>_stack.push(new <it.name>_scope()); separator="\n">
>>

ruleScopeCleanUp() ::= <<
<ruleDescriptor.useScopes: {it | <it>_stack.pop(); separator="\n">
<ruleDescriptor.ruleScope: {it | <it.name>_stack.pop(); separator="\n">
>>

ruleLabelDefs() ::= <<
<[ruleDescriptor.tokenLabels,ruleDescriptor.tokenListLabels,
ruleDescriptor.wildcardTreeLabels,ruleDescriptor.wildcardTreeListLabels]

```

```

    :{it | var <it.label.text>: <labelType> = null}; separator="\n"
  >
  <[ruleDescriptor.tokenListLabels,ruleDescriptor.ruleListLabels,ruleDescriptor.wildcardTreeListLabels]
    :{it | var list_<it.label.text>: java.util.List=null}; separator="\n"
  >
  <ruleDescriptor.ruleLabels:ruleLabelDef(); separator="\n">
  <ruleDescriptor.ruleListLabels:{ll|var <ll.label.text>: RuleReturnScope = null}; separator="\n">
  >>

```

```

lexerRuleLabelDefs() ::= <<
  <[ruleDescriptor.tokenLabels,
    ruleDescriptor.tokenListLabels,
    ruleDescriptor.ruleLabels]
    :{it | var <it.label.text>: <labelType>=null}; separator="\n"
  >
  <ruleDescriptor.charLabels:{it | int <it.label.text>;}; separator="\n">
  <[ruleDescriptor.tokenListLabels,
    ruleDescriptor.ruleListLabels]
    :{it | var list_<it.label.text>: java.util.List=null}; separator="\n"
  >
  >>

```

```

ruleReturnValue() ::= <<
  <if(!ruleDescriptor.isSynPred)>
  <if(ruleDescriptor.hasReturnValue)>
  <if(ruleDescriptor.hasSingleReturnValue)>
  <ruleDescriptor.singleValueReturnName>
  <else>
  retval
  <endif>
  <endif>
  <endif>
  >>

```

```

ruleCleanup() ::= <<
  <if(ruleDescriptor.hasMultipleReturnValues)>
  <if(!TREE_PARSER)>
  retval.stop = input.LT(-1)<\n>
  <endif>
  <endif>
  >>

```

```

memoize() ::= <<
  <if(memoize)>
  <if(backtracking)>
  if ( state.backtracking>0 ) { memoize(input, <ruleDescriptor.index>, <ruleDescriptor.name>_StartIndex) }
  <endif>
  <endif>

```

```
>>
```

```
/** How to generate a rule in the lexer; naked blocks are used for  
* fragment rules.  
*/
```

```
lexerRule(ruleName,nakedBlock,ruleDescriptor,block,memoize) ::= <<  
// $ANTLR start "<ruleName>"  
@throws(classOf[RecognitionException])  
final def m<ruleName>(<ruleDescriptor.parameterScope:parameterScope()): Unit = {  
  <if(trace)>traceIn("<ruleName>", <ruleDescriptor.index>)<endif>  
  <ruleScopeSetUp()>  
  <ruleDeclarations()>  
  try {  
<if(nakedBlock)>  
    <ruleMemoization(name=ruleName)>  
    <lexerRuleLabelDefs()>  
    <ruleDescriptor.actions.init>  
    try <block><\n>  
<else>  
    var _type = <ruleName>  
    var _channel = BaseRecognizer.DEFAULT_TOKEN_CHANNEL  
    <ruleMemoization(name=ruleName)>  
    <lexerRuleLabelDefs()>  
    <ruleDescriptor.actions.init>  
    try <block>  
    <ruleCleanUp()>  
    state.`type` = _type  
    state.channel = _channel  
    <(ruleDescriptor.actions.after):execAction()>  
<endif>  
  }  
  finally {  
    <if(trace)>traceOut("<ruleName>", <ruleDescriptor.index>)<endif>  
    <ruleScopeCleanUp()>  
    <memoize()>  
  }  
}  
// $ANTLR end "<ruleName>"  
>>
```

```
/** How to generate code for the implicitly-defined lexer grammar rule  
* that chooses between lexer rules.  
*/
```

```
tokensRule(ruleName,nakedBlock,args,block,ruleDescriptor) ::= <<  
@throws(classOf[RecognitionException])  
def mTokens(): Unit = {  
  <block><\n>  
}
```

>>

// S U B R U L E S

/** A (...) subrule with multiple alternatives */

block(alts,decls,decision,enclosingBlockLevel,blockLevel,decisionNumber,maxK,maxAlt,description) ::= <<

// <fileName>:<description>

var alt<decisionNumber> = <maxAlt>

<decls>

<@predecision()>

<decision>

<@postdecision()>

<@prebranch()>

alt<decisionNumber> match {

<alts:{ a | <altSwitchCase(i,a)> }>

case _ =>

}

<@postbranch()>

>>

/** A rule block with multiple alternatives */

ruleBlock(alts,decls,decision,enclosingBlockLevel,blockLevel,decisionNumber,maxK,maxAlt,description) ::= <<

// <fileName>:<description>

var alt<decisionNumber> = <maxAlt>

<decls>

<@predecision()>

<decision>

<@postdecision()>

alt<decisionNumber> match {

<alts:{ a | <altSwitchCase(i,a)> }>

case _ =>

}

>>

ruleBlockSingleAlt(alts,decls,decision,enclosingBlockLevel,blockLevel,decisionNumber,description) ::= <<

// <fileName>:<description>

<decls>

<@prealt()>

<alts>

<@postalt()>

>>

/** A special case of a (...) subrule with a single alternative */

blockSingleAlt(alts,decls,decision,enclosingBlockLevel,blockLevel,decisionNumber,description) ::= <<

// <fileName>:<description>

<decls>

<@prealt()>

<alts>

```

<@postalt()>
>>

/** A (..)+ block with 1 or more alternatives */
positiveClosureBlock(alts,decls,decision,enclosingBlockLevel,blockLevel,decisionNumber,maxK,maxAlt,description) ::= <<
// <fileName>:<description>
<decls>
var cnt<decisionNumber>: Int = 0
<@preloop()>
var loop<decisionNumber>_quitflag = false
while (!loop<decisionNumber>_quitflag) {
  var alt<decisionNumber>:Int = <maxAlt>
  <@predecision()>
  <decision>
  <@postdecision()>
  alt<decisionNumber> match {
    <alts:{a | <altSwitchCase(i,a)>}>
  }
  case _ =>
    if ( cnt<decisionNumber> >= 1 ) loop<decisionNumber>_quitflag = true
    else {
      <ruleBacktrackFailure()>
      val eee = new EarlyExitException(<decisionNumber>, input)
      <@earlyExitException()>
      throw eee
    }
  }
  cnt<decisionNumber>+=1
}
<@postloop()>
>>

```

```

positiveClosureBlockSingleAlt ::= positiveClosureBlock

```

```

/** A (..)* block with 1 or more alternatives */
closureBlock(alts,decls,decision,enclosingBlockLevel,blockLevel,decisionNumber,maxK,maxAlt,description) ::= <<
// <fileName>:<description>
<decls>
<@preloop()>
var loop<decisionNumber>_quitflag = false
while (!loop<decisionNumber>_quitflag) {
  var alt<decisionNumber>:Int = <maxAlt>
  <@predecision()>
  <decision>
  <@postdecision()>
  alt<decisionNumber> match {
    <alts:{a | <altSwitchCase(i,a)>}>
  }
}

```

```

    case _ => loop<decisionNumber>_quitflag = true
    }
}
<@postloop()>
>>

closureBlockSingleAlt ::= closureBlock

/** Optional blocks (x)? are translated to (x|) by before code generation
 * so we can just use the normal block template
 */
optionalBlock ::= block

optionalBlockSingleAlt ::= block

/** A case in a switch that jumps to an alternative given the alternative
 * number. A DFA predicts the alternative and then a simple switch
 * does the jump to the code that actually matches that alternative.
 */
altSwitchCase(altNum, alt) ::= <<
case <altNum> =>
    <@prealt()>
    <alt>
>>

/** An alternative is just a list of elements; at outermost level */
alt(elements,altNum,description,autoAST,outerAlt,treeLevel,rew) ::= <<
// <fileName>:<description>
{
<@declarations()>
<elements:element()>
<rew>
<@cleanup()>
}
>>

/** What to emit when there is no rewrite. For auto build
 * mode, does nothing.
 */
noRewrite(rewriteBlockLevel, treeLevel) ::= ""

// E L E M E N T S

/** Dump the elements one per line */
element(e) ::= <<
<@prematch()>
<e.el><\n>
>>

```

```

/** match a token optionally with a label in front */
tokenRef(token,label,elementIndex,terminalOptions) ::= <<
<if(label)><label>=<endif>`match`(input,<token>,FOLLOW_<token>_in_<ruleName><elementIndex>)<if(label)>
.asInstanceOf[<labelType>]<endif>
<checkRuleBacktrackFailure()>
>>

```

```

/** ids+=ID */
tokenRefAndListLabel(token,label,elementIndex,terminalOptions) ::= <<
<tokenRef(...)>
<listLabel(elem=label,...)>
>>

```

```

listLabel(label,elem) ::= <<
if (list_<label>==null) list_<label>=new java.util.ArrayList()
list_<label>.add(<elem>)<\n>
>>

```

```

/** match a character */
charRef(char,label) ::= <<
<if(label)>
<label> = input.LA(1)<\n>
<endif>
`match`(<char>)
<checkRuleBacktrackFailure()>
>>

```

```

/** match a character range */
charRangeRef(a,b,label) ::= <<
<if(label)>
<label> = input.LA(1)<\n>
<endif>
matchRange(<a>,<b>); <checkRuleBacktrackFailure()>
>>

```

```

/** For now, sets are interval tests and must be tested inline */
matchSet(s,label,elementIndex,terminalOptions,postmatchCode="") ::= <<
<if(label)>
<if(LEXER)>
<label>= input.LA(1)<\n>
<else>
<label>=input.LT(1).asInstanceOf[<labelType>]<\n>
<endif>
<endif>
<endif>
if ( <s> ) {
    input.consume()
    <postmatchCode>
}

```



```

<if(!LEXER)>
  state.errorRecovery=false<\n>
<endif>
  <if(backtracking)>state.failed=false<endif>
}
else {
  <ruleBacktrackFailure()>
  val mse = new MismatchedSetException(null,input)
  <@mismatchedSetException()>
<if(LEXER)>
  recover(mse)
  throw mse
<else>
  throw mse
  <! use following code to make it recover inline; remove throw mse;
  recoverFromMismatchedSet(input,mse,FOLLOW_set_in_<ruleName><elementIndex>)
  !>
<endif>
}<\n>
>>

```

```

matchRuleBlockSet ::= matchSet

```

```

matchSetAndListLabel(s,label,elementIndex,postmatchCode) ::= <<
<matchSet(...)>
<listLabel(elem=label,...)>
>>

```

```

/** Match a string literal */

```

```

lexerStringRef(string,label,elementIndex="0") ::= <<
<if(label)>
val <label>Start = getCharIndex()
`match`(<string>)
<checkRuleBacktrackFailure()>
val <label>StartLine<elementIndex> = getLine()
val <label>StartCharPos<elementIndex> = getCharPositionInLine()
<label> = new <labelType>(input, Token.INVALID_TOKEN_TYPE, Token.DEFAULT_CHANNEL, <label>Start,
getCharIndex()-1)
<label>.setLine(<label>StartLine<elementIndex>)
<label>.setCharPositionInLine(<label>StartCharPos<elementIndex>)
<else>
`match`(<string>)
<checkRuleBacktrackFailure()><\n>
<endif>
>>

```

```

wildcard(token,label,elementIndex,terminalOptions) ::= <<
<if(label)>

```

```

<label>=input.LT(1).asInstanceOf[<labelType>]<\n>
<endif>
matchAny(input)
<checkRuleBacktrackFailure()>
>>

```

```

wildcardAndListLabel(token,label,elementIndex,terminalOptions) ::= <<
<wildcard(...)>
<listLabel(elem=label,...)>
>>

```

```

/** Match . wildcard in lexer */
wildcardChar(label, elementIndex) ::= <<
<if(label)>
<label> = input.LA(1)<\n>
<endif>
matchAny()
<checkRuleBacktrackFailure()>
>>

```

```

wildcardCharListLabel(label, elementIndex) ::= <<
<wildcardChar(...)>
<listLabel(elem=label,...)>
>>

```

```

/** Match a rule reference by invoking it possibly with arguments
 * and a return value or values. The 'rule' argument was the
 * target rule name, but now is type Rule, whose toString is
 * same: the rule name. Now though you can access full rule
 * descriptor stuff.
 */
ruleRef(rule,label,elementIndex,args,scope) ::= <<
pushFollow(FOLLOW_<rule.name>_in_<ruleName><elementIndex>)
<if(label)><label>=<endif><if(scope)><scope.delegateName()>.<endif><rule.name>(<args; separator=", ">)<\n>
state._fsp-=1
<checkRuleBacktrackFailure()>
>>

```

```

/** ids+=1 */
ruleRefAndListLabel(rule,label,elementIndex,args,scope) ::= <<
<ruleRef(...)>
<listLabel(elem=label,...)>
>>

```

```

/** A lexer rule reference.
 *
 * The 'rule' argument was the target rule name, but now
 * is type Rule, whose toString is same: the rule name.

```

```

* Now though you can access full rule descriptor stuff.
*/
lexerRuleRef(rule,label,args,elementIndex,scope) ::= <<
<if(label)>
val <label>Start<elementIndex> = getCharIndex()
val <label>StartLine<elementIndex> = getLine()
val <label>StartCharPos<elementIndex> = getCharPositionInLine()
<if(scope)><scope.delegateName().<endif>m<rule.name>(<args; separator=", ">)
<checkRuleBacktrackFailure()>
<label> = new <labelType>(input, Token.INVALID_TOKEN_TYPE, Token.DEFAULT_CHANNEL,
<label>Start<elementIndex>, getCharIndex()-1)
<label>.setLine(<label>StartLine<elementIndex>)
<label>.setCharPositionInLine(<label>StartCharPos<elementIndex>)
<else>
<if(scope)><scope.delegateName().<endif>m<rule.name>(<args; separator=", ">)
<checkRuleBacktrackFailure()>
<endif>
>>

/** i+=INT in lexer */
lexerRuleRefAndListLabel(rule,label,args,elementIndex,scope) ::= <<
<lexerRuleRef(...)>
<listLabel(elem=label,...)>
>>

/** EOF in the lexer */
lexerMatchEOF(label,elementIndex) ::= <<
<if(label)>
val <label>Start<elementIndex> = getCharIndex()
val <label>StartLine<elementIndex> = getLine()
val <label>StartCharPos<elementIndex> = getCharPositionInLine()
`match`(EOF)
<checkRuleBacktrackFailure()>
val <label> = new <labelType>(input, EOF, Token.DEFAULT_CHANNEL, <label>Start<elementIndex>,
getCharIndex()-1)
<label>.setLine(<label>StartLine<elementIndex>)
<label>.setCharPositionInLine(<label>StartCharPos<elementIndex>)
<else>
`match`(EOF)
<checkRuleBacktrackFailure()>
<endif>
>>

// used for left-recursive rules
recRuleDefArg()          ::= "int <recRuleArg()>"
recRuleArg()            ::= "_p"
recRuleAltPredicate(ruleName,opPrec) ::= "<recRuleArg()> |<= <opPrec>"
recRuleSetResultAction() ::= "root_0=${<ruleName>}_primary.tree;"

```

```
recRuleSetReturnAction(src,name) ::= "$<name>=$<src>.<name>";
```

```
/** match ^(root children) in tree parser */
```

```
tree(root, actionsAfterRoot, children, nullableChildList,
```

```
    enclosingTreeLevel, treeLevel) ::= <<
```

```
<root:element()>
```

```
<actionsAfterRoot:element()>
```

```
<if(nullableChildList)>
```

```
if ( input.LA(1)==Token.DOWN ) {
```

```
    `match`(input, Token.DOWN, null)
```

```
    <checkRuleBacktrackFailure()>
```

```
    <children:element()>
```

```
    `match`(input, Token.UP, null)
```

```
    <checkRuleBacktrackFailure()>
```

```
}
```

```
<else>
```

```
`match`(input, Token.DOWN, null)
```

```
<checkRuleBacktrackFailure()>
```

```
<children:element()>
```

```
`match`(input, Token.UP, null)
```

```
<checkRuleBacktrackFailure()>
```

```
<endif>
```

```
>>
```

```
/** Every predicate is used as a validating predicate (even when it is
```

```
 * also hoisted into a prediction expression).
```

```
*/
```

```
validateSemanticPredicate(pred,description) ::= <<
```

```
if ( !(<evalPredicate(...)>) ) {
```

```
    <ruleBacktrackFailure()>
```

```
    throw new FailedPredicateException(input, "<ruleName>", "<description>")
```

```
}
```

```
>>
```

```
// F i x e d D F A (if-then-else)
```

```
dfaState(k,edges,eotPredictsAlt,description,stateNumber,semPredState) ::= <<
```

```
val LA<decisionNumber>_<stateNumber> = input.LA(<k>)<\n>
```

```
<edges; separator="\nelse ">
```

```
else {
```

```
<if(eotPredictsAlt)>
```

```
    alt<decisionNumber>=<eotPredictsAlt>
```

```
<else>
```

```
    <ruleBacktrackFailure()>
```

```
    val nvae = new NoViableAltException("<description>", <decisionNumber>, <stateNumber>, input)<\n>
```

```
    <@noViableAltException()>
```

```
    throw nvae<\n>
```

```
<endif>
```

```

}
>>

/** Same as a normal DFA state except that we don't examine lookahead
 * for the bypass alternative. It delays error detection but this
 * is faster, smaller, and more what people expect. For (X)? people
 * expect "if ( LA(1)==X ) match(X);" and that's it.
 */
dfaOptionalBlockState(k,edges,eotPredictsAlt,description,stateNumber,semPredState) ::= <<
val LA<decisionNumber>_<stateNumber> = input.LA(<k>)<\n>
<edges; separator="\nelse ">
>>

/** A DFA state that is actually the loopback decision of a closure
 * loop. If end-of-token (EOT) predicts any of the targets then it
 * should act like a default clause (i.e., no error can be generated).
 * This is used only in the lexer so that for ('a')* on the end of a rule
 * anything other than 'a' predicts exiting.
 */
dfaLoopbackState(k,edges,eotPredictsAlt,description,stateNumber,semPredState) ::= <<
val LA<decisionNumber>_<stateNumber> = input.LA(<k>)<\n>
<edges; separator="\nelse "><\n>
<if(eotPredictsAlt)>
<if(!edges)>
alt<decisionNumber>=<eotPredictsAlt> <! if no edges, don't gen ELSE !>
<else>
else {
  alt<decisionNumber>=<eotPredictsAlt>
}<\n>
<endif>
<endif>
>>

/** An accept state indicates a unique alternative has been predicted */
dfaAcceptState(alt) ::= "alt<decisionNumber>=<alt>"

/** A simple edge with an expression. If the expression is satisfied,
 * enter to the target state. To handle gated productions, we may
 * have to evaluate some predicates for this edge.
 */
dfaEdge(labelExpr, targetState, predicates) ::= <<
if ( (<labelExpr> <if(predicates)>&& (<predicates>)<endif> ) {
  <targetState>
}
>>

// F i x e d D F A (switch case)

```

```

/** A DFA state where a SWITCH may be generated. The code generator
 * decides if this is possible: CodeGenerator.canGenerateSwitch().
 */
dfaStateSwitch(k,edges,eotPredictsAlt,description,stateNumber,semPredState) ::= <<
input.LA(<k>) match {
<edges; separator="\n">
case _ =>
<if(eotPredictsAlt)>
  alt<decisionNumber>=<eotPredictsAlt>
<else>
  <ruleBacktrackFailure()>
  val nvae = new NoViableAltException("<description>", <decisionNumber>, <stateNumber>, input)<\n>
  <@noViableAltException()>
  throw nvae<\n>
<endif>
}<\n>
>>

dfaOptionalBlockStateSwitch(k,edges,eotPredictsAlt,description,stateNumber,semPredState) ::= <<
input.LA(<k>) match {
  <edges; separator="\n">
  case _ =>
}<\n>
>>

dfaLoopbackStateSwitch(k, edges,eotPredictsAlt,description,stateNumber,semPredState) ::= <<
input.LA(<k>) match {
<edges; separator="\n"><\n>
case _ =>
<if(eotPredictsAlt)>
  alt<decisionNumber>=<eotPredictsAlt>;
<endif>
}<\n>
>>

dfaEdgeSwitch(labels, targetState) ::= <<
case <labels:{it | <it>}>; separator=" | ">=>
{
  <targetState>
}
>>

// C y c l i c D F A

/** The code to initiate execution of a cyclic DFA; this is used
 * in the rule to predict an alt just like the fixed DFA case.
 * The <name> attribute is inherited via the parser, lexer, ...
 */

```

```

dfaDecision(decisionNumber,description) ::= <<
alt<decisionNumber> = dfa<decisionNumber>.predict(input)
>>

/* Dump DFA tables as run-length-encoded Strings of octal values.
* Can't use hex as compiler translates them before compilation.
* These strings are split into multiple, concatenated strings.
* Java puts them back together at compile time thankfully.
* Java cannot handle large static arrays, so we're stuck with this
* encode/decode approach. See analysis and runtime DFA for
* the encoding methods.
*/
cyclicDFA(dfa) ::= <<
val DFA<dfa.decisionNumber>_eotS =
  "<dfa.javaCompressedEOT; wrap="+\n  \"">"
val DFA<dfa.decisionNumber>_eofS =
  "<dfa.javaCompressedEOF; wrap="+\n  \"">"
val DFA<dfa.decisionNumber>_minS =
  "<dfa.javaCompressedMin; wrap="+\n  \"">"
val DFA<dfa.decisionNumber>_maxS =
  "<dfa.javaCompressedMax; wrap="+\n  \"">"
val DFA<dfa.decisionNumber>_acceptS =
  "<dfa.javaCompressedAccept; wrap="+\n  \"">"
val DFA<dfa.decisionNumber>_specialS =
  "<dfa.javaCompressedSpecial; wrap="+\n  \"">}">"
val DFA<dfa.decisionNumber>_transitionS: Array[String] = Array(
  <dfa.javaCompressedTransition: {s|<s; wrap="+\n\"">" }; separator=",\n">
)

val DFA<dfa.decisionNumber>_eot: Array[Short] = DFA.unpackEncodedString(DFA<dfa.decisionNumber>_eotS)
val DFA<dfa.decisionNumber>_eof: Array[Short] = DFA.unpackEncodedString(DFA<dfa.decisionNumber>_eofS)
val DFA<dfa.decisionNumber>_min: Array[Char] =
DFA.unpackEncodedStringToUnsignedChars(DFA<dfa.decisionNumber>_minS)
val DFA<dfa.decisionNumber>_max: Array[Char] =
DFA.unpackEncodedStringToUnsignedChars(DFA<dfa.decisionNumber>_maxS)
val DFA<dfa.decisionNumber>_accept: Array[Short] =
DFA.unpackEncodedString(DFA<dfa.decisionNumber>_acceptS)
val DFA<dfa.decisionNumber>_special: Array[Short] =
DFA.unpackEncodedString(DFA<dfa.decisionNumber>_specialS)
val DFA<dfa.decisionNumber>_transition = new
Array[Array[Short]](DFA<dfa.decisionNumber>_transitionS.length)

for (i \<- DFA<dfa.decisionNumber>_transition.indices) {
  DFA<dfa.decisionNumber>_transition(i) =
DFA.unpackEncodedString(DFA<dfa.decisionNumber>_transitionS(i))
}

class DFA<dfa.decisionNumber> extends DFA {

```

```

def this(recognizer: BaseRecognizer) = {
  this()
  this.recognizer = recognizer
  this.decisionNumber = <dfa.decisionNumber>
  this.eot = DFA<dfa.decisionNumber>_eot
  this.eof = DFA<dfa.decisionNumber>_eof
  this.min = DFA<dfa.decisionNumber>_min
  this.max = DFA<dfa.decisionNumber>_max
  this.accept = DFA<dfa.decisionNumber>_accept
  this.special = DFA<dfa.decisionNumber>_special
  this.transition = DFA<dfa.decisionNumber>_transition
}
override def getDescription = "<dfa.description>"
<@errorMethod()>
<if(dfa.specialStateSTs)>
  @throws(classOf[NoViableAltException])
  override def specialStateTransition(s: Int, _input: IntStream):Int = {
    <if(LEXER)>
      val input = _input
    <endif>
    <if(PARSER)>
      val input = _input.asInstanceOf[TokenStream]
    <endif>
    <if(TREE_PARSER)>
      val input = _input.asInstanceOf[TreeNodeStream]
    <endif>
    val _s = s
    s match {
      <dfa.specialStateSTs:{state |
        case <i0> => <! compressed special state numbers 0..n-1 !>
          <state>}; separator="\n">
        case _ =>
          }
    }
  }
<if(backtracking)>
  if (state.backtracking>0) {state.failed=true; return -1}<\n>
<endif>
  val nvae = new NoViableAltException(getDescription(), <dfa.decisionNumber>, _s, input)
  error(nvae)
  throw nvae
}<\n>
<endif>
}<\n>
>>

/** A state in a cyclic DFA; it's a special state and part of a big switch on
 * state.
 */

```



```

cyclicDFAState(decisionNumber,stateNumber,edges,needErrorClause,semPredState) ::= <<
val LA<decisionNumber>_<stateNumber>: Int = input.LA(1)<\n>
<if(semPredState)> <! get next lookahead symbol to test edges, then rewind !>
val index<decisionNumber>_<stateNumber>: Int = input.index()
input.rewind()<\n>
<endif>
s = -1
<edges; separator="\nelse ">
<if(semPredState)> <! return input cursor to state before we rewound !>
input.seek(index<decisionNumber>_<stateNumber>)<\n>
<endif>
if ( s>=0 ) return s
>>

/** Just like a fixed DFA edge, test the lookahead and indicate what
 * state to jump to next if successful.
 */
cyclicDFAEdge(labelExpr, targetStateNumber, edgeNumber, predicates) ::= <<
if ( (<labelExpr> <if(predicates)>&& (<predicates>)<endif> ) { s = <targetStateNumber>}<\n>
>>

/** An edge pointing at end-of-token; essentially matches any char;
 * always jump to the target.
 */
eotDFAEdge(targetStateNumber,edgeNumber, predicates) ::= <<
s = <targetStateNumber><\n>
>>

// D F A E X P R E S S I O N S

andPredicates(left,right) ::= "<left>&&<right>"

orPredicates(operands) ::= "<operands; separator=\"||\">"

notPredicate(pred) ::= "!(<evalPredicate(pred,\""\")>)"

evalPredicate(pred,description) ::= "<pred>"

evalSynPredicate(pred,description) ::= "<pred>()"

lookaheadTest(atom,k,atomAsInt) ::= "LA<decisionNumber>_<stateNumber>===<atom>"

/** Sometimes a lookahead test cannot assume that LA(k) is in a temp variable
 * somewhere. Must ask for the lookahead directly.
 */
isolatedLookaheadTest(atom,k,atomAsInt) ::= "input.LA(<k>)==<atom>"

```

```

lookaheadRangeTest(lower,upper,k,rangeNumber,lowerAsInt,upperAsInt) ::= <<
(LA<decisionNumber>_<stateNumber> >= <lower> && LA<decisionNumber>_<stateNumber> \<= <upper>)
>>

isolatedLookaheadRangeTest(lower,upper,k,rangeNumber,lowerAsInt,upperAsInt) ::= "(input.LA(<k>) >=<lower>
&& input.LA(<k>) \<= <upper>)"

setTest(ranges) ::= "<ranges; separator=\\\"\\\">"

// A T T R I B U T E S

globalAttributeScope(scope) ::= <<
<if(scope.attributes)>
class <scope.name>_scope {
  <scope.attributes:{it | var <it.name>: <it.type> = _}; separator="\\n">
}
val <scope.name>_stack = new collection.mutable.Stack[<scope.name>_scope]<\\n>
<endif>
>>

ruleAttributeScope(scope) ::= <<
<if(scope.attributes)>
class <scope.name>_scope {
  <scope.attributes:{it | var <it.name>: <it.type> = _}; separator="\\n">
}
val <scope.name>_stack = new collection.mutable.Stack[<scope.name>_scope]<\\n>
<endif>
>>

returnStructName(r) ::= "<r.name>_return"

returnType() ::= <<
<if(ruleDescriptor.hasMultipleReturnValues)>
<ruleDescriptor:returnStructName()>
<else>
<if(ruleDescriptor.hasSingleReturnValue)>
<ruleDescriptor.singleValueReturnType>
<else>
Unit
<endif>
<endif>
>>

/** Generate the Java type associated with a single or multiple return
 * values.
 */
ruleLabelType(referencedRule) ::= <<
<if(referencedRule.hasMultipleReturnValues)>

```

```

<referencedRule.name>_return
<else>
<if(referencedRule.hasSingleReturnValue)>
<referencedRule.singleValueReturnType>
<else>
Unit
<endif>
<endif>
>>

delegateName(d) ::= <<
<if(d.label)><d.label><else>g<d.name><endif>
>>

/** Using a type to init value map, try to init a type; if not in table
 * must be an object, default value is "null".
 */
initValue(typeName) ::= <<
<scalaTypeInitMap.(typeName)>
>>

/** Define a rule label including default value */
ruleLabelDef(label) ::= <<
var <label.label.text>: <ruleLabelType(referencedRule=label.referencedRule)> =
<initValue(typeName=ruleLabelType(referencedRule=label.referencedRule))><\n>
>>

/** Define a return struct for a rule if the code needs to access its
 * start/stop tokens, tree stuff, attributes, ... Leave a hole for
 * subgroups to stick in members.
 * TODO(matthewlloyd): make this static
 */
returnScope(scope) ::= <<
<if(ruleDescriptor.hasMultipleReturnValues)>
final class <ruleDescriptor:returnStructName()> extends
<if(TREE_PARSER)>Tree<else>Parser<endif>RuleReturnScope {
  <scope.attributes:{it | var <it.name>: <it.type> = _}; separator="\n">
  <@ruleReturnMembers()>
}
<endif>
>>

parameterScope(scope) ::= <<
<scope.attributes:{it | <it.name>: <it.type>}; separator=", ">
>>

parameterAttributeRef(attr) ::= "<attr.name>"
parameterSetAttributeRef(attr,expr) ::= "<attr.name> =<expr>"

```

```

scopeAttributeRef(scope,attr,index,negIndex) ::= <%
<if(negIndex)>
<scope>_stack(<scope>_stack.size-<negIndex>-1).<attr.name>
<else>
<if(index)>
<scope>_stack(<index>).<attr.name>
<else>
<scope>_stack.top.<attr.name>
<endif>
<endif>
%>

scopeSetAttributeRef(scope,attr,expr,index,negIndex) ::= <%
<if(negIndex)>
<scope>_stack(<scope>_stack.size-<negIndex>-1).<attr.name> = <expr>
<else>
<if(index)>
<scope>_stack(<index>).<attr.name> = <expr>
<else>
<scope>_stack.top.<attr.name> = <expr>
<endif>
<endif>
%>

/** $x is either global scope or x is rule with dynamic scope; refers
 * to stack itself not top of stack. This is useful for predicates
 * like {$function.size(>)>0 && $function::name.equals("foo")}?
 */
isolatedDynamicScopeRef(scope) ::= "<scope>_stack"

/** reference an attribute of rule; might only have single return value */
ruleLabelRef(referencedRule,scope,attr) ::= <%
<if(referencedRule.hasMultipleReturnValues)>
(if (<scope>!=null) <scope>.<attr.name> else <initValue(attr.type)>)
<else>
<scope>
<endif>
%>

returnAttributeRef(ruleDescriptor,attr) ::= <%
<if(ruleDescriptor.hasMultipleReturnValues)>
retval.<attr.name>
<else>
<attr.name>
<endif>
%>

```

```

returnSetAttributeRef(ruleDescriptor,attr,expr) ::= <%
<if(ruleDescriptor.hasMultipleReturnValues)>
retval.<attr.name> =<expr>
<else>
<attr.name> =<expr>
<endif>
%>

/** How to translate $tokenLabel */
tokenLabelRef(label) ::= "<label>"

/** ids+=ID {$ids} or e+=expr {$e} */
listLabelRef(label) ::= "list_<label>"

// not sure the next are the right approach

tokenLabelPropertyRef_text(scope,attr) ::= "(if (<scope>!=null) <scope>.getText() else null)"
tokenLabelPropertyRef_type(scope,attr) ::= "(if (<scope>!=null) <scope>.getType() else 0)"
tokenLabelPropertyRef_line(scope,attr) ::= "(if (<scope>!=null) <scope>.getLine() else 0)"
tokenLabelPropertyRef_pos(scope,attr) ::= "(if (<scope>!=null) <scope>.getCharPositionInLine() else 0)"
tokenLabelPropertyRef_channel(scope,attr) ::= "(if (<scope>!=null) <scope>.getChannel() else 0)"
tokenLabelPropertyRef_index(scope,attr) ::= "(if (<scope>!=null) <scope>.getTokenIndex() else 0)"
tokenLabelPropertyRef_tree(scope,attr) ::= "<scope>_tree"
tokenLabelPropertyRef_int(scope,attr) ::= "(if (<scope>!=null) Integer.valueOf(<scope>.getText()) else 0)"

ruleLabelPropertyRef_start(scope,attr) ::= "(if (<scope>!=null) <scope>.start.asInstanceOf[<labelType>] else null)"
ruleLabelPropertyRef_stop(scope,attr) ::= "(if (<scope>!=null) <scope>.stop.asInstanceOf[<labelType>] else null)"
ruleLabelPropertyRef_tree(scope,attr) ::= "(if (<scope>!=null) <scope>.tree.asInstanceOf[<ASTLabelType>] else
null)"
ruleLabelPropertyRef_text(scope,attr) ::= <<
<if(TREE_PARSER)>
(if (<scope>!=null) (input.getTokenStream().toString(
input.getTreeAdaptor().getTokenStartIndex(<scope>.start),
input.getTreeAdaptor().getTokenStopIndex(<scope>.start))) else null)
<else>
(if (<scope>!=null) input.toString(<scope>.start,<scope>.stop) else null)
<endif>
>>

ruleLabelPropertyRef_st(scope,attr) ::= "(if (<scope>!=null) <scope>.st else null)"

/** Isolated $RULE ref ok in lexer as it's a Token */
lexerRuleLabel(label) ::= "<label>"

lexerRuleLabelPropertyRef_type(scope,attr) ::=
"(if (<scope>!=null) <scope>.getType() else 0)"
lexerRuleLabelPropertyRef_line(scope,attr) ::=

```

```

"(if (<scope>!=null) <scope>.getLine() else 0)"
lexerRuleLabelPropertyRef_pos(scope,attr) ::=
"(if (<scope>!=null) <scope>.getCharPositionInLine() else -1)"
lexerRuleLabelPropertyRef_channel(scope,attr) ::=
"(if (<scope>!=null) <scope>.getChannel() else 0)"
lexerRuleLabelPropertyRef_index(scope,attr) ::=
"(if (<scope>!=null) <scope>.getTokenIndex() else 0)"
lexerRuleLabelPropertyRef_text(scope,attr) ::=
"(if (<scope>!=null) <scope>.getText() else null)"
lexerRuleLabelPropertyRef_int(scope,attr) ::=
"(if (<scope>!=null) Integer.valueOf(<scope>.getText()) else 0)"

// Somebody may ref $template or $tree or $stop within a rule:
rulePropertyRef_start(scope,attr) ::= "(retval.start.asInstanceOf[<labelType>])"
rulePropertyRef_stop(scope,attr) ::= "(retval.stop.asInstanceOf[<labelType>])"
rulePropertyRef_tree(scope,attr) ::= "(retval.tree.asInstanceOf[<ASTLabelType>])"
rulePropertyRef_text(scope,attr) ::= <<
<if(TREE_PARSER)>
input.getTokenStream().toString(
input.getTreeAdaptor().getTokenStartIndex(retval.start),
input.getTreeAdaptor().getTokenStopIndex(retval.start))
<else>
input.toString(retval.start,input.LT(-1))
<endif>
>>
rulePropertyRef_st(scope,attr) ::= "retval.st"

lexerRulePropertyRef_text(scope,attr) ::= "getText()"
lexerRulePropertyRef_type(scope,attr) ::= "_type"
lexerRulePropertyRef_line(scope,attr) ::= "state.tokenStartLine"
lexerRulePropertyRef_pos(scope,attr) ::= "state.tokenStartCharPositionInLine"
lexerRulePropertyRef_index(scope,attr) ::= "-1" // undefined token index in lexer
lexerRulePropertyRef_channel(scope,attr) ::= "_channel"
lexerRulePropertyRef_start(scope,attr) ::= "state.tokenStartCharIndex"
lexerRulePropertyRef_stop(scope,attr) ::= "(getCharIndex()-1)"
lexerRulePropertyRef_int(scope,attr) ::= "Integer.valueOf(<scope>.getText())"

// setting $st and $tree is allowed in local rule. everything else
// is flagged as error
ruleSetPropertyRef_tree(scope,attr,expr) ::= "retval.tree =<expr>"
ruleSetPropertyRef_st(scope,attr,expr) ::= "retval.st =<expr>"

/** How to execute an action (only when not backtracking) */
execAction(action) ::= <<
<if(backtracking)>
if ( <actions.(actionScope).synpredgate> ) {
<action>
}
}

```

```

<else>
<action>
<endif>
>>

/** How to always execute an action even when backtracking */
execForcedAction(action) ::= "<action>"

// M I S C (properties, etc...)

bitset(name, words64) ::= <<
val <name> = new BitSet(Array[Long](<words64:{it | <it>L};separator=","))<\n>
>>

codeFileExtension() ::= ".scala"

true_value() ::= "true"
false_value() ::= "false"

```

Found in path(s):

```

* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-
jar/org/antlr/codegen/templates/Scala/Scala.stg

```

No license file was found, but licenses were detected in source scan.

```

/*

```

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*/

```
@outputFile.imports() ::= <<
<@super.imports()>
<if(!TREE_PARSER)><! tree parser would already have imported !>
import org.antlr.runtime.tree.*;<\n>
<endif>
>>
```

```
@genericParser.members() ::= <<
<@super.members()>
<parserMembers()>
>>
```

```
/** Add an adaptor property that knows how to build trees */
parserMembers() ::= <<
protected var adaptor:TreeAdaptor = new CommonTreeAdaptor();<\n>
override public function set treeAdaptor(adaptor:TreeAdaptor):void {
    this.adaptor = adaptor;
    <grammar.directDelegates: {g|<g.delegateName()>.treeAdaptor = this.adaptor; }>
}
override public function get treeAdaptor():TreeAdaptor {
    return adaptor;
}
>>
```

```
@returnScope.ruleReturnMembers() ::= <<
<ASTLabelType> tree;
public function get tree():Object { return tree; }
>>
```

```
/** Add a variable to track rule's return AST */
ruleDeclarations() ::= <<
<super.ruleDeclarations()>
var root_0:<ASTLabelType> = null;<\n>
>>
```

```
ruleLabelDefs() ::= <<
<super.ruleLabelDefs()>
<[ruleDescriptor.tokenLabels,ruleDescriptor.wildcardTreeLabels,
ruleDescriptor.wildcardTreeListLabels]:{it |var <it.label.text>_tree:<ASTLabelType>=null;}; separator="\n">
<ruleDescriptor.tokenListLabels: {it |var <it.label.text>_tree:<ASTLabelType>=null;}; separator="\n">
<ruleDescriptor.allTokenRefsInAltsWithRewrites
: {it |var stream_<it>:RewriteRule<rewriteElementType>Stream=new
RewriteRule<rewriteElementType>Stream(adaptor,"token <it>");}; separator="\n">
<ruleDescriptor.allRuleRefsInAltsWithRewrites
```



```

: {it | var stream_<it>: RewriteRuleSubtreeStream = new RewriteRuleSubtreeStream(adaptor, "rule <it>");};
separator = "\n"
>>

/** When doing auto AST construction, we must define some variables;
 * These should be turned off if doing rewrites. This must be a "mode"
 * as a rule could have both rewrite and AST within the same alternative
 * block.
 */
@alt.declarations() ::= <<
<if(autoAST)>
<if(outerAlt)>
<if(!rewriteMode)>
root_0 = <ASTLabelType>(adaptor.nil());<\n>
<endif>
<endif>
<endif>
>>

// Tracking Rule Elements

/** ID and track it for use in a rewrite rule */
tokenRefTrack(token, label, elementIndex, terminalOptions) ::= <<
<tokenRefBang(...)> <! Track implies no auto AST construction!>
<if(backtracking)> if ( <actions.(actionScope).synpredgate> ) <endif> stream_<token>.add(<label>);<\n>
>>

/** ids+=ID and track it for use in a rewrite rule; adds to ids *and*
 * to the tracking list stream_ID for use in the rewrite.
 */
tokenRefTrackAndListLabel(token, label, elementIndex, terminalOptions) ::= <<
<tokenRefTrack(...)>
<listLabel(elem=label, ...)>
>>

/** ^(ID ...) track for rewrite */
tokenRefRuleRootTrack(token, label, elementIndex, terminalOptions) ::= <<
<tokenRefBang(...)>
<if(backtracking)> if ( <actions.(actionScope).synpredgate> ) <endif> stream_<token>.add(<label>);<\n>
>>

/** Match ^(label+=TOKEN ...) track for rewrite */
tokenRefRuleRootTrackAndListLabel(token, label, elementIndex, terminalOptions) ::= <<
<tokenRefRuleRootTrack(...)>
<listLabel(elem=label, ...)>
>>

/** rule when output=AST and tracking for rewrite */

```

```

ruleRefTrack(rule,label,elementIndex,args,scope) ::= <<
<super.ruleRef(...)>
<if(backtracking)>if ( <actions.(actionScope).synpredgate> ) <endif>stream_<rule.name>.add(<label>.tree);
>>

/** x+=rule when output=AST and tracking for rewrite */
ruleRefTrackAndListLabel(rule,label,elementIndex,args,scope) ::= <<
<ruleRefTrack(...)>
<listLabel(label, {<label>.tree})>
>>

/** ^(rule ...) rewrite */
ruleRefRuleRootTrack(rule,label,elementIndex,args,scope) ::= <<
<ruleRefRuleRoot(...)>
<if(backtracking)>if ( <actions.(actionScope).synpredgate> ) <endif>stream_<rule>.add(<label>.tree);
>>

/** ^(x+=rule ...) rewrite */
ruleRefRuleRootTrackAndListLabel(rule,label,elementIndex,args,scope) ::= <<
<ruleRefRuleRootTrack(...)>
<listLabel(label, {<label>.tree})>
>>

// R e w r i t e

rewriteCode(
alts, description,
referencedElementsDeep, // ALL referenced elements to right of ->
referencedTokenLabels,
referencedTokenListLabels,
referencedRuleLabels,
referencedRuleListLabels,
referencedWildcardLabels,
referencedWildcardListLabels,
rewriteBlockLevel, enclosingTreeLevel, treeLevel) ::=
<<

// AST REWRITE
// elements: <referencedElementsDeep; separator=", ">
// token labels: <referencedTokenLabels; separator=", ">
// rule labels: <referencedRuleLabels; separator=", ">
// token list labels: <referencedTokenListLabels; separator=", ">
// rule list labels: <referencedRuleListLabels; separator=", ">
// wildcard labels: <[referencedWildcardLabels,referencedWildcardListLabels]; separator=", ">
<if(backtracking)>
if ( <actions.(actionScope).synpredgate> ) {<\n>
<endif>
<prevRuleRootRef(>.tree = root_0;

```

```

<rewriteCodeLabels()>
root_0 = <ASTLabelType>(adaptor.nil());
<alts:rewriteAlt(); separator="else ">
<! if tree parser and rewrite=true !>
<if(TREE_PARSER)>
<if(rewriteMode)>
<prevRuleRootRef(>.tree = <ASTLabelType>(adaptor.rulePostProcessing(root_0));
input.replaceChildren(adaptor.getParent(retval.start),
    adaptor.getChildIndex(retval.start),
    adaptor.getChildIndex(_last),
    retval.tree);
<endif>
<endif>
<! if parser or tree-parser && rewrite!=true, we need to set result !>
<if(!TREE_PARSER)>
<prevRuleRootRef(>.tree = root_0;
<else>
<if(!rewriteMode)>
<prevRuleRootRef(>.tree = root_0;
<endif>
<endif>
<if(backtracking)>
}
<endif>
>>

rewriteCodeLabels() ::= <<
<referencedTokenLabels
    :{it |var stream_<it>:RewriteRule<rewriteElementType>Stream=new
RewriteRule<rewriteElementType>Stream(adaptor,"token <it>",<it>)};
    separator="\n"
>
<referencedTokenListLabels
    :{it |var stream_<it>:RewriteRule<rewriteElementType>Stream=new
RewriteRule<rewriteElementType>Stream(adaptor,"token <it> ", list_<it>)};
    separator="\n"
>
<referencedWildcardLabels
    :{it |var stream_<it>:RewriteRuleSubtreeStream=new RewriteRuleSubtreeStream(adaptor,"wildcard
<it>",<it>)};
    separator="\n"
>
<referencedWildcardListLabels
    :{it |var stream_<it>:RewriteRuleSubtreeStream=new RewriteRuleSubtreeStream(adaptor,"wildcard
<it> ",list_<it>)};
    separator="\n"
>
<referencedRuleLabels

```

```

    :{it |var stream_<it>:RewriteRuleSubtreeStream=new RewriteRuleSubtreeStream(adaptor,"rule
<it>",<it>!=null?<it>.tree:null);};
    separator="\n"
>
<referencedRuleListLabels
    :{it |var stream_<it>:RewriteRuleSubtreeStream=new RewriteRuleSubtreeStream(adaptor,"token
<it>",<it>.list_<it>);};
    separator="\n"
>
>>

/** Generate code for an optional rewrite block; note it uses the deep ref'd element
 * list rather shallow like other blocks.
 */
rewriteOptionalBlock(
    alt,rewriteBlockLevel,
    referencedElementsDeep, // all nested refs
    referencedElements, // elements in immediately block; no nested blocks
    description) ::=
<<
// <fileName>:<description>
if ( <referencedElementsDeep:{el | stream_<el>.hasNext}; separator="||"> ) {
    <alt>
}
<referencedElementsDeep:{el | stream_<el>.reset();<n>}>
>>

rewriteClosureBlock(
    alt,rewriteBlockLevel,
    referencedElementsDeep, // all nested refs
    referencedElements, // elements in immediately block; no nested blocks
    description) ::=
<<
// <fileName>:<description>
while ( <referencedElements:{el | stream_<el>.hasNext}; separator="||"> ) {
    <alt>
}
<referencedElements:{el | stream_<el>.reset();<n>}>
>>

rewritePositiveClosureBlock(
    alt,rewriteBlockLevel,
    referencedElementsDeep, // all nested refs
    referencedElements, // elements in immediately block; no nested blocks
    description) ::=
<<
if ( !(<referencedElements:{el | stream_<el>.hasNext}; separator="||">) ) {
    throw new RewriteEarlyExitException();
}
}
>>

```

```

}
while ( <referencedElements:{el | stream_<el>.hasNext}; separator="||"> ) {
  <alt>
}
<referencedElements:{el | stream_<el>.reset();<\n>}>
>>

rewriteAlt(a) ::= <<
// <a.description>
<if(a.pred)>
if (<a.pred>) {
  <a.alt>
}<\n>
<else>
{
  <a.alt>
}<\n>
<endif>
>>

/** For empty rewrites: "r : ... -> ;" */
rewriteEmptyAlt() ::= "root_0 = null;"

rewriteTree(root,children,description,enclosingTreeLevel,treeLevel) ::= <<
// <fileName>:<description>
{
var root_<treeLevel>:<ASTLabelType> = <ASTLabelType>(adaptor.nil());
<root:rewriteElement()>
<children:rewriteElement()>
adaptor.addChild(root_<enclosingTreeLevel>, root_<treeLevel>);
}<\n>
>>

rewriteElementList(elements) ::= "<elements:rewriteElement()>"

rewriteElement(e) ::= <<
<@pregen()>
<e.el>
>>

/** Gen ID or ID[args] */
rewriteTokenRef(token,elementIndex,terminalOptions,args) ::= <<
adaptor.addChild(root_<treeLevel>, <createRewriteNodeFromElement(...)>);<\n>
>>

/** Gen $label ... where defined via label=ID */
rewriteTokenLabelRef(label,elementIndex) ::= <<
adaptor.addChild(root_<treeLevel>, stream_<label>.nextNode());<\n>

```

```

>>

/** Gen $label ... where defined via label+=ID */
rewriteTokenListLabelRef(label,elementIndex) ::= <<
adaptor.addChild(root_<treeLevel>, stream_<label>.nextNode());<\n>
>>

/** Gen ^($label ...) */
rewriteTokenLabelRefRoot(label,elementIndex) ::= <<
root_<treeLevel> = <ASTLabelType>(adaptor.becomeRoot(stream_<label>.nextNode(), root_<treeLevel>));<\n>
>>

/** Gen ^($label ...) where label+=... */
rewriteTokenListLabelRefRoot ::= rewriteTokenLabelRefRoot

/** Gen ^(ID ...) or ^(ID[args] ...) */
rewriteTokenRefRoot(token,elementIndex,terminalOptions,args) ::= <<
root_<treeLevel> = <ASTLabelType>(adaptor.becomeRoot(<createRewriteNodeFromElement(...)>,
root_<treeLevel>));<\n>
>>

rewriteImaginaryTokenRef(args,token,terminalOptions,elementIndex) ::= <<
adaptor.addChild(root_<treeLevel>, <createImaginaryNode(token,terminalOptions,args)>);<\n>
>>

rewriteImaginaryTokenRefRoot(args,token,terminalOptions,elementIndex) ::= <<
root_<treeLevel> = <ASTLabelType>(adaptor.becomeRoot(<createImaginaryNode(token,terminalOptions,args)>,
root_<treeLevel>));<\n>
>>

/** plain -> {foo} action */
rewriteAction(action) ::= <<
root_0 = <action>;<\n>
>>

/** What is the name of the previous value of this rule's root tree? This
* let's us refer to $rule to mean previous value. I am reusing the
* variable 'tree' sitting in retval struct to hold the value of root_0 right
* before I set it during rewrites. The assign will be to retval.tree.
*/
prevRuleRootRef() ::= "retval"

rewriteRuleRef(rule) ::= <<
adaptor.addChild(root_<treeLevel>, stream_<rule>.nextTree());<\n>
>>

rewriteRuleRefRoot(rule) ::= <<
root_<treeLevel> = <ASTLabelType>(adaptor.becomeRoot(stream_<rule>.nextNode(), root_<treeLevel>));<\n>

```

```

>>

rewriteNodeAction(action) ::= <<
adaptor.addChild(root_<treeLevel>, <action>);<\n>
>>

rewriteNodeActionRoot(action) ::= <<
root_<treeLevel> = <ASTLabelType>(adaptor.becomeRoot(<action>, root_<treeLevel>));<\n>
>>

/** Gen $ruleLabel ... where defined via ruleLabel=rule */
rewriteRuleLabelRef(label) ::= <<
adaptor.addChild(root_<treeLevel>, stream_<label>.nextTree());<\n>
>>

/** Gen $ruleLabel ... where defined via ruleLabel+=rule */
rewriteRuleListLabelRef(label) ::= <<
adaptor.addChild(root_<treeLevel>, stream_<label>.nextTree());<\n>
>>

/** Gen ^($ruleLabel ...) where ruleLabel=rule */
rewriteRuleLabelRefRoot(label) ::= <<
root_<treeLevel> = <ASTLabelType>(adaptor.becomeRoot(stream_<label>.nextNode(), root_<treeLevel>));<\n>
>>

/** Gen ^($ruleLabel ...) where ruleLabel+=rule */
rewriteRuleListLabelRefRoot(label) ::= <<
root_<treeLevel> = <ASTLabelType>(adaptor.becomeRoot(stream_<label>.nextNode(), root_<treeLevel>));<\n>
>>

rewriteWildcardLabelRef(label) ::= <<
adaptor.addChild(root_<treeLevel>, stream_<label>.nextTree());<\n>
>>

createImaginaryNode(tokenType,terminalOptions,args) ::= <<
<if(terminalOptions.node)>
<! new MethodNode(IDLabel, args) !>
new <terminalOptions.node>(<tokenType><if(args)>, <args; separator=", "><endif>)
<else>
<ASTLabelType>(adaptor.create(<tokenType>, <args; separator=", "><if(!args)>"<tokenType>"<endif>))
<endif>
>>

createRewriteNodeFromElement(token,terminalOptions,args) ::= <<
<if(terminalOptions.node)>
new <terminalOptions.node>(stream_<token>.nextToken(<if(args)>, <args; separator=", "><endif>))
<else>

```

```
<if(args)> <! must create new node from old !>
adaptor.create(<token>, <args; separator=", ">)
<else>
stream_<token>.nextNode()
<endif>
<endif>
>>
```

Found in path(s):

```
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-
jar/org/antlr/codegen/templates/ActionScript/AST.stg
```

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```

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```

```
*/
```

```
/** How to generate rules derived from left-recursive rules.
```

```
* These rely on recRuleDefArg(), recRuleAltPredicate(),
```

```
* recRuleArg(), recRuleSetResultAction(), recRuleSetReturnAction()
```

```
* templates in main language.stg
```

```
*/
```

```
group LeftRecursiveRules;
```



```

recRuleName(ruleName) ::= "<ruleName>_"
recPrimaryName(ruleName) ::= "<ruleName>_primary"

recRuleStart(ruleName, minPrec, userRetvals, userRetvalAssignments) ::= <<
<ruleName><if(userRetvals)> returns [<userRetvals>]<endif>
: <recRuleName(...)>[<minPrec>]
  <if(userRetvals)>
  {
    <userRetvalAssignments; separator="\n">
  }
  <endif>
;
>>

recRule(ruleName, precArgDef, argName, alts, setResultAction, buildAST,
  userRetvals, userRetvalAssignments) ::= <<
<recRuleName(...)>[<precArgDef>]<if(userRetvals)> returns [<userRetvals>]<endif>
: <recPrimaryName(...)>
  <if(buildAST)>
  {
    <setResultAction>
  }
  <endif>
  <if(userRetvals)>
  {
    <userRetvalAssignments; separator="\n">
  }
  <endif>
  ( options { backtrack=false;}
  : ( options { backtrack=false;}
    : <alts; separator="\n | ">
    )
  )*)
;
>>

recPrimaryRule(ruleName, alts, userRetvals) ::= <<
<recPrimaryName(...)><if(userRetvals)> returns [<userRetvals>]<endif>
options { backtrack=true;}
: <alts; separator="\n | ">
;
>>

recRuleAlt(alt, pred) ::= "{<pred>}?=> <alt>"

recRuleRef(ruleName, arg) ::= "<recRuleName(...)>[<arg>]"

```

Found in path(s):

```
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-  
jar/org/antlr/codegen/templates/LeftRecursiveRules.stg
```

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```
/*
```

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```

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```

```
*
```

```
* Conversion to C#:
```

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```

```
*
```

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```

```
*/
```

```
/** Template overrides to add debugging to normal Java output;
```

```
* If ASTs are built, then you'll also get ASTDbg.stg loaded.
```

```
*/
```

```
@outputFile.imports() ::= <<
```

```
<@super.imports(>
```

```
using Antlr.Runtime.Debug;
```

```
using IOException = System.IO.IOException;
```

```
>>
```

```
@genericParser.members() ::= <<
```

```
<if(grammar.grammarIsRoot)>
```

```
public static readonly string[] ruleNames =
```

```

new string[]
{
    "invalidRule", <grammar.allImportedRules:{rST | "<rST.name>"}; wrap="\n ", separator=", ">
};<\n>
<endif>
<if(grammar.grammarIsRoot)><! grammar imports other grammar(s) !>
int ruleLevel = 0;
public virtual int RuleLevel { get { return ruleLevel; } }
public virtual void IncRuleLevel() { ruleLevel++; }
public virtual void DecRuleLevel() { ruleLevel--; }
<if(profile)>
<ctorForProfilingRootGrammar()>
<else>
<ctorForRootGrammar()>
<endif>
<ctorForPredefinedListener()>
<else><! imported grammar !>
public int RuleLevel { get { return <grammar.delegators:{g| <g.delegateName()>>.RuleLevel; } }
public void IncRuleLevel() { <grammar.delegators:{g| <g.delegateName()>>.IncRuleLevel(); }
public void DecRuleLevel() { <grammar.delegators:{g| <g.delegateName()>>.DecRuleLevel(); }
<ctorForDelegateGrammar()>
<endif>
<if(profile)>
public override bool AlreadyParsedRule( IIntStream input, int ruleIndex )
{
    int stopIndex = GetRuleMemoization(ruleIndex, input.Index);
    ((Profiler)dbg).ExamineRuleMemoization(input, ruleIndex, stopIndex,
    <grammar.composite.rootGrammar.recognizerName>.ruleNames[ruleIndex]);
    return base.AlreadyParsedRule(input, ruleIndex);
}<\n>
public override void Memoize( IIntStream input, int ruleIndex, int ruleStartIndex )
{
    ((Profiler)dbg).Memoize(input, ruleIndex, ruleStartIndex,
    <grammar.composite.rootGrammar.recognizerName>.ruleNames[ruleIndex]);
    base.Memoize(input, ruleIndex, ruleStartIndex);
}<\n>
<endif>
protected virtual bool EvalPredicate( bool result, string predicate )
{
    dbg.SemanticPredicate( result, predicate );
    return result;
}<\n>
>>

ctorForRootGrammar() ::= <<
<! bug: can't use <@super.members()> cut-n-paste instead !>
<! Same except we add port number and profile stuff if root grammar !>
<actions.(actionScope).ctorModifier; null="public"> <name>( <inputStreamType> input )

```

```

: this( input, DebugEventSocketProxy.DefaultDebuggerPort, new RecognizerSharedState() )
{
}
<actions.(actionScope).ctorModifier; null="public"> <name>( <inputStreamType> input, int port,
RecognizerSharedState state )
: base( input, state )
{
<createListenerAndHandshake()>
<grammar.directDelegates:{g|<g:delegateName()> = new <g.recognizerName>( input, dbg, this.state,
this<grammar.delegates:{g|, <g:delegateName()>> }> );}; separator="\n">
<parserCtorBody()>
<@finally()>
}<\n>
>>

ctorForProfilingRootGrammar() ::= <<
<! bug: can't use <@super.members()> cut-n-paste instead !>
<actions.(actionScope).ctorModifier; null="public"> <name>( <inputStreamType> input )
: this( input, new Profiler(null), new RecognizerSharedState() )
{
}
<actions.(actionScope).ctorModifier; null="public"> <name>( <inputStreamType> input, IDebugEventListener dbg,
RecognizerSharedState state )
: base( input, dbg, state )
{
Profiler p = (Profiler)dbg;
p.setParser(this);
<grammar.directDelegates:
{g|<g:delegateName()> = new <g.recognizerName>( input, dbg, this.state, this<grammar.delegates:{g|,
<g:delegateName()>> }> );}; separator="\n">
<parserCtorBody()>
<@finally()>
}
}<\n>
>>

/** Basically we don't want to set any dbg listeners are root will have it. */
ctorForDelegateGrammar() ::= <<
<actions.(actionScope).ctorModifier; null="public"> <name>( <inputStreamType> input, IDebugEventListener dbg,
RecognizerSharedState state<grammar.delegates:{g|, <g.recognizerName> <g:delegateName()>> }> )
: base( input, dbg, state )
{
<grammar.directDelegates:
{g|<g:delegateName()> = new <g.recognizerName>( input, this, this.state<grammar.delegates:{g|,
<g:delegateName()>> }> );}; separator="\n">
<parserCtorBody()>
}<\n>
>>

```

```

ctorForPredefinedListener() ::= <<
<actions.(actionScope).ctorModifier; null="public"> <name>( <inputStreamType> input, IDebugEventListener dbg
)
<@superClassRef>: base( input, dbg, new RecognizerSharedState() )<@end>
{
<if(profile)>
Profiler p = (Profiler)dbg;
p.setParser(this);
<endif>
<grammar.directDelegates:{g|<g:delegateName()> = new <g.recognizerName>(input, dbg, this.state,
this<grammar.delegators:{g|, <g:delegateName()>>});}; separator="\n">
<parserCtorBody()>
<@finally()>
}<\n>
>>

```

```

createListenerAndHandshake() ::= <<
<if(TREE_PARSER)>
DebugEventSocketProxy proxy = new DebugEventSocketProxy( this, port, input.TreeAdaptor );<\n>
<else>
DebugEventSocketProxy proxy = new DebugEventSocketProxy( this, port, null );<\n>
<endif>
DebugListener = proxy;
try
{
proxy.Handshake();
}
catch ( IOException ioe )
{
ReportError( ioe );
}
>>

```

```
@genericParser.superClassName() ::= "Debug<@super.superClassName()>"
```

```

/*
* Much of the following rules were merged into CSharp3.stg.
*/

```

```

@rule.preamble() ::= <<
if (RuleLevel == 0)
DebugListener.Commence();
IncRuleLevel();
>>

```

```

//@rule.preamble() ::= <<
//try
//{

```

```

// dbg.EnterRule( GrammarFileName, "<ruleName>" );
// if ( RuleLevel == 0 )
// {
//   dbg.Commence();
// }
// IncRuleLevel();
// dbg.Location( <ruleDescriptor.tree.line>, <ruleDescriptor.tree.charPositionInLine> );<\n>
//>>

@rule.postamble() ::= <<
DecRuleLevel();
if (RuleLevel == 0)
  DebugListener.Terminate();
>>

//@rule.postamble() ::= <<
//dbg.Location(<ruleDescriptor.EORNode.line>, <ruleDescriptor.EORNode.charPositionInLine>);<\n>
//}
//finally
//{
//   dbg.ExitRule( GrammarFileName, "<ruleName>" );
//   DecRuleLevel();
//   if ( RuleLevel == 0 )
//   {
//     dbg.Terminate();
//   }
//}<\n>
//>>

//@insertSynpreds.start() ::= "dbg.BeginBacktrack( state.backtracking );"
//@insertSynpreds.stop() ::= "dbg.EndBacktrack( state.backtracking, success );"

// Common debug event triggers used by region overrides below

//enterSubRule() ::= <<
//try
//{
//   dbg.EnterSubRule( <decisionNumber> );<\n>
//>>

//exitSubRule() ::= <<
//}
//finally
//{
//   dbg.ExitSubRule( <decisionNumber> );
//}<\n>
//>>

//enterDecision() ::= <<

```

```

//try
//{
// dbg.EnterDecision( <decisionNumber> );<n>
//>>

//exitDecision() ::= <<
//}
//finally
//{
// dbg.ExitDecision( <decisionNumber> );
//}<n>
//>>

//enterAlt(n) ::= "dbg.EnterAlt( <n> );<n>"

// Region overrides that tell various constructs to add debugging triggers

//@block.predecision() ::= "<enterSubRule()><enterDecision()>"

//@block.postdecision() ::= "<exitDecision()>"

//@block.postbranch() ::= "<exitSubRule()>"

//@ruleBlock.predecision() ::= "<enterDecision()>"

//@ruleBlock.postdecision() ::= "<exitDecision()>"

//@ruleBlockSingleAlt.prealt() ::= "<enterAlt(n=\"1\")>"

//@blockSingleAlt.prealt() ::= "<enterAlt(n=\"1\")>"

//@positiveClosureBlock.preloop() ::= "<enterSubRule()>"

//@positiveClosureBlock.postloop() ::= "<exitSubRule()>"

//@positiveClosureBlock.predecision() ::= "<enterDecision()>"

//@positiveClosureBlock.postdecision() ::= "<exitDecision()>"

//@positiveClosureBlock.earlyExitException() ::=
// "dbg.RecognitionException( eee<decisionNumber> );<n>"

//@closureBlock.preloop() ::= "<enterSubRule()>"

//@closureBlock.postloop() ::= "<exitSubRule()>"

//@closureBlock.predecision() ::= "<enterDecision()>"

```

```

//@closureBlock.postdecision() ::= "<exitDecision>"

//@altSwitchCase.preatt() ::= "<enterAlt(n=i)>"

//@element.prematch() ::=
// "dbg.Location( <it.line>, <it.pos> );"

//@matchSet.mismatchedSetException() ::=
// "dbg.RecognitionException( mse );"

//@dfaState.noViableAltException() ::= "dbg.RecognitionException( nvae );"

//@dfaStateSwitch.noViableAltException() ::= "dbg.RecognitionException( nvae );"

dfaDecision(decisionNumber,description) ::= <<
//try
//{
// isCyclicDecision = true;
// <super.dfaDecision(...)>
//}
//catch ( NoViableAltException nvae )
//{
// dbg.RecognitionException( nvae );
// throw nvae;
//}
//>>

//@cyclicDFA.errorMethod() ::= <<
//public override void Error( NoViableAltException nvae )
//{
// ((DebugParser)recognizer).dbg.RecognitionException( nvae );
//}
//>>

/** Force predicate validation to trigger an event */
evalPredicate(pred,description) ::= <<
EvalPredicate(<pred>, "<description>")
>>

```

Found in path(s):

```

* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-
jar/org/antlr/codegen/templates/CSharp3/Dbg.stg

```

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```
*/
```

```
/** Template subgroup to add template rewrite output
```

```
* If debugging, then you'll also get STDbg.stg loaded.
```

```
*/
```

```
@outputFile.imports() ::= <<
```

```
<@super.imports(>
```

```
import org.stringtemplate.v4.*;
```

```
import java.util.HashMap;
```

```
>>
```

```
/** Add this to each rule's return value struct */
```

```
@returnScope.ruleReturnMembers() ::= <<
```

```
/* ST returnScope.ruleReturnMembers -- empty */
```

```
>>
```

```
/** Add this to each rule's return value struct */
```

```
@returnScope.ruleReturn.memvars() ::= <<
```

```
ST *st;
```

```
>>
```

```
/** Add this to each rule's return value struct */
```

```
@returnScope.ruleReturn.properties() ::= <<
```

```
@property (retain) ST *st;
```

```
>>
```

```

/** Add this to each rule's return value struct */
@returnScope.ruleReturn.methodsDecl() ::= <<
- (ST *)getTemplate;
- (NSString *)toString;
>>

/** Add this to each rule's return value struct */
@returnScope.ruleReturn.synthesize() ::= <<
@synthesize st;
>>

/** Add this to each rule's return value struct */
@returnScope.ruleReturn.methods() ::= <<
- (ST *)getTemplate { return st; }
- (NSString *)toString { return st==nil?nil:[st render]; }
>>

@genericParser.members() ::= <<
<@super.members()>
STGroup *templateLib = [STGroup newSTGroup];

- (void)setTemplateLib:(STGroup *)aTemplateLib
{
    self.templateLib = aTemplateLib;
}

- (STGroup *)getTemplateLib
{
    return templateLib;
}
>>

@genericParserHeaderFile.memVars() ::= <<
<@super.memVars()>
/* ST genericParserHeaderFile.memVars -- empty now */
STGroup *templateLib; /* ST -- really a part of STAttrMap */
>>

@genericParserHeaderFile.properties() ::= <<
<@super.properties()>
/* ST genericParser.properties */
@property (retain, getter=getTemplateLib, setter=setTemplateLib:) STGroup *templateLib;
>>

@genericParserHeaderFile.methodsDecl() ::= <<
<@super.methodsDecl()>
/* ST genericParser.methodsDecl */
- init;

```

```

- (STGroup *) getTemplateLib;
- (void) setTemplateLib:(STGroup *)aTemplateLib;
@end
>>

```

```

@genericParser.synthesize() ::= <<
<@super.synthesize()>
/* ST genericParserImplementation.synthesize */
@synthesize templateLib;
>>

```

```

@genericParser.methods() ::= <<
<@super.methods()>
/* ST genericParser.methods */

```

```

- (STGroup *)getTemplateLib
{
    return templateLib;
}

```

```

- (void) setTemplateLib:(STGroup *)aTemplateLib
{
    templateLib = aTemplateLib;
}

```

```

>>

```

```

@genericParser.members() ::= <<
<@super.members()>
STGroup *templateLib = [STGroup newSTGroup];

```

```

- (STGroup *) getTemplateLib
{
    return templateLib;
}

```

```

- (void) setTemplateLib:(STGroup *) templateLib
{
    this.templateLib = templateLib;
}

```

```

/** x+=rule when output=template */
ruleRefAndListLabel(rule,label,elementIndex,args,scope) ::= <<
<ruleRef(rule,label,elementIndex,args,scope)>
<listLabel(label, { [<label> getTemplate]; })>
>>

```

```

rewriteTemplate(alts) ::= <<

```

```

// TEMPLATE REWRITE
<if(backtracking)>
if ( <actions.(actionScope).synpredgate> ) {
  <alts:rewriteTemplateAlt(); separator="else ">
  <if(rewriteMode)><replaceTextInLine()><endif>
}
<else>
<alts:rewriteTemplateAlt(); separator="else ">
<if(rewriteMode)><replaceTextInLine()><endif>
<endif>
>>

replaceTextInLine() ::= <<
<if(TREE_PARSER)>
  [((TokenRewriteStream)input getTokenStream)]
  replaceFromIndex:[input getTreeAdaptor] getTokenStartIndex:retval.start]
  ToIndex:[input getTreeAdaptor] getTokenStopIndex:retval.start]
  Text:[retval.st render]];
<else>
  [((TokenRewriteStream)input)
  replaceFromIndex:[((Token)retval.start) getTokenIndex]
  ToIndex:[input LT:-1] getTokenIndex]
  Text:[retval.st render]];
<endif>
>>

rewriteTemplateAlt(alt) ::= <<
// <alt.description>
<if(alt.pred)>
if (<alt.pred>) {
  retval.st = <alt.alt>;
}<\n>
<else>
{
  retval.st = <alt.alt>;
}<\n>
<endif>
>>

rewriteEmptyTemplate(alts) ::= <<
nil;
>>

/** Invoke a template with a set of attribute name/value pairs.
* Set the value of the rule's template *after* having set
* the attributes because the rule's template might be used as
* an attribute to build a bigger template; you get a self-embedded

```

```

* template.
*/
rewriteExternalTemplate(name,args) ::= <%
<if(args)><args:{ a | []}><endif>
[templateLib getInstanceOf:@"<name>"]
<if(args)><args:{ a | add:@"<a.name>" value:<a.value>}]><endif>;
%>

/** expr is a string expression that says what template to load */
rewriteIndirectTemplate(expr,args) ::= <%
<if(args)><args:{ a | []}><endif>
[templateLib getInstanceOf:<expr>];
<if(args)><args:{ a | add:@"<a.name>" value:<a.value>}]><endif>;
%>

/** Invoke an inline template with a set of attribute name/value pairs */
rewriteInlineTemplate(args, template) ::= <%
<if(args)><args:{ a | []}><endif>
[ST newST:templateLib template:"<template>"]
<if(args)><args:{ a | add:@"<a.name>" <a.value>}]><endif>;
%>

/** plain -> {foo} action */
rewriteAction(action) ::= <<
<action>
>>

/** An action has %st.attrName=expr; or % {st}.attrName=expr; */
actionSetAttribute(st,attrName,expr) ::= <<
[(<st>) setAttribute:@"<attrName>" value:<expr>];
>>

/** Translate %{stringExpr} */
actionStringConstructor(stringExpr) ::= <<
[ST newST:templateLib template:<stringExpr>];
>>

Found in path(s):
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-
jar/org/antlr/codegen/templates/ObjC/ST4ObjC.stg
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*
* Conversion to C#:

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 */

```
dfa(decisionRanks,states,edges,rankdir,startState,useBox) ::= <<
digraph NFA {
<if(rankdir)>rankdir=<rankdir>;<endif>
<decisionRanks; separator="\n">
<states; separator="\n">
<edges; separator="\n">
}
>>
```

```
nfa(decisionRanks,states,edges,rankdir,startState) ::= <<
digraph NFA {
rankdir=LR;
<decisionRanks; separator="\n">
<states; separator="\n">
<edges; separator="\n">
}
>>
```

```
decision-rank(states) ::= <<
{rank=same; rankdir=TB; <states; separator=" "; ">}
>>
```

```
edge(src,target,label,arrowhead) ::= <<
<src> -> <target> [fontsize=11, fontname="Courier", arrowsize=.7, label = "<label>"<if(arrowhead)>, arrowhead =
<arrowhead><endif>];
>>
```

```
action-edge(src,target,label,arrowhead) ::= <<
<src> -> <target> [fontsize=11, fontname="Courier", arrowsize=.7, label = "<label>"<if(arrowhead)>, arrowhead =
<arrowhead><endif>];
>>
```

```
epsilon-edge(src,target,label,arrowhead) ::= <<
<src> -> <target> [fontname="Times-Italic", label = "e"];
>>
```

```
state(name,useBox) ::= <<
node [fontsize=11, shape = <if(useBox)>box<else>circle, fixedsize=true, width=.4<endif>]; <name>
>>
```

```
stopstate(name,useBox) ::= <<
node [fontsize=11, shape = <if(useBox)>polygon,sides=4,peripheries=2<else>doublecircle, fixedsize=true,
width=.6<endif>]; <name>
>>
```

Found in path(s):

* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/tool/templates/dot/dot.stg
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* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/tool/ToolSTGroupFile.java

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*/

/** Templates for building ASTs during tree parsing.

*

* Deal with many combinations. Dimensions are:

* Auto build or rewrite

* no label, label, list label (label/no-label handled together)


```

* child, root
* token, set, rule, wildcard
*
* Each combination has its own template except that label/no label
* is combined into tokenRef, ruleRef, ...
*/
/** Add a variable to track last element matched */
ruleDeclarations() ::= <<
<super.ruleDeclarations()>
<ASTLabelType> _last;<\n>
<ASTLabelType> _first_0;<\n>
>>

/** Add a variable to track last element matched */
ruleInitializations() ::= <<
<super.ruleInitializations()>
_last = NULL;<\n>
_first_0 = NULL;<\n>
>>

/** What to emit when there is no rewrite rule. For auto build
* mode, does nothing.
*/
noRewrite(rewriteBlockLevel, treeLevel) ::= <<
<if(backtracking)>if ( BACKTRACKING ==0 ) {<endif>
<if(rewriteMode)>
retval.tree = (<ASTLabelType>)_first_0;
if ( ADAPTOR->getParent(ADAPTOR, retval.tree) != NULL && ADAPTOR->isNilNode(ADAPTOR,
ADAPTOR->getParent(ADAPTOR, retval.tree) ) )
{
    retval.tree = (<ASTLabelType>)ADAPTOR->getParent(ADAPTOR, retval.tree);
}
<endif>
<if(backtracking)>}<endif>
>>

/** match ^(root children) in tree parser; override here to
* add tree construction actions.
*/
tree(root, actionsAfterRoot, children, nullableChildList,
    enclosingTreeLevel, treeLevel) ::= <<
_last = (<ASTLabelType>)LT(1);
{
<ASTLabelType> _save_last_<treeLevel>;
<ASTLabelType> _first_<treeLevel>;
<if(!rewriteMode)>
<ASTLabelType> root_<treeLevel>;
<endif>

```

```

_save_last_<treeLevel> = _last;
_first_<treeLevel> = NULL;
<if(!rewriteMode)>
root_<treeLevel> = (<ASTLabelType>)(ADAPTOR->nilNode(ADAPTOR));
<endif>
<root:element()>
<if(rewriteMode)>
<if(backtracking)>if ( BACKTRACKING ==0 ) {<endif>
<if(root.el.rule)>
if ( _first_<enclosingTreeLevel> == NULL ) _first_<enclosingTreeLevel> = <root.el.label>.tree;
<else>
if ( _first_<enclosingTreeLevel> == NULL ) _first_<enclosingTreeLevel> = <root.el.label>;
<endif>
<if(backtracking)>}<endif>
<endif>
<actionsAfterRoot:element()>
<if(nullableChildList)>
if ( LA(1)==ANTLR3_TOKEN_DOWN ) {
    MATCHT(ANTLR3_TOKEN_DOWN, NULL);
    <children:element()>
    MATCHT(ANTLR3_TOKEN_UP, NULL);
}
<else>
MATCHT(ANTLR3_TOKEN_DOWN, NULL);
<children:element()>
MATCHT(ANTLR3_TOKEN_UP, NULL);
<endif>
<if(!rewriteMode)>
ADAPTOR->addChild(ADAPTOR, root_<enclosingTreeLevel>, root_<treeLevel>);
<endif>
_last = _save_last_<treeLevel>;
}<\n>
>>

```

```
// TOKEN AST STUFF
```

```

/** ID! and output=AST (same as plain tokenRef) 'cept add
 * setting of _last
 */
tokenRefBang(token,label,elementIndex,terminalOptions) ::= <<
_last = (<ASTLabelType>)LT(1);
<super.tokenRef(...)>
>>

```

```

/** ID auto construct */
tokenRef(token,label,elementIndex,terminalOptions) ::= <<
_last = (<ASTLabelType>)LT(1);
<super.tokenRef(...)>

```

```

<if(!rewriteMode)>
<if(backtracking)>if ( BACKTRACKING ==0 ) {<endif>
<if(terminalOptions.node)>
<label>_tree = <terminalOptions.node>New(<label>);
<else>
<label>_tree = (<ASTLabelType>)ADAPTOR->dupNode(ADAPTOR, <label>);
<endif>
ADAPTOR->addChild(ADAPTOR, root_<treeLevel>, <label>_tree);
<if(backtracking)>}<endif>
<else>
<if(backtracking)>if ( BACKTRACKING ==0 ) {<endif>
if ( _first_<treeLevel> == NULL ) _first_<treeLevel> = <label>;
<if(backtracking)>}<endif>
<endif>
>>

/** label+=TOKEN auto construct */
tokenRefAndListLabel(token,label,elementIndex,terminalOptions) ::= <<
<tokenRef(...)>
<listLabel(elem=label,...)>
>>

/** ^(ID ...) auto construct */
tokenRefRuleRoot(token,label,elementIndex,terminalOptions) ::= <<
_last = (<ASTLabelType>)LT(1);
<super.tokenRef(...)>
<if(!rewriteMode)>
<if(backtracking)>if ( BACKTRACKING == 0 ) {<endif>
<if(terminalOptions.node)>
<label>_tree = <terminalOptions.node>New(<label>);
<else>
<label>_tree = (<ASTLabelType>)ADAPTOR->dupNode(ADAPTOR, <label>);
<endif><\n>
root_<treeLevel> = (<ASTLabelType>)ADAPTOR->becomeRoot(ADAPTOR, <label>_tree, root_<treeLevel>);
<if(backtracking)>}<endif>
<endif>
>>

/** Match ^(label+=TOKEN ...) auto construct */
tokenRefRuleRootAndListLabel(token,label,elementIndex,terminalOptions) ::= <<
<tokenRefRuleRoot(...)>
<listLabel(elem=label,...)>
>>

/** Match . wildcard and auto dup the node/subtree */
wildcard(token,label,elementIndex,terminalOptions) ::= <<
_last = (<ASTLabelType>)LT(1);
<super.wildcard(...)>

```

```

<if(!rewriteMode)>
<if(backtracking)>if ( <actions.(actionScope).synpredgate> ) {<endif>
<label>_tree = (<ASTLabelType>)ADAPTOR->dupTree(ADAPTOR, <label>);
ADAPTOR->addChild(ADAPTOR, root_<treeLevel>, <label>_tree);
<if(backtracking)>}<endif>
<else> <! rewrite mode !>
<if(backtracking)>if ( <actions.(actionScope).synpredgate> )<endif>
if ( _first_<treeLevel>==null ) _first_<treeLevel> = <label>;
<endif>
>>

// SET AST

matchSet(s,label,terminalOptions,elementIndex,postmatchCode) ::= <<
_last = (<ASTLabelType>)LT(1);
<super.matchSet(postmatchCode={
<if(!rewriteMode)>
<if(backtracking)>if ( BACKTRACKING == 0 ) {<endif>
<if(terminalOptions.node)>
<label>_tree = <terminalOptions.node>New(<label>);
<else>
<label>_tree = (<ASTLabelType>)ADAPTOR->dupNode(ADAPTOR, <label>);
<endif><\n>
ADAPTOR->addChild(ADAPTOR, root_<treeLevel>, <label>_tree);
<if(backtracking)>}\}<endif>
<endif>
}
,...)>
>>

matchRuleBlockSet(s,label,terminalOptions,elementIndex,postmatchCode,treeLevel="0") ::= <<
<matchSet(...)>
<noRewrite()> <! set return tree !>
>>

matchSetBang(s,label,terminalOptions,elementIndex,postmatchCode) ::= <<
_last = (<ASTLabelType>)LT(1);
<super.matchSet(...)>
>>

matchSetRuleRoot(s,label,terminalOptions,elementIndex,debug) ::= <<
<super.matchSet(postmatchCode={
<if(!rewriteMode)>
<if(backtracking)>if ( <actions.(actionScope).synpredgate> ) {<endif>
<if(terminalOptions.node)>
<label>_tree = <terminalOptions.node>New(<label>);
<else>
<label>_tree = (<ASTLabelType>)ADAPTOR->dupNode(ADAPTOR, <label>);

```

```

<endif>
root_<treeLevel> = (<ASTLabelType>)ADAPTOR->becomeRoot(ADAPTOR, <label>_tree, root_<treeLevel>);
<if(backtracking)>\}<endif>
<endif>
}, ...
)>
>>

// RULE REF AST

/** rule auto construct */
ruleRef(rule,label,elementIndex,args,scope) ::= <<
_last = (<ASTLabelType>)LT(1);
<super.ruleRef(...)>
<if(backtracking)>if ( <actions.(actionScope).synpredgate> )
{
<endif>
<if(!rewriteMode)>
ADAPTOR->addChild(ADAPTOR, root_<treeLevel>, <label>.tree);
<else>
if ( _first_<treeLevel> == NULL ) _first_<treeLevel> = <label>.tree;
<endif>
<if(backtracking)>\}<endif>
>>

/** x+=rule auto construct */
ruleRefAndListLabel(rule,label,elementIndex,args,scope) ::= <<
<ruleRef(...)>
<super.listLabelAST(elem=label,...)>
>>

/** ^(rule ...) auto construct */
ruleRefRuleRoot(rule,label,elementIndex,args,scope) ::= <<
_last = (<ASTLabelType>)LT(1);
<super.ruleRef(...)>
<if(!rewriteMode)>
<if(backtracking)>if ( ( <actions.(actionScope).synpredgate> ) ) <endif>root_<treeLevel> =
(<ASTLabelType>)(ADAPTOR->becomeRoot(ADAPTOR, <label>.tree, root_<treeLevel>));
<endif>
>>

/** ^(x+=rule ...) auto construct */
ruleRefRuleRootAndListLabel(rule,label,elementIndex,args,scope) ::= <<
<ruleRefRuleRoot(...)>
<super.listLabelAST(elem=label,...)>
>>

/** rule when output=AST and tracking for rewrite */

```

```

ruleRefTrack(rule,label,elementIndex,args,scope) ::= <<
  _last = (<ASTLabelType>)LT(1);
  <super.ruleRefTrack(...)>
>>

/** x+=rule when output=AST and tracking for rewrite */
ruleRefTrackAndListLabel(rule,label,elementIndex,args,scope) ::= <<
  _last = (<ASTLabelType>)LT(1);
  <super.ruleRefTrackAndListLabel(...)>
>>
/** ^(rule ...) rewrite */
ruleRefRuleRootTrack(rule,label,elementIndex,args,scope) ::= <<
  _last = (<ASTLabelType>)LT(1);
  <super.ruleRefRuleRootTrack(...)>
>>

/** ^(x+=rule ...) rewrite */
ruleRefRuleRootTrackAndListLabel(rule,label,elementIndex,args,scope) ::= <<
  _last = (<ASTLabelType>)LT(1);
  <super.ruleRefRuleRootTrackAndListLabel(...)>
>>

/** Streams for token refs are tree nodes now; override to
 * change nextToken to nextNode.
 */
createRewriteNodeFromElement(token,terminalOptions,scope) ::= <<
  <if(terminalOptions.node)>
  <terminalOptions.node>New(stream_<token>->nextNode(stream_<token>))
  <else>
  stream_<token>->nextNode(stream_<token>)
  <endif>
>>

ruleCleanUp() ::= <<
  <super.ruleCleanUp(...)>
  <if(backtracking)>
  if ( <actions.(actionScope).synpredgate> ) {<\n>
  <endif>
  <if(!ruleDescriptor.isSynPred)>
  retval.stop = LT(-1);<\n>
  <endif>
  retval.tree = (<ASTLabelType>)ADAPTOR->rulePostProcessing(ADAPTOR, root_0);
  <if(backtracking)>
  }
  <endif>
  <ruleDescriptor.allTokenRefsInAltsWithRewrites
  :{if (stream_<it> != NULL) stream_<it>->free(stream_<it>);}; separator="\n">

```

```
<ruleDescriptor.allRuleRefsInAltsWithRewrites
  :{if (stream_<it> != NULL) stream_<it>->free(stream_<it>);}; separator="\n">
>>
```

Found in path(s):

```
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-
jar/org/antlr/codegen/templates/C/ASTTreeParser.stg
```

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```
*/
```

```
/** Templates for building ASTs during normal parsing.
```

```
*
```

```
* Deal with many combinations. Dimensions are:
```

```
* Auto build or rewrite
```

```
* no label, label, list label (label/no-label handled together)
```

```
* child, root
```

```
* token, set, rule, wildcard
```

```
*
```

* The situation is not too bad as rewrite (->) usage makes ^ and !
 * invalid. There is no huge explosion of combinations.
 */

```
@rule.setErrorReturnValue() ::= <<
retval.tree = (<ASTLabelType>)(ADAPTOR->errorNode(ADAPTOR, INPUT, retval.start, LT(-1), EXCEPTION));
>>
```

```
// TOKEN AST STUFF
```

```
/** ID and output=AST */
```

```
tokenRef(token,label,elementIndex,terminalOptions) ::= <<
<super.tokenRef(...)>
<if(backtracking)>if ( <actions.(actionScope).synpredgate> ) {<endif>
<label>_tree = (<ASTLabelType>)(ADAPTOR->create(ADAPTOR, <label>));
ADAPTOR->addChild(ADAPTOR, root_0, <label>_tree);
<if(backtracking)>}<endif>
>>
```

```
/** ID! and output=AST (same as plain tokenRef) */
```

```
tokenRefBang(token,label,elementIndex,terminalOptions) ::= "<super.tokenRef(...)>"
```

```
/** ID^ and output=AST */
```

```
tokenRefRuleRoot(token,label,elementIndex,terminalOptions) ::= <<
<super.tokenRef(...)>
<if(backtracking)>if ( <actions.(actionScope).synpredgate> ) {<endif>
<label>_tree = <createNodeFromToken(...)>;
root_0 = (<ASTLabelType>)(ADAPTOR->becomeRoot(ADAPTOR, <label>_tree, root_0));
<if(backtracking)>}<endif>
>>
```

```
/** ids+=ID! and output=AST */
```

```
tokenRefBangAndListLabel(token,label,elementIndex,terminalOptions) ::= <<
<tokenRefBang(...)>
<listLabel(elem=label,...)>
>>
```

```
/** label+=TOKEN when output=AST but not rewrite alt */
```

```
tokenRefAndListLabel(token,label,elementIndex,terminalOptions) ::= <<
<tokenRef(...)>
<listLabel(elem=label,...)>
>>
```

```
/** Match label+=TOKEN^ when output=AST but not rewrite alt */
```

```
tokenRefRuleRootAndListLabel(token,label,terminalOptions,elementIndex) ::= <<
<tokenRefRuleRoot(...)>
```



```

<listLabel(elem=label,...)>
>>

// SET AST

// the match set stuff is interesting in that it uses an argument list
// to pass code to the default matchSet; another possible way to alter
// inherited code. I don't use the region stuff because I need to pass
// different chunks depending on the operator. I don't like making
// the template name have the operator as the number of templates gets
// large but this is the most flexible--this is as opposed to having
// the code generator call matchSet then add root code or ruleroot code
// plus list label plus ... The combinations might require complicated
// rather than just added on code. Investigate that refactoring when
// I have more time.

matchSet(s,label,terminalOptions,elementIndex,postmatchCode) ::= <<
<super.matchSet(postmatchCode={<if(backtracking)>if ( <actions.(actionScope).synpredgate> )
<endif>ADAPTOR->addChild(ADAPTOR, root_0, <createNodeFromToken(...)>},...)>
>>

matchRuleBlockSet(s,label,terminalOptions,elementIndex,postmatchCode,treeLevel="0") ::= <<
<matchSet(...)>
>>

matchSetBang(s,label,elementIndex,terminalOptions,postmatchCode) ::= "<super.matchSet(...)>"

// note there is no matchSetTrack because -> rewrites force sets to be
// plain old blocks of alts: (A|B|...|C)

matchSetRuleRoot(s,label,terminalOptions,elementIndex,debug) ::= <<
<if(label)>
<label>=(<labelType>)LT(1);<\n>
<endif>
<super.matchSet(postmatchCode={<if(backtracking)>if ( <actions.(actionScope).synpredgate> ) <endif>root_0 =
(<ASTLabelType>)(ADAPTOR->becomeRoot(ADAPTOR, <createNodeFromToken(...)>, root_0));},...)>
>>

// RULE REF AST

/** rule when output=AST */
ruleRef(rule,label,elementIndex,args,scope) ::= <<
<super.ruleRef(...)>
<if(backtracking)>if ( <actions.(actionScope).synpredgate> ) <endif>ADAPTOR->addChild(ADAPTOR, root_0,
<label>.tree);
>>

/** rule! is same as normal rule ref */

```

```

ruleRefBang(rule,label,elementIndex,args,scope) ::= "<super.ruleRef(...)>"

/** rule^ */
ruleRefRuleRoot(rule,label,elementIndex,args,scope) ::= <<
<super.ruleRef(...)>
<if(backtracking)>if ( <actions.(actionScope).synpredgate> ) <endif>root_0 = (<ASTLabelType>)(ADAPTOR-
>becomeRoot(ADAPTOR, <label>.tree, root_0));
>>

/** x+=rule when output=AST */
ruleRefAndListLabel(rule,label,elementIndex,args,scope) ::= <<
<ruleRef(...)>
<listLabelAST(...)>
>>

/** x+=rule! when output=AST is a rule ref with list addition */
ruleRefBangAndListLabel(rule,label,elementIndex,args,scope) ::= <<
<ruleRefBang(...)>
<listLabelAST(...)>
>>

/** x+=rule^ */
ruleRefRuleRootAndListLabel(rule,label,elementIndex,args,scope) ::= <<
<ruleRefRuleRoot(...)>
<listLabelAST(...)>
>>

// WILDCARD AST

wildcard(token,label,elementIndex,terminalOptions) ::= <<
<super.wildcard(...)>
<if(backtracking)>if ( <actions.(actionScope).synpredgate> ) {<endif>
<label>_tree = (<ASTLabelType>)(ADAPTOR->create(ADAPTOR, <label>));
ADAPTOR->addChild(ADAPTOR, root_0, <label>_tree);
<if(backtracking)>}<endif>
>>

wildcardBang(token,label,elementIndex,terminalOptions) ::= "<super.wildcard(...)>"

wildcardRuleRoot(label,elementIndex) ::= <<
<super.wildcard(...)>
<if(backtracking)>if ( <actions.(actionScope).synpredgate> ) {<endif>
<label>_tree = (<ASTLabelType>)(ADAPTOR->create(ADAPTOR, <label>));
root_0 = (<ASTLabelType>)(ADAPTOR->becomeRoot(ADAPTOR, <label>_tree, root_0));
<if(backtracking)>}<endif>
>>

createNodeFromToken(label,terminalOptions) ::= <<

```

```

<if(terminalOptions.node)>
<terminalOptions.node>New(<label>) <! new MethodNode(IDLabel) !>
<else>
(<ASTLabelType>)(ADAPTOR->create(ADAPTOR, <label>))
<endif>
>>

ruleCleanUp() ::= <<
<super.ruleCleanUp()>
<if(backtracking)>
if ( <actions.(actionScope).synpredgate> )
{<\n>
<endif>
<if(!ruleDescriptor.isSynPred)>
retval.stop = LT(-1);<\n>
<endif>
retval.tree = (<ASTLabelType>)(ADAPTOR->rulePostProcessing(ADAPTOR, root_0));
ADAPTOR->setTokenBoundaries(ADAPTOR, retval.tree, retval.start, retval.stop);
<ruleDescriptor.allTokenRefsInAltsWithRewrites
: {it | if (stream_<it> != NULL) stream_<it>->free(stream_<it>);}; separator="\n">
<ruleDescriptor.allRuleRefsInAltsWithRewrites
: {it | if (stream_<it> != NULL) stream_<it>->free(stream_<it>);}; separator="\n">
<if(backtracking)>
}<\n>
<endif>
>>

```

Found in path(s):

```
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-
jar/org/antlr/codegen/templates/C/ASTParser.stg
```

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```
/*
```

```
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```

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*/

/*

New style messages. This file contains the actual layout of the messages emitted by ANTLR.

The text itself is coming out of the languages/*stg files, according to the chosen locale.

This file contains the default format ANTLR uses.

*/

group antlr;

location(file, line, column) ::= "<file>:<line>:<column>:"

message(id, text) ::= "<id> <text>"

report(location, message, type) ::= "<type><message.id>: <location> <message.text>"

wantsSingleLineMessage() ::= "false"

Found in path(s):

* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/tool/templates/messages/formats/antlr.stg

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*/

/** Template overrides to add debugging to AST stuff. Dynamic inheritance

* hierarchy is set up as ASTDbg : AST : Dbg : Java by code generator.

*/

parserMembers() ::= <<

```
DebugTreeAdaptor *adaptor = [DebugTreeAdaptor newTreeAdaptor:(id)dbg Adaptor:[CommonTreeAdaptor
newTreeAdaptor]];
```

// fix this

- (void) setTreeAdaptor:(id<TreeAdaptor>)anAdaptor

{

```
    adaptor = [DebugTreeAdaptor newTreeAdaptor:dbg Adaptor:anAdaptor];
```

```
<if(grammar.grammarIsRoot)>
```

```
    adaptor = [DebugTreeAdaptor newTreeAdaptor:adaptor withDBG:dbg];
```

```
<else>
```

```
    adaptor = (DebugTreeAdaptor *)adaptor; // delegator sends dbg adaptor
```

```
<endif><\n>
```

```
    <grammar.directDelegates:{g[<g.delegateName()> setTreeAdaptor:adaptor];}>
```

}

- (id<TreeAdaptor>)getTreeAdaptor

{

```
    return adaptor;
```

```
}<\n>
```

>>

parserCtorBody() ::= <<

```
<super.parserCtorBody()>
```

>>

createListenerAndHandshake() ::= <<

```
DebugEventSocketProxy proxy =
```

```
    [DebugEventSocketProxy newDebugEventSocketProxy:self, port, <if(TREE_PARSER)>[input
getTreeAdaptor]<else>adaptor<endif>];
```

```
[self setDebugListener:proxy];
```

```
[self set<inputStreamType>:[Debug<inputStreamType> newDebug<inputStreamType>:input with:proxy]];
```

```
try {
```

```

    [proxy handshake];
}
@catch (IOException *ioe) {
    [self reportError:ioe];
}
>>

```

```

@ctorForRootGrammar.finally() ::= <<
CommonTreeAdaptor *adap = [CommonTreeAdaptor newTreeAdaptor];
[self setTreeAdaptor:adap];
[proxy setTreeAdaptor:adap];
>>

```

```

@ctorForProfilingRootGrammar.finally() ::= <<
CommonTreeAdaptor *adap = [CommonTreeAdaptor newTreeAdaptor];
[self setTreeAdaptor:adap];
[proxy setTreeAdaptor:adap];
>>

```

```

@ctorForPredefinedListener.superClassRef() ::= @"super(input, dbg);"

```

```

@ctorForPredefinedListener.finally() ::= <<
<if(grammar.grammarIsRoot)> <! don't create new adaptor for delegates !>
CommonTreeAdaptor *adap = [CommonTreeAdaptor newTreeAdaptor];
[self setTreeAdaptor:adap];<\n>
<endif>
>>

```

```

@treeParserHeaderFile.superClassName ::= "DebugTreeParser"

```

```

@rewriteElement.pregen() ::= "[debugListener locationLine:<e.line> column:<e.pos>];"

```

Found in path(s):

```

* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-
jar/org/antlr/codegen/templates/ObjC/ASTDbg.stg

```

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```

```

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*/

```
@genericParserHeaderFile.memVars() ::= <<
/* AST parserHeaderFile.memVars */
NSInteger ruleLevel;
NSArray *ruleNames;
<@super.memVars(> /* AST super.memVars */
<parserMemVars(> /* AST parserMemVars */
>>
```

```
@genericParserHeaderFile.properties() ::= <<
/* AST parserHeaderFile.properties */
<@super.properties(> /* AST super.properties */
<parserProperties(> /* AST parserproperties */
>>
```

```
@genericParserHeaderFile.methodsDecl() ::= <<
/* AST parserHeaderFile.methodsDecl */
<@super.methodsDecl(> /* AST super.methodsDecl */
<parserMethodsDecl(> /* AST parsermethodsDecl */
>>
```

```
@genericParser.synthesize() ::= <<
/* AST genericParser.synthesize */
<@super.synthesize(>
<parserSynthesize(>
>>
```

```
@genericParser.methods() ::= <<
/* AST genericParser.methods */
<@super.methods(>
<parserMethods(>
>>
```

```

/* additional init code for tree support */
@genericParser.init() ::= <<
/* AST genericParser.init */
<@super.init(>
[self setTreeAdaptor:[[CommonTreeAdaptor newTreeAdaptor] retain]];
>>

@genericParser.dealloc() ::= <<
/* AST genericParser.dealloc */
[self setTreeAdaptor:nil];
<@super.dealloc(>
>>

/* Add an adaptor property that knows how to build trees */
parserMemVars() ::= <<
/* AST parserMemVars */
id<TreeAdaptor> treeAdaptor;
>>

/* Add an adaptor property that knows how to build trees */
parserProperties() ::= <<
/* AST parserProperties */
@property (retain, getter=getTreeAdaptor, setter=setTreeAdaptor:) id<TreeAdaptor> treeAdaptor;
>>

/** Declaration of additional tree support methods - go in interface of parserHeaderFile() */
parserMethodsDecl() ::= <<
/* AST parserMethodsDecl */
- (id<TreeAdaptor>) getTreeAdaptor;
- (void) setTreeAdaptor:(id<TreeAdaptor>)theTreeAdaptor;
>>

/* Add an adaptor property that knows how to build trees */
parserSynthesize() ::= <<
/* AST parserProperties */
@synthesize treeAdaptor;
>>

/** Definition of addition tree support methods - go in implementation of genericParser() */
parserMethods() ::= <<
/* AST parserMethods */
- (id<TreeAdaptor>) getTreeAdaptor
{
return treeAdaptor;
}

- (void) setTreeAdaptor:(id<TreeAdaptor>)aTreeAdaptor
{

```



```

if (aTreeAdaptor != treeAdaptor) {
    treeAdaptor = aTreeAdaptor;
}
}
>>

/** addition memVars for returnscopes */
@returnScopeInterface.memVars() ::= <<
/* AST returnScopeInterface.memVars */
<recognizer.ASTLabelType; null="CommonTree"> *tree;
>>

/** the interface of returnScope properties */
@returnScopeInterface.properties() ::= <<
/* AST returnScopeInterface.properties */
@property (retain, getter=getTree, setter=setTree;) <recognizer.ASTLabelType; null="CommonTree"> *tree;
>>

/** the interface of returnScope methodsDecl */
@returnScopeInterface.methodsDecl() ::= <<
/* AST returnScopeInterface.methodsDecl */
- (<recognizer.ASTLabelType; null="CommonTree"> *)getTree;<\n>
- (void) setTree:(<recognizer.ASTLabelType; null="CommonTree"> *)aTree;<\n>
>>

/** the implementation of returnScope synthesize */
@returnScopeImplementation.synthesize() ::= <<
/* AST returnScope.synthesize */
@synthesize tree;
>>

/** the implementation of returnScope methods */
@returnScopeImplementation.methods() ::= <<
/* AST returnScope.methods */
- (<ASTLabelType> *)getTree
{
    return tree;
}

- (void) setTree:(<ASTLabelType> *)aTree
{
    if (tree != aTree) {
        if (tree != nil) [tree release];
        if (aTree != nil) [aTree retain];
        tree = aTree;
    }
}
}

```

```

- (void) dealloc
{
    self.tree = nil;
    [super dealloc];
}

>>

/** Add a variable to track rule's return AST */
ruleDeclarations() ::= <<
/* AST ruleDeclarations */
<super.ruleDeclarations()>
<ASTLabelType> *root_0 = nil;<\n>
>>

ruleLabelDefs() ::= <<
/* AST ruleLabelDefs */
<super.ruleLabelDefs()>
<[ruleDescriptor.tokenLabels,ruleDescriptor.wildcardTreeLabels,
    ruleDescriptor.wildcardTreeListLabels]:{it | <ASTLabelType> *<it.label.text>_tree=nil;}; separator="\n">
<ruleDescriptor.tokenListLabels:{it | <ASTLabelType> *<it.label.text>_tree = nil;}; separator="\n">
<ruleDescriptor.allTokenRefsInAltsWithRewrites:{it | RewriteRuleTokenStream *stream_<it> =
    [[RewriteRule<rewriteElementType>Stream newRewriteRule<rewriteElementType>Stream:treeAdaptor
        description:@"token <it>"] retain];}; separator="\n">
<ruleDescriptor.allRuleRefsInAltsWithRewrites:{it | RewriteRuleSubtreeStream *stream_<it> =
    [[RewriteRuleSubtreeStream newRewriteRuleSubtreeStream:treeAdaptor
        description:@"rule <it>"] retain];}; separator="\n">
>>

ruleCleanUp() ::= <<
/* AST ruleCleanUp */
<super.ruleCleanUp()>
<[ruleDescriptor.allTokenRefsInAltsWithRewrites,ruleDescriptor.allRuleRefsInAltsWithRewrites]:{it |
    [stream_<it> release];}; separator="\n">
<!
<if(ruleDescriptor.hasMultipleReturnValues)>
<if(backtracking)>if ( state.backtracking == 0 ) {<\n>
<endif>
    [<prevRuleRootRef()> setTree:(<ASTLabelType> *)[treeAdaptor rulePostProcessing:root_0]];<\n>
    [treeAdaptor setTokenBoundaries:[<prevRuleRootRef()> getTree]
        From:[<prevRuleRootRef()> getStart]
        To:[<prevRuleRootRef()> getStop]];<\n>
<if(backtracking)>}<\n>
<endif>
<endif>
[<root_0 release>];
!>
>>

```

```

rewriteCodeLabelsCleanup() ::= <<
/* AST rewriteCodeLabelsCleanup */
<referencedTokenLabels:{it | [stream_<it> release];}; separator="\n">
<referencedTokenListLabels:{it | [stream_<it> release];}; separator="\n">
<referencedRuleLabels:{it | [stream_<it> release];}; separator="\n">
<referencedRuleListLabels:{it | [stream_<it> release];}; separator="\n">
>>

/** When doing auto AST construction, we must define some variables;
 * These should be turned off if doing rewrites. This must be a "mode"
 * as a rule could have both rewrite and AST within the same alternative
 * block.
 */
@alt.declarations() ::= <<
<if(autoAST)>
<if(outerAlt)>
<if(!rewriteMode)>
root_0 = (<ASTLabelType> *)[[[treeAdaptor class] newEmptyTree] retain];<\n>
<endif>
<endif>
<endif>
>>

// Tracking Rule Elements

/** ID and track it for use in a rewrite rule */
tokenRefTrack(token,label,elementIndex) ::= <<
<! <super.tokenRef(...)> !>
<tokenRefBang(...)> <! Track implies no auto AST construction!>
<if(backtracking)>
if ( <actions.(actionScope).synpredgate> ) <endif>
[stream_<token> addElement:<label>];<\n>
>>

/** ids+=ID and track it for use in a rewrite rule; adds to ids *and*
 * to the tracking list stream_ID for use in the rewrite.
 */
tokenRefTrackAndListLabel(token,label,elementIndex) ::= <<
<tokenRefTrack(...)>
<listLabel(elem=label,...)>
>>

/** ^(ID ...) track for rewrite */
tokenRefRuleRootTrack(token,label,elementIndex) ::= <<
<! <super.tokenRef(...)> !>
<tokenRefBang(...)>
<if(backtracking)>

```

```

if ( !<actions.(actionScope).synpredgate> ) <endif>
  [stream_<token> addElement:<label>];<\n>
>>

/** Match ^(label+=TOKEN ...) track for rewrite */
tokenRefRuleRootTrackAndListLabel(token,label,elementIndex) ::= <<
<tokenRefRuleRootTrack(...)>
<listLabel(elem=label,...)>
>>

/** rule when output=AST and tracking for rewrite */
ruleRefTrack(rule,label,elementIndex,args,scope) ::= <<
<super.ruleRef(...)>
<if(backtracking)>if ( <actions.(actionScope).synpredgate> ) <endif>
[stream_<rule.name> addElement:[<label> getTree]];
>>

/** x+=rule when output=AST and tracking for rewrite */
ruleRefTrackAndListLabel(rule,label,elementIndex,args,scope) ::= <<
<ruleRefTrack(...)>
<listLabel(elem={{<label> getTree}},...)>
>>

/** ^(rule ...) rewrite */
ruleRefRuleRootTrack(rule,label,elementIndex,args,scope) ::= <<
<! <super.ruleRefRuleRoot(...)> !>
<ruleRefRuleRoot(...)>
<if(backtracking)>if ( <actions.(actionScope).synpredgate> ) <endif>
  [stream_<rule.name> addElement:[<label> getTree]];<\n>
>>

/** ^(x+=rule ...) rewrite */
ruleRefRuleRootTrackAndListLabel(rule,label,elementIndex,args,scope) ::= <<
<ruleRefRuleRootTrack(...)>
<listLabel(elem={{<label> getTree}},...)>
>>

// R e w r i t e

rewriteCode(
  alts, description,
  referencedElementsDeep, // ALL referenced elements to right of ->
  referencedTokenLabels,
  referencedTokenListLabels,
  referencedRuleLabels,
  referencedRuleListLabels,
  referencedWildcardLabels,
  referencedWildcardListLabels,

```

```

rewriteBlockLevel, enclosingTreeLevel, treeLevel) ::=
<<

// AST REWRITE
// elements: <referencedElementsDeep; separator=", ">
// token labels: <referencedTokenLabels; separator=", ">
// rule labels: <referencedRuleLabels; separator=", ">
// token list labels: <referencedTokenListLabels; separator=", ">
// rule list labels: <referencedRuleListLabels; separator=", ">
// wildcard labels: <[referencedWildcardLabels,referencedWildcardListLabels]; separator=", ">
<if(backtracking)>
if ( <actions.(actionScope).synpredgate> ) {<\n>
<endif>
<prevRuleRootRef(>.tree = root_0;<\n>
<rewriteCodeLabels(>
root_0 = (<ASTLabelType> *)[[[treeAdaptor class] newEmptyTree] retain];<\n>
<alts:rewriteAlt(); separator="else ">
<! if tree parser and rewrite=true !>
<if(TREE_PARSER)>
<if(rewriteMode)>
<prevRuleRootRef(>.tree = (<ASTLabelType>)[treeAdaptor rulePostProcessing:root_0];
[input replaceChildren:[treeAdaptor getParent:retval.start]
    From:[treeAdaptor getChildIndex:retval.start]
    To:[treeAdaptor getChildIndex:_last]
    With:retval.tree];
<endif>
<endif>
<! if parser or tree-parser && rewrite!=true, we need to set result !>
<if(!TREE_PARSER)>
<prevRuleRootRef(>.tree = root_0;<\n>
<else>
<if(!rewriteMode)>
<prevRuleRootRef(>.tree = root_0;<\n>
<endif>
<endif>
<if(backtracking)>
}
<endif>
>>

rewriteCodeLabels() ::= <<
<referencedTokenLabels
: {it | RewriteRule<rewriteElementType>Stream *stream_<it> =
[[[RewriteRule<rewriteElementType>Stream newRewriteRule<rewriteElementType>Stream:treeAdaptor
description:@"token <it>" element:<it>] retain];};
separator="\n"
>
<referencedTokenListLabels: {it | RewriteRule<rewriteElementType>Stream *stream_<it> =

```

```

[[RewriteRule<rewriteElementType>Stream newRewriteRule<rewriteElementType>Stream:treeAdaptor
  description:@ "token <it>" elements:list_<it>] retain];};
separator="\n"
>
<referencedWildcardLabels:{it | RewriteRuleSubtreeStream stream_<it> =
  [[RewriteRuleSubtreeStream newRewriteRuleSubtreeStream:treeAdaptor
    description:"wildcard <it>" element:<it>] retain];};
separator="\n"
>
<referencedWildcardListLabels:{it | RewriteRuleSubtreeStream stream_<it> =
  [[RewriteRuleSubtreeStream newRewriteRuleSubtreeStream:treeAdaptor
    descriptor:"wildcard <it>" elements:list_<it>] retain];};
separator="\n"
>
<referencedRuleLabels:{it | RewriteRuleSubtreeStream *stream_<it> =
  [[RewriteRuleSubtreeStream newRewriteRuleSubtreeStream:treeAdaptor
    description:@ "token <it>" element:<it>!=nil?[<it> getTree]:nil] retain];};
separator="\n"
>
<referencedRuleListLabels:{it | RewriteRuleSubtreeStream *stream_<it> =
  [[RewriteRuleSubtreeStream newRewriteRuleSubtreeStream:treeAdaptor
    description:@ "token <it>" elements:list_<it>] retain];};
separator="\n"
>
>>

/** Generate code for an optional rewrite block; note it uses the deep ref'd element
 * list rather shallow like other blocks.
 */
rewriteOptionalBlock(
alt,rewriteBlockLevel,
referencedElementsDeep, // all nested refs
referencedElements, // elements in immediately block; no nested blocks
description) ::=
<<
// <fileName>:<description>
if ( <referencedElementsDeep:{el | [stream_<el> hasNext]}; separator="||"> ) {
  <alt>
}
<referencedElementsDeep:{el | [stream_<el> reset];<n>}>
>>

rewriteClosureBlock(
alt,rewriteBlockLevel,
referencedElementsDeep, // all nested refs
referencedElements, // elements in immediately block; no nested blocks
description) ::=
<<

```

```

// <fileName>:<description>
while ( <referencedElements:{el | [stream_<el> hasNext]}; separator="|"> ) {
  <alt>
}
<referencedElements:{el | [stream_<el> reset];<\n>}>
>>

rewritePositiveClosureBlock(
  alt,rewriteBlockLevel,
  referencedElementsDeep, // all nested refs
  referencedElements, // elements in immediately block; no nested blocks
  description) ::=
<<
// <fileName>:<description>
{
if ( !(<referencedElements:{el | [stream_<el> hasNext]}; separator="|">) ) {
  @throw [RewriteEarlyExitException newException];
}
while ( <referencedElements:{el | [stream_<el> hasNext]}; separator="|"> ) {
  <alt>
}
<referencedElements:{el | [stream_<el> reset];<\n>}>
}
>>

rewriteAlt(a) ::= <<
// <a.description>
<if(a.pred)>
if (<a.pred>) {
  <a.alt>
}<\n>
<else>
{
  <a.alt>
}<\n>
<endif>
>>

/** For empty rewrites: "r : ... -> ;" */
rewriteEmptyAlt() ::= "root_0 = nil;"

rewriteTree(root,children,description,enclosingTreeLevel,treeLevel) ::= <<
// <fileName>:<description>
{
  <ASTLabelType> *root_<treeLevel> = (<ASTLabelType> *)[[[treeAdaptor class] newEmptyTree] retain];
  <root:rewriteElement()>
  <children:rewriteElement()>
  [treeAdaptor addChild:root_<treeLevel> toTree:root_<enclosingTreeLevel>];
}

```

```

}<\n>
>>

rewriteElementList(elements) ::= "<elements:rewriteElement()>"

rewriteElement(e) ::= <<
<@pregen()>
<e.el>
>>

/** Gen ID or ID[args] */
rewriteTokenRef(token,elementIndex,terminalOptions,args) ::= <<
// TODO: args: <args; separator=", ">
[treeAdaptor addChild:<createRewriteNodeFromElement(...)> toTree:root_<treeLevel>];<\n>
>>

/** Gen $label ... where defined via label=ID */
rewriteTokenLabelRef(label,elementIndex) ::= <<
[treeAdaptor addChild:[stream_<label> nextNode] toTree:root_<treeLevel>];<\n>
>>

/** Gen $label ... where defined via label+=ID */
rewriteTokenListLabelRef(label,elementIndex) ::= <<
[treeAdaptor addChild:[stream_<label> nextNode] toTree:root_<treeLevel>];<\n>
>>

/** Gen ^($label ...) */
rewriteTokenLabelRefRoot(label,elementIndex) ::= <<
root_<treeLevel> = (<ASTLabelType> *)[treeAdaptor becomeRoot:[stream_<label> nextNode]
old:root_<treeLevel>];<\n>
>>

/** Gen ^($label ...) where label+=... */
rewriteTokenListLabelRefRoot ::= rewriteTokenLabelRefRoot

/** Gen ^(ID ...) or ^(ID[args] ...) */
rewriteTokenRefRoot(token,elementIndex,terminalOptions,args) ::= <<
root_<treeLevel> = (<ASTLabelType> *)[treeAdaptor becomeRoot:<createRewriteNodeFromElement(...)>
old:root_<treeLevel>];<\n>
>>

rewriteImaginaryTokenRef(args,token,terminalOptions,elementIndex) ::= <<
[treeAdaptor addChild:<createImaginaryNode(tokenType=token, ...)> toTree:root_<treeLevel>];<\n>
>>

rewriteImaginaryTokenRefRoot(args,token,terminalOptions,elementIndex) ::= <<
root_<treeLevel> = (<ASTLabelType> *)[treeAdaptor becomeRoot:<createImaginaryNode(tokenType=token, ...)>
old:root_<treeLevel>];<\n>

```



```

>>

/** plain -> {foo} action */
rewriteAction(action) ::= <<
root_0 = <action>;<\n>
>>

/** What is the name of the previous value of this rule's root tree? This
 * let's us refer to $rule to mean previous value. I am reusing the
 * variable 'tree' sitting in retval struct to hold the value of root_0 right
 * before I set it during rewrites. The assign will be to retval.tree.
 */
prevRuleRootRef() ::= "retval"

rewriteRuleRef(rule) ::= <<
[treeAdaptor addChild:[stream_<rule> nextTree] toTree:root_<treeLevel>];<\n>
>>

rewriteRuleRefRoot(rule) ::= <<
root_<treeLevel> = (<ASTLabelType> *)[treeAdaptor becomeRoot:(id<Tree>)[stream_<rule> nextNode]
old:root_<treeLevel>];<\n>
>>

rewriteNodeAction(action) ::= <<
[treeAdaptor addChild:<action> toTree:root_<treeLevel>];<\n>
>>

rewriteNodeActionRoot(action) ::= <<
root_<treeLevel> = (<ASTLabelType> *)[treeAdaptor becomeRoot:<action> old:root_<treeLevel>];<\n>
>>

/** Gen $ruleLabel ... where defined via ruleLabel=rule */
rewriteRuleLabelRef(label) ::= <<
[treeAdaptor addChild:[stream_<label> nextTree] toTree:root_<treeLevel>];<\n>
>>

/** Gen $ruleLabel ... where defined via ruleLabel+=rule */
rewriteRuleListLabelRef(label) ::= <<
[treeAdaptor addChild:[stream_<label> nextTree] toTree:root_<treeLevel>];<\n>
>>

/** Gen ^($ruleLabel ...) where ruleLabel=rule */
rewriteRuleLabelRefRoot(label) ::= <<
root_<treeLevel> = (<ASTLabelType> *)[treeAdaptor becomeRoot:[stream_<label> nextNode]
old:root_<treeLevel>];<\n>
>>

/** Gen ^($ruleLabel ...) where ruleLabel+=rule */

```

```

rewriteRuleListLabelRefRoot(label) ::= <<
root_<treeLevel> = (<ASTLabelType> *)[treeAdaptor becomeRoot:[stream_<label> nextNode]
old:root_<treeLevel>];<n>
>>

rewriteWildcardLabelRef(label) ::= <<
[treeAdaptor addChild:[stream_<label> nextTree] toTree:root_<treeLevel>];<n>
>>

createImaginaryNode(tokenType,terminalOptions,args) ::= <<
<if(terminalOptions.node)>
  [<terminalOptions.node> new<terminalOptions.node>:<tokenType> <if(args)>, <args; separator=", "><endif>]
<else>
  <if(args)>
    [[treeAdaptor createTree:<tokenType> <if(first(args))>FromToken:<first(args)><endif>
<if(first(rest(args)))>Text:<first(rest(args))><else>Text:@ "<tokenType>"<endif>] retain]
  <else>
    [[treeAdaptor createTree:<tokenType> Text:@ "<tokenType>"] retain]
  <endif>
<endif>
>>

createRewriteNodeFromElement(token,terminalOptions,args) ::= <<
<if(terminalOptions.node)>
  [<terminalOptions.node> new<terminalOptions.node>:[stream_<token> nextToken]<if(args)>, <args;
separator=", "><endif>]
<else>
  <if(args)> <! must create new node from old !>
    [[treeAdaptor createTree:<token> Text:<first(rest(args))> <args; separator=", ">] retain]
  <else>
    [stream_<token> nextNode]
  <endif>
<endif>
>>

Found in path(s):
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/codegen/templates/ObjC/AST.stg
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*/

```

```

@outputFile.imports() ::= <<
<@super.imports()>

```

```

<if(!TREE_PARSER)>
<! tree parser would already have imported !>
using Antlr.Runtime.Tree;
using RewriteRuleITokenStream = Antlr.Runtime.Tree.RewriteRuleTokenStream;
<endif>
>>

```

```

@genericParser.members() ::= <<
<@super.members()>
<parserMembers()>
>>

```

```

parserCtorBody() ::= <<
<super.parserCtorBody()>
<treeAdaptorType()> treeAdaptor = default(<treeAdaptorType()>);
CreateTreeAdaptor(ref treeAdaptor);
TreeAdaptor = treeAdaptor<if(!actions.(actionScope).treeAdaptorType)> ?? new CommonTreeAdaptor()<endif>;
>>

```

```

/** Add an adaptor property that knows how to build trees */
parserMembers() ::= <<
// Implement this function in your helper file to use a custom tree adaptor

```

```

partial void CreateTreeAdaptor(ref <treeAdaptorType()> adaptor);

private <treeAdaptorType()> adaptor;

public <treeAdaptorType()> TreeAdaptor
{
    get
    {
        return adaptor;
    }

    set
    {
        this.adaptor = value;
        <grammar.directDelegates:{g|<g:delegateName().TreeAdaptor = this.adaptor;}>
    }
}
>>

treeAdaptorType() ::= <<
<actions.(actionScope).treeAdaptorType; null="ITreeAdaptor">
>>

ruleReturnBaseType() ::= <%
Ast<if(TREE_PARSER)>Tree<else>Parser<endif>RuleReturnScope\<<ASTLabelType>, <labelType>>
%>

/** Add a variable to track rule's return AST */
ruleDeclarations() ::= <<
<super.ruleDeclarations()>
<ASTLabelType> root_0 = default(<ASTLabelType>);<\n>
>>

ruleLabelDefs(ruleDescriptor, labelType, ASTLabelType, rewriteElementType) ::= <%
<super.ruleLabelDefs(...)>
<if(!ruleDescriptor.isSynPred)>
<[ruleDescriptor.tokenLabels,ruleDescriptor.wildcardTreeLabels,ruleDescriptor.wildcardTreeListLabels]
: {it|\n><ASTLabelType> <it.label.text>_tree = default(<ASTLabelType>);}>
<ruleDescriptor.tokenListLabels: {it|\n><ASTLabelType> <it.label.text>_tree = default(<ASTLabelType>);}>
<ruleDescriptor.allTokenRefsInAltsWithRewrites
: {it|\n>RewriteRule<rewriteElementType>Stream stream_<it>=new
RewriteRule<rewriteElementType>Stream(adaptor,"token <it>");}>
<ruleDescriptor.allRuleRefsInAltsWithRewrites
: {it|\n>RewriteRuleSubtreeStream stream_<it>=new RewriteRuleSubtreeStream(adaptor,"rule <it>");}>
<endif>
%>

/** When doing auto AST construction, we must define some variables;

```

```

* These should be turned off if doing rewrites. This must be a "mode"
* as a rule could have both rewrite and AST within the same alternative
* block.
*/
@alt.declarations() ::= <<
<if(autoAST && outerAlt && !rewriteMode && !ruleDescriptor.isSynPred)>
root_0 = (<ASTLabelType>)adaptor.Nil();
<endif>
>>

// Tracking Rule Elements

/** ID and track it for use in a rewrite rule */
tokenRefTrack(token,label,elementIndex,terminalOptions={}) ::= <<
<tokenRefBang(...)> <! Track implies no auto AST construction!>
<if(backtracking)>if (<actions.(actionScope).synpredgate>) <endif>stream_<token>.Add(<label>);<\n>
>>

/** ids+=ID and track it for use in a rewrite rule; adds to ids *and*
* to the tracking list stream_ID for use in the rewrite.
*/
tokenRefTrackAndListLabel(token,label,elementIndex,terminalOptions={}) ::= <<
<tokenRefTrack(...)>
<listLabelElem(elem=label,elemType=labelType,...)>
>>

/** ^(ID ...) track for rewrite */
tokenRefRuleRootTrack(token,label,elementIndex,terminalOptions={}) ::= <<
<tokenRefBang(...)>
<if(backtracking)>if (<actions.(actionScope).synpredgate>) <endif>stream_<token>.Add(<label>);
>>

/** Match ^(label+=TOKEN ...) track for rewrite */
tokenRefRuleRootTrackAndListLabel(token,label,elementIndex,terminalOptions={}) ::= <<
<tokenRefRuleRootTrack(...)>
<listLabelElem(elem=label,elemType=labelType,...)>
>>

/** rule when output=AST and tracking for rewrite */
ruleRefTrack(rule,label,elementIndex,args,scope) ::= <<
<super.ruleRef(...)>
<if(backtracking)>if (<actions.(actionScope).synpredgate>) <endif>stream_<rule.name>.Add(<label>.Tree);
>>

/** x+=rule when output=AST and tracking for rewrite */
ruleRefTrackAndListLabel(rule,label,elementIndex,args,scope) ::= <<
<ruleRefTrack(...)>
<listLabelElem(elem={ <label>.Tree },elemType=ASTLabelType,...)>

```

```

>>

/** ^(rule ...) rewrite */
ruleRefRuleRootTrack(rule,label,elementIndex,args,scope) ::= <<
<ruleRefRuleRoot(...)>
<if(backtracking)>if (<actions.(actionScope).synpredgate>) <endif>stream_<rule>.Add(<label>.Tree);
>>

/** ^(x+=rule ...) rewrite */
ruleRefRuleRootTrackAndListLabel(rule,label,elementIndex,args,scope) ::= <<
<ruleRefRuleRootTrack(...)>
<listLabelElem(elem={<label>.Tree},elemType=ASTLabelType,...)>
>>

// R e w r i t e

rewriteCode(
alts, description,
referencedElementsDeep, // ALL referenced elements to right of ->
referencedTokenLabels,
referencedTokenListLabels,
referencedRuleLabels,
referencedRuleListLabels,
referencedWildcardLabels,
referencedWildcardListLabels,
rewriteBlockLevel, enclosingTreeLevel, treeLevel) ::= <<
<\n>{
// AST REWRITE
// elements: <referencedElementsDeep; separator=", ">
// token labels: <referencedTokenLabels; separator=", ">
// rule labels: <referencedRuleLabels; separator=", ">
// token list labels: <referencedTokenListLabels; separator=", ">
// rule list labels: <referencedRuleListLabels; separator=", ">
// wildcard labels: <[referencedWildcardLabels,referencedWildcardListLabels]; separator=", ">
<if(backtracking)>
if (<actions.(actionScope).synpredgate>) {
<endif>
<prevRuleRootRef(>).Tree = root_0;
<rewriteCodeLabels(>
root_0 = (<ASTLabelType>)adaptor.Nil();
<alts:rewriteAlt(); separator="else ">
<! if tree parser and rewrite=true !>
<if(TREE_PARSER&&rewriteMode)>
<prevRuleRootRef(>).Tree = (<ASTLabelType>)adaptor.RulePostProcessing(root_0);
if (<prevRuleRootRef(>).Tree != null)
input.ReplaceChildren(adaptor.GetParent(retval.Start), adaptor.GetChildIndex(retval.Start),
adaptor.GetChildIndex(_last), retval.Tree);
<endif>

```

```

<! if parser or tree-parser && rewrite!=true, we need to set result !>
<if(!TREE_PARSER||!rewriteMode)>
<prevRuleRootRef().Tree = root_0;
<endif>
<if(backtracking)>
}
<endif>
}

>>

rewriteCodeLabels() ::= <<
<referencedTokenLabels
: {it|RewriteRule<rewriteElementType>Stream stream_<it>=new
RewriteRule<rewriteElementType>Stream(adaptor,"token <it>",<it>)};
separator="\n"
>
<referencedTokenListLabels
: {it|RewriteRule<rewriteElementType>Stream stream_<it>=new
RewriteRule<rewriteElementType>Stream(adaptor,"token <it> ", list_<it>)};
separator="\n"
>
<referencedWildcardLabels
: {it|RewriteRuleSubtreeStream stream_<it>=new RewriteRuleSubtreeStream(adaptor,"wildcard <it>",<it>)};
separator="\n"
>
<referencedWildcardListLabels
: {it|RewriteRuleSubtreeStream stream_<it>=new RewriteRuleSubtreeStream(adaptor,"wildcard <it> ",list_<it>)};
separator="\n"
>
<referencedRuleLabels
: {it|RewriteRuleSubtreeStream stream_<it>=new RewriteRuleSubtreeStream(adaptor,"rule
<it>",<it>!=null?<it>.Tree:null)};
separator="\n"
>
<referencedRuleListLabels
: {it|RewriteRuleSubtreeStream stream_<it>=new RewriteRuleSubtreeStream(adaptor,"token <it> ",list_<it>)};
separator="\n"
>
>>

/** Generate code for an optional rewrite block; note it uses the deep ref'd element
 * list rather shallow like other blocks.
 */
rewriteOptionalBlock(
alt,rewriteBlockLevel,
referencedElementsDeep, // all nested refs
referencedElements, // elements in immediately block; no nested blocks

```

```

description) ::=
<<
// <fileName>:<description>
if (<referencedElementsDeep:{el | stream_<el>.HasNext}; separator="||">)
{
  <alt>
}
<referencedElementsDeep:{el | stream_<el>.Reset();<\n>}>
>>

```

```

rewriteClosureBlock(
  alt,rewriteBlockLevel,
  referencedElementsDeep, // all nested refs
  referencedElements, // elements in immediately block; no nested blocks
  description) ::=
<<
// <fileName>:<description>
while ( <referencedElements:{el | stream_<el>.HasNext}; separator="||"> )
{
  <alt>
}
<referencedElements:{el | stream_<el>.Reset();<\n>}>
>>

```

```

rewritePositiveClosureBlock(
  alt,rewriteBlockLevel,
  referencedElementsDeep, // all nested refs
  referencedElements, // elements in immediately block; no nested blocks
  description) ::=
<<
if (!(<referencedElements:{el | stream_<el>.HasNext}; separator="||">))
{
  throw new RewriteEarlyExitException();
}
while ( <referencedElements:{el | stream_<el>.HasNext}; separator="||"> )
{
  <alt>
}
<referencedElements:{el | stream_<el>.Reset();<\n>}>
>>

```

```

rewriteAlt(a) ::= <<
// <a.description>
<if(a.pred)>
if (<a.pred>)
{
  <a.alt>
}

```



```

<else>
{
  <a.alt>
}
<endif>
>>

/** For empty rewrites: "r : ... -> ;" */
rewriteEmptyAlt() ::= "root_0 = null;"

rewriteTree(root,children,description,enclosingTreeLevel,treeLevel) ::= <<
// <fileName>:<description>
{
  <ASTLabelType> root_<treeLevel> = (<ASTLabelType>)adaptor.Nil();
  <root:rewriteElement()>
  <children:rewriteElement()>
  adaptor.AddChild(root_<enclosingTreeLevel>, root_<treeLevel>);
}<\n>
>>

rewriteElementList(elements) ::= "<elements:rewriteElement()>"

rewriteElement(e) ::= <%
<@pregen()>
DebugLocation(<e.line>, <e.pos>);<\n>
<e.el>
%>

/** Gen ID or ID[args] */
rewriteTokenRef(token,elementIndex,args,terminalOptions={}) ::= <<
adaptor.AddChild(root_<treeLevel>, <createRewriteNodeFromElement(...)>);<\n>
>>

/** Gen $label ... where defined via label=ID */
rewriteTokenLabelRef(label,elementIndex) ::= <<
adaptor.AddChild(root_<treeLevel>, stream_<label>.NextNode());<\n>
>>

/** Gen $label ... where defined via label+=ID */
rewriteTokenListLabelRef(label,elementIndex) ::= <<
adaptor.AddChild(root_<treeLevel>, stream_<label>.NextNode());<\n>
>>

/** Gen ^($label ...) */
rewriteTokenLabelRefRoot(label,elementIndex) ::= <<
root_<treeLevel> = (<ASTLabelType>)adaptor.BecomeRoot(stream_<label>.NextNode(), root_<treeLevel>);<\n>
>>

```

```

/** Gen ^($label ...) where label+=... */
rewriteTokenListLabelRefRoot ::= rewriteTokenLabelRefRoot

/** Gen ^(ID ...) or ^(ID[args] ...) */
rewriteTokenRefRoot(token,elementIndex,args,terminalOptions={}) ::= <<
root_<treeLevel> = (<ASTLabelType>)adaptor.BecomeRoot(<createRewriteNodeFromElement(...)>,
root_<treeLevel>);<\n>
>>

rewriteImaginaryTokenRef(args,token,elementIndex,terminalOptions={}) ::= <<
adaptor.AddChild(root_<treeLevel>, <createImaginaryNode(tokenType=token, ...)>);<\n>
>>

rewriteImaginaryTokenRefRoot(args,token,elementIndex,terminalOptions={}) ::= <<
root_<treeLevel> = (<ASTLabelType>)adaptor.BecomeRoot(<createImaginaryNode(tokenType=token, ...)>,
root_<treeLevel>);<\n>
>>

/** plain -> {foo} action */
rewriteAction(action) ::= <<
root_0 = <action>;<\n>
>>

/** What is the name of the previous value of this rule's root tree? This
* let's us refer to $rule to mean previous value. I am reusing the
* variable 'tree' sitting in retval struct to hold the value of root_0 right
* before I set it during rewrites. The assign will be to retval.tree.
*/
prevRuleRootRef() ::= "retval"

rewriteRuleRef(rule) ::= <<
adaptor.AddChild(root_<treeLevel>, stream_<rule>.NextTree());<\n>
>>

rewriteRuleRefRoot(rule) ::= <<
root_<treeLevel> = (<ASTLabelType>)adaptor.BecomeRoot(stream_<rule>.NextNode(), root_<treeLevel>);<\n>
>>

rewriteNodeAction(action) ::= <<
adaptor.AddChild(root_<treeLevel>, <action>);<\n>
>>

rewriteNodeActionRoot(action) ::= <<
root_<treeLevel> = (<ASTLabelType>)adaptor.BecomeRoot(<action>, root_<treeLevel>);<\n>
>>

/** Gen $ruleLabel ... where defined via ruleLabel=rule */
rewriteRuleLabelRef(label) ::= <<

```

```

adaptor.AddChild(root_<treeLevel>, stream_<label>.NextTree());<\n>
>>

/** Gen $ruleLabel ... where defined via ruleLabel+=rule */
rewriteRuleListLabelRef(label) ::= <<
adaptor.AddChild(root_<treeLevel>, stream_<label>.NextTree());<\n>
>>

/** Gen ^($ruleLabel ...) where ruleLabel=rule */
rewriteRuleLabelRefRoot(label) ::= <<
root_<treeLevel> = (<ASTLabelType>)adaptor.BecomeRoot(stream_<label>.NextNode(), root_<treeLevel>);<\n>
>>

/** Gen ^($ruleLabel ...) where ruleLabel+=rule */
rewriteRuleListLabelRefRoot(label) ::= <<
root_<treeLevel> = (<ASTLabelType>)adaptor.BecomeRoot(stream_<label>.NextNode(), root_<treeLevel>);<\n>
>>

rewriteWildcardLabelRef(label) ::= <<
adaptor.AddChild(root_<treeLevel>, stream_<label>.NextTree());<\n>
>>

createImaginaryNode(tokenType,args,terminalOptions={ }) ::= <%
<if(terminalOptions.node)>
<! new MethodNode(IDLabel, args) !>
new <terminalOptions.node><(tokenType)<if(args)>, <args; separator=", "><endif>
<else>
(<ASTLabelType>)adaptor.Create(<tokenType>, <args; separator=", "><if(!args)>"<tokenType>"<endif>
<endif>
%>

createRewriteNodeFromElement(token,args,terminalOptions={ }) ::= <%
<if(terminalOptions.node)>
new <terminalOptions.node>(stream_<token>.NextToken())<if(args)>, <args; separator=", "><endif>
<else>
<if(args)> <! must create new node from old !>
adaptor.Create(<token>, <args; separator=", ">)
<else>
stream_<token>.NextNode()
<endif>
<endif>
%>

```

Found in path(s):

```

* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-
jar/org/antlr/codegen/templates/CSharp3/AST.stg

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```
*/
```

```
/** Template subgroup to add template rewrite output
```

```
* If debugging, then you'll also get STDbg.stg loaded.
```

```
*/
```

```
@outputFile.imports() ::= <<
```

```
<@super.imports(>
```

```
import stringtemplate3
```

```
>>
```

```
/** Add this to each rule's return value struct */
```

```
@returnScope.ruleReturnInit() ::= <<
```

```
self.st = None
```

```
>>
```

```
@returnScope.ruleReturnMembers() ::= <<
```

```
def getTemplate(self):
```

```
    return self.st
```

```
def toString(self):
```

```
    if self.st is not None:
```

```
        return self.st.toString()
```

```

    return None
    __str__ = toString

>>

@genericParser.init() ::= <<
<@super.init()>
self.templateLib = stringtemplate3.StringTemplateGroup(
    '<name>Templates', lexer='angle-bracket'
)

>>

@genericParser.members() ::= <<
<@super.members()>
def setTemplateLib(self, templateLib):
    self.templateLib = templateLib

def getTemplateLib(self):
    return self.templateLib

>>

/** x+=rule when output=template */
ruleRefAndListLabel(rule,label,elementIndex,args,scope) ::= <<
<ruleRef(...)>
<listLabel(label, {<label>.st})>
>>

rewriteTemplate(alts) ::= <<
# TEMPLATE REWRITE
<if(backtracking)>
if <actions.(actionScope).synpredgate>:
    <first(alts):rewriteTemplateAltFirst()>
    <rest(alts):{it | el<rewriteTemplateAlt(it)>}>
    <if(rewriteMode)><replaceTextInLine()><endif>

<else>
<first(alts):rewriteTemplateAltFirst()>
<rest(alts):{it | el<rewriteTemplateAlt(it)>}>
<if(rewriteMode)><replaceTextInLine()><endif>
<endif>
>>

replaceTextInLine() ::= <<
<if(TREE_PARSER)>
self.input.getTokenStream().replace(
    self.input.getTreeAdaptor().getTokenStartIndex(retval.start),

```

```

    self.input.getTreeAdaptor().getTokenStopIndex(retval.start),
    retval.st
  )
<else>
self.input.replace(
  retval.start.getTokenIndex(),
  self.input.LT(-1).getTokenIndex(),
  retval.st
)
<endif>
>>

```

```

rewriteTemplateAltFirst(alt) ::= <<
<if(alt.pred)>
if <alt.pred>:
  # <alt.description>
  retval.st = <alt.alt>
<\n>
<else>
# <alt.description>
retval.st = <alt.alt>
<\n>
<endif>
>>

```

```

rewriteTemplateAlt(alt) ::= <<
<if(alt.pred)>if <alt.pred>:
  # <alt.description>
  retval.st = <alt.alt>
<\n>
<else>se:
  # <alt.description>
  retval.st = <alt.alt>
<\n>
<endif>
>>

```

```

rewriteEmptyTemplate(alts) ::= <<
None
>>

```

```

/** Invoke a template with a set of attribute name/value pairs.
 * Set the value of the rule's template *after* having set
 * the attributes because the rule's template might be used as
 * an attribute to build a bigger template; you get a self-embedded
 * template.
 */

```

```

rewriteExternalTemplate(name,args) ::= <%

```

```

self.templateLib.getInstanceOf("<name><if(args)>, attributes={<args:{a | "<a.name>": <a.value>}; separator=",
"><endif>)
%>

/** expr is a string expression that says what template to load */
rewriteIndirectTemplate(expr,args) ::= <%
self.templateLib.getInstanceOf(<expr><if(args)>, attributes={<args:{a | "<a.name>": <a.value>}; separator=",
"><endif>)
%>

/** Invoke an inline template with a set of attribute name/value pairs */
rewriteInlineTemplate(args, template) ::= <%
stringtemplate3.StringTemplate("<template>", group=self.templateLib<if(args)>, attributes={<args:{a |
"<a.name>": <a.value>}; separator=", "><endif>)
%>

/** plain -> {foo} action */
rewriteAction(action) ::= <<
<action>
>>

/** An action has %st.attrName=expr; or % {st}.attrName=expr; */
actionSetAttribute(st,attrName,expr) ::= <<
(<st>["<attrName>"] = <expr>
>>

/** Translate %{stringExpr} */
actionStringConstructor(stringExpr) ::= <<
stringtemplate3.StringTemplate(<stringExpr>, group=self.templateLib)
>>

```

Found in path(s):

* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/codegen/templates/Python/ST.stg

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* THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.
*/

```

```

/** Template overrides to add debugging to normal Java output;
* If ASTs are built, then you'll also get ASTDbg.stg loaded.
*/

```

```

@outputFile.debugPreprocessor() ::= "#define ANTLR_DEBUG"

```

```

@outputFile.imports() ::= <<
<@super.imports(>
using Antlr.Runtime.Debug;
using IOException = System.IO.IOException;
>>

```

```

@genericParser.members() ::= <<
<if(grammar.grammarIsRoot)>
public static readonly string[] ruleNames =
new string[]
{
    "invalidRule", <grammar.allImportedRules:{rST | "<rST.name>"}; wrap="\n ", separator=", ">
};<\n>
<endif>
<if(grammar.grammarIsRoot)><! grammar imports other grammar(s) !>
int ruleLevel = 0;
public virtual int RuleLevel { get { return ruleLevel; } }
public virtual void IncRuleLevel() { ruleLevel++; }
public virtual void DecRuleLevel() { ruleLevel--; }
<if(profile)>
<ctorForProfilingRootGrammar(>
<else>
<ctorForRootGrammar(>
<endif>
<ctorForPredefinedListener(>

```



```

<else><! imported grammar !>
public int RuleLevel { get { return <grammar.delegators:{g| <g:delegateName()>>>.RuleLevel; } }
public void IncRuleLevel() { <grammar.delegators:{g| <g:delegateName()>>>.IncRuleLevel(); }
public void DecRuleLevel() { <grammar.delegators:{g| <g:delegateName()>>>.DecRuleLevel(); }
<ctorForDelegateGrammar()>
<endif>
<if(profile)>
public override bool AlreadyParsedRule( IIntStream input, int ruleIndex )
{
int stopIndex = GetRuleMemoization(ruleIndex, input.Index);
((Profiler)dbg).ExamineRuleMemoization(input, ruleIndex, stopIndex,
<grammar.composite.rootGrammar.recognizerName>.ruleNames[ruleIndex]);
return base.AlreadyParsedRule(input, ruleIndex);
}<\n>
public override void Memoize( IIntStream input, int ruleIndex, int ruleStartIndex )
{
((Profiler)dbg).Memoize(input, ruleIndex, ruleStartIndex,
<grammar.composite.rootGrammar.recognizerName>.ruleNames[ruleIndex]);
base.Memoize(input, ruleIndex, ruleStartIndex);
}<\n>
<endif>
protected virtual bool EvalPredicate( bool result, string predicate )
{
dbg.SemanticPredicate( result, predicate );
return result;
}<\n>
>>

ctorForRootGrammar() ::= <<
<! bug: can't use <@super.members()> cut-n-paste instead !>
<! Same except we add port number and profile stuff if root grammar !>
<actions.(actionScope).ctorModifier; null="public"> <name>( <inputStreamType> input )
: this( input, DebugEventSocketProxy.DefaultDebuggerPort, new RecognizerSharedState() )
{
}
<actions.(actionScope).ctorModifier; null="public"> <name>( <inputStreamType> input, int port,
RecognizerSharedState state )
: base( input, state )
{
<createListenerAndHandshake()>
<grammar.directDelegates:{g|<g:delegateName()> = new <g.recognizerName>( input, dbg, this.state,
this<grammar.delegators:{g|, <g:delegateName()>>> );}; separator="\n">
<parserCtorBody()>
<@finally()>
}<\n>
>>

ctorForProfilingRootGrammar() ::= <<

```

```

<! bug: can't use <@super.members()> cut-n-paste instead !>
<actions.(actionScope).ctorModifier; null="public"> <name>( <inputStreamType> input )
: this( input, new Profiler(null), new RecognizerSharedState() )
{
}
<actions.(actionScope).ctorModifier; null="public"> <name>( <inputStreamType> input, IDebugEventListener dbg,
RecognizerSharedState state )
: base( input, dbg, state )
{
Profiler p = (Profiler)dbg;
p.setParser(this);
<grammar.directDelegates:
{g|<g:delegateName()> = new <g.recognizerName>( input, dbg, this.state, this<grammar.delegators:{g|,
<g:delegateName()>>> );}; separator="\n">
<parserCtorBody()>
<@finally()>
}
<\n>
>>

/** Basically we don't want to set any dbg listeners are root will have it. */
ctorForDelegateGrammar() ::= <<
<actions.(actionScope).ctorModifier; null="public"> <name>( <inputStreamType> input, IDebugEventListener dbg,
RecognizerSharedState state<grammar.delegators:{g|, <g.recognizerName> <g:delegateName()>>> )
: base( input, dbg, state )
{
<grammar.directDelegates:
{g|<g:delegateName()> = new <g.recognizerName>( input, this, this.state<grammar.delegators:{g|,
<g:delegateName()>>> );}; separator="\n">
<parserCtorBody()>
}<\n>
>>

ctorForPredefinedListener() ::= <<
<actions.(actionScope).ctorModifier; null="public"> <name>( <inputStreamType> input, IDebugEventListener dbg
)
<@superClassRef>: base( input, dbg, new RecognizerSharedState() )<@end>
{
<if(profile)>
Profiler p = (Profiler)dbg;
p.setParser(this);
<endif>
<grammar.directDelegates:{g|<g:delegateName()> = new <g.recognizerName>(input, dbg, this.state,
this<grammar.delegators:{g|, <g:delegateName()>>>);}; separator="\n">
<parserCtorBody()>
<@finally()>
}<\n>
>>

```

```

createListenerAndHandshake() ::= <<
<if(TREE_PARSER)>
DebugEventSocketProxy proxy = new DebugEventSocketProxy( this, port, input.TreeAdaptor );<\n>
<else>
DebugEventSocketProxy proxy = new DebugEventSocketProxy( this, port, null );<\n>
<endif>
DebugListener = proxy;
try
{
    proxy.Handshake();
}
catch ( IOException ioe )
{
    ReportError( ioe );
}
>>

@genericParser.superClassName() ::= "Debug<@super.superClassName()>"

/*
* Many of the following rules were merged into CSharp2.stg.
*/

@rule.preamble() ::= <<
if (RuleLevel == 0)
    DebugListener.Commence();
IncRuleLevel();
>>
//@rule.preamble() ::= <<
//try
//{
// dbg.EnterRule( GrammarFileName, "<ruleName>" );
// if ( RuleLevel == 0 )
// {
//     dbg.Commence();
// }
// IncRuleLevel();
// dbg.Location( <ruleDescriptor.tree.line>, <ruleDescriptor.tree.charPositionInLine> );<\n>
//>>

@rule.postamble() ::= <<
DecRuleLevel();
if (RuleLevel == 0)
    DebugListener.Terminate();
>>
//@rule.postamble() ::= <<
//dbg.Location(<ruleDescriptor.EORNode.line>, <ruleDescriptor.EORNode.charPositionInLine>);<\n>

```

```

//}
//finally
//{
// dbg.ExitRule( GrammarFileName, "<ruleName>" );
// DecRuleLevel();
// if ( RuleLevel == 0 )
// {
// dbg.Terminate();
// }
//}<\n>
//>>

@@insertSynpreds.start() ::= "dbg.BeginBacktrack( state.backtracking );"
@@insertSynpreds.stop() ::= "dbg.EndBacktrack( state.backtracking, success );"

// Common debug event triggers used by region overrides below

//enterSubRule() ::= <<
//try
//{
// dbg.EnterSubRule( <decisionNumber> );<\n>
//>>

//exitSubRule() ::= <<
//}
//finally
//{
// dbg.ExitSubRule( <decisionNumber> );
//}<\n>
//>>

//enterDecision() ::= <<
//try
//{
// dbg.EnterDecision( <decisionNumber> );<\n>
//>>

//exitDecision() ::= <<
//}
//finally
//{
// dbg.ExitDecision( <decisionNumber> );
//}<\n>
//>>

//enterAlt(n) ::= "dbg.EnterAlt( <n> );<\n>"

// Region overrides that tell various constructs to add debugging triggers

```

```

//@block.predecision() ::= "<enterSubRule()><enterDecision()>"

//@block.postdecision() ::= "<exitDecision()>"

//@block.postbranch() ::= "<exitSubRule()>"

//@ruleBlock.predecision() ::= "<enterDecision()>"

//@ruleBlock.postdecision() ::= "<exitDecision()>"

//@ruleBlockSingleAlt.preal() ::= "<enterAlt(n=\"1\")>"

//@blockSingleAlt.preal() ::= "<enterAlt(n=\"1\")>"

//@positiveClosureBlock.preloop() ::= "<enterSubRule()>"

//@positiveClosureBlock.postloop() ::= "<exitSubRule()>"

//@positiveClosureBlock.predecision() ::= "<enterDecision()>"

//@positiveClosureBlock.postdecision() ::= "<exitDecision()>"

//@positiveClosureBlock.earlyExitException() ::=
// "dbg.RecognitionException( eee<decisionNumber> );<n>"

//@closureBlock.preloop() ::= "<enterSubRule()>"

//@closureBlock.postloop() ::= "<exitSubRule()>"

//@closureBlock.predecision() ::= "<enterDecision()>"

//@closureBlock.postdecision() ::= "<exitDecision()>"

//@altSwitchCase.preal() ::= "<enterAlt(n=i)>"

//@element.prematch() ::=
// "dbg.Location( <it.line>, <it.pos> );"

//@matchSet.mismatchedSetException() ::=
// "dbg.RecognitionException( mse );"

//@dfaState.noViableAltException() ::= "dbg.RecognitionException( nvae );"

//@dfaStateSwitch.noViableAltException() ::= "dbg.RecognitionException( nvae );"

//dfaDecision(decisionNumber,description) ::= <<
//try

```

```

//{{
// isCyclicDecision = true;
// <super.dfaDecision(...)>
//}}
//catch ( NoViableAltException nvae )
//{{
// dbg.RecognitionException( nvae );
// throw nvae;
//}}
//>>

//@cyclicDFA.errorMethod() ::= <<
//public override void Error( NoViableAltException nvae )
//{{
// ((DebugParser)recognizer).dbg.RecognitionException( nvae );
//}}
//>>

/** Force predicate validation to trigger an event */
evalPredicate(pred,description) ::= <<
EvalPredicate(<pred>, "<description>")
>>

```

Found in path(s):

```

* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-
jar/org/antlr/codegen/templates/CSharp2/Dbg.stg

```

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```

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*/

/** Templates for building ASTs during normal parsing.

*

* Deal with many combinations. Dimensions are:

* Auto build or rewrite

* no label, label, list label (label/no-label handled together)

* child, root

* token, set, rule, wildcard

*

* The situation is not too bad as rewrite (->) usage makes ^ and !

* invalid. There is no huge explosion of combinations.

*/

@rule.setErrorReturnValue() ::= <<

/* ASTParser rule.setErrorReturnValue */

retval.tree = (<ASTLabelType> *)[treeAdaptor errorNode:input From:retval.start To:[input LT:-1] Exception:re];

<! System.out.println("<ruleName> returns "+((CommonTree)retval.tree).toStringTree()); !>

>>

// TOKEN AST STUFF

/** ID and output=AST */

tokenRef(token, label, elementIndex, terminalOptions) ::= <<

/* ASTParser tokenRef */

<super.tokenRef(...)>

<if(backtracking)>if (<actions.(actionScope).synpredgate>) {<endif>

<label>_tree = <createNodeFromToken(...)>;

[treeAdaptor addChild:<label>_tree toTree:root_0];

<if(backtracking)>}<endif>

>>

/* ID! and output=AST (same as plain tokenRef) */

/* ASTParser tokenRefBang */

tokenRefBang(token,label,elementIndex,terminalOptions) ::= "<super.tokenRef(...)>"

/** ID^ and output=AST */

tokenRefRuleRoot(token,label,elementIndex,terminalOptions) ::= <<

<super.tokenRef(...)>

<if(backtracking)>if (<actions.(actionScope).synpredgate>) {<endif>

<label>_tree = <createNodeFromToken(...)>;

root_0 = (<ASTLabelType> *)[treeAdaptor becomeRoot:<label>_tree old:root_0];

<if(backtracking)>}<endif>

```

>>

/** ids+=ID! and output=AST */
tokenRefBangAndListLabel(token,label,elementIndex,terminalOptions) ::= <<
/* ASTParser tokenRefBangAndListLabel */
<tokenRefBang(...)>
<listLabel(elem=label,...)>
>>

/** label+=TOKEN when output=AST but not rewrite alt */
tokenRefAndListLabel(token,label,elementIndex,terminalOptions) ::= <<
/* ASTParser tokenRefAndListLabel */
<tokenRef(...)>
<listLabel(elem=label,...)>
>>

/** Match label+=TOKEN^ when output=AST but not rewrite alt */
tokenRefRuleRootAndListLabel(token,label,terminalOptions,elementIndex) ::= <<
/* ASTParser tokenRefRuleRootAndListLabel */
<tokenRefRuleRoot(...)>
<listLabel(elem=label,...)>
>>

// SET AST

// the match set stuff is interesting in that it uses an argument list
// to pass code to the default matchSet; another possible way to alter
// inherited code. I don't use the region stuff because I need to pass
// different chunks depending on the operator. I don't like making
// the template name have the operator as the number of templates gets
// large but this is the most flexible--this is as opposed to having
// the code generator call matchSet then add root code or ruleroot code
// plus list label plus ... The combinations might require complicated
// rather than just added on code. Investigate that refactoring when
// I have more time.

matchSet(s,label,terminalOptions,elementIndex,postmatchCode) ::= <%
/* ASTParser matchSet */
<super.matchSet(postmatchCode={<if(backtracking)>if ( <actions.(actionScope).synpredgate> )<endif>
 [treeAdaptor addChild:<createNodeFromToken(...)> toTree:root_0 ];}, ...)>
%>

matchRuleBlockSet(s,label,terminalOptions,elementIndex,postmatchCode,treeLevel="0") ::= <<
/* ASTParser matchRuleBlockSet */
<matchSet(...)>
>>

matchSetBang(s,label,elementIndex,terminalOptions, postmatchCode) ::= "<super.matchSet(...)>"

```



```

// note there is no matchSetTrack because -> rewrites force sets to be
// plain old blocks of alts: (A|B|...|C)

matchSetRuleRoot(s,label,terminalOptions,elementIndex,debug) ::= <<
/* ASTParser matchSetRuleRoot */
<if(label)>
<label>=(<labelType> *)[input LT:1]; /* matchSetRuleRoot */<\n>
<endif>
<super.matchSet(postmatchCode={ <if(backtracking)>if ( <actions.(actionScope).synpredgate> )<endif>
root_0 = (<ASTLabelType> *)[treeAdaptor becomeRoot:<createNodeFromToken(...)> old:root_0];}, ...)>
>>

// RULE REF AST

/** rule when output=AST */
ruleRef(rule,label,elementIndex,args,scope) ::= <<
/* ASTParser ruleRef */
<super.ruleRef(...)>
<if(backtracking)>if ( <actions.(actionScope).synpredgate> )<endif>
[treeAdaptor addChild:[<label> getTree] toTree:root_0];
>>

/** rule! is same as normal rule ref */
ruleRefBang(rule,label,elementIndex,args,scope) ::= "<super.ruleRef(...)>"

/** rule^ */
ruleRefRuleRoot(rule,label,elementIndex,args,scope) ::= <<
/* ASTParser ruleRefRuleRoot */
<super.ruleRef(...)>
<if(backtracking)>if ( <actions.(actionScope).synpredgate> )<endif>
root_0 = (<ASTLabelType> *)[treeAdaptor becomeRoot:[<label> getTree] old:root_0];
>>

/** x+=rule when output=AST */
ruleRefAndListLabel(rule,label,elementIndex,args,scope) ::= <<
/* ASTParser ruleRefAndListLabel */
<ruleRef(...)>
<listLabel(elem = {[<label> getTree]},...)>
>>

/** x+=rule! when output=AST is a rule ref with list addition */
ruleRefBangAndListLabel(rule,label,elementIndex,args,scope) ::= <<
/* ASTParser ruleRefBangAndListLabel */
<ruleRefBang(...)>
<listLabel(elem = {[<label> getTree]},...)>
>>

```

```

/** x+=rule^ */
ruleRefRuleRootAndListLabel(rule,label,elementIndex,args,scope) ::= <<
/* ASTParser ruleRefRuleRootAndListLabel */
<ruleRefRuleRoot(...)>
<listLabel(elem = {[<label> getTree]},...)>
>>

// WILDCARD AST

wildcard(token,label,elementIndex,terminalOptions) ::= <<
/* ASTParser wildcard */
<super.wildcard(...)>
<if(backtracking)>if ( <actions.(actionScope).synpredgate> ) {<endif>
  [treeAdaptor addChild:[treeAdaptor create:<label>] retain] toTree:root_0];
<if(backtracking)>}<endif>
>>

wildcardBang(token,label,elementIndex,terminalOptions) ::= "<super.wildcard(...)>"

wildcardRuleRoot(token,label,elementIndex,terminalOptions) ::= <<
/* ASTParser wildcardRuleRoot */
<super.wildcard(...)>
<if(backtracking)>if ( <actions.(actionScope).synpredgate> ) {<endif>
  <label>_tree = [[treeAdaptor create:<label>] retain]
  root_0 = (<ASTLabelType> *)[treeAdaptor becomeRoot:<label>_tree old:root_0];
<if(backtracking)>}<endif>
>>

createNodeFromToken(label,terminalOptions) ::= <<
/* ASTParser createNodeFromToken */
<if(terminalOptions.node)>
[<terminalOptions.node> new<terminalOptions.node>:<label>] <! new MethodNode(IDLabel) !>
<else>
(<ASTLabelType> *)[treeAdaptor create:<label>] retain]
<endif>
>>

// straight from java cleanup ///
ruleCleanUp() ::= <<
/* ASTParser ruleCleanUp */
<super.ruleCleanUp()>
<if(backtracking)>if ( <actions.(actionScope).synpredgate> ) {<n><endif>
  retval.tree = (<ASTLabelType> *)[treeAdaptor rulePostProcessing:root_0];
  [treeAdaptor setTokenBoundaries:retval.tree From:retval.start To:retval.stopToken];
<if(backtracking)>}<endif>
>>

```

Found in path(s):

```
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-  
jar/org/antlr/codegen/templates/ObjC/ASTParser.stg
```

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```
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```

```
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```
*/
```

```
/** Template subgroup to add template rewrite output
```

```
* If debugging, then you'll also get STDbg.stg loaded.
```

```
*/
```

```
@returnScopeInterface.memVars() ::= <<
```

```
<@super.memVars()>
```

```
/* ST returnInterface.memVars */
```

```
ST *st;
```

```
>>
```

```
@returnScopeInterface.properties() ::= <<
```

```
<@super.properties()>
```

```
/* ST returnScope.properties */
```

```
@property (retain, getter=getST, setter=setST:) ST *st;
```

```
>>
```

```
@returnScopeInterface.methodsDecl() ::= <<
```

```

<@super.methodsDecl()>
/* ST AST returnScopeInterface.methodsDecl */
- (id) getTemplate;
- (NSString *) toString;
- (NSString *) description;
>>

@returnScopeInterface() ::= <<
/* ST returnScopeInterface */
@interface <returnScopeInterface.name> : ReturnScope {
<returnScopeInterface.memVars()>
}
<returnScopeInterface.properties()>

<returnScopeInterface.methods()>
@end
>>

@returnScopeImplementation.synthesize() ::= <<
<@super.synthesize()>
/* ST returnScope.synthesize */
@synthesize st;
>>

@returnScopeImplementation.methods() ::= <<
<@super.methods()>
/* ST returnScope.methods */
- (id) getTemplate { return st; }
- (NSString *) toString { return st==nil?nil:[st toString]; }
- (NSString *) description { [self toString]; }
>>

@returnScopeImplementation() ::= <<
@implementation <returnScopeImplementation.name>
<returnScopeImplementation.synthesize()>

<returnScopeImplementation.methods()>
@end
>>

/** Add this to each rule's return value struct */
@returnScope.ruleReturnMembers() ::= <<
<@super.ruleReturnMembers()>
/* ST returnScope.ruleReturnMembers -- empty */
>>

@genericParserHeaderFile.memVars() ::= <<
<@super.memVars()>

```

```

/* ST genericParserHeaderFile.memVars -- empty now */
STGroup *templateLib; /* ST -- really a part of STAttrMap */
>>

@genericParserHeaderFile.properties() ::= <<
<@super.properties()>
/* ST genericParser.properties */
@property (retain, getter=getTemplateLib, setter=setTemplateLib:) STGroup *templateLib;
>>

@genericParserHeaderFile.methodsDecl() ::= <<
<@super.methodsDecl()>
/* ST genericParser.methodsDecl */
- init;
- (STGroup *) getTemplateLib;
- (void) setTemplateLib:(STGroup *)aTemplateLib;
@end
>>

@genericParser.synthesize() ::= <<
<@super.synthesize()>
/* ST genericParserImplementation.synthesize */
@synthesize templateLib;
>>

@genericParser.methods() ::= <<
<@super.methods()>
/* ST genericParser.methods */

- (STGroup *)getTemplateLib
{
    return templateLib;
}

- (void) setTemplateLib:(STGroup *)aTemplateLib
{
    templateLib = aTemplateLib;
}

>>

@genericParser.members() ::= <<
<@super.members()>
STGroup *templateLib = [STGroup newSTGroup:@"<name>Templates"];

- (STGroup *) getTemplateLib
{
    return templateLib;
}

```

```

}

- (void) setTemplateLib:(STGroup *) templateLib
{
    this.templateLib = templateLib;
}

/** allows convenient multi-value initialization:
 * "new STAttrMap().put(...).put(...)"
 */
/* REPLACE THIS STATIC CLASS
static class STAttrMap extends HashMap {
- (STAttrMap *) setObject:(id)aValue forKey:(NS*)String attrName
{
    [super setObject:value forKey:attrName];
    return self;
}
- (STAttrMap *) setObjectWithInt:(NSInteger)value forKey:(NSString *)attrName
{
    [super setObject:[NSNumber numberWithInt:value] forKey:attrName];
    return self;
}
}
*/
>>

@STAttrMap() ::= <<
/* ----- ST start STAttrMap ----- */
<@STAttrMap.interface()>
<@STAttrMap.implementation()>
/* ----- ST end STAttrMap ----- */
>>

@STAttrMap.interface() ::= <<
/* ----- ST start STAttrMap.interface ----- */
@interface STAttrMap : HashMap {
/* <@STAttrMap.memVars()> */
    STGroup *templateLib;
}

/* <@STAttrMap.properties()> */
@property (retain, getter=getTemplateLib, setter=setTemplateLib:) STGroup *templateLib;
/* <@STAttrMap.methodsDecl()> */
- (id) init;
- (STAttrMap *) setObject:(id)value forKey:(NSString *)attrName;
- (STAttrMap *) setObjectWithInt:(NSInteger)value forKey:(NSString *)attrName;
- (void) setTemplateLib:(STGroup *)aTemplateLib;
- (STGroup *) getTemplateLib;

```

```

@end
/* ----- ST end STAttrMap.interface ----- */
>>

@STAttrMap.implementation() ::= <<
/* ----- ST start STAttrMap.implementation ----- */
/** allows convenient multi-value initialization:
 * "new STAttrMap().put(...).put(...)"
 */
@implementation STAttrMap
@synthesize templateLib;

<@STAttrMap.methods()>
@end
/* ----- ST end STAttrMap.implementation ----- */
>>

@STAttrMap.memVars() ::= <<
/* ----- ST start STAttrMap.memVars ----- */
    STGroup *templateLib;
/* ----- ST end STAttrMap.memVars ----- */
>>

@STAttrMap.properties() ::= <<
/* ----- ST start STAttrMap.properties ----- */
@property (retain, getter=getTemplateLib, setter=setTemplateLib:) STGroup *templateLib;
/* ----- ST end STAttrMap.properties ----- */
>>

@STAttrMap.methodsDecl() ::= <<
/* ----- ST start STAttrMap.methodsDecl ----- */
- (id) init;
- (STAttrMap *) setObject:(id)value forKey:(NSString *)attrName;
- (STAttrMap *) setObjectWithInt:(NSInteger)value forKey:(NSString *)attrName;
- (void) setTemplateLib:(STGroup *)aTemplateLib;
- (STGroup *) getTemplateLib;
/* ----- ST end STAttrMap.methodsDecl ----- */
>>

@STAttrMap.methods() ::= <<
/* ----- ST start STAttrMap.methods ----- */
- (id) init
{
    self = [super initWithLen:16];
    if ( self != nil ) {
        templateLib = [STGroup newSTGroup:"<name>Templates"];
    }
    return self;
}

```

```

}

- (STAttrMap *) setObject:(id)aValue forKey:(NSString *)aAttrName
{
    [super setObject:aValue forKey:aAttrName];
    return self;
}

- (STAttrMap *) setObjectWithInt:(NSInteger)aValue forKey:(NSString *)aAttrName
{
    [super setObject:[NSNumber numberWithInt:aValue] forKey:aAttrName];
    return self;
}

- (void) setTemplateLib:(STGroup *)aTemplateLib
{
    templateLib = aTemplateLib;
}

- (STGroup *)getTemplateLib
{
    return templateLib;
}

/* ----- ST end STAttrMap.methods ----- */
>>

/** x+=rule when output=template */
ruleRefAndListLabel(rule,label,elementIndex,args,scope) ::= <<
/* ST ruleRefAndListLable */
<ruleRef(...)>
<listLabel(elem=[label getTemplate,...]>
>>

rewriteTemplate(alts) ::= <<
/* ----- ST start rewriteTemplate ----- */
// TEMPLATE REWRITE
<if(backtracking)>
if ( <actions.(actionScope).synpredgate> ) {
    <alts:rewriteTemplateAlt(); separator="else ">
    <if(rewriteMode)><replaceTextInLine()><endif>
}
<else>
<alts:rewriteTemplateAlt(); separator="else ">
<if(rewriteMode)><replaceTextInLine()><endif>
<endif>
/* ----- ST end rewriteTemplate ----- */
>>

replaceTextInLine() ::= <<

```



```

/* ----- ST start replaceTextInLine ----- */
<if(TREE_PARSER)>
[[ (TokenRewriteStream *)input getTokenStream]
  replaceFromIndex: [[input getTreeAdaptor] getTokenStartIndex:retval.start]
    ToIndex: [[input getTreeAdaptor] getTokenStopIndex:retval.start]
    Text:retval.st];
<else>
[[ (TokenRewriteStream *)input)
  replaceFromIndex: [((CommonToken *)retval.start) getTokenIndex]
    ToIndex: [[input LT:-1] getTokenIndex]
    Text:retval.st];
<endif>
/* ----- ST end replaceTextInLine ----- */
>>

rewriteTemplateAlt() ::= <<
/* ----- ST start rewriteTemplateAlt ----- */
/* ST <it.description> */
<if(it.pred)>
if (<it.pred>) {
  retval.st = <it.alt>;
}<\n>
<else>
{
  retval.st = <it.alt>;
}<\n>
<endif>
/* ----- ST end rewriteTemplateAlt ----- */
>>

rewriteEmptyTemplate(alts) ::= <<
nil;
>>

/** Invoke a template with a set of attribute name/value pairs.
 * Set the value of the rule's template *after* having set
 * the attributes because the rule's template might be used as
 * an attribute to build a bigger template; you get a self-embedded
 * template.
 */
rewriteExternalTemplate(name,args) ::= <<
/* ----- ST start rewriteExternalTemplate ----- */
[templateLib getInstanceOf:@"<name>"]
<if(args)>[[STAttrMap newSTAttrMap] <args:{a | setObject:<a.value> forKey:@"<a.name>"}]><endif>]
/* ----- ST end rewriteExternalTemplate ----- */
>>

/** expr is a string expression that says what template to load */

```

```

rewriteIndirectTemplate(expr,args) ::= <<
/* ----- ST start rewriteIndirectTemplate ----- */
[templateLib getInstanceOf:<expr>
<if(args)> [[STAttrMap newSTAttrMap]<args:{a | setObject:<a.value> forKey:@"<a.name>"}]>]
<else>]<endif>
/* ----- ST end rewriteIndirectTemplate ----- */
>>

```

```

/** Invoke an inline template with a set of attribute name/value pairs */
rewriteInlineTemplate(args, template) ::= <<
/* ----- ST start rewriteInlineTemplate ----- */
STGroup *templateLib;
templateLib.templates = [STAttrMap newSTAttrMap];
<if(args)> [templateLib.templates <args:{a | setObject:<a.value> forKey:@"<a.name>"};><endif>
[ST newST:templateLib template:@"<template>"];
/* ----- ST end rewriteInlineTemplate ----- */
>>

```

```

/** plain -> {foo} action */
rewriteAction(action) ::= <<
/* ----- ST start rewriteAction ----- */
<action>
/* ----- ST end rewriteAction ----- */
>>

```

```

/** An action has %st.attrName=expr; or % {st}.attrName=expr; */
actionSetAttribute(st,attrName,expr) ::= <<
/* ----- ST start actionSetAttribute ----- */
[[ST attributes] setObject:<expr> forKey:@"<attrName>"];
<![<st> setAttribute:<expr> name:@"<attrName>"];!>
/* ----- ST end actionSetAttribute ----- */
>>

```

```

/** Translate %{stringExpr} */
actionStringConstructor(stringExpr) ::= <<
/* ----- ST start actionStringConstructor ----- */
[ST newSTWithTemplate:<stringExpr>]
/* ----- ST end actionStringConstructor ----- */
>>

```

Found in path(s):

* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/codegen/templates/ObjC/ST.stg

No license file was found, but licenses were detected in source scan.

/*

[The "BSD license"]

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*/

```
javaTypeInitMap ::= [
  "int": "0",
  "long": "0",
  "float": "0.0f",
  "double": "0.0",
  "boolean": "false",
  "byte": "0",
  "short": "0",
  "char": "0",
  default: "null" // anything other than an atomic type
]
```

```
// System.Boolean.ToString() returns "True" and "False", but the proper C# literals are "true" and "false"
// The Java version of Boolean returns "true" and "false", so they map to themselves here.
```

```
booleanLiteral ::= [
  "True": "true",
  "False": "false",
  "true": "true",
  "false": "false",
  default: "false"
]
```

```
/** The overall file structure of a recognizer; stores methods for rules
```

```
* and cyclic DFAs plus support code.
```

```

*/
outputFile(LEXER,PARSER,TREE_PARSER, actionScope, actions,
    docComment, recognizer,
    name, tokens, tokenNames, rules, cyclicDFAs,
    bitsets, buildTemplate, buildAST, rewriteMode, profile,
    backtracking, synpreds, memoize, numRules,
    fileName, ANTLRVersion, generatedTimestamp, trace,
    scopes, superClass, literals) ::=
<<
// $ANTLR <ANTLRVersion> <fileName> <generatedTimestamp>
<actions.(actionScope).header>

<@imports>
import org antlr.runtime.*;
<if(TREE_PARSER)>
import org antlr.runtime.tree.*;
<endif>
import java.util.Stack;
import java.util.List;
import java.util.ArrayList;
<if(backtracking)>
import java.util.Map;
import java.util.HashMap;
<endif>
<@end>

<docComment>
@SuppressWarnings("all")
<recognizer>

>>

lexer(grammar, name, tokens, scopes, rules, numRules, filterMode, labelType="CommonToken",
    superClass="Lexer") ::= <<
public class <grammar.recognizerName> extends <@superClassName><superClass><@end> {
    <tokens:{it | public static final int <it.name>=<it.type>;}; separator="\n">
    <scopes:{it |<if(it.isDynamicGlobalScope)><globalAttributeScope(it)><endif>}>
    <actions.lexer.members>

    // delegates
    <grammar.delegates:
    {g|public <g.recognizerName> <g:delegateName()>;}; separator="\n">
    // delegators
    <grammar.delegators:
    {g|public <g.recognizerName> <g:delegateName()>;}; separator="\n">
    <last(grammar.delegators):{g|public <g.recognizerName> gParent;}>
    public <superClass>[] getDelegates() {
        return new <superClass>[] {<grammar.delegates: {g|<g:delegateName()>;}; separator = ", ">};

```

```

}

public <grammar.recognizerName>() {} <! needed by subclasses !>
public <grammar.recognizerName>(CharStream input<grammar.delegators:{g|, <g.recognizerName>
<g:delegateName(>>}) {
    this(input, new RecognizerSharedState(<grammar.delegators:{g|, <g:delegateName(>>})>);
}
public <grammar.recognizerName>(CharStream input, RecognizerSharedState state<grammar.delegators:{g|,
<g.recognizerName> <g:delegateName(>>}) {
    super(input,state);
<if(memoize)>
<if(grammar.grammarIsRoot)>
    state.ruleMemo = new HashMap[<numRules>+1];<\n><! index from 1..n !>
<endif>
<endif>
    <grammar.directDelegates:
        {g|<g:delegateName(> = new <g.recognizerName>(input, state<trunc(g.delegators):{p|, <p:delegateName(>>})>,
this);}; separator="\n">
    <grammar.delegators:
        {g|this.<g:delegateName(> = <g:delegateName(>>}; separator="\n">
    <last(grammar.delegators):{g|gParent = <g:delegateName(>>};>
    }
    @Override public String getGrammarFileName() { return "<fileName>"; }

<if(filterMode)>
    <filteringNextToken(>
<endif>
    <rules; separator="\n\n">

    <synpreds:{p | <lexerSynpred(p)>}>

    <cyclicDFAs:{dfa | protected DFA<dfa.decisionNumber> dfa<dfa.decisionNumber> = new
DFA<dfa.decisionNumber>(this);}; separator="\n">
    <cyclicDFAs:cyclicDFA(); separator="\n\n"><! dump tables for all DFA !>

}
>>

/** A override of Lexer.nextToken() that backtracks over mTokens() looking
 * for matches. No error can be generated upon error; just rewind, consume
 * a token and then try again. backtracking needs to be set as well.
 * Make rule memoization happen only at levels above 1 as we start mTokens
 * at backtracking==1.
 */
filteringNextToken() ::= <<
@Override
public Token nextToken() {
    while (true) {

```

```

if ( input.LA(1)==CharStream.EOF ) {
    Token eof = new CommonToken(input,Token.EOF,
        Token.DEFAULT_CHANNEL,
        input.index(),input.index());
    eof.setLine(getLine());
    eof.setCharPositionInLine(getCharPositionInLine());
    return eof;
}
state.token = null;
state.channel = Token.DEFAULT_CHANNEL;
state.tokenStartCharIndex = input.index();
state.tokenStartCharPositionInLine = input.getCharPositionInLine();
state.tokenStartLine = input.getLine();
state.text = null;
try {
    int m = input.mark();
    state.backtracking=1; <! means we won't throw slow exception !>
    state.failed=false;
    mTokens();
    state.backtracking=0;
    <! mTokens backtracks with synpred at backtracking==2
    and we set the synpredgate to allow actions at level 1. !>
    if ( state.failed ) {
        input.rewind(m);
        input.consume(); <! advance one char and try again !>
    }
    else {
        emit();
        return state.token;
    }
}
catch (RecognitionException re) {
    // shouldn't happen in backtracking mode, but...
    reportError(re);
    recover(re);
}
}
}

@Override
public void memoize(IntStream input,
    int ruleIndex,
    int ruleStartIndex)
{
    if ( state.backtracking>1 ) super.memoize(input, ruleIndex, ruleStartIndex);
}

@Override

```

```

public boolean alreadyParsedRule(IntStream input, int ruleIndex) {
if ( state.backtracking>1 ) return super.alreadyParsedRule(input, ruleIndex);
return false;
}
>>

actionGate() ::= "state.backtracking==0"

filteringActionGate() ::= "state.backtracking==1"

/** How to generate a parser */
genericParser(grammar, name, scopes, tokens, tokenNames, rules, numRules,
    bitsets, inputStreamType, superClass,
    labelType, members, rewriteElementType,
    filterMode, ASTLabelType="Object") ::= <<
public class <grammar.recognizerName> extends <@superClassName><superClass><<@end> {
<if(grammar.grammarIsRoot)>
public static final String[] tokenNames = new String[] {
    "\<invalid>", "\<EOR>", "\<DOWN>", "\<UP>", <tokenNames; separator=", ", wrap="\n\t">
};
<endif>
<tokens:{it |public static final int <it.name>=<it.type>;}; separator="\n">

// delegates
<grammar.delegates: {g|public <g.recognizerName> <g.delegateName()>;}; separator="\n">
public <superClass>[] getDelegates() {
return new <superClass>[] {<grammar.delegates: {g|<g.delegateName()>;}; separator = ", ">
}

// delegators
<grammar.delegators:
{g|public <g.recognizerName> <g.delegateName()>;}; separator="\n">
<last(grammar.delegators):{g|public <g.recognizerName> gParent;}>

<scopes:{it |<if(it.isDynamicGlobalScope)><globalAttributeScope(it)><endif>}>

<@members>
<! WARNING. bug in ST: this is cut-n-paste into Dbg.stg !>
public <grammar.recognizerName><(<inputStreamType> input<grammar.delegators:{g|, <g.recognizerName>
<g.delegateName()>>}> {
this(input, new RecognizerSharedState()<grammar.delegators:{g|, <g.delegateName()>>});
}
public <grammar.recognizerName><(<inputStreamType> input, RecognizerSharedState
state<grammar.delegators:{g|, <g.recognizerName> <g.delegateName()>>}> {
super(input, state);
<parserCtorBody()>
<grammar.directDelegates:
{g|<g.delegateName()> = new <g.recognizerName>(input, state<trunc(g.delegators):{p|, <p.delegateName()>>},

```

```

this);}; separator="\n">
  <grammar.indirectDelegates:{ g | <g:delegateName()> = <g.delegateName()>.<g.delegateName()>; }
separator="\n">
  <last(grammar.delegators):{ g|gParent = <g:delegateName()>; }>
  }
<@end>

@Override public String[] getTokenNames() { return
<grammar.composite.rootGrammar.recognizerName>.tokenNames; }
@Override public String getGrammarFileName() { return "<fileName>"; }

<members>

<rules; separator="\n\n">

<! generate rule/method definitions for imported rules so they
  appear to be defined in this recognizer. !>
// Delegated rules
<grammar.delegatedRules:{ ruleDescriptor|
  public <returnType(ruleDescriptor)> <ruleDescriptor.name>(<ruleDescriptor.parameterScope:parameterScope()>)
  throws <ruleDescriptor.throwsSpec; separator=", "> { <if(ruleDescriptor.hasReturnValue)>return
  <endif><ruleDescriptor.grammar:delegateName()>.<ruleDescriptor.name>(<if(ruleDescriptor.parameterScope)><ru
  leDescriptor.parameterScope.attributes:{ a|<a.name>; separator=", "><endif>); \}}; separator="\n">

  <synpreds:{ p | <synpred(p)>}>

  <cyclicDFAs:{ dfa | protected DFA<dfa.decisionNumber> dfa<dfa.decisionNumber> = new
  DFA<dfa.decisionNumber>(this);}; separator="\n">
  <cyclicDFAs:cyclicDFA(); separator="\n\n"><! dump tables for all DFA !>

  <bitsets:{ it | <bitset(name={ FOLLOW_<it.name>_in_<it.inName><it.tokenIndex>},
    words64=it.bits)>; separator="\n">
  }
  >>

  parserCtorBody() ::= <<
  <if(memoize)>
  <if(grammar.grammarIsRoot)>
  this.state.ruleMemo = new HashMap[<length(grammar.allImportedRules)>+1];<n><! index from 1..n !>
  <endif>
  <endif>
  <grammar.delegators:
  { g|this.<g:delegateName()> = <g:delegateName()>;}; separator="\n">
  >>

  parser(grammar, name, scopes, tokens, tokenNames, rules, numRules, bitsets,
    ASTLabelType="Object", superClass="Parser", labelType="Token",
    members={<actions.parser.members>}) ::= <<

```



```

<genericParser(grammar, name, scopes, tokens, tokenNames, rules, numRules,
    bitsets, "TokenStream", superClass,
    labelType, members, "Token",
    false, ASTLabelType)>
>>

/** How to generate a tree parser; same as parser except the input
 * stream is a different type.
 */
treeParser(grammar, name, scopes, tokens, tokenNames, globalAction, rules,
    numRules, bitsets, filterMode, labelType={ <ASTLabelType> }, ASTLabelType="Object",
    superClass={ <if(filterMode)><if(buildAST)>TreeRewriter<else>TreeFilter<endif><else>TreeParser<endif> },
    members={ <actions.treeparser.members> }
    ) ::= <<
<genericParser(grammar, name, scopes, tokens, tokenNames, rules, numRules,
    bitsets, "TreeNodeStream", superClass,
    labelType, members, "Node",
    filterMode, ASTLabelType)>
>>

/** A simpler version of a rule template that is specific to the imaginary
 * rules created for syntactic predicates. As they never have return values
 * nor parameters etc..., just give simplest possible method. Don't do
 * any of the normal memoization stuff in here either; it's a waste.
 * As predicates cannot be inlined into the invoking rule, they need to
 * be in a rule by themselves.
 */
synpredRule(ruleName, ruleDescriptor, block, description, nakedBlock) ::=
<<
// $ANTLR start <ruleName>
public final void <ruleName>_fragment(<ruleDescriptor.parameterScope:parameterScope(>) throws
<ruleDescriptor.throwsSpec: {x|<x>} ; separator=", "> {
    <ruleLabelDefs(>
<if(trace)>
    traceIn("<ruleName>_fragment", <ruleDescriptor.index>);
    try {
        <block>
    }
    finally {
        traceOut("<ruleName>_fragment", <ruleDescriptor.index>);
    }
<else>
    <block>
<endif>
}
// $ANTLR end <ruleName>
>>

```

```

synpred(name) ::= <<
public final boolean <name>() {
state.backtracking++;
<@start(>
int start = input.mark();
try {
<name>_fragment(); // can never throw exception
} catch (RecognitionException re) {
System.err.println("impossible: "+re);
}
boolean success = !state.failed;
input.rewind(start);
<@stop(>
state.backtracking--;
state.failed=false;
return success;
}<\n>
>>

lexerSynpred(name) ::= <<
<synpred(name)>
>>

ruleMemoization(name) ::= <<
<if(memoize)>
if ( state.backtracking>0 && alreadyParsedRule(input, <ruleDescriptor.index> ) ) {
<returnStatement((( { <ruleReturnValue(> })))> }
<endif>
>>

/** How to test for failure and return from rule */
checkRuleBacktrackFailure() ::= <<
<if(backtracking)>if (state.failed) <returnStatement((( { <ruleReturnValue(> })))><endif>
>>

/** This rule has failed, exit indicating failure during backtrack */
ruleBacktrackFailure() ::= <<
<if(backtracking)>if (state.backtracking>0) { state.failed=true;
<returnStatement((( { <ruleReturnValue(> })))>}<endif>
>>

/** How to generate code for a rule. This includes any return type
* data aggregates required for multiple return values.
*/
rule(ruleName,ruleDescriptor,block,emptyRule,description,exceptions,finally,memoize) ::= <<
<ruleAttributeScope(scope=ruleDescriptor.ruleScope)>
<returnScope(scope=ruleDescriptor.returnScope)>

```

```

// $ANTLR start "<ruleName>"
// <fileName>:<description>
<if(isPredefinedRewriteRule.(ruleName) && filterMode && buildAST)>
@Override
<endif>
public final <returnType(ruleDescriptor)> <ruleName>(<ruleDescriptor.parameterScope:parameterScope(>) throws
<ruleDescriptor.throwsSpec:{x|<x>}; separator=", "> {
  <if(trace)>traceIn("<ruleName>", <ruleDescriptor.index>);<endif>
  <ruleScopeSetUp(>
  <ruleDeclarations(>
  <ruleLabelDefs(>
  <ruleDescriptor.actions.init>
  <@preamble(>
  try {
    <ruleMemoization(name=ruleName)>
    <block>
    <ruleCleanUp(>
    <(ruleDescriptor.actions.after):execAction(>
  }
  <if(exceptions)>
    <exceptions:{e|<catch(decl=e.decl,action=e.action)><\n>}>
  <else>
  <if(!emptyRule)>
  <if(actions.(actionScope).rulecatch)>
    <actions.(actionScope).rulecatch>
  <else>
    catch (RecognitionException re) {
      reportError(re);
      recover(input,re);
      <@setErrorReturnValue(>
    }
  <endif>
  <endif>
  <endif>
  finally {
    // do for sure before leaving
    <if(trace)>traceOut("<ruleName>", <ruleDescriptor.index>);<endif>
    <memoize(>
    <ruleScopeCleanUp(>
    <finally>
  }
  <@postamble(>
  <returnStatement((({<ruleReturnValue(>}), false)>
  }
// $ANTLR end "<ruleName>"
>>

```

```
returnStatement(returnValue, force=true) ::= <%
```

```

<if(!isEmptyString.(returnValue))>
  return <returnValue>;
<elseif(force)>
  return;
<endif>
%>

catch(decl,action) ::= <<
catch (<e.decl>) {
  <e.action>
}
>>

ruleDeclarations() ::= <<
<if(ruleDescriptor.hasMultipleReturnValues)>
<returnType(ruleDescriptor)> retval = new <returnType(ruleDescriptor)>();
retval.start = input.LT(1);
<elseif(ruleDescriptor.returnScope)>
<ruleDescriptor.returnScope.attributes: { a |
<a.type> <a.name> = <if(a.initValue)><a.initValue><else><initValue(a.type)><endif>;
}>
<endif>
<if(memoize)>
int <ruleDescriptor.name>_startIndex = input.index();
<endif>
>>

ruleScopeSetUp() ::= <<
<ruleDescriptor.useScopes: { it | <it>_stack.push(new <it>_scope());}; separator="\n">
<ruleDescriptor.ruleScope: { it | <it.name>_stack.push(new <it.name>_scope());}; separator="\n">
>>

ruleScopeCleanUp() ::= <<
<ruleDescriptor.useScopes: { it | <it>_stack.pop();}; separator="\n">
<ruleDescriptor.ruleScope: { it | <it.name>_stack.pop();}; separator="\n">
>>

ruleLabelDefs() ::= <<
<[ruleDescriptor.tokenLabels,ruleDescriptor.tokenListLabels,
ruleDescriptor.wildcardTreeLabels,ruleDescriptor.wildcardTreeListLabels]
: { it | <labelType> <it.label.text>=null;}; separator="\n"
>
<[ruleDescriptor.tokenListLabels,ruleDescriptor.ruleListLabels,ruleDescriptor.wildcardTreeListLabels]
: { it | List<Object> list_<it.label.text>=null;}; separator="\n"
>
<ruleDescriptor.ruleLabels:ruleLabelDef(); separator="\n">
<ruleDescriptor.ruleListLabels: { ll|RuleReturnScope <ll.label.text> = null;}; separator="\n">

```

>>

```
lexerRuleLabelDefs() ::= <<
<[ruleDescriptor.tokenLabels,
ruleDescriptor.tokenListLabels,
ruleDescriptor.ruleLabels]
:{it |<labelType> <it.label.text>=null;}; separator="\n"
>
<ruleDescriptor.charLabels:{it |int <it.label.text>;}; separator="\n">
<[ruleDescriptor.tokenListLabels,
ruleDescriptor.ruleListLabels]
:{it |List<Object> list_<it.label.text>=null;}; separator="\n"
>
>>
```

```
ruleReturnValue() ::= <%
<if(!ruleDescriptor.isSynPred)>
<if(ruleDescriptor.hasReturnValue)>
<if(ruleDescriptor.hasSingleReturnValue)>
<ruleDescriptor.singleValueReturnName>
<else>
retval
<endif>
<endif>
<endif>
%>
```

```
ruleCleanUp() ::= <<
<if(ruleDescriptor.hasMultipleReturnValues)>
<if(!TREE_PARSER)>
retval.stop = input.LT(-1);
<endif>
<endif>
>>
```

```
memoize() ::= <<
<if(memoize)>
<if(backtracking)>
if ( state.backtracking>0 ) { memoize(input, <ruleDescriptor.index>, <ruleDescriptor.name>_startIndex); }
<endif>
<endif>
>>
```

```
/** How to generate a rule in the lexer; naked blocks are used for
* fragment rules.
*/
```

```
lexerRule(ruleName,nakedBlock,ruleDescriptor,block,memoize) ::= <<
// $ANTLR start "<ruleName>"
```

```

public final void m<ruleName>(<ruleDescriptor.parameterScope:parameterScope()>) throws RecognitionException
{
    <if(trace)>traceIn("<ruleName>", <ruleDescriptor.index>);<endif>
    <ruleScopeSetUp()>
    <ruleDeclarations()>
    try {
    <if(nakedBlock)>
        <ruleMemoization(name=ruleName)>
        <lexerRuleLabelDefs()>
        <ruleDescriptor.actions.init>
        <block>
    <else>
        int _type = <ruleName>;
        int _channel = DEFAULT_TOKEN_CHANNEL;
        <ruleMemoization(name=ruleName)>
        <lexerRuleLabelDefs()>
        <ruleDescriptor.actions.init>
        <block>
        <ruleCleanUp()>
        state.type = _type;
        state.channel = _channel;
        <(ruleDescriptor.actions.after):execAction()>
    <endif>
    }
    finally {
        // do for sure before leaving
        <if(trace)>traceOut("<ruleName>", <ruleDescriptor.index>);<endif>
        <ruleScopeCleanUp()>
        <memoize()>
    }
}
// $ANTLR end "<ruleName>"
>>

/** How to generate code for the implicitly-defined lexer grammar rule
 * that chooses between lexer rules.
 */
tokensRule(ruleName,nakedBlock,args,block,ruleDescriptor) ::= <<
@Override
public void mTokens() throws RecognitionException {
    <block>
}
>>

// S U B R U L E S

/** A (...) subrule with multiple alternatives */
block(alts,decls,decision,enclosingBlockLevel,blockLevel,decisionNumber,maxK,maxAlt,description) ::= <<

```

```

// <fileName>:<description>
int alt<decisionNumber>=<maxAlt>;
<decls>
<@predecision()>
<decision>
<@postdecision()>
<@prebranch()>
switch (alt<decisionNumber>) {
  <alts:{a | <altSwitchCase(i,a)>}>
}
<@postbranch()>
>>

/** A rule block with multiple alternatives */
ruleBlock(alts,decls,decision,enclosingBlockLevel,blockLevel,decisionNumber,maxK,maxAlt,description) ::= <<
// <fileName>:<description>
int alt<decisionNumber>=<maxAlt>;
<decls>
<@predecision()>
<decision>
<@postdecision()>
switch (alt<decisionNumber>) {
  <alts:{a | <altSwitchCase(i,a)>}>
}
>>

ruleBlockSingleAlt(alts,decls,decision,enclosingBlockLevel,blockLevel,decisionNumber,description) ::= <<
// <fileName>:<description>
<decls>
<@prealt()>
<alts>
<@postalt()>
>>

/** A special case of a (...) subrule with a single alternative */
blockSingleAlt(alts,decls,decision,enclosingBlockLevel,blockLevel,decisionNumber,description) ::= <<
// <fileName>:<description>
<decls>
<@prealt()>
<alts>
<@postalt()>
>>

/** A (..)+ block with 1 or more alternatives */
positiveClosureBlock(alts,decls,decision,enclosingBlockLevel,blockLevel,decisionNumber,maxK,maxAlt,description) ::= <<
// <fileName>:<description>
int cnt<decisionNumber>=0;

```

```

<decls>
<@preloop()>
loop<decisionNumber>:
while (true) {
int alt<decisionNumber>=<maxAlt>;
<@predecision()>
<decision>
<@postdecision()>
switch (alt<decisionNumber>) {
<alts:{ a | <altSwitchCase(i,a)>}>
default :
if ( cnt<decisionNumber> >= 1 ) break loop<decisionNumber>;
<ruleBacktrackFailure()>
EarlyExitException eee = new EarlyExitException(<decisionNumber>, input);
<@earlyExitException()>
throw eee;
}
cnt<decisionNumber>++;
}
<@postloop()>
>>

```

positiveClosureBlockSingleAlt ::= positiveClosureBlock

/** A (..)* block with 1 or more alternatives */

closureBlock(alts,decls,decision,enclosingBlockLevel,blockLevel,decisionNumber,maxK,maxAlt,description) ::=

<<

// <fileName>:<description>

<decls>

<@preloop()>

loop<decisionNumber>:

while (true) {

int alt<decisionNumber>=<maxAlt>;

<@predecision()>

<decision>

<@postdecision()>

switch (alt<decisionNumber>) {

<alts:{ a | <altSwitchCase(i,a)>}>

default :

break loop<decisionNumber>;

}

}

<@postloop()>

>>

closureBlockSingleAlt ::= closureBlock

/** Optional blocks (x)? are translated to (x|) by before code generation


```

* so we can just use the normal block template
*/
optionalBlock ::= block

optionalBlockSingleAlt ::= block

/** A case in a switch that jumps to an alternative given the alternative
* number. A DFA predicts the alternative and then a simple switch
* does the jump to the code that actually matches that alternative.
*/
altSwitchCase(altNum,alt) ::= <<
case <altNum> :
  <@prealt()>
  <alt>
  break;<\n>
>>

/** An alternative is just a list of elements; at outermost level */
alt(elements,altNum,description,autoAST,outerAlt,treeLevel,rew) ::= <<
// <fileName>:<description>
{
  <@declarations()>
  <elements:element()>
  <rew>
  <@cleanup()>
}
>>

/** What to emit when there is no rewrite. For auto build
* mode, does nothing.
*/
noRewrite(rewriteBlockLevel, treeLevel) ::= ""

// E L E M E N T S

/** Dump the elements one per line */
element(e) ::= <<
  <@prematch()>
  <e.el>
>>

/** match a token optionally with a label in front */
tokenRef(token,label,elementIndex,terminalOptions={}) ::= <<
  <if(label)><label>=<labelType><endif>match(input,<token>,FOLLOW_<token>_in_<ruleName><elementIndex
  >); <checkRuleBacktrackFailure()>
>>

/** ids+=ID */

```

```

tokenRefAndListLabel(token,label,elementIndex,terminalOptions={ }) ::= <<
<tokenRef(token,label,elementIndex,terminalOptions)>
<listLabel(label, label)>
>>

listLabel(label,elem) ::= <<
if (list_<label>==null) list_<label>=new ArrayList<Object>();
list_<label>.add(<elem>);
>>

/** match a character */
charRef(char,label) ::= <<
<if(label)>
<label> = input.LA(1);
<endif>
match(<char>); <checkRuleBacktrackFailure()>
>>

/** match a character range */
charRangeRef(a,b,label) ::= <<
<if(label)>
<label> = input.LA(1);
<endif>
matchRange(<a>,<b>); <checkRuleBacktrackFailure()>
>>

/** For now, sets are interval tests and must be tested inline */
matchSet(s,label,elementIndex,postmatchCode="",terminalOptions={ }) ::= <<
<if(label)>
<if(LEXER)>
<label>= input.LA(1);
<else>
<label>=<castToLabelType("input.LT(1)")>;
<endif>
<endif>
if ( <s> ) {
input.consume();
<postmatchCode>
<if(!LEXER)>
state.errorRecovery=false;
<endif>
<if(backtracking)>state.failed=false;<endif>
}
else {
<ruleBacktrackFailure()>
MismatchedSetException mse = new MismatchedSetException(null,input);
<@mismatchedSetException()>
<if(LEXER)>

```

```

recover(mse);
throw mse;
<else>
throw mse;
<! use following code to make it recover inline; remove throw mse;
recoverFromMismatchedSet(input,mse,FOLLOW_set_in_<ruleName><elementIndex>);
!>
<endif>
}
>>

```

```

matchRuleBlockSet ::= matchSet

```

```

matchSetAndListLabel(s,label,elementIndex,postmatchCode) ::= <<
<matchSet(...)>
<listLabel(label, label)>
>>

```

```

/** Match a string literal */
lexerStringRef(string,label,elementIndex="0") ::= <<
<if(label)>
int <label>Start = getCharIndex();
match(<string>); <checkRuleBacktrackFailure()>
int <label>StartLine<elementIndex> = getLine();
int <label>StartCharPos<elementIndex> = getCharPositionInLine();
<label> = new <labelType>(input, Token.INVALID_TOKEN_TYPE, Token.DEFAULT_CHANNEL, <label>Start,
getCharIndex()-1);
<label>.setLine(<label>StartLine<elementIndex>);
<label>.setCharPositionInLine(<label>StartCharPos<elementIndex>);
<else>
match(<string>); <checkRuleBacktrackFailure()>
<endif>
>>

```

```

wildcard(token,label,elementIndex,terminalOptions={ }) ::= <<
<if(label)>
<label>=<castToLabelType("input.LT(1)")>;
<endif>
matchAny(input); <checkRuleBacktrackFailure()>
>>

```

```

wildcardAndListLabel(token,label,elementIndex,terminalOptions={ }) ::= <<
<wildcard(...)>
<listLabel(label, label)>
>>

```

```

/** Match . wildcard in lexer */
wildcardChar(label, elementIndex) ::= <<

```

```

<if(label)>
<label> = input.LA(1);
<endif>
matchAny(); <checkRuleBacktrackFailure()>
>>

wildcardCharListLabel(label, elementIndex) ::= <<
<wildcardChar(label, elementIndex)>
<listLabel(label, label)>
>>

/** Match a rule reference by invoking it possibly with arguments
 * and a return value or values. The 'rule' argument was the
 * target rule name, but now is type Rule, whose toString is
 * same: the rule name. Now though you can access full rule
 * descriptor stuff.
 */
ruleRef(rule,label,elementIndex,args,scope) ::= <<
pushFollow(FOLLOW_<rule.name>_in_<ruleName><elementIndex>);
<if(label)><label>=<endif><if(scope)><scope.delegateName()>.<endif><rule.name>(<args; separator=", ">);
state._fsp--;
<checkRuleBacktrackFailure()>
>>

/** ids+=1 */
ruleRefAndListLabel(rule,label,elementIndex,args,scope) ::= <<
<ruleRef(rule,label,elementIndex,args,scope)>
<listLabel(label, label)>
>>

/** A lexer rule reference.
 *
 * The 'rule' argument was the target rule name, but now
 * is type Rule, whose toString is same: the rule name.
 * Now though you can access full rule descriptor stuff.
 */
lexerRuleRef(rule,label,args,elementIndex,scope) ::= <<
<if(label)>
int <label>Start<elementIndex> = getCharIndex();
int <label>StartLine<elementIndex> = getLine();
int <label>StartCharPos<elementIndex> = getCharPositionInLine();
<if(scope)><scope.delegateName()>.<endif>m<rule.name>(<args; separator=", ">);
<checkRuleBacktrackFailure()>
<label> = new <labelType>(input, Token.INVALID_TOKEN_TYPE, Token.DEFAULT_CHANNEL,
<label>Start<elementIndex>, getCharIndex()-1);
<label>.setLine(<label>StartLine<elementIndex>);
<label>.setCharPositionInLine(<label>StartCharPos<elementIndex>);
<else>

```

```

<if(scope)><scope:delegateName().<endif>m<rule.name>(<args; separator=", ">);
<checkRuleBacktrackFailure()>
<endif>
>>

/** i+=INT in lexer */
lexerRuleRefAndListLabel(rule,label,args,elementIndex,scope) ::= <<
<lexerRuleRef(rule,label,args,elementIndex,scope)>
<listLabel(label, label)>
>>

/** EOF in the lexer */
lexerMatchEOF(label,elementIndex) ::= <<
<if(label)>
int <label>Start<elementIndex> = getCharIndex();
int <label>StartLine<elementIndex> = getLine();
int <label>StartCharPos<elementIndex> = getCharPositionInLine();
match(EOF); <checkRuleBacktrackFailure()>
<labelType> <label> = new <labelType>(input, EOF, Token.DEFAULT_CHANNEL, <label>Start<elementIndex>,
getCharIndex()-1);
<label>.setLine(<label>StartLine<elementIndex>);
<label>.setCharPositionInLine(<label>StartCharPos<elementIndex>);
<else>
match(EOF); <checkRuleBacktrackFailure()>
<endif>
>>

// used for left-recursive rules
recRuleDefArg()          ::= "int <recRuleArg()>"
recRuleArg()             ::= "_p"
recRuleAltPredicate(ruleName,opPrec) ::= "<recRuleArg()> |<= <opPrec>"
recRuleSetResultAction() ::= "root_0=$<ruleName>_primary.tree;"
recRuleSetReturnAction(src,name) ::= "$<name>=$<src>.<name>;"

/** match ^(root children) in tree parser */
tree(root, actionsAfterRoot, children, nullableChildList,
enclosingTreeLevel, treeLevel) ::= <<
<root:element()>
<actionsAfterRoot:element()>
<if(nullableChildList)>
if ( input.LA(1)==Token.DOWN ) {
match(input, Token.DOWN, null); <checkRuleBacktrackFailure()>
<children:element()>
match(input, Token.UP, null); <checkRuleBacktrackFailure()>
}
<else>
match(input, Token.DOWN, null); <checkRuleBacktrackFailure()>
<children:element()>

```

```

match(input, Token.UP, null); <checkRuleBacktrackFailure()>
<endif>
>>

/** Every predicate is used as a validating predicate (even when it is
 * also hoisted into a prediction expression).
 */
validateSemanticPredicate(pred,description) ::= <<
if ( !(<evalPredicate(pred,description)>) ) {
  <ruleBacktrackFailure()>
  throw new FailedPredicateException(input, "<ruleName>", "<description>");
}
>>

// F i x e d D F A (if-then-else)

dfaState(k,edges,eotPredictsAlt,description,stateNumber,semPredState) ::= <<
int LA<decisionNumber>_<stateNumber> = input.LA(<k>);
<edges; separator="\nelse ">
<if(!isTrue.(last(edges).labelExpr) && (!last(edges).predicates))>
else {
  <if(eotPredictsAlt)>
  alt<decisionNumber>=<eotPredictsAlt>;
  <else>
  <ruleBacktrackFailure()>
  <(nvaExceptionWrapperMap.(k))({NoViableAltException nvae =
  new NoViableAltException("<description>", <decisionNumber>, <stateNumber>, input);
  <@noViableAltException()>
  throw nvae;})>
  <endif>
  }
  <endif>
  >>

nvaExceptionWrapperMap ::= [
  "1":"wrapNvaExceptionForK1",
  "2":"wrapNvaExceptionForK2",
  default:"wrapNvaExceptionForKN"
]

wrapNvaExceptionForK1(exceptionCode) ::= <<
<exceptionCode>
>>

wrapNvaExceptionForK2(exceptionCode) ::= <<
int nvaeMark = input.mark();
try {
  input.consume();

```

```

<exceptionCode>
} finally {
input.rewind(nvaeMark);
}
>>

```

```

wrapNvaExceptionForKN(exceptionCode) ::= <<
int nvaeMark = input.mark();
try {
for (int nvaeConsume = 0; nvaeConsume \< <k> - 1; nvaeConsume++) {
input.consume();
}
<exceptionCode>
} finally {
input.rewind(nvaeMark);
}
>>

```

```

/** Same as a normal DFA state except that we don't examine lookahead
* for the bypass alternative. It delays error detection but this
* is faster, smaller, and more what people expect. For (X)? people
* expect "if ( LA(1)==X ) match(X);" and that's it.
*/

```

```

dfaOptionalBlockState(k,edges,eotPredictsAlt,description,stateNumber,semPredState) ::= <<
int LA<decisionNumber>_<stateNumber> = input.LA(<k>);
<edges; separator="\nelse ">
>>

```

```

/** A DFA state that is actually the loopback decision of a closure
* loop. If end-of-token (EOT) predicts any of the targets then it
* should act like a default clause (i.e., no error can be generated).
* This is used only in the lexer so that for ('a')* on the end of a rule
* anything other than 'a' predicts exiting.
*/

```

```

dfaLoopbackState(k,edges,eotPredictsAlt,description,stateNumber,semPredState) ::= <<
int LA<decisionNumber>_<stateNumber> = input.LA(<k>);
<edges; separator="\nelse ">
<if(eotPredictsAlt)>
<if(!edges)>
alt<decisionNumber>=<eotPredictsAlt>; <! if no edges, don't gen ELSE !>
<else>
else {
alt<decisionNumber>=<eotPredictsAlt>;
}
<endif>
<endif>
>>

```

```

/** An accept state indicates a unique alternative has been predicted */
dfaAcceptState(alt) ::= "alt<decisionNumber>=<alt>";

/** A simple edge with an expression. If the expression is satisfied,
 * enter to the target state. To handle gated productions, we may
 * have to evaluate some predicates for this edge.
 */
dfaEdge(labelExpr, targetState, predicates) ::= <<
if ( (<labelExpr> <if(predicates)>&& (<predicates><endif>) {
    <targetState>
}
>>

// F i x e d D F A (switch case)

/** A DFA state where a SWITCH may be generated. The code generator
 * decides if this is possible: CodeGenerator.canGenerateSwitch().
 */
dfaStateSwitch(k,edges,eotPredictsAlt,description,stateNumber,semPredState) ::= <<
switch ( input.LA(<k>) ) {
<edges; separator="\n">
default:
<if(eotPredictsAlt)>
    alt<decisionNumber>=<eotPredictsAlt>;
<else>
    <ruleBacktrackFailure()>
    <(nvaExceptionWrapperMap.(k))({NoViableAltException nvae =
    new NoViableAltException("<description>", <decisionNumber>, <stateNumber>, input);
    <@noViableAltException()>
    throw nvae;})>
<endif>
}
>>

dfaOptionalBlockStateSwitch(k,edges,eotPredictsAlt,description,stateNumber,semPredState) ::= <<
switch ( input.LA(<k>) ) {
    <edges; separator="\n">
}
>>

dfaLoopbackStateSwitch(k, edges,eotPredictsAlt,description,stateNumber,semPredState) ::= <<
switch ( input.LA(<k>) ) {
<edges; separator="\n">
<if(eotPredictsAlt)>
default:
    alt<decisionNumber>=<eotPredictsAlt>;
    break;
<endif>
}
>>

```



```

}
>>

dfaEdgeSwitch(labels, targetState) ::= <<
<labels:{it |case <it>:}; separator="\n">
{
  <targetState>
}
break;
>>

// C y c l i c D F A

/** The code to initiate execution of a cyclic DFA; this is used
 * in the rule to predict an alt just like the fixed DFA case.
 * The <name> attribute is inherited via the parser, lexer, ...
 */
dfaDecision(decisionNumber,description) ::= <<
alt<decisionNumber> = dfa<decisionNumber>.predict(input);
>>

/* Dump DFA tables as run-length-encoded Strings of octal values.
 * Can't use hex as compiler translates them before compilation.
 * These strings are split into multiple, concatenated strings.
 * Java puts them back together at compile time thankfully.
 * Java cannot handle large static arrays, so we're stuck with this
 * encode/decode approach. See analysis and runtime DFA for
 * the encoding methods.
 */
cyclicDFA(dfa) ::= <<
static final String DFA<dfa.decisionNumber>_eotS =
  "<dfa.javaCompressedEOT; wrap="\n\t">";
static final String DFA<dfa.decisionNumber>_eofS =
  "<dfa.javaCompressedEOF; wrap="\n\t">";
static final String DFA<dfa.decisionNumber>_minS =
  "<dfa.javaCompressedMin; wrap="\n\t">";
static final String DFA<dfa.decisionNumber>_maxS =
  "<dfa.javaCompressedMax; wrap="\n\t">";
static final String DFA<dfa.decisionNumber>_acceptS =
  "<dfa.javaCompressedAccept; wrap="\n\t">";
static final String DFA<dfa.decisionNumber>_specialS =
  "<dfa.javaCompressedSpecial; wrap="\n\t">";
static final String[] DFA<dfa.decisionNumber>_transitionS = {
  <dfa.javaCompressedTransition:{s|<s; wrap="\n\t">}; separator=",\n">
};

static final short[] DFA<dfa.decisionNumber>_eot =
DFA.unpackEncodedString(DFA<dfa.decisionNumber>_eotS);

```

```

static final short[] DFA<dfa.decisionNumber>_eof =
DFA.unpackEncodedString(DFA<dfa.decisionNumber>_eofS);
static final char[] DFA<dfa.decisionNumber>_min =
DFA.unpackEncodedStringToUnsignedChars(DFA<dfa.decisionNumber>_minS);
static final char[] DFA<dfa.decisionNumber>_max =
DFA.unpackEncodedStringToUnsignedChars(DFA<dfa.decisionNumber>_maxS);
static final short[] DFA<dfa.decisionNumber>_accept =
DFA.unpackEncodedString(DFA<dfa.decisionNumber>_acceptS);
static final short[] DFA<dfa.decisionNumber>_special =
DFA.unpackEncodedString(DFA<dfa.decisionNumber>_specialS);
static final short[][] DFA<dfa.decisionNumber>_transition;

static {
int numStates = DFA<dfa.decisionNumber>_transitionS.length;
DFA<dfa.decisionNumber>_transition = new short[numStates][];
for (int i=0; i<numStates; i++) {
DFA<dfa.decisionNumber>_transition[i] = DFA.unpackEncodedString(DFA<dfa.decisionNumber>_transitionS[i]);
}
}

protected class DFA<dfa.decisionNumber> extends DFA {

public DFA<dfa.decisionNumber>(BaseRecognizer recognizer) {
this.recognizer = recognizer;
this.decisionNumber = <dfa.decisionNumber>;
this.eot = DFA<dfa.decisionNumber>_eot;
this.eof = DFA<dfa.decisionNumber>_eof;
this.min = DFA<dfa.decisionNumber>_min;
this.max = DFA<dfa.decisionNumber>_max;
this.accept = DFA<dfa.decisionNumber>_accept;
this.special = DFA<dfa.decisionNumber>_special;
this.transition = DFA<dfa.decisionNumber>_transition;
}
@Override
public String getDescription() {
return "<dfa.description>";
}
<@errorMethod()>
<if(dfa.specialStateSTs)>
@Override
public int specialStateTransition(int s, IntStream _input) throws NoViableAltException {
<if(LEXER)>
IntStream input = _input;
<endif>
<if(PARSER)>
TokenStream input = (TokenStream)_input;
<endif>
<if(TREE_PARSER)>

```

```

TreeNodeStream input = (TreeNodeStream)_input;
<endif>
int _s = s;
switch ( s ) {
<dfa.specialStateSTs:{state |
case <i0> : <! compressed special state numbers 0..n-1 !>
<state>}; separator="\n">
}
<if(backtracking)>
if (state.backtracking>0) {state.failed=true; return -1;}
<endif>
NoViableAltException nvae =
new NoViableAltException(getDescription(), <dfa.decisionNumber>, _s, input);
error(nvae);
throw nvae;
}
<endif>
}
>>

/** A state in a cyclic DFA; it's a special state and part of a big switch on
* state.
*/
cyclicDFAState(decisionNumber,stateNumber,edges,needErrorClause,semPredState) ::= <<
int LA<decisionNumber>_<stateNumber> = input.LA(1);
<if(semPredState)> <! get next lookahead symbol to test edges, then rewind !>
int index<decisionNumber>_<stateNumber> = input.index();
input.rewind();
<endif>
s = -1;
<edges; separator="\nelse ">
<if(semPredState)> <! return input cursor to state before we rewound !>
input.seek(index<decisionNumber>_<stateNumber>);
<endif>
if ( s>=0 ) return s;
break;
>>

/** Just like a fixed DFA edge, test the lookahead and indicate what
* state to jump to next if successful.
*/
cyclicDFAEdge(labelExpr, targetStateNumber, edgeNumber, predicates) ::= <<
if ( (<labelExpr> <if(predicates)>&& (<predicates>)<endif>) {s = <targetStateNumber>;}
>>

/** An edge pointing at end-of-token; essentially matches any char;
* always jump to the target.
*/

```

```

eotDFAEdge(targetStateNumber,edgeNumber, predicates) ::= <<
s = <targetStateNumber>;
>>

// D F A E X P R E S S I O N S

andPredicates(left,right) ::= "<left>&&<right>"

orPredicates(operands) ::= "<operands; separator=\\|\\>"

notPredicate(pred) ::= "!(<evalPredicate(pred,{}>)"

evalPredicate(pred,description) ::= "<pred>"

evalSynPredicate(pred,description) ::= "<pred>()"

lookaheadTest(atom,k,atomAsInt) ::= "LA<decisionNumber>_<stateNumber>==<atom>"

/** Sometimes a lookahead test cannot assume that LA(k) is in a temp variable
 * somewhere. Must ask for the lookahead directly.
 */
isolatedLookaheadTest(atom,k,atomAsInt) ::= "input.LA(<k>)==<atom>"

lookaheadRangeTest(lower,upper,k,rangeNumber,lowerAsInt,upperAsInt) ::= <%
(LA<decisionNumber>_<stateNumber> >= <lower> && LA<decisionNumber>_<stateNumber> \<= <upper>)
%>

isolatedLookaheadRangeTest(lower,upper,k,rangeNumber,lowerAsInt,upperAsInt) ::= "(input.LA(<k>) >= <lower>
&& input.LA(<k>) \<= <upper>)"

setTest(ranges) ::= <<
<ranges; separator="||">
>>

// A T T R I B U T E S

globalAttributeScope(scope) ::= <<
<if(scope.attributes)>
protected static class <scope.name>_scope {
<scope.attributes:{it |<it.decl>;}; separator="\n">
}
protected Stack\<<scope.name>_scope> <scope.name>_stack = new Stack\<<scope.name>_scope>();
<endif>
>>

ruleAttributeScope(scope) ::= <<
<if(scope)>

```

```

<if(scope.attributes)>
protected static class <scope.name>_scope {
  <scope.attributes:{it |<it.decl>;}; separator="\n">
}
protected Stack<<scope.name>_scope> <scope.name>_stack = new Stack<<scope.name>_scope>();
<endif>
<endif>
>>

returnStructName(r) ::= "<r.name>_return"

returnType(ruleDescriptor) ::= <%
<if(ruleDescriptor.hasMultipleReturnValues)>
<ruleDescriptor.grammar.recognizerName>.<ruleDescriptor:returnStructName()>
<elseif(ruleDescriptor.hasSingleReturnValue)>
<ruleDescriptor.singleValueReturnType>
<else>
void
<endif>
%>

/** Generate the Java type associated with a single or multiple return
 * values.
 */
ruleLabelType(referencedRule) ::= <%
<if(referencedRule.hasMultipleReturnValues)>
<returnScopeBaseType()>
<elseif(referencedRule.hasSingleReturnValue)>
<referencedRule.singleValueReturnType>
<else>
void
<endif>
%>

delegateName(d) ::= <<
<if(d.label)><d.label><else>g<d.name><endif>
>>

/** Using a type to init value map, try to init a type; if not in table
 * must be an object, default value is "null".
 */
initValue(typeName) ::= <<
<javaTypeInitMap.(typeName)>
>>

/** Define a rule label including default value */
ruleLabelDef(label) ::= <%
<ruleLabelType(referencedRule=label.referencedRule)> <label.label.text> =

```

```

<initValue(typeName=ruleLabelType(referencedRule=label.referencedRule))>;
%>

/** Define a return struct for a rule if the code needs to access its
 * start/stop tokens, tree stuff, attributes, ... Leave a hole for
 * subgroups to stick in members.
 */
returnScope(scope) ::= <<
<if(ruleDescriptor.hasMultipleReturnValues)>
public static class <ruleDescriptor.returnStructName()> extends <returnScopeBaseType()> {
<if(scope)><scope.attributes:{it |public <it.decl>;}; separator="\n"><endif>
<@ruleReturnMembers()>
};
<endif>
>>

returnScopeBaseType() ::= <%
<if(TREE_PARSER)>Tree<else>Parser<endif>RuleReturnScope
%>

parameterScope(scope) ::= <<
<scope.attributes:{it |<it.decl>}; separator=", ">
>>

parameterAttributeRef(attr) ::= "<attr.name>"
parameterSetAttributeRef(attr,expr) ::= "<attr.name> =<expr>";

scopeAttributeRef(scope,attr,index,negIndex) ::= <%
<if(negIndex)>
<scope>_stack.elementAt(<scope>_stack.size()-<negIndex>-1).<attr.name>
<else>
<if(index)>
<scope>_stack.elementAt(<index>).<attr.name>
<else>
<scope>_stack.peek().<attr.name>
<endif>
<endif>
%>

scopeSetAttributeRef(scope,attr,expr,index,negIndex) ::= <%
<if(negIndex)>
<scope>_stack.elementAt(<scope>_stack.size()-<negIndex>-1).<attr.name> =<expr>;
<else>
<if(index)>
<scope>_stack.elementAt(<index>).<attr.name> =<expr>;
<else>
<scope>_stack.peek().<attr.name> =<expr>;
<endif>
<endif>
%>

```

```

<endif>
%>

/** $x is either global scope or x is rule with dynamic scope; refers
 * to stack itself not top of stack. This is useful for predicates
 * like { $function.size()>0 && $function::name.equals("foo") }?
 */
isolatedDynamicScopeRef(scope) ::= "<scope>_stack"

/** reference an attribute of rule; might only have single return value */
ruleLabelRef(referencedRule,scope,attr) ::= <%
<if(referencedRule.hasMultipleReturnValues)>
(<scope>!=null?(<<returnType(referencedRule)>><scope>).<attr.name>:<initValue(attr.type)>)
<else>
<scope>
<endif>
%>

returnAttributeRef(ruleDescriptor,attr) ::= <%
<if(ruleDescriptor.hasMultipleReturnValues)>
retval.<attr.name>
<else>
<attr.name>
<endif>
%>

returnSetAttributeRef(ruleDescriptor,attr,expr) ::= <%
<if(ruleDescriptor.hasMultipleReturnValues)>
retval.<attr.name> =<expr>;
<else>
<attr.name> =<expr>;
<endif>
%>

/** How to translate $tokenLabel */
tokenLabelRef(label) ::= "<label>"

/** ids+=ID {$ids} or e+=expr {$e} */
listLabelRef(label) ::= "list_<label>"

// not sure the next are the right approach

tokenLabelPropertyRef_text(scope,attr) ::= "<scope>!=null?<scope>.getText():null)"
tokenLabelPropertyRef_type(scope,attr) ::= "<scope>!=null?<scope>.getType():0)"
tokenLabelPropertyRef_line(scope,attr) ::= "<scope>!=null?<scope>.getLine():0)"
tokenLabelPropertyRef_pos(scope,attr) ::= "<scope>!=null?<scope>.getCharPositionInLine():0)"
tokenLabelPropertyRef_channel(scope,attr) ::= "<scope>!=null?<scope>.getChannel():0)"

```

```

tokenLabelPropertyRef_index(scope,attr) ::= "<scope>!=null?<scope>.getTokenIndex():0)"
tokenLabelPropertyRef_tree(scope,attr) ::= "<scope>_tree"
tokenLabelPropertyRef_int(scope,attr) ::= "<scope>!=null?Integer.valueOf(<scope>.getText():0)"

ruleLabelPropertyRef_start(scope,attr) ::= "<scope>!=null?(<castToLabelType({<scope>.start})>):null)"
ruleLabelPropertyRef_stop(scope,attr) ::= "<scope>!=null?(<castToLabelType({<scope>.stop})>):null)"
ruleLabelPropertyRef_tree(scope,attr) ::= "<scope>!=null?(<ASTLabelType><scope>.getTree():null)"
ruleLabelPropertyRef_text(scope,attr) ::= <%
<if(TREE_PARSER)>
(<scope>!=null?(input.getTokenStream().toString(
input.getTreeAdaptor().getTokenStartIndex(<scope>.start),
input.getTreeAdaptor().getTokenStopIndex(<scope>.start))):null)
<else>
(<scope>!=null?input.toString(<scope>.start,<scope>.stop):null)
<endif>
%>

ruleLabelPropertyRef_st(scope,attr) ::= "<scope>!=null?((StringTemplate)<scope>.getTemplate()):null)"

/** Isolated $RULE ref ok in lexer as it's a Token */
lexerRuleLabel(label) ::= "<label>"

lexerRuleLabelPropertyRef_type(scope,attr) ::=
("<scope>!=null?<scope>.getType():0)"
lexerRuleLabelPropertyRef_line(scope,attr) ::=
("<scope>!=null?<scope>.getLine():0)"
lexerRuleLabelPropertyRef_pos(scope,attr) ::=
("<scope>!=null?<scope>.getCharPositionInLine():-1)"
lexerRuleLabelPropertyRef_channel(scope,attr) ::=
("<scope>!=null?<scope>.getChannel():0)"
lexerRuleLabelPropertyRef_index(scope,attr) ::=
("<scope>!=null?<scope>.getTokenIndex():0)"
lexerRuleLabelPropertyRef_text(scope,attr) ::=
("<scope>!=null?<scope>.getText():null)"
lexerRuleLabelPropertyRef_int(scope,attr) ::=
("<scope>!=null?Integer.valueOf(<scope>.getText():0)"

// Somebody may ref $template or $tree or $stop within a rule:
rulePropertyRef_start(scope,attr) ::= "<castToLabelType(\"retval.start\")>"
rulePropertyRef_stop(scope,attr) ::= "<castToLabelType(\"retval.stop\")>"
rulePropertyRef_tree(scope,attr) ::= "retval.tree"
rulePropertyRef_text(scope,attr) ::= <%
<if(TREE_PARSER)>
input.getTokenStream().toString(
input.getTreeAdaptor().getTokenStartIndex(retval.start),
input.getTreeAdaptor().getTokenStopIndex(retval.start))
<else>
input.toString(retval.start,input.LT(-1))

```



```

<endif>
%>
rulePropertyRef_st(scope,attr) ::= "retval.st"

lexerRulePropertyRef_text(scope,attr) ::= "getText()"
lexerRulePropertyRef_type(scope,attr) ::= "_type"
lexerRulePropertyRef_line(scope,attr) ::= "state.tokenStartLine"
lexerRulePropertyRef_pos(scope,attr) ::= "state.tokenStartCharPositionInLine"
lexerRulePropertyRef_index(scope,attr) ::= "-1" // undefined token index in lexer
lexerRulePropertyRef_channel(scope,attr) ::= "_channel"
lexerRulePropertyRef_start(scope,attr) ::= "state.tokenStartCharIndex"
lexerRulePropertyRef_stop(scope,attr) ::= "(getCharIndex()-1)"
lexerRulePropertyRef_int(scope,attr) ::= "Integer.valueOf(<scope>.getText())"

// setting $st and $tree is allowed in local rule. everything else
// is flagged as error
ruleSetPropertyRef_tree(scope,attr,expr) ::= "retval.tree =<expr>";
ruleSetPropertyRef_st(scope,attr,expr) ::= "retval.st =<expr>";

/** How to execute an action (only when not backtracking) */
execAction(action) ::= <%
<if(backtracking)>
if ( <actions.(actionScope).synpredgate> ) {
  <action>
}
<else>
<action>
<endif>
%>

/** How to always execute an action even when backtracking */
execForcedAction(action) ::= "<action>"

// M I S C (properties, etc...)

bitset(name, words64) ::= <<
public static final BitSet <name> = new BitSet(new long[] { <words64: { it | <it>L }; separator="," > });
>>

codeFileExtension() ::= ".java"

true_value() ::= "true"
false_value() ::= "false"

isEmptyString ::= [
  "" : true,
  default : false
]

```

```
isTrue ::= [  
  "true" : true,  
  default : false  
]
```

```
isDefaultLabelType ::= [  
  "Token" : true,  
  default : false  
]
```

```
isPredefinedRewriteRule ::= [  
  "topdown" : true,  
  "bottomup" : true,  
  default : false  
]
```

```
castToLabelType(value) ::= <%  
<if(!isDefaultLabelType.(labelType))>  
(<labelType>  
<endif>  
<value>  
>%
```

Found in path(s):

* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/codegen/templates/Java/Java.stg

No license file was found, but licenses were detected in source scan.

```
/*  
 * [The "BSD license"]  
 * Copyright (c) 2011 Terence Parr  
 * All rights reserved.  
 *  
 * Conversion to C#:  
 * Copyright (c) 2011 Sam Harwell, Pixel Mine, Inc.  
 * All rights reserved.  
 *  
 * Redistribution and use in source and binary forms, with or without  
 * modification, are permitted provided that the following conditions  
 * are met:  
 * 1. Redistributions of source code must retain the above copyright  
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 * documentation and/or other materials provided with the distribution.  
 * 3. The name of the author may not be used to endorse or promote products  
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 *
```

```

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* NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE,
* DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY
* THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT
* (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF
* THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.
*/

```

```

csharpVisibilityMap ::= [
  "private":"private",
  "protected":"protected",
  "public":"public",
  "fragment":"private",
  default:"private"
]

```

```

/** The overall file structure of a recognizer; stores methods for rules
* and cyclic DFAs plus support code.
*/

```

```

outputFile( LEXER,PARSER,TREE_PARSER, actionScope, actions,
  docComment, recognizer,
  name, tokens, tokenNames, rules, cyclicDFAs,
  bitsets, buildTemplate, buildAST, rewriteMode, profile,
  backtracking, synpreds, memoize, numRules,
  fileName, ANTLRVersion, generatedTimestamp, trace,
  scopes, superClass, literals) ::=

```

```
<<
```

```
//-----
```

```
// <auto-generated>
```

```
// This code was generated by a tool.
```

```
// ANTLR Version: <ANTLRVersion>
```

```
//
```

```
// Changes to this file may cause incorrect behavior and will be lost if
```

```
// the code is regenerated.
```

```
// </auto-generated>
```

```
//-----
```

```
// $ANTLR <ANTLRVersion> <fileName> <generatedTimestamp>
```

```
// The variable 'variable' is assigned but its value is never used.
```

```
#pragma warning disable 219
```

```
// Unreachable code detected.
```

```
#pragma warning disable 162
```

```
// Missing XML comment for publicly visible type or member 'Type_or_Member'
```

```

#pragma warning disable 1591
// CLS compliance checking will not be performed on 'type' because it is not visible from outside this assembly.
#pragma warning disable 3019

<actions.(actionScope).header>

<@imports>
using System.Collections.Generic;
using Antlr.Runtime;
using Antlr.Runtime.Misc;
<if(TREE_PARSER)>
using Antlr.Runtime.Tree;
using RewriteRuleITokenStream = Antlr.Runtime.Tree.RewriteRuleTokenStream;
<endif>
<@end>
<if(actions.(actionScope).namespace)>
namespace <actions.(actionScope).namespace>
{
<endif>
<docComment>
<recognizer>
<if(actions.(actionScope).namespace)>

} // namespace <actions.(actionScope).namespace>
<endif>
>>

lexerInputStreamType() ::= <<
<actions.(actionScope).inputStreamType; null="ICharStream">
>>

lexer(grammar, name, tokens, scopes, rules, numRules, filterMode, labelType="CommonToken",
superClass={ <if(actions.(actionScope).superClass)><actions.(actionScope).superClass><else>Antlr.Runtime.Lexer
<endif>},
rewriteElementType={}, ASTLabelType={}) ::= <<
[System.CodeDom.Compiler.GeneratedCode("ANTLR", "<ANTLRVersion>")]
[System.CLSCompliant(false)]
<parserModifier(grammar=grammar, actions=actions)> partial class <grammar.recognizerName> :
<@superClassName><superClass><@end>
{
<tokens:{it|public const int <it.name; format="id">=<it.type>;}; separator="\n">
<scopes:{it|<if(it.isDynamicGlobalScope)><globalAttributeScope(scope=it)><endif>}>
<actions.lexer.members>

// delegates
<grammar.delegates>
{g|private <g.recognizerName> <g.delegateName()>;}; separator="\n">
// delegators

```

```

<grammar.delegates:
  {g|private <g.recognizerName> <g.delegateName()>;}; separator="\n">
<last(grammar.delegates):{g|private <g.recognizerName> gParent;}>

<actions.(actionScope).ctorModifier; null="public"> <grammar.recognizerName>(<! needed by subclasses !>
{
  OnCreated();
}

<actions.(actionScope).ctorModifier; null="public"> <grammar.recognizerName>(<lexerInputStreamType()>
input<grammar.delegates:{g|, <g.recognizerName> <g.delegateName()>}> )
: this(input, new RecognizerSharedState()<grammar.delegates:{g|, <g.delegateName()>}>)
{
}

<actions.(actionScope).ctorModifier; null="public"> <grammar.recognizerName>(<lexerInputStreamType()> input,
RecognizerSharedState state<grammar.delegates:{g|, <g.recognizerName> <g.delegateName()>}>)
: base(input, state)
{
<if(memoize)>
<if(grammar.grammarIsRoot)>
  state.ruleMemo = new System.Collections.Generic.Dictionary<int, int>[<numRules>+1];<\n><! index from 1..n !>
<endif>
<endif>
  <grammar.directDelegates:
    {g|<g.delegateName()> = new <g.recognizerName>(input, this.state<trunc(g.delegates):{p|,
<p:delegateName()>}>, this);}; separator="\n">
  <grammar.delegates:
    {g|this.<g.delegateName()> = <g.delegateName()>;}; separator="\n">
  <last(grammar.delegates):{g|gParent = <g.delegateName()>;}>

  OnCreated();
}
public override string GrammarFileName { get { return "<fileName>"; } }

<if(grammar.hasDelegates)>
public override <lexerInputStreamType()> CharStream
{
  get
  {
    return base.CharStream;
  }
  set
  {
    base.CharStream = value;
    <grammar.directDelegates:
      {g|<g.delegateName()> = new <g.recognizerName>(input, state<trunc(g.delegates):{p|, <p:delegateName()>}>,
this);}; separator="\n">

```

```

<grammar.delegators:
  {g|this.<g:delegateName()> = <g:delegateName()>;}; separator="\n">
<last(grammar.delegators):{g|gParent = <g:delegateName()>;}>
}
}

<if(grammar.delegates)>
public override void SetState(RecognizerSharedState state)
{
  base.SetState(state);
  <grammar.delegates:{g|<g:delegateName()>.SetState(state);}; separator="\n">
}
<endif>

<endif>
<if(filterMode)>
  <filteringNextToken()>
<endif>

partial void OnCreated();
partial void EnterRule(string ruleName, int ruleIndex);
partial void LeaveRule(string ruleName, int ruleIndex);

<rules; separator="\n">

<insertLexerSynpreds(synpreds)>

#region DFA
<cyclicDFAs:{dfa | DFA<dfa.decisionNumber> dfa<dfa.decisionNumber>;}; separator="\n">

protected override void InitDFAs()
{
  base.InitDFAs();
  <cyclicDFAs:{dfa | dfa<dfa.decisionNumber> = new DFA<dfa.decisionNumber>(this<if(dfa.specialStateSTs)>,
SpecialStateTransition<dfa.decisionNumber><endif>;}; separator="\n">
}

<cyclicDFAs:cyclicDFA()><! dump tables for all DFA !>
#endregion

}
>>

/** A override of Lexer.nextToken() that backtracks over mTokens() looking
 * for matches. No error can be generated upon error; just rewind, consume
 * a token and then try again. backtracking needs to be set as well.
 * Make rule memoization happen only at levels above 1 as we start mTokens

```

```

* at backtracking==1.
*/
filteringNextToken() ::= <<
public override IToken NextToken()
{
while (true)
{
if (input.LA(1) == CharStreamConstants.EndOfFile)
{
IToken eof = new CommonToken((ICharStream)input, CharStreamConstants.EndOfFile, TokenChannels.Default,
input.Index, input.Index);
eof.Line = Line;
eof.CharPositionInLine = CharPositionInLine;
return eof;
}
state.token = null;
state.channel = TokenChannels.Default;
state.tokenStartCharIndex = input.Index;
state.tokenStartCharPositionInLine = input.CharPositionInLine;
state.tokenStartLine = input.Line;
state.text = null;
try
{
int m = input.Mark();
state.backtracking=1;<! means we won't throw slow exception !>
state.failed=false;
mTokens();
state.backtracking=0;
<! mTokens backtracks with synpred at backtracking==2
and we set the synpredgate to allow actions at level 1. !>
if (state.failed)
{
input.Rewind(m);
input.Consume();<! advance one char and try again !>
}
else
{
Emit();
return state.token;
}
}
catch (RecognitionException re)
{
// shouldn't happen in backtracking mode, but...
ReportError(re);
Recover(re);
}
}
}

```

```

}

public override void Memoize(IIntStream input, int ruleIndex, int ruleStartIndex)
{
    if (state.backtracking > 1)
        base.Memoize(input, ruleIndex, ruleStartIndex);
}

public override bool AlreadyParsedRule(IIntStream input, int ruleIndex)
{
    if (state.backtracking > 1)
        return base.AlreadyParsedRule(input, ruleIndex);

    return false;
}
>>

actionGate() ::= "state.backtracking == 0"

filteringActionGate() ::= "state.backtracking == 1"

/** How to generate a parser */
genericParser(grammar, name, scopes, tokens, tokenNames, rules, numRules,
    bitsets, inputStreamType, superClass,
    labelType, members, rewriteElementType,
    filterMode, ASTLabelType="object") ::= <<
[System.CodeDom.Compiler.GeneratedCode("ANTLR", "<ANTLRVersion>")]
[System.CLSCompliant(false)]
<parserModifier(grammar=grammar, actions=actions)> partial class <grammar.recognizerName> :
<@superClassName><superClass><@end>
{
<if(grammar.grammarIsRoot)>
    internal static readonly string[] tokenNames = new string[] {
        "\<invalid>", "\<EOR>", "\<DOWN>", "\<UP>", <tokenNames; separator=", ">
    };
<endif>
    <tokens:{it|public const int <it.name; format="id">=<it.type>;}; separator="\n">

<if(grammar.delegates)>
    // delegates
    <grammar.delegates:
        {g|private <g.recognizerName> <g.delegateName(>);}; separator="\n">
<endif>
<if(grammar.delegators)>
    // delegators
    <grammar.delegators:
        {g|private <g.recognizerName> <g.delegateName(>);}; separator="\n">
    <last(grammar.delegators):{g|private <g.recognizerName> gParent;}>

```



```

<endif>

<if(grammar.delegates)>
public override void SetState(RecognizerSharedState state)
{
    base.SetState(state);
    <grammar.delegates:{g|<g:delegateName().SetState(state);}; separator="\n">
}

<if(TREE_PARSER)>
public override void SetTreeNodeStream(ITreeNodeStream input)
{
    base.SetTreeNodeStream(input);
    <grammar.delegates:{g|<g:delegateName().SetTreeNodeStream(input);}; separator="\n">
}
<endif>
<endif>

<scopes: {it|<if(it.isDynamicGlobalScope)><globalAttributeScope(scope=it)><endif> }>
<@members()>

public override string[] TokenNames { get { return
<grammar.composite.rootGrammar.recognizerName>.tokenNames; } }
public override string GrammarFileName { get { return "<fileName>"; } }

<members>

partial void OnCreated();
partial void EnterRule(string ruleName, int ruleIndex);
partial void LeaveRule(string ruleName, int ruleIndex);

#region Rules
<rules; separator="\n">
#endregion Rules

<if(grammar.delegatedRules)>
<! generate rule/method definitions for imported rules so they
appear to be defined in this recognizer. !>
#region Delegated rules
<grammar.delegatedRules:{ruleDescriptor|
    <ruleModifier(grammar=grammar,ruleDescriptor=ruleDescriptor)> <return Type(ruleDescriptor)>
    <ruleDescriptor.name; format="id"><ruleDescriptor.parameterScope:parameterScope()><!throws
RecognitionException !>{ <if(ruleDescriptor.hasReturnValue)>return
<endif><ruleDescriptor.grammar:delegateName().<ruleDescriptor.name;
format="id"><ruleDescriptor.parameterScope><ruleDescriptor.parameterScope.attributes:{a|<a.name;
format="id">}; separator=", "><endif>}; \}}; separator="\n">
#endregion Delegated rules
<endif>

```

```

<insertSynpreds(synpreds)>

<if(cyclicDFAs)>
#region DFA
<cyclicDFAs:{ dfa | private DFA<dfa.decisionNumber> dfa<dfa.decisionNumber>;}; separator="\n">

protected override void InitDFAs()
{
base.InitDFAs();
<cyclicDFAs:{ dfa | dfa<dfa.decisionNumber> = new DFA<dfa.decisionNumber>( this<if(dfa.specialStateSTs)>,
SpecialStateTransition<dfa.decisionNumber><endif> );}; separator="\n">
}

<cyclicDFAs:cyclicDFA()><! dump tables for all DFA !>
#endregion DFA
<endif>

<if(bitsets)>
#region Follow sets
private static class Follow
{
<bitsets:{ it|<bitset(name=_<it.name>_in_<it.inName><it.tokenIndex>), words64=it.bits}>; separator="\n">
}
#endregion Follow sets
<endif>
}
>>

@genericParser.members() ::= <<
<! WARNING. bug in ST: this is cut-n-paste into Dbg.stg !>
<actions.(actionScope).ctorModifier; null="public"> <grammar.recognizerName><(inputStreamType>
input<grammar.delegates:{g|, <g.recognizerName> <g.delegateName()>}>>
: this(input, new RecognizerSharedState()<grammar.delegates:{g|, <g.delegateName()>}>>
{
}
<actions.(actionScope).ctorModifier; null="public"> <grammar.recognizerName><(inputStreamType> input,
RecognizerSharedState state<grammar.delegates:{g|, <g.recognizerName> <g.delegateName()>}>>
: base(input, state)
{
<if(grammar.directDelegates)>
<grammar.directDelegates:
{g|<g.delegateName()> = new <g.recognizerName>(input, state<trunc(g.delegates):{p|, <p.delegateName()>}>,
this);}; separator="\n">
<endif>
<if(grammar.indirectDelegates)>
<grammar.indirectDelegates:{g | <g.delegateName()> = <g.delegator.delegateName()>.<g.delegateName()>};
separator="\n">

```

```

<endif>
<if(grammar.delegators)>
  <last(grammar.delegators):{g|gParent = <g:delegateName(>};}>
<endif>
<parserCtorBody()>
  OnCreated();
}
>>

// imported grammars are 'public' (can't be internal because their return scope classes must be accessible)
parserModifier(grammar, actions) ::= <<
<if(grammar.grammarIsRoot)><actions.(actionScope).modifier; null="public"><else>public<endif>
>>

parserCtorBody() ::= <<
<if(memoize)>
<if(grammar.grammarIsRoot)>
this.state.ruleMemo = new System.Collections.Generic.Dictionary<int,
int>[<length(grammar.allImportedRules)>+1];<n><! index from 1..n !>
<endif>
<endif>
<grammar.delegators:
{g|this.<g:delegateName(> = <g:delegateName(>}; separator="\n">
>>

parser(grammar, name, scopes, tokens, tokenNames, rules, numRules, bitsets,
  ASTLabelType="object",
superClass={<if(actions.(actionScope).superClass)><actions.(actionScope).superClass><else>Antlr.Runtime.Parser
<endif>}, labelType="IToken",
  members={<actions.parser.members>}) ::= <<
<genericParser(inputStreamType="ITokenStream", rewriteElementType="IToken", filterMode=false, ...)>
>>

/** How to generate a tree parser; same as parser except the input
 * stream is a different type.
 */
treeParser(grammar, name, scopes, tokens, tokenNames, globalAction, rules,
  numRules, bitsets, filterMode, labelType={<ASTLabelType>}, ASTLabelType="object",
superClass={<if(actions.(actionScope).superClass)><actions.(actionScope).superClass><else>Antlr.Runtime.Tree.<
if(filterMode)><if(buildAST)>TreeRewriter<else>TreeFilter<endif><else>TreeParser<endif><endif>},
  members={<actions.treeparser.members>}) ::= <<
<genericParser(inputStreamType="ITreeNodeStream", rewriteElementType="Node", ...)>
>>

/** A simpler version of a rule template that is specific to the imaginary
 * rules created for syntactic predicates. As they never have return values
 * nor parameters etc..., just give simplest possible method. Don't do
 * any of the normal memoization stuff in here either; it's a waste.

```

```

* As predicates cannot be inlined into the invoking rule, they need to
* be in a rule by themselves.
*/
synpredRule(ruleName, ruleDescriptor, block, description, nakedBlock) ::=
<<

partial void EnterRule_<ruleName>_fragment();
partial void LeaveRule_<ruleName>_fragment();

// $ANTLR start <ruleName>
<ruleModifier(grammar=grammar,ruleDescriptor=ruleDescriptor)> void
<ruleName>_fragment(<ruleDescriptor.parameterScope:parameterScope()>)
{
    <ruleLabelDefs(...)>
    EnterRule_<ruleName>_fragment();
    EnterRule("<ruleName>_fragment", <ruleDescriptor.index>);
    TraceIn("<ruleName>_fragment", <ruleDescriptor.index>);
    try
    {
        <block>
    }
    finally
    {
        TraceOut("<ruleName>_fragment", <ruleDescriptor.index>);
        LeaveRule("<ruleName>_fragment", <ruleDescriptor.index>);
        LeaveRule_<ruleName>_fragment();
    }
}
// $ANTLR end <ruleName>
>>

insertLexerSynpreds(synpreds) ::= <<
<insertSynpreds(synpreds)>
>>

insertSynpreds(synpreds) ::= <<
<if(synpreds)>
#region Synpreds
private bool EvaluatePredicate(System.Action fragment)
{
    bool success = false;
    state.backtracking++;
    <@start()>
    try { DebugBeginBacktrack(state.backtracking);
    int start = input.Mark();
    try
    {
        fragment();

```

```

    }
    catch ( RecognitionException re )
    {
        System.Console.Error.WriteLine("impossible: "+re);
    }
    success = !state.failed;
    input.Rewind(start);
    } finally { DebugEndBacktrack(state.backtracking, success); }
    <@stop()>
    state.backtracking--;
    state.failed=false;
    return success;
    }
#endregion Synpreds
<endif>
>>

ruleMemoization(name) ::= <<
<if(memoize)>
if (state.backtracking > 0 && AlreadyParsedRule(input, <ruleDescriptor.index>)) { <returnFromRule()> }
<endif>
>>

/** How to test for failure and return from rule */
checkRuleBacktrackFailure() ::= <<
<if(backtracking)>if (state.failed) <returnFromRule()><endif>
>>

/** This rule has failed, exit indicating failure during backtrack */
ruleBacktrackFailure() ::= <<
<if(backtracking)>if (state.backtracking>0) { state.failed=true; <returnFromRule()>}<endif>
>>

ruleWrapperMap ::= [
    "bottomup":{<ruleWrapperBottomup()>},
    "topdown":{<ruleWrapperTopdown()>},
    default:""
]

ruleWrapperBottomup() ::= <<
<if(TREE_PARSER && filterMode)>
protected override <if(buildAST)>IAstRuleReturnScope<else>void<endif> Bottomup() { <if(buildAST)>return
<endif>bottomup(); }
<endif>
>>

ruleWrapperTopdown() ::= <<
<if(TREE_PARSER && filterMode)>

```

```

protected override <if(buildAST)>IAstRuleReturnScope<else>void<endif> Topdown() { <if(buildAST)>return
<endif>topdown(); }
<endif>
>>

/** How to generate code for a rule. This includes any return type
 * data aggregates required for multiple return values.
 */
rule(ruleName,ruleDescriptor,block,emptyRule,description,exceptions,finally,memoize) ::= <<
<ruleAttributeScope(scope=ruleDescriptor.ruleScope)>
<returnScope(ruleDescriptor.returnScope)>
partial void EnterRule_<ruleName>();
partial void LeaveRule_<ruleName>();
<ruleWrapperMap.(ruleName)>
// $ANTLR start "<ruleName>"
// <fileName>:<description>
[GrammarRule("<ruleName>")]
<ruleModifier(grammar=grammar,ruleDescriptor=ruleDescriptor)> <returnType(ruleDescriptor)> <ruleName>;
format="id">(<ruleDescriptor.parameterScope:parameterScope(>>)
{
  EnterRule_<ruleName>();
  EnterRule("<ruleName>", <ruleDescriptor.index>);
  TraceIn("<ruleName>", <ruleDescriptor.index>);
  <ruleScopeSetUp(>
  <ruleDeclarations(>
  <ruleLabelDefs(...)>
  <ruleDescriptor.actions.init>
  try { DebugEnterRule(GrammarFileName, "<ruleName>");
  DebugLocation(<ruleDescriptor.tree.line>, <ruleDescriptor.EORNode.charPositionInLine>);
  <@preamble(>
  try
  {
    <ruleMemoization(name=ruleName)>
    <block>
    <ruleCleanUp(>
    <(ruleDescriptor.actions.after):execAction(>
  }
  <if(exceptions)>
  <exceptions: {e|<catch(decl=e.decl,action=e.action)><\n>}>
  <else>
  <if(!emptyRule)>
  <if(actions.(actionScope).rulecatch)>
  <actions.(actionScope).rulecatch>
  <else>
  catch (RecognitionException re)
  {
    ReportError(re);
    Recover(input,re);

```

```

    <@setErrorReturnValue()>
    }
<endif>
<endif>
<endif>
finally
{
    TraceOut("<ruleName>", <ruleDescriptor.index>);
    LeaveRule("<ruleName>", <ruleDescriptor.index>);
    LeaveRule_<ruleName>();
    <memoize()>
    <ruleScopeCleanUp()>
    <finally>
    }
    DebugLocation(<ruleDescriptor.EORNode.line>, <ruleDescriptor.EORNode.charPositionInLine>);
} finally { DebugExitRule(GrammarFileName, "<ruleName>"); }
<@postamble()>
<returnFromRule()><\n>
}
// $ANTLR end "<ruleName>"
>>

// imported grammars need to have internal rules
ruleModifier(grammar,ruleDescriptor) ::= <<
<if(grammar.grammarIsRoot)><csharpVisibilityMap.(ruleDescriptor.modifier);
null="private"><else>internal<endif>
>>

// imported grammars need to have public return scopes
returnScopeModifier(grammar,ruleDescriptor) ::= <<
<if(grammar.grammarIsRoot)><csharpVisibilityMap.(ruleDescriptor.modifier);
null="private"><else>public<endif>
>>

catch(decl,action) ::= <<
catch (<e.decl>)
{
    <e.action>
}
>>

ruleDeclarations() ::= <<
<if(ruleDescriptor.hasMultipleReturnValues)>
<returnType(ruleDescriptor)> retval = new
<returnType(ruleDescriptor)><(if(ruleDescriptor.returnScope.attributes)>this<endif>);
retval.Start = (<labelType>)input.LT(1);
<elseif(ruleDescriptor.returnScope)>
<ruleDescriptor.returnScope.attributes>: { a |

```

```

<a.type> <a.name; format="id"> = <if(a.initValue)><a.initValue><else><initValue(a.type)><endif>;
}>
<endif>
<if(memoize)>
int <ruleDescriptor.name>_startIndex = input.Index;
<endif>
>>

ruleScopeSetUp() ::= <<
<ruleDescriptor.useScopes: {it|<it>_stack.Push(new <it>_scope(this));<it>_scopeInit(<it>_stack.Peek());};
separator="\n">
<ruleDescriptor.ruleScope: {it|<it.name>_stack.Push(new
<it.name>_scope(this));<it.name>_scopeInit(<it.name>_stack.Peek());}; separator="\n">
>>

ruleScopeCleanUp() ::= <<
<ruleDescriptor.useScopes: {it|<it>_scopeAfter(<it>_stack.Peek());<it>_stack.Pop();}; separator="\n">
<ruleDescriptor.ruleScope: {it|<it.name>_scopeAfter(<it.name>_stack.Peek());<it.name>_stack.Pop();};
separator="\n">
>>

ruleLabelDefs(ruleDescriptor, labelType, ASTLabelType, rewriteElementType) ::= <<
<[ruleDescriptor.tokenLabels,ruleDescriptor.tokenListLabels,ruleDescriptor.wildcardTreeLabels,ruleDescriptor.wildcardTreeListLabels]
: {it|<labelType> <it.label.text> = default(<labelType>);}; separator="\n"
>
<ruleDescriptor.tokenListLabels
: {it|List<<labelType>> list_<it.label.text> = null;}; separator="\n"
>
<[ruleDescriptor.ruleListLabels,ruleDescriptor.wildcardTreeListLabels]
: {it|List<<ASTLabelType>> list_<it.label.text> = null;}; separator="\n"
>
<ruleDescriptor.ruleLabels:ruleLabelDef(); separator="\n">
<ruleDescriptor.ruleListLabels:ruleLabelDef(); separator="\n">
>>

lexerRuleLabelDefs() ::= <<
<[ruleDescriptor.tokenLabels,
ruleDescriptor.tokenListLabels,
ruleDescriptor.ruleLabels]
: {it|<labelType> <it.label.text> = default(<labelType>);}; separator="\n"
>
<[ruleDescriptor.charListLabels,
ruleDescriptor.charLabels]
: {it|int <it.label.text> = 0;}; separator="\n"
>
<[ruleDescriptor.tokenListLabels,
ruleDescriptor.ruleListLabels]

```



```

: {it|List|<<labelType>> list_<it.label.text> = null;}; separator="\n"
>
<ruleDescriptor.charListLabels: {it|List|<int> list_<it.label.text> = null;}; separator="\n"
>
>>

returnFromRule() ::= <%
return
<if(!ruleDescriptor.isSynPred)>
<if(ruleDescriptor.hasReturnValue)>
<if(ruleDescriptor.hasSingleReturnValue)>
<! This comment is a hack to make sure the following
  single space appears in the output. !> <ruleDescriptor.singleValueReturnName>
<else>
<!!> retval
<endif>
<endif>
<endif>
;
%>

ruleCleanUp() ::= <<
<if(ruleDescriptor.hasMultipleReturnValues)>
<if(!TREE_PARSER)>
retval.Stop = (<labelType>)input.LT(-1);
<endif>
<endif>
>>

memoize() ::= <<
<if(memoize)>
<if(backtracking)>
if (state.backtracking > 0) { Memoize(input, <ruleDescriptor.index>, <ruleDescriptor.name>_StartIndex); }
<endif>
<endif>
>>

/** How to generate a rule in the lexer; naked blocks are used for
 * fragment rules.
 */
lexerRule(ruleName,nakedBlock,ruleDescriptor,block,memoize) ::= <<

partial void EnterRule_<ruleName>();
partial void LeaveRule_<ruleName>();

// $ANTLR start "<ruleName>"
[GrammarRule("<ruleName>")]
<ruleModifier(grammar=grammar,ruleDescriptor=ruleDescriptor)> void

```

```

m<ruleName>(<ruleDescriptor.parameterScope:parameterScope()>)
{
  EnterRule_<ruleName>();
  EnterRule("<ruleName>", <ruleDescriptor.index>);
  TraceIn("<ruleName>", <ruleDescriptor.index>);
  <ruleScopeSetUp()>
  <ruleDeclarations()>
  try
  {
    <if(nakedBlock)>
      <ruleMemoization(name=ruleName)>
      <lexerRuleLabelDefs()>
      <ruleDescriptor.actions.init>
      <block>
    <else>
      int _type = <ruleName>;
      int _channel = DefaultTokenChannel;
      <ruleMemoization(name=ruleName)>
      <lexerRuleLabelDefs()>
      <ruleDescriptor.actions.init>
      <block>
      <ruleCleanUp()>
      state.type = _type;
      state.channel = _channel;
      <(ruleDescriptor.actions.after):execAction()>
    <endif>
  }
  finally
  {
    TraceOut("<ruleName>", <ruleDescriptor.index>);
    LeaveRule("<ruleName>", <ruleDescriptor.index>);
    LeaveRule_<ruleName>();
    <ruleScopeCleanUp()>
    <memoize()>
  }
}
// $ANTLR end "<ruleName>"
>>

/** How to generate code for the implicitly-defined lexer grammar rule
 * that chooses between lexer rules.
 */
tokensRule(ruleName,nakedBlock,args,block,ruleDescriptor) ::= <<

public override void mTokens()
{
  <block><\n>
}

```

>>

// S U B R U L E S

/** A (...) subrule with multiple alternatives */

block(alts,decls,decision,enclosingBlockLevel,blockLevel,decisionNumber,maxK,maxAlt,description) ::= <<

// <fileName>:<description>

int alt<decisionNumber>=<maxAlt>;

<decls>

<@predecision()>

try { DebugEnterSubRule(<decisionNumber>);

try { DebugEnterDecision(<decisionNumber>, false<!<decision.dfa.hasSynPred>!>);

<decision>

} finally { DebugExitDecision(<decisionNumber>); }

<@postdecision()>

<@prebranch()>

switch (alt<decisionNumber>)

{

<alts:{a|altSwitchCase(i,a)}>>

}

} finally { DebugExitSubRule(<decisionNumber>); }

<@postbranch()>

>>

/** A rule block with multiple alternatives */

ruleBlock(alts,decls,decision,enclosingBlockLevel,blockLevel,decisionNumber,maxK,maxAlt,description) ::= <<

// <fileName>:<description>

int alt<decisionNumber>=<maxAlt>;

<decls>

<@predecision()>

try { DebugEnterDecision(<decisionNumber>, false<!<decision.dfa.hasSynPred>!>);

<decision>

} finally { DebugExitDecision(<decisionNumber>); }

<@postdecision()>

switch (alt<decisionNumber>)

{

<alts:{a|altSwitchCase(i,a)}>>

}

>>

ruleBlockSingleAlt(alts,decls,decision,enclosingBlockLevel,blockLevel,decisionNumber,description) ::= <<

// <fileName>:<description>

<decls>

<@prealt()>

DebugEnterAlt(1);

<alts>

<@postalt()>

>>

```

/** A special case of a (...) subrule with a single alternative */
blockSingleAlt(alts,decls,decision,enclosingBlockLevel,blockLevel,decisionNumber,description) ::= <<
// <fileName>:<description>
<decls>
<@prealt()>
DebugEnterAlt(1);
<alts>
<@postalt()>
>>

/** A (..)+ block with 1 or more alternatives */
positiveClosureBlock(alts,decls,decision,enclosingBlockLevel,blockLevel,decisionNumber,maxK,maxAlt,description) ::= <<
// <fileName>:<description>
int cnt<decisionNumber>=0;
<decls>
<@preloop()>
try { DebugEnterSubRule(<decisionNumber>);
while (true)
{
int alt<decisionNumber>=<maxAlt>;
<@predecision()>
try { DebugEnterDecision(<decisionNumber>, false!<decision.dfa.hasSynPred!>);
<decision>
} finally { DebugExitDecision(<decisionNumber>); }
<@postdecision()>
switch (alt<decisionNumber>)
{
<alts:{a|altSwitchCase(i,a)}>
default:
if (cnt<decisionNumber> >= 1)
goto loop<decisionNumber>;

<ruleBacktrackFailure()>
EarlyExitException eee<decisionNumber> = new EarlyExitException( <decisionNumber>, input );
DebugRecognitionException(eee<decisionNumber>);
<@earlyExitException()>
throw eee<decisionNumber>;
}
cnt<decisionNumber>++;
}
loop<decisionNumber>:
;

} finally { DebugExitSubRule(<decisionNumber>); }
<@postloop()>
>>

```

```
positiveClosureBlockSingleAlt ::= positiveClosureBlock
```

```
/** A (..)* block with 1 or more alternatives */
```

```
closureBlock(alts,decls,decision,enclosingBlockLevel,blockLevel,decisionNumber,maxK,maxAlt,description) ::=
```

```
<<
```

```
// <fileName>:<description>
```

```
<decls>
```

```
<@preloop()>
```

```
try { DebugEnterSubRule(<decisionNumber>);
```

```
while (true)
```

```
{
```

```
int alt<decisionNumber>=<maxAlt>;
```

```
<@predecision()>
```

```
try { DebugEnterDecision(<decisionNumber>, false<!<decision.dfa.hasSynPred>!>);
```

```
<decision>
```

```
} finally { DebugExitDecision(<decisionNumber>); }
```

```
<@postdecision()>
```

```
switch ( alt<decisionNumber> )
```

```
{
```

```
<alts:{a|<altSwitchCase(i,a)>}>
```

```
default:
```

```
goto loop<decisionNumber>;
```

```
}
```

```
}
```

```
loop<decisionNumber>:
```

```
;
```

```
} finally { DebugExitSubRule(<decisionNumber>); }
```

```
<@postloop()>
```

```
>>
```

```
closureBlockSingleAlt ::= closureBlock
```

```
/** Optional blocks (x)? are translated to (x|) by before code generation
```

```
* so we can just use the normal block template
```

```
*/
```

```
optionalBlock ::= block
```

```
optionalBlockSingleAlt ::= block
```

```
/** A case in a switch that jumps to an alternative given the alternative
```

```
* number. A DFA predicts the alternative and then a simple switch
```

```
* does the jump to the code that actually matches that alternative.
```

```
*/
```

```
altSwitchCase(altNum,alt) ::= <<
```

```
case <altNum>:
```

```

<@prealt()>
DebugEnterAlt(<altNum>);
<alt>
break;<\n>
>>

/** An alternative is just a list of elements; at outermost level */
alt(elements,altNum,description,autoAST,outerAlt,treeLevel,rew) ::= <<
// <fileName>:<description>
{
<@declarations()>
<elements:element()>
<rew>
<@cleanup()>
}
>>

/** What to emit when there is no rewrite. For auto build
* mode, does nothing.
*/
noRewrite(rewriteBlockLevel, treeLevel) ::= ""

// E L E M E N T S

/** Dump the elements one per line */
element(it) ::= <%
<@prematch()>
DebugLocation(<it.line>, <it.pos>);<\n>
<it.el><\n>
%>

/** match a token optionally with a label in front */
tokenRef(token,label,elementIndex,terminalOptions={}) ::= <<
<if(label)><label>=<labelType><endif>Match(input,<token>,Follow._<token>_in_<ruleName><elementIndex>);
<checkRuleBacktrackFailure()>
>>

/** ids+=ID */
tokenRefAndListLabel(token,label,elementIndex,terminalOptions={}) ::= <<
<tokenRef(...)>
<listLabelElem(elem=label,elemType=labelType,...)>
>>

listLabel(label,elem) ::= <<
#error The listLabel template should not be used with this target.<\n>
>>

listLabelElem(label,elem,elemType) ::= <<

```

```

if (list_<label>==null) list_<label>=new List<<elemType; null={ <labelType>}>>();
list_<label>.Add(<elem>);<\n>
>>

/** match a character */
charRef(char,label) ::= <<
<if(label)>
<label> = input.LA(1);<\n>
<endif>
Match(<char>); <checkRuleBacktrackFailure()>
>>

/** match a character range */
charRangeRef(a,b,label) ::= <<
<if(label)>
<label> = input.LA(1);<\n>
<endif>
MatchRange(<a>,<b>); <checkRuleBacktrackFailure()>
>>

/** For now, sets are interval tests and must be tested inline */
matchSet(s,label,elementIndex,postmatchCode="",terminalOptions={}) ::= <<
<if(label)>
<matchSetLabel()>
<endif>
if (<s>)
{
input.Consume();
<postmatchCode>
<if(!LEXER)>state.errorRecovery=false;<endif><if(backtracking)>state.failed=false;<endif>
}
else
{
<ruleBacktrackFailure()>
MismatchedSetException mse = new MismatchedSetException(null,input);
DebugRecognitionException(mse);
<@mismatchedSetException()>
<if(LEXER)>
Recover(mse);
throw mse;
<else>
throw mse;
<! use following code to make it recover inline; remove throw mse;
recoverFromMismatchedSet(input,mse,Follow._set_in_<ruleName><elementIndex>);
!>
<endif>
}<\n>
>>

```

```

matchSetUnchecked(s,label,elementIndex,postmatchCode=false) ::= <%
<if(label)>
<matchSetLabel()><\n>
<endif>
input.Consume();<\n>
<if(postmatchCode)>
<postmatchCode><\n>
<endif>
<if(!LEXER)>state.errorRecovery=false;<endif><if(backtracking)>state.failed=false;<endif>
%>

matchSetLabel() ::= <%
<if(LEXER)>
<label>= input.LA(1);
<else>
<label>=(<labelType>)input.LT(1);
<endif>
%>

matchRuleBlockSet ::= matchSet

matchSetAndListLabel(s,label,elementIndex,postmatchCode) ::= <<
<matchSet(...)>
<listLabelElem(elem=label,elemType=labelType,...)>
>>

/** Match a string literal */
lexerStringRef(string,label,elementIndex) ::= <%
<if(label)>
int <label>Start = CharIndex;<\n>
Match(<string>); <checkRuleBacktrackFailure()><\n>
int <label>StartLine<elementIndex> = Line;<\n>
int <label>StartCharPos<elementIndex> = CharPositionInLine;<\n>
<label> = new <labelType>(input, TokenTypes.Invalid, TokenChannels.Default, <label>Start, CharIndex-1);<\n>
<label>.Line = <label>StartLine<elementIndex>;<\n>
<label>.CharPositionInLine = <label>StartCharPos<elementIndex>;
<else>
Match(<string>); <checkRuleBacktrackFailure()><\n>
<endif>
%>

wildcard(token,label,elementIndex,terminalOptions={ }) ::= <<
<if(label)>
<label>=(<labelType>)input.LT(1);<\n>
<endif>
MatchAny(input); <checkRuleBacktrackFailure()>
>>

```



```

wildcardAndListLabel(token,label,elementIndex,terminalOptions={}) ::= <<
<wildcard(...)>
<listLabelElem(elem=label,elemType=labelType,...)>
>>

/** Match . wildcard in lexer */
wildcardChar(label, elementIndex) ::= <<
<if(label)>
<label> = input.LA(1);<\n>
<endif>
MatchAny(); <checkRuleBacktrackFailure()>
>>

wildcardCharListLabel(label, elementIndex) ::= <<
<wildcardChar(...)>
<listLabelElem(elem=label,elemType=labelType,...)>
>>

/** Match a rule reference by invoking it possibly with arguments
 * and a return value or values. The 'rule' argument was the
 * target rule name, but now is type Rule, whose toString is
 * same: the rule name. Now though you can access full rule
 * descriptor stuff.
 */
ruleRef(rule,label,elementIndex,args,scope) ::= <<
PushFollow(Follow._<rule.name>_in_<ruleName><elementIndex>);
<if(label)><label>=<endif><if(scope)><scope.delegateName()>.<endif><rule.name; format="id">(<args;
separator=", ">);
PopFollow();
<checkRuleBacktrackFailure()>
>>

/** ids+=r */
ruleRefAndListLabel(rule,label,elementIndex,args,scope) ::= <<
<ruleRef(...)>
<listLabelElem(elem=label,elemType={<ASTLabelType>},...)>
>>

/** A lexer rule reference.
 *
 * The 'rule' argument was the target rule name, but now
 * is type Rule, whose toString is same: the rule name.
 * Now though you can access full rule descriptor stuff.
 */
lexerRuleRef(rule,label,args,elementIndex,scope) ::= <%
<if(label)>
int <label>Start<elementIndex> = CharIndex;<\n>

```

```

int <label>StartLine<elementIndex> = Line;<\n>
int <label>StartCharPos<elementIndex> = CharPositionInLine;<\n>
<if(scope)><scope:delegateName().<endif>m<rule.name>(<args; separator=", ">);
<checkRuleBacktrackFailure()><\n>
<label> = new <labelType>(input, TokenType.Invalid, TokenChannels.Default, <label>Start<elementIndex>,
CharIndex-1);<\n>
<label>.Line = <label>StartLine<elementIndex>;<\n>
<label>.CharPositionInLine = <label>StartCharPos<elementIndex>;
<else>
<if(scope)><scope:delegateName().<endif>m<rule.name>(<args; separator=", ">);
<checkRuleBacktrackFailure()>
<endif>
%>

/** i+=INT in lexer */
lexerRuleRefAndListLabel(rule,label,args,elementIndex,scope) ::= <<
<lexerRuleRef(...)>
<listLabelElem(elem=label,elemType=labelType,...)>
>>

/** EOF in the lexer */
lexerMatchEOF(label,elementIndex) ::= <%
<if(label)>
int <label>Start<elementIndex> = CharIndex;<\n>
int <label>StartLine<elementIndex> = Line;<\n>
int <label>StartCharPos<elementIndex> = CharPositionInLine;<\n>
Match(EOF); <checkRuleBacktrackFailure()><\n>
<labelType> <label> = new <labelType>(input, EOF, TokenChannels.Default, <label>Start<elementIndex>,
CharIndex-1);<\n>
<label>.Line = <label>StartLine<elementIndex>;<\n>
<label>.CharPositionInLine = <label>StartCharPos<elementIndex>;
<else>
Match(EOF); <checkRuleBacktrackFailure()>
<endif>
%>

// used for left-recursive rules
recRuleDefArg()          ::= "int <recRuleArg()>"
recRuleArg()            ::= "_p"
recRuleAltPredicate(ruleName,opPrec) ::= "<recRuleArg() \<= <opPrec>"
recRuleSetResultAction() ::= "root_0=$<ruleName>_primary.tree;"

/** match ^(root children) in tree parser */
tree(root, actionsAfterRoot, children, nullableChildList,
enclosingTreeLevel, treeLevel) ::= <<
<root:element()>
<actionsAfterRoot:element()>
<if(nullableChildList)>

```

```

if (input.LA(1) == TokenTypes.Down)
{
    Match(input, TokenTypes.Down, null); <checkRuleBacktrackFailure()>
    <children:element()>
    Match(input, TokenTypes.Up, null); <checkRuleBacktrackFailure()>
}
<else>
Match(input, TokenTypes.Down, null); <checkRuleBacktrackFailure()>
<children:element()>
Match(input, TokenTypes.Up, null); <checkRuleBacktrackFailure()>
<endif>
>>

/** Every predicate is used as a validating predicate (even when it is
 * also hoisted into a prediction expression).
 */
validateSemanticPredicate(pred,description) ::= <<
if (!(<evalPredicate(...)>))
{
    <ruleBacktrackFailure()>
    throw new FailedPredicateException(input, "<ruleName>", "<description>");
}
>>

// F i x e d D F A (if-then-else)

dfaState(k,edges,eotPredictsAlt,description,stateNumber,semPredState) ::= <<
int LA<decisionNumber>_<k> = input.LA(<k>);<n>
<edges; separator="\nelse ">
else
{
    <if(eotPredictsAlt)>
    alt<decisionNumber> = <eotPredictsAlt>;
    <else>
    <ruleBacktrackFailure()>
    NoViableAltException nvae = new NoViableAltException("<description>", <decisionNumber>, <stateNumber>,
input, <k>);
    DebugRecognitionException(nvae);
    <@noViableAltException()>
    throw nvae;
    <endif>
}
>>

/** Same as a normal DFA state except that we don't examine lookahead
 * for the bypass alternative. It delays error detection but this
 * is faster, smaller, and more what people expect. For (X)? people
 * expect "if ( LA(1)==X ) match(X);" and that's it.

```

```

*/
dfaOptionalBlockState(k,edges,eotPredictsAlt,description,stateNumber,semPredState) ::= <<
int LA<decisionNumber>_<k> = input.LA(<k>);<\n>
<edges; separator="\nelse ">
>>

```

```

/** A DFA state that is actually the loopback decision of a closure
* loop. If end-of-token (EOT) predicts any of the targets then it
* should act like a default clause (i.e., no error can be generated).
* This is used only in the lexer so that for ('a'* on the end of a rule
* anything other than 'a' predicts exiting.
*/

```

```

*/
dfaLoopbackState(k,edges,eotPredictsAlt,description,stateNumber,semPredState) ::= <<
int LA<decisionNumber>_<k> = input.LA(<k>);<\n>
<edges; separator="\nelse "><\n>
<if(eotPredictsAlt)>
<if(!edges)>
alt<decisionNumber> = <eotPredictsAlt>;<! if no edges, don't gen ELSE !>
<else>
else
{
alt<decisionNumber> = <eotPredictsAlt>;
}<\n>
<endif>
<endif>
>>

```

```

/** An accept state indicates a unique alternative has been predicted */
dfaAcceptState(alt) ::= "alt<decisionNumber> = <alt>;"

```

```

/** A simple edge with an expression. If the expression is satisfied,
* enter to the target state. To handle gated productions, we may
* have to evaluate some predicates for this edge.
*/

```

```

dfaEdge(labelExpr, targetState, predicates) ::= <<
if ((<labelExpr>)<if(predicates)> && (<predicates>)<endif>)
{
<targetState>
}
>>

```

```

// F i x e d D F A (switch case)

```

```

/** A DFA state where a SWITCH may be generated. The code generator
* decides if this is possible: CodeGenerator.canGenerateSwitch().
*/

```

```

dfaStateSwitch(k,edges,eotPredictsAlt,description,stateNumber,semPredState) ::= <<
switch (input.LA(<k>))

```

```

{
<edges; separator="\n">
default:
<if(eotPredictsAlt)>
alt<decisionNumber>=<eotPredictsAlt>;
break;<\n>
<else>
{
<ruleBacktrackFailure()>
NoViableAltException nvae = new NoViableAltException("<description>", <decisionNumber>, <stateNumber>,
input, <k>);
DebugRecognitionException(nvae);
<@noViableAltException()>
throw nvae;
}
<endif>
}<\n>
>>

```

```

dfaOptionalBlockStateSwitch(k,edges,eotPredictsAlt,description,stateNumber,semPredState) ::= <<
switch (input.LA(<k>))
{
<edges; separator="\n">
}<\n>
>>

```

```

dfaLoopbackStateSwitch(k, edges,eotPredictsAlt,description,stateNumber,semPredState) ::= <<
switch (input.LA(<k>))
{
<edges; separator="\n">
<if(eotPredictsAlt)>
default:
alt<decisionNumber>=<eotPredictsAlt>;
break;<\n>
<endif>
}<\n>
>>

```

```

dfaEdgeSwitch(labels, targetState) ::= <<
<labels: {it|case <it>:}; separator="\n">
{
<targetState>
}
break;
>>

```

```

// C y c l i c D F A

```

```

/** The code to initiate execution of a cyclic DFA; this is used
 * in the rule to predict an alt just like the fixed DFA case.
 * The <name> attribute is inherited via the parser, lexer, ...
 */
dfaDecision(decisionNumber,description) ::= <<
try
{
alt<decisionNumber> = dfa<decisionNumber>.Predict(input);
}
catch (NoViableAltException nvae)
{
DebugRecognitionException(nvae);
throw;
}
>>

/* Dump DFA tables as run-length-encoded Strings of octal values.
 * Can't use hex as compiler translates them before compilation.
 * These strings are split into multiple, concatenated strings.
 * Java puts them back together at compile time thankfully.
 * Java cannot handle large static arrays, so we're stuck with this
 * encode/decode approach. See analysis and runtime DFA for
 * the encoding methods.
 */
cyclicDFA(dfa) ::= <<
private class DFA<dfa.decisionNumber> : DFA
{
private const string DFA<dfa.decisionNumber>_eotS =
"<dfa.javaCompressedEOT; wrap="+\n\t\t"">";
private const string DFA<dfa.decisionNumber>_eofS =
"<dfa.javaCompressedEOF; wrap="+\n\t\t"">";
private const string DFA<dfa.decisionNumber>_minS =
"<dfa.javaCompressedMin; wrap="+\n\t\t"">";
private const string DFA<dfa.decisionNumber>_maxS =
"<dfa.javaCompressedMax; wrap="+\n\t\t"">";
private const string DFA<dfa.decisionNumber>_acceptS =
"<dfa.javaCompressedAccept; wrap="+\n\t\t"">";
private const string DFA<dfa.decisionNumber>_specialS =
"<dfa.javaCompressedSpecial; wrap="+\n\t\t"">}>";
private static readonly string[] DFA<dfa.decisionNumber>_transitionS =
{
<dfa.javaCompressedTransition:{s|"<s; wrap="+\n\t\t"">"; separator=",\n">
};

private static readonly short[] DFA<dfa.decisionNumber>_eot =
DFA.UnpackEncodedString(DFA<dfa.decisionNumber>_eotS);
private static readonly short[] DFA<dfa.decisionNumber>_eof =
DFA.UnpackEncodedString(DFA<dfa.decisionNumber>_eofS);

```

```

private static readonly char[] DFA<dfa.decisionNumber>_min =
DFA.UnpackEncodedStringToUnsignedChars(DFA<dfa.decisionNumber>_minS);
private static readonly char[] DFA<dfa.decisionNumber>_max =
DFA.UnpackEncodedStringToUnsignedChars(DFA<dfa.decisionNumber>_maxS);
private static readonly short[] DFA<dfa.decisionNumber>_accept =
DFA.UnpackEncodedString(DFA<dfa.decisionNumber>_acceptS);
private static readonly short[] DFA<dfa.decisionNumber>_special =
DFA.UnpackEncodedString(DFA<dfa.decisionNumber>_specialS);
private static readonly short[][] DFA<dfa.decisionNumber>_transition;

static DFA<dfa.decisionNumber>()
{
    int numStates = DFA<dfa.decisionNumber>_transitionS.Length;
    DFA<dfa.decisionNumber>_transition = new short[numStates][];
    for ( int i=0; i < numStates; i++ )
    {
        DFA<dfa.decisionNumber>_transition[i] =
DFA.UnpackEncodedString(DFA<dfa.decisionNumber>_transitionS[i]);
    }
}

public DFA<dfa.decisionNumber>( BaseRecognizer recognizer<if(dfa.specialStateSTs)>,
SpecialStateTransitionHandler specialStateTransition<endif> )
<if(dfa.specialStateSTs)>
    : base(specialStateTransition)
<endif>
{
    this.recognizer = recognizer;
    this.decisionNumber = <dfa.decisionNumber>;
    this.eot = DFA<dfa.decisionNumber>_eot;
    this.eof = DFA<dfa.decisionNumber>_eof;
    this.min = DFA<dfa.decisionNumber>_min;
    this.max = DFA<dfa.decisionNumber>_max;
    this.accept = DFA<dfa.decisionNumber>_accept;
    this.special = DFA<dfa.decisionNumber>_special;
    this.transition = DFA<dfa.decisionNumber>_transition;
}

public override string Description { get { return "<dfa.description>"; } }

public override void Error(NoViableAltException nvae)
{
    DebugRecognitionException(nvae);
}
}<\n>
<if(dfa.specialStateSTs)>
private int SpecialStateTransition<dfa.decisionNumber>(DFA dfa, int s, IIntStream _input)<! throws
NoViableAltException!>

```

```

{
<if(LEXER)>
  IIntStream input = _input;
<endif>
<if(PARSER)>
  ITokenStream input = (ITokenStream)_input;
<endif>
<if(TREE_PARSER)>
  ITreeNodeStream input = (ITreeNodeStream)_input;
<endif>
  int _s = s;
  s = -1;
  <! pull these outside the switch cases to save space on locals !>
  int LA<dfa.decisionNumber>_1 = input.LA(1);
  int index<dfa.decisionNumber>_1 = input.Index;
  switch (_s)
  {
  <dfa.specialStateSTs: {state |case <i0>:<! compressed special state numbers 0..n-1 !>
  <state>}; separator="\n">

  default:
    break;
  }

  if (s >= 0)
    return s;

  <if(backtracking)>
  if (state.backtracking > 0) {state.failed=true; return -1;}
  <endif>
  NoViableAltException nvae = new NoViableAltException(dfa.Description, <dfa.decisionNumber>, _s, input);
  dfa.Error(nvae);
  throw nvae;
  }
  <endif>
  >>

  /** A state in a cyclic DFA; it's a special state and part of a big switch on
  * state.
  */
  cyclicDFAState(decisionNumber,stateNumber,edges,needErrorClause,semPredState) ::= <<
  {
  <if(semPredState)>
  <! get next lookahead symbol to test edges, then rewind !>
  input.Rewind();
  <endif>
  <edges; separator="\nelse ">
  <if(semPredState)>

```



```

<! return input cursor to state before we rewound !>
input.Seek(index<decisionNumber>_1);
<endif>
break;
}
>>

/** Just like a fixed DFA edge, test the lookahead and indicate what
 * state to jump to next if successful.
 */
cyclicDFAEdge(labelExpr, targetStateNumber, edgeNumber, predicates) ::= <<
if ((<labelExpr><if(predicates)> && (<predicates><endif>) {s = <targetStateNumber>;}<\n>
>>

/** An edge pointing at end-of-token; essentially matches any char;
 * always jump to the target.
 */
eotDFAEdge(targetStateNumber,edgeNumber, predicates) ::= <<
s = <targetStateNumber>;<\n>
>>

// D F A E X P R E S S I O N S

andPredicates(left,right) ::= "(<left>&&<right>)"

orPredicates(operands) ::= "(<operands; separator=\\|\\>)"

notPredicate(pred) ::= "!(<evalPredicate(...)>)"

evalPredicate(pred,description) ::= "(<pred>)"

evalSynPredicate(pred,description) ::= "EvaluatePredicate(<pred>_fragment)"

lookaheadTest(atom,k,atomAsInt) ::= "LA<decisionNumber>_<k>===<atom>"

/** Sometimes a lookahead test cannot assume that LA(k) is in a temp variable
 * somewhere. Must ask for the lookahead directly.
 */
isolatedLookaheadTest(atom,k,atomAsInt) ::= "input.LA(<k>)==<atom>"

lookaheadRangeTest(lower,upper,k,rangeNumber,lowerAsInt,upperAsInt) ::= <%
(LA<decisionNumber>_<k><ge()><lower> && LA<decisionNumber>_<k><le()><upper>)
%>

isolatedLookaheadRangeTest(lower,upper,k,rangeNumber,lowerAsInt,upperAsInt) ::=
"(input.LA(<k><ge()><lower> && input.LA(<k><le()><upper>))"

```

```
le() ::= "\<="
```

```
ge() ::= ">="
```

```
setTest(ranges) ::= <<  
<ranges; separator="||">  
>>
```

```
// A T T R I B U T E S
```

```
attributeScope(scope) ::= <<
```

```
<if(scope)>
```

```
<if(scope.attributes)>
```

```
protected sealed partial class <scope.name>_scope
```

```
{
```

```
<scope.attributes:{it|public <it.decl>;}; separator="\n">
```

```
public <scope.name>_scope(<grammar.recognizerName> grammar) { OnCreated(grammar); }
```

```
partial void OnCreated(<grammar.recognizerName> grammar);
```

```
}
```

```
<if(scope.actions.scopeinit)>
```

```
protected void <scope.name>_scopeInit( <scope.name>_scope scope )
```

```
{
```

```
<scope.actions.scopeinit>
```

```
}
```

```
<else>
```

```
partial void <scope.name>_scopeInit( <scope.name>_scope scope );
```

```
<endif>
```

```
<if(scope.actions.scopeafter)>
```

```
protected void <scope.name>_scopeAfter( <scope.name>_scope scope )
```

```
{
```

```
<scope.actions.scopeafter>
```

```
}
```

```
<else>
```

```
partial void <scope.name>_scopeAfter( <scope.name>_scope scope );
```

```
<endif>
```

```
protected readonly ListStack<<scope.name>_scope> <scope.name>_stack = new
```

```
ListStack<<scope.name>_scope>();
```

```
<endif>
```

```
<endif>
```

```
>>
```

```
globalAttributeScope(scope) ::= <<
```

```
<attributeScope(...)>
```

```
>>
```

```
ruleAttributeScope(scope) ::= <<
```

```
<attributeScope(...)>
```

```
>>
```

```

returnStructName(it) ::= "<it.name>_return"

returnType(ruleDescriptor) ::= <%
<if(ruleDescriptor.returnScope.attributes && ruleDescriptor.hasMultipleReturnValues)>
  <ruleDescriptor.grammar.recognizerName>.<ruleDescriptor:returnStructName()>
<elseif(ruleDescriptor.hasMultipleReturnValues)>
  <ruleReturnBaseType()>
<elseif(ruleDescriptor.hasSingleReturnValue)>
  <ruleDescriptor.singleValueReturnType>
<else>
  void
<endif>
%>

/** Generate the C# type associated with a single or multiple return
 * values.
 */
ruleLabelType(referencedRule) ::= <%
<if(referencedRule.hasMultipleReturnValues)>
  <ruleReturnBaseType()>
<elseif(referencedRule.hasSingleReturnValue)>
  <referencedRule.singleValueReturnType>
<else>
  void
<endif>
%>

delegateName(it) ::= <<
<if(it.label)><it.label><else>g<it.name><endif>
>>

/** Using a type to init value map, try to init a type; if not in table
 * must be an object, default value is "null".
 */
initValue(typeName) ::= <<
default(<typeName>)
>>

/** Define a rule label including default value */
ruleLabelDef(label) ::= <%
<ruleLabelType(label.referencedRule)> <label.label.text> = <initValue(ruleLabelType(label.referencedRule))>;
%>

/** Define a return struct for a rule if the code needs to access its
 * start/stop tokens, tree stuff, attributes, ... Leave a hole for
 * subgroups to stick in members.
 */

```

```

returnScope(scope) ::= <<
<if(scope.attributes && ruleDescriptor.hasMultipleReturnValues)>
<returnScopeModifier(grammar=grammar,ruleDescriptor=ruleDescriptor)> sealed partial class
<ruleDescriptor:returnStructName(): <ruleReturnBaseType()><@ruleReturnInterfaces()>
{
<scope.attributes:{it|public <it.decl>;}; separator="\n">
<@ruleReturnMembers()>
}
<endif>
>>

ruleReturnBaseType() ::= <%
<if(TREE_PARSER)>Tree<else>Parser<endif>RuleReturnScope\<<labelType>>
%>

@returnScope.ruleReturnMembers() ::= <<
public <ruleDescriptor:returnStructName()>(grammar) { OnCreated(grammar); }
partial void OnCreated(<grammar.recognizerName> grammar);
>>

parameterScope(scope) ::= <<
<scope.attributes:{it|<it.decl>;}; separator=", ">
>>

parameterAttributeRef(attr) ::= <<
<attr.name; format="id">
>>

parameterSetAttributeRef(attr,expr) ::= <<
<attr.name; format="id"> =<expr>;
>>

scopeAttributeRef(scope,attr,index,negIndex) ::= <%
<if(negIndex)>
<scope>_stack[<scope>_stack.Count - <negIndex> - 1].<attr.name; format="id">
<else>
<if(index)>
<scope>_stack[<index>].<attr.name; format="id">
<else>
<scope>_stack.Peek().<attr.name; format="id">
<endif>
<endif>
%>

scopeSetAttributeRef(scope,attr,expr,index,negIndex) ::= <%
<if(negIndex)>
<scope>_stack[<scope>_stack.Count - <negIndex> - 1].<attr.name; format="id"> = <expr>;
<else>

```

```

<if(index)>
<scope>_stack[<index>].<attr.name; format="id"> = <expr>;
<else>
<scope>_stack.Peek().<attr.name; format="id"> = <expr>;
<endif>
<endif>
%>

/** $x is either global scope or x is rule with dynamic scope; refers
 * to stack itself not top of stack. This is useful for predicates
 * like {$function.Count>0 && $function::name.Equals("foo")}?
 */
isolatedDynamicScopeRef(scope) ::= "<scope>_stack"

/** reference an attribute of rule; might only have single return value */
ruleLabelRef(referencedRule,scope,attr) ::= <%
<if(referencedRule.hasMultipleReturnValues)>
(<scope>!=null?(<<return Type(referencedRule)>><scope>).<attr.name; format="id">:<initValue(attr.type)>)
<else>
<scope>
<endif>
%>

returnAttributeRef(ruleDescriptor,attr) ::= <%
<if(ruleDescriptor.hasMultipleReturnValues)>
retval.<attr.name; format="id">
<else>
<attr.name; format="id">
<endif>
%>

returnSetAttributeRef(ruleDescriptor,attr,expr) ::= <%
<if(ruleDescriptor.hasMultipleReturnValues)>
retval.<attr.name; format="id"> =<expr>;
<else>
<attr.name; format="id"> =<expr>;
<endif>
%>

/** How to translate $tokenLabel */
tokenLabelRef(label) ::= "<label>"

/** ids+=ID {$ids} or e+=expr {$e} */
listLabelRef(label) ::= "list_<label>"

// not sure the next are the right approach

```

```

tokenLabelPropertyRef_text(scope,attr) ::= "<scope>!=null?<scope>.Text:default(string)"
tokenLabelPropertyRef_type(scope,attr) ::= "<scope>!=null?<scope>.Type:0)"
tokenLabelPropertyRef_line(scope,attr) ::= "<scope>!=null?<scope>.Line:0)"
tokenLabelPropertyRef_pos(scope,attr) ::= "<scope>!=null?<scope>.CharPositionInLine:0)"
tokenLabelPropertyRef_channel(scope,attr) ::= "<scope>!=null?<scope>.Channel:0)"
tokenLabelPropertyRef_index(scope,attr) ::= "<scope>!=null?<scope>.TokenIndex:0)"
tokenLabelPropertyRef_tree(scope,attr) ::= "<scope>_tree"
tokenLabelPropertyRef_int(scope,attr) ::= "<scope>!=null?int.Parse(<scope>.Text):0)"

ruleLabelPropertyRef_start(scope,attr) ::= "<scope>!=null?((<labelType>)<scope>.Start):default(<labelType>)"
ruleLabelPropertyRef_stop(scope,attr) ::= "<scope>!=null?((<labelType>)<scope>.Stop):default(<labelType>)"
ruleLabelPropertyRef_tree(scope,attr) ::=
"<scope>!=null?((<ASTLabelType>)<scope>.Tree):default(<ASTLabelType>)"
ruleLabelPropertyRef_text(scope,attr) ::= <%
<if(TREE_PARSER)>
(<scope>!=null?(input.TokenStream.ToString(
input.TreeAdaptor.GetTokenStartIndex(<scope>.Start),
input.TreeAdaptor.GetTokenStopIndex(<scope>.Start))):default(string)
<else>
(<scope>!=null?input.ToString(<scope>.Start,<scope>.Stop):default(string))
<endif>
%>

ruleLabelPropertyRef_st(scope,attr) ::= "<scope>!=null?<scope>.Template:null)"

/** Isolated $RULE ref ok in lexer as it's a Token */
lexerRuleLabel(label) ::= "<label>"

lexerRuleLabelPropertyRef_type(scope,attr) ::=
"<scope>!=null?<scope>.Type:0)"

lexerRuleLabelPropertyRef_line(scope,attr) ::=
"<scope>!=null?<scope>.Line:0)"

lexerRuleLabelPropertyRef_pos(scope,attr) ::=
"<scope>!=null?<scope>.CharPositionInLine:-1)"

lexerRuleLabelPropertyRef_channel(scope,attr) ::=
"<scope>!=null?<scope>.Channel:0)"

lexerRuleLabelPropertyRef_index(scope,attr) ::=
"<scope>!=null?<scope>.TokenIndex:0)"

lexerRuleLabelPropertyRef_text(scope,attr) ::=
"<scope>!=null?<scope>.Text:default(string)"

lexerRuleLabelPropertyRef_int(scope,attr) ::=
"<scope>!=null?int.Parse(<scope>.Text):0)"

```

```

// Somebody may ref $template or $tree or $stop within a rule:
rulePropertyRef_start(scope,attr) ::= "retval.Start"
rulePropertyRef_stop(scope,attr) ::= "retval.Stop"
rulePropertyRef_tree(scope,attr) ::= "retval.Tree"
rulePropertyRef_text(scope,attr) ::= <%
<if(TREE_PARSER)>
input.TokenStream.ToString(
  input.TreeAdaptor.GetTokenStartIndex(retval.Start),
  input.TreeAdaptor.GetTokenStopIndex(retval.Start))
<else>
input.ToString(retval.Start,input.LT(-1))
<endif>
%>
rulePropertyRef_st(scope,attr) ::= "retval.Template"

lexerRulePropertyRef_text(scope,attr) ::= "Text"
lexerRulePropertyRef_type(scope,attr) ::= "_type"
lexerRulePropertyRef_line(scope,attr) ::= "state.tokenStartLine"
lexerRulePropertyRef_pos(scope,attr) ::= "state.tokenStartCharPositionInLine"
lexerRulePropertyRef_index(scope,attr) ::= "-1" // undefined token index in lexer
lexerRulePropertyRef_channel(scope,attr) ::= "_channel"
lexerRulePropertyRef_start(scope,attr) ::= "state.tokenStartCharIndex"
lexerRulePropertyRef_stop(scope,attr) ::= "(CharIndex-1)"
lexerRulePropertyRef_int(scope,attr) ::= "int.Parse(<scope>.Text)"

// setting $st and $tree is allowed in local rule. everything else
// is flagged as error
ruleSetPropertyRef_tree(scope,attr,expr) ::= "retval.Tree = <expr>;"
ruleSetPropertyRef_st(scope,attr,expr) ::= "retval.Template =<expr>;"

/** How to execute an action (only when not backtracking) */
execAction(action) ::= <%
<if(backtracking)>
if (<actions.(actionScope).synpredgate><\n>
{<\n>
<@indentedAction()><\n>
}
<else>
<action>
<endif>
%>

@execAction.indentedAction() ::= <<
<action>
>>

/** How to always execute an action even when backtracking */

```

```

execForcedAction(action) ::= "<action>"

// M I S C (properties, etc...)

bitset(name, words64) ::= <<
public static readonly BitSet <name> = new BitSet(new ulong[] { <words64: {it|<it>UL}; separator=", "> });
>>

codeFileExtension() ::= ".cs"

true_value() ::= "true"
false_value() ::= "false"

Found in path(s):
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-
jar/org/antlr/codegen/templates/CSharp3/CSharp3.stg
No license file was found, but licenses were detected in source scan.

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THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.
*/

/** Templates for building ASTs during normal parsing.
*

```


- * Deal with many combinations. Dimensions are:
- * Auto build or rewrite
- * no label, label, list label (label/no-label handled together)
- * child, root
- * token, set, rule, wildcard
- *
- * The situation is not too bad as rewrite (->) usage makes ^ and !
- * invalid. There is no huge explosion of combinations.
- */

```
finishedBacktracking(block) ::= <<
<if(!ruleDescriptor.isSynPred)>
<if(backtracking)>
if <actions.(actionScope).synpredgate>:
  <block>
<else>
<block>
<endif>
<endif>
>>
```

```
@ruleBody.setErrorReturnValue() ::= <<
retval.tree = self._adaptor.errorNode(self.input, retval.start, self.input.LT(-1), re)
>>
```

```
// TOKEN AST STUFF
```

```
/** ID and output=AST */
tokenRef(token,label,elementIndex,terminalOptions={}) ::= <<
<super.tokenRef(...)>
<finishedBacktracking({
<label>_tree = <createNodeFromToken(...)>
self._adaptor.addChild(root_0, <label>_tree)
})>
>>
```

```
/** ID! and output=AST (same as plain tokenRef) */
tokenRefBang(token,label,elementIndex,terminalOptions={}) ::= "<super.tokenRef(...)>"
```

```
/** ID^ and output=AST */
tokenRefRuleRoot(token,label,elementIndex,terminalOptions={}) ::= <<
<super.tokenRef(...)>
<finishedBacktracking({
<label>_tree = <createNodeFromToken(...)>
root_0 = self._adaptor.becomeRoot(<label>_tree, root_0)
})>
>>
```

```

/** ids+=ID! and output=AST */
tokenRefBangAndListLabel(token,label,elementIndex,terminalOptions={}) ::= <<
<tokenRefBang(...)>
<listLabel(elem=label,...)>
>>

/** label+=TOKEN when output=AST but not rewrite alt */
tokenRefAndListLabel(token,label,elementIndex,terminalOptions={}) ::= <<
<tokenRef(...)>
<listLabel(elem=label,...)>
>>

/** Match label+=TOKEN^ when output=AST but not rewrite alt */
tokenRefRuleRootAndListLabel(token,label,elementIndex,terminalOptions={}) ::= <<
<tokenRefRuleRoot(...)>
<listLabel(elem=label,...)>
>>

// SET AST

// the match set stuff is interesting in that it uses an argument list
// to pass code to the default matchSet; another possible way to alter
// inherited code. I don't use the region stuff because I need to pass
// different chunks depending on the operator. I don't like making
// the template name have the operator as the number of templates gets
// large but this is the most flexible--this is as opposed to having
// the code generator call matchSet then add root code or ruleroot code
// plus list label plus ... The combinations might require complicated
// rather than just added on code. Investigate that refactoring when
// I have more time.

matchSet(s,label,elementIndex,postmatchCode,terminalOptions={}) ::= <%
<super.matchSet(postmatchCode={ <finishedBacktracking({self._adaptor.addChild(root_0,
<createNodeFromToken(...)>})>}, ...)>
%>

matchRuleBlockSet(s,label,elementIndex,postmatchCode,treeLevel="0",terminalOptions={}) ::= <<
<matchSet(...)>
>>

matchSetBang(s,label,elementIndex,postmatchCode,terminalOptions={}) ::= "<super.matchSet(...)>"

// note there is no matchSetTrack because -> rewrites force sets to be
// plain old blocks of alts: (A|B|...|C)

matchSetRuleRoot(s,label,elementIndex,debug,terminalOptions={}) ::= <<
<if(label)>
<label> = self.input.LT(1)<n>

```

```

<endif>
<super.matchSet(postmatchCode={ <finishedBacktracking({root_0 =
self._adaptor.becomeRoot(<createNodeFromToken(...)>, root_0)})>, ...}>
>>

// RULE REF AST

/** rule when output=AST */
ruleRef(rule,label,elementIndex,args,scope) ::= <<
<super.ruleRef(...)>
<finishedBacktracking({self._adaptor.addChild(root_0, <label>.tree})>}>
>>

/** rule! is same as normal rule ref */
ruleRefBang(rule,label,elementIndex,args,scope) ::= "<super.ruleRef(...)>"

/** rule^ */
ruleRefRuleRoot(rule,label,elementIndex,args,scope) ::= <<
<super.ruleRef(...)>
<finishedBacktracking({root_0 = self._adaptor.becomeRoot(<label>.tree, root_0)})>
>>

/** x+=rule when output=AST */
ruleRefAndListLabel(rule,label,elementIndex,args,scope) ::= <<
<ruleRef(...)>
<listLabel(label, {<label>.tree})>
>>

/** x+=rule! when output=AST is a rule ref with list addition */
ruleRefBangAndListLabel(rule,label,elementIndex,args,scope) ::= <<
<ruleRefBang(...)>
<listLabel(label, {<label>.tree})>
>>

/** x+=rule^ */
ruleRefRuleRootAndListLabel(rule,label,elementIndex,args,scope) ::= <<
<ruleRefRuleRoot(...)>
<listLabel(label, {<label>.tree})>
>>

// WILDCARD AST

wildcard(token,label,elementIndex,terminalOptions={ }) ::= <<
<super.wildcard(...)>
<finishedBacktracking({
<label>_tree = self._adaptor.createWithPayload(<label>)
self._adaptor.addChild(root_0, <label>_tree)
})>

```

>>

```
wildcardBang(label,elementIndex) ::= "<super.wildcard(...)>"
```

```
wildcardRuleRoot(token,label,elementIndex,terminalOptions={ }) ::= <<  
<super.wildcard(...)>  
<finishedBacktracking({  
<label>_tree = self._adaptor.createWithPayload(<label>  
root_0 = self._adaptor.becomeRoot(<label>_tree, root_0)  
})>  
>>
```

```
createNodeFromToken(label,terminalOptions={ }) ::= <%  
<if(terminalOptions.node)>  
<terminalOptions.node>(<label>) <! new MethodNode(IDLabel) !>  
<else>  
self._adaptor.createWithPayload(<label>  
<endif>  
>
```

```
ruleCleanUp() ::= <<  
<super.ruleCleanUp()>  
<finishedBacktracking({  
retval.tree = self._adaptor.rulePostProcessing(root_0)  
self._adaptor.setTokenBoundaries(retval.tree, retval.start, retval.stop)  
})>  
>>
```

Found in path(s):

```
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-  
jar/org/antlr/codegen/templates/Python3/ASTParser.stg  
No license file was found, but licenses were detected in source scan.
```

/*

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*/

/** Template overrides to add debugging to AST stuff. Dynamic inheritance

* hierarchy is set up as ASTDbg : AST : Dbg : Java by code generator.

*/

```
parserMembers() ::= <<
protected DebugTreeAdaptor adaptor =
    new DebugTreeAdaptor(null,new CommonTreeAdaptor());
public void setTreeAdaptor(TreeAdaptor adaptor) {
    this.adaptor = new DebugTreeAdaptor(dbg,adaptor);
}
public TreeAdaptor getTreeAdaptor() {
    return adaptor;
}<\n>
>>
```

```
parserCtorBody() ::= <<
>>
```

```
createListenerAndHandshake() ::= <<
<super.createListenerAndHandshake(>
>>
```

```
ctorForPredefinedListener() ::= <<
>>
```

```
@rewriteElement.pregen() ::= ""
```

Found in path(s):

* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/codegen/templates/C/ASTDbg.stg

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/*

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*/

Found in path(s):

* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/codegen/templates/ObjC/Dbg.stg

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*/

/*

- * Template group file for the Objective C code generator.
- * Heavily based on Java.stg
- *
- * Written by Kay Roepke <kroepke(at)classdump.org>
- * Modified by Alan Condit <acondit(at)ipns.com>
- *
- * This file is part of ANTLR and subject to the same license as ANTLR itself.

*/

objcTypeInitMap ::= [

```
"int"      : "0",      // Integers  start out being 0
"long"     : "0",      // Longs    start out being 0
"float"    : "0.0",    // Floats   start out being 0
"double"   : "0.0",    // Doubles  start out being 0
"BOOL"     : "NO",     // Booleans start out being Antlr ObjC for false
"byte"     : "0",      // Bytes    start out being 0
"short"    : "0",      // Shorts   start out being 0
"char"     : "0",      // Chars    start out being 0
"id"       : "nil",    // ids      start out being nil
default    : "nil"     // anything other than an atomic type
```

]

// System.Boolean.ToString() returns "True" and "False", but the proper C# literals are "true" and "false"

// The Java version of Boolean returns "true" and "false", so they map to themselves here.

booleanLiteral ::= [

```
"True": "true",
"False": "false",
"true": "YES",
"false": "NO",
default: "NO"
```

]

className() ::= "<name><!<if(LEXER)>Lexer<else><if(TREE_PARSER)>Tree<endif>Parser<endif>!>"

leadIn(type) ::=

<<

```

/** \file
 * This <type> file was generated by $ANTLR version <ANTLRVersion>
 *
 * - From the grammar source file : <fileName>
 * - On : <generatedTimestamp>
<if(LEXER)>
 * - for the lexer : <name>Lexer
<endif>
<if(PARSER)>
 * - for the parser : <name>Parser
<endif>
<if(TREE_PARSER)>
 * - for the tree parser : <name>TreeParser
<endif>
 *
 * Editing it, at least manually, is not wise.
 *
 * ObjC language generator and runtime by Alan Condit, acondit|hereisanat|ipns|dotgoeshere|com.
 *
 *
 >>

/** The overall file structure of a recognizer; stores methods for rules
 * and cyclic DFAs plus support code.
 */
outputFile( LEXER,
            PARSER,
            TREE_PARSER,
            actionScope,
            actions,
            docComment,
            recognizer,
            name,
            tokens,
            tokenNames,
            rules,
            cyclicDFAs,
            bitsets,
            buildTemplate,
            buildAST,
            rewriteMode,
            profile,
            backtracking,
            synpreds,
            memoize,
            numRules,
            fileName,
            ANTLRVersion,

```



```

        generatedTimestamp,
        trace,
        scopes,
        superClass,
        literals
    ) ::=
<<
<leadIn("OBJC source")>
*/
// $ANTLR <ANTLRVersion> <fileName> <generatedTimestamp>

<! <if(actions.(actionScope).header)>
/* =====
* This is what the grammar programmer asked us to put at the top of every file.
*/
<actions.(actionScope).header>
/* End of Header action.
* =====
*/
<endif> !>

/* -----
* Include the ANTLR3 generated header file.
*/
#import "<name><!<if(LEXER)>Lexer<else><if(TREE_PARSER)>Tree<endif>Parser<endif>!>.h"
<actions.(actionScope).postinclude>
/* ----- */

<docComment>

<if(literals)>
/** String literals used by <name> that we must do things like MATCHS() with.
* C will normally just lay down 8 bit characters, and you can use L"xxx" to
* get wchar_t, but wchar_t is 16 bits on Windows, which is not UTF32 and so
* we perform this little trick of defining the literals as arrays of UINT32
* and passing in the address of these.
*/
<literals:{it | static ANTLR3_UCHAR lit_<i>[] = <it>;}; separator="\n">

<endif>

/* ===== */
/* ===== */
* Start of recognizer
*/
<recognizer>
>>
headerFileExtension() ::= ".h"

```

```

headerFile( LEXER,
    PARSEr,
    TREE_PARSER,
    actionScope,
    actions,
    docComment,
    recognizer,
    name,
    tokens,
    tokenNames,
    rules,
    cyclicDFAs,
    bitsets,
    buildTemplate,
    buildAST,
    rewriteMode,
    profile,
    backtracking,
    synpreds,
    memoize,
    numRules,
    fileName,
    ANTLRVersion,
    generatedTimestamp,
    trace,
    scopes,
    superClass,
    literals
) ::=

<<
// $ANTLR <ANTLRVersion> <fileName> <generatedTimestamp>

<@imports>
<actions.(actionScope).preincludes>
/* =====
* Standard antlr OBJC runtime definitions
*/
#import \<Cocoa/Cocoa.h>
#import \<ANTLR/ANTLR.h>
/* End of standard antlr3 runtime definitions
* =====
*/
<actions.(actionScope).includes>
<@end>

<if(LEXER)>
<lexerHeaderFile(...)>

```

```

<endif>
<if(PARSER)>
<parserHeaderFile(...)>
<endif>
<if(TREE_PARSER)>
<treeParserHeaderFile(...)>
<endif>
<docComment>
>>

```

```

lexerHeaderFile( LEXER,
    PARSER,
    TREE_PARSER,
    actionScope,
    actions,
    docComment,
    recognizer,
    name,
    tokens,
    tokenNames,
    rules,
    cyclicDFAs,
    bitsets,
    buildTemplate,
    profile,
    backtracking,
    synpreds,
    memoize,
    numRules,
    fileName,
    ANTLRVersion,
    generatedTimestamp,
    trace,
    scopes,
    superClass="Lexer"
) ::=

```

```
<<
```

```
<if(actions.(actionScope).header)>
```

```
/* =====
```

```
* This is what the grammar programmer asked us to put at the top of every file.
```

```
*/
```

```
<actions.(actionScope).header>
```

```
/* End of Header action.
```

```
* =====
```

```
*/
```

```
<endif>
```

```

/* Start cyclicDFAInterface */
<cyclicDFAs:cyclicDFAInterface(>

#pragma mark Rule return scopes Interface start
<rules:{rule |
<rule.ruleDescriptor:{ruleDescriptor | <returnScopeInterface(scope=ruleDescriptor.returnScope)>>>>
#pragma mark Rule return scopes Interface end
#pragma mark Tokens
#ifndef TOKENLISTAlreadyDefined
#define TOKENLISTAlreadyDefined 1
#ifdef EOF
#undef EOF
#endif
<tokens:{it | #define <it.name> <it.type>}; separator="\n">
#endif
/* interface lexer class */
@interface <className()> <@superClassName>: <superClass><@end> { // line 283
<cyclicDFAs:{dfa | DFA<dfa.decisionNumber> *dfa<dfa.decisionNumber>;}; separator="\n">
<synpreds:{pred | SEL <pred>Selector;}; separator="\n">
/* ObjC start of actions.lexer.memVars */
<actions.lexer.memVars>
/* ObjC end of actions.lexer.memVars */
}
+ (void) initialize;
+ (<className()> *)new<className()>WithCharStream:(id<CharStream>)anInput;
/* ObjC start actions.lexer.methodsDecl */
<actions.lexer.methodsDecl>
/* ObjC end actions.lexer.methodsDecl */
<rules:{rule |
- (<rule.ruleDescriptor:{ruleDescriptor|<returnType()>>>)
<if(!rule.ruleDescriptor.isSynPred)>m<rule.ruleName><else><rule.ruleName>_fragment<endif>
<if(rule.ruleDescriptor.parameterScope)><rule.ruleDescriptor.parameterScope:parameterScope()><endif>; };
separator="\n"><\n>
@end /* end of <className()> interface */<\n>
>>

headerReturnScope(ruleDescriptor) ::= "<returnScopeInterface(...)>"
headerReturnType(ruleDescriptor) ::= <<
<if(LEXER)>
<if(!r.ruleDescriptor.isSynPred)>
void
<else>
<ruleDescriptor:returnType()>
<endif>
<else>
<ruleDescriptor:returnType()>
<endif>
>>

```

```

// Produce the lexer output
lexer( grammar,
    name,
    tokens,
    scopes,
    rules,
    numRules,
    filterMode,
    labelType="CommonToken",
    superClass="Lexer"
) ::= <<
<cyclicDFAs:cyclicDFA(>

/** As per Terence: No returns for lexer rules! */
<!
#pragma mark Rule return scopes start
<rules:{rule | <rule.ruleDescriptor:{ruleDescriptor |
<returnScopeImplementation(scope=ruleDescriptor.returnScope)>>
}>
#pragma mark Rule return scopes end
!>
@implementation <grammar.recognizerName> // line 330

+ (void) initialize
{
    [BaseRecognizer setGrammarFileName:@"<fileName>"];
}

+ (NSString *) tokenNameForType:(NSInteger)aTokenType
{
    return [[self getTokenNames] objectAtIndex:aTokenType];
}

+ (<grammar.recognizerName> *)new<grammar.recognizerName>WithCharStream:(id<CharStream>)anInput
{
    return [[<grammar.recognizerName> alloc] initWithCharStream:anInput];
}

- (id) initWithCharStream:(id<CharStream>)anInput
{
    self = [super initWithCharStream:anInput state:[RecognizerSharedState
newRecognizerSharedStateWithRuleLen:<numRules>+1]];
    if ( self != nil ) {
<if(memoize)>
        if ( state.ruleMemo == nil ) {
            state.ruleMemo = [[RuleStack newRuleStackWithSize:<numRules>+1] retain];
        }
        if ( [state.ruleMemo count] == 0 ) {

```

```

        // initialize the memoization cache - the indices are 1-based in the runtime code!
        <! [state.ruleMemo addObject:[NSNull null]]; /* dummy entry to ensure 1-basedness. */ !>
        for (NSInteger i = 0; i \< <numRules>; i++) {
            [state.ruleMemo addObject:[HashRule newHashRuleWithLen:17]];
        }
    }
<endif>
    <synpreds:{ pred | <lexerSynpred(name=pred)>};separator="\n">
    <cyclicDFAs:{ dfa | dfa<dfa.decisionNumber> = [DFA<dfa.decisionNumber>
newDFA<dfa.decisionNumber>WithRecognizer:self];}; separator="\n">
    <actions.lexer.init>
    }
    return self;
}

- (void) dealloc
{
    <cyclicDFAs:{ dfa | [dfa<dfa.decisionNumber> release];}; separator="\n">
<actions.lexer.dealloc>
    [super dealloc];
}

/* ObjC Start of actions.lexer.methods */
<actions.lexer.methods>
/* ObjC end of actions.lexer.methods */
/* ObjC start methods() */
<@methods()>
/* ObjC end methods() */

<if(actions.lexer.reset)>
- (void) reset
{
    <actions.lexer.reset>
    [super reset];
}
<endif>

<if(filterMode)>
<filteringNextToken()>
<endif>
/* Start of Rules */
<rules; separator="\n">

@end /* end of <grammar.recognizerName> implementation line 397 */
>>

/** A override of Lexer.nextToken() that backtracks over mTokens() looking
 * for matches. No error can be generated upon error; just rewind, consume

```

```

* a token and then try again. backtracking needs to be set as well.
* Make rule memoization happen only at levels above 1 as we start mTokens
* at backtracking==1.
*/
filteringNextToken() ::= <<
- (id\<Token>) nextToken
{
  while (YES) {
    if ( [input LA:1] == CharStreamEOF ) {
      return [<labelType> eofToken];
    }
    state.token = nil;
    state.channel = TokenChannelDefault;
    state.tokenStartCharIndex = input.index;
    state.tokenStartCharPositionInLine = input.charPositionInLine;
    state.tokenStartLine = input.line;
    state.text = nil;
    @try {
      NSInteger m = [input mark];
      state.backtracking = 1; /* means we won't throw slow exception */
      state.failed = NO;
      [self mTokens];
      state.backtracking = 0;
      /* mTokens backtracks with synpred at backtracking==2
      and we set the synpredgate to allow actions at level 1. */
      if ( state.failed ) {
        [input rewind:m];
        [input consume]; /* advance one char and try again */
      } else {
        [self emit];
        return state.token;
      }
    }
    @catch (RecognitionException *re) {
      // shouldn't happen in backtracking mode, but...
      [self reportError:re];
      [self recover:re];
    }
  }
}

- (void)memoize:(id\<IntStream\>)anInput
  RuleIndex:(NSInteger)ruleIndex
  StartIndex:(NSInteger)ruleStartIndex
{
  if ( state.backtracking > 1 ) [super memoize:anInput RuleIndex:ruleIndex StartIndex:ruleStartIndex];
}

```

```

- (BOOL)alreadyParsedRule:(id)<IntStream>anInput RuleIndex:(NSInteger)ruleIndex
{
    if ( state.backtracking > 1 ) return [super alreadyParsedRule:anInput RuleIndex:ruleIndex];
    return NO;
}
>>

```

```

actionGate() ::= "state.backtracking == 0"

```

```

filteringActionGate() ::= "state.backtracking == 1"

```

```

parserHeaderFile( LEXER,
    PARSEr,
    TREE_PARSER,
    actionScope,
    actions,
    docComment,
    recognizer,
    name,
    tokens,
    tokenNames,
    rules,
    cyclicDFAs,
    bitsets,
    buildTemplate,
    profile,
    backtracking,
    synpreds,
    memoize,
    numRules,
    fileName,
    ANTLRVersion,
    generatedTimestamp,
    trace,
    scopes,
    literals,
    superClass="Parser"
) ::= <<
/* parserHeaderFile */
<genericParserHeaderFile(inputStreamType="id<TokenStream>",...)>
>>

```

```

treeParserHeaderFile( LEXER,
    PARSEr,
    TREE_PARSER,
    actionScope,
    actions,
    docComment,

```



```

recognizer,
name,
tokens,
tokenNames,
rules,
cyclicDFAs,
bitsets,
buildTemplate,
profile,
backtracking,
synpreds,
memoize,
numRules,
fileName,
ANTLRVersion,
generatedTimestamp,
trace,
scopes,
literals,
superClass="TreeParser"
) ::= <<
/* treeParserHeaderFile */
<genericParserHeaderFile(inputStreamType="id\<TreeNodeStream>",...)>
>>

```

```

genericParserHeaderFile( LEXER,
    PARSE,
    TREE_PARSER,
    actionScope,
    actions,
    docComment,
    recognizer,
    name,
    tokens,
    tokenNames,
    rules,
    cyclicDFAs,
    bitsets,
    buildTemplate,
    profile,
    backtracking,
    synpreds,
    memoize,
    numRules,
    fileName,
    ANTLRVersion,
    generatedTimestamp,
    trace,

```

```

        scopes,
        superClass,
        literals,
        inputStreamType
    ) ::=
<<
<if(actions.(actionScope).header)>
/* =====
* This is what the grammar programmer asked us to put at the top of every file.
*/
<actions.(actionScope).header>
/* End of Header action.
* =====
*/
<endif>

#ifndef ANTLR3TokenTypeAlreadyDefined
#define ANTLR3TokenTypeAlreadyDefined
typedef enum {
    ANTLR_EOF = -1,
    INVALID,
    EOR,
    DOWN,
    UP,
    MIN
} ANTLR3TokenType;
#endif

<cyclicDFAs:cyclicDFAInterface(>
#pragma mark Tokens
#ifndef TOKENLISTAlreadyDefined
#define TOKENLISTAlreadyDefined 1
#ifdef EOF
#undef EOF
#endif
#endif
<tokens:{it | #define <it.name> <it.type>}; separator="\n">
#endif
#pragma mark Dynamic Global Scopes globalAttributeScopeInterface
<scopes:{it | <if(it.isDynamicGlobalScope)><globalAttributeScopeInterface(scope=it)><endif>}>
#pragma mark Dynamic Rule Scopes ruleAttributeScopeInterface
<rules:{rule |
<rule.ruleDescriptor:{ ruleDescriptor | <ruleAttributeScopeInterface(scope=ruleDescriptor.ruleScope)>>>
#pragma mark Rule Return Scopes returnScopeInterface
<rules:{rule |<rule.ruleDescriptor:{ ruleDescriptor |
<returnScopeInterface(scope=ruleDescriptor.returnScope)>>>

/* Interface grammar class */
@interface <className()> <@superClassName> : <superClass><@end> { /* line 572 */

```

```

#pragma mark Dynamic Rule Scopes ruleAttributeScopeDecl
<rules:{ rule | <rule.ruleDescriptor.ruleScope:ruleAttributeScopeDecl(scope=rule.ruleDescriptor.ruleScope)>}>
#pragma mark Dynamic Global Rule Scopes globalAttributeScopeMemVar
<scopes:{ it | <if(it.isDynamicGlobalScope)><globalAttributeScopeMemVar(scope=it)><endif>}><\n>
/* ObjC start of actions.(actionScope).memVars */
<actions.(actionScope).memVars>
/* ObjC end of actions.(actionScope).memVars */
/* ObjC start of memVars */
<@memVars()>
/* ObjC end of memVars */

<cyclicDFAs:{ dfa | DFA<dfa.decisionNumber> *dfa<dfa.decisionNumber>;}; separator="\n">
<synpreds:{ pred | SEL <pred>Selector;}; separator="\n">
}

/* ObjC start of actions.(actionScope).properties */
<actions.(actionScope).properties>
/* ObjC end of actions.(actionScope).properties */
/* ObjC start of properties */
<@properties()>
/* ObjC end of properties */

+ (void) initialize;
+ (<className()> *) new<className()>:(<inputStreamType>)aStream;
/* ObjC start of actions.(actionScope).methodsDecl */
<actions.(actionScope).methodsDecl>
/* ObjC end of actions.(actionScope).methodsDecl */

/* ObjC start of methodsDecl */
<@methodsDecl()>
/* ObjC end of methodsDecl */

<rules:{ rule |
-
(<rule.ruleDescriptor:{ ruleDescriptor|<returnType()>}>><if(!rule.ruleDescriptor.isSynPred)><rule.ruleName><else
><rule.ruleName>_fragment<endif><if(rule.ruleDescriptor.parameterScope)><rule.ruleDescriptor.parameterScope:
parameterScope()><endif>; }; separator="\n"><\n>

@end /* end of <className()> interface */<\n>
>>

parser( grammar,
    name,
    scopes,
    tokens,
    tokenNames,
    rules,
    numRules,

```

```

    bitsets,
    ASTLabelType="CommonTree",
    superClass="Parser",
    labelType="CommonToken",
    members={<actions.parser.members>}
) ::= <<
<genericParser(inputStreamType="id\<TokenStream>", rewriteElementType="Token", ...)>
>>

/** How to generate a tree parser; same as parser except the input
 * stream is a different type.
 */
treeParser( grammar,
    name,
    scopes,
    tokens,
    tokenNames,
    globalAction,
    rules,
    numRules,
    bitsets,
    filterMode,
    labelType={<ASTLabelType>},
    ASTLabelType="CommonTree",
    superClass={<if(filterMode)><if(buildAST)>TreeRewriter<else>TreeFilter<endif><else>TreeParser<endif>},
    members={<actions.treeparser.members>}
) ::= <<
<genericParser(inputStreamType="id\<TreeNodeStream>", rewriteElementType="Node", ...)>
>>

/** How to generate a parser */
genericParser( grammar,
    name,
    scopes,
    tokens,
    tokenNames,
    rules,
    numRules,
    cyclicDFAs,    // parser init -- initializes the DFAs
    bitsets,
    labelType,
    ASTLabelType,
    superClass,
    members,
    filterMode,
    rewriteElementType,
    inputStreamType
) ::= <<

```

```

<cyclicDFAs:cyclicDFA()>

#pragma mark Bitsets
<bitsets:{it | <bitset(name={FOLLOW_<it.name>_in_<it.inName><it.tokenIndex>}, words64=it.bits)>>>

#pragma mark Dynamic Global globalAttributeScopeImplementation
<scopes:{it | <if(it.isDynamicGlobalScope)><globalAttributeScopeImplementation(scope=it)><endif>>>

#pragma mark Dynamic Rule Scopes ruleAttributeScopeImplementation
<rules:{rule |
<rule.ruleDescriptor:{ ruleDescriptor | <ruleAttributeScopeImplementation(scope=ruleDescriptor.ruleScope)>>>>

#pragma mark Rule Return Scopes returnScopeImplementation
<rules:{rule | <rule.ruleDescriptor:{ ruleDescriptor |
<returnScopeImplementation(scope=ruleDescriptor.returnScope)>>>>

@implementation <grammar.recognizerName> // line 637

/* ObjC start of ruleAttributeScope */
#pragma mark Dynamic Rule Scopes ruleAttributeScope
<rules:{rule | <rule.ruleDescriptor.ruleScope:ruleAttributeScope()>>>
/* ObjC end of ruleAttributeScope */
#pragma mark global Attribute Scopes globalAttributeScope
/* ObjC start globalAttributeScope */
<scopes:{it | <if(it.isDynamicGlobalScope)><globalAttributeScope()><endif>>>
/* ObjC end globalAttributeScope */
/* ObjC start actions.(actionScope).synthesize */
<actions.(actionScope).synthesize>
/* ObjC start synthesize() */
<@synthesize()>

+ (void) initialize
{
    #pragma mark Bitsets
    <bitsets:{it | <bitsetInit(name={FOLLOW_<it.name>_in_<it.inName><it.tokenIndex>}, words64=it.bits)>>>
    [BaseRecognizer setTokenNames:[[AMutableArray arrayWithObjects:@"\<invalid>", @"\<EOR>",
@"\<DOWN>", @"\<UP>", <tokenNames:{it | @<it>}; separator=",", wrap="\n", nil] retain]];
    [BaseRecognizer setGrammarFileName:@"<fileName>"];
    <synpreds:{pred | <synpred(pred)>>>
}

+ (<grammar.recognizerName> *)new<grammar.recognizerName>:(<inputStreamType>)aStream
{
<if(PARSER)>
    return [[<grammar.recognizerName> alloc] initWithTokenStream:aStream];
<else><! TREE_PARSER !>
    return [[<grammar.recognizerName> alloc] initWithStream:aStream];
<endif>

```

```

}

<if(PARSER)>
- (id) initWithTokenStream:(<inputStreamType>)aStream
{
    self = [super initWithTokenStream:aStream State:[[RecognizerSharedState
newRecognizerSharedStateWithRuleLen:<numRules>+1] retain]];
    if ( self != nil ) {
<else><! TREE_PARSER !>
- (id) initWithStream:(<inputStreamType>)aStream
{
    self = [super initWithStream:aStream State:[[RecognizerSharedState
newRecognizerSharedStateWithRuleLen:<numRules>+1] retain]];
    if ( self != nil ) {
<endif>
        <! <parserCtorBody()> !>
        <cyclicDFAs:{ dfa | dfa<dfa.decisionNumber> = [DFA<dfa.decisionNumber>
newDFA<dfa.decisionNumber>WithRecognizer:self];}; separator="\n">
        <scopes:{it | <if(it.isDynamicGlobalScope)><globalAttributeScopeInit(scope=it)><endif>}>
        <rules:{rule | <rule.ruleDescriptor.ruleScope:ruleAttributeScopeInit()>>
/* start of actions-actionScope-init */
        <actions.(actionScope).init>
/* start of init */
        <@init()>
    }
    return self;
}

- (void) dealloc
{
    <cyclicDFAs:{ dfa | [dfa<dfa.decisionNumber> release];}; separator="\n">
    <scopes:{it | <if(it.isDynamicGlobalScope)><globalAttributeScopeDealloc(scope=it)><endif>}>
    <actions.(actionScope).dealloc>
    <@dealloc()>
    [super dealloc];
}

/* ObjC start actions.(actionScope).methods */
<actions.(actionScope).methods>
/* ObjC end actions.(actionScope).methods */
/* ObjC start methods() */
<@methods()>
/* ObjC end methods() */
/* ObjC start rules */
<rules; separator="\n">
/* ObjC end rules */

@end /* end of <grammar.recognizerName> implementation line 692 */<\n>

```

>>

```
parserCtorBody() ::= <<
<if(memoize)> /* parserCtorBody */
<if(grammar.grammarIsRoot)>
state.ruleMemo = [[RuleStack newRuleStack:<numRules>+1] retain];<\n> <! index from 1..n !>
<endif>
<endif>
<grammar.delegators:
{g|this.<g:delegateName()> = <g:delegateName()>;} separator="\n">
>>
```

```
/** A simpler version of a rule template that is specific to the imaginary
 * rules created for syntactic predicates. As they never have return values
 * nor parameters etc..., just give simplest possible method. Don't do
 * any of the normal memoization stuff in here either; it's a waste.
 * As predicates cannot be inlined into the invoking rule, they need to
 * be in a rule by themselves.
 */
```

```
synpredRule(ruleName, ruleDescriptor, block, description, nakedBlock) ::=
<<
// $ANTLR start <ruleName>_fragment
- (void) <ruleName>_fragment
{
  <ruleLabelDefs()>
  <if(trace)>
    [self traceIn:@"<ruleName>_fragment" Index:<ruleDescriptor.index>];
    @try {
      <block>
    }
    @finally {
      [self traceOut:@"<ruleName>_fragment" Index:<ruleDescriptor.index>];
    }
  <else>
    <block>
  <endif>
} // $ANTLR end <ruleName>_fragment
>>
```

```
synpred(name) ::= <<
SEL <name>Selector = @selector(<name>_fragment);
<! // $ANTLR start <name>
- (BOOL) <name>
{
  state.backtracking++;
  <@start()>
  NSInteger start = [input mark];
  @try {
```

```

    [self <name>_fragment]; // can never throw exception
}
@catch (RecognitionException *re) {
    NSLog(@"impossible: %@\n", re.name);
}
BOOL success = (state.failed == NO);
[input rewind:start];
<@stop()>
state.backtracking--;
state.failed=NO;
return success;
} // $ANTLR end <name> <\n !>
>>

lexerSynpred(name) ::= <<
<synpred(name)>
>>

ruleMemoization(name) ::= <<
<if(memoize)>
if ( state.backtracking > 0 && [self alreadyParsedRule:input RuleIndex:<ruleDescriptor.index>] ) { return
<ruleReturnValue()>; }
<endif>
>>

/** How to test for failure and return from rule */
checkRuleBacktrackFailure() ::= <<
<if (backtracking)>if ( state.failed ) return <ruleReturnValue()>;<endif>
>>

/** This rule has failed, exit indicating failure during backtrack */
ruleBacktrackFailure() ::= <<
<if(backtracking)>if ( state.backtracking > 0 ) { state.failed = YES; return <ruleReturnValue()>; }<\n><endif>
>>

/** How to generate code for a rule.
* The return type aggregates are declared in the header file (headerFile template)
*/
rule(ruleName,ruleDescriptor,block,emptyRule,description,exceptions,finally,memoize) ::= <<

/*
* $ANTLR start <ruleName>
* <fileName>:<description>
*/
- (<returnType()>) <ruleName><ruleDescriptor.parameterScope:parameterScope()>
{
    <if(trace)>[self traceIn:\@"<ruleName>" Index:<ruleDescriptor.index>];<endif>
    <if(trace)>NSLog(@"enter <ruleName> %@ failed=%@ backtracking=%d", [input LT:1],

```



```

(state.failed==YES)?@"YES":@"NO", state.backtracking);<endif>
  <ruleScopeSetUp()>
  <ruleDeclarations()>
  <ruleDescriptor.actions.init>
  <@preamble()>
  @try {
    <ruleMemoization(name=ruleName)>
    <ruleLabelDefs()>
    <block>
    <ruleCleanup()>
    <(ruleDescriptor.actions.after):execAction()>
  }
  <if(exceptions)>
    <exceptions: {e|<catch(decl=e.decl,action=e.action)><\n}>>
  <else><if(!emptyRule)><if(actions.(actionScope).rulecatch)>
    <actions.(actionScope).rulecatch>
  <else>
    @catch (RecognitionException *re) {
      [self reportError:re];
      [self recover:input Exception:re];
      <@setErrorReturnValue()>
    }<\n>
  <endif><endif><endif>
  @finally {
    <if(trace)>[self traceOut:@"<ruleName>" Index:<ruleDescriptor.index>];<endif>
    <memoize()>
    <ruleScopeCleanup()>
    <finally>
  }
  <@postamble()>
  return <ruleReturnValue()>;
}
/* $ANTLR end <ruleName> */
>>

```

```

finalCode(finalBlock) ::= <<
{
  <finalBlock>
}
>>

```

```

catch(decl,action) ::= <<
@catch (<e.decl>) {
  <e.action>
}
>>

```

```

ruleDeclarations() ::= <<

```

```

/* ruleDeclarations */
<if(ruleDescriptor.hasMultipleReturnValues)>
<returnType()> retval = [<ruleDescriptor:returnStructName()> new<ruleDescriptor:returnStructName()>];
[retval setStart:[input LT:1]];<\n>
<else>
<ruleDescriptor.returnScope.attributes:{ a |
<a.type> <a.name> = <if(a.initValue)><a.initValue><else><initValue(a.type)><endif>;
}>
<endif>
<if(memoize)>
NSInteger <ruleDescriptor.name>_startIndex = input.index;
<endif>
>>

ruleScopeSetUp() ::= <<
/* ruleScopeSetUp */
<ruleDescriptor.useScopes:{it | [<it>_stack push:[<it>_Scope new<it>_Scope]];}>
<ruleDescriptor.ruleScope:{it | [<it.name>_stack push:[<it.name>_Scope new<it.name>_Scope]];}>
>>

ruleScopeCleanUp() ::= <<
/* ruleScopeCleanUp */
<ruleDescriptor.useScopes:{it | [<it>_stack pop];}; separator="\n">
<ruleDescriptor.ruleScope:{it | [<it.name>_stack pop];}; separator="\n">
>>

ruleLabelDefs() ::= <%
/* ruleLabelDefs entry */<\n">
<[ruleDescriptor.tokenLabels, ruleDescriptor.tokenListLabels,
ruleDescriptor.wildcardTreeLabels,ruleDescriptor.wildcardTreeListLabels]
: {it | <labelType> *<it.label.text> = nil;}; separator="\n"><\n">
<[ruleDescriptor.tokenListLabels,ruleDescriptor.ruleListLabels,ruleDescriptor.wildcardTreeListLabels]
: {it | AMutableArray *list_<it.label.text> = nil;}; separator="\n"><\n">
<ruleDescriptor.ruleLabels:ruleLabelDef(); separator="\n"><\n">
<ruleDescriptor.ruleListLabels:{||ParserRuleReturnScope *<it.label.text> = nil;}; separator="\n"><\n">
%>

lexerRuleLabelDefs() ::= <<
<[ruleDescriptor.tokenLabels,
ruleDescriptor.tokenListLabels,
ruleDescriptor.ruleLabels]
: {it | <labelType> *<it.label.text>=nil;}; separator="\n"
>
<ruleDescriptor.charLabels:{it |NSInteger <it.label.text>;}; separator="\n">
<[ruleDescriptor.tokenListLabels,
ruleDescriptor.ruleListLabels]:{it |AMutableArray *list_<it.label.text>=nil; }; separator="\n">
>>

```

```

ruleReturnValue() ::= <%
<if(!ruleDescriptor.isSynPred)>
<if(ruleDescriptor.hasReturnValue)>
<if(ruleDescriptor.hasSingleReturnValue)>
<ruleDescriptor.singleValueReturnName>
<else>
retval
<endif>
<endif>
<endif>
%>

ruleCleanUp() ::= <<
/* token+rule list labels */
<[ruleDescriptor.tokenListLabels,ruleDescriptor.ruleListLabels]:{it |[list_<it.label.text> release];}; separator="\n">
<if(ruleDescriptor.hasMultipleReturnValues)>
<if(!TREE_PARSER)>
[retval setStop:[input LT:-1]];<\n>
<endif><endif>
>>

memoize() ::= <<
<if(memoize)>
<if(backtracking)>
if (state.backtracking > 0) [self memoize:input RuleIndex:<ruleDescriptor.index>
StartIndex:<ruleDescriptor.name>_StartIndex];
<endif><endif>
>>

/** How to generate a rule in the lexer; naked blocks are used for
 * fragment rules.
 */
lexerRule(ruleName, nakedBlock, ruleDescriptor, block, memoize) ::= <<
// $ANTLR start "<ruleName>"
- (void)
m<ruleName><if(ruleDescriptor.parameterScope)><ruleDescriptor.parameterScope:parameterScope(scope=it)><en
dif>
{
//<if(trace)>[self traceIn:\@"<ruleName>" Index:<ruleDescriptor.index>];<endif>
<if(trace)>NSLog(@"enter <ruleName> %C line=%d:%d failed=%@ backtracking=%d",
[input LA:1],
self.line,
self.charPositionInLine,
(state.failed==YES) ? @"YES" : @"NO",
state.backtracking);
<endif>
<ruleScopeSetUp()>
<ruleDeclarations()>

```

```

    @try {
<if(nakedBlock)>
    <ruleMemoization(name=ruleName)>
    <lexerRuleLabelDefs()>
    <ruleDescriptor.actions.init>
    <block><\n>
<else>
    NSInteger _type = <ruleName>;
    NSInteger _channel = TokenChannelDefault;
    <ruleMemoization(name=ruleName)>
    <lexerRuleLabelDefs()>
    <ruleDescriptor.actions.init>
    <block>
    <ruleCleanUp()>
    state.type = _type;
    state.channel = _channel;
    <(ruleDescriptor.actions.after):execAction()>
<endif>
    }
    @finally {
        //<if(trace)>[self traceOut:[NSString stringWithFormat:@"<ruleName> %d\n",
<ruleDescriptor.index>]];<endif>
        <if(trace)>NSLog(@"exit <ruleName> %C line=%d:%d failed=%@ backtracking=%d",
            [input LA:1], self.line, self.charPositionInLine,
            (state.failed==YES) ? @"YES" : @"NO", state.backtracking);<endif>
        <ruleScopeCleanUp()>
        <memoize()>
    }
    return;
}
/* $ANTLR end "<ruleName>" */
>>

/** How to generate code for the implicitly-defined lexer grammar rule
 * that chooses between lexer rules.
 */
tokensRule(ruleName,nakedBlock,args,block,ruleDescriptor) ::= <<
- (void) mTokens
{
    <block><\n>
}
>>

// S U B R U L E S

/** A (...) subrule with multiple alternatives */
block(alts,decls,decision,enclosingBlockLevel,blockLevel,decisionNumber,maxK,maxAlt,description) ::= <<
// <fileName>:<description> // block

```

```

NSInteger alt<decisionNumber>=<maxAlt>;
<decls>
<@predecision()>
<decision>
<@postdecision()>
<@prebranch()>
switch (alt<decisionNumber>) {
  <alts:{ a | <altSwitchCase(i, a)>}>
}
<@postbranch()>
>>

/** A rule block with multiple alternatives */
ruleBlock(alts,decls,decision,enclosingBlockLevel,blockLevel,decisionNumber,maxK,maxAlt,description) ::= <<
// <fileName>:<description> //ruleblock
NSInteger alt<decisionNumber>=<maxAlt>;
<decls>
<@predecision()>
<decision>
<@postdecision()>
switch (alt<decisionNumber>) {
  <alts:{ a | <altSwitchCase(i, a)>}>
}
>>

ruleBlockSingleAlt(alts,decls,decision,enclosingBlockLevel,blockLevel,decisionNumber,description) ::= <<
// <fileName>:<description> // ruleBlockSingleAlt
<decls>
<@prealt()>
<alts>
<@postalt()>
>>

/** A special case of a (...) subrule with a single alternative */
blockSingleAlt(alts,decls,decision,enclosingBlockLevel,blockLevel,decisionNumber,description) ::= <<
// <fileName>:<description> // blockSingleAlt
<decls>
<@prealt()>
<alts>
<@postalt()>
>>

/** A (..)+ block with 1 or more alternatives */
positiveClosureBlock(alts,decls,decision,enclosingBlockLevel,blockLevel,decisionNumber,maxK,maxAlt,description) ::= <<
// <fileName>:<description> // positiveClosureBlock
NSInteger cnt<decisionNumber> = 0;
<decls>

```

```

<@preloop(>
do {
  NSInteger alt<decisionNumber> = <maxAlt>;
  <@predecision(>
  <decision>
  <@postdecision(>
  switch (alt<decisionNumber>) {
    <alts:{a | <altSwitchCase(i, a)>}>
    default :
      if ( cnt<decisionNumber> >= 1 )
        goto loop<decisionNumber>;
      <ruleBacktrackFailure(>
      EarlyExitException *eee =
        [EarlyExitException newException:input decisionNumber:<decisionNumber>];
      <@earlyExitException(>
      @throw eee;
    }
    cnt<decisionNumber>++;
  } while (YES);
loop<decisionNumber>; ;
<@postloop(>
>>

```

positiveClosureBlockSingleAlt ::= positiveClosureBlock

*/** A (..)* block with 0 or more alternatives */*

closureBlock(alts,decls,decision,enclosingBlockLevel,blockLevel,decisionNumber,maxK,maxAlt,description) ::=

<<

<decls>

<@preloop(>

do {

NSInteger alt<decisionNumber>=<maxAlt>;

<@predecision(>

<decision>

<@postdecision(>

switch (alt<decisionNumber>) {

<alts:{a | <altSwitchCase(i, a)>}>

default :

goto loop<decisionNumber>;

}

} while (YES);

loop<decisionNumber>; ;

<@postloop(>

>>

closureBlockSingleAlt ::= closureBlock

*/** Optional blocks (x)? are translated to (x|) by before code generation*

```

* so we can just use the normal block template
*/
optionalBlock ::= block

optionalBlockSingleAlt ::= block

/** A case in a switch that jumps to an alternative given the alternative
* number. A DFA predicts the alternative and then a simple switch
* does the jump to the code that actually matches that alternative.
*/
altSwitchCase(altNum, alt) ::= <<
case <altNum> : ;
  <@prealt(>
  <alt>
  break;<\n>
>>

/** An alternative is just a list of elements; at outermost level */
alt(elements,altNum,description,autoAST,outerAlt,treeLevel,rew) ::= <<
// <fileName>:<description> // alt
{
<@declarations(>
<elements:element(>
<rew>
<@cleanup(>
}
>>

/** What to emit when there is no rewrite. For auto build
* mode, does nothing.
*/
noRewrite(rewriteBlockLevel, treeLevel) ::= ""

// E L E M E N T S

/** Dump the elements one per line */
element(e) ::= << <@prematch(><\n><e.el><\n> >>

/** match a token optionally with a label in front */
tokenRef(token,label,elementIndex,terminalOptions) ::= <<
<if(label)><label>=(<labelType> *)<endif>[self match:input TokenType:<token>
Follow:FOLLOW_<token>_in_<ruleName><elementIndex>]; <checkRuleBacktrackFailure(>
>>

/** ids+=ID */
tokenRefAndListLabel(token,label,elementIndex,terminalOptions) ::= <<
<tokenRef(...>
<listLabel(elem=label,...>

```

>>

```
listLabel(label,elem) ::= <<
if (list_<label> == nil) list_<label> = [[AMutableArray arrayWithCapacity:5] retain];
[list_<label> addObject:<elem>];<\n>
>>
```

```
/** match a character */
charRef(char,label) ::= <<
<if(label)>NSInteger <label> = [input LA:1];<\n><endif>
[self matchChar:<char>]; <checkRuleBacktrackFailure()><\n>
>>
```

```
/** match a character range */
charRangeRef(a,b,label) ::= <<
<if(label)><label> = [input LA:1];<\n><endif>
[self matchRangeFromChar:<a> to:<b>]; <checkRuleBacktrackFailure()>
>>
```

```
/** For now, sets are interval tests and must be tested inline */
matchSet(s,label,elementIndex,terminalOptions,postmatchCode="") ::= <<
<if(label)>
<if(LEXER)>
<label> = [input LA:1];<\n>
<else>
<label> = (<labelType> *)[input LT:1]; /* matchSet */<\n>
<endif><endif>
if (<s>) {
    [input consume];
    <postmatchCode>
<if(!LEXER)>
    [state setIsErrorRecovery:NO];
<endif>
    <if(backtracking)>state.failed = NO;<\n><endif>
} else {
    <ruleBacktrackFailure()>
    MismatchedSetException *mse = [MismatchedSetException newException:nil stream:input];
    <@mismatchedSetException()>
<if(LEXER)>
<if(label)>
    mse.c = <label>;
<endif>
    [self recover:mse];
    @throw mse;
<else>
    @throw mse;
    <! use following code to make it recover inline; remove throw mse;
    [self recoverFromMismatchedSet:input exception:mse follow:FOLLOW_set_in_<ruleName><elementIndex>]; !>
```



```

<endif>
}<\n>
>>

matchRuleBlockSet ::= matchSet

matchSetAndListLabel(s,label,elementIndex,postmatchCode) ::= <<
<matchSet(...)>
<listLabel(elem=label,...)>
>>

/** Match a string literal */
lexerStringRef(string,label,elementIndex="0") ::= <<
<if(label)>
NSInteger <label>Start = input.index;
[self matchString:<string>]; <checkRuleBacktrackFailure()>
NSInteger StartLine<elementIndex> = self.line;
NSInteger <label>StartCharPos<elementIndex> = self.charPositionInLine;
<label> = [[<labelType> newToken:input Type:TokenTypeInvalid Channel:TokenChannelDefault
Start:<label>Start Stop:input.index] retain];
[self setLine:<label>StartLine<elementIndex>];
[self setCharPositionInLine:<label>StartCharPos<elementIndex>];
<else>
[self matchString:<string>]; <checkRuleBacktrackFailure()><\n>
<endif>
>>

wildcard(token,label,elementIndex,terminalOptions) ::= <<
<if(label)>
<label> = (<labelType> *)[input LT:1];<\n>
<endif>
[self matchAny:input]; <checkRuleBacktrackFailure()>
>>

wildcardAndListLabel(token,label,elementIndex,terminalOptions) ::= <<
<wildcard(...)>
<listLabel(elem=label,...)>
>>

/** Match . wildcard in lexer */
wildcardChar(label, elementIndex) ::= <<
<if(label)>
NSInteger <label> = [input LA:1];<\n>
<endif>
[self matchAny]; <checkRuleBacktrackFailure()><\n>
>>

wildcardCharListLabel(label, elementIndex) ::= <<

```

```

<wildcardChar(...)>
<listLabel(elem=label,...)>
>>

/** Match a rule reference by invoking it possibly with arguments
 * and a return value or values. The 'rule' argument was the
 * target rule name, but now is type Rule, whose toString is
 * same: the rule name. Now though you can access full rule
 * descriptor stuff.
 */
ruleRef(rule,label,elementIndex,args,scope) ::= <<
/* ruleRef */
[self pushFollow:FOLLOW_<rule.name>_in_<ruleName><elementIndex>];
<if(label)><label> = <endif>[self <if(scope)><scope.delegateName()>.<endif><rule.name><if(args)>:<first(args)>
<rest(args):{ a | arg<i>:<rest(args)>}; separator=" "><endif>];<\n>
[self popFollow];
<checkRuleBacktrackFailure()><\n>
>>

/** ids+=r */
ruleRefAndListLabel(rule,label,elementIndex,args,scope) ::= <<
<ruleRef(...)>
<listLabel(elem=label,...)>
>>

/** A lexer rule reference.
 *
 * The 'rule' argument was the target rule name, but now
 * is type Rule, whose toString is same: the rule name.
 * Now though you can access full rule descriptor stuff.
 */
lexerRuleRef(rule,label,args,elementIndex,scope) ::= <<
<if(label)>
NSInteger <label>Start<elementIndex> = input.index;
[self m<rule.name><if(args)>:<args; separator=":"><endif>]; <checkRuleBacktrackFailure()><\n>
<label> = [[<labelType> newToken:input Type:TokenTypeInvalid Channel:TokenChannelDefault
Start:<label>Start<elementIndex> Stop:input.index-1] retain];
<label>.line = self.line;
<else>
[self <if(scope)><scope.delegateName()>.<endif>m<rule.name><if(args)>:<args; separator=":"><endif>];
<checkRuleBacktrackFailure()><\n>
<endif>
>>

/** i+=INT in lexer */
lexerRuleRefAndListLabel(rule,label,args,elementIndex,scope) ::= <<
<lexerRuleRef(...)>
<listLabel(elem=label,...)>

```

```

>>

/** EOF in the lexer */
lexerMatchEOF(label,elementIndex) ::= <<
<if(label)>
NSInteger <label>Start<elementIndex> = input.index;
[self matchChar:CharStreamEOF]; <checkRuleBacktrackFailure()><\n>
<labelType> <label> = [[<labelType> newToken:input Type:TokenTypeEOF Channel:TokenChannelDefault
Start:<label>Start<elementIndex> Stop:input.index-1] retain];
<label>.line = self.line;
<else>
[self matchChar:CharStreamEOF]; <checkRuleBacktrackFailure()><\n>
<endif>
>>

// used for left-recursive rules
recRuleDefArg()          ::= "int <recRuleArg()>"
recRuleArg()             ::= "_p"
recRuleAltPredicate(ruleName,opPrec) ::= "<recRuleArg()> |<= <opPrec>"
recRuleSetResultAction() ::= "root_0=$<ruleName>_primary.tree;"
recRuleSetReturnAction(src,name) ::= "$<name>=$<src>.<name>;"

/** match ^(root children) in tree parser */
tree(root, actionsAfterRoot, children, nullableChildList, enclosingTreeLevel, treeLevel) ::= <<
<root:element()>
<actionsAfterRoot:element()>
<if(nullableChildList)>
if ( [input LA:1] == DOWN ) {
    [self match:input TokenType:DOWN Follow:nil]; <checkRuleBacktrackFailure()>
    <children:element()>
    [self match:input TokenType:UP Follow:nil]; <checkRuleBacktrackFailure()>
}
<else>
    [self match:input TokenType:DOWN Follow:nil]; <checkRuleBacktrackFailure()>
    <children:element()>
    [self match:input TokenType:UP Follow:nil]; <checkRuleBacktrackFailure()>
<endif>
>>

/** Every predicate is used as a validating predicate (even when it is
* also hoisted into a prediction expression).
*/
validateSemanticPredicate(pred,description) ::= <<
if ( !(<evalPredicate(...)>) ) {
    <ruleBacktrackFailure()>
    @throw [FailedPredicateException newException:@ "<ruleName>" predicate:@ "<description>" stream:input];
}
>>

```

```

// F i x e d D F A (if-then-else)

dfaState(k,edges,eotPredictsAlt,description,stateNumber,semPredState) ::= <<
NSInteger LA<decisionNumber>_<stateNumber> = [input LA:<k>];<\n>
<edges; separator="\nelse ">
else {
<if(eotPredictsAlt)>
  alt<decisionNumber> = <eotPredictsAlt>;
<else>
  <ruleBacktrackFailure()>
  NoViableAltException *nvae = [NoViableAltException newException:<decisionNumber> state:<stateNumber>
stream:input];
  nvae.c = LA<decisionNumber>_<stateNumber>;
  <@noViableAltException()>
  @throw nvae;<\n>
<endif>
}
>>

/** Same as a normal DFA state except that we don't examine lookahead
 * for the bypass alternative. It delays error detection but this
 * is faster, smaller, and more what people expect. For (X)? people
 * expect "if ( LA(1)==X ) match(X);" and that's it.
 */
dfaOptionalBlockState(k,edges,eotPredictsAlt,description,stateNumber,semPredState) ::= <<
NSInteger LA<decisionNumber>_<stateNumber> = [input LA:<k>];<\n>
<edges; separator="\nelse ">
>>

/** A DFA state that is actually the loopback decision of a closure
 * loop. If end-of-token (EOT) predicts any of the targets then it
 * should act like a default clause (i.e., no error can be generated).
 * This is used only in the lexer so that for ('a')* on the end of a rule
 * anything other than 'a' predicts exiting.
 */
dfaLoopbackState(k,edges,eotPredictsAlt,description,stateNumber,semPredState) ::= <<
NSInteger LA<decisionNumber>_<stateNumber> = [input LA:<k>];
<edges; separator="\nelse "><\n>
<if(eotPredictsAlt)>
<if(!edges)>
alt<decisionNumber>=<eotPredictsAlt>; <! if no edges, don't gen ELSE !>
<else>
else {
  alt<decisionNumber> = <eotPredictsAlt>;
}<\n>
<endif><endif>
>>

```

```

/** An accept state indicates a unique alternative has been predicted */
dfaAcceptState(alt) ::= "alt<decisionNumber>=<alt>";

/** A simple edge with an expression. If the expression is satisfied,
 * enter to the target state. To handle gated productions, we may
 * have to evaluate some predicates for this edge.
 */
dfaEdge(labelExpr, targetState, predicates) ::= <<
if ( (<labelExpr> <if(predicates)>&& (<predicates>)<endif>) {
    <targetState>
}
>>

// F i x e d D F A (switch case)

/** A DFA state where a SWITCH may be generated. The code generator
 * decides if this is possible: CodeGenerator.canGenerateSwitch().
 */
dfaStateSwitch(k,edges,eotPredictsAlt,description,stateNumber,semPredState) ::= <<
unichar charLA<decisionNumber> = [input LA:<k>];
switch (charLA<decisionNumber>) {
    <edges; separator="\n"><\n>
default: ;
<if(eotPredictsAlt)>
    alt<decisionNumber> = <eotPredictsAlt>;
<else>
    <ruleBacktrackFailure()>
    NoViableAltException *nvae = [NoViableAltException newException:<decisionNumber> state:<stateNumber>
stream:input];
    nvae.c = charLA<decisionNumber>;
    <@noViableAltException()>
    @throw nvae;<\n>
<endif>
}<\n>
>>

dfaOptionalBlockStateSwitch(k,edges,eotPredictsAlt,description,stateNumber,semPredState) ::= <<
switch ([input LA:<k>]) { // dfaOptionalBlockStateSwitch
    <edges; separator="\n"><\n>
}<\n>
>>

dfaLoopbackStateSwitch(k, edges,eotPredictsAlt,description,stateNumber,semPredState) ::= <<
switch ([input LA:<k>]) { // dfaLoopbackStateSwitch
    <edges; separator="\n"><\n>
<if(eotPredictsAlt)>
default:

```

```

    alt<decisionNumber> = <eotPredictsAlt>;
    break;<\n>
<endif>
}<\n>
>>

dfaEdgeSwitch(labels, targetState) ::= <<
<labels:{it | case <it>: ;}; separator="\n">
{
    <targetState>
}
break;
>>

// C y c l i c D F A

/** The code to initiate execution of a cyclic DFA; this is used
 * in the rule to predict an alt just like the fixed DFA case.
 * The <name> attribute is inherited via the parser, lexer, ...
 */
dfaDecision(decisionNumber,description) ::= <<
alt<decisionNumber> = [dfa<decisionNumber> predict:input];
>>

/** Used in headerFile */
cyclicDFAInterface(dfa) ::= <<
#pragma mark Cyclic DFA interface start DFA<dfa.decisionNumber>
@interface DFA<dfa.decisionNumber> : DFA {
}
+ (DFA<dfa.decisionNumber> *) newDFA<dfa.decisionNumber>WithRecognizer:(BaseRecognizer
*)theRecognizer;
- initWithRecognizer:(BaseRecognizer *)recognizer;
@end /* end of DFA<dfa.decisionNumber> interface */<\n>
#pragma mark Cyclic DFA interface end DFA<dfa.decisionNumber><\n>
>>

/** Used in lexer/parser implementation files */
/* Dump DFA tables as run-length-encoded Strings of octal values.
 * Can't use hex as compiler translates them before compilation.
 * These strings are split into multiple, concatenated strings.
 * Java puts them back together at compile time thankfully.
 * Java cannot handle large static arrays, so we're stuck with this
 * encode/decode approach. See analysis and runtime DFA for
 * the encoding methods.
 */
cyclicDFA(dfa) ::= <<
#pragma mark Cyclic DFA implementation start DFA<dfa.decisionNumber>

```

```

@implementation DFA<dfa.decisionNumber>
const static NSInteger dfa<dfa.decisionNumber>_eot[<dfa.numberofStates>] =
    {<dfa.eot; wrap="\n    ", separator=",", null="-1">};
const static NSInteger dfa<dfa.decisionNumber>_eof[<dfa.numberofStates>] =
    {<dfa.eof; wrap="\n    ", separator=",", null="-1">};
const static unichar dfa<dfa.decisionNumber>_min[<dfa.numberofStates>] =
    {<dfa.min; wrap="\n    ", separator=",", null="-1">};
const static unichar dfa<dfa.decisionNumber>_max[<dfa.numberofStates>] =
    {<dfa.max; wrap="\n    ", separator=",", null="-1">};
const static NSInteger dfa<dfa.decisionNumber>_accept[<dfa.numberofStates>] =
    {<dfa.accept; wrap="\n    ", separator=",", null="-1">};
const static NSInteger dfa<dfa.decisionNumber>_special[<dfa.numberofStates>] =
    {<dfa.special; wrap="\n    ", separator=",", null="-1">};

/** Used when there is no transition table entry for a particular state */
#define dfa<dfa.decisionNumber>_T_empty    nil

<dfa.edgeTransitionClassMap.keys:{ table |
const static NSInteger dfa<dfa.decisionNumber>_T<i0>[] =
{
    <table; separator=", ", wrap="\n ", null="-1">
\};
}; null="">

const static NSInteger *dfa<dfa.decisionNumber>_transition[] =
{
    <dfa.transitionEdgeTables:{ whichTable|dfa<dfa.decisionNumber>_T<whichTable>}; separator=", ", wrap="\n",
null="nil">
};

+ (DFA<dfa.decisionNumber> *) newDFA<dfa.decisionNumber>WithRecognizer:(BaseRecognizer *)aRecognizer
{
    return [[[DFA<dfa.decisionNumber> alloc] initWithRecognizer:aRecognizer] retain];
}

- (id) initWithRecognizer:(BaseRecognizer *) theRecognizer
{
    self = [super initWithRecognizer:theRecognizer];
    if ( self != nil ) {
        decisionNumber = <dfa.decisionNumber>;
        eot = dfa<dfa.decisionNumber>_eot;
        eof = dfa<dfa.decisionNumber>_eof;
        min = dfa<dfa.decisionNumber>_min;
        max = dfa<dfa.decisionNumber>_max;
        accept = dfa<dfa.decisionNumber>_accept;
        special = dfa<dfa.decisionNumber>_special;
        transition = dfa<dfa.decisionNumber>_transition;
    }
}

```

```

    return self;
}

<if(dfa.specialStateSTs)>
/* start dfa.specialStateSTs */
- (NSInteger) specialStateTransition:(NSInteger)s Stream:(id<IntStream>)anInput
{
<if(LEXER)>
    id<IntStream> input = anInput;<\n>
<endif>
<if(PARSER)>
    id<TokenStream> input = (id<TokenStream>)anInput;<\n>
<endif>
<if(TREE_PARSER)>
    id<TreeNodeStream> input = (id<TreeNodeStream>)anInput;<\n>
<endif>
    switch (s) {
        <dfa.specialStateSTs:{state |
            case <i0> : ;<! compressed special state numbers 0..n-1 !>
                <state>}; separator="\n">
    }
<if(backtracking)>
    if ( [recognizer getBacktrackingLevel] > 0 ) { [recognizer setFailed:YES]; return -1; }<\n>
<endif>
    NoViableAltException *nvae = [NoViableAltException newException:<dfa.decisionNumber> state:s
stream:recognizer.input];
    // nvae.c = s;
    /* [self error:nvae]; */ <! for debugger - do later !>
    @throw nvae;
}<\n>
/* end dfa.specialStateSTs */
<endif>

- (void) dealloc
{
    //free(transition);
    [super dealloc];
}

- (NSString *) description
{
    return @"<dfa.description>";
}

<@errorMethod()>

@end /* end DFA<dfa.decisionNumber> implementation */<\n>
#pragma mark Cyclic DFA implementation end DFA<dfa.decisionNumber>

```



```

<\n>
>>
/** A state in a cyclic DFA; it's a special state and part of a big switch on
 * state.
 */
cyclicDFAState(decisionNumber, stateNumber, edges, needErrorClause, semPredState) ::= <<
/* cyclicDFAState */
NSInteger LA<decisionNumber>_<stateNumber> = [input LA:1];<\n>
<if(semPredState)> <! get next lookahead symbol to test edges, then rewind !>
NSInteger index<decisionNumber>_<stateNumber> = input.index;
[input rewind];<\n>
<endif>
s = -1;
<edges; separator="\nelse ">
<if(semPredState)> <! return input cursor to state before we rewound !>
[input seek.index<decisionNumber>_<stateNumber>];<\n>
<endif>
if ( s >= 0 )
    return s;
break;
>>

/** Just like a fixed DFA edge, test the lookahead and indicate what
 * state to jump to next if successful.
 */
cyclicDFAEdge(labelExpr, targetStateNumber, edgeNumber, predicates) ::= <<
/* cyclicDFAEdge */
if (<labelExpr><if(predicates)> && (<predicates>)<endif>) { s = <targetStateNumber>;}<\n>
>>

/** An edge pointing at end-of-token; essentially matches any char;
 * always jump to the target.
 */
eotDFAEdge(targetStateNumber,edgeNumber, predicates) ::= <<
s = <targetStateNumber>;<\n> /* eotDFAEdge */
>>

// D F A E X P R E S S I O N S

andPredicates(left,right) ::= "<left>&&<right>"

orPredicates(operands) ::= "<operands; separator=\"||\">"

notPredicate(pred) ::= "!(<evalPredicate(pred, {})>)"

evalPredicate(pred,description) ::= "<pred>"

/*

```

```

* evalSynPredicate(pred,description) ::= "<pred>()"
*
* synpreds are broken in cyclic DFA special states
* Damn! For now, work around with using the selectors directly, and by providing a trampoline evalSynPred
method in
* DFA
*/
/* evalSynPredicate(pred,description) ::= "[self evaluateSyntacticPredicate:<pred>Selector stream:input]" */
evalSynPredicate(pred,description) ::= "[self evaluateSyntacticPredicate:@selector(<pred>_fragment)]"
/* evalSynPredicate(pred,description) ::= "[recognizer <pred>]" */

lookaheadTest(atom,k,atomAsInt) ::= "LA<decisionNumber>_<stateNumber>==<atom>"

/** Sometimes a lookahead test cannot assume that LA(k) is in a temp variable
* somewhere. Must ask for the lookahead directly.
*/
isolatedLookaheadTest(atom,k,atomAsInt) ::= "[input LA:<k>] == <atom>"

lookaheadRangeTest(lower,upper,k,rangeNumber,lowerAsInt,upperAsInt) ::= <%
(LA<decisionNumber>_<stateNumber> >= <lower> && LA<decisionNumber>_<stateNumber> \<= <upper>)
%>

isolatedLookaheadRangeTest(lower,upper,k,rangeNumber,lowerAsInt,upperAsInt) ::= "(((input LA:<k>] >=
<lower>) && ([input LA:<k>] \<= <upper>)))"

setTest(ranges) ::= <%
<ranges; separator="||">
%>

// A T T R I B U T E S

memVars(scope) ::= <% <scope.attributes:{a|<a.type> <a.name>;<\n>}; separator="\n"> %>

properties(scope) ::= <%
<scope.attributes:{a|@property (assign, getter=get<a.name>, setter=set<a.name>:) <a.type> <a.name>;<\n>};
separator="\n">
%>

methodsDecl(scope) ::= <%
<scope.attributes:{a|- (<a.type>)get<a.name>;<\n>- (void)set<a.name>:(<a.type>)aVal;<\n>}; separator="\n">
%>

synthesize(scope) ::= <% <scope.attributes:{a|@synthesize <a.name>;}; separator="\n"> %>

methods(scope) ::= <%
<scope.attributes:{a|
- (<a.type>)get<a.name> { return( <a.name> ); }\<\n>
- (void)set<a.name>:(<a.type>)aVal { <a.name> = aVal; }\<\n>}; separator="\n">

```

```

%>

globalAttributeScopeInterface(scope) ::= <%
/* globalAttributeScopeInterface */<\n>
@interface <scope.name>_Scope : SymbolsScope {<\n>
<if(scope.attributes)>
<memVars(scope)>
<endif>
}<\n>
<if(scope.attributes)>
/* start of globalAttributeScopeInterface properties */<\n>
<properties(scope)>
/* end globalAttributeScopeInterface properties */<\n>
<endif>

+ (<scope.name>_Scope *)new<scope.name>_Scope;<\n>
- (id) init;<\n>
<if(scope.attributes)>
/* start of globalAttributeScopeInterface methodsDecl */<\n>
<methodsDecl(scope)>
/* End of globalAttributeScopeInterface methodsDecl */<\n>
<endif>
@end /* end of <scope.name>_Scope interface */<\n>
%>

globalAttributeScopeMemVar(scope) ::= <%
/* globalAttributeScopeMemVar */<\n>
SymbolStack *<scope.name>_stack;<\n>
<scope.name>_Scope *<scope.name>_scope;<\n>
%>

globalAttributeScopeImplementation(scope) ::= <%
@implementation <scope.name>_Scope /* globalAttributeScopeImplementation */<\n>
<if(scope.attributes)>
/* start of synthesize -- OBJC-Line 1750 */<\n>
<synthesize(scope)><\n>
<endif>
<\n>
+ (<scope.name>_Scope *)new<scope.name>_Scope<\n>
{<\n>
return [[<scope.name>_Scope alloc] init];<\n>
}<\n>
<\n>
- (id) init<\n>
{<\n>
self = [super init];<\n>
return self;<\n>
}<\n>

```

```

<\n>
<if(scope.attributes)>
/* start of iterate get and set functions */<\n>
<methods(scope)><\n>
/* End of iterate get and set functions */<\n>
<endif>
@end /* end of <scope.name>_Scope implementation */<\n><\n>
%>

globalAttributeScopeInit(scope) ::= <<
/* globalAttributeScopeInit */<\n>
<scope.name>_scope = [<scope.name>_Scope new<scope.name>_Scope];<\n>
<scope.name>_stack = [SymbolStack newSymbolStackWithLen:30];<\n>
>>

globalAttributeScopeDealloc(scope) ::= <% [<scope.name>_stack release];<\n> %>

globalAttributeScope(scope) ::= <%
<if(scope.name)>
static <scope.name>_stack;<\n>
<endif>
%>

ruleAttributeScopeMemVar(scope) ::= <%
/* ObjC ruleAttributeScopeMemVar */<\n>
<if(scope.attributes)>
<scope.name>_Scope *<scope.name>_scope; /* ObjC ruleAttributeScopeMemVar */<\n>
<endif>
%>

ruleAttributeScopeInterface(scope) ::= <%
<if(scope.attributes)>
/* start of ruleAttributeScopeInterface */<\n>
@interface <scope.name>_Scope : SymbolsScope {<\n>
    <memVars(scope)><\n>
}<\n>
<\n>
/* start property declarations */<\n>
<properties(scope)><\n>
/* start method declarations */<\n>
+ (<scope.name>_Scope *)new<scope.name>_Scope;<\n>
- (id) init;<\n>
<methodsDecl(scope)><\n>
@end /* end of ruleAttributeScopeInterface */<\n><\n>
<endif>
%>

ruleAttributeScopeImplementation(scope) ::= <%

```

```

<if(scope.attributes)>
@implementation <scope.name>_Scope /* start of ruleAttributeScopeImplementation */<\n>
<synthesize(scope)><\n>
<\n>
+ (<scope.name>_Scope *)new<scope.name>_Scope<\n>
{<\n>
    return [[<scope.name>_Scope alloc] init];<\n>
}<\n>
<\n>
- (id) init<\n>
{<\n>
    self = [super init];<\n>
    return self;<\n>
}<\n>
<\n>
/* start of <scope.name>_Scope get and set functions */<\n>
<methods(scope)><\n>
/* End of <scope.name>_Scope get and set functions */<\n>
@end /* end of ruleAttributeScopeImplementation */<\n><\n>
<endif>
%>

```

```

ruleAttributeScopeInit(scope) ::= <%
/* ruleAttributeScopeInit */<\n>
<scope.name>_scope = [<scope.name>_Scope new<scope.name>_Scope];<\n>
<scope.name>_stack = [SymbolStack newSymbolStackWithLen:30];<\n>
%>

```

```

ruleAttributeScopeDealloc(scope) ::= <% [<scope.name>_Scope release];<\n> %>

```

```

ruleAttributeScope(scope) ::= <%
<if(scope.attributes)>
/* ruleAttributeScope */<\n>
static SymbolStack *<scope.name>_stack;<\n>
static <scope.name>_Scope *<scope.name>_scope;
<endif>
%>

```

```

ruleAttributeScopeDecl(scope) ::= <%
/* ruleAttributeScopeDecl */<\n>
<if(scope.attributes)>
<scope.name>_Scope *<scope.name>_scope;<\n>
<endif>
%>

```

```

returnStructName(r) ::= "<className()>_<r.name>_return"

```

```

returnType() ::= <%

```

```

<if(!ruleDescriptor.isSynPred)>
<if(ruleDescriptor.hasMultipleReturnValues)>
<ruleDescriptor:returnStructName()> *
<else>
<if(ruleDescriptor.hasSingleReturnValue)>
<ruleDescriptor.singleValueReturnType>
<else>
void
<endif>
<endif>
<else>
void
<endif>
%>

/** Generate the Objective-C type associated with a single or multiple return
 * values.
 */
ruleLabelType(referencedRule) ::= <%
<if(referencedRule.hasMultipleReturnValues)>
<className()>_<referencedRule.name>_return *<else>
<if(referencedRule.hasSingleReturnValue)><referencedRule.singleValueReturnType><else>
void<endif>
<endif>
%>

delegateName(d) ::= <% <if(d.label)><d.label><else>g<d.name><endif> %>

/** Using a type to init value map, try to init a type; if not in table
 * must be an object, default value is "null".
 */
initValue(typeName) ::= <% <objcTypeInitMap.(typeName)> %>

/** Define a rule label including default value */
ruleLabelDef(label) ::= <%
<ruleLabelType(referencedRule=label.referencedRule)> <label.label.text> =
<initValue(typeName=ruleLabelType(referencedRule=label.referencedRule))>;<\n>
%>

/** Define a return struct for a rule if the code needs to access its
 * start/stop tokens, tree stuff, attributes, ... Leave a hole for
 * subgroups to stick in members.
 */
returnScopeInterface(scope) ::= <<
<if(ruleDescriptor.hasMultipleReturnValues)>
/* returnScopeInterface <ruleDescriptor:returnStructName()> */
@interface <ruleDescriptor:returnStructName()> :
<if(TREE_PARSER)>Tree<else>Parser<endif>RuleReturnScope { /* returnScopeInterface line 1838 */

```

```

<@memVars()> /* ObjC start of memVars() */<\n>
<if(scope.attributes)>
<memVars(scope)><\n>
<endif>
}
/* start property declarations */
<@properties()><\n>
<if(scope.attributes)>
<properties(scope)><\n>
<endif>
/* start of method declarations */<\n>
+ (<ruleDescriptor:returnStructName()> *)new<ruleDescriptor:returnStructName()>;
/* this is start of set and get methods */
<@methodsDecl()> /* methodsDecl */<\n>
<if(scope.attributes)>
/* start of iterated get and set functions */<\n>
<methodsDecl(scope)><\n>
<endif>
@end /* end of returnScopeInterface interface */<\n>
<endif>
>>

returnScopeImplementation(scope) ::= <%
<if(ruleDescriptor.hasMultipleReturnValues)>
@implementation <ruleDescriptor:returnStructName()> /* returnScopeImplementation */<\n>
<@synthesize()> /* start of synthesize -- OBJC-Line 1837 */<\n>
<if(scope.attributes)>
<synthesize(scope)><\n>
<endif>
+ (<ruleDescriptor:returnStructName()> *)new<ruleDescriptor:returnStructName()><\n>
{<\n>
return [[(<ruleDescriptor:returnStructName()> alloc) init] retain];<\n>
}<\n>
<\n>
- (id) init<\n>
{<\n>
self = [super init];<\n>
return self;<\n>
}<\n>
<\n>
<@methods()><\n>
<if(scope.attributes)>
/* start of iterate get and set functions */<\n>
<methods(scope)><\n>
/* End of iterate get and set functions */<\n>
<endif>
<actions.(actionScope).ruleReturnMethods>
<@ruleReturnMembers()><\n>

```

```

@end /* end of returnScope implementation */<\n><\n>
<endif>
%>

parameterScope(scope) ::= <<
<! <scope.attributes:{ it | :(<it.type><it.name>); separator=" "> !>
<first(scope.attributes):{ a | :(<a.type><a.name>)> <rest(scope.attributes):{ a | arg<i>:(<a.type><a.name> }>
separator=" ">
>>

parameterAttributeRef(attr) ::= "<attr.name>"
parameterSetAttributeRef(attr,expr) ::= "<attr.name> = <expr>";

/** Note that the scopeAttributeRef does not have access to the
 * grammar name directly
 */
scopeAttributeRef(scope,attr,index,negIndex) ::= <%
<if(negIndex)>
(((<scope>_Scope *) [<scope>_stack objectAtIndex:[<scope>_stack size]-<negIndex>-1])).<attr.name>
<else>
<if(index)>
((<scope>_Scope *) [<scope>_stack objectAtIndex:<index>]).<attr.name>
<else>
((<scope>_Scope *) [<scope>_stack peek]).<attr.name>
<endif>
<endif>
%>

scopeSetAttributeRef(scope,attr,expr,index,negIndex) ::= <%
/* scopeSetAttributeRef */
<if(negIndex)>
((<scope>_Scope *) [<scope>_stack objectAtIndex:([<scope>_stack size]-<negIndex>-1])).<attr.name> = <expr>;
<else>
<if(index)>
((<scope>_Scope *) [<scope>_stack objectAtIndex:<index>]).<attr.name> = <expr>;
<else>
((<scope>_Scope *) [<scope>_stack peek]).<attr.name> = <expr>;
<endif>
<endif>
%>

scopeAttributeRefStack() ::= <<
/* scopeAttributeRefStack */
<if(negIndex)>
((<scope>_Scope *) [<scope>_stack objectAtIndex:[<scope>_stack count]-<negIndex>-1]).<attr.name> = <expr>;
<else>
<if(index)>
((<scope>_Scope *) [<scope>_stack objectAtIndex:<index>]).<attr.name> = <expr>;

```



```

<else>
(((<scope>_Scope *)[<scope>_stack peek]).<attr.name> = <expr>;
<endif>
<endif>
>>

/** $x is either global scope or x is rule with dynamic scope; refers
 * to stack itself not top of stack. This is useful for predicates
 * like {$function.size()>0 && $function::name.equals("foo")}?
 */
isolatedDynamicScopeRef(scope) ::= "<scope>_stack"

/** reference an attribute of rule; might only have single return value */
ruleLabelRef(referencedRule,scope,attr) ::= <<
<if(referencedRule.hasMultipleReturnValues)>
(<scope>!=nil?<scope>.<attr.name>:<initValue(attr.type)>)
<else>
<scope>
<endif>
>>

returnAttributeRef(ruleDescriptor,attr) ::= <%
<if(ruleDescriptor.hasMultipleReturnValues)>
retval.<attr.name> /* added to returnAttributeRef */<\n>
<else>
<attr.name><\n>
<endif>
%>

returnSetAttributeRef(ruleDescriptor,attr,expr) ::= <%
<if(ruleDescriptor.hasMultipleReturnValues)>
retval.<attr.name> =<expr>; /* added to returnSetAttributeRef */<\n>
<else>
<attr.name> = <expr>;<\n>
<endif>
%>

/** How to translate $tokenLabel */
tokenLabelRef(label) ::= "<label>"

/** ids+=ID {$ids} or e+=expr {$e} */
listLabelRef(label) ::= "list_<label>"

/* not sure the next are the right approach; and they are evaluated early; */
/* they cannot see TREE_PARSER or PARSER attributes for example. :( */

tokenLabelPropertyRef_text(scope,attr) ::= "(<scope>!=nil?<scope>.text:nil)"

```

```

tokenLabelPropertyRef_type(scope,attr) ::= "<scope>!=nil?<scope>.type:0)"
tokenLabelPropertyRef_line(scope,attr) ::= "<scope>!=nil?<scope>.line:0)"
tokenLabelPropertyRef_pos(scope,attr) ::= "<scope>!=nil?<scope>.charPositionInLine:0)"
tokenLabelPropertyRef_channel(scope,attr) ::= "<scope>!=nil?<scope>.channel:0)"
tokenLabelPropertyRef_index(scope,attr) ::= "<scope>!=nil?[<scope> getTokenIndex]:0)"
tokenLabelPropertyRef_tree(scope,attr) ::= "<scope>_tree"
tokenLabelPropertyRef_int(scope,attr) ::= "<scope>!=nil?[<scope>.text integerValue]:0)"

ruleLabelPropertyRef_start(scope,attr) ::= "<scope>!=nil?((<labelType> *)<scope>.start):nil)"
ruleLabelPropertyRef_stop(scope,attr) ::= "<scope>!=nil?((<labelType> *)<scope>.stopToken):nil)"
ruleLabelPropertyRef_tree(scope,attr) ::= "<scope>!=nil?((<ASTLabelType> *)<scope>.tree):nil)"
ruleLabelPropertyRef_text(scope,attr) ::= <%
<if(TREE_PARSER)>
<scope>!=nil?[[input getTokenStream] toStringFromStart:[[input getTreeAdaptor] getTokenStartIndex:[<scope>
getStart]]
    ToEnd:[[input getTreeAdaptor] getTokenStopIndex:[<scope> getStart]]]:0)
<else>
<scope>!=nil?([input toStringFromToken:[<scope> getStart] ToToken:[<scope> getStop]]):0)
<endif>
%>
ruleLabelPropertyRef_st(scope,attr) ::= "<scope>!=nil?[<scope> st]:nil)"

/** Isolated $RULE ref ok in lexer as it's a Token */
lexerRuleLabel(label) ::= "<label>"

lexerRuleLabelPropertyRef_type(scope,attr) ::= "<scope>!=nil?<scope>.type:0)"
lexerRuleLabelPropertyRef_line(scope,attr) ::= "<scope>!=nil?<scope>.line:0)"
lexerRuleLabelPropertyRef_pos(scope,attr) ::= "<scope>!=nil?<scope>.charPositionInLine:-1)"
lexerRuleLabelPropertyRef_channel(scope,attr) ::= "<scope>!=nil?<scope>.channel:0)"
lexerRuleLabelPropertyRef_index(scope,attr) ::= "<scope>!=nil?[<scope> getTokenIndex]:0)"
lexerRuleLabelPropertyRef_text(scope,attr) ::= "<scope>!=nil?<scope>.text:nil)"
lexerRuleLabelPropertyRef_int(scope,attr) ::= "<scope>!=nil?[<scope>.text integerValue]:0)"

// Somebody may ref $template or $tree or $stop within a rule:
rulePropertyRef_start(scope,attr) ::= "((<labelType> *)retval.start)"
rulePropertyRef_stop(scope,attr) ::= "((<labelType> *)retval.stopToken)"
rulePropertyRef_tree(scope,attr) ::= "((<ASTLabelType> *)retval.tree)"
rulePropertyRef_text(scope,attr) ::= <<
<if(TREE_PARSER)>
[[input getTokenStream] toStringFromStart:[[input getTreeAdaptor]
getTokenStartIndex:retval.start.token.startIndex]
    ToEnd:[[input getTreeAdaptor] getTokenStopIndex:retval.start.token.stopIndex]]
<else>
[input toStringFromToken:retval.start ToToken:[input LT:-1]]
<endif>
>>
rulePropertyRef_st(scope,attr) ::= "retval.st"

```

```

/* hideous: find a way to cut down on the number of templates to support read/write access */
/* TODO: also, which ones are valid to write to? ask Ter */
lexerRuleSetPropertyRef_text(scope,attr,expr) ::= "state.text = <expr>";
lexerRuleSetPropertyRef_type(scope,attr,expr) ::= "_type"
lexerRuleSetPropertyRef_line(scope,attr,expr) ::= "state.tokenStartLine"
lexerRuleSetPropertyRef_pos(scope,attr,expr) ::= "state.tokenStartCharPositionInLine"
lexerRuleSetPropertyRef_index(scope,attr,expr) ::= "-1" /* undefined token index in lexer */
lexerRuleSetPropertyRef_channel(scope,attr,expr) ::= "state.channel=<expr>";
lexerRuleSetPropertyRef_start(scope,attr,expr) ::= "state.tokenStartCharIndex"
lexerRuleSetPropertyRef_stop(scope,attr,expr) ::= "(input.index-1)"

lexerRulePropertyRef_text(scope,attr) ::= "self.text"
lexerRulePropertyRef_type(scope,attr) ::= "state.type"
lexerRulePropertyRef_line(scope,attr) ::= "state.tokenStartLine"
lexerRulePropertyRef_pos(scope,attr) ::= "state.tokenStartCharPositionInLine"
lexerRulePropertyRef_index(scope,attr) ::= "-1" // undefined token index in lexer
lexerRulePropertyRef_channel(scope,attr) ::= "_channel"
lexerRulePropertyRef_start(scope,attr) ::= "state.tokenStartCharIndex"
lexerRulePropertyRef_stop(scope,attr) ::= "(input.index-1)"
lexerRulePropertyRef_int(scope,attr) ::= "[<scope>.text integerValue]"

// setting $st and $tree is allowed in local rule. everything else
// is flagged as error
ruleSetPropertyRef_tree(scope,attr,expr) ::= "retval.start =<expr>";
ruleSetPropertyRef_st(scope,attr,expr) ::= "retval.st =<expr>"; /* "<\n>#error StringTemplates are
unsupported<\n>" */

/** How to execute an action */
execAction(action) ::= <<
<if(backtracking)>
if ( <actions.(actionScope).synpredgate> ) {
    <action>
}
<else>
<action>
<endif>
>>

/** How to always execute an action even when backtracking */
execForcedAction(action) ::= "<action>"

// M I S C (properties, etc...)

bitset(name, words64) ::= <<
static ANTLRBitSet *<name>;
static const unsigned long long <name>_data[] = { <words64:{it | <it>LL};separator=", ">>};<\n>

```

>>

```
bitsetInit(name, words64) ::= <<
<name> = [[ANTLRBitSet newBitSetWithBits:(const unsigned long long *)<name>_data
Count:(NSUInteger)<length(words64)>] retain];<n>
>>
```

```
codeFileExtension() ::= ".m"
```

```
true_value() ::= "YES"
```

```
false_value() ::= "NO"
```

Found in path(s):

```
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-
jar/org/antlr/codegen/templates/ObjC/ObjC.stg
```

No license file was found, but licenses were detected in source scan.

```
/*
```

```
[The "BSD license"]
```

```
Copyright (c) 2005-2006 Terence Parr
```

```
Copyright (c) 2007-2008 Ronald Blaschke
```

```
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```

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```
*/
```

```
group Perl5;
```

```

/** The overall file structure of a recognizer; stores methods for rules
 * and cyclic DFAs plus support code.
 */
outputFile(LEXER,PARSER,TREE_PARSER, actionScope, actions,
           docComment, recognizer,
           name, tokens, tokenNames, rules, cyclicDFAs,
           bitsets, buildTemplate, buildAST, rewriteMode, profile,
           backtracking, synpreds, memoize, numRules,
           fileName, ANTLRVersion, generatedTimestamp, trace,
           scopes, superClass, literals) ::=
<<
# $ANTLR <ANTLRVersion> <fileName> <generatedTimestamp>
<actions.(actionScope).header>

<@imports>
<if(TREE_PARSER)>
<endif>
<if(backtracking)>
<endif>
<@end>

<docComment>
<recognizer>
>>

lexer(grammar, name, tokens, scopes, rules, numRules, labelType="Token",
       filterMode, superClass="ANTLR::Runtime::Lexer") ::= <<
package <name>;

use Carp;
use English qw( -no_match_vars );
use Readonly;
use Switch;

use ANTLR::Runtime::BaseRecognizer;
use ANTLR::Runtime::DFA;
use ANTLR::Runtime::NoViableAltException;

use Moose;

extends 'ANTLR::Runtime::Lexer';

Readonly my $HIDDEN => ANTLR::Runtime::BaseRecognizer->HIDDEN;
sub HIDDEN { $HIDDEN }

use constant {
  <tokens:{ <it.name> => <it.type>, }; separator="\n">
};

```

```

<scopes:{<if(it.isDynamicGlobalScope)><globalAttributeScope(scope=it)><endif>}>
<actions.lexer.members>

sub BUILD {
    my ($self, $arg_ref) = @_ ;

    $self->init_dfas();
}

sub get_grammar_file_name {
    return "<fileName>";
}

<if(filterMode)>
<filteringNextToken()>
<endif>
<rules; separator="\n\n">

<synpreds:{p | <lexerSynpred(p)>}>

<cyclicDFAs:{dfa | has 'dfa<dfa.decisionNumber>';}; separator="\n">

sub init_dfas {
    my ($self) = @_ ;

    <cyclicDFAs:{dfa |
    $self->dfa<dfa.decisionNumber>(<name>::DFA<dfa.decisionNumber>->new({ recognizer => $self }));
    }; separator="\n">

    return;
}

<cyclicDFAs:cyclicDFA()> <! dump tables for all DFA !>

no Moose;
__PACKAGE__->meta->make_immutable();
1;

>>

perlTypeInitMap ::= [
    "$":"undef",
    "@":"()",
    "%":"()",
    default:"undef"
]

/** A override of Lexer.nextToken() that backtracks over mTokens() looking

```

- * for matches. No error can be generated upon error; just rewind, consume
- * a token and then try again. backtracking needs to be set as well.
- * Make rule memoization happen only at levels above 1 as we start mTokens
- * at backtracking==1.

*/

filteringNextToken() ::= <<

```
public Token nextToken() {
    while (true) {
        if ( input.LA(1)==CharStream.EOF ) {
            return Token.EOF_TOKEN;
        }
        token = null;
channel = Token.DEFAULT_CHANNEL;
        tokenStartCharIndex = input.index();
        tokenStartCharPositionInLine = input.getCharPositionInLine();
        tokenStartLine = input.getLine();
text = null;
        try {
            int m = input.mark();
            backtracking=1; <!-- means we won't throw slow exception !>
            failed=false;
            mTokens();
            backtracking=0;
            <!-- mTokens backtracks with synpred at backtracking==2
            and we set the synpredgate to allow actions at level 1. !>
            if ( failed ) {
                input.rewind(m);
                input.consume(); <!-- advance one char and try again !>
            }
            else {
                emit();
                return token;
            }
        }
        catch (RecognitionException re) {
            // shouldn't happen in backtracking mode, but...
            reportError(re);
            recover(re);
        }
    }
}
```

```
public void memoize(IntStream input,
    int ruleIndex,
    int ruleStartIndex)
{
    if ( backtracking>1 ) super.memoize(input, ruleIndex, ruleStartIndex);
}
```

```

public boolean alreadyParsedRule(IntStream input, int ruleIndex) {
if ( backtracking>1 ) return super.alreadyParsedRule(input, ruleIndex);
return false;
}
>>

actionGate() ::= "$self->state->backtracking==0"

filteringActionGate() ::= "backtracking==1"

/** How to generate a parser */
genericParser(grammar, name, scopes, tokens, tokenNames, rules, numRules,
    bitsets, inputStreamType, superClass, filterMode,
    ASTLabelType="Object", labelType, members) ::= <<
package <name>;

use English qw( -no_match_vars );
use Readonly;
use Switch;
use Carp;
use ANTLR::Runtime::BitSet;

use Moose;

extends '<@superClassName><superClass><@end>';

Readonly my $token_names => [
    "\<invalid>", "\<EOR>", "\<DOWN>", "\<UP>", <tokenNames; separator=", ">
];

use constant {
<tokens:{ <it.name> => <it.type>, }; separator="\n">
};

<bitsets:bitset(name={FOLLOW_<it.name>_in_<it.inName><it.tokenIndex>},
    words64=it.bits)>

<scopes:{<if(it.isDynamicGlobalScope)><globalAttributeScope(scope=it)><endif>}>
<@members>
<! WARNING. bug in ST: this is cut-n-paste into Dbg.stg !>

sub BUILD {
    my ($self, $arg_ref) = @_;

<if(backtracking)>
    $self->state->rule_memo({});<\n>
<endif>

```



```

}
<@end>

sub get_token_names {
    return $token_names;
}

sub get_grammar_file_name {
    return "<fileName>";
}

<members>

<rules; separator="\n\n">

<synpreds:{ p | <synpred(p)>}>

<cyclicDFAs:{ dfa | dfa<dfa.decisionNumber> = __PACKAGE__::DFA<dfa.decisionNumber>->new($self);};
separator="\n">
<cyclicDFAs:cyclicDFA(> <! dump tables for all DFA !>

no Moose;
__PACKAGE__->meta->make_immutable();
1;
__END__
>>

parser(grammar, name, scopes, tokens, tokenNames, rules, numRules, bitsets, ASTLabelType,
superClass="ANTLR::Runtime::Parser", labelType="ANTLR::Runtime::Token",
members={<actions.parser.members>}) ::= <<
<genericParser(inputStreamType="ANTLR::Runtime::TokenStream", ...)>
>>

/** How to generate a tree parser; same as parser except the input
 * stream is a different type.
 */
treeParser(grammar, name, scopes, tokens, tokenNames, globalAction, rules, numRules, bitsets,
labelType={<ASTLabelType>}, ASTLabelType="Object", superClass="ANTLR::Runtime::TreeParser",
members={<actions.treeparser.members>}, filterMode) ::= <<
<genericParser(inputStreamType="TreeNodeStream", ...)>
>>

/** A simpler version of a rule template that is specific to the imaginary
 * rules created for syntactic predicates. As they never have return values
 * nor parameters etc..., just give simplest possible method. Don't do
 * any of the normal memoization stuff in here either; it's a waste.
 * As predicates cannot be inlined into the invoking rule, they need to
 * be in a rule by themselves.

```

```

*/
synpredRule(ruleName, ruleDescriptor, block, description, nakedBlock) ::=
<<
# $ANTLR start <ruleName>
sub <ruleName>_fragment {
# <ruleDescriptor.parameterScope:parameterScope(scope=it)>

<if(trace)>
  $self->traceIn("<ruleName>_fragment", <ruleDescriptor.index>);
  eval {
    <block>
  };
  $self->traceOut("<ruleName>_fragment", <ruleDescriptor.index>);
  if ($EVAL_ERROR) {
    croak $EVAL_ERROR;
  }
<else>
  <block>
<endif>
}
# $ANTLR end <ruleName>
>>

```

```

synpred(name) ::= <<
public final boolean <name>() {
  backtracking++;
  <@start()>
  int start = input.mark();
  try {
    <name>_fragment(); // can never throw exception
  } catch (RecognitionException re) {
    System.err.println("impossible: "+re);
  }
  boolean success = !failed;
  input.rewind(start);
  <@stop()>
  backtracking--;
  failed=false;
  return success;
}<\n>
>>

```

```

lexerSynpred(name) ::= <<
<synpred(name)>
>>

```

```

ruleMemoization(name) ::= <<
<if(memoize)>

```

```

if ( backtracking>0 && alreadyParsedRule(input, <ruleDescriptor.index> ) ) { return <ruleReturnValue(); }
<endif>
>>

/** How to test for failure and return from rule */
checkRuleBacktrackFailure() ::= <<
<if(backtracking)>
if ($self->state->failed) {
    return <ruleReturnValue();
}
<endif>
>>

/** This rule has failed, exit indicating failure during backtrack */
ruleBacktrackFailure() ::= <<
<if(backtracking)>if (backtracking>0) { failed=true; return <ruleReturnValue();}<endif>
>>

/** How to generate code for a rule. This includes any return type
 * data aggregates required for multiple return values.
 */
rule(ruleName,ruleDescriptor,block,emptyRule,description,exceptions,finally,memoize) ::= <<
<ruleAttributeScope(scope=ruleDescriptor.ruleScope)>
<returnScope(scope=ruleDescriptor.returnScope)>

# $ANTLR start <ruleName>
# <fileName>:<description>
sub <ruleName>() {
    my ($self, <ruleDescriptor.parameterScope:parameterScope(scope=it)>) = @_ ;
    <if(trace)>$self->traceIn("<ruleName>", <ruleDescriptor.index>);<endif>
    <ruleScopeSetUp()>
    <ruleDeclarations()>
    <ruleLabelDefs()>
    <ruleDescriptor.actions.init>
    <@preamble()>
    eval {
        <ruleMemoization(name=ruleName)>
        <block>
        <ruleCleanUp()>
        <(ruleDescriptor.actions.after):execAction()>
    };
    <if(exceptions)>
        <exceptions:{e|<catch(decl=e.decl,action=e.action)><n>}>
    <else>
    <if(!emptyRule)>
    <if(actions.(actionScope).rulecatch)>
        <actions.(actionScope).rulecatch>
    <else>

```

```

my $exception = $EVAL_ERROR;
if (ref $exception && $exception->isa('ANTLR::Runtime::RecognitionException')) {
    $self->report_error($exception);
    $self->recover($self->input, $exception);
    $exception = undef;
}
<\n>
<endif>
<endif>
<endif>
<if(trace)>$self->traceOut("<ruleName>", <ruleDescriptor.index>);<endif>
<memoize()>
<ruleScopeCleanUp()>
<finally>
if ($exception) {
    croak $exception;
    # $exception->rethrow();
}
<@postamble()>
return <ruleReturnValue()>;
}
# $ANTLR end <ruleName>
>>

catch(decl,action) ::= <<
catch (<e.decl>) {
    <e.action>
}
>>

ruleDeclarations() ::= <<
<if(ruleDescriptor.hasMultipleReturnValues)>
my $retval = <returnType()>->new();
$retval->set_start($self->input->LT(1));<\n>
<else>
<ruleDescriptor.returnScope.attributes:{ a |
my $<a.name> = <if(a.initValue)><a.initValue><else><initValue(a.type)><endif>;
}>
<endif>
<if(memoize)>
my $<ruleDescriptor.name>_start_index = $self->input->index();
<endif>
>>

ruleScopeSetUp() ::= <<
<ruleDescriptor.useScopes:{<it>_stack.push(new <it>_scope());}; separator="\n">
<ruleDescriptor.ruleScope:{<it.name>_stack.push(new <it.name>_scope());}; separator="\n">
>>

```

```

ruleScopeCleanUp() ::= <<
<ruleDescriptor.useScopes:{<it>_stack.pop();}; separator="\n">
<ruleDescriptor.ruleScope:{<it.name>_stack.pop();}; separator="\n">
>>

```

```

ruleLabelDefs() ::= <<
<[ruleDescriptor.tokenLabels,ruleDescriptor.tokenListLabels]
: {my $<it.label.text> = undef;}; separator="\n"
>
<[ruleDescriptor.tokenListLabels,ruleDescriptor.ruleListLabels]
: {List list_<it.label.text>=null;}; separator="\n"
>
<ruleDescriptor.ruleLabels:ruleLabelDef(label=it); separator="\n">
<ruleDescriptor.ruleListLabels: {||RuleReturnScope <ll.label.text> = null;}; separator="\n">
>>

```

```

lexerRuleLabelDefs() ::= <<
<[ruleDescriptor.tokenLabels,
ruleDescriptor.tokenListLabels,
ruleDescriptor.ruleLabels]
: {<labelType> <it.label.text>=null;}; separator="\n"
>
<ruleDescriptor.charLabels: {my $<it.label.text>;}; separator="\n">
<[ruleDescriptor.tokenListLabels,
ruleDescriptor.ruleListLabels,
ruleDescriptor.ruleListLabels]
: {List list_<it.label.text>=null;}; separator="\n"
>
>>

```

```

ruleReturnValue() ::= <<
<if(!ruleDescriptor.isSynPred)>
<if(ruleDescriptor.hasReturnValue)>
<if(ruleDescriptor.hasSingleReturnValue)>
$<ruleDescriptor.singleValueReturnName>
<else>
$retval
<endif>
<endif>
<endif>
>>

```

```

ruleCleanUp() ::= <<
<if(ruleDescriptor.hasMultipleReturnValues)>
<if(!TREE_PARSER)>
$retval->set_stop($self->input->LT(-1));<\n>
<endif>
<endif>

```

```

>>

memoize() ::= <<
<if(memoize)>
<if(backtracking)>
if ( backtracking>0 ) { memoize(input, <ruleDescriptor.index>, <ruleDescriptor.name>_StartIndex); }
<endif>
<endif>
>>

/** How to generate a rule in the lexer; naked blocks are used for
 * fragment rules.
 */
lexerRule(ruleName,nakedBlock,ruleDescriptor,block,memoize) ::= <<
# $ANTLR start <ruleName>
sub m_<ruleName> {
# <ruleDescriptor.parameterScope:parameterScope(scope=it)>
my ($self) = @_;
<if(trace)>traceIn("<ruleName>", <ruleDescriptor.index>);<endif>
<ruleDeclarations()>
eval {
<if(nakedBlock)>
<ruleMemoization(name=ruleName)>
<lexerRuleLabelDefs()>
<ruleDescriptor.actions.init>
<block><\n>
<else>
my $_type = <ruleName>;
my $_channel = $self->DEFAULT_TOKEN_CHANNEL;
<ruleMemoization(name=ruleName)>
<lexerRuleLabelDefs()>
<ruleDescriptor.actions.init>
<block>
<ruleCleanUp()>
$self->state->type($_type);
$self->state->channel($_channel);
<(ruleDescriptor.actions.after):execAction()>
<endif>
};
<if(trace)>traceOut("<ruleName>", <ruleDescriptor.index>);<endif>
<memoize()>

if ($EVAL_ERROR) {
croak $EVAL_ERROR;
}
}
# $ANTLR end <ruleName>
>>

```

```

/** How to generate code for the implicitly-defined lexer grammar rule
 * that chooses between lexer rules.
 */
tokensRule(ruleName,nakedBlock,args,block,ruleDescriptor) ::= <<
sub m_tokens {
  my ($self) = @_;
  <block><\n>
}
>>

// S U B R U L E S

/** A (...) subrule with multiple alternatives */
block(alts,decls,decision,enclosingBlockLevel,blockLevel,decisionNumber,maxK,maxAlt,description) ::= <<
# <fileName>:<description>
my $alt<decisionNumber> = <maxAlt>;
<decls>
<@predecision()>
<decision>
<@postdecision()>
<@prebranch()>
switch ($alt<decisionNumber>) {
  <alts:altSwitchCase()>
}
<@postbranch()>
>>

/** A rule block with multiple alternatives */
ruleBlock(alts,decls,decision,enclosingBlockLevel,blockLevel,decisionNumber,maxK,maxAlt,description) ::= <<
# <fileName>:<description>
my $alt<decisionNumber> = <maxAlt>;
<decls>
<@predecision()>
<decision>
<@postdecision()>
switch ($alt<decisionNumber>) {
  <alts:altSwitchCase()>
}
>>

ruleBlockSingleAlt(alts,decls,decision,enclosingBlockLevel,blockLevel,decisionNumber,description) ::= <<
# <fileName>:<description>
<decls>
<@prealt()>
<alts>
<@postalt()>
>>

```

```

/** A special case of a (...) subrule with a single alternative */
blockSingleAlt(alts,decls,decision,enclosingBlockLevel,blockLevel,decisionNumber,description) ::= <<
# <fileName>:<description>
<decls>
<@prealt()>
<alts>
<@postalt()>
>>

/** A (..)+ block with 1 or more alternatives */
positiveClosureBlock(alts,decls,decision,enclosingBlockLevel,blockLevel,decisionNumber,maxK,maxAlt,description) ::= <<
# <fileName>:<description>
my $cnt<decisionNumber> = 0;
<decls>
<@preloop()>
LOOP<decisionNumber>:
while (1) {
  my $alt<decisionNumber> = <maxAlt>;
  <@predecision()>
  <decision>
  <@postdecision()>
  switch ($alt<decisionNumber>) {
    <alts:altSwitchCase()>
    else {
      if ( $cnt<decisionNumber> >= 1 ) { last LOOP<decisionNumber> }
      <ruleBacktrackFailure()>
      my $see =
        ANTLR::Runtime::EarlyExitException->new(<decisionNumber>, $self->input);
      <@earlyExitException()>
      croak $see;
    }
  }
  ++$cnt<decisionNumber>;
}
<@postloop()>
>>

positiveClosureBlockSingleAlt ::= positiveClosureBlock

```

```

/** A (..)* block with 1 or more alternatives */
closureBlock(alts,decls,decision,enclosingBlockLevel,blockLevel,decisionNumber,maxK,maxAlt,description) ::= <<
# <fileName>:<description>
<decls>
<@preloop()>
LOOP<decisionNumber>:

```



```

while (1) {
  my $alt<decisionNumber> = <maxAlt>;
  <@predecision()>
  <decision>
  <@postdecision()>
  switch ($alt<decisionNumber>) {
    <alts:altSwitchCase()>
    else { last LOOP<decisionNumber> }
  }
}
<@postloop()>
>>

```

```
closureBlockSingleAlt ::= closureBlock
```

```

/** Optional blocks (x)? are translated to (x|) by before code generation
 * so we can just use the normal block template
 */

```

```
optionalBlock ::= block
```

```
optionalBlockSingleAlt ::= block
```

```

/** A case in a switch that jumps to an alternative given the alternative
 * number. A DFA predicts the alternative and then a simple switch
 * does the jump to the code that actually matches that alternative.
 */

```

```

altSwitchCase() ::= <<
case <i> {
  <@prealt()>
  <it>
}<\n>
>>

```

```

/** An alternative is just a list of elements; at outermost level */
alt(elements,altNum,description,autoAST,outerAlt,treeLevel,rew) ::= <<
# <fileName>:<description>
{
  <@declarations()>
  <elements:element()>
  <rew>
  <@cleanup()>
}
>>

```

```

/** What to emit when there is no rewrite. For auto build
 * mode, does nothing.
 */
noRewrite(rewriteBlockLevel, treeLevel) ::= ""

```

```

// ELEMENTS

/** Dump the elements one per line */
element() ::= <<
<@prematch(>
<it.el><\n>
>>

/** match a token optionally with a label in front */
tokenRef(token,label,elementIndex,terminalOptions) ::= <<
<if(label)>$<label> =<endif>$self->match($self->input, <token>,
$FOLLOW_<token>_in_<ruleName><elementIndex>);
<checkRuleBacktrackFailure(>
>>

/** ids+=ID */
tokenRefAndListLabel(token,label,elementIndex,terminalOptions) ::= <<
<tokenRef(...>
<listLabel(elem=label,...>
>>

listLabel(label,elem) ::= <<
if (list_<label>==null) list_<label>=new ArrayList();
list_<label>.add(<elem>);<\n>
>>

/** match a character */
charRef(char,label) ::= <<
<if(label)>
<label> = $self->input->LA(1);<\n>
<endif>
$self->match(<char>); <checkRuleBacktrackFailure(>
>>

/** match a character range */
charRangeRef(a,b,label) ::= <<
<if(label)>
<label> = $self->input->LA(1);<\n>
<endif>
$self->match_range(<a>,<b>); <checkRuleBacktrackFailure(>
>>

/** For now, sets are interval tests and must be tested inline */
matchSet(s,label,elementIndex,postmatchCode="") ::= <<
<if(label)>
<if(LEXER)>
<label>= $self->input->LA(1);<\n>

```

```

<else>
<label>=(<labelType>)input.LT(1);<\n>
<endif>
<endif>
if ( <s> ) {
    $self->input->consume();
    <postmatchCode>
<if(!LEXER)>
    $self->state->error_recovery(0);
<endif>
    <if(backtracking)>failed=false;<endif>
}
else {
    <ruleBacktrackFailure()>
    my $mse =
        ANTLR::Runtime::MismatchedSetException->new(undef, $self->input);
    <@mismatchedSetException()>
<if(LEXER)>
    $self->recover($mse);
    $mse->throw();
<else>
    $mse->throw();
    <! use following code to make it recover inline; remove throw mse;
    $self->recoverFromMismatchedSet($self->input, $mse, $FOLLOW_set_in_<ruleName><elementIndex>);
    !>
<endif>
}<\n>
>>

matchRuleBlockSet ::= matchSet

matchSetAndListLabel(s,label,elementIndex,postmatchCode) ::= <<
<matchSet(...)>
<listLabel(elem=label,...)>
>>

/** Match a string literal */
lexerStringRef(string,label,elementIndex) ::= <<
<if(label)>
int <label>Start = getCharIndex();
$self->match(<string>); <checkRuleBacktrackFailure()>
<labelType> <label> = new CommonToken(input, Token.INVALID_TOKEN_TYPE,
Token.DEFAULT_CHANNEL, <label>Start, getCharIndex()-1);
<else>
$self->match(<string>); <checkRuleBacktrackFailure()><\n>
<endif>
>>

```

```
wildcard(label,elementIndex) ::= <<
<if(label)>
<label>=(<labelType>)input.LT(1);<\n>
<endif>
matchAny(input); <checkRuleBacktrackFailure()>
>>
```

```
wildcardAndListLabel(label,elementIndex) ::= <<
<wildcard(...)>
<listLabel(elem=label,...)>
>>
```

```
/** Match . wildcard in lexer */
wildcardChar(label, elementIndex) ::= <<
<if(label)>
<label> = $self->input->LA(1);<\n>
<endif>
matchAny(); <checkRuleBacktrackFailure()>
>>
```

```
wildcardCharListLabel(label, elementIndex) ::= <<
<wildcardChar(...)>
<listLabel(elem=label,...)>
>>
```

```
/** Match a rule reference by invoking it possibly with arguments
 * and a return value or values.
 */
ruleRef(rule,label,elementIndex,args,scope) ::= <<
$self->push_follow($FOLLOW_<rule.name>_in_<ruleName><elementIndex>);
<if(label)>
$self-><rule.name>(<args; separator="," ">);<\n>
<else>
$self-><rule.name>(<args; separator="," ">);<\n>
<endif>
$self->state->_fsp($self->state->_fsp - 1);
<checkRuleBacktrackFailure()>
>>
```

```
/** ids+=r */
ruleRefAndListLabel(rule,label,elementIndex,args,scope) ::= <<
<ruleRef(...)>
<listLabel(elem=label,...)>
>>
```

```
/** A lexer rule reference.
 *
 * The 'rule' argument was the target rule name, but now
```

```

* is type Rule, whose toString is same: the rule name.
* Now though you can access full rule descriptor stuff.
*/
lexerRuleRef(rule,label,args,elementIndex,scope) ::= <<
<if(label)>
int <label>Start<elementIndex> = getCharIndex();
$self->m_<rule><(args; separator=" "> <checkRuleBacktrackFailure()>
<label> = new CommonToken(input, Token.INVALID_TOKEN_TYPE, Token.DEFAULT_CHANNEL,
<label>Start<elementIndex>, getCharIndex()-1);
<else>
$self->m_<rule.name><(args; separator=" "> <checkRuleBacktrackFailure()>
<endif>
>>

/** i+=INT in lexer */
lexerRuleRefAndListLabel(rule,label,args,elementIndex,scope) ::= <<
<lexerRuleRef(...)>
<listLabel(elem=label,...)>
>>

/** EOF in the lexer */
lexerMatchEOF(label,elementIndex) ::= <<
<if(label)>
int <label>Start<elementIndex> = getCharIndex();
match(EOF); <checkRuleBacktrackFailure()>
<labelType> <label> = new CommonToken(input, EOF, Token.DEFAULT_CHANNEL,
<label>Start<elementIndex>, getCharIndex()-1);
<else>
match(EOF); <checkRuleBacktrackFailure()>
<endif>
>>

/** match ^(root children) in tree parser */
tree(root, actionsAfterRoot, children, nullableChildList,
enclosingTreeLevel, treeLevel) ::= <<
<root:element()>
<actionsAfterRoot:element()>
<if(nullableChildList)>
if ( input.LA(1)==Token.DOWN ) {
    match(input, Token.DOWN, null); <checkRuleBacktrackFailure()>
    <children:element()>
    match(input, Token.UP, null); <checkRuleBacktrackFailure()>
}
<else>
match(input, Token.DOWN, null); <checkRuleBacktrackFailure()>
<children:element()>
match(input, Token.UP, null); <checkRuleBacktrackFailure()>
<endif>

```

```

>>

/** Every predicate is used as a validating predicate (even when it is
 * also hoisted into a prediction expression).
 */
validateSemanticPredicate(pred,description) ::= <<
if ( !( <evalPredicate(...)> ) ) {
    <ruleBacktrackFailure()>
    throw new FailedPredicateException(input, "<ruleName>", "<description>");
}
>>

// F i x e d D F A (if-then-else)

dfaState(k,edges,eotPredictsAlt,description,stateNumber,semPredState) ::= <<
my $LA<decisionNumber>_<stateNumber> = $self->input->LA(<k>);<\n>
<edges; separator="\nls">
else {
<if(eotPredictsAlt)>
    $alt<decisionNumber> = <eotPredictsAlt>;
<else>
    <ruleBacktrackFailure()>
    my $nvae =
        ANTLR::Runtime::NoViableAltException->new({
            grammar_decision_description => "<description>",
            decision_number => <decisionNumber>,
            state_number => <stateNumber>,
            input => $self->input,
        });<\n>
    <@noViableAltException()>
    croak $nvae;<\n>
<endif>
}
>>

/** Same as a normal DFA state except that we don't examine lookahead
 * for the bypass alternative. It delays error detection but this
 * is faster, smaller, and more what people expect. For (X)? people
 * expect "if ( LA(1)==X ) match(X);" and that's it.
 */
dfaOptionalBlockState(k,edges,eotPredictsAlt,description,stateNumber,semPredState) ::= <<
my $LA<decisionNumber>_<stateNumber> = $self->input->LA(<k>);<\n>
<edges; separator="\nls">
>>

/** A DFA state that is actually the loopback decision of a closure
 * loop. If end-of-token (EOT) predicts any of the targets then it
 * should act like a default clause (i.e., no error can be generated).

```

```

* This is used only in the lexer so that for ('a')* on the end of a rule
* anything other than 'a' predicts exiting.
*/
dfaLoopbackState(k,edges,eotPredictsAlt,description,stateNumber,semPredState) ::= <<
my $LA<decisionNumber>_<stateNumber> = $self->input->LA(<k>);<\n>
<edges; separator="\nls"><\n>
<if(eotPredictsAlt)>
<if(!edges)>
$alt<decisionNumber> = <eotPredictsAlt>; <! if no edges, don't gen ELSE !>
<else>
else {
    $alt<decisionNumber> = <eotPredictsAlt>;
}<\n>
<endif>
<endif>
>>

```

```

/** An accept state indicates a unique alternative has been predicted */
dfaAcceptState(alt) ::= "$alt<decisionNumber> = <alt>";

```

```

/** A simple edge with an expression. If the expression is satisfied,
* enter to the target state. To handle gated productions, we may
* have to evaluate some predicates for this edge.
*/
dfaEdge(labelExpr, targetState, predicates) ::= <<
if ( (<labelExpr> <if(predicates)>&& (<predicates>)<endif> ) {
    <targetState>
}
>>

```

```

// F i x e d D F A (switch case)

```

```

/** A DFA state where a SWITCH may be generated. The code generator
* decides if this is possible: CodeGenerator.canGenerateSwitch().
*/
dfaStateSwitch(k,edges,eotPredictsAlt,description,stateNumber,semPredState) ::= <<
switch ( $self->input->LA(<k> ) ) {
    <edges; separator="\n">
    else {
    <if(eotPredictsAlt)>
        $alt<decisionNumber> = <eotPredictsAlt>;
    <else>
    <ruleBacktrackFailure()>
    my $nvae =
        ANTLR::Runtime::NoViableAltException->new({
            grammar_decision_description => "<description>",
            decision_number => <decisionNumber>,
            state_number => <stateNumber>,

```

```

        input => $self->input,
    });<\n>
    <@noViableAltException()>
    croak $nvae;<\n>
<endif>
}
}<\n>
>>

dfaOptionalBlockStateSwitch(k,edges,eotPredictsAlt,description,stateNumber,semPredState) ::= <<
switch ( $self->input->LA(<k> ) ) {
    <edges; separator="\n">
}<\n>
>>

dfaLoopbackStateSwitch(k, edges,eotPredictsAlt,description,stateNumber,semPredState) ::= <<
switch ( $self->input->LA(<k> ) ) {
    <edges; separator="\n"><\n>
    <if(eotPredictsAlt)>
    else { $alt<decisionNumber> = <eotPredictsAlt> }<\n>
    <endif>
}<\n>
>>

dfaEdgeSwitch(labels, targetState) ::= <<
case [<labels: { <it> }; separator=", ">] { <targetState> }
>>

// C y c l i c D F A

/** The code to initiate execution of a cyclic DFA; this is used
 * in the rule to predict an alt just like the fixed DFA case.
 * The <name> attribute is inherited via the parser, lexer, ...
 */
dfaDecision(decisionNumber,description) ::= <<
$alt<decisionNumber> = $self->dfa<decisionNumber>->predict($self->input);
>>

/* Dump DFA tables as run-length-encoded Strings of octal values.
 * Can't use hex as compiler translates them before compilation.
 * These strings are split into multiple, concatenated strings.
 * Java puts them back together at compile time thankfully.
 * Java cannot handle large static arrays, so we're stuck with this
 * encode/decode approach. See analysis and runtime DFA for
 * the encoding methods.
 */
cyclicDFA(dfa) ::= <<
Readonly my $DFA<dfa.decisionNumber>_eot => ANTLR::Runtime::DFA->unpack_rle([

```



```

<dfa.javaCompressedEOT; separator=", "> ]);
Readonly my $DFA<dfa.decisionNumber>_eof => ANTLR::Runtime::DFA->unpack_rle([
<dfa.javaCompressedEOF; separator=", "> ]);
Readonly my $DFA<dfa.decisionNumber>_min => ANTLR::Runtime::DFA->unpack_rle([
<dfa.javaCompressedMin; separator=", "> ]);
Readonly my $DFA<dfa.decisionNumber>_max => ANTLR::Runtime::DFA->unpack_rle([
<dfa.javaCompressedMax; separator=", "> ]);
Readonly my $DFA<dfa.decisionNumber>_accept => ANTLR::Runtime::DFA->unpack_rle([
<dfa.javaCompressedAccept; separator=", "> ]);
Readonly my $DFA<dfa.decisionNumber>_special => ANTLR::Runtime::DFA->unpack_rle([
<dfa.javaCompressedSpecial; separator=", "> ]);
Readonly my $DFA<dfa.decisionNumber>_transition => [
<dfa.javaCompressedTransition:{s|ANTLR::Runtime::DFA->unpack_rle([ <s; separator=", "> ])}; separator=", "> ];

{
package <name>::DFA<dfa.decisionNumber>;
use ANTLR::Runtime::Class;

use strict;
use warnings;

extends 'ANTLR::Runtime::DFA';

sub BUILD {
    my $self = shift;
    my $param_ref = __PACKAGE__->unpack_params(@_, {
        spec => [
            {
                name => 'recognizer',
                isa => 'ANTLR::Runtime::BaseRecognizer'
            },
        ]
    });

    $self->recognizer($param_ref->{recognizer});
    $self->decision_number(<dfa.decisionNumber>);
    $self->eot($DFA<dfa.decisionNumber>_eot);
    $self->eof($DFA<dfa.decisionNumber>_eof);
    $self->min($DFA<dfa.decisionNumber>_min);
    $self->max($DFA<dfa.decisionNumber>_max);
    $self->accept($DFA<dfa.decisionNumber>_accept);
    $self->special($DFA<dfa.decisionNumber>_special);
    $self->transition($DFA<dfa.decisionNumber>_transition);
}

sub get_description {
    return "<dfa.description>";
}

```

```

<@errorMethod(>

<if(dfa.specialStateSTs)>
sub special_state_transition {
  my ($self, $param_ref) = unpack_params(@_, {
    spec => [
      {
        name => 's',
        type => SCALAR,
      },
      {
        name => 'input',
        isa => 'ANTLR::Runtime::IntStream',
      }
    ]
  });
  my $s = $param_ref->{s};
  my $input = $param_ref->{input};

  switch ($s) {
    <dfa.specialStateSTs:{state |
    case <i0> \{ <! compressed special state numbers 0..n-1 !>
      <state>}; separator="\n">
    }
  }

<if(backtracking)>
  if ($self->state->backtracking > 0) {
    $self->state->failed = 1;
    return -1;
  }<\n>
<endif>

  my $nvae =
    ANTLR::Runtime::NoViableAltException->new({
      grammar_decision_description => $self->get_description(),
      decision_number => <dfa.decisionNumber>,
      state_number => $s,
      input => $input,
    });<\n>
    $self->error($nvae);
    $nvae->throw();
  }<\n>
<endif>
}<\n>
>>

```

```

/** A state in a cyclic DFA; it's a special state and part of a big switch on
 * state.
 */
cyclicDFAState(decisionNumber,stateNumber,edges,needErrorClause,semPredState) ::= <<
my $input = $self->input;
my $LA<decisionNumber>_<stateNumber> = $input->LA(1);<\n>
<if(semPredState)> <! get next lookahead symbol to test edges, then rewind !>
my $index<decisionNumber>_<stateNumber> = $input->index();
$input->rewind();<\n>
<endif>
s = -1;
<edges; separator="\nls">
<if(semPredState)> <! return input cursor to state before we rewound !>
input.seek(index<decisionNumber>_<stateNumber>);<\n>
<endif>
if ( s>=0 ) return s;
break;
>>

/** Just like a fixed DFA edge, test the lookahead and indicate what
 * state to jump to next if successful.
 */
cyclicDFAEdge(labelExpr, targetStateNumber, edgeNumber, predicates) ::= <<
if ( (<labelExpr> <if(predicates)>&& (<predicates>)<endif> ) { s = <targetStateNumber>;}<\n>
>>

/** An edge pointing at end-of-token; essentially matches any char;
 * always jump to the target.
 */
eotDFAEdge(targetStateNumber,edgeNumber, predicates) ::= <<
s = <targetStateNumber>;<\n>
>>

// D F A E X P R E S S I O N S

andPredicates(left,right) ::= "<left> && <right>"

orPredicates(operands) ::= "<operands; separator=\\|\\>"

notPredicate(pred) ::= "!(<evalPredicate(...)>)"

evalPredicate(pred,description) ::= "<pred>"

evalSynPredicate(pred,description) ::= "<pred>()"

lookaheadTest(atom,k,atomAsInt) ::= "$LA<decisionNumber>_<stateNumber> eq <atom>"

```

```

/** Sometimes a lookahead test cannot assume that LA(k) is in a temp variable
 * somewhere. Must ask for the lookahead directly.
 */
isolatedLookaheadTest(atom,k,atomAsInt) ::= "$self->input->LA(<k>) eq <atom>"

lookaheadRangeTest(lower,upper,k,rangeNumber,lowerAsInt,upperAsInt) ::= <<
($LA<decisionNumber>_<stateNumber> ge <lower> && $LA<decisionNumber>_<stateNumber> le <upper>)
>>

isolatedLookaheadRangeTest(lower,upper,k,rangeNumber,lowerAsInt,upperAsInt) ::= "($self->input->LA(<k>) ge
<lower> && $self->input->LA(<k>) le <upper>)"

setTest(ranges) ::= "<ranges; separator=\\\" || \\\">"

// A T T R I B U T E S

globalAttributeScope(scope) ::= <<
<if(scope.attributes)>
protected static class <scope.name>_scope {
    <scope.attributes:{<it.decl>;}; separator=\\\"\\n">
}
protected Stack <scope.name>_stack = new Stack();<\\n>
<endif>
>>

ruleAttributeScope(scope) ::= <<
<if(scope.attributes)>
protected static class <scope.name>_scope {
    <scope.attributes:{<it.decl>;}; separator=\\\"\\n">
}
protected Stack <scope.name>_stack = new Stack();<\\n>
<endif>
>>

returnType() ::= <<
<if(ruleDescriptor.hasMultipleReturnValues)>
<ruleDescriptor.name>_return
<else>
<if(ruleDescriptor.hasSingleReturnValue)>
<ruleDescriptor.singleValueReturnType>
<else>
void
<endif>
<endif>
>>

/** Generate the Java type associated with a single or multiple return
 * values.

```

```

*/
ruleLabelType(referencedRule) ::= <<
<if(referencedRule.hasMultipleReturnValues)>
<referencedRule.name>_return
<else>
<if(referencedRule.hasSingleReturnValue)>
<referencedRule.singleValueReturnType>
<else>
void
<endif>
<endif>
>>

/** Using a type to init value map, try to init a type; if not in table
 * must be an object, default value is "undef".
 */
initValue(typeName) ::= <<
<if(typeName)>
<perlTypeInitMap.(typeName)>
<else>
undef
<endif>
>>

/** Define a rule label including default value */
ruleLabelDef(label) ::= <<
my $<label.label.text> = <initValue(typeName=ruleLabelType(referencedRule=label.referencedRule))>;<\n>
>>

/** Define a return struct for a rule if the code needs to access its
 * start/stop tokens, tree stuff, attributes, ... Leave a hole for
 * subgroups to stick in members.
 */
returnScope(scope) ::= <<
<if(ruleDescriptor.hasMultipleReturnValues)>
{
package <returnType()>;
use ANTLR::Runtime::Class;

extends 'ANTLR::Runtime::<if(TREE_PARSER)>Tree<else>Parser<endif>RuleReturnScope';

<scope.attributes:{public <it.decl>;}; separator="\n">
<@ruleReturnMembers()>
}
<endif>
>>

parameterScope(scope) ::= <<

```

```

<scope.attributes:{$<it.name>}; separator=", ">
>>

parameterAttributeRef(attr) ::= "$<attr.name>"
parameterSetAttributeRef(attr,expr) ::= "$<attr.name> =<expr>";

scopeAttributeRef(scope,attr,index,negIndex) ::= <<
<if(negIndex)>
((<scope>_scope)<scope>_stack.elementAt(<scope>_stack.size()-<negIndex>-1)).<attr.name>
<else>
<if(index)>
((<scope>_scope)<scope>_stack.elementAt(<index>)).<attr.name>
<else>
((<scope>_scope)<scope>_stack.peek()).<attr.name>
<endif>
<endif>
>>

scopeSetAttributeRef(scope,attr,expr,index,negIndex) ::= <<
<if(negIndex)>
((<scope>_scope)<scope>_stack.elementAt(<scope>_stack.size()-<negIndex>-1)).<attr.name> =<expr>;
<else>
<if(index)>
((<scope>_scope)<scope>_stack.elementAt(<index>)).<attr.name> =<expr>;
<else>
((<scope>_scope)<scope>_stack.peek()).<attr.name> =<expr>;
<endif>
<endif>
>>

/** $x is either global scope or x is rule with dynamic scope; refers
 * to stack itself not top of stack. This is useful for predicates
 * like {$function.size()>0 && $function::name.equals("foo")}?
 */
isolatedDynamicScopeRef(scope) ::= "<scope>_stack"

/** reference an attribute of rule; might only have single return value */
ruleLabelRef(referencedRule,scope,attr) ::= <<
<if(referencedRule.hasMultipleReturnValues)>
$<scope>.<attr.name>
<else>
$<scope>
<endif>
>>

returnAttributeRef(ruleDescriptor,attr) ::= <<
<if(ruleDescriptor.hasMultipleReturnValues)>
retval.<attr.name>

```

```

<else>
$<attr.name>
<endif>
>>

returnSetAttributeRef(ruleDescriptor,attr,expr) ::= <<
<if(ruleDescriptor.hasMultipleReturnValues)>
retval.<attr.name> =<expr>;
<else>
$<attr.name> =<expr>;
<endif>
>>

/** How to translate $tokenLabel */
tokenLabelRef(label) ::= "$<label>"

/** ids+=ID {$ids} or e+=expr {$e} */
listLabelRef(label) ::= "list_<label>"

// not sure the next are the right approach

tokenLabelPropertyRef_text(scope,attr) ::= "$<scope>->get_text()"
tokenLabelPropertyRef_type(scope,attr) ::= "<scope>.getType()"
tokenLabelPropertyRef_line(scope,attr) ::= "<scope>.getLine()"
tokenLabelPropertyRef_pos(scope,attr) ::= "<scope>.getCharPositionInLine()"
tokenLabelPropertyRef_channel(scope,attr) ::= "<scope>.getChannel()"
tokenLabelPropertyRef_index(scope,attr) ::= "<scope>.getTokenIndex()"
tokenLabelPropertyRef_tree(scope,attr) ::= "<scope>_tree"

ruleLabelPropertyRef_start(scope,attr) ::= "((<labelType>)<scope>.start)"
ruleLabelPropertyRef_stop(scope,attr) ::= "((<labelType>)<scope>.stop)"
ruleLabelPropertyRef_tree(scope,attr) ::= "((<ASTLabelType>)<scope>.tree)"
ruleLabelPropertyRef_text(scope,attr) ::= <<
<if(TREE_PARSER)>
input.getTokenStream().toString(
input.getTreeAdaptor().getTokenStartIndex(<scope>.start),
input.getTreeAdaptor().getTokenStopIndex(<scope>.start))
<else>
substr($self->input, $<scope>->start, $<scope>->stop)
<endif>
>>

ruleLabelPropertyRef_st(scope,attr) ::= "<scope>.st"

/** Isolated $RULE ref ok in lexer as it's a Token */
lexerRuleLabel(label) ::= "$<label>"

```

```

lexerRuleLabelPropertyRef_type(scope,attr) ::= "<scope>.getType()"
lexerRuleLabelPropertyRef_line(scope,attr) ::= "<scope>.getLine()"
lexerRuleLabelPropertyRef_pos(scope,attr) ::= "<scope>.getCharPositionInLine()"
lexerRuleLabelPropertyRef_channel(scope,attr) ::= "<scope>.getChannel()"
lexerRuleLabelPropertyRef_index(scope,attr) ::= "<scope>.getTokenIndex()"
lexerRuleLabelPropertyRef_text(scope,attr) ::= "<scope>.getText()"

```

```

// Somebody may ref $template or $tree or $stop within a rule:
rulePropertyRef_start(scope,attr) ::= "((<labelType>)retval.start)"
rulePropertyRef_stop(scope,attr) ::= "((<labelType>)retval.stop)"
rulePropertyRef_tree(scope,attr) ::= "((<ASTLabelType>)retval.tree)"
rulePropertyRef_text(scope,attr) ::= <<
<if(TREE_PARSER)>
input.getTokenStream().toString(
input.getTreeAdaptor().getTokenStartIndex(retval.start),
input.getTreeAdaptor().getTokenStopIndex(retval.start))
<else>
input.toString(retval.start,input.LT(-1))
<endif>
>>
rulePropertyRef_st(scope,attr) ::= "retval.st"

```

```

lexerRulePropertyRef_text(scope,attr) ::= "getText()"
lexerRulePropertyRef_type(scope,attr) ::= "$_type"
lexerRulePropertyRef_line(scope,attr) ::= "tokenStartLine"
lexerRulePropertyRef_pos(scope,attr) ::= "tokenStartCharPositionInLine"
lexerRulePropertyRef_index(scope,attr) ::= "-1" // undefined token index in lexer
lexerRulePropertyRef_channel(scope,attr) ::= "$_channel"
lexerRulePropertyRef_start(scope,attr) ::= "tokenStartCharIndex"
lexerRulePropertyRef_stop(scope,attr) ::= "(getCharIndex()-1)"
lexerRulePropertyRef_self(scope,attr) ::= "$self"

```

```

// setting $st and $tree is allowed in local rule. everything else
// is flagged as error
ruleSetPropertyRef_tree(scope,attr,expr) ::= "retval.tree =<expr>";
ruleSetPropertyRef_st(scope,attr,expr) ::= "retval.st =<expr>";

```

```

/** How to execute an action */
execAction(action) ::= <<
<if(backtracking)>
<if(actions.(actionScope).synpredgate)>
if ( <actions.(actionScope).synpredgate> ) {
<action>
}
<else>
if ( backtracking==0 ) {
<action>

```



```

}
<endif>
<else>
<action>
<endif>
>>

// M I S C (properties, etc...)

bitset(name, words64) ::= <<
Readonly my $<name> => ANTLR::Runtime::BitSet->new({ words64 => [ <words64:{'<it>'};separator=", "> ]
});<\n>
>>

```

```
codeFileExtension() ::= ".pm"
```

```
true() ::= "1"
false() ::= "0"
```

Found in path(s):

```
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-
jar/org/antlr/codegen/templates/Perl5/Perl5.stg
```

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```
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```

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*/

/** Templates for building ASTs during tree parsing.

*

* Deal with many combinations. Dimensions are:

* Auto build or rewrite

* no label, label, list label (label/no-label handled together)

* child, root

* token, set, rule, wildcard

*

* Each combination has its own template except that label/no label

* is combined into tokenRef, ruleRef, ...

*/

/** Add a variable to track last element matched */

ruleDeclarations() ::= <<

<super.ruleDeclarations()>

<if(!ruleDescriptor.isSynPred)>

<ASTLabelType> _first_0 = null;

<ASTLabelType> _last = null;<\n>

<endif>

>>

/** What to emit when there is no rewrite rule. For auto build

* mode, does nothing.

*/

noRewrite(rewriteBlockLevel=false, treeLevel=false) ::= <<

<if(!ruleDescriptor.isSynPred)>

<if(backtracking)>if (<actions.(actionScope).synpredgate>) {<endif>

<if(rewriteMode)>

retval.tree = _first_0;

if (adaptor.getParent(retval.tree)!=null && adaptor.isNil(adaptor.getParent(retval.tree)))

retval.tree = (<ASTLabelType>)adaptor.getParent(retval.tree);

<endif>

<if(backtracking)>}<endif>

<endif>

>>

/** match ^(root children) in tree parser; override here to

* add tree construction actions.

*/

tree(root, actionsAfterRoot, children, nullableChildList,

enclosingTreeLevel, treeLevel) ::= <<

<if(!ruleDescriptor.isSynPred)>

_last = (<ASTLabelType>)input.LT(1);

{

```

<ASTLabelType> _save_last_<treeLevel> = _last;
<ASTLabelType> _first_<treeLevel> = null;
<if(!rewriteMode)>
<ASTLabelType> root_<treeLevel> = (<ASTLabelType>)adaptor.nil();
<endif>
<root:element()>
<if(rewriteMode)>
<if(backtracking)>if ( <actions.(actionScope).synpredgate> )<endif>
<if(root.el.rule)>
if ( _first_<enclosingTreeLevel>==null ) _first_<enclosingTreeLevel> =
(<ASTLabelType>)<root.el.label>.getTree();
<elseif(root.el.label)>
if ( _first_<enclosingTreeLevel>==null ) _first_<enclosingTreeLevel> = <root.el.label>;
<endif>
<endif>
<actionsAfterRoot:element()>
<if(nullableChildList)>
if ( input.LA(1)==Token.DOWN ) {
  match(input, Token.DOWN, null); <checkRuleBacktrackFailure()>
  <children:element()>
  match(input, Token.UP, null); <checkRuleBacktrackFailure()>
}
<else>
match(input, Token.DOWN, null); <checkRuleBacktrackFailure()>
<children:element()>
match(input, Token.UP, null); <checkRuleBacktrackFailure()>
<endif>
<if(!rewriteMode)>
adaptor.addChild(root_<enclosingTreeLevel>, root_<treeLevel>);
<endif>
_last = _save_last_<treeLevel>;
}<\n>
<else>
<super.tree(...)>
<endif>
>>

```

```
// TOKEN AST STUFF
```

```

/** ID! and output=AST (same as plain tokenRef) 'cept add
 * setting of _last
 */
tokenRefBang(token,label,elementIndex,terminalOptions={ }) ::= <<
<if(!ruleDescriptor.isSynPred)>
_last = (<ASTLabelType>)input.LT(1);
<super.tokenRef(...)>
<else>
<super.tokenRefBang(...)>

```

```

<endif>
>>

/** ID auto construct */
tokenRef(token,label,elementIndex,terminalOptions={}) ::= <<
<if(!ruleDescriptor.isSynPred)>
  _last = (<ASTLabelType>)input.LT(1);
<super.tokenRef(...)>
<if(!rewriteMode)>
<if(backtracking)>if ( <actions.(actionScope).synpredgate> ) {<endif>
<if(terminalOptions.node)>
<label>_tree = new <terminalOptions.node>(<label>);
<else>
<label>_tree = (<ASTLabelType>)adaptor.dupNode(<label>);
<endif><\n>
adaptor.addChild(root_<treeLevel>, <label>_tree);
<if(backtracking)>}<endif>
<else> <! rewrite mode !>
<if(backtracking)>if ( <actions.(actionScope).synpredgate> )<endif>
if ( _first_<treeLevel>==null ) _first_<treeLevel> = <label>;
<endif>
<else>
<super.tokenRef(...)>
<endif>
>>

/** label+=TOKEN auto construct */
tokenRefAndListLabel(token,label,elementIndex,terminalOptions={}) ::= <<
<if(!ruleDescriptor.isSynPred)>
<tokenRef(...)>
<listLabel(elem=label,...)>
<else>
<super.tokenRefAndListLabel(...)>
<endif>
>>

/** ^(ID ...) auto construct */
tokenRefRuleRoot(token,label,elementIndex,terminalOptions={}) ::= <<
<if(!ruleDescriptor.isSynPred)>
  _last = (<ASTLabelType>)input.LT(1);
<super.tokenRef(...)>
<if(!rewriteMode)>
<if(backtracking)>if ( <actions.(actionScope).synpredgate> ) {<endif>
<if(terminalOptions.node)>
<label>_tree = new <terminalOptions.node>(<label>);
<else>
<label>_tree = (<ASTLabelType>)adaptor.dupNode(<label>);
<endif><\n>

```

```

root_<treeLevel> = (<ASTLabelType>)adaptor.becomeRoot(<label>_tree, root_<treeLevel>);
<if(backtracking)>}<endif>
<endif>
<else>
<super.tokenRefRuleRoot(...)>
<endif>
>>

/** Match ^(label+=TOKEN ...) auto construct */
tokenRefRuleRootAndListLabel(token,label,elementIndex,terminalOptions={}) ::= <<
<if(!ruleDescriptor.isSynPred)>
<tokenRefRuleRoot(...)>
<listLabel(elem=label,...)>
<else>
<super.tokenRefRuleRootAndListLabel(...)>
<endif>
>>

/** Match . wildcard and auto dup the node/subtree */
wildcard(token,label,elementIndex,terminalOptions={}) ::= <<
<if(!ruleDescriptor.isSynPred)>
_last = (<ASTLabelType>)input.LT(1);
<super.wildcard(...)>
<if(!rewriteMode)>
<if(backtracking)>if ( <actions.(actionScope).synpredgate> ) {<endif>
<label>_tree = (<ASTLabelType>)adaptor.dupTree(<label>);
adaptor.addChild(root_<treeLevel>, <label>_tree);
<if(backtracking)>}<endif>
<else> <! rewrite mode !>
<if(backtracking)>if ( <actions.(actionScope).synpredgate> )<endif>
if ( _first_<treeLevel>==null ) _first_<treeLevel> = <label>;
<endif>
<else>
<super.wildcard(...)>
<endif>
>>

// SET AST

matchSet(s,label,elementIndex,postmatchCode,terminalOptions={}) ::= <<
<if(!ruleDescriptor.isSynPred)>
_last = (<ASTLabelType>)input.LT(1);
<super.matchSet(postmatchCode={
<if(!rewriteMode)>
<if(backtracking)>if ( <actions.(actionScope).synpredgate> ) {<endif>
<if(terminalOptions.node)>
<label>_tree = new <terminalOptions.node>(<label>);
<else>

```

```

<label>_tree = (<ASTLabelType>)adaptor.dupNode(<label>);
<endif><\n>
adaptor.addChild(root_<treeLevel>, <label>_tree);
<if(backtracking)>\}<endif>
<endif>
}, ...
)>
<else>
<super.matchSet(...)>
<endif>
>>

matchRuleBlockSet(s,label,elementIndex,postmatchCode,treeLevel="0",terminalOptions={ }) ::= <<
<if(!ruleDescriptor.isSynPred)>
<matchSet(...)>
<noRewrite(...)> <! set return tree !>
<else>
<super.matchRuleBlockSet(...)>
<endif>
>>

matchSetBang(s,label,elementIndex,postmatchCode,terminalOptions={ }) ::= <<
<if(!ruleDescriptor.isSynPred)>
_last = (<ASTLabelType>)input.LT(1);
<super.matchSet(...)>
<else>
<super.matchSetBang(...)>
<endif>
>>

matchSetRuleRoot(s,label,elementIndex,debug,terminalOptions={ }) ::= <<
<if(!ruleDescriptor.isSynPred)>
<super.matchSet(postmatchCode={
<if(!rewriteMode)>
<if(backtracking)>if ( <actions.(actionScope).synpredgate> ) {<endif>
<if(terminalOptions.node)>
<label>_tree = new <terminalOptions.node>(<label>);
<else>
<label>_tree = (<ASTLabelType>)adaptor.dupNode(<label>);
<endif><\n>
root_<treeLevel> = (<ASTLabelType>)adaptor.becomeRoot(<label>_tree, root_<treeLevel>);
<if(backtracking)>\}<endif>
<endif>
}, ...
)>
<else>
<super.matchSetRuleRoot(...)>
<endif>

```

>>

// RULE REF AST

/** rule auto construct */

```
ruleRef(rule,label,elementIndex,args,scope) ::= <<
<if(!ruleDescriptor.isSynPred)>
_last = (<ASTLabelType>)input.LT(1);
<super.ruleRef(...)>
<if(backtracking)>if ( <actions.(actionScope).synpredgate> ) <endif>
<if(!rewriteMode)>
adaptor.addChild(root_<treeLevel>, <label>.getTree());
<else> <! rewrite mode !>
if ( _first_<treeLevel>==null ) _first_<treeLevel> = (<ASTLabelType>)<label>.getTree();
<endif>
<else>
<super.ruleRef(...)>
<endif>
>>
```

/** x+=rule auto construct */

```
ruleRefAndListLabel(rule,label,elementIndex,args,scope) ::= <<
<if(!ruleDescriptor.isSynPred)>
<ruleRef(...)>
<listLabel(label, {<label>.getTree()})>
<else>
<super.ruleRefAndListLabel(...)>
<endif>
>>
```

/** ^(rule ...) auto construct */

```
ruleRefRuleRoot(rule,label,elementIndex,args,scope) ::= <<
<if(!ruleDescriptor.isSynPred)>
_last = (<ASTLabelType>)input.LT(1);
<super.ruleRef(...)>
<if(!rewriteMode)>
<if(backtracking)>if ( <actions.(actionScope).synpredgate> ) <endif>root_<treeLevel> =
(<ASTLabelType>)adaptor.becomeRoot(<label>.getTree(), root_<treeLevel>);
<endif>
<else>
<super.ruleRefRuleRoot(...)>
<endif>
>>
```

/** ^(x+=rule ...) auto construct */

```
ruleRefRuleRootAndListLabel(rule,label,elementIndex,args,scope) ::= <<
<if(!ruleDescriptor.isSynPred)>
<ruleRefRuleRoot(...)>
```

```

<listLabel(label, {<label>.getTree()})>
<else>
<super.ruleRefRuleRootAndListLabel(...)>
<endif>
>>

/** rule when output=AST and tracking for rewrite */
ruleRefTrack(rule,label,elementIndex,args,scope) ::= <<
_last = (<ASTLabelType>)input.LT(1);
<super.ruleRefTrack(...)>
>>

/** x+=rule when output=AST and tracking for rewrite */
ruleRefTrackAndListLabel(rule,label,elementIndex,args,scope) ::= <<
<if(!ruleDescriptor.isSynPred)>
_last = (<ASTLabelType>)input.LT(1);
<super.ruleRefTrackAndListLabel(...)>
<else>
<super.ruleRefTrackAndListLabel(...)>
<endif>
>>

/** ^(rule ...) rewrite */
ruleRefRuleRootTrack(rule,label,elementIndex,args,scope) ::= <<
<if(!ruleDescriptor.isSynPred)>
_last = (<ASTLabelType>)input.LT(1);
<super.ruleRefRootTrack(...)>
<else>
<super.ruleRefRootTrack(...)>
<endif>
>>

/** ^(x+=rule ...) rewrite */
ruleRefRuleRootTrackAndListLabel(rule,label,elementIndex,args,scope) ::= <<
<if(!ruleDescriptor.isSynPred)>
_last = (<ASTLabelType>)input.LT(1);
<super.ruleRefRuleRootTrackAndListLabel(...)>
<else>
<super.ruleRefRuleRootTrackAndListLabel(...)>
<endif>
>>

/** Streams for token refs are tree nodes now; override to
 * change nextToken to nextNode.
 */
createRewriteNodeFromElement(token,args,terminalOptions={}) ::= <<
<if(terminalOptions.node)>
new <terminalOptions.node>(stream_<token>.nextNode())

```



```

<else>
stream_<token>.nextNode()
<endif>
>>

ruleCleanup() ::= <<
<super.ruleCleanup()>
<if(!ruleDescriptor.isSynPred)>
<if(!rewriteMode)>
<if(backtracking)>if ( <actions.(actionScope).synpredgate> ) {<\n><endif>
retval.tree = (<ASTLabelType>)adaptor.rulePostProcessing(root_0);
<if(backtracking)>}<endif>
<endif>
<endif>
>>

```

Found in path(s):

```
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-
jar/org/antlr/codegen/templates/Java/ASTTreeParser.stg
```

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```

```
*/
```

```

asTypeInitMap ::= [
    "int":"0",
    "uint":"0",
    "Number":"0.0",
    "Boolean":"false",
    default:"null" // anything other than an atomic type
]

/** The overall file structure of a recognizer; stores methods for rules
 * and cyclic DFAs plus support code.
 */
outputFile(LEXER,PARSER,TREE_PARSER, actionScope, actions,
    docComment, recognizer,
    name, tokens, tokenNames, rules, cyclicDFAs,
    bitsets, buildTemplate, buildAST, rewriteMode, profile,
    backtracking, synpreds, memoize, numRules,
    fileName, ANTLRVersion, generatedTimestamp, trace,
    scopes, superClass, literals) ::=
<<
// $ANTLR <ANTLRVersion> <fileName> <generatedTimestamp>
package<if(actions.(actionScope).package)> <actions.(actionScope).package><endif> {
    <actions.(actionScope).header>
    <@imports>
import org.antlr.runtime.*;
<if(TREE_PARSER)>
    import org.antlr.runtime.tree.*;
<endif>
    <@end>

    <docComment>
    <recognizer>
}
>>

lexer(grammar, name, tokens, scopes, rules, numRules, filterMode, labelType="Token",
    superClass="Lexer") ::= <<
public class <grammar.recognizerName> extends
<if(actions.(actionScope).superClass)><actions.(actionScope).superClass><else><@superClassName><superClass>
<<@end><endif> {
    <tokens:{it |public static const <it.name>:int=<it.type>;}; separator="\n">
    <scopes:{it |<if(it.isDynamicGlobalScope)><globalAttributeScope(it)><endif>}>
    <actions.lexer.members>

    // delegates
    <grammar.delegates:
        {g|public var <g.delegateName()>:<g.recognizerName>;}; separator="\n">
    // delegators

```

```

<grammar.delegators:
    {g|public var <g.delegateName():<g.recognizerName>;}; separator="\n">
<last(grammar.delegators):{g|public var gParent:<g.recognizerName>;}>

    public function <grammar.recognizerName>(<grammar.delegators:{g|<g.delegateName():<g.recognizerName>,
}>input:CharStream = null, state:RecognizerSharedState = null) {
        super(input, state);
        <cyclicDFAs:cyclicDFACTOR(>
<if(memoize)>
<if(grammar.grammarIsRoot)>
        this.state.ruleMemo = new Array(<numRules>+1);<n><! index from 1..n !>
<endif>
<endif>
        <grammar.directDelegates:
            {g|<g.delegateName()> = new <g.recognizerName>(<trunc(g.delegators):{p|<p.delegateName()>, }>this,
input, this.state);}; separator="\n">
        <grammar.delegators:
            {g|this.<g.delegateName()> = <g.delegateName()>;}; separator="\n">
            <last(grammar.delegators):{g|gParent = <g.delegateName()>;}>
        }
        public override function get grammarFileName():String { return "<fileName>"; }

<if(filterMode)>
    <filteringNextToken()>
<endif>
    <rules; separator="\n\n">

    <synpreds:{p | <lexerSynpred(p)>}>

    <cyclicDFAs:cyclicDFA()> <! dump tables for all DFA !>

}
>>

/** A override of Lexer.nextToken() that backtracks over mTokens() looking
 * for matches. No error can be generated upon error; just rewind, consume
 * a token and then try again. backtracking needs to be set as well.
 * Make rule memoization happen only at levels above 1 as we start mTokens
 * at backtracking==1.
 */
filteringNextToken() ::= <<
public override function nextToken():Token {
    while (true) {
        if ( input.LA(1)==CharStreamConstants.EOF ) {
            return TokenConstants.EOF_TOKEN;
        }
        this.state.token = null;
        this.state.channel = TokenConstants.DEFAULT_CHANNEL;

```

```

this.state.tokenStartCharIndex = input.index;
this.state.tokenStartCharPositionInLine = input.charPositionInLine;
this.state.tokenStartLine = input.line;
this.state.text = null;
try {
    var m:int = input.mark();
    this.state.backtracking=1; <! means we won't throw slow exception !>
    this.state.failed=false;
    mTokens();
    this.state.backtracking=0;
    <! mTokens backtracks with synpred at backtracking==2
    and we set the synpredgate to allow actions at level 1. !>
    if ( this.state.failed ) {
        input.rewindTo(m);
        input.consume(); <! advance one char and try again !>
    }
    else {
        emit();
        return this.state.token;
    }
}
catch (re:RecognitionException) {
    // shouldn't happen in backtracking mode, but...
    reportError(re);
    recover(re);
}
}
// Not reached - For ActionScript compiler
throw new Error();
}

public override function memoize(input:IntStream,
    ruleIndex:int,
    ruleStartIndex:int):void
{
    if ( this.state.backtracking>1 ) super.memoize(input, ruleIndex, ruleStartIndex);
}

public override function alreadyParsedRule(input:IntStream, ruleIndex:int):Boolean {
    if ( this.state.backtracking>1 ) return super.alreadyParsedRule(input, ruleIndex);
    return false;
}
}
>>

actionGate() ::= "this.state.backtracking==0"

filteringActionGate() ::= "this.state.backtracking==1"

```

```

/** How to generate a parser */
genericParser(grammar, name, scopes, tokens, tokenNames, rules, numRules,
    bitsets, inputStreamType, superClass,
    labelType, members, rewriteElementType,
    filterMode, ASTLabelType="Object") ::= <<
public class <grammar.recognizerName> extends
<if(actions.(actionScope).superClass)><actions.(actionScope).superClass><else><@superClassName><superClass>
<<@end><endif> {
<if(grammar.grammarIsRoot)>
    public static const tokenNames:Array = [
        "\<invalid>", "\<EOR>", "\<DOWN>", "\<UP>", <tokenNames; separator=", ">
    ];<\n>
<endif>
    <tokens:{it |public static const <it.name>:int=<it.type>;}; separator="\n">

    // delegates
    <grammar.delegates: {g|public var <g:delegateName():<g.recognizerName>;}; separator="\n">
    // delegators
    <grammar.delegators:
        {g|public var <g:delegateName():<g.recognizerName>;}; separator="\n">
    <last(grammar.delegators):{g|public var gParent:<g.recognizerName>;}>

    <scopes:{it |<if(it.isDynamicGlobalScope)><globalAttributeScope(it)><endif>}>
    <@members>
    <! WARNING. bug in ST: this is cut-n-paste into Dbg.stg !>
    public function <grammar.recognizerName>(<grammar.delegators:{g|<g:delegateName():<g.recognizerName>,
}>input:<inputStreamType>, state:RecognizerSharedState = null) {
        super(input, state);
        <cyclicDFAs:cyclicDFACtor>
        <parserCtorBody>
        <grammar.directDelegates:
            {g|<g:delegateName()> = new <g.recognizerName>(<trunc(g.delegators):{p|<p:delegateName()>, }>this,
input, this.state);}; separator="\n">
            <grammar.indirectDelegates:{g | <g:delegateName()> = <g.delegator:delegateName()>.<g:delegateName()>;};
separator="\n">
            <last(grammar.delegators):{g|gParent = <g:delegateName()>;}>
        }
    <@end>

    public override function get tokenNames():Array { return
<grammar.composite.rootGrammar.recognizerName>.tokenNames; }
    public override function get grammarFileName():String { return "<fileName>"; }

    <members>

    <rules; separator="\n\n">

    <! generate rule/method definitions for imported rules so they

```

```

    appear to be defined in this recognizer. !>
    // Delegated rules
    <grammar.delegatedRules:{ruleDescriptor|
        public function <ruleDescriptor.name>(<ruleDescriptor.parameterScope:parameterScope():<returnType()> {
    <if(ruleDescriptor.hasReturnValue)>return
    <endif><ruleDescriptor.grammar:delegateName()>.<ruleDescriptor.name>(<ruleDescriptor.parameterScope.attributes:
    {a|<a.name>}; separator=", ">); \} }; separator="\n">

    <synpreds:{p | <synpred(p)>>

    <cyclicDFAs:cyclicDFA()> <! dump tables for all DFA !>

    <bitsets:{it | <bitset(name={FOLLOW_<it.name>_in_<it.inName><it.tokenIndex>},
        words64=it.bits)>>
    }
    >>

    parserCtorBody() ::= <<
    <if(memoize)>
    <if(grammar.grammarIsRoot)>
    this.state.ruleMemo = new Array(<length(grammar.allImportedRules)>+1);<\n> <! index from 1..n !>
    <endif>
    <endif>
    <grammar.delegators:
    {g|this.<g:delegateName()> = <g:delegateName()>;}; separator="\n">
    >>

    parser(grammar, name, scopes, tokens, tokenNames, rules, numRules, bitsets, ASTLabelType="Object",
    superClass="Parser", labelType="Token", members={<actions.parser.members>}) ::= <<
    <genericParser(grammar, name, scopes, tokens, tokenNames, rules, numRules,
        bitsets, "TokenStream", superClass,
        labelType, members, "Token",
        false, ASTLabelType)>
    >>

    /** How to generate a tree parser; same as parser except the input
    * stream is a different type.
    */
    treeParser(grammar, name, scopes, tokens, tokenNames, globalAction, rules,
        numRules, bitsets, filterMode, labelType={<ASTLabelType>}, ASTLabelType="Object",
        superClass="TreeParser", members={<actions.treeparser.members>}) ::= <<
    <genericParser(grammar, name, scopes, tokens, tokenNames, rules, numRules,
        bitsets, "TreeNodeStream", superClass,
        labelType, members, "Node",
        filterMode, ASTLabelType)>
    >>

    /** A simpler version of a rule template that is specific to the imaginary

```

```

* rules created for syntactic predicates. As they never have return values
* nor parameters etc..., just give simplest possible method. Don't do
* any of the normal memoization stuff in here either; it's a waste.
* As predicates cannot be inlined into the invoking rule, they need to
* be in a rule by themselves.
*/
synpredRule(ruleName, ruleDescriptor, block, description, nakedBlock) ::=
<<
// $ANTLR start <ruleName>
public final function <ruleName>_fragment(<ruleDescriptor.parameterScope:parameterScope()>):void {
    <ruleLabelDefs()>
<if(trace)>
    traceIn("<ruleName>_fragment", <ruleDescriptor.index>);
    try {
        <block>
    }
    finally {
        traceOut("<ruleName>_fragment", <ruleDescriptor.index>);
    }
<else>
    <block>
<endif>
}
// $ANTLR end <ruleName>
>>

synpred(name) ::= <<
public final function <name>():Boolean {
    this.state.backtracking++;
    <@start()>
    var start:int = input.mark();
    try {
        <name>_fragment(); // can never throw exception
    } catch (re:RecognitionException) {
        trace("impossible: "+re);
    }
    var success:Boolean = !this.state.failed;
    input.rewindTo(start);
    <@stop()>
    this.state.backtracking--;
    this.state.failed=false;
    return success;
}<\n>
>>

lexerSynpred(name) ::= <<
<synpred(name)>
>>

```

```

ruleMemoization(name) ::= <<
<if(memoize)>
if ( this.state.backtracking>0 && alreadyParsedRule(input, <ruleDescriptor.index>) ) { return <ruleReturnValue()>;
}
<endif>
>>

/** How to test for failure and return from rule */
checkRuleBacktrackFailure() ::= <<
<if(backtracking)>if (this.state.failed) return <ruleReturnValue()>;<endif>
>>

/** This rule has failed, exit indicating failure during backtrack */
ruleBacktrackFailure() ::= <<
<if(backtracking)>if (this.state.backtracking>0) {this.state.failed=true; return <ruleReturnValue()>;}<endif>
>>

/** How to generate code for a rule. This includes any return type
* data aggregates required for multiple return values.
*/
rule(ruleName,ruleDescriptor,block,emptyRule,description,exceptions,finally,memoize) ::= <<
<ruleAttributeScope(scope=ruleDescriptor.ruleScope)>
// $ANTLR start <ruleName>
// <fileName>:<description>
public final function <ruleName>(<ruleDescriptor.parameterScope:parameterScope()>):<returnType()> {
<if(trace)>traceIn("<ruleName>", <ruleDescriptor.index>);<endif>
<ruleScopeSetUp()>
<ruleDeclarations()>
<ruleLabelDefs()>
<ruleDescriptor.actions.init>
<@preamble()>
try {
<ruleMemoization(name=ruleName)>
<block>
<ruleCleanUp()>
<(ruleDescriptor.actions.after):execAction()>
}
<if(exceptions)>
<exceptions:{e|<catch(decl=e.decl,action=e.action)><n>}>
<else>
<if(!emptyRule)>
<if(actions.(actionScope).rulecatch)>
<actions.(actionScope).rulecatch>
<else>
catch (re:RecognitionException) {
reportError(re);
recoverStream(input,re);

```



```

    <@setErrorReturnValue()>
    }<\n>
<endif>
<endif>
<endif>
    finally {
        <if(trace)>traceOut("<ruleName>", <ruleDescriptor.index>);<endif>
        <memoize()>
        <ruleScopeCleanUp()>
        <finally>
    }
    <@postamble()>
    return <ruleReturnValue()>;
}
// $ANTLR end <ruleName>
>>

catch(decl,action) ::= <<
catch (<e.decl>) {
    <e.action>
}
>>

ruleDeclarations() ::= <<
<if(ruleDescriptor.hasMultipleReturnValues)>
var retVal:<returnType()> = new <returnType()>();
retVal.start = input.LT(1);<\n>
<else>
<ruleDescriptor.returnScope.attributes: { a |
var <a.name>:<a.type> = <if(a.initValue)><a.initValue><else><initValue(a.type)><endif>;
}>
<endif>
<if(memoize)>
var <ruleDescriptor.name>_startIndex:int = input.index;
<endif>
>>

ruleScopeSetUp() ::= <<
<ruleDescriptor.useScopes: { it |<it>_stack.push(new Object());}; separator="\n">
<ruleDescriptor.ruleScope: { it |<it.name>_stack.push(new Object());}; separator="\n">
>>

ruleScopeCleanUp() ::= <<
<ruleDescriptor.useScopes: { it |<it>_stack.pop();}; separator="\n">
<ruleDescriptor.ruleScope: { it |<it.name>_stack.pop();}; separator="\n">
>>

ruleLabelDefs() ::= <<

```

```

<[ruleDescriptor.tokenLabels,ruleDescriptor.tokenListLabels,
ruleDescriptor.wildcardTreeLabels,ruleDescriptor.wildcardTreeListLabels]
: {it | var <it.label.text>:<labelType>=null;}; separator="\n"
>
<[ruleDescriptor.tokenListLabels,ruleDescriptor.ruleListLabels,ruleDescriptor.wildcardTreeListLabels]
: {it | var list_<it.label.text>:Array=null;}; separator="\n"
>
<ruleDescriptor.ruleLabels:ruleLabelDef(); separator="\n">
<ruleDescriptor.ruleListLabels: {ll|var <ll.label.text>:RuleReturnScope = null;}; separator="\n">
>>

```

```

lexerRuleLabelDefs() ::= <<
<[ruleDescriptor.tokenLabels,
ruleDescriptor.tokenListLabels,
ruleDescriptor.ruleLabels]
: {it | var <it.label.text>:<labelType>=null;}; separator="\n"
>
<ruleDescriptor.charLabels: {it | var <it.label.text>:int;}; separator="\n">
<[ruleDescriptor.tokenListLabels,
ruleDescriptor.ruleListLabels]
: {it | var list_<it.label.text>:Array=null;}; separator="\n"
>
>>

```

```

ruleReturnValue() ::= <%
<if(!ruleDescriptor.isSynPred)>
<if(ruleDescriptor.hasReturnValue)>
<if(ruleDescriptor.hasSingleReturnValue)>
<ruleDescriptor.singleValueReturnName>
<else>
retval
<endif>
<endif>
<endif>
%>

```

```

ruleCleanup() ::= <<
<if(ruleDescriptor.hasMultipleReturnValues)>
<if(!TREE_PARSER)>
retval.stop = input.LT(-1);<\n>
<endif>
<endif>
>>

```

```

memoize() ::= <<
<if(memoize)>
<if(backtracking)>
if ( this.state.backtracking>0 ) { memoize(input, <ruleDescriptor.index>, <ruleDescriptor.name>_startIndex); }

```

```

<endif>
<endif>
>>

/** How to generate a rule in the lexer; naked blocks are used for
 * fragment rules.
 */
lexerRule(ruleName,nakedBlock,ruleDescriptor,block,memoize) ::= <<
// $ANTLR start <ruleName>
public final function m<ruleName>(<ruleDescriptor.parameterScope:parameterScope(>):void {
    <if(trace)>traceIn("<ruleName>", <ruleDescriptor.index>);<endif>
    <ruleScopeSetUp(>
    <ruleDeclarations(>
    try {
<if(nakedBlock)>
        <ruleMemoization(name=ruleName)>
        <lexerRuleLabelDefs(>
        <ruleDescriptor.actions.init>
        <block><\n>
    <else>
        var _type:int = <ruleName>;
        var _channel:int = DEFAULT_TOKEN_CHANNEL;
        <ruleMemoization(name=ruleName)>
        <lexerRuleLabelDefs(>
        <ruleDescriptor.actions.init>
        <block>
        <ruleCleanUp(>
        this.state.type = _type;
        this.state.channel = _channel;
        <(ruleDescriptor.actions.after):execAction(>
    <endif>
    }
    finally {
        <if(trace)>traceOut("<ruleName>", <ruleDescriptor.index>);<endif>
        <ruleScopeCleanUp(>
        <memoize(>
    }
}
// $ANTLR end <ruleName>
>>

/** How to generate code for the implicitly-defined lexer grammar rule
 * that chooses between lexer rules.
 */
tokensRule(ruleName,nakedBlock,args,block,ruleDescriptor) ::= <<
public override function mTokens():void {
    <block><\n>
}

```

>>

// S U B R U L E S

/** A (...) subrule with multiple alternatives */

block(alts,decls,decision,enclosingBlockLevel,blockLevel,decisionNumber,maxK,maxAlt,description) ::= <<

// <fileName>:<description>

var alt<decisionNumber>:int=<maxAlt>;

<decls>

<@predecision()>

<decision>

<@postdecision()>

<@prebranch()>

switch (alt<decisionNumber>) {

<alts:{a | <altSwitchCase(i, a)>}>

}

<@postbranch()>

>>

/** A rule block with multiple alternatives */

ruleBlock(alts,decls,decision,enclosingBlockLevel,blockLevel,decisionNumber,maxK,maxAlt,description) ::= <<

// <fileName>:<description>

var alt<decisionNumber>:int=<maxAlt>;

<decls>

<@predecision()>

<decision>

<@postdecision()>

switch (alt<decisionNumber>) {

<alts:{a | <altSwitchCase(i, a)>}>

}

>>

ruleBlockSingleAlt(alts,decls,decision,enclosingBlockLevel,blockLevel,decisionNumber,description) ::= <<

// <fileName>:<description>

<decls>

<@prealt()>

<alts>

<@postalt()>

>>

/** A special case of a (...) subrule with a single alternative */

blockSingleAlt(alts,decls,decision,enclosingBlockLevel,blockLevel,decisionNumber,description) ::= <<

// <fileName>:<description>

<decls>

<@prealt()>

<alts>

<@postalt()>

>>

```

/** A (..)+ block with 1 or more alternatives */
positiveClosureBlock(alts,decls,decision,enclosingBlockLevel,blockLevel,decisionNumber,maxK,maxAlt,description) ::= <<
// <fileName>:<description>
var cnt<decisionNumber>:int=0;
<decls>
<@preloop()>
loop<decisionNumber>:
do {
  var alt<decisionNumber>:int=<maxAlt>;
  <@predecision()>
  <decision>
  <@postdecision()>
  switch (alt<decisionNumber>) {
<alts:{a | <altSwitchCase(i, a)>}>
  default :
    if ( cnt<decisionNumber> >= 1 ) break loop<decisionNumber>;
    <ruleBacktrackFailure()>
    throw new EarlyExitException(<decisionNumber>, input);
    <! Need to add support for earlyExitException debug hook !>
  }
  cnt<decisionNumber>++;
} while (true);
<@postloop()>
>>

```

positiveClosureBlockSingleAlt ::= positiveClosureBlock

```

/** A (..)* block with 1 or more alternatives */
closureBlock(alts,decls,decision,enclosingBlockLevel,blockLevel,decisionNumber,maxK,maxAlt,description) ::=
<<
// <fileName>:<description>
<decls>
<@preloop()>
loop<decisionNumber>:
do {
  var alt<decisionNumber>:int=<maxAlt>;
  <@predecision()>
  <decision>
  <@postdecision()>
  switch (alt<decisionNumber>) {
<alts:{a | <altSwitchCase(i, a)>}>
  default :
    break loop<decisionNumber>;
  }
} while (true);
<@postloop()>

```

```

>>

closureBlockSingleAlt ::= closureBlock

/** Optional blocks (x)? are translated to (x|) by before code generation
 * so we can just use the normal block template
 */
optionalBlock ::= block

optionalBlockSingleAlt ::= block

/** A case in a switch that jumps to an alternative given the alternative
 * number. A DFA predicts the alternative and then a simple switch
 * does the jump to the code that actually matches that alternative.
 */
altSwitchCase(altNum, alt) ::= <<
case <altNum> :
  <@prealt()>
  <alt>
  break;<\n>
>>

/** An alternative is just a list of elements; at outermost level */
alt(elements,altNum,description,autoAST,outerAlt,treeLevel,rew) ::= <<
// <fileName>:<description>
{
<@declarations()>
<elements:element()>
<rew>
<@cleanup()>
}
>>

/** What to emit when there is no rewrite. For auto build
 * mode, does nothing.
 */
noRewrite(rewriteBlockLevel, treeLevel) ::= ""

// E L E M E N T S

/** Dump the elements one per line */
element(e) ::= <<
<@prematch()>
<e.el><\n>
>>

/** match a token optionally with a label in front */
tokenRef(token,label,elementIndex,terminalOptions) ::= <<

```

```

<if(label)><label>=<labelType><endif>matchStream(input,<token>,FOLLOW_<token>_in_<ruleName><element
Index><if(label)><endif>; <checkRuleBacktrackFailure()>
>>

/** ids+=ID */
tokenRefAndListLabel(token,label,elementIndex,terminalOptions) ::= <<
<tokenRef(token,label,elementIndex,terminalOptions)>
<listLabel(label, label)>
>>

listLabel(label,elem) ::= <<
if (list_<label>==null) list_<label>=new Array();
list_<label>.push(<elem>);<\n>
>>

/** match a character */
charRef(char,label) ::= <<
<if(label)>
<label> = input.LA(1);<\n>
<endif>
match(<char>); <checkRuleBacktrackFailure()>
>>

/** match a character range */
charRangeRef(a,b,label) ::= <<
<if(label)>
<label> = input.LA(1);<\n>
<endif>
matchRange(<a>,<b>); <checkRuleBacktrackFailure()>
>>

/** For now, sets are interval tests and must be tested inline */
matchSet(s,label,elementIndex,terminalOptions,postmatchCode="") ::= <<
<if(label)>
<if(LEXER)>
<label>= input.LA(1);<\n>
<else>
<label>=<labelType>(input.LT(1));<\n>
<endif>
<endif>
<endif>
if ( <s> ) {
    input.consume();
    <postmatchCode>
<if(!LEXER)>
    this.state.errorRecovery=false;
<endif>
    <if(backtracking)>this.state.failed=false;<endif>
}

```

```

else {
    <ruleBacktrackFailure()>
    <@mismatchedSetException()>
<if(LEXER)>
    throw recover(new MismatchedSetException(null,input));<\n>
<else>
    throw new MismatchedSetException(null,input);
    <! use following code to make it recover inline; remove throw mse;
    recoverFromMismatchedSet(input,mse,FOLLOW_set_in_<ruleName><elementIndex>);
    !>
<endif>
}<\n>
>>

matchRuleBlockSet ::= matchSet

matchSetAndListLabel(s,label,elementIndex,postmatchCode) ::= <<
<matchSet(...)>
<listLabel(label, label)>
>>

/** Match a string literal */
lexerStringRef(string,label,elementIndex="0") ::= <<
<if(label)>
var <label>Start:int = charIndex;
matchString(<string>); <checkRuleBacktrackFailure()>
var <label>StartLine<elementIndex>:int = line;
var <label>StartCharPos<elementIndex>:int = charPositionInLine;
<label> = CommonToken.createFromStream(input, TokenConstants.INVALID_TOKEN_TYPE,
TokenConstants.DEFAULT_CHANNEL, <label>Start, charIndex-1);
<label>.line = <label>StartLine<elementIndex>;
<label>.charPositionInLine = <label>StartCharPos<elementIndex>;
<else>
matchString(<string>); <checkRuleBacktrackFailure()><\n>
<endif>
>>

wildcard(token,label,elementIndex,terminalOptions) ::= <<
<if(label)>
<label>=<labelType>(input.LT(1));<\n>
<endif>
matchAny(input); <checkRuleBacktrackFailure()>
>>

wildcardAndListLabel(token,label,elementIndex,terminalOptions) ::= <<
<wildcard(...)>
<listLabel(label, label)>
>>

```



```

/** Match . wildcard in lexer */
wildcardChar(label, elementIndex) ::= <<
<if(label)>
<label> = input.LA(1);<\n>
<endif>
matchAny(); <checkRuleBacktrackFailure()>
>>

wildcardCharListLabel(label, elementIndex) ::= <<
<wildcardChar(label, elementIndex)>
<listLabel(label, label)>
>>

/** Match a rule reference by invoking it possibly with arguments
 * and a return value or values. The 'rule' argument was the
 * target rule name, but now is type Rule, whose toString is
 * same: the rule name. Now though you can access full rule
 * descriptor stuff.
 *
 * GMS: Note: do not use post-decrement operator! ASC produces bad code for exceptions in this case.
 * See: https://bugs.adobe.com/jira/browse/ASC-3625
 */
ruleRef(rule,label,elementIndex,args,scope) ::= <<
pushFollow(FOLLOW_<rule.name>_in_<ruleName><elementIndex>);
<if(label)><label>=<endif><if(scope)><scope.delegateName()>.<endif><rule.name>(<args; separator=", ">);<\n>
state._fsp = state._fsp - 1;
<checkRuleBacktrackFailure()>
>>

/** ids+=r */
ruleRefAndListLabel(rule,label,elementIndex,args,scope) ::= <<
<ruleRef(rule,label,elementIndex,args,scope)>
<listLabel(label, label)>
>>

/** A lexer rule reference.
 *
 * The 'rule' argument was the target rule name, but now
 * is type Rule, whose toString is same: the rule name.
 * Now though you can access full rule descriptor stuff.
 */
lexerRuleRef(rule,label,args,elementIndex,scope) ::= <<
<if(label)>
var <label>Start<elementIndex>:int = charIndex;
var <label>StartLine<elementIndex>:int = line;
var <label>StartCharPos<elementIndex>:int = charPositionInLine;

```

```

<if(scope)><scope:delegateName().<endif>m<rule.name>(<args; separator=", ">);
<checkRuleBacktrackFailure()>
<label> = CommonToken.createFromStream(input, TokenConstants.INVALID_TOKEN_TYPE,
TokenConstants.DEFAULT_CHANNEL, <label>Start<elementIndex>, charIndex-1);
<label>.line = <label>StartLine<elementIndex>;
<label>.charPositionInLine = <label>StartCharPos<elementIndex>;
<else>
<if(scope)><scope:delegateName().<endif>m<rule.name>(<args; separator=", ">);
<checkRuleBacktrackFailure()>
<endif>
>>

```

```

/** i+=INT in lexer */
lexerRuleRefAndListLabel(rule,label,args,elementIndex,scope) ::= <<
<lexerRuleRef(rule,label,args,elementIndex,scope)>
<listLabel(label, label)>
>>

```

```

/** EOF in the lexer */
lexerMatchEOF(label,elementIndex) ::= <<
<if(label)>
var <label>Start<elementIndex>:int = charIndex;
var <label>StartLine<elementIndex>:int = line;
var <label>StartCharPos<elementIndex>:int = charPositionInLine;
match(EOF); <checkRuleBacktrackFailure()>
var <label>:<labelType> = CommonToken.createFromStream(input, EOF,
TokenConstants.DEFAULT_CHANNEL, <label>Start<elementIndex>, charIndex-1);
<label>.line = <label>StartLine<elementIndex>;
<label>.charPositionInLine = <label>StartCharPos<elementIndex>;
<else>
match(EOF); <checkRuleBacktrackFailure()>
<endif>
>>

```

```

// used for left-recursive rules
recRuleDefArg()          ::= "var <recRuleArg()>:int"
recRuleArg()             ::= "_p"
recRuleAltPredicate(ruleName,opPrec) ::= "<recRuleArg()> \<= <opPrec>"
recRuleSetResultAction() ::= "root_0=$<ruleName>_primary.tree;"
recRuleSetReturnAction(src,name) ::= "$<name>=$<src>.<name>;"

```

```

/** match ^(root children) in tree parser */
tree(root, actionsAfterRoot, children, nullableChildList,
enclosingTreeLevel, treeLevel) ::= <<
<root:element()>
<actionsAfterRoot:element()>
<if(nullableChildList)>
if ( input.LA(1)==TokenConstants.DOWN ) {

```

```

    matchStream(input, TokenConstants.DOWN, null); <checkRuleBacktrackFailure()>
    <children:element()>
    matchStream(input, TokenConstants.UP, null); <checkRuleBacktrackFailure()>
}
<else>
matchStream(input, TokenConstants.DOWN, null); <checkRuleBacktrackFailure()>
<children:element()>
matchStream(input, TokenConstants.UP, null); <checkRuleBacktrackFailure()>
<endif>
>>

/** Every predicate is used as a validating predicate (even when it is
 * also hoisted into a prediction expression).
 */
validateSemanticPredicate(pred,description) ::= <<
if ( !(<evalPredicate(pred,description)>) ) {
    <ruleBacktrackFailure()>
    throw new FailedPredicateException(input, "<ruleName>", "<description>");
}
>>

// F i x e d D F A (if-then-else)

dfaState(k,edges,eotPredictsAlt,description,stateNumber,semPredState) ::= <<
var LA<decisionNumber>_<stateNumber>:int = input.LA(<k>);<n>
<edges; separator="\nelse ">
else {
<if(eotPredictsAlt)>
    alt<decisionNumber>=<eotPredictsAlt>;
<else>
    <ruleBacktrackFailure()>
    throw new NoViableAltException("<description>", <decisionNumber>, <stateNumber>, input);<n>
    <! Need to add hook for noViableAltException() !>
<endif>
}
>>

/** Same as a normal DFA state except that we don't examine lookahead
 * for the bypass alternative. It delays error detection but this
 * is faster, smaller, and more what people expect. For (X)? people
 * expect "if ( LA(1)==X ) match(X);" and that's it.
 */
dfaOptionalBlockState(k,edges,eotPredictsAlt,description,stateNumber,semPredState) ::= <<
var LA<decisionNumber>_<stateNumber>:int = input.LA(<k>);<n>
<edges; separator="\nelse ">
>>

/** A DFA state that is actually the loopback decision of a closure

```

```

* loop. If end-of-token (EOT) predicts any of the targets then it
* should act like a default clause (i.e., no error can be generated).
* This is used only in the lexer so that for ('a'* on the end of a rule
* anything other than 'a' predicts exiting.
*/
dfaLoopbackState(k,edges,eotPredictsAlt,description,stateNumber,semPredState) ::= <<
var LA<decisionNumber>_<stateNumber>:int = input.LA(<k>);<\n>
<edges; separator="\nelse "><\n>
<if(eotPredictsAlt)>
<if(!edges)>
alt<decisionNumber>=<eotPredictsAlt>; <! if no edges, don't gen ELSE !>
<else>
else {
    alt<decisionNumber>=<eotPredictsAlt>;
}<\n>
<endif>
<endif>
>>

/** An accept state indicates a unique alternative has been predicted */
dfaAcceptState(alt) ::= "alt<decisionNumber>=<alt>";

/** A simple edge with an expression. If the expression is satisfied,
* enter to the target state. To handle gated productions, we may
* have to evaluate some predicates for this edge.
*/
dfaEdge(labelExpr, targetState, predicates) ::= <<
if ( (<labelExpr> <if(predicates)>&& (<predicates>)<endif> ) {
    <targetState>
}
>>

// F i x e d D F A (switch case)

/** A DFA state where a SWITCH may be generated. The code generator
* decides if this is possible: CodeGenerator.canGenerateSwitch().
*/
dfaStateSwitch(k,edges,eotPredictsAlt,description,stateNumber,semPredState) ::= <<
switch ( input.LA(<k> ) ) {
<edges; separator="\n">
default:
<if(eotPredictsAlt)>
    alt<decisionNumber>=<eotPredictsAlt>;
<else>
    <ruleBacktrackFailure()>
    throw new NoViableAltException("<description>", <decisionNumber>, <stateNumber>, input);<\n>
    <! Need to add hook for noViableAltException !>
<endif>

```

```

}<\n>
>>

dfaOptionalBlockStateSwitch(k,edges,eotPredictsAlt,description,stateNumber,semPredState) ::= <<
switch ( input.LA(<k>)) {
    <edges; separator="\n">
}<\n>
>>

dfaLoopbackStateSwitch(k, edges,eotPredictsAlt,description,stateNumber,semPredState) ::= <<
switch ( input.LA(<k>)) {
<edges; separator="\n"><\n>
<if(eotPredictsAlt)>
default:
    alt<decisionNumber>=<eotPredictsAlt>;
    break;<\n>
<endif>
}<\n>
>>

dfaEdgeSwitch(labels, targetState) ::= <<
<labels: {it |case <it>:}; separator="\n">
{
    <targetState>
}
break;
>>

// C y c l i c D F A

/** The code to initiate execution of a cyclic DFA; this is used
 * in the rule to predict an alt just like the fixed DFA case.
 * The <name> attribute is inherited via the parser, lexer, ...
 */
dfaDecision(decisionNumber,description) ::= <<
alt<decisionNumber> = dfa<decisionNumber>.predict(input);
>>

cyclicDFActor(dfa) ::= <<

dfa<dfa.decisionNumber> = new DFA(this, <dfa.decisionNumber>,
    "<dfa.description>",
    DFA<dfa.decisionNumber>_eot, DFA<dfa.decisionNumber>_eof, DFA<dfa.decisionNumber>_min,
    DFA<dfa.decisionNumber>_max, DFA<dfa.decisionNumber>_accept, DFA<dfa.decisionNumber>_special,
    DFA<dfa.decisionNumber>_transition<if(dfa.specialStateSTs)>,
    DFA<dfa.decisionNumber>_specialStateTransition<endif>);

>>

```

```

/* Dump DFA tables as run-length-encoded Strings of octal values.
* Can't use hex as compiler translates them before compilation.
* These strings are split into multiple, concatenated strings.
* Java puts them back together at compile time thankfully.
* Java cannot handle large static arrays, so we're stuck with this
* encode/decode approach. See analysis and runtime DFA for
* the encoding methods.
*/
cyclicDFA(dfa) ::= <<

private const DFA<dfa.decisionNumber>_eot:Array =
  DFA.unpackEncodedString("<dfa.javaCompressedEOT; wrap=\"\"+\n  \">");
private const DFA<dfa.decisionNumber>_eof:Array =
  DFA.unpackEncodedString("<dfa.javaCompressedEOF; wrap=\"\"+\n  \">");
private const DFA<dfa.decisionNumber>_min:Array =
  DFA.unpackEncodedString("<dfa.javaCompressedMin; wrap=\"\"+\n  \">", true);
private const DFA<dfa.decisionNumber>_max:Array =
  DFA.unpackEncodedString("<dfa.javaCompressedMax; wrap=\"\"+\n  \">", true);
private const DFA<dfa.decisionNumber>_accept:Array =
  DFA.unpackEncodedString("<dfa.javaCompressedAccept; wrap=\"\"+\n  \">");
private const DFA<dfa.decisionNumber>_special:Array =
  DFA.unpackEncodedString("<dfa.javaCompressedSpecial; wrap=\"\"+\n  \">");
private const DFA<dfa.decisionNumber>_transition:Array = [
  <dfa.javaCompressedTransition: {s|DFA.unpackEncodedString("<s; wrap=\"\"+\n\">"); separator=",\n">
];
<if(dfa.specialStateSTs)>
  private function DFA<dfa.decisionNumber>_specialStateTransition(dfa:DFA, s:int, _input:InputStream):int {
    <if(LEXER)>
      var input:InputStream = _input;
    <endif>
    <if(PARSER)>
      var input:TokenStream = TokenStream(_input);
    <endif>
    <if(TREE_PARSER)>
      var input:TreeNodeStream = TreeNodeStream(_input);
    <endif>
    var _s:int = s;
    switch ( s ) {
      <dfa.specialStateSTs:{state |
        case <i0> : <! compressed special state numbers 0..n-1 !>
          <state>}; separator="\n">
    }
  }
<if(backtracking)>
  if (this.state.backtracking>0) {this.state.failed=true; return -1;}<\n>
<endif>
  throw dfa.error(new NoViableAltException(dfa.description, <dfa.decisionNumber>, _s, input));
}<\n>
<endif>

```

```

protected var dfa<dfa.decisionNumber>:DFA; // initialized in constructor

>>

/** A state in a cyclic DFA; it's a special state and part of a big switch on
 * state.
 */
cyclicDFAState(decisionNumber,stateNumber,edges,needErrorClause,semPredState) ::= <<
var LA<decisionNumber>_<stateNumber>:int = input.LA(1);<\n>
<if(semPredState)> <! get next lookahead symbol to test edges, then rewind !>
var index<decisionNumber>_<stateNumber>:int = input.index;
input.rewind();<\n>
<endif>
s = -1;
<edges; separator="\nelse ">
<if(semPredState)> <! return input cursor to state before we rewound !>
input.seek(index<decisionNumber>_<stateNumber>);<\n>
<endif>
if ( s>=0 ) return s;
break;
>>

/** Just like a fixed DFA edge, test the lookahead and indicate what
 * state to jump to next if successful.
 */
cyclicDFAEdge(labelExpr, targetStateNumber, edgeNumber, predicates) ::= <<
if ( (<labelExpr> <if(predicates)>&& (<predicates>)<endif> ) { s = <targetStateNumber>;}<\n>
>>

/** An edge pointing at end-of-token; essentially matches any char;
 * always jump to the target.
 */
eotDFAEdge(targetStateNumber,edgeNumber, predicates) ::= <<
s = <targetStateNumber>;<\n>
>>

// D F A E X P R E S S I O N S

andPredicates(left,right) ::= "(<left>&&<right>)"

orPredicates(operands) ::= "(<operands; separator=\\|\\>)"

notPredicate(pred) ::= "!(<evalPredicate(pred,{}>)"

evalPredicate(pred,description) ::= "(<pred>)"

```

```

evalSynPredicate(pred,description) ::= "<pred>()"

lookaheadTest(atom,k,atomAsInt) ::= "LA<decisionNumber>_<stateNumber>===<atomAsInt>"

/** Sometimes a lookahead test cannot assume that LA(k) is in a temp variable
 * somewhere. Must ask for the lookahead directly.
 */
isolatedLookaheadTest(atom,k,atomAsInt) ::= "input.LA(<k>)===<atomAsInt>"

lookaheadRangeTest(lower,upper,k,rangeNumber,lowerAsInt,upperAsInt) ::= <%
(LA<decisionNumber>_<stateNumber> >= <lowerAsInt> && LA<decisionNumber>_<stateNumber> \<=
<upperAsInt>)
%>

isolatedLookaheadRangeTest(lower,upper,k,rangeNumber,lowerAsInt,upperAsInt) ::= "(input.LA(<k>) >=
<lowerAsInt> && input.LA(<k>) \<= <upperAsInt>)"

setTest(ranges) ::= <<
<ranges; separator="||">
>>

// A T T R I B U T E S

globalAttributeScope(scope) ::= <<
<if(scope.attributes)>
protected var <scope.name>_stack:Array = new Array();<\n>
<endif>
>>

ruleAttributeScope(scope) ::= <<
<if(scope.attributes)>
protected var <scope.name>_stack:Array = new Array();<\n>
<endif>
>>

returnStructName() ::= "<if(TREE_PARSER)>Tree<else>Parser<endif>RuleReturnScope"

returnType() ::= <<
<if(ruleDescriptor.hasMultipleReturnValues)>
<returnStructName()>
<else>
<if(ruleDescriptor.hasSingleReturnValue)>
<ruleDescriptor.singleValueReturnType>
<else>
void
<endif>
<endif>
>>

```



```

/** Generate the Java type associated with a single or multiple return
 * values.
 */
ruleLabelType(referencedRule) ::= <<
<if(referencedRule.hasMultipleReturnValues)>
<returnStructName()>
<else>
<if(referencedRule.hasSingleReturnValue)>
<referencedRule.singleValueReturnType>
<else>
void
<endif>
<endif>
>>

delegateName(d) ::= <<
<if(d.label)><d.label><else>g<d.name><endif>
>>

/** Using a type to init value map, try to init a type; if not in table
 * must be an object, default value is "null".
 */
initValue(typeName) ::= <<
<asTypeInitMap.(typeName)>
>>

/** Define a rule label including default value */
ruleLabelDef(label) ::= <<
var <label.label.text>:<ruleLabelType(referencedRule=label.referencedRule)> =
<initValue(typeName=ruleLabelType(referencedRule=label.referencedRule))>;<\n>
>>

/** Define a return struct for a rule if the code needs to access its
 * start/stop tokens, tree stuff, attributes, ... Leave a hole for
 * subgroups to stick in members.
 */
returnScope(scope) ::= <<
<if(ruleDescriptor.hasMultipleReturnValues)>
public static class <returnType()> extends <if(TREE_PARSER)>Tree<else>Parser<endif>RuleReturnScope {
  <scope.attributes:{it |public <it.decl>;}; separator="\n">
  <@ruleReturnMembers()>
};
<endif>
>>

parameterScope(scope) ::= <<
<scope.attributes:{it |<it.name>:<it.type>;}; separator=" ">

```

>>

```
parameterAttributeRef(attr) ::= "<attr.name>"  
parameterSetAttributeRef(attr,expr) ::= "<attr.name> =<expr>";
```

```
scopeAttributeRef(scope,attr,index,negIndex) ::= <<  
<if(negIndex)>  
<scope>_stack[<scope>_stack.length-<negIndex>-1].<attr.name>  
<else>  
<if(index)>  
<scope>_stack[<index>].<attr.name>  
<else>  
<scope>_stack[<scope>_stack.length-1].<attr.name>  
<endif>  
<endif>  
>>
```

```
scopeSetAttributeRef(scope,attr,expr,index,negIndex) ::= <<  
<if(negIndex)>  
<scope>_stack[<scope>_stack.length-<negIndex>-1].<attr.name> =<expr>;  
<else>  
<if(index)>  
<scope>_stack[<index>].<attr.name> =<expr>;  
<else>  
<scope>_stack[<scope>_stack.length-1].<attr.name> =<expr>;  
<endif>  
<endif>  
>>
```

```
/** $x is either global scope or x is rule with dynamic scope; refers  
 * to stack itself not top of stack. This is useful for predicates  
 * like {$function.size()>0 && $function::name.equals("foo")}?  
 */  
isolatedDynamicScopeRef(scope) ::= "<scope>_stack"
```

```
/** reference an attribute of rule; might only have single return value */  
ruleLabelRef(referencedRule,scope,attr) ::= <<  
<if(referencedRule.hasMultipleReturnValues)>  
(<scope>!=null?<scope>.values.<attr.name>:<initValue(attr.type)>)  
<else>  
<scope>  
<endif>  
>>
```

```
returnAttributeRef(ruleDescriptor,attr) ::= <<  
<if(ruleDescriptor.hasMultipleReturnValues)>  
retval.values.<attr.name>  
<else>
```

```

<attr.name>
<endif>
>>

returnSetAttributeRef(ruleDescriptor,attr,expr) ::= <<
<if(ruleDescriptor.hasMultipleReturnValues)>
retval.values.<attr.name> =<expr>;
<else>
<attr.name> =<expr>;
<endif>
>>

/** How to translate $tokenLabel */
tokenLabelRef(label) ::= "<label>"

/** ids+=ID {$ids} or e+=expr {$e} */
listLabelRef(label) ::= "list_<label>"

// not sure the next are the right approach

tokenLabelPropertyRef_text(scope,attr) ::= "(<scope>!=null?<scope>.text:null)"
tokenLabelPropertyRef_type(scope,attr) ::= "(<scope>!=null?<scope>.type:0)"
tokenLabelPropertyRef_line(scope,attr) ::= "(<scope>!=null?<scope>.line:0)"
tokenLabelPropertyRef_pos(scope,attr) ::= "(<scope>!=null?<scope>.charPositionInLine:0)"
tokenLabelPropertyRef_channel(scope,attr) ::= "(<scope>!=null?<scope>.channel:0)"
tokenLabelPropertyRef_index(scope,attr) ::= "(<scope>!=null?<scope>.tokenIndex:0)"
tokenLabelPropertyRef_tree(scope,attr) ::= "<scope>_tree"
tokenLabelPropertyRef_int(scope,attr) ::= "(<scope>!=null?int(<scope>.text):0)"

ruleLabelPropertyRef_start(scope,attr) ::= "(<scope>!=null?<labelType>(<scope>.start):null)"
ruleLabelPropertyRef_stop(scope,attr) ::= "(<scope>!=null?<labelType>(<scope>.stop):null)"
ruleLabelPropertyRef_tree(scope,attr) ::= "(<scope>!=null?<ASTLabelType>(<scope>.tree):null)"
ruleLabelPropertyRef_text(scope,attr) ::= <<
<if(TREE_PARSER)>
(<scope>!=null?(input.tokenStream.toStringWithRange(
input.treeAdaptor.getTokenStartIndex(<scope>.start),
input.treeAdaptor.getTokenStopIndex(<scope>.start))):null)
<else>
(<scope>!=null?input.toStringWithTokenRange(<scope>.start,<scope>.stop):null)
<endif>
>>

ruleLabelPropertyRef_st(scope,attr) ::= "(<scope>!=null?<scope>.st:null)"

/** Isolated $RULE ref ok in lexer as it's a Token */
lexerRuleLabel(label) ::= "<label>"

```

```

lexerRuleLabelPropertyRef_type(scope,attr) ::=
    "<scope>!=null?<scope>.type:0)"
lexerRuleLabelPropertyRef_line(scope,attr) ::=
    "<scope>!=null?<scope>.lien:0)"
lexerRuleLabelPropertyRef_pos(scope,attr) ::=
    "<scope>!=null?<scope>.charPositionInLine:0)"
lexerRuleLabelPropertyRef_channel(scope,attr) ::=
    "<scope>!=null?<scope>.channel:0)"
lexerRuleLabelPropertyRef_index(scope,attr) ::=
    "<scope>!=null?<scope>.tokenIndex:0)"
lexerRuleLabelPropertyRef_text(scope,attr) ::=
    "<scope>!=null?<scope>.text:null)"
lexerRuleLabelPropertyRef_int(scope,attr) ::=
    "<scope>!=null?int(<scope>.text):0)"

// Somebody may ref $template or $tree or $stop within a rule:
rulePropertyRef_start(scope,attr) ::= "<labelType>(retval.start)"
rulePropertyRef_stop(scope,attr) ::= "<labelType>(retval.stop)"
rulePropertyRef_tree(scope,attr) ::= "<ASTLabelType>(retval.tree)"
rulePropertyRef_text(scope,attr) ::= <<
<if(TREE_PARSER)>
input.tokenStream.toStringWithRange(
    input.treeAdaptor.getTokenStartIndex(retval.start),
    input.treeAdaptor.getTokenStopIndex(retval.start))
<else>
input.toStringWithTokenRange(retval.start,input.LT(-1))
<endif>
>>
rulePropertyRef_st(scope,attr) ::= "retval.st"

lexerRulePropertyRef_text(scope,attr) ::= "text"
lexerRulePropertyRef_type(scope,attr) ::= "_type"
lexerRulePropertyRef_line(scope,attr) ::= "state.tokenStartLine"
lexerRulePropertyRef_pos(scope,attr) ::= "state.tokenStartCharPositionInLine"
lexerRulePropertyRef_index(scope,attr) ::= "-1" // undefined token index in lexer
lexerRulePropertyRef_channel(scope,attr) ::= "_channel"
lexerRulePropertyRef_start(scope,attr) ::= "state.tokenStartCharIndex"
lexerRulePropertyRef_stop(scope,attr) ::= "(charIndex-1)"
lexerRulePropertyRef_int(scope,attr) ::= "int(<scope>.text)"

// setting $st and $tree is allowed in local rule. everything else
// is flagged as error
ruleSetPropertyRef_tree(scope,attr,expr) ::= "retval.tree =<expr>;"
ruleSetPropertyRef_st(scope,attr,expr) ::= "retval.st =<expr>;"

/** How to execute an action (only when not backtracking) */
execAction(action) ::= <<
<if(backtracking)>

```

```

if ( <actions.(actionScope).synpredgate> ) {
  <action>
}
<else>
<action>
<endif>
>>

/** How to always execute an action even when backtracking */
execForcedAction(action) ::= "<action>"

// M I S C (properties, etc...)

bitset(name, words64) ::= <<
public static const <name>:BitSet = new BitSet([<words64:{it |<it>};separator=", ">]);<n>
>>

codeFileExtension() ::= ".as"

true_value() ::= "true"
false_value() ::= "false"

```

Found in path(s):

```

* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-
jar/org/antlr/codegen/templates/ActionScript/ActionScript.stg

```

No license file was found, but licenses were detected in source scan.

/*

[The "BSD license"]

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*/

/** The API version of the runtime that recognizers generated by this runtime

* need.

*/

apiVersion() ::= "1"

// System.Boolean.ToString() returns "True" and "False", but the proper C# literals are "true" and "false"

// The Java version of Boolean returns "true" and "false", so they map to themselves here.

booleanLiteral ::= [

 "True": "true",

 "False": "false",

 "true": "true",

 "false": "false",

 default: "false"

]

/** The overall file structure of a recognizer; stores methods for rules

* and cyclic DFAs plus support code.

*/

outputFile(LEXER,PARSER,TREE_PARSER, actionScope, actions,

 docComment, recognizer,

 name, tokens, tokenNames, rules, cyclicDFAs,

 bitsets, buildTemplate, buildAST, rewriteMode, profile,

 backtracking, synpreds, memoize, numRules,

 fileName, ANTLRVersion, generatedTimestamp, trace,

 scopes, superClass, literals) ::=

<<

\$ANTLR <ANTLRVersion> <fileName> <generatedTimestamp>

<@imports>

import sys

from antlr3 import *

<if(TREE_PARSER)>

from antlr3.tree import *<\n>

<endif>

from antlr3.compat import set, frozenset

<@end>

<actions.(actionScope).header>

<! <docComment> !>

```

# for convenience in actions
HIDDEN = BaseRecognizer.HIDDEN

# token types
<tokens:{it | <it.name>=<it.type>}; separator="\n">

<recognizer>

<if(actions.(actionScope).main)>
<actions.(actionScope).main>
<else>
def main(argv, stdin=sys.stdin, stdout=sys.stdout, stderr=sys.stderr):
<if(LEXER)>
    from antlr3.main import LexerMain
    main = LexerMain(<recognizer.name>)<\n>
<endif>
<if(PARSER)>
    from antlr3.main import ParserMain
    main = ParserMain("<recognizer.grammar.name>Lexer", <recognizer.name>)<\n>
<endif>
<if(TREE_PARSER)>
    from antlr3.main import WalkerMain
    main = WalkerMain(<recognizer.name>)<\n>
<endif>
    main.stdin = stdin
    main.stdout = stdout
    main.stderr = stderr
    main.execute(argv)<\n>
<endif>

<actions.(actionScope).footer>

if __name__ == '__main__':
    main(sys.argv)

>>

lexer(grammar, name, tokens, scopes, rules, numRules, filterMode,
    labelType="CommonToken", superClass="Lexer") ::= <<
<grammar.directDelegates:
{g|from <g.recognizerName> import <g.recognizerName>}; separator="\n">

class <grammar.recognizerName>(<@superClassName><superClass><@end>):
    <scopes:{it|<if(it.isDynamicGlobalScope)><globalAttributeScope(scope=it)><endif>}>

    grammarFileName = "<fileName>"
    api_version = <apiVersion()>

```

```

def __init__(self<grammar.delegators:{g|,<g:delegateName(>>}, input=None, state=None):
    if state is None:
        state = RecognizerSharedState()
        super(<grammar.recognizerName>, self).__init__(input, state)

<if(memoize)>
<if(grammar.grammarIsRoot)>
    self._state.ruleMemo = {}
<endif>
<endif>

    <grammar.directDelegates:
        {g|self.<g:delegateName(> = <g.recognizerName>(<trunc(g.delegators):{p|<p:delegateName(>, }>self, input,
state)); separator="\n">
    <grammar.directDelegates:
        {g|<g.delegates:{h|self.<h:delegateName(> = self.<g:delegateName(>.<h:delegateName(>};
separator="\n">}; separator="\n">
    <grammar.delegators:
        {g|self.<g:delegateName(> = <g:delegateName(>}; separator="\n">
    <last(grammar.delegators):
    {g|self.gParent = <g:delegateName(>}; separator="\n">
    self.delegates = [<grammar.delegates: {g|self.<g:delegateName(>}; separator = ", ">]

    <cyclicDFAs:{dfa | <cyclicDFAInit(dfa)>}; separator="\n">

    <actions.lexer.init>

    <actions.lexer.members>

<if(filterMode)>
    <filteringNextToken(>
<endif>
    <rules; separator="\n\n">

    <synpreds:{p | <lexerSynpred(p)>}>

    <cyclicDFAs:cyclicDFA(> <! dump tables for all DFA !>

>>

/** A override of Lexer.nextToken() that backtracks over mTokens() looking
* for matches. No error can be generated upon error; just rewind, consume
* a token and then try again. backtracking needs to be set as well.
* Make rule memoization happen only at levels above 1 as we start mTokens
* at backtracking==1.

```



```

*/
filteringNextToken() ::= <<
def nextToken(self):
    while True:
        if self.input.LA(1) == EOF:
            return self.makeEOFToken()

        self._state.token = None
        self._state.channel = DEFAULT_CHANNEL
        self._state.tokenStartCharIndex = self.input.index()
        self._state.tokenStartCharPositionInLine = self.input.charPositionInLine
        self._state.tokenStartLine = self.input.line
        self._state._text = None
        try:
            m = self.input.mark()
            try:
                # means we won't throw slow exception
                self._state.backtracking = 1
                try:
                    self.mTokens()
                finally:
                    self._state.backtracking = 0

            except BacktrackingFailed:
                # mTokens backtracks with synpred at backtracking==2
                # and we set the synpredgate to allow actions at level 1.
                self.input.rewind(m)
                self.input.consume() # advance one char and try again

        else:
            self.emit()
            return self._state.token

    except RecognitionException, re:
        # shouldn't happen in backtracking mode, but...
        self.reportError(re)
        self.recover(re)

def memoize(self, input, ruleIndex, ruleStartIndex, success):
    if self._state.backtracking > 1:
        # is Lexer always superclass?
        super(<grammar.recognizerName>, self).memoize(input, ruleIndex, ruleStartIndex, success)

def alreadyParsedRule(self, input, ruleIndex):
    if self._state.backtracking > 1:
        return super(<grammar.recognizerName>, self).alreadyParsedRule(input, ruleIndex)

```

```

return False

>>

actionGate() ::= "self._state.backtracking == 0"

filteringActionGate() ::= "self._state.backtracking == 1"

/** How to generate a parser */

genericParser(grammar, name, scopes, tokens, tokenNames, rules, numRules,
              bitsets, inputStreamType, superClass, labelType, members,
              rewriteElementType, filterMode, init, ASTLabelType="Object") ::= <<
<if(grammar.grammarIsRoot)>
# token names
tokenNames = [
  "\<invalid>", "\<EOR>", "\<DOWN>", "\<UP>",
  <tokenNames; wrap, separator=", ">
]<\n>
<else>
from <grammar.composite.rootGrammar.recognizerName> import tokenNames<\n>
<endif>
<scopes:{it|<if(it.isDynamicGlobalScope)><globalAttributeScopeClass(scope=it)><endif>}>

<grammar.directDelegates:
{g|from <g.recognizerName> import <g.recognizerName>; separator="\n">

<rules:{it|<ruleAttributeScopeClass(scope=it.ruleDescriptor.ruleScope)>}>

class <grammar.recognizerName>(<@superClassName><superClass><@end>):
  grammarFileName = "<fileName>"
  api_version = <apiVersion()>
  tokenNames = tokenNames

  def __init__(self<grammar.delegators:{g|, <g:delegateName()>}>, input, state=None, *args, **kwargs):
    if state is None:
      state = RecognizerSharedState()

    <@args()>
    super(<grammar.recognizerName>, self).__init__(input, state, *args, **kwargs)

<if(memoize)>
<if(grammar.grammarIsRoot)>
  self._state.ruleMemo = {}
<endif>
<endif>

```

```

<cyclicDFAs:{ dfa | <cyclicDFAInit(dfa)>}; separator="\n">

<scopes:{ it | <if(it.isDynamicGlobalScope)><globalAttributeScopeStack(scope=it)><endif> }>
<rules:{ it | <ruleAttributeScopeStack(scope=it.ruleDescriptor.ruleScope)> }>

<init>

<grammar.delegators:
  {g|self.<g:delegateName()> = <g:delegateName()>}; separator="\n">
<grammar.directDelegates:
  {g|self.<g:delegateName()> = <g.recognizerName>(<trunc(g.delegators):{p|<p:delegateName()>, }>self, input,
state)); separator="\n">
  <grammar.directDelegates:
    {g|<g.delegates:{h|self.<h:delegateName()> = self.<g:delegateName()>.<h:delegateName()>};
separator="\n">}; separator="\n">
  <last(grammar.delegators):
    {g|self.gParent = self.<g:delegateName()>}; separator="\n">
    self.delegates = [<grammar.delegates: {g|self.<g:delegateName()>}; separator = ", ">]

<@init><@end>

<@members><@end>

<members>

<rules; separator="\n\n">

<! generate rule/method definitions for imported rules so they
  appear to be defined in this recognizer. !>
<grammar.delegatedRules:{ ruleDescriptor| <delegateRule(ruleDescriptor)> }; separator="\n">

<synpreds:{ p | <synpred(p)> }>

<cyclicDFAs:cyclicDFA()> <! dump tables for all DFA !>

<bitsets:{ it | FOLLOW_<it.name>_in_<it.inName><it.tokenIndex> = frozenset([<it.tokenTypes:{ it |
<it>};separator=", ">])<n> }>

>>

delegateRule(ruleDescriptor) ::= <<
def <ruleDescriptor.name>(self, <ruleDescriptor.parameterScope:parameterScope()>):
<\> <if(ruleDescriptor.hasReturnValue)>return
<endif>self.<ruleDescriptor.grammar:delegateName()>.<ruleDescriptor.name>(<if(ruleDescriptor.parameterScope)
><ruleDescriptor.parameterScope.attributes:{a|<a.name>}; separator=", "><endif>)

```

```

>>

parser(grammar, name, scopes, tokens, tokenNames, rules, numRules, bitsets,
  ASTLabelType="Object", superClass="Parser", labelType="Token",
  members={<actions.parser.members>},
  init={<actions.parser.init>}
) ::= <<
<genericParser(grammar, name, scopes, tokens, tokenNames, rules, numRules,
  bitsets, "TokenStream", superClass,
  labelType, members, "Token",
  false, init, ASTLabelType)>
>>

/** How to generate a tree parser; same as parser except the input
 * stream is a different type.
 */
treeParser(grammar, name, scopes, tokens, tokenNames, globalAction, rules,
  numRules, bitsets, filterMode, labelType={<ASTLabelType>}, ASTLabelType="Object",
  superClass={<if(filterMode)><if(buildAST)>TreeRewriter<else>TreeFilter<endif><else>TreeParser<endif>},
  members={<actions.treeparser.members>},
  init={<actions.treeparser.init>}
) ::= <<
<genericParser(grammar, name, scopes, tokens, tokenNames, rules, numRules,
  bitsets, "TreeNodeStream", superClass,
  labelType, members, "Node",
  filterMode, init, ASTLabelType)>
>>

/** A simpler version of a rule template that is specific to the imaginary
 * rules created for syntactic predicates. As they never have return values
 * nor parameters etc..., just give simplest possible method. Don't do
 * any of the normal memoization stuff in here either; it's a waste.
 * As predicates cannot be inlined into the invoking rule, they need to
 * be in a rule by themselves.
 */
synpredRule(ruleName, ruleDescriptor, block, description, nakedBlock) ::=
<<
# $ANTLR start "<ruleName>"
def <ruleName>_fragment(self, <ruleDescriptor.parameterScope:parameterScope(>):
  <ruleLabelDefs(>
<if(trace)>
  self.traceIn("<ruleName>_fragment", <ruleDescriptor.index>)
  try:
    <block>

  finally:
    self.traceOut("<ruleName>_fragment", <ruleDescriptor.index>)

```

```
<else>
  <block>
<endif>
# $ANTLR end "<ruleName>"
```

```
>>
```

```
synpred(name) ::= <<
def <name>(self):
  self._state.backtracking += 1
  <@start()>
  start = self.input.mark()
  try:
    self.<name>_fragment()
  except BacktrackingFailed:
    success = False
  else:
    success = True
  self.input.rewind(start)
  <@stop()>
  self._state.backtracking -= 1
  return success
```

```
>>
```

```
lexerSynpred(name) ::= <<
<synpred(name)>
>>
```

```
ruleMemoization(name) ::= <<
<if(memoize)>
if self._state.backtracking > 0 and self.alreadyParsedRule(self.input, <ruleDescriptor.index>):
  # for cached failed rules, alreadyParsedRule will raise an exception
  success = True
  return <ruleReturnValue()>
```

```
<endif>
```

```
>>
```

```
/** This rule has failed, exit indicating failure during backtrack */
```

```
ruleBacktrackFailure() ::= <<
<if(backtracking)>
if self._state.backtracking > 0:
  raise BacktrackingFailed
```

```
<endif>
```

```
>>
```

```
/** How to generate code for a rule. This includes any return type
```

```
* data aggregates required for multiple return values.
```

```
*/
```

```
rule(ruleName,ruleDescriptor,block,emptyRule,description,exceptions,finally,memoize) ::= <<
```

```
<returnScope(scope=ruleDescriptor.returnScope)>
```

```
# $ANTLR start "<ruleName>"
```

```
# <fileName>:<description>
```

```
<ruleDescriptor.actions.decorate>
```

```
def <ruleName>(self, <ruleDescriptor.parameterScope:parameterScope()>):
```

```
<if(trace)>
```

```
    self.traceIn("<ruleName>", <ruleDescriptor.index>)<\n>
```

```
<endif>
```

```
    <ruleScopeSetUp()>
```

```
    <ruleDeclarations()>
```

```
    <ruleLabelDefs()>
```

```
    <ruleDescriptor.actions.init>
```

```
    <@preamble()>
```

```
    <@body><ruleBody()><@end>
```

```
    <@postamble()>
```

```
    return <ruleReturnValue()>
```

```
# $ANTLR end "<ruleName>"
```

```
>>
```

```
ruleBody() ::= <<
```

```
<if(memoize)>
```

```
<if(backtracking)>
```

```
success = False<\n>
```

```
<endif>
```

```
<endif>
```

```
try:
```

```
    try:
```

```
        <ruleMemoization(name=ruleName)>
```

```
        <block>
```

```
        <ruleCleanUp()>
```

```
        <(ruleDescriptor.actions.after):execAction()>
```

```
<if(memoize)>
```

```
<if(backtracking)>
```

```
    success = True<\n>
```

```
<endif>
```

```
<endif>
```

```
<if(exceptions)>
```

```
    <exceptions:{e|catch(decl=e.decl,action=e.action)><\n}>
```

```
<else>
```

```

<if(!emptyRule)>
<if(actions.(actionScope).rulecatch)>
  <actions.(actionScope).rulecatch>
<else>
  except RecognitionException, re:
    self.reportError(re)
    self.recover(self.input, re)
    <@setErrorReturnValue()>

<endif>
<else>
  finally:
    pass

<endif>
<endif>
finally:
<if(trace)>
  self.traceOut("<ruleName>", <ruleDescriptor.index>)<\n>
<endif>
  <memoize()>
  <ruleScopeCleanUp()>
  <finally>
  pass
>>

catch(decl,action) ::= <<
except <e.decl>:
  <e.action>

>>

ruleDeclarations() ::= <<
<if(ruleDescriptor.hasMultipleReturnValues)>
retval = self.<ruleDescriptor.name>_return()
retval.start = self.input.LT(1)<\n>
<elseif(ruleDescriptor.returnScope)>
<ruleDescriptor.returnScope.attributes: { a |
<a.name> = <if(a.initValue)><a.initValue><else>None<endif>
}>
<endif>
<if(memoize)>
<ruleDescriptor.name>_startIndex = self.input.index()
<endif>
>>

ruleScopeSetUp() ::= <<
<ruleDescriptor.useScopes: {it | self.<it>_stack.append(<it>_scope()); separator="\n">

```

```

<ruleDescriptor.ruleScope:{it | self.<it.name>_stack.append(<it.name>_scope()); separator="\n">
>>

ruleScopeCleanUp() ::= <<
<ruleDescriptor.useScopes:{it | self.<it>_stack.pop()}; separator="\n">
<ruleDescriptor.ruleScope:{it | self.<it.name>_stack.pop()}; separator="\n">
>>

ruleLabelDefs() ::= <<
<[ruleDescriptor.tokenLabels,ruleDescriptor.tokenListLabels,
ruleDescriptor.wildcardTreeLabels,ruleDescriptor.wildcardTreeListLabels]
: {it | <it.label.text> = None }; separator="\n"
>
<[ruleDescriptor.tokenListLabels,ruleDescriptor.ruleListLabels,
ruleDescriptor.wildcardTreeListLabels]
: {it | list_<it.label.text> = None }; separator="\n"
>
<ruleDescriptor.ruleLabels:ruleLabelDef(); separator="\n">
<ruleDescriptor.ruleListLabels:{it | <it.label.text> = None }; separator="\n">
>>

lexerRuleLabelDefs() ::= <<
<[ruleDescriptor.tokenLabels,
ruleDescriptor.tokenListLabels,
ruleDescriptor.ruleLabels]
: {it | <it.label.text> = None }; separator="\n"
>
<ruleDescriptor.charLabels:{it | <it.label.text> = None }; separator="\n">
<[ruleDescriptor.tokenListLabels,
ruleDescriptor.ruleListLabels]
: {it | list_<it.label.text> = None }; separator="\n"
>
>>

ruleReturnValue() ::= <%
<if(!ruleDescriptor.isSynPred)>
<if(ruleDescriptor.hasReturnValue)>
<if(ruleDescriptor.hasSingleReturnValue)>
<ruleDescriptor.singleValueReturnName>
<else>
retval
<endif>
<endif>
<endif>
<endif>
%>

ruleCleanUp() ::= <<
<if(ruleDescriptor.hasMultipleReturnValues)>

```



```

<if(!TREE_PARSER)>
retval.stop = self.input.LT(-1)<\n>
<endif>
<endif>
>>

memoize() ::= <<
<if(memoize)>
<if(backtracking)>
if self._state.backtracking > 0:
    self.memoize(self.input, <ruleDescriptor.index>, <ruleDescriptor.name>_startIndex, success)

<endif>
<endif>
>>

/** How to generate a rule in the lexer; naked blocks are used for
 * fragment rules.
 */
lexerRule(ruleName,nakedBlock,ruleDescriptor,block,memoize) ::= <<
# $ANTLR start "<ruleName>"
def m<ruleName>(self, <ruleDescriptor.parameterScope:parameterScope()>):
<if(trace)>
    self.traceIn("<ruleName>", <ruleDescriptor.index>)<\n>
<endif>
    <ruleScopeSetUp()>
    <ruleDeclarations()>
<if(memoize)>
<if(backtracking)>
    success = False<\n>
<endif>
<endif>
    try:
<if(nakedBlock)>
        <ruleMemoization(name=ruleName)>
        <lexerRuleLabelDefs()>
        <ruleDescriptor.actions.init>
        <block><\n>
<else>
        _type = <ruleName>
        _channel = DEFAULT_CHANNEL

        <ruleMemoization(name=ruleName)>
        <lexerRuleLabelDefs()>
        <ruleDescriptor.actions.init>
        <block>
        <ruleCleanUp()>
        self._state.type = _type

```

```

        self._state.channel = _channel
        <(ruleDescriptor.actions.after):execAction(>
<endif>
<if(memoize)>
<if(backtracking)>
    success = True<\n>
<endif>
<endif>

    finally:
<if(trace)>
    self.traceOut("<ruleName>", <ruleDescriptor.index>)<\n>
<endif>
<ruleScopeCleanUp(>
    <memoize(>
    pass

# $ANTLR end "<ruleName>"

>>

/** How to generate code for the implicitly-defined lexer grammar rule
 * that chooses between lexer rules.
 */
tokensRule(ruleName,nakedBlock,args,block,ruleDescriptor) ::= <<
def mTokens(self):
    <block><\n>

>>

// S U B R U L E S

/** A (...) subrule with multiple alternatives */
block(alts,decls,decision,enclosingBlockLevel,blockLevel,decisionNumber,maxK,maxAlt,description) ::= <<
# <fileName>:<description>
alt<decisionNumber> = <maxAlt>
<decls>
<@body><blockBody()><@end>
>>

blockBody() ::= <<
<@predecision()>
<@decision><decision><@end>
<@postdecision()>
<@prebranch()>
<alts:{ a | <altSwitchCase(i, a)> }; separator="\n1">

```

```

<@postbranch(>
>>

/** A rule block with multiple alternatives */
ruleBlock(alts,decls,decision,enclosingBlockLevel,blockLevel,decisionNumber,maxK,maxAlt,description) ::= <<
# <fileName>:<description>
alt<decisionNumber> = <maxAlt>
<decls>
<@predecision(>
<@decision><decision><@end>
<@postdecision(>
<alts:{a | <altSwitchCase(i, a)>}; separator="\nel">
>>

ruleBlockSingleAlt(alts,decls,decision,enclosingBlockLevel,blockLevel,decisionNumber,description) ::= <<
# <fileName>:<description>
<decls>
<@prealt(>
<alts>
<@postalt(>
>>

/** A special case of a (...) subrule with a single alternative */
blockSingleAlt(alts,decls,decision,enclosingBlockLevel,blockLevel,decisionNumber,description) ::= <<
# <fileName>:<description>
<decls>
<@prealt(>
<alts>
<@postalt(>
>>

/** A (..)+ block with 1 or more alternatives */
positiveClosureBlock(alts,decls,decision,enclosingBlockLevel,blockLevel,decisionNumber,maxK,maxAlt,description) ::= <<
# <fileName>:<description>
cnt<decisionNumber> = 0
<decls>
<@preloop(>
<@loopBody>
<positiveClosureBlockLoop(>
<@end>
<@postloop(>
>>

positiveClosureBlockLoop() ::= <<
while True: #loop<decisionNumber>
  alt<decisionNumber> = <maxAlt>
  <@predecision(>

```

```

<@decisionBody><decision><@end>
<@postdecision()>
<alts:{a | <altSwitchCase(i, a)>}; separator="\nel">
else:
  if cnt<decisionNumber> >= 1:
    break #loop<decisionNumber>

  <ruleBacktrackFailure()>
  eee = EarlyExitException(<decisionNumber>, self.input)
  <@earlyExitException()>
  raise eee

  cnt<decisionNumber> += 1
>>

positiveClosureBlockSingleAlt ::= positiveClosureBlock

/** A (..)* block with 1 or more alternatives */
closureBlock(alts,decls,decision,enclosingBlockLevel,blockLevel,decisionNumber,maxK,maxAlt,description) ::=
<<
# <fileName>:<description>
<decls>
<@preloop()>
<@loopBody>
<closureBlockLoop()>
<@end>
<@postloop()>
>>

closureBlockLoop() ::= <<
while True: #loop<decisionNumber>
  alt<decisionNumber> = <maxAlt>
  <@predecision()>
  <@decisionBody><decision><@end>
  <@postdecision()>
  <alts:{a | <altSwitchCase(i, a)>}; separator="\nel">
  else:
    break #loop<decisionNumber>
>>

closureBlockSingleAlt ::= closureBlock

/** Optional blocks (x)? are translated to (x|) by before code generation
* so we can just use the normal block template
*/
optionalBlock ::= block

optionalBlockSingleAlt ::= block

```

```

/** A case in a switch that jumps to an alternative given the alternative
 * number. A DFA predicts the alternative and then a simple switch
 * does the jump to the code that actually matches that alternative.
 */
altSwitchCase(altNum,alt) ::= <<
if alt<decisionNumber> == <altNum>:
  <@prealt()>
  <alt>
>>

/** An alternative is just a list of elements; at outermost level */
alt(elements,altNum,description,autoAST,outerAlt, treeLevel,rew) ::= <<
# <fileName>:<description>
pass <! so empty alternatives are a valid block !>
<@declarations()>
<elements:element()>
<rew>
<@cleanup()>
>>

/** What to emit when there is no rewrite. For auto build
 * mode, does nothing.
 */
noRewrite(rewriteBlockLevel, treeLevel) ::= ""

// E L E M E N T S

/** Dump the elements one per line */
element(e) ::= <<
<@prematch()>
<e.el><\n>
>>

/** match a token optionally with a label in front */
tokenRef(token,label,elementIndex,terminalOptions={}) ::= <<
<if(label)><label> = <endif>self.match(self.input, <token>,
self.FOLLOW_<token>_in_<ruleName><elementIndex>)
>>

/** ids+=ID */
tokenRefAndListLabel(token,label,elementIndex,terminalOptions={}) ::= <<
<tokenRef(token,label,elementIndex,terminalOptions)>
<listLabel(label, label)>
>>

listLabel(label, elem) ::= <<
if list_<label> is None:

```

```

    list_<label> = []
list_<label>.append(<elem>)<\n>
>>

/** match a character */
charRef(char,label) ::= <<
<if(label)>
<label> = self.input.LA(1)<\n>
<endif>
self.match(<char>)
>>

/** match a character range */
charRangeRef(a,b,label) ::= <<
<if(label)>
<label> = self.input.LA(1)<\n>
<endif>
self.matchRange(<a>, <b>)
>>

/** For now, sets are interval tests and must be tested inline */
matchSet(s,label,elementIndex,postmatchCode="",terminalOptions={}) ::= <<
<if(label)>
<label> = self.input.LT(1)<\n>
<endif>
if <s>:
    self.input.consume()
    <postmatchCode>
<if(!LEXER)>
    self._state.errorRecovery = False<\n>
<endif>

else:
    <ruleBacktrackFailure()>
    mse = MismatchedSetException(None, self.input)
    <@mismatchedSetException()>
<if(LEXER)>
    self.recover(mse)
    raise mse
<else>
    raise mse
<! use following code to make it recover inline; remove throw mse;
self.recoverFromMismatchedSet(
    self.input, mse, self.FOLLOW_set_in_<ruleName><elementIndex>
)
!>
<endif>
<\n>

```

```
>>
```

```
matchRuleBlockSet ::= matchSet
```

```
matchSetAndListLabel(s,label,elementIndex,postmatchCode) ::= <<
```

```
<matchSet(...)>
```

```
<listLabel(label, label)>
```

```
>>
```

```
/** Match a string literal */
```

```
lexerStringRef(string,label,elementIndex="0") ::= <<
```

```
<if(label)>
```

```
<label>Start = self.getCharIndex()
```

```
self.match(<string>)
```

```
<label>StartLine<elementIndex> = self.getLine()
```

```
<label>StartCharPos<elementIndex> = self.getCharPositionInLine()
```

```
<label> = <labelType>(input=self.input, type=INVALID_TOKEN_TYPE, channel=DEFAULT_CHANNEL,  
start=<label>Start, stop=self.getCharIndex()-1)
```

```
<label>.setLine(<label>StartLine<elementIndex>)
```

```
<label>.setCharPositionInLine(<label>StartCharPos<elementIndex>)
```

```
<else>
```

```
self.match(<string>)
```

```
<endif>
```

```
>>
```

```
wildcard(token,label,elementIndex,terminalOptions={}) ::= <<
```

```
<if(label)>
```

```
<label> = self.input.LT(1)<\n>
```

```
<endif>
```

```
self.matchAny(self.input)
```

```
>>
```

```
wildcardAndListLabel(token,label,elementIndex,terminalOptions={}) ::= <<
```

```
<wildcard(...)>
```

```
<listLabel(label,label)>
```

```
>>
```

```
/** Match . wildcard in lexer */
```

```
wildcardChar(label, elementIndex) ::= <<
```

```
<if(label)>
```

```
<label> = self.input.LA(1)<\n>
```

```
<endif>
```

```
self.matchAny()
```

```
>>
```

```
wildcardCharListLabel(label, elementIndex) ::= <<
```

```
<wildcardChar(label, elementIndex)>
```

```
<listLabel(label, label)>
```

```
>>
```

```
/** Match a rule reference by invoking it possibly with arguments
 * and a return value or values. The 'rule' argument was the
 * target rule name, but now is type Rule, whose toString is
 * same: the rule name. Now though you can access full rule
 * descriptor stuff.
 */
ruleRef(rule,label,elementIndex,args,scope) ::= <<
self._state.following.append(self.FOLLOW_<rule.name>_in_<ruleName><elementIndex>)
<if(label)><label> = <endif>self.<if(scope)><scope:delegateName().<endif><rule.name><args; separator=",
"><\n>
self._state.following.pop()
>>
```

```
/** ids+=rule */
ruleRefAndListLabel(rule,label,elementIndex,args,scope) ::= <<
<ruleRef(rule,label,elementIndex,args,scope)>
<listLabel(label, label)>
>>
```

```
/** A lexer rule reference
 * The 'rule' argument was the target rule name, but now
 * is type Rule, whose toString is same: the rule name.
 * Now though you can access full rule descriptor stuff.
 */
lexerRuleRef(rule,label,args,elementIndex,scope) ::= <<
<if(label)>
<label>Start<elementIndex> = self.getCharIndex()
self.<if(scope)><scope:delegateName().<endif>m<rule.name><args; separator=", ">
<label>StartLine<elementIndex> = self.getLine()
<label>StartCharPos<elementIndex> = self.getCharPositionInLine()
<label> = <labelType>(
input=self.input,
type=INVALID_TOKEN_TYPE,
channel=DEFAULT_CHANNEL,
start=<label>Start<elementIndex>,
stop=self.getCharIndex()-1)
<label>.setLine(<label>StartLine<elementIndex>)
<label>.setCharPositionInLine(<label>StartCharPos<elementIndex>)
<else>
self.<if(scope)><scope:delegateName().<endif>m<rule.name><args; separator=", ">
<endif>
>>
```

```
/** i+=INT in lexer */
lexerRuleRefAndListLabel(rule,label,args,elementIndex,scope) ::= <<
<lexerRuleRef(rule,label,args,elementIndex,scope)>
```



```

<listLabel(label, label)>
>>

/** EOF in the lexer */
lexerMatchEOF(label,elementIndex) ::= <<
<if(label)>
<label>Start<elementIndex> = self.getCharIndex()
<label>StartLine<elementIndex> = self.getLine()
<label>StartCharPos<elementIndex> = self.getCharPositionInLine()
self.match(EOF)
<label> = <labelType>(input=self.input, type=EOF, channel=DEFAULT_CHANNEL,
start=<label>Start<elementIndex>, stop=self.getCharIndex()-1)
<label>.setLine(<label>StartLine<elementIndex>)
<label>.setCharPositionInLine(<label>StartCharPos<elementIndex>)
<else>
self.match(EOF)
<endif>
>>

// used for left-recursive rules
recRuleDefArg()          ::= "<recRuleArg()>"
recRuleArg()            ::= "_p"
recRuleAltPredicate(ruleName, opPrec) ::= "<recRuleArg()> |<= <opPrec>"
recRuleSetResultAction() ::= "root_0 = $<ruleName>_primary.tree"
recRuleSetReturnAction(src, name)    ::= "$<name> = $<src>.<name>"

/** match ^(root children) in tree parser */
tree(root, actionsAfterRoot, children, nullableChildList,
enclosingTreeLevel, treeLevel) ::= <<
<root:element()>
<actionsAfterRoot:element()>
<if(nullableChildList)>
if self.input.LA(1) == DOWN:
self.match(self.input, DOWN, None)
<children:element()>
self.match(self.input, UP, None)

<else>
self.match(self.input, DOWN, None)
<children:element()>
self.match(self.input, UP, None)
<endif>
>>

/** Every predicate is used as a validating predicate (even when it is
* also hoisted into a prediction expression).
*/
validateSemanticPredicate(pred,description) ::= <<

```

```

if not (<evalPredicate(pred, description)>):
    <ruleBacktrackFailure()>
    raise FailedPredicateException(self.input, "<ruleName>", "<description>")

>>

// F i x e d D F A (if-then-else)

dfaState(k,edges,eotPredictsAlt,description,stateNumber,semPredState) ::= <<
LA<decisionNumber>_<stateNumber> = self.input.LA(<k>)<\n>
<edges; separator="\n" >
else:
<if(eotPredictsAlt)>
    alt<decisionNumber> = <eotPredictsAlt>
<else>
    <ruleBacktrackFailure()>
    nvae = NoViableAltException("<description>", <decisionNumber>, <stateNumber>, self.input)<\n>
    <@noViableAltException()>
    raise nvae<\n>
<endif>
>>

/** Same as a normal DFA state except that we don't examine lookahead
 * for the bypass alternative. It delays error detection but this
 * is faster, smaller, and more what people expect. For (X)? people
 * expect "if ( LA(1)==X ) match(X);" and that's it.
 */
dfaOptionalBlockState(k,edges,eotPredictsAlt,description,stateNumber,semPredState) ::= <<
LA<decisionNumber>_<stateNumber> = self.input.LA(<k>)<\n>
<edges; separator="\n" >
>>

/** A DFA state that is actually the loopback decision of a closure
 * loop. If end-of-token (EOT) predicts any of the targets then it
 * should act like a default clause (i.e., no error can be generated).
 * This is used only in the lexer so that for ('a')* on the end of a rule
 * anything other than 'a' predicts exiting.
 */
dfaLoopbackState(k,edges,eotPredictsAlt,description,stateNumber,semPredState) ::= <<
LA<decisionNumber>_<stateNumber> = self.input.LA(<k>)<\n>
<edges; separator="\n" ><\n>
<if(eotPredictsAlt)>
<if(!edges)>
alt<decisionNumber> = <eotPredictsAlt> <! if no edges, don't gen ELSE !>
<else>
else:
    alt<decisionNumber> = <eotPredictsAlt>
<\n>

```

```

<endif>
<endif>
>>

/** An accept state indicates a unique alternative has been predicted */
dfaAcceptState(alt) ::= "alt<decisionNumber> = <alt>"

/** A simple edge with an expression. If the expression is satisfied,
 * enter to the target state. To handle gated productions, we may
 * have to evaluate some predicates for this edge.
 */
dfaEdge(labelExpr, targetState, predicates) ::= <<
if (<labelExpr>) <if(predicates)>and (<predicates>)<endif>:
    <targetState>
>>

// F i x e d D F A (switch case)

/** A DFA state where a SWITCH may be generated. The code generator
 * decides if this is possible: CodeGenerator.canGenerateSwitch().
 */
dfaStateSwitch(k,edges,eotPredictsAlt,description,stateNumber,semPredState) ::= <<
<!
    FIXME: this is one of the few occasion, where I miss a switch statement
    in Python. ATM this is implemented as a list of if .. elif ..
    This may be replaced by faster a dictionary lookup, when I find a solution
    for the cases when an edge is not a plain dfaAcceptState.
!>
LA<decisionNumber> = self.input.LA(<k>)
<edges; separator="\n">
else:
<if(eotPredictsAlt)>
    alt<decisionNumber> = <eotPredictsAlt>
<else>
    <ruleBacktrackFailure()>
    nvae = NoViableAltException("<description>", <decisionNumber>, <stateNumber>, self.input)<\n>
    <@noViableAltException()>
    raise nvae<\n>
<endif>

>>

dfaOptionalBlockStateSwitch(k,edges,eotPredictsAlt,description,stateNumber,semPredState) ::= <<
LA<decisionNumber> = self.input.LA(<k>)
<edges; separator="\n">
>>

dfaLoopbackStateSwitch(k, edges,eotPredictsAlt,description,stateNumber,semPredState) ::= <<

```

```

LA<decisionNumber> = self.input.LA(<k>)
<edges; separator="\n\n">
<if(eotPredictsAlt)>
else:
    alt<decisionNumber> = <eotPredictsAlt>
<endif>
>>

dfaEdgeSwitch(labels, targetState) ::= <<
if <labels:{it | LA<decisionNumber> == <it>}; separator=" or ">:
    <targetState>
>>

// C y c l i c D F A

/** The code to initiate execution of a cyclic DFA; this is used
 * in the rule to predict an alt just like the fixed DFA case.
 * The <name> attribute is inherited via the parser, lexer, ...
 */
dfaDecision(decisionNumber,description) ::= <<
alt<decisionNumber> = self.dfa<decisionNumber>.predict(self.input)
>>

/* Dump DFA tables as run-length-encoded Strings of octal values.
 * Can't use hex as compiler translates them before compilation.
 * These strings are split into multiple, concatenated strings.
 * Java puts them back together at compile time thankfully.
 * Java cannot handle large static arrays, so we're stuck with this
 * encode/decode approach. See analysis and runtime DFA for
 * the encoding methods.
 */
cyclicDFA(dfa) ::= <<
# lookup tables for DFA #<dfa.decisionNumber>

DFA<dfa.decisionNumber>_eot = DFA.unpack(
    u"<dfa.javaCompressedEOT; wrap="\n    u\>"
)

DFA<dfa.decisionNumber>_eof = DFA.unpack(
    u"<dfa.javaCompressedEOF; wrap="\n    u\>"
)

DFA<dfa.decisionNumber>_min = DFA.unpack(
    u"<dfa.javaCompressedMin; wrap="\n    u\>"
)

DFA<dfa.decisionNumber>_max = DFA.unpack(
    u"<dfa.javaCompressedMax; wrap="\n    u\>"
)

```

```

)

DFA<dfa.decisionNumber>_accept = DFA.unpack(
    u"<dfa.javaCompressedAccept; wrap=""\n  u"">"
)

DFA<dfa.decisionNumber>_special = DFA.unpack(
    u"<dfa.javaCompressedSpecial; wrap=""\n  u"">"
)

DFA<dfa.decisionNumber>_transition = [
    <dfa.javaCompressedTransition:{s|DFA.unpack(u"<s; wrap=""\nu"">)}; separator=",\n">
]

# class definition for DFA #<dfa.decisionNumber>

class DFA<dfa.decisionNumber>(DFA):
    pass

    <@errorMethod()>

    <if(dfa.specialStateSTs)>
    def specialStateTransition(self_, s, input):
        # convince pylint that my self_ magic is ok ;)
        # pylint: disable-msg=E0213

        # pretend we are a member of the recognizer
        # thus semantic predicates can be evaluated
        self = self_.recognizer

        _s = s

        <dfa.specialStateSTs:{state | if s == <i0>: <! compressed special state numbers 0..n-1 !>
        <state>}; separator="\nel">

    <if(backtracking)>
        if self._state.backtracking > 0:
            raise BacktrackingFailed

    <endif>
        nvae = NoViableAltException(self_.getDescription(), <dfa.decisionNumber>, _s, input)
        self_.error(nvae)
        raise nvae<\n>
    <endif>

    >>

```

```

cyclicDFAInit(dfa) ::= <<
self.dfa<dfa.decisionNumber> = self.DFA<dfa.decisionNumber>(
  self, <dfa.decisionNumber>,
  eot = self.DFA<dfa.decisionNumber>_eot,
  eof = self.DFA<dfa.decisionNumber>_eof,
  min = self.DFA<dfa.decisionNumber>_min,
  max = self.DFA<dfa.decisionNumber>_max,
  accept = self.DFA<dfa.decisionNumber>_accept,
  special = self.DFA<dfa.decisionNumber>_special,
  transition = self.DFA<dfa.decisionNumber>_transition
)<\n>
>>

/** A state in a cyclic DFA; it's a special state and part of a big switch on
 * state.
 */
cyclicDFAState(decisionNumber,stateNumber,edges,needErrorClause,semPredState) ::= <<
LA<decisionNumber>_<stateNumber> = input.LA(1)<\n>
<if(semPredState)> <! get next lookahead symbol to test edges, then rewind !>
index<decisionNumber>_<stateNumber> = input.index()
input.rewind()<\n>
<endif>
s = -1
<edges; separator="\n">
<if(semPredState)> <! return input cursor to state before we rewound !>
input.seek(index<decisionNumber>_<stateNumber>)<\n>
<endif>
if s >= 0:
  return s
>>

/** Just like a fixed DFA edge, test the lookahead and indicate what
 * state to jump to next if successful.
 */
cyclicDFAEdge(labelExpr, targetStateNumber, edgeNumber, predicates) ::= <<
if (<labelExpr>)<if(predicates)> and (<predicates>)<endif>:
  s = <targetStateNumber><\n>
>>

/** An edge pointing at end-of-token; essentially matches any char;
 * always jump to the target.
 */
eotDFAEdge(targetStateNumber,edgeNumber, predicates) ::= <<
se:
  s = <targetStateNumber><\n>
>>

```

// D F A E X P R E S S I O N S

```
andPredicates(left,right) ::= "((<left>) and (<right>))"
```

```
orPredicates(operands) ::= "<operands; separator=\" or \">"
```

```
notPredicate(pred) ::= "not (<evalPredicate(pred, {}>)"
```

```
evalPredicate(pred,description) ::= "<pred>"
```

```
evalSynPredicate(pred,description) ::= "self.<pred>()"
```

```
lookaheadTest(atom,k,atomAsInt) ::= "LA<decisionNumber>_<stateNumber> == <atom>"
```

```
/** Sometimes a lookahead test cannot assume that LA(k) is in a temp variable
```

```
* somewhere. Must ask for the lookahead directly.
```

```
*/
```

```
isolatedLookaheadTest(atom,k,atomAsInt) ::= "self.input.LA(<k>) == <atom>"
```

```
lookaheadRangeTest(lower,upper,k,rangeNumber,lowerAsInt,upperAsInt) ::= <%
```

```
<lower> \<= LA<decisionNumber>_<stateNumber> \<= <upper>
```

```
%>
```

```
isolatedLookaheadRangeTest(lower,upper,k,rangeNumber,lowerAsInt,upperAsInt) ::= "<lower> \<= self.input.LA(<k>) \<= <upper>"
```

```
setTest(ranges) ::= "<ranges; separator=\" or \">"
```

// A T T R I B U T E S

```
globalAttributeScopeClass(scope) ::= <<
```

```
<if(scope)>
```

```
<if(scope.attributes)>
```

```
class <scope.name>_scope(object):
```

```
    def __init__(self):
```

```
        <scope.attributes:{it | self.<it.decl> = None}; separator="\n">
```

```
<endif>
```

```
<endif>
```

```
>>
```

```
globalAttributeScopeStack(scope) ::= <<
```

```
<if(scope)>
```

```
<if(scope.attributes)>
```

```
self.<scope.name>_stack = []<\n>
```

```
<endif>
```

```
<endif>
```

```
>>
```

```

ruleAttributeScopeClass(scope) ::= <<
<if(scope)>
<if(scope.attributes)>
class <scope.name>_scope(object):
    def __init__(self):
        <scope.attributes:{it | self.<it.decl> = None}; separator="\n">

<endif>
<endif>
>>

ruleAttributeScopeStack(scope) ::= <<
<if(scope)>
<if(scope.attributes)>
self.<scope.name>_stack = []<\n>
<endif>
<endif>
>>

delegateName(d) ::= <<
<if(d.label)><d.label><else>g<d.name><endif>
>>

/** Define a rule label including default value */
ruleLabelDef(label) ::= <<
<label.label.text> = None
>>

returnStructName(r) ::= "<r.name>_return"

/** Define a return struct for a rule if the code needs to access its
 * start/stop tokens, tree stuff, attributes, ... Leave a hole for
 * subgroups to stick in members.
 */
returnScope(scope) ::= <<
<if(ruleDescriptor.hasMultipleReturnValues)>
class <ruleDescriptor:returnStructName()>( <if(TREE_PARSER)>Tree<else>Parser<endif>RuleReturnScope):
    def __init__(self):
        super(<grammar.recognizerName>.<ruleDescriptor:returnStructName()>, self).__init__()

        <if(scope)><scope.attributes:{it | self.<it.decl> = None}; separator="\n"><endif>
        <@ruleReturnInit()>

        <@ruleReturnMembers()>

<endif>

```


>>

```
parameterScope(scope) ::= <<  
<if(scope)><scope.attributes:{it | <it.decl>}; separator=", "><endif>  
>>
```

```
parameterAttributeRef(attr) ::= "<attr.name>"  
parameterSetAttributeRef(attr,expr) ::= "<attr.name> = <expr>"
```

```
scopeAttributeRef(scope,attr,index,negIndex) ::= <%  
<if(negIndex)>  
self.<scope>_stack[-<negIndex>].<attr.name>  
<else>  
<if(index)>  
self.<scope>_stack[<index>].<attr.name>  
<else>  
self.<scope>_stack[-1].<attr.name>  
<endif>  
<endif>  
>%
```

/* not applying patch because of bug in action parser!

```
<if(negIndex)>  
((len(self.<scope>_stack) - <negIndex> - 1) >= 0 and [self.<scope>_stack[-<negIndex>].<attr.name>] or [None])[0]  
<else>  
<if(index)>  
((<index> \< len(self.<scope>_stack)) and [self.<scope>_stack[<index>].<attr.name>] or [None])[0]  
<else>  
((len(self.<scope>_stack) > 0) and [self.<scope>_stack[-1].<attr.name>] or [None])[0]  
<endif>  
<endif>
```

*/

```
scopeSetAttributeRef(scope,attr,expr,index,negIndex) ::= <%  
<if(negIndex)>  
<!FIXME: this seems not to be used by ActionTranslator...!>  
self.<scope>_stack[-<negIndex>].<attr.name> = <expr>  
<else>  
<if(index)>  
<!FIXME: this seems not to be used by ActionTranslator...!>  
self.<scope>_stack[<index>].<attr.name> = <expr>  
<else>  
self.<scope>_stack[-1].<attr.name> = <expr>  
<endif>  
<endif>  
>%
```

```

/** $x is either global scope or x is rule with dynamic scope; refers
 * to stack itself not top of stack. This is useful for predicates
 * like {$function.size()>0 && $function::name.equals("foo")}?
 */
isolatedDynamicScopeRef(scope) ::= "self.<scope>_stack"

/** reference an attribute of rule; might only have single return value */
ruleLabelRef(referencedRule,scope,attr) ::= <%
<if(referencedRule.hasMultipleReturnValues)>
((<scope> is not None) and [<scope>.<attr.name>] or [None])[0]
<else>
<scope>
<endif>
%>

returnAttributeRef(ruleDescriptor,attr) ::= <%
<if(ruleDescriptor.hasMultipleReturnValues)>
retval.<attr.name>
<else>
<attr.name>
<endif>
%>

returnSetAttributeRef(ruleDescriptor,attr,expr) ::= <%
<if(ruleDescriptor.hasMultipleReturnValues)>
retval.<attr.name> = <expr>
<else>
<attr.name> = <expr>
<endif>
%>

/** How to translate $tokenLabel */
tokenLabelRef(label) ::= "<label>"

/** ids+=ID {$ids} or e+=expr {$e} */
listLabelRef(label) ::= "list_<label>"

// not sure the next are the right approach; and they are evaluated early;
// they cannot see TREE_PARSER or PARSER attributes for example :(

tokenLabelPropertyRef_text(scope,attr) ::= "<scope>.text"
tokenLabelPropertyRef_type(scope,attr) ::= "<scope>.type"
tokenLabelPropertyRef_line(scope,attr) ::= "<scope>.line"
tokenLabelPropertyRef_pos(scope,attr) ::= "<scope>.charPositionInLine"
tokenLabelPropertyRef_channel(scope,attr) ::= "<scope>.channel"
tokenLabelPropertyRef_index(scope,attr) ::= "<scope>.index"

```

```

tokenLabelPropertyRef_tree(scope,attr) ::= "<scope>_tree"

ruleLabelPropertyRef_start(scope,attr) ::= "<scope>.start"
ruleLabelPropertyRef_stop(scope,attr) ::= "<scope>.stop"
ruleLabelPropertyRef_tree(scope,attr) ::= "<scope>.tree"
ruleLabelPropertyRef_text(scope,attr) ::= <%
<if(TREE_PARSER)>
((<scope> is not None) and [self.input.getTokenStream().toString(
    self.input.getTreeAdaptor().getTokenStartIndex(<scope>.start),
    self.input.getTreeAdaptor().getTokenStopIndex(<scope>.start)
    ]) or [None])[0]
<else>
((<scope> is not None) and [self.input.toString(<scope>.start,<scope>.stop)] or [None])[0]
<endif>
%>
ruleLabelPropertyRef_st(scope,attr) ::= "((<scope> is not None) and [<scope>.st] or [None])[0]"

/** Isolated $RULE ref ok in lexer as it's a Token */
lexerRuleLabel(label) ::= "<label>"

lexerRuleLabelPropertyRef_type(scope,attr) ::= "((<scope> is not None) and [<scope>.type] or [0])[0]"
lexerRuleLabelPropertyRef_line(scope,attr) ::= "((<scope> is not None) and [<scope>.line] or [0])[0]"
lexerRuleLabelPropertyRef_pos(scope,attr) ::= "((<scope> is not None) and [<scope>.charPositionInLine] or [0])[0]"
lexerRuleLabelPropertyRef_channel(scope,attr) ::= "((<scope> is not None) and [<scope>.channel] or [0])[0]"
lexerRuleLabelPropertyRef_index(scope,attr) ::= "((<scope> is not None) and [<scope>.index] or [0])[0]"
lexerRuleLabelPropertyRef_text(scope,attr) ::= "((<scope> is not None) and [<scope>.text] or [None])[0]"
lexerRuleLabelPropertyRef_int(scope,attr) ::= "((<scope> is not None) and [int(<scope>.text)] or [0])[0]"

// Somebody may ref $template or $tree or $stop within a rule:
rulePropertyRef_start(scope,attr) ::= "retval.start"
rulePropertyRef_stop(scope,attr) ::= "retval.stop" //mmm... or input.LT(-1)??
rulePropertyRef_tree(scope,attr) ::= "retval.tree"
rulePropertyRef_text(scope,attr) ::= "self.input.toString(retval.start, self.input.LT(-1))"
rulePropertyRef_st(scope,attr) ::= "retval.st"

lexerRulePropertyRef_text(scope,attr) ::= "self.text"
lexerRulePropertyRef_type(scope,attr) ::= "_type"
lexerRulePropertyRef_line(scope,attr) ::= "self._state.tokenStartLine"
lexerRulePropertyRef_pos(scope,attr) ::= "self._state.tokenStartCharPositionInLine"
lexerRulePropertyRef_index(scope,attr) ::= "-1" // undefined token index in lexer
lexerRulePropertyRef_channel(scope,attr) ::= "_channel"
lexerRulePropertyRef_start(scope,attr) ::= "self._state.tokenStartCharIndex"
lexerRulePropertyRef_stop(scope,attr) ::= "(self.getCharIndex()-1)"
lexerRulePropertyRef_int(scope,attr) ::= "int(<scope>.text)"

// setting $st and $tree is allowed in local rule. everything else
// is flagged as error

```

```
ruleSetPropertyRef_tree(scope,attr,expr) ::= "retval.tree =<expr>"
```

```
ruleSetPropertyRef_st(scope,attr,expr) ::= "retval.st =<expr>"
```

```
/** How to execute an action (only when not backtracking) */
```

```
execAction(action) ::= <<
```

```
<if(backtracking)>
```

```
<if(actions.(actionScope).synpredgate)>
```

```
if <actions.(actionScope).synpredgate>:
```

```
    pass
```

```
    <action>
```

```
<else>
```

```
if <actions.(actionScope).synpredgate>:
```

```
    pass
```

```
    <action>
```

```
<endif>
```

```
<else>
```

```
#action start
```

```
<action>
```

```
#action end
```

```
<endif>
```

```
>>
```

```
/** How to always execute an action even when backtracking */
```

```
execForcedAction(action) ::= "<action>"
```

```
// M I S C (properties, etc...)
```

```
codeFileExtension() ::= ".py"
```

```
true_value() ::= "True"
```

```
false_value() ::= "False"
```

```
Found in path(s):
```

```
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-  
jar/org/antlr/codegen/templates/Python/Python.stg
```

```
No license file was found, but licenses were detected in source scan.
```

```
/*
```

```
[The "BSD license"]
```

```
Copyright (c) 2005-2012 Terence Parr
```

```
All rights reserved.
```

```
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modification, are permitted provided that the following conditions
```

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*/

/** Template overrides to add debugging to AST stuff. Dynamic inheritance

* hierarchy is set up as ASTDbg : AST : Dbg : Python by code generator.

*/

group ASTDbg;

astAccessor() ::= <<

def setTreeAdaptor(self, adaptor):

<if(grammar.grammarIsRoot)>

self._adaptor = DebugTreeAdaptor(self.dbg, adaptor)

<else>

self._adaptor = adaptor # delegator sends dbg adaptor

<endif>

<grammar.directDelegates:{g|<g.delegateName()>.setTreeAdaptor(self._adaptor)}>

def getTreeAdaptor(self):

return self._adaptor

adaptor = property(getTreeAdaptor, setTreeAdaptor)<\n>

>>

createListenerAndHandshake() ::= <<

proxy = DebugEventSocketProxy(self,

adaptor=<if(TREE_PARSER)>self.input.getTreeAdaptor()<else>self._adaptor<endif>,

debug=debug_socket, port=port)

self.setDebugListener(proxy)

self.adaptor.setDebugListener(proxy)

self.input.setDebugListener(proxy)

```
#self.set<InputStreamType>(Debug<InputStreamType>(self.input, proxy))
proxy.handshake()
>>
```

```
@rewriteElement.pregen() ::= "self._dbg.location(<e.line>, <e.pos>)"
```

Found in path(s):

```
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-
jar/org/antlr/codegen/templates/Python3/ASTDbg.stg
```

No license file was found, but licenses were detected in source scan.

```
/* [The "BSD license"]
```

```
Copyright (c) 2008 Erik van Bilzen
```

```
Copyright (c) 2007-2008 Johannes Luber
```

```
Copyright (c) 2005-2007 Kunle Odutola
```

```
Copyright (c) 2005-2006 Terence Parr
```

```
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```
*/
```

```
group Delphi;
```

```
csharpTypeInitMap ::= [
```

```
"int": "0",
```

```
"uint": "0",
```

```
"long": "0",
```

```
"ulong": "0",
```

```
"float": "0.0",
```

```

"double": "0.0",
"bool": "False",
"byte": "0",
"sbyte": "0",
"short": "0",
"ushort": "0",
"char": "#0",
"string": "",
"String": "",
default: "nil" // anything other than an atomic type
]

```

```

/** The overall file structure of a recognizer; stores methods for rules
 * and cyclic DFAs plus support code.
 * LEXER (Boolean): should we generate lexer code?
 * PARSER (Boolean): should we generate parser code?
 * TREE_PARSER (Boolean): should we generate tree parser code?
 * actionScope (String): 'lexer', 'parser', 'tree_parser' or custom scope
 * actions (HashMap):
 * docComment (String): document comment
 * recognizer (Object): recognizer class generator
 * name (String): name of grammar
 * tokens (HashMap<name: String, type: Integer>):
 * tokenNames:
 * rules:
 * cyclicDFAs:
 * bitsets:
 * buildTemplate (Boolean): should we generate a string template?
 * buildAST (Boolean): should we generate an AST?
 * rewriteMode (Boolean): are we rewriteing nodes?
 * profile (Boolean):
 * backtracking (Boolean): backtracking mode?
 * synpreds (): syntactic predicates
 * memoize (Boolean): should we memoize?
 * numRules (Integer): number of rules
 * fileName (String): fully qualified name of original .g file
 * ANTLRVersion (String): ANTLR version in Major.Minor.Build format
 * generatedTimestamp (String): date/time when the file is generated
 * trace (Boolean): should we trace input/output?
 * scopes:
 * superClass (String): name of base class, or empty string
 * literals:
 */
outputFile(LEXER,PARSER,TREE_PARSER, actionScope, actions,
           docComment, recognizer,
           name, tokens, tokenNames, rules, cyclicDFAs,
           bitsets, buildTemplate, buildAST, rewriteMode, profile,
           backtracking, synpreds, memoize, numRules,

```

```

    fileName, ANTLRVersion, generatedTimestamp, trace,
    scopes, superClass, literals) ::=
<<
unit <name>;

{$HINTS OFF}

// $ANTLR <ANTLRVersion> <fileName> <generatedTimestamp>

<actions.(actionScope).header>

interface

<@imports>
uses<\n>
<@end>
<actions.(actionScope).usesInterface>
<if(TREE_PARSER)>
    Antlr.Runtime.Tree,<\n>
<endif>
    Antlr.Runtime,
    Antlr.Runtime.Collections,
    Antlr.Runtime.Tools;

<docComment>
<recognizer>
>>

/** Generates source code for the lexer class
 * grammar (Grammar object)
 */
lexer(grammar, name, tokens, scopes, rules, numRules, labelType="Token",
    filterMode, superClass="Lexer") ::= <<
type
I<grammar.recognizerName> = interface(I<@superClassName><superClass><@end>)
end;

T<grammar.recognizerName> = class(T<@superClassName><superClass><@end>,
I<grammar.recognizerName>)
strict private
    FCnt: array [0..<grammar.numberOfDecisions>] of Byte;
    FLA: array [0..<grammar.numberOfDecisions>, 0..255] of Integer;
    FException: ERecognitionException;
    procedure InitializeCyclicDFAs;
<cyclicDFAs:cyclicDFADeclaration()>
public
const
    <tokens:{<it.name> = <it.type>;}; separator="\n">

```



```

    <scopes: { <if(it.isDynamicGlobalScope)><globalAttributeScope(scope=it)><endif> } >
strict private
    <actions.(actionScope).memberDeclarations>
public
    // delegates
    <grammar.delegates: { g | <g.delegateName(): I<superClass>; { <g.recognizerName> } }; separator="\n" >
public
    // delegators
    <grammar.delegators: { g | <g.delegateName(): Pointer; { <g.recognizerName> } }; separator="\n" >
    <last(grammar.delegators): { g | gParent: Pointer; { <g.recognizerName> } } >
protected
    { IBaseRecognizer }
    function GetGrammarFileName: String; override;
<if(filterMode)>
    function AlreadyParsedRule(const Input: IIntStream;
        const RuleIndex: Integer): Boolean; override;
    procedure Memoize(const Input: IIntStream; const RuleIndex,
        RuleStartIndex: Integer); override;
protected
    { ILexer }
    function NextToken: IToken; override;<\n>
<endif>
protected
    { ILexer }
    procedure DoTokens; override;
public
    constructor Create; overload;
    constructor Create(const AInput: ICharStream<grammar.delegators: { g | <g.delegateName():
IBaseRecognizer{ <g.recognizerName> } } >); overload;
    constructor Create(const AInput: ICharStream; const AState: IRecognizerSharedState<grammar.delegators: { g |
const A<g.delegateName(): IBaseRecognizer{ <g.recognizerName> } } >); overload;

    <rules: { r | <if(!r.ruleDescriptor.isSynPred)><lexerRuleDeclaration(r)><endif> } >
    <synpreds: { p | <lexerSynpredDeclaration(p)> }; separator="\n" >
end;

implementation

uses
    <grammar.delegates: { g | <g.recognizerName>; }; separator="\n" >
    <grammar.delegators: { g | <g.recognizerName>; }; separator="\n" >
    <actions.(actionScope).usesImplementation>
    SysUtils,
    StrUtils,
    Math;

    { T<grammar.recognizerName> }

```

```

constructor T<grammar.recognizerName>.Create;
begin
  InitializeCyclicDFAs;
end;

constructor T<grammar.recognizerName>.Create(const AInput: ICharStream<grammar.delegators:{g}; const
A<g:delegateName(): IBaseRecognizer{<g.recognizerName}>}>);
begin
  Create(AInput, nil<grammar.delegators:{g}, A<g:delegateName()>>);
end;

constructor T<grammar.recognizerName>.Create(const AInput: ICharStream; const AState:
IRRecognizerSharedState<grammar.delegators:{g}; const A<g:delegateName():
IBaseRecognizer{<g.recognizerName}>}>);
begin
  inherited Create(AInput, AState);
  InitializeCyclicDFAs; { TODO: Necessary in Delphi??? Not removed yet. }
  <if(memoize)>
  <if(grammar.grammarIsRoot)>
    State.RuleMemoCount := <numRules>+1;<\n> <! index from 1..n !>
  <endif>
  <endif>
  <grammar.directDelegates:
  {g<g:delegateName()> := T<g.recognizerName>.Create(AInput, State<trunc(g.delegators):{p|,
<p:delegateName()>>, Self);}; separator="\n">
  <grammar.delegators:
  {g<g:delegateName()> := Pointer(A<g:delegateName()>);}; separator="\n">
  <last(grammar.delegators):{g|gParent := Pointer(A<g:delegateName()>);}>
  <actions.(actionScope).memberInitializations>
end;
  <actions.(actionScope).memberImplementations>
function T<grammar.recognizerName>.GetGrammarFileName: String;
begin
  Result := '<fileName>';
end;

<if(filterMode)>
<filteringNextToken()>
<endif>

<rules; separator="\n\n">
<synpreds:{p | <lexerSynpred(p)>}>

procedure T<grammar.recognizerName>.InitializeCyclicDFAs;
begin
  <cyclicDFAs:{dfa | FDFA<dfa.decisionNumber> :=
TDFA<dfa.decisionNumber>.Create(Self<@debugAddition()>);}; separator="\n">
  <cyclicDFAs:{dfa | <if(dfa.specialStateSTs)>FDFA<dfa.decisionNumber>.SpecialStateTransitionHandler :=

```

```
DFA<dfa.decisionNumber>_SpecialStateTransition;<endif>}; separator="\n">
end;
```

```
<cyclicDFAs:cyclicDFA()> <! dump tables for all DFA !>
end.>>
```

```
lexerRuleDeclaration(rule) ::= <<
procedure m<rule.ruleName>(<rule.ruleDescriptor.parameterScope:parameterScope(scope=rule)>);<\n>
>>
```

```
/** A override of Lexer.nextToken() that backtracks over mTokens() looking
 * for matches. No error can be generated upon error; just rewind, consume
 * a token and then try again. backtracking needs to be set as well.
 *
 * Make rule memoization happen only at levels above 1 as we start mTokens
 * at backtracking==1.
 */
```

```
filteringNextToken() ::= <<
function T<grammar.recognizerName>.NextToken: IToken;
var
  M: Integer;
begin
  while (True) do
  begin
    if (Input.LA(1) = Integer(cscEOF)) then
      Exit(TToken.EOF_TOKEN);

    State.Token := nil;
    State.Channel := TToken.DEFAULT_CHANNEL;
    State.TokenStartCharIndex := Input.Index;
    State.TokenStartCharPositionInLine := Input.CharPositionInLine;
    State.TokenStartLine := Input.Line;
    State.Text := "";
    try
      M := Input.Mark();
      State.Backtracking := 1; <! means we won't throw slow exception !>
      State.Failed := False;
      mTokens();
      State.Backtracking := 0;
    <!
      mTokens backtracks with synpred at backtracking==2
      and we set the synpredgate to allow actions at level 1.
    !>
    if (State.Failed) then
    begin
      Input.Rewind(M);
      Input.Consume; <! // advance one char and try again !>
    end
  end
```

```

else
begin
  Emit;
  Exit(State.Token);
end;
except
on RE: ERecognitionException do
begin
  // shouldn't happen in backtracking mode, but...
  ReportError(RE);
  Recover(RE);
end;
end;
end;
end;

function T<grammar.recognizerName>.AlreadyParsedRule(const Input: IIntStream;
const RuleIndex: Integer): Boolean;
begin
if (State.Backtracking > 1) then
  Result := inherited AlreadyParsedRule(Input, RuleIndex)
else
  Result := False;
end;

procedure T<grammar.recognizerName>.Memoize(const Input: IIntStream; const RuleIndex,
RuleStartIndex: Integer);
begin
if (State.Backtracking > 1) then
  inherited Memoize(Input, RuleIndex, RuleStartIndex);
end;

>>

filteringActionGate() ::= "(State.Backtracking = 1)"

/** How to generate a parser */
genericParser(grammar, name, scopes, tokens, tokenNames, rules, numRules,
  bitsets, inputStreamType, superClass, filterMode,
  ASTLabelType="ANTLRInterface", labelType, members, rewriteElementType) ::= <<
type
<rules: {r | <genericParserRuleReturnType(rule=r, ruleDescriptor=r.ruleDescriptor)>>>
I<grammar.recognizerName> = interface(I<@superClassName><superClass><@end>)
  <rules: {r | <genericParserRuleInterface(rule=r, ruleDescriptor=r.ruleDescriptor)>>>
end;

T<grammar.recognizerName> = class(T<@superClassName><superClass><@end>,
I<grammar.recognizerName>)

```

```

<if(grammar.grammarIsRoot)>
public
  const
    TOKEN_NAMES: array [0..<length(tokenNames)>+3] of String = (
      '\<invalid>',
      '\<EOR>',
      '\<DOWN>',
      '\<UP>',
      <tokenNames; separator=",\n">);<\n>
<endif>
public
  const
    <tokens:{<it.name> = <it.type>;}; separator="\n">
public
  // delegates
  <grammar.delegates: {g|<g.delegateName(): I<superClass>; {<g.recognizerName>}}; separator="\n">
public
  // delegators
  <grammar.delegators: {g|<g.delegateName(): Pointer; {<g.recognizerName>}}; separator="\n">
  <last(grammar.delegators):{g|gParent: Pointer; {<g.recognizerName>}}>

  <scopes:{<if(it.isDynamicGlobalScope)><globalAttributeScopeDeclaration(scope=it)><endif>}>
<@members>
  <! WARNING. bug in ST: this is cut-n-paste into Dbg.stg !>
public
  constructor Create(const AInput: <inputStreamType><grammar.delegators:{g}; const A<g.delegateName():
IBaseRecognizer{<g.recognizerName>}>); overload;
  constructor Create(const AInput: <inputStreamType>; const AState:
IRecognizerSharedState<grammar.delegators:{g}; const A<g.delegateName():
IBaseRecognizer{<g.recognizerName>}>); overload;
<@end>
protected
  { IBaseRecognizer }
  function GetTokenNames: TStringArray; override;
  function GetGrammarFileName: String; override;
strict private
  <actions.(actionScope).memberDeclarations>
  <rules: {r | <genericParserRuleDeclaration(rule=r, ruleDescriptor=r.ruleDescriptor)>}>

  <! generate rule/method definitions for imported rules so they
  appear to be defined in this recognizer. !>
  // Delegated rules
  <grammar.delegatedRules:{ruleDescriptor| <delegatedRuleDeclaration(ruleDescriptor)>}>

  <synpreds:{p | <synpredDeclaration(p)>}>; separator="\n">
  <cyclicDFAs:cyclicDFADeclaration()>
strict private
  FException: ERecognitionException;

```

```

    FLA: array [0..<grammar.numberOfDecisions>, 0..255] of Integer;
    FCnt: array [0..<grammar.numberOfDecisions>] of Byte;
    procedure InitializeCyclicDFAs;
<if(bitsets)>
public
    class var
        <bitsets:bitsetDecl(name={FOLLOW_<it.name>_in_<it.inName><it.tokenIndex>})>
public
    class procedure InitializeBitsets; static;<\n>
<endif>
end;

implementation

uses
    <grammar.delegates: {g|<g.recognizerName>,}; separator="\n">
    <grammar.delegates: {g|<g.recognizerName>,}; separator="\n">
    <actions.(actionScope).usesImplementation>
    SysUtils,
    StrUtils,
    Math;

{ T<grammar.recognizerName> }

constructor T<grammar.recognizerName>.Create(const AInput: <inputStreamType><grammar.delegates:{g|; const
A<g:delegateName(): IBaseRecognizer{<g.recognizerName>} }>);
begin
    Create(AInput, TRecognizerSharedState.Create<grammar.delegates: {g|, A<g:delegateName()>}>);
end;

constructor T<grammar.recognizerName>.Create(const AInput: <inputStreamType>;
const AState: IRecognizerSharedState<grammar.delegates:{g|; const A<g:delegateName()>};
IBaseRecognizer{<g.recognizerName>} }>);
begin
    inherited Create(AInput, AState);
    <@membersConstructor>
    <@end>
    <parserCtorBody()>
    <grammar.directDelegates: {g|<g:delegateName()> := T<g.recognizerName>.Create(Input,
State<trunc(g.delegates):{p|, <p:delegateName()>}>, Self);}; separator="\n">
    <grammar.indirectDelegates: {g | <g:delegateName()> := <g.delegate:delegateName()>.<g:delegateName()>;};
separator="\n">
    <last(grammar.delegates): {g|gParent := Pointer(A<g:delegateName()>)}>
    <rules: {r | <ruleAttributeScopeInit(scope=r.ruleDescriptor.ruleScope)>}>
    <scopes: {<if(it.isDynamicGlobalScope)><globalAttributeScope(scope=it)><endif>}>
    <actions.(actionScope).memberInitializations>
end;
    <actions.(actionScope).memberImplementations>

```

```

<grammar.delegatedRules:{ruleDescriptor| <delegatedRuleImplementation(ruleDescriptor)>}; separator="\n">
procedure T<grammar.recognizerName>.InitializeCyclicDFAs;
begin
  <cyclicDFAs:{ dfa | FDFA<dfa.decisionNumber> := TDFA<dfa.decisionNumber>.Create(Self);}; separator="\n">
  <cyclicDFAs:{ dfa | <if(dfa.specialStateSTs)>FDFA<dfa.decisionNumber>.SpecialStateTransitionHandler :=
DFA<dfa.decisionNumber>_SpecialStateTransition;<endif>}; separator="\n">
end;

<if(bitsets)>
class procedure T<grammar.recognizerName>.InitializeBitsets;
begin
  <bitsets:bitset(name={FOLLOW_<it.name>_in_<it.inName><it.tokenIndex>}, words64=it.bits)>
end;
<endif>

<@membersImplementation>
<@end>

function T<grammar.recognizerName>.GetTokenNames: TStringArray;
var
  I: Integer;
begin
  SetLength(Result,Length(T<grammar.composite.rootGrammar.recognizerName>.TOKEN_NAMES));
  for I := 0 to Length(T<grammar.composite.rootGrammar.recognizerName>.TOKEN_NAMES) - 1 do
    Result[I] := T<grammar.composite.rootGrammar.recognizerName>.TOKEN_NAMES[I];
  end;
end;

function T<grammar.recognizerName>.GetGrammarFileName: String;
begin
  Result := '<fileName>';
end;

<rules; separator="\n\n">
<synpreds:{p | <synpred(p)>}>

<cyclicDFAs:cyclicDFA()> <! dump tables for all DFA !>
<if(bitsets)>
initialization
  T<grammar.recognizerName>.InitializeBitsets;<\n>
<endif>
end.>>

delegatedRuleDeclaration(ruleDescriptor) ::= <<
<if(ruleDescriptor.hasMultipleReturnValues)>
function <ruleDescriptor.name>(<ruleDescriptor.parameterScope:parameterScope(scope=it)>):
I<returnType()>;<\n>
<else>

```

```

<if(ruleDescriptor.hasSingleReturnValue)>
function <ruleDescriptor.name>(<ruleDescriptor.parameterScope:parameterScope(scope=it)>):
<returnType()>;<\n>
<else>
procedure <ruleDescriptor.name>(<ruleDescriptor.parameterScope:parameterScope(scope=it)>);<\n>
<endif>
<endif>
>>

delegatedRuleImplementation(ruleDescriptor) ::= <<
<if(ruleDescriptor.hasMultipleReturnValues)>
function
T<grammar.recognizerName>.<ruleDescriptor.name>(<ruleDescriptor.parameterScope:parameterScope(scope=it)>
): I<returnType()>;<\n>
<else>
<if(ruleDescriptor.hasSingleReturnValue)>
function
T<grammar.recognizerName>.<ruleDescriptor.name>(<ruleDescriptor.parameterScope:parameterScope(scope=it)>
): <returnType()>;<\n>
<else>
procedure
T<grammar.recognizerName>.<ruleDescriptor.name>(<ruleDescriptor.parameterScope:parameterScope(scope=it)>
);<\n>
<endif>
<endif>
begin
<if(ruleDescriptor.hasReturnValue)>Result :=<endif>
T<ruleDescriptor.grammar.recognizerName>(<ruleDescriptor.grammar:delegateName()>.Implementor).<ruleDescriptor.name>(<ruleDescriptor.parameterScope.attributes: { a|<a.name> }; separator=" , ">);
end;

>>

parserCtorBody() ::= <<
InitializeCyclicDFAs;
<if(memoize)>
<if(grammar.grammarIsRoot)>
State.RuleMemoCount := <length(grammar.allImportedRules)>+1;<\n> <! index from 1..n !>
<endif>
<endif>
<grammar.delegators: { g|<g:delegateName()> := Pointer(A<g:delegateName()>); separator="\n">
>>

parser(grammar, name, scopes, tokens, tokenNames, rules, numRules, bitsets, ASTLabelType, superClass="Parser",
labelType="Token", members={<actions.parser.members>}) ::= <<
<genericParser(inputStreamType="ITokenStream", rewriteElementType="Token", ...)>
>>

```



```

/** How to generate a tree parser; same as parser except the input
 * stream is a different type.
 */
treeParser(grammar, name, scopes, tokens, tokenNames, globalAction, rules, numRules, bitsets,
labelType={ <ASTLabelType> }, ASTLabelType="object", superClass="TreeParser",
members={ <actions.treeparser.members> }, filterMode) ::= <<
<genericParser(inputStreamType="ITreeNodeStream", rewriteElementType="Node", ...)>
>>

/** A simpler version of a rule template that is specific to the imaginary
 * rules created for syntactic predicates. As they never have return values
 * nor parameters etc..., just give simplest possible method. Don't do
 * any of the normal memoization stuff in here either; it's a waste.
 * As predicates cannot be inlined into the invoking rule, they need to
 * be in a rule by themselves.
 */
synpredRule(ruleName, ruleDescriptor, block, description, nakedBlock) ::=
<<
// $ANTLR start "<ruleName>"
procedure
T<grammar.recognizerName>.<ruleName>_fragment(<ruleDescriptor.parameterScope:parameterScope(scope=it)>)
;
var
Alt: array [0..<grammar.numberOfDecisions>] of Integer;
<ruleLabelDefVars()>
begin
<ruleLabelDefs()>
<if(trace)>
TraceIn('<ruleName>_fragment', <ruleDescriptor.index>);
try
<block>
finally
TraceOut('<ruleName>_fragment', <ruleDescriptor.index>);
end;
<else>
<block>
<endif>
end;
// $ANTLR end "<ruleName>"
>>

synpredDecls(name) ::= <<
SynPredPointer <name>;<\n>
>>

synpred(name) ::= <<

function T<grammar.recognizerName>.<name>: Boolean;

```

```

var
  Start: Integer;
  Success: Boolean;
begin
  State.Backtracking := State.Backtracking + 1;
  <@start(>
  Start := Input.Mark;
  try
    <name>_fragment(); // can never throw exception
  except
    on RE: ERecognitionException do
      WriteLn('Impossible: ' + RE.ToString);
  end;
  Success := not State.Failed;
  Input.Rewind(Start);
  <@stop(>
  State.Backtracking := State.Backtracking - 1;
  State.Failed := False;
  Result := Success;
end;<\n>
>>

lexerSynpred(name) ::= <<
<synpred(name)>
>>

lexerSynpredDeclaration(name) ::= <<
function <name>: Boolean;
procedure <name>_fragment;
>>

synpredDeclaration(name) ::= <<
function <name>: Boolean;
procedure <name>_fragment;
>>

ruleMemoization(name) ::= <<
<if(memoize)>
if ((State.Backtracking > 0) and AlreadyParsedRule(Input, <ruleDescriptor.index>)) then
  Exit(<ruleReturnValue(>);
<endif>
>>

/** How to test for failure and return from rule */
checkRuleBacktrackFailure() ::= <<
<if(backtracking)><\n>if (State.Failed) then Exit(<ruleReturnValue(>);<\n><endif>
>>

```

```

/** This rule has failed, exit indicating failure during backtrack */
ruleBacktrackFailure() ::= <<
<if(backtracking)>if (State.Backtracking > 0) then
begin
  State.Failed := True;
  Exit(<ruleReturnValue(>);
end;<endif>
>>

genericParserRuleDeclaration(rule, ruleDescriptor) ::= <<
<if(ruleDescriptor.isSynPred)>
<else>
<ruleAttributeScopeDeclaration(scope=ruleDescriptor.ruleScope)>
<returnScopeDeclaration(scope=ruleDescriptor.returnScope)>
public
<if(ruleDescriptor.hasMultipleReturnValues)>
  function <rule.ruleName>: I<returnType(>;<\n>
<else>
<if(ruleDescriptor.hasSingleReturnValue)>
  function <rule.ruleName>: <returnType(>;<\n>
<else>
  procedure <rule.ruleName>;<\n>
<endif>
<endif>
<endif>
>>

genericParserRuleInterface(rule, ruleDescriptor) ::= <<
<if(ruleDescriptor.isSynPred)>
<else>
<if(ruleDescriptor.hasMultipleReturnValues)>
function <rule.ruleName>: I<returnType(>;<\n>
<else>
<if(ruleDescriptor.hasSingleReturnValue)>
function <rule.ruleName>: <returnType(>;<\n>
<else>
procedure <rule.ruleName>;<\n>
<endif>
<endif>
<endif>
>>

genericParserRuleReturnType(rule, ruleDescriptor) ::= <<
<if(ruleDescriptor.hasMultipleReturnValues)>
<if(ruleDescriptor.isSynPred)>
<else>
I<returnType(> = interface(I<if(TREE_PARSER)>Tree<else>Parser<endif>RuleReturnScope)
end;<\n>

```

```

<endif>
<endif>
>>

/** How to generate code for a rule. This includes any return type
 * data aggregates required for multiple return values.
 */
rule(ruleName,ruleDescriptor,block,emptyRule,description,exceptions,finally,memoize) ::= <<
<ruleAttributeScope(scope=ruleDescriptor.ruleScope)>
<returnScope(scope=ruleDescriptor.returnScope)>

// $ANTLR start "<ruleName>"
(* <fileName>:<description> *)
<if(ruleDescriptor.hasMultipleReturnValues)>
function T<grammar.recognizerName>.<ruleName>(<ruleDescriptor.parameterScope:parameterScope(scope=it)>):
I<returnType()>;
<else>
<if(ruleDescriptor.hasSingleReturnValue)>
function T<grammar.recognizerName>.<ruleName>(<ruleDescriptor.parameterScope:parameterScope(scope=it)>):
<returnType()>;
<else>
procedure
T<grammar.recognizerName>.<ruleName>(<ruleDescriptor.parameterScope:parameterScope(scope=it)>);
<endif>
<endif>

var
<ruleDescriptor.actions.vars>
Locals: TLocalStorage;
<if(ruleDescriptor.hasMultipleReturnValues)>
RetVal: I<returnType()>;<\n>
<else>
<if(ruleDescriptor.hasSingleReturnValue)>
RetVal: <returnType()>;<\n>
<else>
<endif>
<endif>
Alt: array [0..<grammar.numberOfDecisions>] of Integer;
<ruleDeclarationVars()>
<ruleLabelDefVars()>
begin
Locals.Initialize;
try
<if(trace)>TraceIn('<ruleName>', <ruleDescriptor.index>);<endif>
<ruleScopeSetUp()>
<ruleDeclarations()>
<ruleLabelDefs()>
<ruleDescriptor.actions.init>

```

```

<@preamble()>
try
  try
    <ruleMemoization(name=ruleName)>
    <block>
    <ruleCleanUp()>
    <(ruleDescriptor.actions.after):execAction()>
<if(exceptions)>
  <exceptions: { e|<catch(decl=e.decl,action=e.action)><\n}> }>
<else>
<if(!emptyRule)>
<if(actions.(actionScope).rulecatch)>
  <actions.(actionScope).rulecatch>
<else>
  except
    on RE: ERecognitionException do
    begin
      ReportError(RE);
      Recover(Input,RE);
      <@setErrorReturnValue()>
    end;<\n>
<endif>
<endif>
<endif>
  end;
  finally
    <if(trace)>TraceOut("<ruleName>", <ruleDescriptor.index>);<endif>
    <memoize()>
    <ruleScopeCleanUp()>
    <finally>
  end;
  <@postamble()>
  finally
    Locals.Finalize;
  end;
  Exit(<ruleReturnValue()>);
end;
// $ANTLR end "<ruleName>"
>>

catch(decl,action) ::= <<
catch (<e.decl>)
{
  <e.action>
}
>>

ruleDeclarations() ::= <<

```

```

<if(ruleDescriptor.hasMultipleReturnValues)>
RetVal := T<returnType().Create;
RetVal.Start := Input.LT(1);<\n>
<else>
<ruleDescriptor.returnScope.attributes: { a |
<a.name> := <if(a.initValue)><a.initValue><else><initValue(a.type)><endif>;
}>
<endif>
<if(memoize)>
<ruleDescriptor.name>_StartIndex := Input.Index();
<endif>
>>

ruleDeclarationVars() ::= <<
<if(ruleDescriptor.hasMultipleReturnValues)>
<else>
<ruleDescriptor.returnScope.attributes: { a |
<a.name>: <a.type>;
}>
<endif>
<if(memoize)>
<ruleDescriptor.name>_StartIndex: Integer;
<endif>
>>

ruleScopeSetUp() ::= <<
<ruleDescriptor.useScopes: {<it>Stack.Push(T<it>Scope.Create);}; separator="\n">
<ruleDescriptor.ruleScope: {<it.name>Stack.Push(T<it.name>Scope.Create);}; separator="\n">
>>

ruleScopeCleanUp() ::= <<
<ruleDescriptor.useScopes: {<it>Stack.Pop();}; separator="\n">
<ruleDescriptor.ruleScope: {<it.name>Stack.Pop();}; separator="\n">
>>

ruleLabelDefs() ::= <<
<[ruleDescriptor.tokenLabels,ruleDescriptor.tokenListLabels]: {<it.label.text> := nil;}; separator="\n">
<[ruleDescriptor.tokenListLabels,ruleDescriptor.ruleListLabels]: {list_<it.label.text> := nil;}; separator="\n">
<ruleDescriptor.ruleLabels:ruleLabelDef(label=it); separator="\n">
<ruleDescriptor.ruleListLabels: {ll|<ll.label.text> := nil;}; separator="\n">
>>

ruleLabelDefVars() ::= <<
<[ruleDescriptor.tokenLabels,ruleDescriptor.tokenListLabels]: {<it.label.text>: I<labelType>;}; separator="\n">
<[ruleDescriptor.tokenListLabels,ruleDescriptor.ruleListLabels]: {list_<it.label.text>: IList<IANTLRInterface>;};
separator="\n">
<ruleDescriptor.ruleLabels:ruleLabelDefVar(label=it); separator="\n">
<ruleDescriptor.ruleListLabels: {ll|<ll.label.text>: <ruleLabelType(referencedRule=ll.referencedRule)>;};

```

```
separator="\n">
```

```
>>
```

```
lexerRuleLabelDefs() ::= <<
```

```
<[ruleDescriptor.tokenLabels,
```

```
ruleDescriptor.tokenListLabels,
```

```
ruleDescriptor.ruleLabels]
```

```
 :{<it.label.text> := nil;}; separator="\n"
```

```
>
```

```
<ruleDescriptor.charLabels:{int <it.label.text>;}; separator="\n">
```

```
<[ruleDescriptor.tokenListLabels,
```

```
ruleDescriptor.ruleListLabels,
```

```
ruleDescriptor.ruleListLabels]
```

```
 :{List_<it.label.text> := nil;}; separator="\n"
```

```
>
```

```
>>
```

```
lexerRuleLabelDefDeclarations() ::= <<
```

```
<[ruleDescriptor.tokenLabels,
```

```
ruleDescriptor.tokenListLabels,
```

```
ruleDescriptor.ruleLabels]
```

```
 :{<it.label.text>: I<labelType>;}; separator="\n"
```

```
>
```

```
<ruleDescriptor.charLabels:{int <it.label.text>;}; separator="\n">
```

```
<[ruleDescriptor.tokenListLabels,
```

```
ruleDescriptor.ruleListLabels,
```

```
ruleDescriptor.ruleListLabels]
```

```
 :{List_<it.label.text>: IList;}; separator="\n"
```

```
>
```

```
>>
```

```
ruleReturnValue() ::= <<
```

```
<if(!ruleDescriptor.isSynPred)>
```

```
<if(ruleDescriptor.hasReturnValue)>
```

```
<if(ruleDescriptor.hasSingleReturnValue)>
```

```
<ruleDescriptor.singleValueReturnName>
```

```
<else>
```

```
RetVal
```

```
<endif>
```

```
<else>
```

```
<! nil !>
```

```
<endif>
```

```
<endif>
```

```
>>
```

```
ruleCleanUp() ::= <<
```

```
<if(ruleDescriptor.hasMultipleReturnValues)>
```

```
<if(!TREE_PARSER)>
```

```

RetVal.Stop := Input.LT(-1);
<endif>
<endif>
>>

memoize() ::= <<
<if(memoize)>
<if(backtracking)>
if (State.Backtracking > 0) then
Memoize(Input, <ruleDescriptor.index>, <ruleDescriptor.name>_StartIndex);
<endif>
<endif>
>>

/** How to generate a rule in the lexer; naked blocks are used for
 * fragment rules.
 */
lexerRule(ruleName,nakedBlock,ruleDescriptor,block,memoize) ::= <<
// $ANTLR start "<ruleName>"
<ruleDescriptor.parameterScope>
procedure
T<grammar.recognizerName>.m<ruleName>(<ruleDescriptor.parameterScope:parameterScope(scope=it)>);
var
<ruleDescriptor.actions.vars>
Locals: TLocalStorage;
TokenType, Channel: Integer;
Alt: array [0..<grammar.numberofDecisions>] of Integer;
<lexerRuleLabelDefDeclarations()>
begin
Locals.Initialize;
try
<ruleAttributeScope(scope=ruleDescriptor.ruleScope)>
<if(trace)>TraceIn("<ruleName>", <ruleDescriptor.index>);<endif>
<ruleScopeSetUp()>
<ruleDeclarations()>
try
<if(nakedBlock)>
<ruleMemoization(name=ruleName)>
<lexerRuleLabelDefs()>
<ruleDescriptor.actions.init>
<block><\n>
<else>
TokenType := <ruleName>;
Channel := DEFAULT_TOKEN_CHANNEL;
<ruleMemoization(name=ruleName)>
<lexerRuleLabelDefs()>
<ruleDescriptor.actions.init>
<block>

```



```

    <ruleCleanUp()>
    State.TokenType := TokenType;
    State.Channel := Channel;
    <(ruleDescriptor.actions.after):execAction()>
<endif>
    finally
    <if(trace)>TraceOut("<ruleName>", <ruleDescriptor.index>);<endif>
    <ruleScopeCleanUp()>
    <memoize()>
    end;
    finally
    Locals.Finalize;
    end;
end;
// $ANTLR end "<ruleName>"
>>

```

```

/** How to generate code for the implicitly-defined lexer grammar rule
 * that chooses between lexer rules.
 */

```

```

*/
tokensRule(ruleName,nakedBlock,args,block,ruleDescriptor) ::= <<
procedure T<grammar.recognizerName>.mTokens;
var
    Alt: array [0..<grammar.numberOfDecisions>] of Integer;
begin
    <block>
end;

procedure T<grammar.recognizerName>.DoTokens;
begin
    mTokens;
end;
>>

```

```

// S U B R U L E S

```

```

/** A (...) subrule with multiple alternatives */
block(alts,decls,decision,enclosingBlockLevel,blockLevel,decisionNumber,maxK,maxAlt,description) ::= <<
(* <fileName>:<description> *)
Alt[<decisionNumber>] := <maxAlt>;
<decls>
<@predecision()>
<decision>
<@postdecision()>
<@prebranch()>
case Alt[<decisionNumber>] of
    <alts:altSwitchCase()>
end;

```

```

<@postbranch()>
>>

/** A rule block with multiple alternatives */
ruleBlock(alts,decls,decision,enclosingBlockLevel,blockLevel,decisionNumber,maxK,maxAlt,description) ::= <<
(* <fileName>:<description> *)
Alt[<decisionNumber>] := <maxAlt>;
<decls>
<@predecision()>
<decision>
<@postdecision()>
case Alt[<decisionNumber>] of
<alts:altSwitchCase()>
end;
>>

ruleBlockSingleAlt(alts,decls,decision,enclosingBlockLevel,blockLevel,decisionNumber,description) ::= <<
(* <fileName>:<description> *)
<decls>
<@prealt()>
<alts>
<@postalt()>
>>

/** A special case of a (...) subrule with a single alternative */
blockSingleAlt(alts,decls,decision,enclosingBlockLevel,blockLevel,decisionNumber,description) ::= <<
(* <fileName>:<description> *)
<decls>
<@prealt()>
<alts>
<@postalt()>
>>

/** A (..)+ block with 1 or more alternatives */
positiveClosureBlock(alts,decls,decision,enclosingBlockLevel,blockLevel,decisionNumber,maxK,maxAlt,description) ::= <<
(* <fileName>:<description> *)
FCnt[<decisionNumber>] := 0;
<decls>
<@preloop()>
while (True) do
begin
Alt[<decisionNumber>] := <maxAlt>;
<@predecision()>
<decision>
<@postdecision()>
case Alt[<decisionNumber>] of
<alts:altSwitchCase()>

```

```

else
  begin
    if (FCnt[<decisionNumber>] >= 1) then
      Break;
      <ruleBacktrackFailure()>
      raise EEarlyExitException.Create(<decisionNumber>, Input);
      <@earlyExitException()>
    end;
  end;
  Inc(FCnt[<decisionNumber>]);
end;
<@postloop()>
>>

```

positiveClosureBlockSingleAlt ::= positiveClosureBlock

```

/** A (..)* block with 1 or more alternatives */
closureBlock(alts,decls,decision,enclosingBlockLevel,blockLevel,decisionNumber,maxK,maxAlt,description) ::=
<<
(* <fileName>:<description> *)
<decls>
<@preloop()>
while (True) do
  begin
    Alt[<decisionNumber>] := <maxAlt>;
    <@predecision()>
    <decision>
    <@postdecision()>
    case Alt[<decisionNumber>] of
      <alts:altSwitchCase()>
    else
      Break;
    end;
  end;
  <@postloop()>
>>

```

closureBlockSingleAlt ::= closureBlock

```

/** Optional blocks (x)? are translated to (x|) by before code generation
* so we can just use the normal block template
*/
optionalBlock ::= block

```

optionalBlockSingleAlt ::= block

```

/** A case in a switch that jumps to an alternative given the alternative
* number. A DFA predicts the alternative and then a simple switch

```

```

* does the jump to the code that actually matches that alternative.
*/
altSwitchCase() ::= <<
<i>:
<@prealt()>
<it><\n>
>>

/** An alternative is just a list of elements; at outermost level */
alt(elements,altNum,description,autoAST,outerAlt,treeLevel,rew) ::= <<
(* <fileName>:<description> *)
begin
<@declarations()>
<elements:element()>
<rew>
<@cleanup()>
end;
>>

/** What to emit when there is no rewrite. For auto build
* mode, does nothing.
*/
noRewrite(rewriteBlockLevel, treeLevel) ::= ""

// E L E M E N T S

/** Dump the elements one per line */
element() ::= <<
<@prematch()>
<it.el>
>>

/** match a token optionally with a label in front */
tokenRef(token,label,elementIndex,terminalOptions) ::= <<
<if(label)><label> := <endif>Match(Input, <token>,
FOLLOW_<token>_in_<ruleName><elementIndex>)<if(label)> as
I<labelType><endif>;<\n><checkRuleBacktrackFailure()>
>>

/** ids+=ID */
tokenRefAndListLabel(token,label,elementIndex,terminalOptions) ::= <<
<tokenRef(...)>
<listLabel(elem=label,...)>
>>

listLabel(label,elem) ::= <<
if (list_<label> = nil) then list_<label> := TList<IANTLRInterface>.Create;
list_<label>.Add(<elem>);<\n>

```

>>

```
/** match a character */
charRef(char,label) ::= <<
<if(label)>
<label> := Input.LA(1);<\n>
<endif>
Match(<char>); <checkRuleBacktrackFailure()>
>>
```

```
/** match a character range */
charRangeRef(a,b,label) ::= <<
<if(label)>
<label> := Input.LA(1);<\n>
<endif>
MatchRange(<a>, <b>); <checkRuleBacktrackFailure()>
>>
```

```
/** For now, sets are interval tests and must be tested inline */
matchSet(s,label,elementIndex,postmatchCode="") ::= <<
<if(label)>
<if(LEXER)>
<label> := Input.LA(1);<\n>
<else>
<label> := Input.LT(1) as I<labelType>;<\n>
<endif>
<endif>
if (<s>) then
begin
Input.Consume;
<postmatchCode>
<if(!LEXER)>
State.ErrorRecovery := False;<endif>
<if(backtracking)>State.Failed := False;<endif>
end
else
begin
<ruleBacktrackFailure()>
FException := EMismatchedSetException.Create(nil, Input);
<@mismatchedSetException()>
<if(LEXER)>
Recover(FException);
raise FException;<\n>
<else>
raise FException;
<! use following code to make it recover inline; remove throw mse;
RecoverFromMismatchedSet(input,mse,FOLLOW_set_in_<ruleName><elementIndex>);
!>
```

```

<endif>
end;<\n>
>>

matchRuleBlockSet ::= matchSet

matchSetAndListLabel(s,label,elementIndex,postmatchCode) ::= <<
<matchSet(...)>
<listLabel(elem=label,...)>
>>

/** Match a string literal */
lexerStringRef(string,label,elementIndex) ::= <<
<if(label)>
Locals.AsInteger['<label>Start'] := CharIndex;
Match(<string>); <checkRuleBacktrackFailure()>
<label> := TCommonToken.Create(Input, TToken.INVALID_TOKEN_TYPE, TToken.DEFAULT_CHANNEL,
Locals.AsInteger['<label>Start'], CharIndex-1);
<else>
Match(<string>); <checkRuleBacktrackFailure()>
<endif>
>>

wildcard(label,elementIndex) ::= <<
<if(label)>
<label> := Input.LT(1) as I<labelType>;<\n>
<endif>
MatchAny(input); <checkRuleBacktrackFailure()>
>>

wildcardAndListLabel(label,elementIndex) ::= <<
<wildcard(...)>
<listLabel(elem=label,...)>
>>

/** Match . wildcard in lexer */
wildcardChar(label, elementIndex) ::= <<
<if(label)>
<label> := Input.LA(1);<\n>
<endif>
MatchAny(); <checkRuleBacktrackFailure()>
>>

wildcardCharListLabel(label, elementIndex) ::= <<
<wildcardChar(...)>
<listLabel(elem=label,...)>
>>

```

```

/** Match a rule reference by invoking it possibly with arguments
 * and a return value or values. The 'rule' argument was the
 * target rule name, but now is type Rule, whose toString is
 * same: the rule name. Now though you can access full rule
 * descriptor stuff.
 */
ruleRef(rule,label,elementIndex,args,scope) ::= <<
PushFollow(FOLLOW_<rule.name>_in_<ruleName><elementIndex>);
<if(label)>
<label> := <if(scope)><scope:delegateName()>.<endif><rule.name>(<args; separator=", ">);<\n>
<else>
<if(scope)>T<scope.recognizerName>(IANTLRObject(<scope:delegateName()>).Implementor).<endif><rule.name>
>(<args; separator=", ">);<\n>
<endif>
State.FollowingStackPointer := State.FollowingStackPointer - 1;
<checkRuleBacktrackFailure()>
>>

/** ids+=r */
ruleRefAndListLabel(rule,label,elementIndex,args,scope) ::= <<
<ruleRef(...)>
<listLabel(elem=label,...)>
>>

/** A lexer rule reference.
 *
 * The 'rule' argument was the target rule name, but now
 * is type Rule, whose toString is same: the rule name.
 * Now though you can access full rule descriptor stuff.
 */
lexerRuleRef(rule,label,args,elementIndex,scope) ::= <<
<if(label)>
Locals.AsInteger['<label>Start<elementIndex>'] := CharIndex;
<if(scope)><scope:delegateName()>.<endif>m<rule.name>(<args; separator=", ">);
<checkRuleBacktrackFailure()>
<label> := TCommonToken.Create(Input, TToken.INVALID_TOKEN_TYPE, TToken.DEFAULT_CHANNEL,
Locals.AsInteger['<label>Start<elementIndex>'], CharIndex - 1);
<else>
<if(scope)><scope:delegateName()>.Implementor as T<scope.recognizerName>.<endif>m<rule.name>(<args;
separator=", ">); <checkRuleBacktrackFailure()>
<endif>
>>

/** i+=INT in lexer */
lexerRuleRefAndListLabel(rule,label,args,elementIndex,scope) ::= <<
<lexerRuleRef(...)>
<listLabel(elem=label,...)>
>>

```

```

/** EOF in the lexer */
lexerMatchEOF(label,elementIndex) ::= <<
<if(label)>
Locals.AsInteger['<label>Start<elementIndex>'] := CharIndex;
Match(EOF); <checkRuleBacktrackFailure()>
Locals['<label>'] := TCommonToken.Create(Input, EOF, TToken.DEFAULT_CHANNEL,
Locals.AsInteger['<label>Start<elementIndex>'], CharIndex-1);
<else>
Match(EOF); <checkRuleBacktrackFailure()>
<endif>
>>

```

```

/** match ^(root children) in tree parser */
tree(root, actionsAfterRoot, children, nullableChildList,
enclosingTreeLevel, treeLevel) ::= <<
<root:element()>
<actionsAfterRoot:element()>
<if(nullableChildList)>
if (Input.LA(1) = TToken.DOWN) then
begin
Match(Input, TToken.DOWN, nil); <checkRuleBacktrackFailure()>
<children:element()>
Match(Input, TToken.UP, nil); <checkRuleBacktrackFailure()>
end;
<else>
Match(Input, TToken.DOWN, nil); <checkRuleBacktrackFailure()>
<children:element()>
Match(Input, TToken.UP, nil);<\n><checkRuleBacktrackFailure()>
<endif>
>>

```

```

/** Every predicate is used as a validating predicate (even when it is
* also hoisted into a prediction expression).
*/
validateSemanticPredicate(pred,description) ::= <<
if (not (<evalPredicate(...)>)) then
begin
<ruleBacktrackFailure()>
raise EFailedPredicateException.Create(Input, '<ruleName>', '<description>');
end;<\n>
>>

```

```

// F i x e d D F A (if-then-else)

```

```

dfaState(k,edges,eotPredictsAlt,description,stateNumber,semPredState) ::= <<
FLA[<decisionNumber>,<stateNumber>] := Input.LA(<k>);<\n>
<edges; separator="\nelse ">

```



```

else
begin
<if(eotPredictsAlt)>
  Alt[<decisionNumber>] := <eotPredictsAlt>;<\n>
<else>
  <ruleBacktrackFailure()>
  raise ENoViableAltException.Create('<description>', <decisionNumber>, <stateNumber>, Input);<\n>
<endif>
end;
>>

```

```

/** Same as a normal DFA state except that we don't examine lookahead
 * for the bypass alternative. It delays error detection but this
 * is faster, smaller, and more what people expect. For (X)? people
 * expect "if ( LA(1)==X ) match(X);" and that's it.
 */
dfaOptionalBlockState(k,edges,eotPredictsAlt,description,stateNumber,semPredState) ::= <<
FLA[<decisionNumber>,<stateNumber>] := Input.LA(<k>);<\n>
<edges; separator="\nelse ">;
>>

```

```

/** A DFA state that is actually the loopback decision of a closure
 * loop. If end-of-token (EOT) predicts any of the targets then it
 * should act like a default clause (i.e., no error can be generated).
 * This is used only in the lexer so that for ('a')* on the end of a rule
 * anything other than 'a' predicts exiting.
 */
dfaLoopbackState(k,edges,eotPredictsAlt,description,stateNumber,semPredState) ::= <<
FLA[<decisionNumber>,<stateNumber>] := Input.LA(<k>);
<edges; separator="\nelse ">;<\n>
<if(eotPredictsAlt)>
<if(!edges)>
Alt[<decisionNumber>] := <eotPredictsAlt>; <! if no edges, don't gen ELSE !>
<else>
else
begin
  Alt[<decisionNumber>] := <eotPredictsAlt>;
end;<\n>
<endif>
<endif>
>>

```

```

/** An accept state indicates a unique alternative has been predicted */
dfaAcceptState(alt) ::= "Alt[<decisionNumber>] := <alt>;"

```

```

/** A simple edge with an expression. If the expression is satisfied,
 * enter to the target state. To handle gated productions, we may
 * have to evaluate some predicates for this edge.

```

```

*/
dfaEdge(labelExpr, targetState, predicates) ::= <<
if ((<labelExpr>)<if(predicates)> and (<predicates>)<endif>) then
begin
  <targetState>
end <! no ; here !>
>>

// F i x e d D F A (switch case)

/** A DFA state where a SWITCH may be generated. The code generator
 * decides if this is possible: CodeGenerator.canGenerateSwitch().
 */
dfaStateSwitch(k,edges,eotPredictsAlt,description,stateNumber,semPredState) ::= <<
case Input.LA(<k>) of
  <edges; separator="\n">
else
begin
  <if(eotPredictsAlt)>
    Alt[<decisionNumber>] := <eotPredictsAlt>;
  <else>
    <ruleBacktrackFailure()>
    <@noViableAltException()>
    raise ENoViableAltException.Create('<description>', <decisionNumber>, <stateNumber>, Input);<\n>
  <endif>
end;
end;<\n>
>>

dfaOptionalBlockStateSwitch(k,edges,eotPredictsAlt,description,stateNumber,semPredState) ::= <<
case Input.LA(<k>) of
  <edges; separator="\n">
end;<\n>
>>

dfaLoopbackStateSwitch(k, edges,eotPredictsAlt,description,stateNumber,semPredState) ::= <<
case Input.LA(<k>) of
  <edges; separator="\n"><\n>
  <if(eotPredictsAlt)>
else
  Alt[<decisionNumber>] := <eotPredictsAlt>;<\n>
  <endif>
end;<\n>
>>

dfaEdgeSwitch(labels, targetState) ::= <<
<labels:{<it>}; separator=",\n">:
begin

```

```

    <targetState>
end;
>>

// C y c l i c D F A

/** The code to initiate execution of a cyclic DFA; this is used
 * in the rule to predict an alt just like the fixed DFA case.
 * The <name> attribute is inherited via the parser, lexer, ...
 */
dfaDecision(decisionNumber,description) ::= <<
Alt[<decisionNumber>] := FDFA<decisionNumber>.Predict(Input);
>>

/* Dump DFA tables.
 */
cyclicDFADeclaration(dfa) ::= <<
strict protected
type
  TDFA<dfa.decisionNumber> = class(TDFA)
protected
  { IDFA }
  function Description: String; override;
public
  constructor Create(const ARecognizer: IBaseRecognizer);
end;
var
  FDFA<dfa.decisionNumber>: IDFA;
<if(dfa.specialStateSTs)>
strict protected
function DFA<dfa.decisionNumber>_SpecialStateTransition(const DFA: IDFA; S: Integer;
  const AInput: IIntStream): Integer;<endif>
>>

cyclicDFA(dfa) ::= <<
{ T<grammar.recognizerName>.TDFA<dfa.decisionNumber> }

constructor T<grammar.recognizerName>.TDFA<dfa.decisionNumber>.Create(const ARecognizer:
IBaseRecognizer);
const
DFA<dfa.decisionNumber>_EOT = '<dfa.javaCompressedEOT; wrap=""+\n  "'>;
DFA<dfa.decisionNumber>_EOF = '<dfa.javaCompressedEOF; wrap=""+\n  "'>;
DFA<dfa.decisionNumber>_MIN = '<dfa.javaCompressedMin; wrap=""+\n  "'>;
DFA<dfa.decisionNumber>_MAX = '<dfa.javaCompressedMax; wrap=""+\n  "'>;
DFA<dfa.decisionNumber>_ACCEPT = '<dfa.javaCompressedAccept; wrap=""+\n  "'>;
DFA<dfa.decisionNumber>_SPECIAL = '<dfa.javaCompressedSpecial; wrap=""+\n  "'>;
DFA<dfa.decisionNumber>_TRANSITION: array [0..<length(dfa.javaCompressedTransition)>-1] of String = (
  <dfa.javaCompressedTransition: {s|<s; wrap=""+\n">'}; separator=",\n">);

```

```

begin
  inherited Create;
  Recognizer := ARecognizer;
  DecisionNumber := <dfa.decisionNumber>;
  EOT := TDFA.UnpackEncodedString(DFA<dfa.decisionNumber>_EOT);
  EOF := TDFA.UnpackEncodedString(DFA<dfa.decisionNumber>_EOF);
  Min := TDFA.UnpackEncodedStringToUnsignedChars(DFA<dfa.decisionNumber>_MIN);
  Max := TDFA.UnpackEncodedStringToUnsignedChars(DFA<dfa.decisionNumber>_MAX);
  Accept := TDFA.UnpackEncodedString(DFA<dfa.decisionNumber>_ACCEPT);
  Special := TDFA.UnpackEncodedString(DFA<dfa.decisionNumber>_SPECIAL);
  Transition := TDFA.UnpackEncodedStringArray(DFA<dfa.decisionNumber>_TRANSITION);
end;

function T<grammar.recognizerName>.TDFA<dfa.decisionNumber>.Description: String;
begin
  Result := '<dfa.description>';
end;<\n>
<if(dfa.specialStateSTs)>
function T<grammar.recognizerName>.DFA<dfa.decisionNumber>_SpecialStateTransition(const DFA: IDFA; S:
Integer;
const AInput: IIntStream): Integer;
var
  Locals: TLocalStorage;
  <if(LEXER)>
  Input: IIntStream;
  <endif>
  <if(PARSER)>
  Input: ITokenStream;
  <endif>
  <if(TREE_PARSER)>
  Input: ITreeNodeStream;
  <endif>
  _S: Integer;
  NVAE: ENoViableAltException;
begin
  Result := -1;
  Locals.Initialize;
  try
    <if(LEXER)>
    Input := AInput;
    <endif>
    <if(PARSER)>
    Input := AInput as ITokenStream;
    <endif>
    <if(TREE_PARSER)>
    Input := AInput as ITreeNodeStream;
    <endif>
    _S := S;

```

```

case S of
  <dfa.specialStateSTs:{state | <i0>: begin<! compressed special state numbers 0..n-1 !>
    <state> <\n> end;}; separator="\n">
  end;
<if(backtracking)>
  if (State.Backtracking > 0) then
  begin
    State.Failed := True;
    Exit(-1);
  end;<\n>
<endif>
  NVAE := ENoViableAltException.Create(DFA.Description, <dfa.decisionNumber>, _S, Input);
  DFA.Error(NVAE);
  raise NVAE;
finally
  Locals.Finalize;
end;
end;<\n>
<endif>
>>

/** A state in a cyclic DFA; it's a special state and part of a big switch on
 * state.
 */
cyclicDFAState(decisionNumber,stateNumber,edges,needErrorClause,semPredState) ::= <<
FLA[<decisionNumber>,<stateNumber>] := Input.LA(1);<\n>
<if(semPredState)> <! get next lookahead symbol to test edges, then rewind !>
Locals.AsInteger['index<decisionNumber>_<stateNumber>'] := Input.Index;
Input.Rewind;<\n>
<endif>
S := -1;
<edges; separator="\nelse ">;
<if(semPredState)> <! return input cursor to state before we rewound !>
Input.Seek(Locals.AsInteger['index<decisionNumber>_<stateNumber>']);<\n>
<endif>
if (S >= 0) then
  Exit(S);
>>

/** Just like a fixed DFA edge, test the lookahead and indicate what
 * state to jump to next if successful.
 */
cyclicDFAEdge(labelExpr, targetStateNumber, edgeNumber, predicates) ::= <<
if ((<labelExpr>)<if(predicates)> and (<predicates>)<endif>) then
  S := <targetStateNumber>
>>

/** An edge pointing at end-of-token; essentially matches any char;

```

```

* always jump to the target.
*/
eotDFAEdge(targetStateNumber,edgeNumber, predicates) ::= <<
S := <targetStateNumber>;<\n>
>>

// D F A E X P R E S S I O N S

andPredicates(left,right) ::= "((<left>) and (<right>))"

orPredicates(operands) ::= "<operands:{o|(<o>)}; separator=\" or \">"

notPredicate(pred) ::= "!(<evalPredicate(...)>)"

evalPredicate(pred,description) ::= "<pred>"

evalSynPredicate(pred,description) ::= "<pred>()"

lookaheadTest(atom,k,atomAsInt) ::= "FLA[<decisionNumber>,<stateNumber>] = <atomAsInt>"

/** Sometimes a lookahead test cannot assume that LA(k) is in a temp variable
* somewhere. Must ask for the lookahead directly.
*/
isolatedLookaheadTest(atom,k,atomAsInt) ::= "Input.LA(<k>) = <atomAsInt>"

lookaheadRangeTest(lower,upper,k,rangeNumber,lowerAsInt,upperAsInt) ::= <<
((FLA[<decisionNumber>,<stateNumber>] \>= <lowerAsInt>) and (FLA[<decisionNumber>,<stateNumber>] \<=
<upperAsInt>))
>>

isolatedLookaheadRangeTest(lower,upper,k,rangeNumber,lowerAsInt,upperAsInt) ::= "(Input.LA(<k>) \>=
<lowerAsInt>) and (Input.LA(<k>) \<= <upperAsInt>)"

setTest(ranges) ::= "<ranges; separator=\" or (\">"

// A T T R I B U T E S

globalAttributeScope(scope) ::= <<
<scope.name>Stack := TStackList<I<scope.name>Scope>.Create;<\n>
<endif>
>>

globalAttributeScopeDeclaration(scope) ::= <<
<if(scope.attributes)>
strict protected
type
I<scope.name>Scope = interface(IANTLROject)

```

```

end;
T<scope.name>Scope = class(TANTLRObjct, I<scope.name>Scope)
protected
  <scope.attributes:{<it.name>: <it.type>;}; separator="\n">
end;
strict protected
<scope.name>Stack: IStackList<I<scope.name>Scope>;
<endif>
>>

```

```

ruleAttributeScopeDeclaration(scope) ::= <<
<if(scope.attributes)>
strict protected
type
  I<scope.name>Scope = interface(IANTLRObjct)
  end;
  T<scope.name>Scope = class(TANTLRObjct, I<scope.name>Scope)
  protected
    <scope.attributes:{<it.name>: <it.type>;}; separator="\n">
  end;
strict protected
  <scope.name>Stack: IStackList<I<scope.name>Scope>;
<endif>
>>

```

```

ruleAttributeScope(scope) ::= <<
<! protected Stack <scope.name>Stack = new Stack();<\n !>
>>

```

```

ruleAttributeScopeInit(scope) ::= <<
<if(scope)>
<scope.name>Stack := TStackList<I<scope.name>Scope>.Create;<\n>
<endif>
>>

```

```

returnStructName() ::= "<it.name>_return"

```

```

returnType() ::= <<
<if(ruleDescriptor.hasMultipleReturnValues)>
<ruleDescriptor:returnStructName()>
<! I<if(TREE_PARSER)>Tree<else>Parser<endif>RuleReturnScope !>
<else>
<if(ruleDescriptor.hasSingleReturnValue)>
<ruleDescriptor.singleValueReturnType>
<else>
<! Pointer/void !>
<endif>
<endif>

```

```

>>

/** Generate the C# type associated with a single or multiple return
 * values.
 */
ruleLabelType(referencedRule) ::= <<
<if(referencedRule.hasMultipleReturnValues)>
I<referencedRule.name>_return
<else>
<if(referencedRule.hasSingleReturnValue)>
<referencedRule.singleValueReturnType>
<else>
void
<endif>
<endif>
>>

delegateName() ::= <<
<if(it.label)><it.label><else>g<it.name><endif>
>>

/** Using a type to init value map, try to init a type; if not in table
 * must be an object, default value is "null".
 */
initValue(typeName) ::= <<
<csharpTypeInitMap.(typeName)>
>>

/** Define a rule label including default value */
ruleLabelDef(label) ::= <<
<label.label.text> := <initValue(typeName=ruleLabelType(referencedRule=label.referencedRule))>;<\n>
>>

ruleLabelDefVar(label) ::= <<
<label.label.text>: <ruleLabelType(referencedRule=label.referencedRule)>;
>>

/** Define a return struct for a rule if the code needs to access its
 * start/stop tokens, tree stuff, attributes, ... Leave a hole for
 * subgroups to stick in members.
 */
returnScope(scope) ::= <<
<if(ruleDescriptor.hasMultipleReturnValues)>
{ T<ruleDescriptor:returnStructName()> }

<scope.attributes:{public <it.decl>;}; separator="\n">
<@ruleReturnMembers()>
<endif>

```


>>

```
returnScopeDeclaration(scope) ::= <<
<if(ruleDescriptor.hasMultipleReturnValues)>
public
type
  T<ruleDescriptor:returnStructName()> =
class(T<if(TREE_PARSER)>Tree<else>Parser<endif>RuleReturnScope, I<ruleDescriptor:returnStructName()>)
  <scope.attributes:{public <it.decl>;}; separator="\n">
  <@ruleReturnMembers()>
  end;
<endif>
>>
```

```
parameterScope(scope) ::= <<
<scope.attributes:{<it.decl>}; separator=", ">
>>
```

```
parameterAttributeRef(attr) ::= "<attr.name>"
parameterSetAttributeRef(attr,expr) ::= "<attr.name> := <expr>;"
```

```
scopeAttributeRef(scope,attr,index,negIndex) ::= <<
<if(negIndex)>
(<scope>Stack[<scope>Stack.Count-<negIndex>-1] as T<scope>Scope).<attr.name>
<else>
<if(index)>
(<scope>Stack[<index>] as T<scope>Scope).<attr.name>
((<scope>_scope)<scope>_stack[<index>]).<attr.name>
<else>
(<scope>Stack.Peek.Implementor as T<scope>Scope).<attr.name>
<endif>
<endif>
>>
```

```
scopeSetAttributeRef(scope,attr,expr,index,negIndex) ::= <<
<if(negIndex)>
(<scope>Stack[<scope>Stack.Count-<negIndex>-1] as T<scope>Scope).<attr.name> := <expr>;<\n>
<else>
<if(index)>
(<scope>Stack[<index>] as T<scope>Scope).<attr.name> := <expr>;<\n>
<else>
(<scope>Stack.Peek.Implementor as T<scope>Scope).<attr.name> := <expr>;<\n>
<endif>
<endif>
>>
```

/** \$x is either global scope or x is rule with dynamic scope; refers

* to stack itself not top of stack. This is useful for predicates

```

* like {$function.size()>0 && $function::name.equals("foo")}?
*/
isolatedDynamicScopeRef(scope) ::= "<scope>Stack"

/** reference an attribute of rule; might only have single return value */
ruleLabelRef(referencedRule,scope,attr) ::= <<
<if(referencedRule.hasMultipleReturnValues)>
(IfThen(Assigned(<scope>),Def(<scope>).<attr.name>,<initValue(attr.type)>))
<else>
<scope>
<endif>
>>

returnAttributeRef(ruleDescriptor,attr) ::= <<
<if(ruleDescriptor.hasMultipleReturnValues)>
RetVal.<attr.name>
<else>
<attr.name>
<endif>
>>

returnSetAttributeRef(ruleDescriptor,attr,expr) ::= <<
<if(ruleDescriptor.hasMultipleReturnValues)>
RetVal.<attr.name> := <expr>;
<else>
<attr.name> := <expr>;
<endif>
>>

/** How to translate $tokenLabel */
tokenLabelRef(label) ::= "<label>"

/** ids+=ID {$ids} or e+=expr {$e} */
listLabelRef(label) ::= "list_<label>"

// not sure the next are the right approach

tokenLabelPropertyRef_text(scope,attr) ::= "(Def(<scope>).Text)"
tokenLabelPropertyRef_type(scope,attr) ::= "(Def(<scope>).TokenType)"
tokenLabelPropertyRef_line(scope,attr) ::= "(Def(<scope>).Line)"
tokenLabelPropertyRef_pos(scope,attr) ::= "(Def(<scope>).CharPositionInLine)"
tokenLabelPropertyRef_channel(scope,attr) ::= "(Def(<scope>).Channel)"
tokenLabelPropertyRef_index(scope,attr) ::= "(Def(<scope>).TokenIndex)"
tokenLabelPropertyRef_tree(scope,attr) ::= "<scope>_tree"
tokenLabelPropertyRef_int(scope,attr) ::= "(StrToIntDef(Def(<scope>).Text,0))"

ruleLabelPropertyRef_start(scope,attr) ::= "(IfThen(Assigned(<scope>), Def(<scope>).Start, nil) as I<labelType>)"

```

```

ruleLabelPropertyRef_stop(scope,attr) ::= "(Def(<scope>).Stop as I<labelType>)"
ruleLabelPropertyRef_tree(scope,attr) ::= "(Def(Def(<scope>).Tree as I<ASTLabelType>))"
ruleLabelPropertyRef_text(scope,attr) ::= <<
<if(TREE_PARSER)>
IfThen(Assigned(<scope>), Input.TokenStream.ToString(
  Input.TreeAdaptor.GetTokenStartIndex(Def(<scope>).Start),
  Input.TreeAdaptor.GetTokenStopIndex(Def(<scope>).Start)), ")
<else>
IfThen(Assigned(<scope>), Input.ToString(
  (Def(<scope>).Start) as IToken,(Def(<scope>).Stop) as IToken), ")
<endif>
>>
ruleLabelPropertyRef_st(scope,attr) ::= "((<scope> != null) ? <scope>.ST : null)"

/** Isolated $RULE ref ok in lexer as it's a Token */
lexerRuleLabel(label) ::= "<label>"

lexerRuleLabelPropertyRef_type(scope,attr) ::= "(Def(<scope>).TokenType)"
lexerRuleLabelPropertyRef_line(scope,attr) ::= "(Def(<scope>).Line)"
lexerRuleLabelPropertyRef_pos(scope,attr) ::= "(IfThen(Assigned(<scope>),Def(<scope>).CharPositionInLine,-1))"
lexerRuleLabelPropertyRef_channel(scope,attr) ::= "(Def(<scope>).Channel)"
lexerRuleLabelPropertyRef_index(scope,attr) ::= "(Def(<scope>).TokenIndex)"
lexerRuleLabelPropertyRef_text(scope,attr) ::= "(Def(<scope>).Text)"
lexerRuleLabelPropertyRef_int(scope,attr) ::= "(StrToIntDef(Def(<scope>).Text,0))"

// Somebody may ref $template or $tree or $stop within a rule:
rulePropertyRef_start(scope,attr) ::= "(RetVal.Start as I<labelType>)"
rulePropertyRef_stop(scope,attr) ::= "(RetVal.Stop as I<labelType>)"
rulePropertyRef_tree(scope,attr) ::= "(RetVal.Tree as I<ASTLabelType>)"
rulePropertyRef_text(scope,attr) ::= <<
<if(TREE_PARSER)>
Input.TokenStream.ToString(
  Input.TreeAdaptor.GetTokenStartIndex(RetVal.Start),
  Input.TreeAdaptor.GetTokenStopIndex(RetVal.Start))
<else>
Input.ToString(RetVal.Start as IToken,Input.LT(-1))
<endif>
>>
rulePropertyRef_st(scope,attr) ::= "RetVal.ST"

lexerRulePropertyRef_text(scope,attr) ::= "Text"
lexerRulePropertyRef_type(scope,attr) ::= "TokenType"
lexerRulePropertyRef_line(scope,attr) ::= "State.TokenStartLine"
lexerRulePropertyRef_pos(scope,attr) ::= "State.TokenStartCharPositionInLine"
lexerRulePropertyRef_index(scope,attr) ::= "-1" // undefined token index in lexer
lexerRulePropertyRef_channel(scope,attr) ::= "Channel"
lexerRulePropertyRef_start(scope,attr) ::= "State.TokenStartCharIndex"
lexerRulePropertyRef_stop(scope,attr) ::= "(CharIndex-1)"

```

```

lexerRulePropertyRef_int(scope,attr) ::= "StrToInt(<scope>.Text)"

// setting $st and $tree is allowed in local rule. everything else
// is flagged as error
ruleSetPropertyRef_tree(scope,attr,expr) ::= "RetVal.Tree := <expr>;"
ruleSetPropertyRef_st(scope,attr,expr) ::= "RetVal.ST := <expr>;"

/** How to execute an action (only when not backtracking) */
execAction(action) ::= <<
<if(backtracking)>
<if(actions.(actionScope).synpredgate)>
if (<actions.(actionScope).synpredgate>) then
begin
<action>
end;
<else>
if (State.Backtracking = 0) then
begin
<action>
end;<\n>
<endif>
<else>
<action>
<endif>
>>

/** How to always execute an action even when backtracking */
execForcedAction(action) ::= "<action>"

// M I S C (properties, etc...)

bitset(name, words64) ::= <<
<name> := TBitSet.Create([<words64: {<it>} ;separator=",">]);<\n>
>>

bitsetDecl(name) ::= <<
<name>: IBitSet;<\n>
>>

codeFileExtension() ::= ".pas"

true() ::= "True"
false() ::= "False"

Found in path(s):
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-

```

jar/org/antlr/codegen/templates/Delphi/Delphi.stg

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```
/*
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 * THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT
 * (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF
 * THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.
 */
```

```
/** Template overrides to add debugging to AST stuff. Dynamic inheritance
 * hierarchy is set up as ASTDbg : AST : Dbg : Java by code generator.
 */
```

```
parserMembers() ::= <<
// Implement this function in your helper file to use a custom tree adaptor
partial void InitializeTreeAdaptor();
protected DebugTreeAdaptor adaptor;

public ITreeAdaptor TreeAdaptor
{
    get
    {
```

```

    return adaptor;
}
set
{
<if(grammar.grammarIsRoot)>
    this.adaptor = new DebugTreeAdaptor(dbg,adaptor);
<else>
    this.adaptor = (DebugTreeAdaptor)adaptor; // delegator sends dbg adaptor
<endif><\n>
    <grammar.directDelegates:{g|<g.delegateName()>.TreeAdaptor = this.adaptor;}>
}
}<\n>
>>

```

```

parserCtorBody() ::= <<
<super.parserCtorBody()>
>>

```

```

createListenerAndHandshake() ::= <<
DebugEventSocketProxy proxy = new DebugEventSocketProxy( this, port,
<if(TREE_PARSER)>input.TreeAdaptor<else>adaptor<endif> );
DebugListener = proxy;
<inputStreamType> = new Debug<inputStreamType>( input, proxy );
try
{
    proxy.Handshake();
}
catch ( IOException ioe )
{
    ReportError( ioe );
}
>>

```

```

@ctorForRootGrammar.finally() ::= <<
ITreeAdaptor adap = new CommonTreeAdaptor();
TreeAdaptor = adap;
proxy.TreeAdaptor = adap;
>>

```

```

@ctorForProfilingRootGrammar.finally() ::= <<
ITreeAdaptor adap = new CommonTreeAdaptor();
TreeAdaptor = adap;
>>

```

```

@ctorForPredefinedListener.superClassRef() ::= ": base( input, dbg )"

```

```

@ctorForPredefinedListener.finally() ::= <<
<if(grammar.grammarIsRoot)><! don't create new adaptor for delegates !>

```

```
ITreeAdaptor adap = new CommonTreeAdaptor();
TreeAdaptor = adap;<\n>
<endif>
>>

//@rewriteElement.pregen() ::= "dbg.Location( <e.line>, <e.pos> );"
```

Found in path(s):

```
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-
jar/org/antlr/codegen/templates/CSharp3/ASTDbg.stg
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 */

/** Templates for building ASTs during normal parsing.
 *
 * Deal with many combinations. Dimensions are:
 * Auto build or rewrite
 * no label, label, list label (label/no-label handled together)
```

```

* child, root
* token, set, rule, wildcard
*
* The situation is not too bad as rewrite (->) usage makes ^ and !
* invalid. There is no huge explosion of combinations.
*/

@rule.setErrorReturnValue() ::= <<
retval.Tree = (<ASTLabelType>)adaptor.ErrorNode(input, retval.Start, input.LT(-1), re);
<! System.out.WriteLine("<ruleName> returns "+((CommonTree)retval.tree).toStringTree()); !>
>>

// TOKEN AST STUFF

/** ID and output=AST */
tokenRef(token,label,elementIndex,terminalOptions={}) ::= <<
<super.tokenRef(...)>
<if(backtracking)>if (state.backtracking == 0) {<endif>
<label>_tree = <createNodeFromToken(...)>;
adaptor.AddChild(root_0, <label>_tree);
<if(backtracking)>}<endif>
>>

/** ID! and output=AST (same as plain tokenRef) */
tokenRefBang(token,label,elementIndex) ::= "<super.tokenRef(...)>"

/** ID^ and output=AST */
tokenRefRuleRoot(token,label,elementIndex,terminalOptions={}) ::= <<
<super.tokenRef(...)>
<if(backtracking)>if (<actions.(actionScope).synpredgate>) {<endif>
<label>_tree = <createNodeFromToken(...)>;
root_0 = (<ASTLabelType>)adaptor.BecomeRoot(<label>_tree, root_0);
<if(backtracking)>}<endif>
>>

/** ids+=ID! and output=AST */
tokenRefBangAndListLabel(token,label,elementIndex,terminalOptions={}) ::= <<
<tokenRefBang(...)>
<listLabelElem(elem=label,elemType=labelType,...)>
>>

/** label+=TOKEN when output=AST but not rewrite alt */
tokenRefAndListLabel(token,label,elementIndex,terminalOptions={}) ::= <<
<tokenRef(...)>
<listLabelElem(elem=label,elemType=labelType,...)>
>>

/** Match label+=TOKEN^ when output=AST but not rewrite alt */

```



```

tokenRefRuleRootAndListLabel(token,label,elementIndex,terminalOptions={}) ::= <<
<tokenRefRuleRoot(...)>
<listLabelElem(elem=label,elemType=labelType,...)>
>>

// SET AST

// the match set stuff is interesting in that it uses an argument list
// to pass code to the default matchSet; another possible way to alter
// inherited code. I don't use the region stuff because I need to pass
// different chunks depending on the operator. I don't like making
// the template name have the operator as the number of templates gets
// large but this is the most flexible--this is as opposed to having
// the code generator call matchSet then add root code or ruleroot code
// plus list label plus ... The combinations might require complicated
// rather than just added on code. Investigate that refactoring when
// I have more time.

matchSet(s,label,elementIndex,postmatchCode,terminalOptions={}) ::= <<
<super.matchSet(postmatchCode={ <if(backtracking)>if (<actions.(actionScope).synpredgate>)
<endif>adaptor.AddChild(root_0, <createNodeFromToken(...)>);}, ...)>
>>

matchRuleBlockSet(s,label,elementIndex,postmatchCode,treeLevel="0",terminalOptions={}) ::= <<
<matchSet(...)>
>>

matchSetBang(s,label,elementIndex,postmatchCode,terminalOptions={}) ::= "<super.matchSet(...)>"

// note there is no matchSetTrack because -> rewrites force sets to be
// plain old blocks of alts: (A|B|...|C)

matchSetRuleRoot(s,label,elementIndex,debug,terminalOptions={}) ::= <<
<if(label)>
<label>=(<labelType>)input.LT(1);
<endif>
<super.matchSet(postmatchCode={ <if(backtracking)>if (<actions.(actionScope).synpredgate>) <endif>root_0 =
(<ASTLabelType>)adaptor.BecomeRoot(<createNodeFromToken(...)>, root_0);}, ...)>
>>

// RULE REF AST

/** rule when output=AST */
ruleRef(rule,label,elementIndex,args,scope) ::= <<
<super.ruleRef(...)>
<if(backtracking)>if (<actions.(actionScope).synpredgate>) <endif>adaptor.AddChild(root_0, <label>.Tree);
>>

```

```

/** rule! is same as normal rule ref */
ruleRefBang(rule,label,elementIndex,args,scope) ::= "<super.ruleRef(...)>"

/** rule^ */
ruleRefRuleRoot(rule,label,elementIndex,args,scope) ::= <<
<super.ruleRef(...)>
<if(backtracking)>if (<actions.(actionScope).synpredgate>) <endif>root_0 =
(<ASTLabelType>)adaptor.BecomeRoot(<label>.Tree, root_0);
>>

/** x+=rule when output=AST */
ruleRefAndListLabel(rule,label,elementIndex,args,scope) ::= <<
<ruleRef(...)>
<listLabelElem(elem={<label>.Tree},elemType=ASTLabelType,...)>
>>

/** x+=rule! when output=AST is a rule ref with list addition */
ruleRefBangAndListLabel(rule,label,elementIndex,args,scope) ::= <<
<ruleRefBang(...)>
<listLabelElem(elem={<label>.Tree},elemType=ASTLabelType,...)>
>>

/** x+=rule^ */
ruleRefRuleRootAndListLabel(rule,label,elementIndex,args,scope) ::= <<
<ruleRefRuleRoot(...)>
<listLabelElem(elem={<label>.Tree},elemType=ASTLabelType,...)>
>>

// WILDCARD AST

wildcard(token,label,elementIndex,terminalOptions={ }) ::= <<
<super.wildcard(...)>
<if(backtracking)>if (<actions.(actionScope).synpredgate>) {<endif>
<label>_tree = (<ASTLabelType>)adaptor.Create(<label>);
adaptor.AddChild(root_0, <label>_tree);
<if(backtracking)>}<endif>
>>

wildcardBang(label,elementIndex) ::= "<super.wildcard(token=[],...)>"

wildcardRuleRoot(token,label,elementIndex,terminalOptions={ }) ::= <<
<super.wildcard(...)>
<if(backtracking)>if (<actions.(actionScope).synpredgate>) {<endif>
<label>_tree = (<ASTLabelType>)adaptor.Create(<label>);
root_0 = (<ASTLabelType>)adaptor.BecomeRoot(<label>_tree, root_0);
<if(backtracking)>}<endif>
>>

```

```

createNodeFromToken(label,terminalOptions={ }) ::= <%
<if(terminalOptions.node)>
new
<terminalOptions.node><(if(terminalOptions.type)><terminalOptions.type>,<endif><label><(if(terminalOptions.text)>,<terminalOptions.text; format="string"><endif>)
<else>
(<ASTLabelType>)adaptor.Create(<(if(terminalOptions.type)><terminalOptions.type>,<endif><label><(if(terminalOptions.text)>,<terminalOptions.text; format="string"><endif>)
<endif>
%>

```

```

ruleCleanUp() ::= <<
<super.ruleCleanUp()>
<if(backtracking)>if (<actions.(actionScope).synpredgate>) {<endif>
retval.Tree = (<ASTLabelType>)adaptor.RulePostProcessing(root_0);
adaptor.SetTokenBoundaries(retval.Tree, retval.Start, retval.Stop);
<if(backtracking)>}<endif>
>>

```

Found in path(s):

```
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-
jar/org/antlr/codegen/templates/CSharp2/ASTParser.stg
```

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```
/*
```

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*/

/** Templates for building ASTs during normal parsing.

*

* Deal with many combinations. Dimensions are:

* Auto build or rewrite

* no label, label, list label (label/no-label handled together)

* child, root

* token, set, rule, wildcard

*

* The situation is not too bad as rewrite (->) usage makes ^ and !

* invalid. There is no huge explosion of combinations.

*/

```
finishedBacktracking(block) ::= <<
```

```
<if(!ruleDescriptor.isSynPred)>
```

```
<if(backtracking)>
```

```
if <actions.(actionScope).synpredgate>:
```

```
  <block>
```

```
<else>
```

```
<block>
```

```
<endif>
```

```
<endif>
```

```
>>
```

```
@ruleBody.setErrorReturnValue() ::= <<
```

```
retval.tree = self._adaptor.errorNode(self.input, retval.start, self.input.LT(-1), re)
```

```
>>
```

```
// TOKEN AST STUFF
```

```
/** ID and output=AST */
```

```
tokenRef(token,label,elementIndex,terminalOptions={}) ::= <<
```

```
<super.tokenRef(...)>
```

```
<finishedBacktracking({
```

```
<label>_tree = <createNodeFromToken(...)>
```

```
self._adaptor.addChild(root_0, <label>_tree
```

```
})>
```

```
>>
```

```
/** ID! and output=AST (same as plain tokenRef) */
```

```
tokenRefBang(token,label,elementIndex,terminalOptions={}) ::= "<super.tokenRef(...)>"
```

```
/** ID^ and output=AST */
```

```
tokenRefRuleRoot(token,label,elementIndex,terminalOptions={}) ::= <<
```

```
<super.tokenRef(...)>
```

```

<finishedBacktracking({
<label>_tree = <createNodeFromToken(...)>
root_0 = self._adaptor.becomeRoot(<label>_tree, root_0)
})>
>>

/** ids+=ID! and output=AST */
tokenRefBangAndListLabel(token,label,elementIndex,terminalOptions={}) ::= <<
<tokenRefBang(...)>
<listLabel(elem=label,...)>
>>

/** label+=TOKEN when output=AST but not rewrite alt */
tokenRefAndListLabel(token,label,elementIndex,terminalOptions={}) ::= <<
<tokenRef(...)>
<listLabel(elem=label,...)>
>>

/** Match label+=TOKEN^ when output=AST but not rewrite alt */
tokenRefRuleRootAndListLabel(token,label,elementIndex,terminalOptions={}) ::= <<
<tokenRefRuleRoot(...)>
<listLabel(elem=label,...)>
>>

// SET AST

// the match set stuff is interesting in that it uses an argument list
// to pass code to the default matchSet; another possible way to alter
// inherited code. I don't use the region stuff because I need to pass
// different chunks depending on the operator. I don't like making
// the template name have the operator as the number of templates gets
// large but this is the most flexible--this is as opposed to having
// the code generator call matchSet then add root code or ruleroot code
// plus list label plus ... The combinations might require complicated
// rather than just added on code. Investigate that refactoring when
// I have more time.

matchSet(s,label,elementIndex,postmatchCode,terminalOptions={}) ::= <%
<super.matchSet(postmatchCode={<finishedBacktracking({self._adaptor.addChild(root_0,
<createNodeFromToken(...)>})>}, ...)>
%>

matchRuleBlockSet(s,label,elementIndex,postmatchCode,treeLevel="0",terminalOptions={}) ::= <<
<matchSet(...)>
>>

matchSetBang(s,label,elementIndex,postmatchCode,terminalOptions={}) ::= "<super.matchSet(...)>"

```

```

// note there is no matchSetTrack because -> rewrites force sets to be
// plain old blocks of alts: (A|B|...|C)

matchSetRuleRoot(s,label,elementIndex,debug,terminalOptions={}) ::= <<
<if(label)>
<label> = self.input.LT(1)<\n>
<endif>
<super.matchSet(postmatchCode={ <finishedBacktracking({root_0 =
self._adaptor.becomeRoot(<createNodeFromToken(...)>, root_0)}>}, ...)>
>>

// RULE REF AST

/** rule when output=AST */
ruleRef(rule,label,elementIndex,args,scope) ::= <<
<super.ruleRef(...)>
<finishedBacktracking({self._adaptor.addChild(root_0, <label>.tree})>)>
>>

/** rule! is same as normal rule ref */
ruleRefBang(rule,label,elementIndex,args,scope) ::= "<super.ruleRef(...)>"

/** rule^ */
ruleRefRuleRoot(rule,label,elementIndex,args,scope) ::= <<
<super.ruleRef(...)>
<finishedBacktracking({root_0 = self._adaptor.becomeRoot(<label>.tree, root_0)}>)>
>>

/** x+=rule when output=AST */
ruleRefAndListLabel(rule,label,elementIndex,args,scope) ::= <<
<ruleRef(...)>
<listLabel(label, {<label>.tree})>
>>

/** x+=rule! when output=AST is a rule ref with list addition */
ruleRefBangAndListLabel(rule,label,elementIndex,args,scope) ::= <<
<ruleRefBang(...)>
<listLabel(label, {<label>.tree})>
>>

/** x+=rule^ */
ruleRefRuleRootAndListLabel(rule,label,elementIndex,args,scope) ::= <<
<ruleRefRuleRoot(...)>
<listLabel(label, {<label>.tree})>
>>

// WILDCARD AST

```

```
wildcard(token,label,elementIndex,terminalOptions={ }) ::= <<
<super.wildcard(...)>
<finishedBacktracking({
<label>_tree = self._adaptor.createWithPayload(<label>)
self._adaptor.addChild(root_0, <label>_tree)
})>
>>
```

```
wildcardBang(label,elementIndex) ::= "<super.wildcard(...)>"
```

```
wildcardRuleRoot(token,label,elementIndex,terminalOptions={ }) ::= <<
<super.wildcard(...)>
<finishedBacktracking({
<label>_tree = self._adaptor.createWithPayload(<label>)
root_0 = self._adaptor.becomeRoot(<label>_tree, root_0)
})>
>>
```

```
createNodeFromToken(label,terminalOptions={ }) ::= <%
<if(terminalOptions.node)>
<terminalOptions.node>(<label>) <! new MethodNode(IDLabel) !>
<else>
self._adaptor.createWithPayload(<label>)
<endif>
%>
```

```
ruleCleanUp() ::= <<
<super.ruleCleanUp()>
<finishedBacktracking({
retval.tree = self._adaptor.rulePostProcessing(root_0)
self._adaptor.setTokenBoundaries(retval.tree, retval.start, retval.stop)
})>
>>
```

Found in path(s):

```
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-
jar/org/antlr/codegen/templates/Python/ASTParser.stg
```

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```

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*/

group AST;

```
@outputFile.imports() ::= <<
<@super.imports()><if(!TREE_PARSER)><! tree parser would already have imported !>
Antlr.Runtime.Tree,<\n><endif>
>>
```

```
@genericParser.members() ::= <<
<@super.members()>
<parserMembers()>
>>
```

```
@genericParser.membersConstructor() ::= <<
<@super.membersConstructor()>
<parserMembersConstructor()>
>>
```

```
@genericParser.membersImplementation() ::= <<
<@super.membersImplementation()>
<parserMembersImplementation()>
>>
```

/** Add an adaptor property that knows how to build trees */

```
parserMembers() ::= <<
strict protected
FAdaptor: ITreeAdaptor;
procedure SetAdaptor(const Value: ITreeAdaptor);
```



```

    property Adaptor: ITreeAdaptor read FAdaptor;
public
    property TreeAdaptor: ITreeAdaptor read FAdaptor write SetAdaptor;

>>

parserMembersConstructor() ::= <<
FAdaptor := TCommonTreeAdaptor.Create;
>>

parserMembersImplementation() ::= <<
procedure T<grammar.recognizerName>.SetAdaptor(const Value: ITreeAdaptor);
begin
    FAdaptor := Value;
    <grammar.directDelegates:{g|<g:delegateName>.TreeAdaptor := FAdaptor;}>
end;
>>

@returnScope.ruleReturnMembers() ::= <<
function T<grammar.recognizerName>.T<ruleDescriptor:returnStructName>.GetTree: IANTLRInterface;
begin
    Result := FTree;
end;

procedure T<grammar.recognizerName>.T<ruleDescriptor:returnStructName>.SetTree(const Value:
IANTLRInterface);
begin
    FTree := Value as I<ASTLabelType>;
end;
>>

@returnScopeDeclaration.ruleReturnMembers() ::= <<
strict private
    FTree: I<ASTLabelType>;
protected
    { IRuleReturnScope }
    function GetTree: IANTLRInterface; override;
    procedure SetTree(const Value: IANTLRInterface); override;
>>

/** Add a variable to track rule's return AST */
ruleDeclarations() ::= <<
<super.ruleDeclarations()>
Root[0] := nil;<\n>
>>

ruleDeclarationVars() ::= <<
<super.ruleDeclarationVars()>

```

Root: array [0..63] of I<ASTLabelType>;

>>

```
ruleLabelDefs() ::= <<
<super.ruleLabelDefs()>
<ruleDescriptor.tokenLabels:{<it.label.text>_tree := nil;}; separator="\n">
<ruleDescriptor.tokenListLabels:{<it.label.text>_tree := nil;}; separator="\n">
<ruleDescriptor.allTokenRefsInAltsWithRewrites:{Locals['Stream_<it>'] :=
TRewriteRule<rewriteElementType>Stream.Create(Adaptor,'token <it>');}; separator="\n">
<ruleDescriptor.allRuleRefsInAltsWithRewrites:{Locals['Stream_<it>'] :=
TRewriteRuleSubtreeStream.Create(Adaptor,'rule <it>');}; separator="\n">
>>
```

```
ruleLabelDefVars() ::= <<
<super.ruleLabelDefVars()>
<ruleDescriptor.tokenLabels:{<it.label.text>_tree: I<ASTLabelType>;}; separator="\n">
<ruleDescriptor.tokenListLabels:{<it.label.text>_tree: I<ASTLabelType>;}; separator="\n">
>>
```

```
/** When doing auto AST construction, we must define some variables;
 * These should be turned off if doing rewrites. This must be a "mode"
 * as a rule could have both rewrite and AST within the same alternative
 * block.
 */
```

```
@alt.declarations() ::= <<
<if(autoAST)>
<if(outerAlt)>
<if(!rewriteMode)>
Root[0] := Adaptor.GetNilNode as I<ASTLabelType>;
<endif>
<endif>
<endif>
>>
```

```
// Tracking Rule Elements
```

```
/** ID and track it for use in a rewrite rule */
tokenRefTrack(token,label,elementIndex,terminalOptions) ::= <<
<tokenRefBang(...)> <! Track implies no auto AST construction!>
<if(backtracking)>if (State.Backtracking = 0) then <endif>(Locals['Stream_<token>'] as
IRewriteRuleElementStream).Add(<label>);<\n>
>>
```

```
/** ids+=ID and track it for use in a rewrite rule; adds to ids *and*
 * to the tracking list stream_ID for use in the rewrite.
 */
```

```
tokenRefTrackAndListLabel(token,label,elementIndex,terminalOptions) ::= <<
<tokenRefTrack(...)>
<listLabel(elem=label,...)>
```

```

>>

/** ^(ID ...) track for rewrite */
tokenRefRuleRootTrack(token,label,elementIndex,terminalOptions) ::= <<
<tokenRefBang(...)>
<if(backtracking)>if (State.Backtracking = 0) then <endif>(Locals['Stream_<token>'] as
IRewriteRuleElementStream).Add(<label>);<\n>
>>

/** Match ^(label+=TOKEN ...) track for rewrite */
tokenRefRuleRootTrackAndListLabel(token,label,elementIndex,terminalOptions) ::= <<
<tokenRefRuleRootTrack(...)>
<listLabel(elem=label,...)>
>>

wildcardTrack(label,elementIndex) ::= <<
<super.wildcard(...)>
>>

/** rule when output=AST and tracking for rewrite */
ruleRefTrack(rule,label,elementIndex,args,scope) ::= <<
<super.ruleRef(...)>
<if(backtracking)>if (State.Backtracking = 0) then <endif>(Locals['Stream_<rule.name>'] as
IRewriteRuleElementStream).Add(<label>.Tree);<\n>
>>

/** x+=rule when output=AST and tracking for rewrite */
ruleRefTrackAndListLabel(rule,label,elementIndex,args,scope) ::= <<
<ruleRefTrack(...)>
<listLabel(elem=label+".Tree",...)>
>>

/** ^(rule ...) rewrite */
ruleRefRuleRootTrack(rule,label,elementIndex,args,scope) ::= <<
<ruleRefRuleRoot(...)>
<if(backtracking)>if (State.Backtracking = 0) then <endif>(Locals['Stream_<rule>'] as
IRewriteRuleElementStream).Add(<label>.Tree);
>>

/** ^(x+=rule ...) rewrite */
ruleRefRuleRootTrackAndListLabel(rule,label,elementIndex,args,scope) ::= <<
<ruleRefRuleRootTrack(...)>
<listLabel(elem=label+".Tree",...)>
>>

// R e w r i t e

rewriteCode(

```

```

alts, description,
referencedElementsDeep, // ALL referenced elements to right of ->
referencedTokenLabels,
referencedTokenListLabels,
referencedRuleLabels,
referencedRuleListLabels,
  referencedWildcardLabels,
  referencedWildcardListLabels,
rewriteBlockLevel, enclosingTreeLevel, treeLevel) ::=
<<

// AST REWRITE
// elements:    <referencedElementsDeep; separator=", ">
// token labels: <referencedTokenLabels; separator=", ">
// rule labels:  <referencedRuleLabels; separator=", ">
// token list labels: <referencedTokenListLabels; separator=", ">
// rule list labels: <referencedRuleListLabels; separator=", ">
<if(backtracking)>
if (State.Backtracking = 0) then
begin<\n>
<endif>
<prevRuleRootRef(>).Tree := Root[0];
<rewriteCodeLabels(>
Root[0] := Adaptor.GetNilNode as I<ASTLabelType>;
<alts:rewriteAlt(> separator="else ">
<! if tree parser and rewrite=true !>
<if(TREE_PARSER)>
<if(rewriteMode)>
<prevRuleRootRef(>).Tree = (<ASTLabelType>)adaptor.rulePostProcessing(root[0]);
input.ReplaceChildren(adaptor.GetParent(retval.Start),
                      adaptor.GetChildIndex(retval.Start),
                      adaptor.GetChildIndex(_last),
                      retval.Tree);

<endif>
<endif>
<! if parser or rewrite!=true, we need to set result !>
<if(!TREE_PARSER)>
<prevRuleRootRef(>).Tree := Root[0];<\n>
<endif>
<if(!rewriteMode)>
<prevRuleRootRef(>).Tree := Root[0];<\n>
<endif>
<if(backtracking)>
end;
<endif>
>>

rewriteCodeLabels() ::= <<

```

```

<referencedTokenLabels
  :{Locals['Stream_<it>'] := TRewriteRule<rewriteElementType>Stream.Create(Adaptor, 'token <it>', <it>);}
  separator="\n"
>
<referencedTokenListLabels
  :{Locals['Stream_<it>'] := TRewriteRule<rewriteElementType>Stream.Create(Adaptor,'token <it>', list_<it>);}
  separator="\n"
>
<referencedRuleLabels:{
if Assigned(<it>) then
  Locals['Stream_<it>'] := TRewriteRuleSubtreeStream.Create(Adaptor, 'token <it>', <it>.Tree)
else
  Locals['Stream_<it>'] := TRewriteRuleSubtreeStream.Create(Adaptor, 'token <it>', nil);} separator="\n">
<referencedRuleListLabels
  :{Locals['Stream_<it>'] := TRewriteRuleSubtreeStream.Create(Adaptor, 'token <it>', list_<it>);}
  separator="\n"
>
>>

/** Generate code for an optional rewrite block; note it uses the deep ref'd element
 * list rather shallow like other blocks.
 */
rewriteOptionalBlock(
  alt,rewriteBlockLevel,
  referencedElementsDeep, // all nested refs
  referencedElements, // elements in immediately block; no nested blocks
  description) ::=
<<
(* <fileName>:<description> *)
if (<referencedElementsDeep:{el | (Locals['Stream_<el>'] as IRewriteRuleElementStream).HasNext}; separator="
or ">) then
begin
  <alt>
end;
<referencedElementsDeep:{el | (Locals['Stream_<el>'] as IRewriteRuleElementStream).Reset;<\n>}>
>>

rewriteClosureBlock(
  alt,rewriteBlockLevel,
  referencedElementsDeep, // all nested refs
  referencedElements, // elements in immediately block; no nested blocks
  description) ::=
<<
(* <fileName>:<description> *)
while (<referencedElements:{el | (Locals['Stream_<el>'] as IRewriteRuleElementStream).HasNext}; separator="
">) do
begin
  <alt>

```

```

end;
<referencedElements:{el | (Locals['Stream_<el>'] as IRewriteRuleElementStream).Reset();<\n>}>
>>

rewritePositiveClosureBlock(
  alt,rewriteBlockLevel,
  referencedElementsDeep, // all nested refs
  referencedElements,    // elements in immediately block; no nested blocks
  description) ::=
<<
if (not (<referencedElements:{el | (Locals['Stream_<el>'] as IRewriteRuleElementStream).HasNext}; separator=" or
">)) then
  raise ERewriteEarlyExitException.Create("");

while (<referencedElements:{el | (Locals['Stream_<el>'] as IRewriteRuleElementStream).HasNext}; separator=" or
">) do
begin
  <alt>
end;
<referencedElements:{el | (Locals['Stream_<el>'] as IRewriteRuleElementStream).Reset();<\n>}>
>>

rewriteAlt(a) ::= <<
(* <a.description> *)
<if(a.pred)>
if (<a.pred>) then
begin
  <a.alt>
end<\n>
<else>
begin
  <a.alt>
end;<\n>
<endif>
>>

/** For empty rewrites: "r : ... -> ;" */
rewriteEmptyAlt() ::= "Root[0] = null;"

rewriteTree(root,children,description,enclosingTreeLevel,treeLevel) ::= <<
(* <fileName>:<description> *)
begin
  Root[<treeLevel>] := Adaptor.GetNilNode as I<ASTLabelType>;
  <root:rewriteElement()>
  <children:rewriteElement()>
  Adaptor.AddChild(Root[<enclosingTreeLevel>], Root[<treeLevel>]);
end;<\n>
>>

```

```

rewriteElementList(elements) ::= "<elements:rewriteElement()>"

rewriteElement(e) ::= <<
<@pregen()>
<e.el>
>>

/** Gen ID or ID[args] */
rewriteTokenRef(token,elementIndex,terminalOptions,args) ::= <<
Adaptor.AddChild(Root[<treeLevel>], <createRewriteNodeFromElement(...)>);<\n>
>>

/** Gen $label ... where defined via label=ID */
rewriteTokenLabelRef(label,elementIndex) ::= <<
Adaptor.AddChild(Root[<treeLevel>], (Locals['Stream_<label>'] as
IRewriteRuleElementStream).NextNode());<\n>
>>

/** Gen $label ... where defined via label+=ID */
rewriteTokenListLabelRef(label,elementIndex) ::= <<
Adaptor.AddChild(Root[<treeLevel>], (Locals['Stream_<label>'] as IRewriteRuleElementStream).NextNode());<\n>
>>

/** Gen ^($label ...) */
rewriteTokenLabelRefRoot(label,elementIndex) ::= <<
Root[<treeLevel>] := Adaptor.BecomeRoot((Locals['Stream_<label>'] as
IRewriteRuleElementStream).NextNode(), Root[<treeLevel>]) as I<ASTLabelType>;<\n>
>>

/** Gen ^($label ...) where label+=... */
rewriteTokenListLabelRefRoot ::= rewriteTokenLabelRefRoot

/** Gen ^(ID ...) or ^(ID[args] ...) */
rewriteTokenRefRoot(token,elementIndex,terminalOptions,args) ::= <<
Root[<treeLevel>] := Adaptor.BecomeRoot(<createRewriteNodeFromElement(...)>, Root[<treeLevel>]) as
I<ASTLabelType>;<\n>
>>

rewriteImaginaryTokenRef(args,token,terminalOptions,elementIndex) ::= <<
Adaptor.AddChild(Root[<treeLevel>], <createImaginaryNode(tokenType=token, ...)>);<\n>
>>

rewriteImaginaryTokenRefRoot(args,token,terminalOptions,elementIndex) ::= <<
Root[<treeLevel>] := Adaptor.BecomeRoot(<createImaginaryNode(tokenType=token, ...)>, Root[<treeLevel>]) as
I<ASTLabelType>;<\n>
>>

```

```

/** plain -> {foo} action */
rewriteAction(action) ::= <<
Root[0] = <action>;<\n>
>>

/** What is the name of the previous value of this rule's root tree? This
 * let's us refer to $rule to mean previous value. I am reusing the
 * variable 'tree' sitting in retval struct to hold the value of Root[0] right
 * before I set it during rewrites. The assign will be to retval.Tree.
 */
prevRuleRootRef() ::= "RetVal"

rewriteRuleRef(rule) ::= <<
Adaptor.AddChild(Root[<treeLevel>], (Locals['Stream_<rule>'] as IRewriteRuleElementStream).NextTree());<\n>
>>

rewriteRuleRefRoot(rule) ::= <<
Root[<treeLevel>] := Adaptor.BecomeRoot((Locals['Stream_<rule>'] as IRewriteRuleElementStream).NextNode,
Root[<treeLevel>]) as I<ASTLabelType>;<\n>
>>

rewriteNodeAction(action) ::= <<
Adaptor.AddChild(Root[<treeLevel>], <action>;<\n>
>>

rewriteNodeActionRoot(action) ::= <<
Root[<treeLevel>] := Adaptor.BecomeRoot(<action>, Root[<treeLevel>]) as I<ASTLabelType>;<\n>
>>

/** Gen $ruleLabel ... where defined via ruleLabel=rule */
rewriteRuleLabelRef(label) ::= <<
Adaptor.AddChild(Root[<treeLevel>], (Locals['Stream_<label>'] as IRewriteRuleElementStream).NextTree());<\n>
>>

/** Gen $ruleLabel ... where defined via ruleLabel+=rule */
rewriteRuleListLabelRef(label) ::= <<
Adaptor.AddChild(Root[<treeLevel>], (Locals['Stream_<label>'] as IRewriteRuleElementStream).NextTree());<\n>
>>

/** Gen ^($ruleLabel ...) where ruleLabel=rule */
rewriteRuleLabelRefRoot(label) ::= <<
Root[<treeLevel>] := Adaptor.BecomeRoot((Locals['Stream_<label>'] as IRewriteRuleElementStream).NextNode,
Root[<treeLevel>]) as I<ASTLabelType>;<\n>
>>

/** Gen ^($ruleLabel ...) where ruleLabel+=rule */
rewriteRuleListLabelRefRoot(label) ::= <<
Root[<treeLevel>] := Adaptor.BecomeRoot((Locals['Stream_<label>'] as IRewriteRuleElementStream).NextNode,

```



```
Root[<treeLevel>]) as I<ASTLabelType>;<\n>
```

```
>>
```

```
createImaginaryNode(tokenType,terminalOptions,args) ::= <<
```

```
<if(terminalOptions.node)>
```

```
<! new MethodNode(IDLabel, args) !>
```

```
T<terminalOptions.node>.Create(<tokenType><if(args)>, <args; separator=", "><endif>)
```

```
<else>
```

```
Adaptor.CreateNode(<tokenType>, <args; separator=", "><if(!args)>'<tokenType>'<endif>) as I<ASTLabelType>
```

```
<endif>
```

```
>>
```

```
createRewriteNodeFromElement(token,terminalOptions,args) ::= <<
```

```
<if(terminalOptions.node)>
```

```
T<terminalOptions.node>.Create((Locals['Stream_<token>'] as IRewriteRuleElementStream).NextToken<if(args)>,
```

```
<args; separator=", "><endif>)
```

```
<else>
```

```
<if(args)> <! must create new node from old !>
```

```
Adaptor.Create(<token>, <args; separator=", ">)
```

```
<else>
```

```
(Locals['Stream_<token>'] as IRewriteRuleElementStream).NextNode
```

```
<endif>
```

```
<endif>
```

```
>>
```

Found in path(s):

```
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-  
jar/org/antlr/codegen/templates/Delphi/AST.stg
```

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```
/*
```

```
[The "BSD license"]
```

```
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*/

/** Template overrides to add debugging to normal Java output;

* If ASTs are built, then you'll also get ASTDbg.stg loaded.

*/

@outputFile.imports() ::= <<

<@super.imports(>

import org.antlr.runtime.debug.*;

import java.io.IOException;

>>

@genericParser.members() ::= <<

<if(grammar.grammarIsRoot)>

public static final String[] ruleNames = new String[] {

"invalidRule", <grammar.allImportedRules:{rST | "<rST.name>"}; wrap="\n\t", separator=", ">

};<\n>

<endif>

public static final boolean[] decisionCanBacktrack = new boolean[] {

false, // invalid decision

<grammar.decisions:{d | <d.dfa.hasSynPred; null="false">}; wrap="\n ", separator=", ">

};<\n>

<if(grammar.grammarIsRoot)> <! grammar imports other grammar(s) !>

public int ruleLevel = 0;

public int getRuleLevel() { return ruleLevel; }

public void incRuleLevel() { ruleLevel++; }

public void decRuleLevel() { ruleLevel--; }

<if(profile)>

<ctorForProfilingRootGrammar(>

<else>

<ctorForRootGrammar(>

<endif>

<ctorForPredefinedListener(>

<else><! imported grammar !>

public int getRuleLevel() { return <grammar.delegators:{g| <g.delegateName(>>}.getRuleLevel(); }

public void incRuleLevel() { <grammar.delegators:{g| <g.delegateName(>>}.incRuleLevel(); }

public void decRuleLevel() { <grammar.delegators:{g| <g.delegateName(>>}.decRuleLevel(); }

<ctorForDelegateGrammar(>

<endif>

<if(profile)>

public boolean alreadyParsedRule(IntStream input, int ruleIndex) {

int stopIndex = getRuleMemoization(ruleIndex, input.index());

```

    ((Profiler)dbg).examineRuleMemoization(input, ruleIndex, stopIndex,
<grammar.composite.rootGrammar.recognizerName>.ruleNames[ruleIndex]);
    return super.alreadyParsedRule(input, ruleIndex);
}

```

```
@Override
```

```

public void memoize(IntStream input,
    int ruleIndex,
    int ruleStartIndex)
{
    ((Profiler)dbg).memoize(input, ruleIndex, ruleStartIndex,
<grammar.composite.rootGrammar.recognizerName>.ruleNames[ruleIndex]);
    super.memoize(input, ruleIndex, ruleStartIndex);
}

```

```
<endif>
```

```

protected boolean evalPredicate(boolean result, String predicate) {
    dbg.semanticPredicate(result, predicate);
    return result;
}

```

```
>>
```

```
ctorForRootGrammar() ::= <<
```

```
<! bug: can't use <@super.members()> cut-n-paste instead !>
```

```
<! Same except we add port number and profile stuff if root grammar !>
```

```

public <name>(<inputStreamType> input) {
    this(input, DebugEventSocketProxy.DEFAULT_DEBUGGER_PORT, new RecognizerSharedState());
}

```

```

public <name>(<inputStreamType> input, int port, RecognizerSharedState state) {

```

```
    super(input, state);
```

```
    <parserCtorBody()>
```

```
    <createListenerAndHandshake()>
```

```

    <grammar.directDelegates: {g|<g:delegateName()> = new <g.recognizerName>(input, dbg, this.state,
this<grammar.delegators: {g|, <g:delegateName()>}>);}; separator="\n">

```

```
    <@finally()>
```

```
    }

```

```
>>
```

```
ctorForProfilingRootGrammar() ::= <<
```

```
<! bug: can't use <@super.members()> cut-n-paste instead !>
```

```

public <name>(<inputStreamType> input) {
    this(input, new Profiler(null), new RecognizerSharedState());
}

```

```

public <name>(<inputStreamType> input, DebugEventListener dbg, RecognizerSharedState state) {

```

```
    super(input, dbg, state);
```

```
    Profiler p = (Profiler)dbg;
```

```
    p.setParser(this);
```

```
    <parserCtorBody()>
```

```
    <grammar.directDelegates:
```

```

    {g|<g:delegateName()> = new <g.recognizerName>(input, dbg, this.state, this<grammar.delegators:{g|,
<g:delegateName()>>});}; separator="\n">
    <@finally()>
}
<\n>
>>

```

```

/** Basically we don't want to set any dbg listeners are root will have it. */
ctorForDelegateGrammar() ::= <<
public <name>(<inputStreamType> input, DebugEventListener dbg, RecognizerSharedState
state<grammar.delegators:{g|, <g.recognizerName> <g:delegateName()>>}) {
    super(input, dbg, state);
    <parserCtorBody()>
    <grammar.directDelegates:
    {g|<g:delegateName()> = new <g.recognizerName>(input, this, this.state<grammar.delegators:{g|,
<g:delegateName()>>});}; separator="\n">
    }<\n>
>>

```

```

ctorForPredefinedListener() ::= <<
public <name>(<inputStreamType> input, DebugEventListener dbg) {
    <@superClassRef>super(input, dbg, new RecognizerSharedState());<@end>
    <if(profile)>
        Profiler p = (Profiler)dbg;
        p.setParser(this);
    <endif>
    <parserCtorBody()>
    <grammar.directDelegates:{g|<g:delegateName()> = new <g.recognizerName>(input, dbg, this.state,
this<grammar.delegators:{g|, <g:delegateName()>>});}; separator="\n">
    <@finally()>
    }<\n>
>>

```

```

createListenerAndHandshake() ::= <<
<if(TREE_PARSER)>
DebugEventSocketProxy proxy =
    new DebugEventSocketProxy(this, port, input.getTreeAdaptor());<\n>
<else>
DebugEventSocketProxy proxy =
    new DebugEventSocketProxy(this, port, null);<\n>
<endif>
setDebugListener(proxy);
try {
    proxy.handshake();
}
catch (IOException ioe) {
    reportError(ioe);
}

```

>>

```
@genericParser.superClassName() ::= "Debug<@super.superClassName(>"
```

```
@rule.preamble() ::= <<
try { dbg.enterRule(getGrammarFileName(), "<ruleName>");
if ( getRuleLevel()==0 ) {dbg.commence();}
incRuleLevel();
dbg.location(<ruleDescriptor.tree.line>, <ruleDescriptor.tree.charPositionInLine>);<\n>
>>
```

```
@rule.postamble() ::= <<
dbg.location(<ruleDescriptor.EORNode.line>, <ruleDescriptor.EORNode.charPositionInLine>);<\n>
}
finally {
dbg.exitRule(getGrammarFileName(), "<ruleName>");
decRuleLevel();
if ( getRuleLevel()==0 ) {dbg.terminate();}
}<\n>
>>
```

```
@synpred.start() ::= "dbg.beginBacktrack(state.backtracking);"
```

```
@synpred.stop() ::= "dbg.endBacktrack(state.backtracking, success);"
```

```
// Common debug event triggers used by region overrides below
```

```
enterSubRule() ::=
"try { dbg.enterSubRule(<decisionNumber>);<\n>"
```

```
exitSubRule() ::=
"} finally {dbg.exitSubRule(<decisionNumber>);}<\n>"
```

```
enterDecision() ::=
"try { dbg.enterDecision(<decisionNumber>, decisionCanBacktrack[<decisionNumber>]);<\n>"
```

```
exitDecision() ::=
"} finally {dbg.exitDecision(<decisionNumber>);}<\n>"
```

```
enterAlt(n) ::= "dbg.enterAlt(<n>);<\n>"
```

```
// Region overrides that tell various constructs to add debugging triggers
```

```
@block.predecision() ::= "<enterSubRule()><enterDecision()>"
```

```
@block.postdecision() ::= "<exitDecision()>"
```

```
@block.postbranch() ::= "<exitSubRule()>"
```

```

@ruleBlock.predecision() ::= "<enterDecision(>"

@ruleBlock.postdecision() ::= "<exitDecision(>"

@ruleBlockSingleAlt.prealt() ::= "<enterAlt(n=\"1\")>"

@blockSingleAlt.prealt() ::= "<enterAlt(n=\"1\")>"

@positiveClosureBlock.preloop() ::= "<enterSubRule(>"

@positiveClosureBlock.postloop() ::= "<exitSubRule(>"

@positiveClosureBlock.predecision() ::= "<enterDecision(>"

@positiveClosureBlock.postdecision() ::= "<exitDecision(>"

@positiveClosureBlock.earlyExitException() ::=
"dbg.recognitionException(eee);<n>"

@closureBlock.preloop() ::= "<enterSubRule(>"

@closureBlock.postloop() ::= "<exitSubRule(>"

@closureBlock.predecision() ::= "<enterDecision(>"

@closureBlock.postdecision() ::= "<exitDecision(>"

@altSwitchCase.prealt() ::= "<enterAlt(altNum)>" // altNum is arg of altSwitchCase

@element.prematch() ::=
"dbg.location(<e.line>,<e.pos>);" // e is arg of element

@matchSet.mismatchedSetException() ::=
"dbg.recognitionException(mse);"

@dfaState.noViableAltException() ::= "dbg.recognitionException(nvae);"

@dfaStateSwitch.noViableAltException() ::= "dbg.recognitionException(nvae);"

dfaDecision(decisionNumber,description) ::= <<
try {
isCyclicDecision = true;
<super.dfaDecision(...)>
}
catch (NoViableAltException nvae) {
dbg.recognitionException(nvae);
throw nvae;
}

```

```
}  
>>
```

```
@cyclicDFA.errorMethod() ::= <<  
public void error(NoViableAltException nvae) {  
    dbg.recognitionException(nvae);  
}  
>>
```

```
/** Force predicate validation to trigger an event */  
evalPredicate(pred,description) ::= <<  
evalPredicate(<pred>,"<description>")  
>>
```

Found in path(s):

* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/codegen/templates/Java/Dbg.stg
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```
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```
*/
```

```

/** Templates for building ASTs during normal parsing.
*
* Deal with many combinations. Dimensions are:
* Auto build or rewrite
* no label, label, list label (label/no-label handled together)
* child, root
* token, set, rule, wildcard
*
* The situation is not too bad as rewrite (->) usage makes ^ and !
* invalid. There is no huge explosion of combinations.
*/
group ASTParser;

@rule.setErrorReturnValue() ::= <<
RetVal.Tree := Adaptor.ErrorNode(Input, RetVal.Start as IToken,
Input.LT(-1), RE) as I<ASTLabelType>;
>>

// TOKEN AST STUFF

/** ID and output=AST */
tokenRef(token,label,elementIndex,terminalOptions) ::= <<
<super.tokenRef(...)>
<if(backtracking)>
if (State.Backtracking = 0) then
begin<\n>
<endif>
<label>_tree := <createNodeFromToken(...)>;
Adaptor.AddChild(Root[0], <label>_tree);
<if(backtracking)>
end;
<endif>
>>

/** ID! and output=AST (same as plain tokenRef) */
tokenRefBang(token,label,elementIndex) ::= "<super.tokenRef(...)>"

/** ID^ and output=AST */
tokenRefRuleRoot(token,label,elementIndex,terminalOptions) ::= <<
<super.tokenRef(...)>
<if(backtracking)>
if (State.Backtracking = 0) then
begin
<endif>
<label>_tree := <createNodeFromToken(...)>;
Root[0] := Adaptor.BecomeRoot(<label>_tree, Root[0]) as I<ASTLabelType>;
<if(backtracking)>

```



```

end;
<endif>
>>

/** ids+=ID! and output=AST */
tokenRefBangAndListLabel(token,label,elementIndex,terminalOptions) ::= <<
<tokenRefBang(...)>
<listLabel(elem=label,...)>
>>

/** label+=TOKEN when output=AST but not rewrite alt */
tokenRefAndListLabel(token,label,elementIndex,terminalOptions) ::= <<
<tokenRef(...)>
<listLabel(elem=label,...)>
>>

/** Match label+=TOKEN^ when output=AST but not rewrite alt */
tokenRefRuleRootAndListLabel(token,label,terminalOptions,elementIndex) ::= <<
<tokenRefRuleRoot(...)>
<listLabel(elem=label,...)>
>>

// SET AST

// the match set stuff is interesting in that it uses an argument list
// to pass code to the default matchSet; another possible way to alter
// inherited code. I don't use the region stuff because I need to pass
// different chunks depending on the operator. I don't like making
// the template name have the operator as the number of templates gets
// large but this is the most flexible--this is as opposed to having
// the code generator call matchSet then add root code or ruleroot code
// plus list label plus ... The combinations might require complicated
// rather than just added on code. Investigate that refactoring when
// I have more time.

matchSet(s,label,terminalOptions,elementIndex,postmatchCode) ::= <<
<super.matchSet(..., postmatchCode={<if(backtracking)>if (State.Backtracking = 0) then
<endif>Adaptor.AddChild(Root[0], <createNodeFromToken(...)>);}>
>>

matchRuleBlockSet(s,label,terminalOptions,elementIndex,postmatchCode,treeLevel="0") ::= <<
<matchSet(...)>
>>

matchSetBang(s,label,elementIndex,postmatchCode) ::= "<super.matchSet(...)>"

// note there is no matchSetTrack because -> rewrites force sets to be
// plain old blocks of alts: (A|B|...|C)

```

```

matchSetRuleRoot(s,label,terminalOptions,elementIndex,debug) ::= <<
<if(label)>
<label> := Input.LT(1) as I<labelType>;<\n>
<endif>
<super.matchSet(..., postmatchCode={<if(backtracking)>if (State.Backtracking = 0) then <endif>Root[0] :=
Adaptor.BecomeRoot(<createNodeFromToken(...)>, Root[0]) as I<ASTLabelType>;}>
>>

// RULE REF AST

/** rule when output=AST */
ruleRef(rule,label,elementIndex,args,scope) ::= <<
<super.ruleRef(...)>
<if(backtracking)>if (State.Backtracking = 0) then <endif>Adaptor.AddChild(Root[0], <label>.Tree);
>>

/** rule! is same as normal rule ref */
ruleRefBang(rule,label,elementIndex,args,scope) ::= "<super.ruleRef(...)>"

/** rule^ */
ruleRefRuleRoot(rule,label,elementIndex,args,scope) ::= <<
<super.ruleRef(...)>
<if(backtracking)>if (State.Backtracking = 0) then <endif>Root[0] := Adaptor.BecomeRoot(<label>.Tree, Root[0])
as I<ASTLabelType>;
>>

/** x+=rule when output=AST */
ruleRefAndListLabel(rule,label,elementIndex,args,scope) ::= <<
<ruleRef(...)>
<listLabel(elem=label+".Tree",...)>
>>

/** x+=rule! when output=AST is a rule ref with list addition */
ruleRefBangAndListLabel(rule,label,elementIndex,args,scope) ::= <<
<ruleRefBang(...)>
<listLabel(elem=label+".Tree",...)>
>>

/** x+=rule^ */
ruleRefRuleRootAndListLabel(rule,label,elementIndex,args,scope) ::= <<
<ruleRefRuleRoot(...)>
<listLabel(elem=label+".Tree",...)>
>>

// WILDCARD AST

wildcard(label,elementIndex) ::= <<

```

```

<super.wildcard(...)>
<if(backtracking)>
if (State.Backtracking = 0) then
begin
<endif>
<label>_tree := Adaptor.CreateNode(<label>) as I<ASTLabelType>;
Adaptor.AddChild(Root[0], <label>_tree);
<if(backtracking)>
end;
<endif>
>>

```

```
wildcardBang(label,elementIndex) ::= "<super.wildcard(...)>"
```

```

wildcardRuleRoot(label,elementIndex) ::= <<
<super.wildcard(...)>
<if(backtracking)>
if (State.Backtracking = 0) then
begin
<endif>
<label>_tree := Adaptor.CreateNode(<label>) as I<ASTLabelType>;
Root[0] := Adaptor.BecomeRoot(<label>_tree, Root[0]) as I<ASTLabelType>;
<if(backtracking)>
end;
<endif>
>>

```

```

createNodeFromToken(label,terminalOptions) ::= <<
<if(terminalOptions.node)>
T<terminalOptions.node>.Create(<label>) <! new MethodNode(IDLabel) !>
<else>
Adaptor.CreateNode(<label>) as I<ASTLabelType>
<endif>
>>

```

```

ruleCleanUp() ::= <<
<super.ruleCleanUp()>
<if(backtracking)>
if (State.Backtracking = 0) then
begin<\n>
<endif>
RetVal.Tree := Adaptor.RulePostProcessing(Root[0]) as I<ASTLabelType>;
<if(!TREE_PARSER)>
Adaptor.SetTokenBoundaries(RetVal.Tree, RetVal.Start as IToken, RetVal.Stop as IToken);
<endif>
<if(backtracking)>
<\n>end;
<endif>

```

>>

Found in path(s):

* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/codegen/templates/Delphi/ASTParser.stg

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/*

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*/

/** Template overrides to add debugging to normal C output;

* If ASTs are built, then you'll also get ASTDbg.stg loaded.

*/

```
@genericParser.members() ::= <<
```

```
<if(grammar.grammarIsRoot)>
```

```
const char *
```

```
ruleNames[] =
```

```
{
```

```
"invalidRule", <grammar.allImportedRules: {rST | "<rST.name>"}; wrap="\n ", separator=", ">
```

```
};<\n>
```

```
<endif>
```

```

<if(grammar.grammarIsRoot)> <! grammar imports other grammar(s) !>
static ANTLR3_UINT32 ruleLevel = 0;
static ANTLR3_UINT32 getRuleLevel()
{
    return ruleLevel;
}
static void incRuleLevel()
{
    ruleLevel++;
}
static void decRuleLevel()
{
    ruleLevel--;
}
<else> <! imported grammar !>
static ANTLR3_UINT32
getRuleLevel()
{
    return <grammar.delegators:{g| <g:delegateName(>}>->getRuleLevel();
}
static void incRuleLevel()
{
    <grammar.delegators:{g| <g:delegateName(>}>->incRuleLevel();
}
static void
decRuleLevel()
{
    <grammar.delegators:{g| <g:delegateName(>}>}.decRuleLevel();
}
<endif>
<if(profile)>
// Profiling not yet implemented for C target
//
<endif>
<if(grammar.grammarIsRoot)>
<ctorForPredefinedListener(>
<else>
<ctorForDelegateGrammar(>
<endif>

static ANTLR3_BOOLEAN
evalPredicate(p<name> ctx, ANTLR3_BOOLEAN result, const char * predicate)
{
    DBG->semanticPredicate(DBG, result, predicate);
    return result;
}<\n>
>>

```

```

@genericParser.debugStuff() ::= <<
<if(grammar.grammarIsRoot)>
<createListenerAndHandshake(>
<endif>
>>

ctorForProfilingRootGrammar() ::= <<
>>

/** Basically we don't want to set any dbg listeners as root will have it. */
ctorForDelegateGrammar() ::= <<
>>

ctorForPredefinedListener() ::= <<
>>

createListenerAndHandshake() ::= <<
{
// DEBUG MODE code
//
pANTLR3_DEBUG_EVENT_LISTENER proxy;
proxy = antlr3DebugListenerNew();
proxy->grammarFileName = INPUT->tokenSource->strFactory->newStr8(INPUT->tokenSource->strFactory,
(pANTLR3_UINT8)ctx->getGrammarFileName());

<if(TREE_PARSER)>
proxy->adaptor = ADAPTOR;
<endif>
PARSER->setDebugListener(PARSER, proxy);

// Try to connect to the debugger (waits forever for a connection)
//
proxy->handshake(proxy);

// End DEBUG MODE code
//
}
>>

@rule.preamble() ::= <<
if ( getRuleLevel()==0 )
{
DBG->commence(DBG);
}
DBG->enterRule(DBG, getGrammarFileName(), (const char *)"<ruleName>");

```

```

incRuleLevel();
DBG->location(DBG, <ruleDescriptor.tree.line>, <ruleDescriptor.tree.column>);<\n>
>>

@rule.postamble() ::= <<
DBG->location(DBG, <ruleDescriptor.EORNode.line>, <ruleDescriptor.EORNode.column>);<\n>
DBG->exitRule(DBG, getGrammarFileName(), (const char *)"<ruleName>");
decRuleLevel();
if ( getRuleLevel()==0 )
{
  DBG->terminate(DBG);
}
<\n>
>>

@checkRuleBacktrackFailure.debugClean() ::= <<
DBG->exitRule(DBG, getGrammarFileName(), (const char *)"<ruleName>");
decRuleLevel();
>>

@synpred.start() ::= "DBG->beginBacktrack(DBG, BACKTRACKING);"

@synpred.stop() ::= "DBG->endBacktrack(DBG, BACKTRACKING, success);"

// Common debug event triggers used by region overrides below

enterSubRule() ::=
  "DBG->enterSubRule(DBG, <decisionNumber>);<\n>"

exitSubRule() ::=
  "DBG->exitSubRule(DBG, <decisionNumber>);<\n>"

enterDecision() ::=
  "DBG->enterDecision(DBG, <decisionNumber>);<\n>"

exitDecision() ::=
  "DBG->exitDecision(DBG, <decisionNumber>);<\n>"

enterAlt(n) ::= "DBG->enterAlt(DBG, <n>);<\n>"

// Region overrides that tell various constructs to add debugging triggers

@block.predecision() ::= "<enterSubRule()><enterDecision()>"

@block.postdecision() ::= "<exitDecision()>"

@block.postbranch() ::= "<exitSubRule()>"

```

```

@ruleBlock.predecision() ::= "<enterDecision(>"

@ruleBlock.postdecision() ::= "<exitDecision(>"

@ruleBlockSingleAlt.prealt() ::= "<enterAlt(n=\"1\")>"

@blockSingleAlt.prealt() ::= "<enterAlt(n=\"1\")>"

@positiveClosureBlock.preloop() ::= "<enterSubRule(>"

@positiveClosureBlock.postloop() ::= "<exitSubRule(>"

@positiveClosureBlock.predecision() ::= "<enterDecision(>"

@positiveClosureBlock.postdecision() ::= "<exitDecision(>"

@positiveClosureBlock.earlyExitException() ::=
    "DBG->recognitionException(DBG, EXCEPTION);<n>"

@closureBlock.preloop() ::= "<enterSubRule(>"

@closureBlock.postloop() ::= "<exitSubRule(>"

@closureBlock.predecision() ::= "<enterDecision(>"

@closureBlock.postdecision() ::= "<exitDecision(>"

@altSwitchCase.prealt() ::= "<enterAlt(altNum)>"

@element.prematch() ::=
    "DBG->location(DBG, <e.line>, <e.pos>);" // e is arg of element

@matchSet.mismatchedSetException() ::=
    "DBG->recognitionException(DBG, EXCEPTION);"

@newNVEException.noViableAltException() ::= "DBG->recognitionException(DBG, EXCEPTION);"

dfaDecision(decisionNumber,description) ::= <<
alt<decisionNumber> = cdfa<decisionNumber>.predict(ctx, RECOGNIZER, ISTREAM,
&cdfa<decisionNumber>);
if (HASEXCEPTION())
{
    DBG->recognitionException(DBG, EXCEPTION);
    goto rule<ruleDescriptor.name>Ex;
}
<checkRuleBacktrackFailure(>
>>

```



```

@cyclicDFA.errorMethod() ::= <<
//static void
//dfaError(p<name> ctx)
//{
//  DBG->recognitionException(DBG, EXCEPTION);
//}
>>

/** Force predicate validation to trigger an event */
evalPredicate(pred,description) ::= <<
evalPredicate(ctx, <pred>, (const char *)"<description>")
>>

```

Found in path(s):

* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/codegen/templates/C/Dbg.stg

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*/

```

```

/** Templates for building ASTs during tree parsing.

```

```

*
```

```

* Deal with many combinations. Dimensions are:

```

```

* Auto build or rewrite
* no label, label, list label (label/no-label handled together)
* child, root
* token, set, rule, wildcard
*
* Each combination has its own template except that label/no label
* is combined into tokenRef, ruleRef, ...
*/

/* addition memVars for returnscopes */
@returnScopeInterface.memVars() ::= <<
/* ASTTreeParser returnScopeInterface.memVars */
<recognizer.ASTLabelType; null="CommonTree"> *tree;
>>

/** the interface of returnScope methodsDecl */
@returnScopeInterface.methodsDecl() ::= <<
/* ASTTreeParser returnScopeInterface.methodsDecl */
- (<recognizer.ASTLabelType; null="CommonTree"> *)getTree;
- (void) setTree:(<recognizer.ASTLabelType; null="CommonTree"> *)aTree;<\n>
>>

/** the implementation of returnScope methods */
@returnScope.methods() ::= <<
/* ASTTreeParser returnScope.methods */
- (<ASTLabelType> *)getTree
{
    return tree;
}

- (void) setTree:(<ASTLabelType> *)aTree
{
    if (tree != aTree) {
        if (tree != nil) [tree release];
        if (aTree != nil) [aTree retain];
        tree = aTree;
    }
}

- (void) dealloc
{
    [self setTree:nil];
    [super dealloc];
}

@synthesize tree;
>>

```



```

<actionsAfterRoot:element()>
<if(nullableChildList)>
if ( [input LA:1] == TokenTypeDOWN ) {
  [self match:input TokenType:TokenTypeDOWN Follow:nil]; <checkRuleBacktrackFailure()>
  <children:element()>
  [self match:input TokenType:TokenTypeUP Follow:nil]; <checkRuleBacktrackFailure()>
}
<else>
[self match:input TokenType:TokenTypeDOWN Follow:nil]; <checkRuleBacktrackFailure()>
<children:element()>
[self match:input TokenType:TokenTypeUP Follow:nil]; <checkRuleBacktrackFailure()>
<endif>
<if(!rewriteMode)>
[treeAdaptor addChild:root_<treeLevel> toTree:root_<enclosingTreeLevel>];
<endif>
_last = _save_last_<treeLevel>;
}<\n>
>>

// TOKEN AST STUFF

/** ID! and output=AST (same as plain tokenRef) 'cept add
 * setting of _last
 */
tokenRefBang(token,label,elementIndex,terminalOptions) ::= <<
/* ASTTreeParser tokenRefBang */
_last = (<ASTLabelType> *)[input LT:1];
<super.tokenRef(...)>
>>

/** ID auto construct */
tokenRef(token,label,elementIndex,terminalOptions) ::= <<
/* ASTTreeParser tokenRef */
_last = (<ASTLabelType> *)[input LT:1];
<super.tokenRef(...)>
<if(!rewriteMode)>
<if(backtracking)>if ( <actions.(actionScope).synpredgate> ) {<endif>
<if(terminalOptions.node)>
  <label>_tree = [<terminalOptions.node> new<terminalOptions.node>:<label>];
<else>
  <label>_tree = (<ASTLabelType> *)[treeAdaptor dupNode:<label>];
<endif><\n>
  [treeAdaptor addChild:<label>_tree toTree:root_<treeLevel>];
<if(backtracking)>}<endif>
<else> <! rewrite mode !>
<if(backtracking)>if ( <actions.(actionScope).synpredgate> )<endif>
if ( _first_<treeLevel>==nil ) _first_<treeLevel> = <label>;
<endif>

```

>>

```
/** label+=TOKEN auto construct */
tokenRefAndListLabel(token,label,elementIndex,terminalOptions) ::= <<
/* ASTTreeParser tokenRefAndListLabel */
<tokenRef(...)>
<listLabel(elem=label,...)>
>>
```

```
/** ^(ID ...) auto construct */
tokenRefRuleRoot(token,label,elementIndex) ::= <<
/* ASTTreeParser tokenRefRuleRoot */
_last = (<ASTLabelType> *)[input LT:1];
<super.tokenRef(...)>
<if(!rewriteMode)>
<if(backtracking)>if ( <actions.(actionScope).synpredgate> ) {<endif>
<if(terminalOptions.node)>
<label>_tree = [<terminalOptions.node> new<terminalOptions.node>:<label>];
<else>
<label>_tree = (<ASTLabelType> *)[treeAdaptor dupNode:<label>];
<endif><\n>
root_<treeLevel> = (<ASTLabelType> *)[treeAdaptor becomeRoot:<label>_tree old:root_<treeLevel>];
<if(backtracking)>}<endif>
<endif>
>>
```

```
/** Match ^(label+=TOKEN ...) auto construct */
tokenRefRuleRootAndListLabel(token,label,elementIndex,terminalOptions) ::= <<
/* ASTTreeParser tokenRefRuleRootAndListLabel */
<tokenRefRuleRoot(...)>
<listLabel(elem=label,...)>
>>
```

```
/** Match . wildcard and auto dup the node/subtree */
wildcard(token,label,elementIndex,terminalOptions) ::= <<
/* ASTTreeParser wildcard */
_last = (<ASTLabelType> *)[input LT:1];
<super.wildcard(...)>
<if(!rewriteMode)>
<if(backtracking)>if ( <actions.(actionScope).synpredgate> ) {<endif>
<label>_tree = (<ASTLabelType> *)[adaptor dupTree:<label>];
[adaptor addChild:<label>_tree toTree:root_<treeLevel>];
<if(backtracking)>}<endif>
<else> <! rewrite mode !>
<if(backtracking)>if ( <actions.(actionScope).synpredgate> )<endif>
if ( _first_<treeLevel> == nil ) _first_<treeLevel> = <label>;
<endif>
>>
```

```

// SET AST

matchSet(s,label,terminalOptions,elementIndex,postmatchCode) ::= <<
/* ASTTreeParser matchSet */
_last = (<ASTLabelType> *)[input LT:1];
<super.matchSet(postmatchCode={
<if(!rewriteMode)>
<if(backtracking)>if ( <actions.(actionScope).synpredgate> ) {<endif>
<if(terminalOptions.node)>
<label>_tree = [<terminalOptions.node> new<terminalOptions.node>:<label>];
<else>
<label>_tree = (<ASTLabelType> *)[adaptor dupNode:<label>];
<endif><\n>
[adaptor addChild:<label>_tree toTree:root_<treeLevel>];
<if(backtracking)>\}<endif>
<endif>
}, ...
)>
>>

matchRuleBlockSet(s,label,terminalOptions,elementIndex,postmatchCode,treeLevel="0") ::= <<
/* ASTTreeParser matchRuleBlockSet */
<matchSet(...)>
<noRewrite(...)> <! set return tree !>
>>

matchSetBang(s,label,terminalOptions,elementIndex,postmatchCode) ::= <<
/* ASTTreeParser matchSetBang */
_last = (<ASTLabelType> *)[input LT:1];
<super.matchSet(...)>
>>

matchSetRuleRoot(s,label,terminalOptions,elementIndex,debug) ::= <<
/* ASTTreeParser matchSetRuleRoot */
<super.matchSet(postmatchCode={
<if(!rewriteMode)>
<if(backtracking)>if ( <actions.(actionScope).synpredgate> ) {<endif>
<if(terminalOptions.node)>
<label>_tree = [<terminalOptions.node> new<terminalOptions.node>:<label>];
<else>
<label>_tree = (<ASTLabelType> *)[adaptor dupNode:<label>];
<endif><\n>
root_<treeLevel> = (<ASTLabelType> *)[adaptor becomeRoot:<label>_tree old:root_<treeLevel>];
<if(backtracking)>\}<endif>
<endif>
}, ...
)>

```

>>

// RULE REF AST

/** rule auto construct */

ruleRef(rule,label,elementIndex,args,scope) ::= <<

/* ASTTreeParser ruleRef */

_last = (<ASTLabelType> *)[input LT:1];

<super.ruleRef(...)>

<if(backtracking)>if (<actions.(actionScope).synpredgate>) <endif>

<if(!rewriteMode)>

[treeAdaptor addChild:<label>.tree toTree:root_<treeLevel>];

<else> <! rewrite mode !>

if (_first_<treeLevel> == nil) _first_<treeLevel> = <label>.tree;

<endif>

>>

/** x+=rule auto construct */

ruleRefAndListLabel(rule,label,elementIndex,args,scope) ::= <<

/* ASTTreeParser ruleRefAndListLabel */

<ruleRef(...)>

<! <listLabel(elem = "["+label+" getTree]",...)> !>

<listLabel(elem = {[<label> getTree]},...)>

>>

/** ^(rule ...) auto construct */

ruleRefRuleRoot(rule,label,elementIndex,args,scope) ::= <<

/* ASTTreeParser ruleRefRuleRoot */

_last = (<ASTLabelType> *)[input LT:1];

<super.ruleRef(...)>

<if(!rewriteMode)>

<if(backtracking)>if (state.backtracking == 0) <endif>

root_<treeLevel> = (<ASTLabelType> *)[treeAdaptor becomeRoot:<label>.tree old:root_<treeLevel>];

<endif>

>>

/** ^(x+=rule ...) auto construct */

ruleRefRuleRootAndListLabel(rule,label,elementIndex,args,scope) ::= <<

/* ASTTreeParser ruleRefRuleRootAndListLabel */

<ruleRefRuleRoot(...)>

<listLabel(elem = {[<label> getTree]},...)>

>>

/** rule when output=AST and tracking for rewrite */

ruleRefTrack(rule,label,elementIndex,args,scope) ::= <<

/* ASTTreeParser ruleRefTrack */

_last = (<ASTLabelType> *)[input LT:1];

<super.ruleRefTrack(...)>

>>

```
/** x+=rule when output=AST and tracking for rewrite */
ruleRefTrackAndListLabel(rule,label,elementIndex,args,scope) ::= <<
/* ASTTreeParser ruleRefTrackAndListLabel */
_last = (<ASTLabelType> *)[input LT:1];
<super.ruleRefTrackAndListLabel(...)>
>>
```

```
/** ^(rule ...) rewrite */
ruleRefRuleRootTrack(rule,label,elementIndex,args,scope) ::= <<
/* ASTTreeParser ruleRefRuleRootTrack */
_last = (<ASTLabelType> *)[input LT:1];
<super.ruleRefRuleRootTrack(...)>
>>
```

```
/** ^(x+=rule ...) rewrite */
ruleRefRuleRootTrackAndListLabel(rule,label,elementIndex,args,scope) ::= <<
/* ASTTreeParser ruleRefRuleRootTrackAndListLabel */
_last = (<ASTLabelType> *)[input LT:1];
<super.ruleRefRuleRootTrackAndListLabel(...)>
>>
```

```
/** Streams for token refs are tree nodes now; override to
 * change nextToken to nextNode.
 */
createRewriteNodeFromElement(token,terminalOptions,scope) ::= <<
/* ASTTreeParser createRewriteNodeFromElement */
<if(terminalOptions.node)>
<! new <terminalOptions.node>(stream_<token>.nextNode()) !>
[[[<terminalOptions.node>(stream_<token> alloc] init] nextNode];
<else>
<! stream_<token>.nextNode() !>
[stream_<token> nextNode]
<endif>
>>
```

```
ruleCleanUp() ::= <<
/* ASTTreeParser ruleCleanUp */
<super.ruleCleanUp()>
<if(!rewriteMode)>
<if(backtracking)>if ( <actions.(actionScope).synpredgate> ) {<\n><endif>
retval.tree = (<ASTLabelType> *)[treeAdaptor rulePostProcessing:root_0];
<if(backtracking)>}<endif>
<endif>
>>
```

Found in path(s):


```
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-  
jar/org/antlr/codegen/templates/ObjC/ASTTreeParser.stg
```

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```

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```

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```

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```

```
*/
```

```
/** Template overrides to add debugging to AST stuff. Dynamic inheritance
```

```
* hierarchy is set up as ASTDbg : AST : Dbg : Java by code generator.
```

```
*/
```

```
parserMembers() ::= <<
```

```
protected DebugTreeAdaptor adaptor;
```

```
public ITreeAdaptor TreeAdaptor
```

```
{
```

```
get
```

```
{
```

```
return adaptor;
```

```
}
```

```
set
```

```

{
<if(grammar.grammarIsRoot)>
  this.adaptor = new DebugTreeAdaptor(dbg,adaptor);
<else>
  this.adaptor = (DebugTreeAdaptor)adaptor; // delegator sends dbg adaptor
<endif><\n>
  <grammar.directDelegates:{g|<g.delegateName()>.TreeAdaptor = this.adaptor;}>
  }
}<\n>
>>

```

```

parserCtorBody() ::= <<
<super.parserCtorBody()>
>>

```

```

createListenerAndHandshake() ::= <<
DebugEventSocketProxy proxy = new DebugEventSocketProxy( this, port,
<if(TREE_PARSER)>input.TreeAdaptor<else>adaptor<endif> );
DebugListener = proxy;
<inputStreamType> = new Debug<inputStreamType>( input, proxy );
try
{
  proxy.Handshake();
}
catch ( IOException ioe )
{
  ReportError( ioe );
}
>>

```

```

@ctorForRootGrammar.finally() ::= <<
ITreeAdaptor adap = new CommonTreeAdaptor();
TreeAdaptor = adap;
proxy.TreeAdaptor = adap;
>>

```

```

@ctorForProfilingRootGrammar.finally() ::= <<
ITreeAdaptor adap = new CommonTreeAdaptor();
TreeAdaptor = adap;
>>

```

```

@ctorForPredefinedListener.superClassRef() ::= ": base( input, dbg )"

```

```

@ctorForPredefinedListener.finally() ::= <<
<if(grammar.grammarIsRoot)><! don't create new adaptor for delegates !>
ITreeAdaptor adap = new CommonTreeAdaptor();
TreeAdaptor = adap;<\n>
<endif>

```

>>

```
//@rewriteElement.pregen() ::= "dbg.Location( <e.line>, <e.pos> );"
```

Found in path(s):

```
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/codegen/templates/CSharp2/ASTDbg.stg
```

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```

```
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```

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```
*
```

```
* Conversion to C#:
```

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```
*/
```

Found in path(s):

```
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/codegen/CSharp3Target.java
```

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*/

/*

* This code generating template and the associated Cpp runtime was produced by:

* Gokulakannan Somasundaram (heavy lifting from C Run-time by Jim Idle)

*/

```
cTypeInitMap ::= [  
  "int"   : "0",      // Integers  start out being 0  
  "long"  : "0",      // Longs    start out being 0  
  "float" : "0.0",    // Floats  start out being 0  
  "double": "0.0",    // Doubles start out being 0  
  "bool"  : "false", // Booleans start out being Antlr C for false  
  "byte"  : "0",      // Bytes   start out being 0  
  "short" : "0",      // Shorts  start out being 0  
  "char"  : "0"       // Chars   start out being 0  
]
```

```
leadIn(type) ::=
```

```
<<
```

```
/** \file
```

```
* This <type> file was generated by $ANTLR version <ANTLRVersion>
```

```
*
```

```
* - From the grammar source file : <fileName>
```

```
* - On : <generatedTimestamp>
```

```

<if(LEXER)>
*   -           for the lexer : <name>Lexer
<endif>
<if(PARSER)>
*   -           for the parser : <name>Parser
<endif>
<if(TREE_PARSER)>
*   -           for the tree parser : <name>TreeParser
<endif>
*
* Editing it, at least manually, is not wise.
*
* C++ language generator and runtime by Gokulakannan Somasundaram ( heavy lifting from C Run-time by Jim
Idle )
*
*
>>

/** The overall file structure of a recognizer; stores methods for rules
* and cyclic DFAs plus support code.
*/
outputFile( LEXER,
            PARSER,
            TREE_PARSER,
            actionScope,
            actions,
            docComment,
            recognizer,
            name,
            tokens,
            tokenNames,
            rules,
            cyclicDFAs,
            bitsets,
            buildTemplate,
            buildAST,
            rewriteMode,
            profile,
            backtracking,
            synpreds,
            memoize,
            numRules,
            fileName,
            ANTLRVersion,
            generatedTimestamp,
            trace,
            scopes,
            superClass,

```

```

        literals
    ) ::=
<<
<leadIn("C++ source")>
*/
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<if(actions.(actionScope).header)>

/* =====
* This is what the grammar programmer asked us to put at the top of every file.
*/
<actions.(actionScope).header>
/* End of Header action.
* =====
*/
<endif>

/* -----
* Include the ANTLR3 generated header file.
*/
#include "<name>.hpp"
<if(trace)>

```

```

#include <iostream>
<endif>
<if(recognizer.grammar.delegators)>
// Include delegator definition header files
//
<recognizer.grammar.delegators: {g#include "<g.recognizerName>.hpp" }; separator="\n">
<endif>

<actions.(actionScope).postinclude>
/* ----- */

<docComment>

<if(literals)>

<beginNamespace(actions)>

/** String literals used by <name> that we must do things like MATCHS() with.
 * C will normally just lay down 8 bit characters, and you can use L"xxx" to
 * get wchar_t, but wchar_t is 16 bits on Windows, which is not UTF32 and so
 * we perform this little trick of defining the literals as arrays of UINT32
 * and passing in the address of these.
 */
<literals:{it | static ANTLR_UCHAR lit_<i>[] = <it>;}; separator="\n">

<endNamespace(actions)>

<endif>

/* ===== */

/* =====
 * Start of recognizer
 */

<recognizer>

/* End of code
 * =====
 */

>>
headerFileExtension() ::= ".hpp"

beginNamespace(actions) ::= <%
<if(actions.(actionScope).namespace)>
namespace <actions.(actionScope).namespace> {
<endif>

```

```
%>
```

```
endNamespace(actions) ::= <%  
<if(actions.actionScope.namespace)>  
}  
<endif>  
%>
```

```
headerFile( LEXER,  
           PARSEr,  
           TREE_PARSER,  
           actionScope,  
           actions,  
           docComment,  
           recognizer,  
           name,  
           tokens,  
           tokenNames,  
           rules,  
           cyclicDFAs,  
           bitsets,  
           buildTemplate,  
           buildAST,  
           rewriteMode,  
           profile,  
           backtracking,  
           synpreds,  
           memoize,  
           numRules,  
           fileName,  
           ANTLRVersion,  
           generatedTimestamp,  
           trace,  
           scopes,  
           superClass,  
           literals  
           ) ::=  
<<  
<leadIn("C++ header")>  
<if(PARSEr)>  
* The parser <mainName()> has the callable functions (rules) shown below,  
<endif>  
<if(LEXER)>  
* The lexer <mainName()> has the callable functions (rules) shown below,  
<endif>  
<if(TREE_PARSER)>  
* The tree parser <mainName()> has the callable functions (rules) shown below,
```



```

<endif>
* which will invoke the code for the associated rule in the source grammar
* assuming that the input stream is pointing to a token/text stream that could begin
* this rule.
*
* For instance if you call the first (topmost) rule in a parser grammar, you will
* get the results of a full parse, but calling a rule half way through the grammar will
* allow you to pass part of a full token stream to the parser, such as for syntax checking
* in editors and so on.
*
*/
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#ifndef _<name>_H
#define _<name>_H
<actions.(actionScope).preincludes>
/* =====
* Standard antlr3 C++ runtime definitions
*/
#include \<antlr3.hpp>

/* End of standard antlr 3 runtime definitions
* =====

```

```

*/

<actions.(actionScope).includes>

<if(recognizer.grammar.delegates)>
// Include delegate definition header files
//
<recognizer.grammar.delegates: {g|#include "<g.recognizerName>.hpp"}; separator="\n">

<endif>

<actions.(actionScope).header>

#ifdef WIN32
// Disable: Unreferenced parameter, - Rules with parameters that are not used
// constant conditional, - ANTLR realizes that a prediction is always true (synpred usually)
// initialized but unused variable - tree rewrite variables declared but not needed
// Unreferenced local variable - lexer rule declares but does not always use _type
// potentially uninitialized variable used - retval always returned from a rule
// unreferenced local function has been removed - susually getTokenNames or freeScope, they can go without
warnigns
//
// These are only really displayed at warning level /W4 but that is the code ideal I am aiming at
// and the codegen must generate some of these warnings by necessity, apart from 4100, which is
// usually generated when a parser rule is given a parameter that it does not use. Mostly though
// this is a matter of orthogonality hence I disable that one.
//
#pragma warning( disable : 4100 )
#pragma warning( disable : 4101 )
#pragma warning( disable : 4127 )
#pragma warning( disable : 4189 )
#pragma warning( disable : 4505 )
#pragma warning( disable : 4701 )
#endif
<if(backtracking)>

/* =====
* BACKTRACKING IS ENABLED
* =====
*/
<endif>

<beginNamespace(actions)>

<if(recognizer.grammar.delegators)>
// Include delegator definition classes
//

```

```

<recognizer.grammar.delegates: {g|class <g.recognizerName>; separator="\n">
<endif>

<actions.(actionScope).traits>
typedef <name>Traits <name>ImplTraits;

<rules:{r | <if(r.ruleDescriptor.isSynPred)> struct <r.ruleDescriptor.name> {}; <endif>}; separator="\n">

class <name>Tokens
{
public:
/** Symbolic definitions of all the tokens that the <grammarType()> will work with.
*
* Antlr will define EOF, but we can't use that as it is too common in
* in C header files and that would be confusing. There is no way to filter this out at the moment
* so we just undef it here for now. That isn't the value we get back from C recognizers
* anyway. We are looking for ANTLR_TOKEN_EOF.
*/
enum Tokens
{
EOF_TOKEN = <name>ImplTraits::CommonTokenType::TOKEN_EOF
<tokens:{it | , <it.name> = <it.type> }; separator="\n">
};

};

/** Context tracking structure for <mainName()>
*/
class <name> : public <componentBaseType()>, public <name>Tokens
{
public:
typedef <name>ImplTraits ImplTraits;
typedef <name> ComponentType;
typedef ComponentType::StreamType StreamType;
typedef <componentBaseType()> BaseType;
typedef ImplTraits::RecognizerSharedStateType\<StreamType> RecognizerSharedStateType;
typedef StreamType InputType;
<if(recognizer.filterMode)>
static const bool IsFiltered = true;
<else>
static const bool IsFiltered = false;
<endif>

<scopes:{it | <if(it.isDynamicGlobalScope)><globalAttributeScopeDecl(it)><endif> }>
<rules:{r | <if(r.ruleDescriptor.ruleScope)><ruleAttributeScopeDecl(scope=r.ruleDescriptor.ruleScope)><endif> }>

private:
<if(recognizer.grammar.delegates)>

```

```

<recognizer.grammar.delegates:
  {g|<g.recognizerName>* m_<g.delegateName()>;}; separator="\n">
<endif>
<if(recognizer.grammar.delegators)>
  <recognizer.grammar.delegators:
    {g|<g.recognizerName>* m_<g.delegateName()>;}; separator="\n">
  <endif>
<scopes:{it | <if(it.isDynamicGlobalScope)>
  <globalAttributeScopeDef(it)>
<endif>}; separator="\n\n">
<rules: {r |<if(r.ruleDescriptor.ruleScope)>
  <ruleAttributeScopeDef(scope=r.ruleDescriptor.ruleScope)>
<endif>}>
  <@members>
  <@end>

public:
  <name>(InputType* instream<recognizer.grammar.delegators:{g|, <g.recognizerName>*
<g.delegateName()>}>);
  <name>(InputType* instream, RecognizerSharedStateType* state<recognizer.grammar.delegators:{g|,
<g.recognizerName>* <g.delegateName()>}>);

  void init(InputType* instream <recognizer.grammar.delegators:{g|, <g.recognizerName>* <g.delegateName()>}>
);

  <actions.(actionScope).context>

<if(LEXER)>
<if(recognizer.filterMode)>
  void memoize(ANTLR_MARKER ruleIndex, ANTLR_MARKER ruleParseStart);
  bool alreadyParsedRule(ANTLR_MARKER ruleIndex);
  <filteringNextToken()>
<endif>
  <rules:{r | <if(!r.ruleDescriptor.isSynPred)><headerReturnType(ruleDescriptor=r.ruleDescriptor)>
m<r.ruleDescriptor.name>( <r.ruleDescriptor.parameterScope:parameterScope()>);<endif>}; separator="\n">
  <rules:{r | <if(r.ruleDescriptor.isSynPred)> <headerReturnType(ruleDescriptor=r.ruleDescriptor)> msynpred(
antlr3::ClassForwarder\< <r.ruleDescriptor.name> > <r.ruleDescriptor.parameterScope:parameterScope()>);
  void m<r.ruleDescriptor.name>_fragment (<r.ruleDescriptor.parameterScope:parameterScope()>);<endif>};
separator="\n">
<endif>
<if(!LEXER)>
  <rules:{r | <headerReturnScope(ruleDescriptor=r.ruleDescriptor)>}>
  <rules:{r | <if(!r.ruleDescriptor.isSynPred)> <headerReturnType(ruleDescriptor=r.ruleDescriptor)>
<r.ruleDescriptor.name> (<r.ruleDescriptor.parameterScope:parameterScope()>); <endif>}; separator="\n">
  <rules:{r | <if(r.ruleDescriptor.isSynPred)> <headerReturnType(ruleDescriptor=r.ruleDescriptor)> msynpred(
antlr3::ClassForwarder\< <r.ruleDescriptor.name> > <r.ruleDescriptor.parameterScope:parameterScope()>);
  void m<r.ruleDescriptor.name>_fragment (<r.ruleDescriptor.parameterScope:parameterScope()>);<endif>};
separator="\n">

```

```

<! generate rule/method definitions for imported rules so they
appear to be defined in this recognizer. !>
// Delegated rules
<recognizer.grammar.delegatedRules:{ruleDescriptor|
  <headerReturnType(ruleDescriptor)>
  <ruleDescriptor.name>( <ruleDescriptor.parameterScope:parameterScope()>);}; separator="\n">
<endif>

const char *  getGrammarFileName();
void          reset();
~<name>();

};

// Function prototypes for the constructor functions that external translation units
// such as delegators and delegates may wish to call.
//
<if(!recognizer.grammar.grammarIsRoot)>
extern ANTLR_UINT8*  <recognizer.grammar.composite.rootGrammar.recognizerName>TokenNames[];
<endif>

/* End of token definitions for <name>
* =====
*/

<endNamespace(actions)>

#endif

/* END - Note:Keep extra line feed to satisfy UNIX systems */

>>

grammarType() ::= <%
<if(PARSER)>
parser
<endif>
<if(LEXER)>
lexer
<endif>
<if(TREE_PARSER)>
tree parser
<endif>
%>

componentType() ::= <<
<if(PARSER)>

```

```
<name>ImplTraits::ParserType
<endif>
<if(LEXER)>
<name>ImplTraits::LexerType
<endif>
<if(TREE_PARSER)>
<name>ImplTraits::TreeParserType
<endif>
>>
```

```
componentBaseType() ::= <%
<if(PARSER)>
<name>ImplTraits::BaseParserType
<endif>
<if(LEXER)>
<name>ImplTraits::BaseLexerType
<endif>
<if(TREE_PARSER)>
<name>ImplTraits::BaseTreeParserType
<endif>
%>
```

```
streamType() ::= <<
<if(PARSER)>
<name>ImplTraits::ParserType::StreamType
<endif>
<if(LEXER)>
<name>ImplTraits::LexerType::StreamType
<endif>
<if(TREE_PARSER)>
<name>ImplTraits::TreeParserType::StreamType
<endif>
>>
```

```
mainName() ::= <%
<if(PARSER)>
<name>
<endif>
<if(LEXER)>
<name>
<endif>
<if(TREE_PARSER)>
<name>
<endif>
%>
```

```
headerReturnScope(ruleDescriptor) ::= "<returnScope(scope=ruleDescriptor.returnScope)>"
```

```

headerReturnType(ruleDescriptor) ::= <%
<if(LEXER)>
<if(!ruleDescriptor.isSynPred)>
void
<else>
<returnType()>
<endif>
<else>
<returnType()>
<endif>
%>

// Produce the lexer output
//
lexer( grammar,
name,
tokens,
scopes,
rules,
numRules,
filterMode,
superClass,
labelType="ImplTraits::CommonTokenType*" ) ::= <<

using namespace antlr3;

<beginNamespace(actions)>

<if(filterMode)>

/* Override the normal MEMOIZE and HAVEALREADYPARSED macros as this is a filtering
* lexer. In filter mode, the memoizing and backtracking are gated at BACKTRACKING > 1 rather
* than just BACKTRACKING. In some cases this might generate code akin to:
* if (BACKTRACKING) if (BACKTRACKING > 1) memoize.
*/
void <name>::memoize(ANTLR_MARKER ruleIndex, ANTLR_MARKER ruleParseStart)
{
BaseType* base = this;
if ( this->get_backtracking()>1 )
base->memoize( ruleIndex, ruleParseStart );
}

bool <name>::alreadyParsedRule(ANTLR_MARKER ruleIndex)
{
BaseType* base = this;
if ( this->get_backtracking() > 1 )

```

```

    return base->haveParsedRule(ruleIndex);
return false;
}

<endif>

/* =====
* Lexer matching rules end.
* =====
*/

<scopes:{it |<if(it.isDynamicGlobalScope)><globalAttributeScope(it)><endif>}>

<actions.lexer.members>

<name>::~~<name>()
{
<if(memoize)>
RuleMemoType* rulememo = this->getRuleMemo();
if(rulememo != NULL)
{
delete rulememo;
this->setRuleMemo(NULL);
}
<endif>
<if(grammar.directDelegates)>
// Free the lexers that we delegated to
// functions to. NULL the state so we only free it once.
//
<grammar.directDelegates:
    {g|m_<g:delegateName()->set_lexstate(NULL);
    delete m_<g:delegateName(); }; separator="\n">
<endif>
}

void
<name>::~reset()
{
this->get_rec()->reset();
}

/** \brief Name of the grammar file that generated this code
*/
static const char fileName[] = "<fileName>";

/** \brief Return the name of the grammar file that generated this code.
*/
const char* <name>::getGrammarFileName()

```



```

{
return fileName;
}

/** \brief Create a new lexer called <name>
 *
 * \param[in] instream Pointer to an initialized input stream
 * \return
 * - Success p<name> initialized for the lex start
 * - Fail NULL
 */
<name>::<name>(StreamType* instream<grammar.delegators:{g|, <g.recognizerName>* <g.delegateName()>>>)
:<name>ImplTraits::BaseLexerType(ANTLR_SIZE_HINT, instream, NULL)
{
// See if we can create a new lexer with the standard constructor
//
this->init(instream <grammar.delegators:{g|, <g.delegateName()>>>);
}

/** \brief Create a new lexer called <name>
 *
 * \param[in] instream Pointer to an initialized input stream
 * \param[state] state Previously created shared recognizer stat
 * \return
 * - Success p<name> initialized for the lex start
 * - Fail NULL
 */
<name>::<name>(StreamType* instream, RecognizerSharedStateType* state<grammar.delegators:{g|,
<g.recognizerName>* <g.delegateName()>>>)
:<name>ImplTraits::BaseLexerType(ANTLR_SIZE_HINT, instream, state)
{
this->init(instream <grammar.delegators:{g|, <g.delegateName()>>> >);
}

void <name>::init(StreamType* instream<grammar.delegators:{g|, <g.recognizerName>* <g.delegateName()>> >)
{
/* -----
 * Memory for basic structure is allocated, now to fill in
 * in base ANTLR3 structures. We initialize the function pointers
 * for the standard ANTLR3 lexer function set, but upon return
 * from here, the programmer may set the pointers to provide custom
 * implementations of each function.
 *
 * We don't use the macros defined in <name>.h here so you can get a sense
 * of what goes where.
 */

<if(memoize)>

```

```

<if(grammar.grammarIsRoot)>
  // Create a LIST for recording rule memos.
  //
  this->setRuleMemo( new IntTrie(15) ); /* 16 bit depth is enough for 32768 rules! */
<endif>
<endif>

<if(grammar.directDelegates)>
  // Initialize the lexers that we are going to delegate some
  // functions to.
  //
  <grammar.directDelegates:
    { g|m_<g:delegateName()> = new <g.recognizerName>(instream, this->get_lexstate(),
this<grammar.delegators:{ g|, <g:delegateName()>}>);}; separator="\n">
  <endif>
<if(grammar.delegators)>
  // Install the pointers back to lexers that will delegate us to perform certain functions
  // for them.
  //
  <grammar.delegators:
    { g| m_<g:delegateName()> = <g:delegateName()>;}; separator="\n">
  <endif>
}

<if(cyclicDFAs)>

/* =====
* DFA tables for the lexer
*/
<cyclicDFAs:cyclicDFA()> <! dump tables for all DFA !>
/* =====
* End of DFA tables for the lexer
*/
<endif>

/* =====
* Functions to match the lexer grammar defined tokens from the input stream
*/

<rules; separator="\n\n">

/* =====
* Lexer matching rules end.
* =====
*/
<if(synpreds)>

/* =====

```

```

* Lexer syntactic predicates
*/
<synpreds: {p | <lexerSynpred(predname=p)>}>
/* =====
* Lexer syntactic predicates end.
* =====
*/
<endif>

/* End of Lexer code
* =====
* =====
*/

<endNamespace(actions)>

>>

filteringNextToken() ::= <<
<name>ImplTraits::CommonTokenType*
<name>ImplTraits::TokenSourceType::nextToken()
{
  LexerType* lexer;
  typename LexerType::RecognizerSharedStateType* state;

  lexer = this->get_super();
  state = lexer->get_lexstate();

  /* Get rid of any previous token (token factory takes care of
   * any deallocation when this token is finally used up.
   */
  state->set_token_present( false );
  state->set_error( false ); /* Start out without an exception */
  state->set_failedflag(false);

  /* Record the start of the token in our input stream.
   */
  state->set_tokenStartCharIndex( lexer->index());
  state->set_tokenStartCharPositionInLine( lexer->getCharPositionInLine() );
  state->set_tokenStartLine( lexer->getLine() );
  state->set_text("");

  /* Now call the matching rules and see if we can generate a new token
   */
  for (;;)
  {
    if (lexer->LA(1) == ANTLR_CHARSTREAM_EOF)

```



```

/** How to generate a parser */
genericParser( grammar, name, scopes, tokens, tokenNames, rules, numRules,
              bitsets, inputStreamType, superClass,
              labelType, members, rewriteElementType,
              filterMode, ASTLabelType="ImplTraits::TreeType*") ::= <<

using namespace antlr3;
<if(grammar.grammarIsRoot)>
/** \brief Table of all token names in symbolic order, mainly used for
 *   error reporting.
 */
ANTLR_UINT8* <name>TokenNames[<length(tokenNames)>+4]
= {
  (ANTLR_UINT8*) "\<invalid>", /* String to print to indicate an invalid token */
  (ANTLR_UINT8*) "\<EOR>",
  (ANTLR_UINT8*) "\<DOWN>",
  (ANTLR_UINT8*) "\<UP>",
  <tokenNames:{it |(ANTLR_UINT8*) <it>}; separator=",\n">
};
<endif>

<@members>

<@end>

/** \brief Name of the grammar file that generated this code
 */
static const char fileName[] = "<fileName>";

/** \brief Return the name of the grammar file that generated this code.
 */
const char* <name>::getGrammarFileName()
{
  return fileName;
}
/** \brief Create a new <name> parser and return a context for it.
 *
 * \param[in] instream Pointer to an input stream interface.
 *
 * \return Pointer to new parser context upon success.
 */
<name>::<name>( StreamType* instream<grammar.delegators:{g|, <g.recognizerName>* <g.delegateName()>}>
<constructorInitializerType("NULL")>
{
  // See if we can create a new parser with the standard constructor
  //
  this->init(instream<grammar.delegators:{g|, <g.delegateName()>}>);

```

```

}

/** \brief Create a new <name> parser and return a context for it.
 *
 * \param[in] instream Pointer to an input stream interface.
 *
 * \return Pointer to new parser context upon success.
 */
<name>::<name>( StreamType* instream, RecognizerSharedStateType* state<grammar.delegators:{g|,
<g.recognizerName>* <g.delegateName()>>>)
<constructorInitializerType("state")>
{
  this->init(instream <grammar.delegators:{g|, <g.delegateName()>>});
}

void <name>::init(StreamType* instream<grammar.delegators:{g|, <g.recognizerName>* <g.delegateName()>>})
{
  <actions.parser.apifuncs>
  <if(memoize)>
  <if(grammar.grammarIsRoot)>
    /* Create a LIST for recording rule memos.
     */
    typedef RecognizerSharedStateType::RuleMemoType RuleMemoType;
    this->setRuleMemo( new RuleMemoType(15) ); /* 16 bit depth is enough for 32768 rules! */<\n>
  <endif>
  <endif>
  <if(grammar.directDelegates)>
    // Initialize the lexers that we are going to delegate some
    // functions to.
    //
    <grammar.directDelegates:
      {g|m_<g.delegateName()> = new <g.recognizerName>(instream, this->get_psrstate(),
this<grammar.delegators:{g|, <g.delegateName()>>}); separator="\n">
    <endif>
    <if(grammar.delegators)>
      // Install the pointers back to lexers that will delegate us to perform certain functions
      // for them.
      //
      <grammar.delegators: {g| m_<g.delegateName()> = <g.delegateName()>; separator="\n">
    <endif>
    /* Install the token table
     */
    this->get_psrstate()->set_tokenNames( <grammar.composite.rootGrammar.recognizerName>TokenNames );

  <@debugStuff()>
}

```

```

void
<name>::reset()
{
    this->get_rec()->reset();
}

/** Free the parser resources
*/
<name>::~~<name>()
{
    <@cleanup>
    <@end>
<if(grammar.directDelegates)>
    // Free the parsers that we delegated to
    // functions to.NULL the state so we only free it once.
    //
    <grammar.directDelegates:
        {g| m_<g:delegateName()->set_psrstate( NULL );
        delete m_<g:delegateName()->; separator="\n">
    <endif>
<if(memoize)>
<if(grammar.grammarIsRoot)>
    if(this->getRuleMemo() != NULL)
    {
        delete this->getRuleMemo();
        this->setRuleMemo(NULL);
    }
    <endif>
<endif>
}

/** Return token names used by this <grammarType>
*
* The returned pointer is used as an index into the token names table (using the token
* number as the index).
*
* \return Pointer to first char * in the table.
*/
static ANTLR_UINT8** getTokenNames()
{
    return <grammar.composite.rootGrammar.recognizerName>TokenNames;
}

<members>

/* Declare the bitsets
*/
<bitsets:{it | <bitsetDeclare(bitsetName={FOLLOW_<it.name>_in_<it.inName><it.tokenIndex>},

```

```
words64=it.bits, traits={ <name>ImplTraits } )>>
```

```
<if(cyclicDFAs)>
```

```
/* =====
```

```
* DFA tables for the parser
```

```
*/
```

```
<cyclicDFAs:cyclicDFA() <! dump tables for all DFA !>
```

```
/* =====
```

```
* End of DFA tables for the parser
```

```
*/
```

```
<endif>
```

```
/* =====
```

```
* Parsing rules
```

```
*/
```

```
<rules; separator="\n\n">
```

```
<if(grammar.delegatedRules)>
```

```
// Delegated methods that appear to be a part of this
```

```
// parser
```

```
//
```

```
<grammar.delegatedRules:{ruleDescriptor|
```

```
  <return Type()> <name>::<ruleDescriptor.name>( <ruleDescriptor.parameterScope:parameterScope()>)
```

```
  {
```

```
    <if(ruleDescriptor.hasReturnValue)>return <endif>m_<ruleDescriptor.grammar:delegateName()>-
```

```
><ruleDescriptor.name>( <if(ruleDescriptor.parameterScope)><ruleDescriptor.parameterScope.attributes:{ a|<a.name>  
>}; separator="," ><endif>);
```

```
  \}}; separator="\n">
```

```
<endif>
```

```
/* End of parsing rules
```

```
* =====
```

```
*/
```

```
/* =====
```

```
* Syntactic predicates
```

```
*/
```

```
<synpreds:{ p | <synpred(predname=p)> }>
```

```
/* End of syntactic predicates
```

```
* =====
```

```
*/
```

```
>>
```

```
constructorInitializerType(rec_state) ::= <<
```

```
<if(PARSER)>
```

```
  :ImplTraits::BaseParserType(ANTLR_SIZE_HINT, instream, <rec_state>)
```



```

<endif>
<if(TREE_PARSER)>
  :ImplTraits::BaseTreeParserType(ANTLR_SIZE_HINT, instream, <rec_state>)
<endif>
>>

parser( grammar,
  name,
  scopes,
  tokens,
  tokenNames,
  rules,
  numRules,
  bitsets,
  ASTLabelType,
  superClass="Parser",
  labelType="ImplTraits::CommonTokenType*",
  members={<actions.parser.members>}
) ::= <<
<beginNamespace(actions)>
<genericParser(inputStreamType="CommonTokenStreamType*", rewriteElementType="Token", filterMode=false,
...)>
<endNamespace(actions)>
>>

/** How to generate a tree parser; same as parser except the input
 * stream is a different type.
 */
treeParser( grammar,
  name,
  scopes,
  tokens,
  tokenNames,
  globalAction,
  rules,
  numRules,
  bitsets,
  filterMode,
  labelType={<ASTLabelType>},
  ASTLabelType="ImplTraits::TreeType*",
  superClass="TreeParser",
  members={<actions.treeparser.members>}
) ::= <<
<beginNamespace(actions)>
<genericParser(inputStreamType="CommonTreeNodeStream*", rewriteElementType="Node", ...)>
<endNamespace(actions)>
>>

```

```

/** A simpler version of a rule template that is specific to the imaginary
 * rules created for syntactic predicates. As they never have return values
 * nor parameters etc..., just give simplest possible method. Don't do
 * any of the normal memoization stuff in here either; it's a waste.
 * As predicates cannot be inlined into the invoking rule, they need to
 * be in a rule by themselves.
 */
synpredRule(ruleName, ruleDescriptor, block, description, nakedBlock) ::=
<<
// $ANTLR start <ruleName>
void <name>::m<ruleName>_fragment( <ruleDescriptor.parameterScope:parameterScope(>) )
{
<ruleLabelDefs(>
<ruleLabelInitializations(>
<if(trace)>
    ANTLR_PRINTF("enter <ruleName> %d failed = %d, backtracking = %d\\n", this->LT(1),failed,this-
>get_backtracking() );
    <block>
    ANTLR_PRINTF("exit <ruleName> %d, failed = %d, backtracking = %d\\n", this->LT(1),failed,this-
>get_backtracking());

<else>
    <block>
<endif>

goto rule<ruleDescriptor.name>Ex; /* Prevent compiler warnings */
rule<ruleDescriptor.name>Ex; ;
}
// $ANTLR end <ruleName>
>>

synpred(predname) ::= <<

bool <name>::msynpred( antlr3::ClassForwarder< <predname> > )
{
    ANTLR_MARKER start;
    bool success;

    this->inc_backtracking();
    <@start(>
    start = this->mark();
    this->m<predname>_fragment(); // can never throw exception
    success = !( this->get_failedflag() );
    this->rewind(start);
    <@stop(>
    this->dec_backtracking();
    this->set_failedflag(false);
    return success;
}

```

```

}<\n>
>>

lexerSynpred(predname) ::= <<
<synpred(predname)>
>>

ruleMemoization(rname) ::= <<
<if(memoize)>
if ( (this->get_backtracking()>0) && (this->haveParsedRule(<ruleDescriptor.index>)) )
{
<if(ruleDescriptor.hasMultipleReturnValues)>
<if(!ruleDescriptor.isSynPred)>
retval.start = 0;<\n>
<endif>
<endif>
<(ruleDescriptor.actions.after):execAfter(>
<finalCode(finalBlock=finally)>
<if(!ruleDescriptor.isSynPred)>
<scopeClean()><\n>
<endif>
return <ruleReturnValue(>;
}
<endif>
>>

/** How to test for failure and return from rule */
checkRuleBacktrackFailure() ::= <<
if (this->hasException())
{
goto rule<ruleDescriptor.name>Ex;
}
<if(backtracking)>
if (this->hasFailed())
{
<scopeClean()>
<@debugClean()>
return <ruleReturnValue(>;
}
<endif>
>>

/** This rule has failed, exit indicating failure during backtrack */
ruleBacktrackFailure() ::= <<
<if(backtracking)>
if (this->get_backtracking()>0)
{
this->set_failedflag( true );
}
}

```

```

    <scopeClean()>
    return <ruleReturnValue()>;
}
<endif>
>>

/** How to generate code for a rule. This includes any return type
 * data aggregates required for multiple return values.
 */
rule(ruleName,ruleDescriptor,block,emptyRule,description,exceptions,finally,memoize) ::= <<
/**
 * $ANTLR start <ruleName>
 * <fileName>:<description>
 */
<returnType()>
<name>::<ruleName>(<ruleDescriptor.parameterScope.parameterScope()>)
{
    <if(trace)>ANTLR_PRINTF("enter <ruleName> %s failed=%d, backtracking=%d\n", this->LT(1), this-
>get_backtracking() );<endif>
    <ruleDeclarations()>
    <ruleDescriptor.actions.declarations>
    <ruleLabelDefs()>
    <ruleInitializations()>
    <ruleDescriptor.actions.init>
    <ruleMemoization(rname=ruleName)>
    <ruleLabelInitializations()>

    <if(actions.(actionScope).rulecatch)>
    try {
    <else>
    <if(exceptions)>
        try {
    <endif>
    <endif>
    <@preamble()>
    {
        <block>
    }
    <ruleCleanup()>

    <if(exceptions)>
    <(ruleDescriptor.actions.after):execAfter()>
    <exceptions:{ e|<catch(decl=e.decl,action=e.action)><n}>}>
    <else>
    <if(!emptyRule)>
    if (this->hasException())
    {
        this->preporterror();

```

```

        this->precover();
        <@setErrorReturnValue()>
    }
    <if(ruleDescriptor.actions.after)>
    else
    {
        <(ruleDescriptor.actions.after):execAfter()>
    }<\n>
    <endif>
<if(actions.(actionScope).rulecatch)>
    } <actions.(actionScope).rulecatch>
    <endif>
<endif>
<endif>
<endif>

    <if(trace)>ANTLR_PRINTF("exit <ruleName> %d failed=%s backtracking=%s\n", this->LT(1), failed, this-
>get_backtracking() );<endif>
    <memoize()>
<if(finally)>
    <finalCode(finalBlock=finally)>
<endif>
    <scopeClean()>
    <@postamble()>
    return <ruleReturnValue()>;
}
/* $ANTLR end <ruleName> */
>>

finalCode(finalBlock) ::= <<
{
    <finalBlock>
}

>>

catch(decl,action) ::= <<
/* catch(decl,action)
*/
}catch (<e.decl>) {
    <e.action>
}
>>

ruleDeclarations() ::= <<

<if(ruleDescriptor.hasMultipleReturnValues)>
<returnType()> retval(this);<\n>
<else>

```

```

<if(PARSER)>
  <name>ImplTraits::RuleReturnValueType _antlr_rule_exit(this);
<endif>
<if(ruleDescriptor.returnScope)>
<ruleDescriptor.returnScope.attributes: { a |
<a.type> <a.name>;
}>
<endif>
<endif>
<if(memoize)>
ANTLR_MARKER <ruleDescriptor.name>_StartIndex;
<endif>
>>

ruleInitializations() ::= <<
/* Initialize rule variables
*/
<if(ruleDescriptor.returnScope)>
<if(ruleDescriptor.hasMultipleReturnValues)>
<ruleDescriptor.returnScope.attributes: { a | <if(a.initValue)>retval.<a.name> = <a.initValue>;<endif> }>
<else>
<ruleDescriptor.returnScope.attributes: { a | <if(a.initValue)><a.name> = <a.initValue>;<endif> }>
<endif>
<endif>
<if(memoize)>
<ruleDescriptor.name>_StartIndex = this->index();<\n>
<endif>
<ruleDescriptor.useScopes: { it | m_<it>_stack.push(<it>Scope()); }; separator="\n">
<ruleDescriptor.ruleScope: { it | m_<it.name>_stack.push(<it.name>Scope()); }; separator="\n">
>>

ruleLabelDefs() ::= <<
<[ruleDescriptor.tokenLabels,ruleDescriptor.tokenListLabels,
ruleDescriptor.wildcardTreeLabels,ruleDescriptor.wildcardTreeListLabels]
: { it | <labelType> <it.label.text> = NULL; }; separator="\n"
>
<[ruleDescriptor.tokenListLabels,ruleDescriptor.ruleListLabels,ruleDescriptor.wildcardTreeListLabels]
: { it | ImplTraits::TokenPtrsListType list_<it.label.text>; }; separator="\n"
>
<ruleDescriptor.ruleLabels:ruleLabelDef(); separator="\n">
>>

ruleLabelInitializations() ::= <<
<if(ruleDescriptor.hasMultipleReturnValues)>
<if(!ruleDescriptor.isSynPred)>
retval.call_start_placeholder();
<endif>
<endif>

```

>>

```
lexerRuleLabelDefs() ::= <<
<[ruleDescriptor.tokenLabels,
ruleDescriptor.tokenListLabels,
ruleDescriptor.ruleLabels]
: {it | <labelType> <it.label.text> = NULL;}; separator="\n"
>
<ruleDescriptor.charLabels: {it | ANTLR_UINT32 <it.label.text>;}; separator="\n">
<[ruleDescriptor.tokenListLabels,
ruleDescriptor.ruleListLabels,
ruleDescriptor.ruleListLabels]
: {it | ImplTraits::IntTrieType<CommonTokenType>* list_<it.label.text>;}; separator="\n"
>
>>
```

```
lexerRuleLabelInit() ::= <<
<[ruleDescriptor.tokenListLabels,
ruleDescriptor.ruleListLabels,
ruleDescriptor.ruleListLabels]
: {it | list_<it.label.text> = new ImplTraits::IntTrieType<CommonTokenType>(31);}; separator="\n"
>
>>
```

```
lexerRuleLabelFree() ::= <<
<[ruleDescriptor.tokenLabels,
ruleDescriptor.tokenListLabels,
ruleDescriptor.ruleLabels]
: {it | <it.label.text> = NULL;}; separator="\n"
>
<[ruleDescriptor.tokenListLabels,
ruleDescriptor.ruleListLabels,
ruleDescriptor.ruleListLabels]
: {it | delete list_<it.label.text>;}; separator="\n"
>
>>
```

```
ruleReturnValue() ::= <%
<if(!ruleDescriptor.isSynPred)>
<if(ruleDescriptor.hasReturnValue)>
<if(ruleDescriptor.hasSingleReturnValue)>
<ruleDescriptor.singleValueReturnName>
<else>
retval
<endif>
<endif>
<endif>
%>
```

```

memoize() ::= <<
<if(memoize)>
<if(backtracking)>
if ( this->get_backtracking() > 0 ) { this->memoize(<ruleDescriptor.index>, <ruleDescriptor.name>_StartIndex); }
<endif>
<endif>
>>

```

```

ruleCleanUp() ::= <<

// This is where rules clean up and exit
//
goto rule<ruleDescriptor.name>Ex; /* Prevent compiler warnings */
rule<ruleDescriptor.name>Ex; ;
<if(ruleDescriptor.hasMultipleReturnValues)>
<if(!TREE_PARSER)>
<if(!ruleDescriptor.isSynPred)>
retval.call_stop_placeholder();<\n>
<endif>
<endif>
<endif>
>>

```

```

scopeClean() ::= <<
<ruleDescriptor.useScopes:{it | m_<it>_stack.pop(); }; separator="\n">
<ruleDescriptor.ruleScope:{it | m_<it.name>_stack.pop(); }; separator="\n">

```

```

>>
/** How to generate a rule in the lexer; naked blocks are used for
 * fragment rules, which do not produce tokens.
 */
lexerRule(ruleName,nakedBlock,ruleDescriptor,block,memoize) ::= <<
// Comes from: <block.description>
/** \brief Lexer rule generated by ANTLR3
 *
 * $ANTLR start <ruleName>
 *
 * Looks to match the characters the constitute the token <ruleName>
 * from the attached input stream.
 *
 * \remark
 * - lexer->error == true if an exception was thrown.
 */
void <name>::m<ruleName>(<ruleDescriptor.parameterScope:parameterScope(>))
{
    ANTLR_UINT32 _type;

```



```

<ruleDeclarations()>
<ruleDescriptor.actions.declarations>
<lexerRuleLabelDefs()>
<if(trace)>
std::cout <<< "enter <ruleName> " <<< (char)this->LA(1)
    <<< " line=" <<< this->getLine() <<< ":" <<< this->getCharPositionInLine()
    <<< " failed=" <<< this->get_failedflag() <<< " backtracking=" <<< this->get_backtracking() <<<
std::endl;
<endif>

<if(nakedBlock)>
    <ruleMemoization(rname=ruleName)>
    <lexerRuleLabelInit()>
    <ruleDescriptor.actions.init>

    <block><<\n>
<else>
    <ruleMemoization(rname=ruleName)>
    <lexerRuleLabelInit()>
    _type = <ruleName>;

    <ruleDescriptor.actions.init>

    <block>
this->get_lexstate()->set_type(_type);
<endif>
    <if(trace)>
std::cout <<< "exit <ruleName> " <<< (char)this->LA(1)
    <<< " line=" <<< this->getLine() <<< ":" <<< this->getCharPositionInLine()
    <<< " failed=" <<< this->get_failedflag() <<< " backtracking=" <<< this->get_backtracking() <<<
std::endl;
    <endif>
    <ruleCleanUp()>
    <lexerRuleLabelFree()>
    <(ruleDescriptor.actions.after):execAfter()>
    <memoize>
}
// $ANTLR end <ruleName>
>>

/** How to generate code for the implicitly-defined lexer grammar rule
 * that chooses between lexer rules.
 */
tokensRule(ruleName,nakedBlock,args,block,ruleDescriptor) ::= <<
/** This is the entry point in to the lexer from an object that
 * wants to generate the next token, such as a pCOMMON_TOKEN_STREAM
 */
void

```

```

<name>::mTokens()
{
    <block><\n>

    goto ruleTokensEx; /* Prevent compiler warnings */
ruleTokensEx: ;
}
>>

// S U B R U L E S

/** A (...) subrule with multiple alternatives */
block(alts,decls,decision,enclosingBlockLevel,blockLevel,decisionNumber,maxK,maxAlt,description) ::= <<

// <fileName>:<description>
{
    int alt<decisionNumber>=<maxAlt>;
    <decls>
    <@predecision()>
    <decision>
    <@postdecision()>
    <@prebranch()>
    switch (alt<decisionNumber>)
    {
    <alts:{ a | <altSwitchCase(i,a)> }>
    }
    <@postbranch()>
}
>>

/** A rule block with multiple alternatives */
ruleBlock(alts,decls,decision,enclosingBlockLevel,blockLevel,decisionNumber,maxK,maxAlt,description) ::= <<
{
    // <fileName>:<description>

    ANTLR_UINT32 alt<decisionNumber>;

    alt<decisionNumber>=<maxAlt>;

    <decls>
    <@predecision()>
    <decision>
    <@postdecision()>
    switch (alt<decisionNumber>)
    {
    <alts:{ a | <altSwitchCase(i,a)> }>
    }
}

```

>>

```
ruleBlockSingleAlt(alts,decls,decision,enclosingBlockLevel,blockLevel,decisionNumber,description) ::= <<
// <fileName>:<description>
<decls>
<@prealt()>
<alts>
<@postalt()>
>>
```

*/** A special case of a (...) subrule with a single alternative */*

```
blockSingleAlt(alts,decls,decision,enclosingBlockLevel,blockLevel,decisionNumber,description) ::= <<
// <fileName>:<description>
<decls>
<@prealt()>
<alts>
<@postalt()>
>>
```

*/** A (..)+ block with 1 or more alternatives */*

```
positiveClosureBlock(alts,decls,decision,enclosingBlockLevel,blockLevel,decisionNumber,maxK,maxAlt,description) ::= <<
// <fileName>:<description>
{
  int cnt<decisionNumber>=0;
  <decls>
  <@preloop()>

  for (;)
  {
    int alt<decisionNumber>=<maxAlt>;
    <@predecision()>
    <decision>
    <@postdecision()>
    switch (alt<decisionNumber>)
    {
      <alts:{ a | <altSwitchCase(i,a)> }>
      default:

      if ( cnt<decisionNumber> >= 1 )
      {
        goto loop<decisionNumber>;
      }
      <ruleBacktrackFailure()>
      <earlyExitEx()>
      <@earlyExitException()>
      goto rule<ruleDescriptor.name>Ex;
    }
  }
}
```

```

cnt<decisionNumber>++;
}
loop<decisionNumber>; /* Jump to here if this rule does not match */
<@postloop()>
}
>>

earlyExitEx() ::= <<
/* mismatchedSetEx()
*/
new ANTLR_Exception<< <name>ImplTraits, EARLY_EXIT_EXCEPTION, StreamType>( this->get_rec(), "" );
<\n>
>>
positiveClosureBlockSingleAlt ::= positiveClosureBlock

/** A (..)* block with 1 or more alternatives */
closureBlock(alts,decls,decision,enclosingBlockLevel,blockLevel,decisionNumber,maxK,maxAlt,description) ::=
<<

// <fileName>:<description>
<decls>

<@preloop()>
for (;;)
{
    int alt<decisionNumber>=<maxAlt>;
    <@predecision()>
    <decision>
    <@postdecision()>
    switch (alt<decisionNumber>)
    {
    <alts:{ a | <altSwitchCase(i,a)> }>
    default:
        goto loop<decisionNumber>; /* break out of the loop */
        break;
    }
}
loop<decisionNumber>; /* Jump out to here if this rule does not match */
<@postloop()>
>>

closureBlockSingleAlt ::= closureBlock

/** Optional blocks (x)? are translated to (x|) by antlr before code generation
* so we can just use the normal block template
*/
optionalBlock ::= block

```

```
optionalBlockSingleAlt ::= block
```

```
/** A case in a switch that jumps to an alternative given the alternative  
 * number. A DFA predicts the alternative and then a simple switch  
 * does the jump to the code that actually matches that alternative.  
 */
```

```
altSwitchCase(altNum,alt) ::= <<  
case <altNum>:  
  <@prealt()>  
  <alt>  
  break;<\n>  
>>
```

```
/** An alternative is just a list of elements; at outermost level */  
alt(elements,altNum,description,autoAST,outerAlt,treeLevel,rew) ::= <<  
// <fileName>:<description>  
{  
  <@declarations()>  
  <@initializations()>  
  <elements:element()>  
  <rew>  
  <@cleanup()>  
}  
>>
```

```
// E L E M E N T S  
/** What to emit when there is no rewrite. For auto build  
 * mode, does nothing.  
 */  
noRewrite(rewriteBlockLevel, treeLevel) ::= ""
```

```
/** Dump the elements one per line */  
element(e) ::= <<  
<@prematch()>  
<e.el><\n>  
>>
```

```
/** match a token optionally with a label in front */  
tokenRef(token,label,elementIndex,terminalOptions) ::= <<  
<if(label)><label> = <endif> this->matchToken(<token>, &FOLLOW_<token>_in_<ruleName><elementIndex>);  
<checkRuleBacktrackFailure()>  
>>
```

```
/** ids+=ID */  
tokenRefAndListLabel(token,label,elementIndex,terminalOptions) ::= <<  
<tokenRef(...)>  
<listLabel(elem=label,...)>  
>>
```

```

listLabel(label,elem) ::= <<
list_<label>.push_back(<elem>);
>>

/** match a character */
charRef(char,label) ::= <<
<if(label)>
<label> = this->LA(1);<\n>
<endif>
this->matchc(<char>);
<checkRuleBacktrackFailure()>
>>

/** match a character range */
charRangeRef(a,b,label) ::= <<
<if(label)>
<label> = this->LA(1);<\n>
<endif>
this->matchRange(<a>, <b>);
<checkRuleBacktrackFailure()>
>>

/** For now, sets are interval tests and must be tested inline */
matchSet(s,label,elementIndex,terminalOptions,postmatchCode="") ::= <<
<if(label)>
<if(LEXER)>
<label>= this->LA(1);<\n>
<else>
<label>=(<labelType>) this->LT(1);<\n>
<endif>
<endif>
if ( <s> )
{
    this->consume();
    <postmatchCode>
<if(!LEXER)>
    this->set_perror_recovery(false);
<endif>
    <if(backtracking)> this->set_failedflag(false); <\n><endif>
}
else
{
    <ruleBacktrackFailure()>
    <mismatchedSetEx()>
    <@mismatchedSetException()>
<if(LEXER)>

```

```

    this->recover();
<else>
<! use following code to make it recover inline;
    this->recoverFromMismatchedSet(&FOLLOW_set_in_<ruleName><elementIndex>);
!>
<endif>
    goto rule<ruleDescriptor.name>Ex;
}<\n>
>>

mismatchedSetEx() ::= <<
new ANTLR_Exception\< <name>ImplTraits, MISMATCHED_SET_EXCEPTION, StreamType>( this->get_rec(),
"" );
<if(PARSER)>
this->get_exception()->set_expectingSet(NULL);
<! use following code to make it recover inline;
this->get_exception()->set_expectingSet( &FOLLOW_set_in_<ruleName><elementIndex> );
!>
<endif>
>>

matchRuleBlockSet ::= matchSet

matchSetAndListLabel(s,label,elementIndex,postmatchCode) ::= <<
<matchSet(...)>
<listLabel(elem=label,...)>
>>

/** Match a string literal */
lexerStringRef(string,label,elementIndex) ::= <<
<if(label)>
ANTLR_MARKER <label>Start = this->getCharIndex();
ANTLR_UINT32 <label>StartLine<elementIndex> = this->getLine();
ANTLR_UINT32 <label>StartCharPos<elementIndex> = this->getCharPositionInLine();
this->matchs(<string>);
<checkRuleBacktrackFailure()>
<label> = new CommonTokenType;
<label>->set_type( CommonTokenType::TOKEN_INVALID );
<label>->set_startIndex( <label>Start);
<label>->set_stopIndex( this->getCharIndex()-1);
<label>->set_input( this->get_input() );
<label>->set_line( <label>StartLine<elementIndex> );
<label>->set_charPositionInLine( <label>StartCharPos<elementIndex> );
<else>
this->matchs(<string>);
<checkRuleBacktrackFailure()><\n>
<endif>
>>

```

```

wildcard(token,label,elementIndex,terminalOptions) ::= <<
<if(label)>
<label>=(<labelType>)this->LT(1);<\n>
<endif>
this->matchAnyToken();
<checkRuleBacktrackFailure()>
>>

```

```

wildcardAndListLabel(token,label,elementIndex,terminalOptions) ::= <<
<wildcard(...)>
<listLabel(elem=label,...)>
>>

```

```

/** Match . wildcard in lexer */
wildcardChar(label, elementIndex) ::= <<
<if(label)>
<label> = this->LA(1);<\n>
<endif>
this->matchAny();
<checkRuleBacktrackFailure()>
>>

```

```

wildcardCharListLabel(label, elementIndex) ::= <<
<wildcardChar(...)>
<listLabel(elem=label,...)>
>>

```

```

/** Match a rule reference by invoking it possibly with arguments
 * and a return value or values. The 'rule' argument was the
 * target rule name, but now is type Rule, whose toString is
 * same: the rule name. Now though you can access full rule
 * descriptor stuff.
 */
ruleRef(rule,label,elementIndex,args,scope) ::= <<
this->followPush(FOLLOW_<rule.name>_in_<ruleName><elementIndex>);
<if(label)><label>=<endif><if(scope)>m_<scope:delegateName()-><endif><rule.name><(if(args)><args;
separator=", "><endif>);<\n>
this->followPop();
<checkRuleBacktrackFailure()>
>>

```

```

/** ids+=r */
ruleRefAndListLabel(rule,label,elementIndex,args,scope) ::= <<
<ruleRef(...)>
<listLabel(elem=label,...)>
>>

```



```

/** A lexer rule reference
 * The 'rule' argument was the target rule name, but now
 * is type Rule, whose toString is same: the rule name.
 * Now though you can access full rule descriptor stuff.
 */
lexerRuleRef(rule,label,args,elementIndex,scope) ::= <<
/* <description> */
<if(label)>
{
  ANTLR_MARKER <label>Start<elementIndex> = this->getCharIndex();
  ANTLR_UINT32 <label>StartLine<elementIndex> = this->getLine();
  ANTLR_UINT32 <label>StartCharPos<elementIndex> = this->getCharPositionInLine();
  <if(scope)>m_<scope:delegateName()-><endif>m<rule.name>(<if(scope)>m_<scope:delegateName()-><endif>
<if(args)>, <endif><args; separator="," ">);
  <checkRuleBacktrackFailure()>
  <label> = new CommonTokenType();
  <label>->set_type( CommonTokenType::TOKEN_INVALID);
  <label>->set_startIndex( <label>Start<elementIndex> );
  <label>->set_stopIndex( this->getCharIndex()-1 );
  <label>->set_input( this->get_input() );
  <label>->set_line( <label>StartLine<elementIndex> );
  <label>->set_charPositionInLine( <label>StartCharPos<elementIndex> );
}
<else>
<if(scope)>m_<scope:delegateName()-><endif>m<rule.name>(<args; separator="," ">);
<checkRuleBacktrackFailure()>
<endif>
>>

/** i+=INT in lexer */
lexerRuleRefAndListLabel(rule,label,args,elementIndex,scope) ::= <<
<lexerRuleRef(...)>
<listLabel(elem=label,...)>
>>

/** EOF in the lexer */
lexerMatchEOF(label,elementIndex) ::= <<
<if(label)>
{
  ANTLR_UINT32 <label>Start<elementIndex>;
  ANTLR_UINT32 <label>StartLine<elementIndex> = this->getLine();
  ANTLR_UINT32 <label>StartCharPos<elementIndex> = this->getCharPositionInLine();
  <labelType> <label>;
  <label>Start<elementIndex> = this->getCharIndex();
  this->matchc(ANTLR_CHARSTREAM_EOF);
  <checkRuleBacktrackFailure()>
  <label> = new CommonTokenType();
  <label>->set_type( CommonTokenType::TOKEN_EOF );

```

```

<label>->set_startIndex(<label>Start<elementIndex>);
<label>->set_stopIndex(this->getCharIndex()-1);
<label>->set_input( this->get_input() );
<label>->set_line( <label>StartLine<elementIndex> );
<label>->set_charPositionInLine( <label>StartCharPos<elementIndex> );
}
<else>
  this->matchc(ANTLR_CHARSTREAM_EOF);
  <checkRuleBacktrackFailure()>
  <endif>
>>

// used for left-recursive rules
recRuleDefArg()          ::= "int <recRuleArg()>"
recRuleArg()             ::= "_p"
recRuleAltPredicate(ruleName,opPrec) ::= "<recRuleArg()> \<= <opPrec>"
recRuleSetResultAction() ::= "root_0=$<ruleName>_primary.tree;"
recRuleSetReturnAction(src,name)  ::= "$<name>=$<src>.<name>;"

/** match ^(root children) in tree parser */
tree(root, actionsAfterRoot, children, nullableChildList, enclosingTreeLevel, treeLevel) ::= <<
<root:element()>
<actionsAfterRoot:element()>
<if(nullableChildList)>
if ( this->LA(1)== CommonTokenType::TOKEN_DOWN ) {
  this->matchToken(CommonTokenType::TOKEN_DOWN, NULL);
  <checkRuleBacktrackFailure()>
  <children:element()>
  this->matchToken(CommonTokenType::TOKEN_UP, NULL);
  <checkRuleBacktrackFailure()>
}
<else>
this->matchToken(CommonTokenType::TOKEN_DOWN, NULL);
<checkRuleBacktrackFailure()>
<children:element()>
this->matchToken(CommonTokenType::TOKEN_UP, NULL);
<checkRuleBacktrackFailure()>
<endif>
>>

/** Every predicate is used as a validating predicate (even when it is
 * also hoisted into a prediction expression).
 */
validateSemanticPredicate(pred,description) ::= <<
if ( !(<evalPredicate(...)> )
{
  <ruleBacktrackFailure()>
  <newFPE(...)>

```

```

}
>>

newFPE() ::= <<
ExceptionBaseType* ex = new ANTLR_Exception\< <name>ImplTraits, FAILED_PREDICATE_EXCEPTION,
StreamType>( this->get_rec(), "<description>" );
ex->set_ruleName( "<ruleName>" );
<\n>
>>

// F i x e d D F A (if-then-else)

dfaState(k,edges,eotPredictsAlt,description,stateNumber,semPredState) ::= <<

{
int LA<decisionNumber>_<stateNumber> = this->LA(<k>);
<edges; separator="\nelse ">
else
{
<if(eotPredictsAlt)>
alt<decisionNumber>=<eotPredictsAlt>;
<else>
<ruleBacktrackFailure()>

<newNVException()>
goto rule<ruleDescriptor.name>Ex;

<endif>
}
}
>>

newNVException() ::= <<
ExceptionBaseType* ex = new ANTLR_Exception\< <name>ImplTraits, NO_VIABLE_ALT_EXCEPTION,
StreamType>( this->get_rec(), "<description>" );
ex->set_decisionNum( <decisionNumber> );
ex->set_state( <stateNumber> );
<@noViableAltException()>
<\n>
>>

/** Same as a normal DFA state except that we don't examine lookahead
 * for the bypass alternative. It delays error detection but this
 * is faster, smaller, and more what people expect. For (X)? people
 * expect "if ( LA(1)==X ) match(X);" and that's it.
 */
dfaOptionalBlockState(k,edges,eotPredictsAlt,description,stateNumber,semPredState) ::= <<
{

```

```

    int LA<decisionNumber>_<stateNumber> = this->LA(<k>);
    <edges; separator="\nelse ">
}
>>

/** A DFA state that is actually the loopback decision of a closure
 * loop. If end-of-token (EOT) predicts any of the targets then it
 * should act like a default clause (i.e., no error can be generated).
 * This is used only in the lexer so that for ('a')* on the end of a rule
 * anything other than 'a' predicts exiting.
 */

dfaLoopbackStateDecls() ::= <<
ANTLR_UINT32 LA<decisionNumber>_<stateNumber>;
>>

dfaLoopbackState(k,edges,eotPredictsAlt,description,stateNumber,semPredState) ::= <<
{
    /* dfaLoopbackState(k,edges,eotPredictsAlt,description,stateNumber,semPredState)
    */
    int LA<decisionNumber>_<stateNumber> = this->LA(<k>);
    <edges; separator="\nelse "><n>
    <if(eotPredictsAlt)>
    <if(!edges)>
alt<decisionNumber>=<eotPredictsAlt>; <! if no edges, don't gen ELSE !>
<else>
    else
    {
alt<decisionNumber>=<eotPredictsAlt>;
    }<n>
    <endif>
    <endif>
}
>>

/** An accept state indicates a unique alternative has been predicted */
dfaAcceptState(alt) ::= "alt<decisionNumber>=<alt>";

/** A simple edge with an expression. If the expression is satisfied,
 * enter to the target state. To handle gated productions, we may
 * have to evaluate some predicates for this edge.
 */
dfaEdge(labelExpr, targetState, predicates) ::= <<
if ( (<labelExpr><if(predicates)> && (<predicates><endif>))
{
    <targetState>
}
>>

```

```

// F i x e d D F A (switch case)

/** A DFA state where a SWITCH may be generated. The code generator
 * decides if this is possible: CodeGenerator.canGenerateSwitch().
 */
dfaStateSwitch(k,edges,eotPredictsAlt,description,stateNumber,semPredState) ::= <<
switch ( this->LA(<k>) )
{
<edges; separator="\n">

default:
<if(eotPredictsAlt)>
  alt<decisionNumber>=<eotPredictsAlt>;
<else>
  <ruleBacktrackFailure()>
  <newNVEException()>
  goto rule<ruleDescriptor.name>Ex;<\n>
<endif>
}<\n>
>>

dfaOptionalBlockStateSwitch(k,edges,eotPredictsAlt,description,stateNumber,semPredState) ::= <<
switch ( this->LA(<k>) )
{
  <edges; separator="\n">
}<\n>
>>

dfaLoopbackStateSwitch(k, edges,eotPredictsAlt,description,stateNumber,semPredState) ::= <<
switch ( this->LA(<k>) )
{
<edges; separator="\n"><\n>
<if(eotPredictsAlt)>
default:
  alt<decisionNumber>=<eotPredictsAlt>;
  break;<\n>
<endif>
}<\n>
>>

dfaEdgeSwitch(labels, targetState) ::= <<
<labels: {it |case <it>:}; separator="\n">
{
  <targetState>
}
break;
>>

```

```

// C y c l i c D F A

/** The code to initiate execution of a cyclic DFA; this is used
 * in the rule to predict an alt just like the fixed DFA case.
 * The <name> attribute is inherited via the parser, lexer, ...
 */
dfaDecision(decisionNumber,description) ::= <<
alt<decisionNumber> = cdfa<decisionNumber>.predict(this, this->get_rec(), this->get_istream(),
cdfa<decisionNumber> );
<checkRuleBacktrackFailure()>
>>

/* Dump DFA tables as static initialized arrays of shorts(16 bits)/characters(8 bits)
 * which are then used to statically initialize the dfa structure, which means that there
 * is no runtime initialization whatsoever, other than anything the C compiler might
 * need to generate. In general the C compiler will lay out memory such that there is no
 * runtime code required.
 */
cyclicDFA(dfa) ::= <<
/** Static dfa state tables for Cyclic dfa:
 * <dfa.description>
 */
static const ANTLR_INT32 dfa<dfa.decisionNumber>_eot[<dfa.numberofStates>] =
{
<dfa.eot; wrap="\n", separator=" ", null="-1">
};
static const ANTLR_INT32 dfa<dfa.decisionNumber>_eof[<dfa.numberofStates>] =
{
<dfa.eof; wrap="\n", separator=" ", null="-1">
};
static const ANTLR_INT32 dfa<dfa.decisionNumber>_min[<dfa.numberofStates>] =
{
<dfa.min; wrap="\n", separator=" ", null="-1">
};
static const ANTLR_INT32 dfa<dfa.decisionNumber>_max[<dfa.numberofStates>] =
{
<dfa.max; wrap="\n", separator=" ", null="-1">
};
static const ANTLR_INT32 dfa<dfa.decisionNumber>_accept[<dfa.numberofStates>] =
{
<dfa.accept; wrap="\n", separator=" ", null="-1">
};
static const ANTLR_INT32 dfa<dfa.decisionNumber>_special[<dfa.numberofStates>] =
{
<dfa.special; wrap="\n", separator=" ", null="-1">
};

/** Used when there is no transition table entry for a particular state */

```

```

static const ANTLR_INT32* dfa<dfa.decisionNumber>_T_empty = NULL;

<dfa.edgeTransitionClassMap.keys:{ table |
static const ANTLR_INT32 dfa<dfa.decisionNumber>_T<i0>[] =
    {
    <table; separator=" ", wrap="\n", null="-1">
    \};<\n>}; null = "">

/* Transition tables are a table of sub tables, with some tables
* reused for efficiency.
*/
static const ANTLR_INT32 * const dfa<dfa.decisionNumber>_transitions[] =
{
    <dfa.transitionEdgeTables:{ xref[dfa<dfa.decisionNumber>_T<xref>]; separator=" ", wrap="\n", null="NULL">
};

<@errorMethod()>

/* Declare tracking structure for Cyclic DFA <dfa.decisionNumber>
*/
class <name>CyclicDFA<dfa.decisionNumber> : public CyclicDFA\< <name>ImplTraits, <name> >, public
<name>Tokens
{
public:
typedef CyclicDFA\< <name>ImplTraits, <name> > BaseType;
typedef BaseType::ContextType CtxType;

private:
<if(dfa.specialStateSTs)>
//to maintain C-Target compatibility, we need to make some of ctx functions look like member funcs
CtxType* m_ctx;
<endif>

public:
<name>CyclicDFA<dfa.decisionNumber>( ANTLR_INT32 decisionNumber
    , const ANTLR_UCHAR* description
    , const ANTLR_INT32* const eot
    , const ANTLR_INT32* const eof
    , const ANTLR_INT32* const min
    , const ANTLR_INT32* const max
    , const ANTLR_INT32* const accept
    , const ANTLR_INT32* const special
    , const ANTLR_INT32* const *const transition)
:BaseType( decisionNumber, description, eot, eof, min, max, accept,
    special, transition )
{
<if(dfa.specialStateSTs)>
m_ctx = NULL;

```

```

<endif>
}

<if(dfa.specialStateSTs)>
ANTLR_UINT32 LA(ANTLR_INT32 i)
{
    return m_ctx->LA(i);
}

<if(PARSER)>
const CtxType::CommonTokenType* LT(ANTLR_INT32 k)
{
    return m_ctx->LT(k);
}
<endif>
<if(synpreds)>
template<typename PredType>
bool msynpred( PredType pred )
{
    return m_ctx->msynpred(pred);
}
<endif>

ANTLR_INT32 specialStateTransition(CtxType * ctx, RecognizerType* recognizer, IntStreamType* is,
ANTLR_INT32 s)
{
    ANTLR_INT32 _s;

    m_ctx = ctx;
    _s = s;
    switch (s)
    {
        <dfa.specialStateSTs:{state |
        case <i0>:

        <state>}; separator="\n">
    }
    <if(backtracking)>
        if ( ctx->get_backtracking() > 0)
        {
            ctx->set_failedflag( true );
            return -1;
        }
    <endif>
        ExceptionBaseType* ex = new ANTLR_Exception<< <name>ImplTraits, NO_VIABLE_ALT_EXCEPTION,
StreamType>( recognizer, "<dfa.description>" );
        ex->set_decisionNum( <dfa.decisionNumber> );
        ex->set_state(_s);

```



```

    <@noViableAltException()>
    return -1;
}
<endif>
};

static <name>CyclicDFA<dfa.decisionNumber> cdfa<dfa.decisionNumber>(
    <dfa.decisionNumber>, /* Decision number of this dfa */
    /* Which decision this represents: */
    (const ANTLR_UCHAR*)<dfa.description>,
    dfa<dfa.decisionNumber>_eot, /* EOT table */
    dfa<dfa.decisionNumber>_eof, /* EOF table */
    dfa<dfa.decisionNumber>_min, /* Minimum tokens for each state */
    dfa<dfa.decisionNumber>_max, /* Maximum tokens for each state */
    dfa<dfa.decisionNumber>_accept, /* Accept table */
    dfa<dfa.decisionNumber>_special, /* Special transition states */
    dfa<dfa.decisionNumber>_transitions /* Table of transition tables */

);

/* End of Cyclic DFA <dfa.decisionNumber>
* -----
*/
>>

/** A state in a cyclic DFA; it's a special state and part of a big switch on
* state.
*/
cyclicDFAState(decisionNumber,stateNumber,edges,needErrorClause,semPredState) ::= <<
{
    ANTLR_UINT32 LA<decisionNumber>_<stateNumber>;<\n>
    ANTLR_MARKER index<decisionNumber>_<stateNumber>;<\n>

    LA<decisionNumber>_<stateNumber> = ctx->LA(1);<\n>
    <if(semPredState)> <! get next lookahead symbol to test edges, then rewind !>
    index<decisionNumber>_<stateNumber> = ctx->index();<\n>
    ctx->rewindLast();<\n>
    <endif>
    s = -1;
    <edges; separator="\nelse ">
    <if(semPredState)> <! return input cursor to state before we rewound !>
    ctx->seek(index<decisionNumber>_<stateNumber>);<\n>
    <endif>
    if ( s>=0 )
    {
return s;
    }
}

```

```

}
break;
>>

/** Just like a fixed DFA edge, test the lookahead and indicate what
 * state to jump to next if successful.
 */
cyclicDFAEdge(labelExpr, targetStateNumber, edgeNumber, predicates) ::= <<
if ( (<labelExpr> <if(predicates)>&& (<predicates>)<endif> )
{
    s = <targetStateNumber>;
}<\n>
>>

/** An edge pointing at end-of-token; essentially matches any char;
 * always jump to the target.
 */
eotDFAEdge(targetStateNumber,edgeNumber, predicates) ::= <<
s = <targetStateNumber>;<\n>
>>

// D F A E X P R E S S I O N S

andPredicates(left,right) ::= "( (<left> ) && (<right> ) )"

orPredicates(operands) ::= "(<operands:{o|(<o>)}; separator=\"||\">)"

notPredicate(pred) ::= "!(<evalPredicate(pred,{ })>)"

evalPredicate(pred,description) ::= "(<pred>)"

evalSynPredicate(pred,description) ::= "this->msynpred( antlr3::ClassForwarder\<<pred>>() )"

lookaheadTest(atom,k,atomAsInt) ::= "LA<decisionNumber>_<stateNumber> == <atom>"

/** Sometimes a lookahead test cannot assume that LA(k) is in a temp variable
 * somewhere. Must ask for the lookahead directly.
 */
isolatedLookaheadTest(atom,k,atomAsInt) ::= "this->LA(<k>) == <atom>"

lookaheadRangeTest(lower,upper,k,rangeNumber,lowerAsInt,upperAsInt) ::= <%
((LA<decisionNumber>_<stateNumber> >= <lower> ) && (LA<decisionNumber>_<stateNumber> \<= <upper>))
%>

isolatedLookaheadRangeTest(lower,upper,k,rangeNumber,lowerAsInt,upperAsInt) ::= "((this->LA(<k>) >=
<lower> ) && (this->LA(<k>) \<= <upper>))"

```

```
setTest(ranges) ::= "<ranges; separator=\\\" || \\\">"
```

```
// A T T R I B U T E S
```

```
makeScopeSet() ::= <<
```

```
/* makeScopeSet()
```

```
*/
```

```
/** Definition of the <scope.name> scope variable tracking
```

```
* structure. An instance of this structure is created by calling
```

```
* <name>_<scope.name>Push().
```

```
*/
```

```
struct <scopeStruct(sname=scope.name,...)>
```

```
{
```

```
/* =====
```

```
* Programmer defined variables...
```

```
*/
```

```
<scope.attributes:{it |<it.decl>;}; separator="\n">
```

```
/* End of programmer defined variables
```

```
* =====
```

```
*/
```

```
};
```

```
>>
```

```
globalAttributeScopeDecl(scope) ::= <<
```

```
<if(scope.attributes)>
```

```
/* globalAttributeScopeDecl(scope)
```

```
*/
```

```
<makeScopeSet(...)>
```

```
<endif>
```

```
>>
```

```
ruleAttributeScopeDecl(scope) ::= <<
```

```
<if(scope.attributes)>
```

```
/* ruleAttributeScopeDecl(scope)
```

```
*/
```

```
<makeScopeSet(...)>
```

```
<endif>
```

```
>>
```

```
globalAttributeScopeDef(scope) ::=
```

```
<<
```

```
/* globalAttributeScopeDef(scope)
```

```
*/
```

```
<if(scope.attributes)>
```

```
StackType\< <scopeStruct(sname=scope.name)> > <scopeStack(sname=scope.name)>;
```

```

<endif>
>>

ruleAttributeScopeDef(scope) ::= <<
<if(scope.attributes)>
/* ruleAttributeScopeDef(scope)
*/
StackType\< <scopeStruct(sname=scope.name)> > <scopeStack(sname=scope.name,...)>;

<endif>
>>

scopeStruct(sname) ::= <<
<sname>Scope
>>

scopeStack(sname) ::= <<
m_<sname>_stack
>>

returnStructName(r) ::= "<r.name>_return"

returnType() ::= <%
<if(!ruleDescriptor.isSynPred)>
<if(ruleDescriptor.hasMultipleReturnValues)>
<ruleDescriptor.grammar.recognizerName>::<ruleDescriptor:returnStructName()>
<else>
<if(ruleDescriptor.hasSingleReturnValue)>
<ruleDescriptor.singleValueReturnType>
<else>
void
<endif>
<endif>
<else>
bool
<endif>
%>

/** Generate the C type associated with a single or multiple return
* value(s).
*/
ruleLabelType(referencedRule) ::= <%
<if(referencedRule.hasMultipleReturnValues)>
<referencedRule.name>_return
<else>
<if(referencedRule.hasSingleReturnValue)>
<referencedRule.singleValueReturnType>

```

```

<else>
void
<endif>
<endif>
%>

delegateName(d) ::= <<
<if(d.label)><d.label><else>g<d.name><endif>
>>

/** Using a type to init value map, try to init a type; if not in table
 * must be an object, default value is "0".
 */
initValue(typeName) ::= <<
= <cTypeInitMap.(typeName)>
>>

/** Define a rule label */
ruleLabelDef(label) ::= <<
<ruleLabelType(referencedRule=label.referencedRule)> <label.label.text>;
>>
/** Rule label default value */
ruleLabelInitVal(label) ::= <<
>>

ASTLabelType() ::=
"<if(recognizer.ASTLabelType)><recognizer.ASTLabelType><else>ImplTraits::TreeType*<endif>"

/** Define a return struct for a rule if the code needs to access its
 * start/stop tokens, tree stuff, attributes, ... Leave a hole for
 * subgroups to stick in members.
 */
returnScope(scope) ::= <<
<if(!ruleDescriptor.isSynPred)>
<if(ruleDescriptor.hasMultipleReturnValues)>
<if(!TREE_PARSER)>
struct <ruleDescriptor:returnStructName()> : public <name>ImplTraits::RuleReturnValueType
{
public:
    typedef <name>ImplTraits::RuleReturnValueType BaseType;
    <ruleDescriptor:returnStructName()>()
        : BaseType()
        <if(scope)>, <scope.attributes:{it | <it.name>() } ; separator=","><endif>
        { init(); }
    <ruleDescriptor:returnStructName()>( BaseParserType* parser )
        : BaseType(parser)
        <if(scope)>, <scope.attributes:{it | <it.name>() } ; separator=","><endif>
        { init(); }
}

```

```

<ruleDescriptor:returnStructName()>( const <ruleDescriptor:returnStructName()>& other )
    : BaseType(other)
<if(scope)>, <scope.attributes:{it | <it.name>(other.<it.name>) }; separator=", "><endif>
{ copy(other); }
~<ruleDescriptor:returnStructName()>()
{
    <@ruleReturnMembersDelete()>
}

<ruleDescriptor:returnStructName()>&
operator=( const <ruleDescriptor:returnStructName()>& other )
{
    BaseType::operator=( other );
    <if(scope)><scope.attributes:{it | <it.name> = other.<it.name>; }; separator="\n"><endif>
    copy(other);
    return *this;
}
<@ruleReturnMembers()>
void init() { <@ruleReturnMembersInit()> }
void copy( const <ruleDescriptor:returnStructName()>& other ) { <@ruleReturnMembersCopy()> }
<else>
struct <ruleDescriptor:returnStructName()>
{
public:
    <name>ImplTraits::<recognizer.ASTLabelType>    start;
    <name>ImplTraits::<recognizer.ASTLabelType>    stop;
    <ruleDescriptor:returnStructName()>( const <ruleDescriptor:returnStructName()>& other )
    <if(scope.attributes)>
    <scope.attributes:{it | <it.name>(other.<it.name>) }; separator=", ">
    <endif>
    {
        start = other.start;
        stop = other.stop;
    }

    <ruleDescriptor:returnStructName()>&
    operator=( const <ruleDescriptor:returnStructName()>& other )
    {
        start = other.start;
        stop = other.stop;

        <scope.attributes:{it | <it.name> = other.<it.name>; }; separator="\n">
        return *this;
    }
<endif>
    <if(scope)><scope.attributes:{it | <it.type> <it.name>; }; separator="\n"><endif>
};

```

```

<endif>
<endif>
>>

parameterScope(scope) ::= <<
<scope.attributes:{it |<it.decl>} ; separator=", ">
>>

parameterAttributeRef(attr) ::= "<attr.name>"
parameterSetAttributeRef(attr,expr) ::= "<attr.name>=<expr>";

/** Note that the scopeAttributeRef does not have access to the
 * grammar name directly
 */
scopeAttributeRef(scope,attr,index,negIndex) ::= <%
<if(negIndex)>
m_<scope>_stack.at( m_<scope>_stack.size()-<negIndex>-1).<attr.name>
<else>
<if(index)>
m_<scope>_stack.at(<index>).<attr.name>
<else>
m_<scope>_stack.peek().<attr.name>
<endif>
<endif>
%>

scopeSetAttributeRef(scope,attr,expr,index,negIndex) ::= <%
<if(negIndex)>
m_<scope>_stack.at( m_<scope>_stack.size()-<negIndex>-1).<attr.name> = <expr>;
<else>
<if(index)>
m_<scope>_stack.at(<index>).<attr.name> = <expr>;
<else>
m_<scope>_stack.peek().<attr.name> =<expr>;
<endif>
<endif>
%>

/** $x is either global scope or x is rule with dynamic scope; refers
 * to stack itself not top of stack. This is useful for predicates
 * like {$function.size()>0 && $function::name.equals("foo")}?
 */
isolatedDynamicScopeRef(scope) ::= "<scope>_stack"

/** reference an attribute of rule; might only have single return value */
ruleLabelRef(referencedRule,scope,attr) ::= <<
<if(referencedRule.hasMultipleReturnValues)>
<scope>.<attr.name>

```

```

<else>
<scope>
<endif>
>>

returnAttributeRef(ruleDescriptor,attr) ::= <<
<if(ruleDescriptor.hasMultipleReturnValues)>
retval.<attr.name>
<else>
<attr.name>
<endif>
>>

returnSetAttributeRef(ruleDescriptor,attr,expr) ::= <<
<if(ruleDescriptor.hasMultipleReturnValues)>
retval.<attr.name>=<expr>;
<else>
<attr.name>=<expr>;
<endif>
>>

/** How to translate $tokenLabel */
tokenLabelRef(label) ::= "<label>"

/** ids+=ID {$ids} or e+=expr {$e} */
listLabelRef(label) ::= "list_<label>"

// not sure the next are the right approach
//
tokenLabelPropertyRef_text(scope,attr) ::= "<scope>->getText()"
tokenLabelPropertyRef_type(scope,attr) ::= "<scope>->get_type()"
tokenLabelPropertyRef_line(scope,attr) ::= "<scope>->get_line()"
tokenLabelPropertyRef_pos(scope,attr) ::= "<scope>->get_charPositionInLine()"
tokenLabelPropertyRef_channel(scope,attr) ::= "<scope>->get_channel()"
tokenLabelPropertyRef_index(scope,attr) ::= "<scope>->get_tokenIndex()"
tokenLabelPropertyRef_tree(scope,attr) ::= "<scope>->get_tree()"
tokenLabelPropertyRef_int(scope,attr) ::= "<name>ImplTraits::ConvertToInt32(<scope>->getText())"

ruleLabelPropertyRef_start(scope,attr) ::= "<scope>.start"
ruleLabelPropertyRef_stop(scope,attr) ::= "<scope>.stop"
ruleLabelPropertyRef_tree(scope,attr) ::= "<scope>.tree"
ruleLabelPropertyRef_text(scope,attr) ::= <<
<if(TREE_PARSER)>
(this->get_strstream()->toStringSS(<scope>.start, <scope>.start))
<else>
(this->get_strstream()->toStringTT(<scope>.start, <scope>.stop))
<endif>

```



```

>>

ruleLabelPropertyRef_st(scope,attr) ::= "<scope>.st"

/** Isolated $RULE ref ok in lexer as it's a Token */
lexerRuleLabel(label) ::= "<label>"

lexerRuleLabelPropertyRef_type(scope,attr) ::= "<scope>->get_type()"
lexerRuleLabelPropertyRef_line(scope,attr) ::= "<scope>->get_line()"
lexerRuleLabelPropertyRef_pos(scope,attr) ::= "<scope>->get_charPositionInLine()"
lexerRuleLabelPropertyRef_channel(scope,attr) ::= "<scope>->get_channel()"
lexerRuleLabelPropertyRef_index(scope,attr) ::= "<scope>->get_tokenIndex()"
lexerRuleLabelPropertyRef_text(scope,attr) ::= "<scope>->getText()"

// Somebody may ref $template or $tree or $stop within a rule:
rulePropertyRef_start(scope,attr) ::= "retval.start"
rulePropertyRef_stop(scope,attr) ::= "retval.stop"
rulePropertyRef_tree(scope,attr) ::= "retval.tree"
rulePropertyRef_text(scope,attr) ::= <<
<if(TREE_PARSER)>
this->get_input()->toStringSS( this->get_adaptor()->getTokenStartIndex(retval.start), this->get_adaptor()-
>getTokenStopIndex(retval.start))
<else>
this->get_strstream()->toStringTT(retval.start, this->LT(-1))
<endif>
>>
rulePropertyRef_st(scope,attr) ::= "retval.st"

lexerRulePropertyRef_text(scope,attr) ::= "this->getText()"
lexerRulePropertyRef_type(scope,attr) ::= "_type"
lexerRulePropertyRef_line(scope,attr) ::= "this->get_state()->get_tokenStartLine()"
lexerRulePropertyRef_pos(scope,attr) ::= "this->get_state()->get_tokenStartCharPositionInLine()"
lexerRulePropertyRef_channel(scope,attr) ::= "this->get_state()->get_channel()"
lexerRulePropertyRef_start(scope,attr) ::= "this->get_state()->get_tokenStartCharIndex()"
lexerRulePropertyRef_stop(scope,attr) ::= "(this->getCharIndex()-1)"
lexerRulePropertyRef_index(scope,attr) ::= "-1" // undefined token index in lexer
lexerRulePropertyRef_int(scope,attr) ::= "<name>ImplTraits::ConvertToInt32(<scope>->getText())"

// setting $st and $tree is allowed in local rule. everything else is flagged as error
ruleSetPropertyRef_tree(scope,attr,expr) ::= "retval.tree=<expr>;"
ruleSetPropertyRef_st(scope,attr,expr) ::= "retval.st=<expr>;"

/** How to deal with an @after for C targets. Because we cannot rely on
* any garbage collection, after code is executed even in backtracking
* mode. Must be documented clearly.
*/

```

```

execAfter(action) ::= <<
{
  <action>
}
>>

/** How to execute an action (when not backtracking) */
execAction(action) ::= <<
<if(backtracking)>
<if(actions.(actionScope).synpredgate)>
if ( <actions.(actionScope).synpredgate> )
{
  <action>
}
<else>
if ( BACKTRACKING == 0 )
{
  <action>
}
<endif>
<else>
{
  <action>
}
<endif>
>>

// M I S C (properties, etc...)

bitsetDeclare(bitsetName, words64, traits) ::= <<

/** Bitset defining follow set for error recovery in rule state: <name> */
static ANTLR_BITWORD <bitsetName>_bits[] = { <words64:{it |ANTLR_UINT64_LIT(<it>)}; separator=", "> };
static <traits>::BitsetListType <bitsetName>( <bitsetName>_bits, <length(words64)> );
>>

codeFileExtension() ::= ".cpp"

true_value() ::= "true"
false_value() ::= "false"

Found in path(s):
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/codegen/templates/Cpp/Cpp.stg
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*/

/** Template overrides to add debugging to AST stuff. Dynamic inheritance

* hierarchy is set up as ASTDbg : AST : Dbg : Java by code generator.

*/

```
parserMembers() ::= <<
protected DebugTreeAdaptor adaptor;
public void setTreeAdaptor(TreeAdaptor adaptor) {
<if(grammar.grammarIsRoot)>
    this.adaptor = new DebugTreeAdaptor(dbg, adaptor);
<else>
    this.adaptor = (DebugTreeAdaptor) adaptor; // delegator sends dbg adaptor
<endif>
    <grammar.directDelegates: {g|<g:delegateName()>.setTreeAdaptor(this.adaptor);}>
    }
    public TreeAdaptor getTreeAdaptor() {
        return adaptor;
    }
}>>
```

```
parserCtorBody() ::= <<
<super.parserCtorBody()>
>>
```

```

createListenerAndHandshake() ::= <<
DebugEventSocketProxy proxy =
  new DebugEventSocketProxy(this,port,<if(TREE_PARSER)>input.getTreeAdaptor()<else>adaptor<endif>);
setDebugListener(proxy);
set<inputStreamType>(new Debug<inputStreamType>(input,proxy));
try {
  proxy.handshake();
}
catch (IOException ioe) {
  reportError(ioe);
}
>>

```

```

@ctorForRootGrammar.finally() ::= <<
TreeAdaptor adap = new CommonTreeAdaptor();
setTreeAdaptor(adap);
proxy.setTreeAdaptor(adap);
>>

```

```

@ctorForProfilingRootGrammar.finally() ::= <<
TreeAdaptor adap = new CommonTreeAdaptor();
setTreeAdaptor(adap);
>>

```

```

@ctorForPredefinedListener.superClassRef() ::= "super(input, dbg);"

```

```

@ctorForPredefinedListener.finally() ::= <<
<if(grammar.grammarIsRoot)> <! don't create new adaptor for delegates !>
TreeAdaptor adap = new CommonTreeAdaptor();
setTreeAdaptor(adap);
<endif>
>>

```

```

@rewriteElement.pregen() ::= "dbg.location(<e.line>,<e.pos>);"

```

Found in path(s):

```

* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-
jar/org/antlr/codegen/templates/Java/ASTDbg.stg

```

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```

/*

```

```

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```

```

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```

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*/

/** Template overrides to add debugging to AST stuff. Dynamic inheritance
* hierarchy is set up as ASTDbg : AST : Dbg : Python by code generator.

*/

group ASTDbg;

astAccessor() ::= <<

def setTreeAdaptor(self, adaptor):

<if(grammar.grammarIsRoot)>

self._adaptor = DebugTreeAdaptor(self.dbg, adaptor)

<else>

self._adaptor = adaptor # delegator sends dbg adaptor

<endif>

<grammar.directDelegates:{g|<g.delegateName()>.setTreeAdaptor(self._adaptor)}>

def getTreeAdaptor(self):

return self._adaptor

adaptor = property(getTreeAdaptor, setTreeAdaptor)<\n>

>>

createListenerAndHandshake() ::= <<

proxy = DebugEventSocketProxy(self,

adaptor=<if(TREE_PARSER)>self.input.getTreeAdaptor(<else>self._adaptor<endif>,

debug=debug_socket, port=port)

self.setDebugListener(proxy)

self.adaptor.setDebugListener(proxy)

self.input.setDebugListener(proxy)

#self.set<inputStreamType>(Debug<inputStreamType>(self.input, proxy))

```
proxy.handshake()
```

```
>>
```

```
@rewriteElement.pregen() ::= "self._dbg.location(<e.line>, <e.pos>)"
```

Found in path(s):

```
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-  
jar/org/antlr/codegen/templates/Python/ASTDbg.stg
```

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```
*/
```

```
@outputFile.imports() ::= <<
```

```
<@super.imports(>
```

```
<if(!TREE_PARSER)><! tree parser would already have imported !>
```

```
import org.antlr.runtime.tree.*;<\n>
```

```
<endif>
```

```
>>
```

```
@genericParser.members() ::= <<
```

```
<@super.members(>
```

```
<parserMembers(>
```

>>

```
/** Add an adaptor property that knows how to build trees */  
parserMembers() ::= <<  
protected TreeAdaptor adaptor = new CommonTreeAdaptor();
```

```
public void setTreeAdaptor(TreeAdaptor adaptor) {  
    this.adaptor = adaptor;  
    <grammar.directDelegates: {g|<g:delegateName().setTreeAdaptor(this.adaptor);}>  
}  
public TreeAdaptor getTreeAdaptor() {  
    return adaptor;  
}  
>>
```

```
@returnScope.ruleReturnMembers() ::= <<  
<ASTLabelType> tree;  
@Override  
public <ASTLabelType> getTree() { return tree; }  
>>
```

```
/** Add a variable to track rule's return AST */  
ruleDeclarations() ::= <<  
<super.ruleDeclarations()>  
<ASTLabelType> root_0 = null;<\n>  
>>
```

```
ruleLabelDefs() ::= <<  
<super.ruleLabelDefs()>  
<if(!ruleDescriptor.isSynPred)>  
<[ruleDescriptor.tokenLabels,ruleDescriptor.wildcardTreeLabels,  
    ruleDescriptor.wildcardTreeListLabels]:{it | <ASTLabelType> <it.label.text>_tree=null;}; separator="\n">  
<ruleDescriptor.tokenListLabels:{it | <ASTLabelType> <it.label.text>_tree=null;}; separator="\n">  
<if(ruleDescriptor.supportsLabelOptimization)>  
<ruleDescriptor.allTokenRefsInRewrites  
    :{it | RewriteRule<rewriteElementType>Stream stream_<it>=new  
    RewriteRule<rewriteElementType>Stream(adaptor,"token <it>");}; separator="\n">  
<ruleDescriptor.allRuleRefsInRewrites  
    :{it | RewriteRuleSubtreeStream stream_<it>=new RewriteRuleSubtreeStream(adaptor,"rule <it>");};  
    separator="\n">  
<else>  
<ruleDescriptor.allTokenRefsInAltsWithRewrites  
    :{it | RewriteRule<rewriteElementType>Stream stream_<it>=new  
    RewriteRule<rewriteElementType>Stream(adaptor,"token <it>");}; separator="\n">  
<ruleDescriptor.allRuleRefsInAltsWithRewrites  
    :{it | RewriteRuleSubtreeStream stream_<it>=new RewriteRuleSubtreeStream(adaptor,"rule <it>");};  
    separator="\n">  
<endif>
```

```

<endif>
>>

/** When doing auto AST construction, we must define some variables;
 * These should be turned off if doing rewrites. This must be a "mode"
 * as a rule could have both rewrite and AST within the same alternative
 * block.
 */
@alt.declarations() ::= <<
<if(autoAST)>
<if(outerAlt)>
<if(!rewriteMode && !ruleDescriptor.isSynPred)>
root_0 = (<ASTLabelType>)adaptor.nil();<\n>
<endif>
<endif>
<endif>
>>

// Tracking Rule Elements

/** ID and track it for use in a rewrite rule */
tokenRefTrack(token,label,elementIndex,terminalOptions={}) ::= <<
<tokenRefBang(...)> <! Track implies no auto AST construction!>
<if(backtracking)>if ( <actions.(actionScope).synpredgate> ) <endif>stream_<token>.add(<label>);<\n>
>>

/** ids+=ID and track it for use in a rewrite rule; adds to ids *and*
 * to the tracking list stream_ID for use in the rewrite.
 */
tokenRefTrackAndListLabel(token,label,elementIndex,terminalOptions={}) ::= <<
<tokenRefTrack(...)>
<listLabel(elem=label, ...)>
>>

/** ^(ID ...) track for rewrite */
tokenRefRuleRootTrack(token,label,elementIndex,terminalOptions={}) ::= <<
<tokenRefBang(...)>
<if(backtracking)>if ( <actions.(actionScope).synpredgate> ) <endif>stream_<token>.add(<label>);<\n>
>>

/** Match ^(label+=TOKEN ...) track for rewrite */
tokenRefRuleRootTrackAndListLabel(token,label,elementIndex,terminalOptions={}) ::= <<
<tokenRefRuleRootTrack(...)>
<listLabel(elem=label, ...)>
>>

/** rule when output=AST and tracking for rewrite */
ruleRefTrack(rule,label,elementIndex,args,scope) ::= <<

```



```

<super.ruleRef(...)>
<if(backtracking)>if ( <actions.(actionScope).synpredgate> ) <endif>stream_<rule.name>.add(<label>.getTree());
>>

/** x+=rule when output=AST and tracking for rewrite */
ruleRefTrackAndListLabel(rule,label,elementIndex,args,scope) ::= <<
<ruleRefTrack(...)>
<listLabel(label, {<label>.getTree()})>
>>

/** ^(rule ...) rewrite */
ruleRefRuleRootTrack(rule,label,elementIndex,args,scope) ::= <<
<ruleRefRuleRoot(...)>
<if(backtracking)>if ( <actions.(actionScope).synpredgate> ) <endif>stream_<rule>.add(<label>.getTree());
>>

/** ^(x+=rule ...) rewrite */
ruleRefRuleRootTrackAndListLabel(rule,label,elementIndex,args,scope) ::= <<
<ruleRefRuleRootTrack(...)>
<listLabel(label, {<label>.getTree()})>
>>

// R e w r i t e

rewriteCode(
alts, description,
referencedElementsDeep, // ALL referenced elements to right of ->
referencedTokenLabels,
referencedTokenListLabels,
referencedRuleLabels,
referencedRuleListLabels,
referencedWildcardLabels,
referencedWildcardListLabels,
rewriteBlockLevel, enclosingTreeLevel, treeLevel) ::=
<<

// AST REWRITE
// elements: <referencedElementsDeep; separator=", ">
// token labels: <referencedTokenLabels; separator=", ">
// rule labels: <referencedRuleLabels; separator=", ">
// token list labels: <referencedTokenListLabels; separator=", ">
// rule list labels: <referencedRuleListLabels; separator=", ">
// wildcard labels: <referencedWildcardLabels,referencedWildcardListLabels; separator=", ">
<if(backtracking)>
if ( <actions.(actionScope).synpredgate> ) {
<endif>
<prevRuleRootRef(>.tree = root_0;
<rewriteCodeLabels(>

```

```

root_0 = (<ASTLabelType>)adaptor.nil();
<alts:rewriteAlt(); separator="else ">
<! if tree parser and rewrite=true !>
<if(TREE_PARSER)>
<if(rewriteMode)>
<prevRuleRootRef(>.tree = (<ASTLabelType>)adaptor.rulePostProcessing(root_0);
input.replaceChildren(adaptor.getParent(retval.start),
    adaptor.getChildIndex(retval.start),
    adaptor.getChildIndex(_last),
    retval.tree);
<endif>
<endif>
<! if parser or tree-parser && rewrite!=true, we need to set result !>
<if(!TREE_PARSER)>
<prevRuleRootRef(>.tree = root_0;
<else>
<if(!rewriteMode)>
<prevRuleRootRef(>.tree = root_0;
<endif>
<endif>
<if(backtracking)>
}
<endif>
>>

rewriteCodeLabels() ::= <<
<referencedTokenLabels
:{it | RewriteRule<rewriteElementType>Stream stream_<it>=new
RewriteRule<rewriteElementType>Stream(adaptor,"token <it>",<it>)};
separator="\n"
>
<referencedTokenListLabels
:{it | RewriteRule<rewriteElementType>Stream stream_<it>=new
RewriteRule<rewriteElementType>Stream(adaptor,"token <it> ", list_<it>)};
separator="\n"
>
<referencedWildcardLabels
:{it | RewriteRuleSubtreeStream stream_<it>=new RewriteRuleSubtreeStream(adaptor,"wildcard <it>",<it>)};
separator="\n"
>
<referencedWildcardListLabels
:{it | RewriteRuleSubtreeStream stream_<it>=new RewriteRuleSubtreeStream(adaptor,"wildcard <it> ",list_<it>)};
separator="\n"
>
<referencedRuleLabels
:{it | RewriteRuleSubtreeStream stream_<it>=new RewriteRuleSubtreeStream(adaptor,"rule
<it>",<it>!=null?<it>.getTree():null)};
separator="\n"

```

```

>
<referencedRuleListLabels
: {it | RewriteRuleSubtreeStream stream_<it>=new RewriteRuleSubtreeStream(adaptor,"token <it>","list_<it>");
separator="\n"
>
>>

```

```

/** Generate code for an optional rewrite block; note it uses the deep ref'd element
 * list rather shallow like other blocks.
 */

```

```

rewriteOptionalBlock(
alt,rewriteBlockLevel,
referencedElementsDeep, // all nested refs
referencedElements, // elements in immediately block; no nested blocks
description) ::=
<<
// <fileName>:<description>
if ( <referencedElementsDeep:{el | stream_<el>.hasNext()}; separator="||"> ) {
<alt>
}
<referencedElementsDeep:{el | stream_<el>.reset();<\n>}>
>>

```

```

rewriteClosureBlock(
alt,rewriteBlockLevel,
referencedElementsDeep, // all nested refs
referencedElements, // elements in immediately block; no nested blocks
description) ::=
<<
// <fileName>:<description>
while ( <referencedElements:{el | stream_<el>.hasNext()}; separator="||"> ) {
<alt>
}
<referencedElements:{el | stream_<el>.reset();<\n>}>
>>

```

```

rewritePositiveClosureBlock(
alt,rewriteBlockLevel,
referencedElementsDeep, // all nested refs
referencedElements, // elements in immediately block; no nested blocks
description) ::=
<<
if ( !(<referencedElements:{el | stream_<el>.hasNext()}; separator="||">) ) {
throw new RewriteEarlyExitException();
}
while ( <referencedElements:{el | stream_<el>.hasNext()}; separator="||"> ) {
<alt>
}
}

```

```

<referencedElements:{el | stream_<el>.reset();<\n}>
>>

rewriteAlt(a) ::= <<
// <a.description>
<if(a.pred)>
if (<a.pred>) {
  <a.alt>
}<\n>
<else>
{
  <a.alt>
}<\n>
<endif>
>>

/** For empty rewrites: "r : ... -> ;" */
rewriteEmptyAlt() ::= "root_0 = null;"

rewriteTree(root,children,description,enclosingTreeLevel,treeLevel) ::= <<
// <fileName>:<description>
{
<ASTLabelType> root_<treeLevel> = (<ASTLabelType>)adaptor.nil();
<root:rewriteElement()>
<children:rewriteElement()>
adaptor.addChild(root_<enclosingTreeLevel>, root_<treeLevel>);
}<\n>
>>

rewriteElementList(elements) ::= "<elements:rewriteElement()>"

rewriteElement(e) ::= <<
<@pregen()>
<e.el>
>>

/** Gen ID or ID[args] */
rewriteTokenRef(token,elementIndex,args,terminalOptions={}) ::= <<
adaptor.addChild(root_<treeLevel>, <createRewriteNodeFromElement(...)>);
>>

/** Gen $label ... where defined via label=ID */
rewriteTokenLabelRef(label,elementIndex) ::= <<
adaptor.addChild(root_<treeLevel>, stream_<label>.nextNode());
>>

/** Gen $label ... where defined via label+=ID */
rewriteTokenListLabelRef(label,elementIndex) ::= <<

```

```

adaptor.addChild(root_<treeLevel>, stream_<label>.nextNode());
>>

/** Gen ^($label ...) */
rewriteTokenLabelRefRoot(label,elementIndex) ::= <<
root_<treeLevel> = (<ASTLabelType>)adaptor.becomeRoot(stream_<label>.nextNode(), root_<treeLevel>);
>>

/** Gen ^($label ...) where label+=... */
rewriteTokenListLabelRefRoot ::= rewriteTokenLabelRefRoot

/** Gen ^(ID ...) or ^(ID[args] ...) */
rewriteTokenRefRoot(token,elementIndex,args,terminalOptions={}) ::= <<
root_<treeLevel> = (<ASTLabelType>)adaptor.becomeRoot(<createRewriteNodeFromElement(...)>,
root_<treeLevel>);
>>

rewriteImaginaryTokenRef(args,token,elementIndex,terminalOptions={}) ::= <<
adaptor.addChild(root_<treeLevel>, <createImaginaryNode(token,args,terminalOptions)>);
>>

rewriteImaginaryTokenRefRoot(args,token,elementIndex,terminalOptions={}) ::= <<
root_<treeLevel> = (<ASTLabelType>)adaptor.becomeRoot(<createImaginaryNode(token,args,terminalOptions)>,
root_<treeLevel>);
>>

/** plain -> {foo} action */
rewriteAction(action) ::= <<
root_0 = <action>;
>>

/** What is the name of the previous value of this rule's root tree? This
* let's us refer to $rule to mean previous value. I am reusing the
* variable 'tree' sitting in retval struct to hold the value of root_0 right
* before I set it during rewrites. The assign will be to retval.tree.
*/
prevRuleRootRef() ::= "retval"

rewriteRuleRef(rule) ::= <<
adaptor.addChild(root_<treeLevel>, stream_<rule>.nextTree());
>>

rewriteRuleRefRoot(rule) ::= <<
root_<treeLevel> = (<ASTLabelType>)adaptor.becomeRoot(stream_<rule>.nextNode(), root_<treeLevel>);
>>

rewriteNodeAction(action) ::= <<
adaptor.addChild(root_<treeLevel>, <action>);

```

```

>>

rewriteNodeActionRoot(action) ::= <<
root_<treeLevel> = (<ASTLabelType>)adaptor.becomeRoot(<action>, root_<treeLevel>);
>>

/** Gen $ruleLabel ... where defined via ruleLabel=rule */
rewriteRuleLabelRef(label) ::= <<
adaptor.addChild(root_<treeLevel>, stream_<label>.nextTree());
>>

/** Gen $ruleLabel ... where defined via ruleLabel+=rule */
rewriteRuleListLabelRef(label) ::= <<
adaptor.addChild(root_<treeLevel>, stream_<label>.nextTree());
>>

/** Gen ^($ruleLabel ...) where ruleLabel=rule */
rewriteRuleLabelRefRoot(label) ::= <<
root_<treeLevel> = (<ASTLabelType>)adaptor.becomeRoot(stream_<label>.nextNode(), root_<treeLevel>);
>>

/** Gen ^($ruleLabel ...) where ruleLabel+=rule */
rewriteRuleListLabelRefRoot(label) ::= <<
root_<treeLevel> = (<ASTLabelType>)adaptor.becomeRoot(stream_<label>.nextNode(), root_<treeLevel>);
>>

rewriteWildcardLabelRef(label) ::= <<
adaptor.addChild(root_<treeLevel>, stream_<label>.nextTree());
>>

createImaginaryNode(tokenType,args,terminalOptions={ }) ::= <%
<if(terminalOptions.node)>
<! new MethodNode(IDLabel, args) !>
new <terminalOptions.node>(<tokenType><if(args)>, <args; separator=", "><endif>)
<else>
(<ASTLabelType>)adaptor.create(<tokenType>, <args; separator=", "><if(!args)>"<tokenType>"<endif>)
<endif>
%>

createRewriteNodeFromElement(token,args,terminalOptions={ }) ::= <%
<if(terminalOptions.node)>
new <terminalOptions.node>(stream_<token>.nextToken(<if(args)>, <args; separator=", "><endif>)
<else>
<if(args)> <! must create new node from old !>
adaptor.create(<token>, <args; separator=", ">)
<else>
stream_<token>.nextNode()

```

<endif>

<endif>

%>

Found in path(s):

* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/codegen/templates/Java/AST.stg

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*/

/** Template subgroup to add template rewrite output

* If debugging, then you'll also get STDbg.stg loaded.

*/

```
@outputFile.imports() ::= <<
```

```
<@super.imports(>
```

```
import stringtemplate3
```

```
>>
```

/** Add this to each rule's return value struct */

```
@returnScope.ruleReturnInit() ::= <<
```

```
self.st = None
```

```
>>
```

```

@returnScope.ruleReturnMembers() ::= <<
def getTemplate(self):
    return self.st

def toString(self):
    if self.st is not None:
        return self.st.toString()
    return None
__str__ = toString

>>

@genericParser.init() ::= <<
<@super.init()>
self.templateLib = stringtemplate3.StringTemplateGroup(
    '<name>Templates', lexer='angle-bracket'
)

>>

@genericParser.members() ::= <<
<@super.members()>
def setTemplateLib(self, templateLib):
    self.templateLib = templateLib

def getTemplateLib(self):
    return self.templateLib

>>

/** x+=rule when output=template */
ruleRefAndListLabel(rule,label,elementIndex,args,scope) ::= <<
<ruleRef(...)>
<listLabel(label, {<label>.st})>
>>

rewriteTemplate(alts) ::= <<
# TEMPLATE REWRITE
<if(backtracking)>
if <actions.(actionScope).synpredgate>:
    <first(alts):rewriteTemplateAltFirst()>
    <rest(alts):{it | el<rewriteTemplateAlt(it)>}>
    <if(rewriteMode)><replaceTextInLine()><endif>

<else>
<first(alts):rewriteTemplateAltFirst()>
<rest(alts):{it | el<rewriteTemplateAlt(it)>}>

```



```
<if(rewriteMode)><replaceTextInLine()><endif>
<endif>
>>
```

```
replaceTextInLine() ::= <<
<if(TREE_PARSER)>
self.input.getTokenStream().replace(
  self.input.getTreeAdaptor().getTokenStartIndex(retval.start),
  self.input.getTreeAdaptor().getTokenStopIndex(retval.start),
  retval.st
)
<else>
self.input.replace(
  retval.start.getTokenIndex(),
  self.input.LT(-1).getTokenIndex(),
  retval.st
)
<endif>
>>
```

```
rewriteTemplateAltFirst(alt) ::= <<
<if(alt.pred)>
if <alt.pred>:
  # <alt.description>
  retval.st = <alt.alt>
<\n>
<else>
# <alt.description>
retval.st = <alt.alt>
<\n>
<endif>
>>
```

```
rewriteTemplateAlt(alt) ::= <<
<if(alt.pred)>if <alt.pred>:
  # <alt.description>
  retval.st = <alt.alt>
<\n>
<else>se:
  # <alt.description>
  retval.st = <alt.alt>
<\n>
<endif>
>>
```

```
rewriteEmptyTemplate(alts) ::= <<
None
>>
```

```

/** Invoke a template with a set of attribute name/value pairs.
 * Set the value of the rule's template *after* having set
 * the attributes because the rule's template might be used as
 * an attribute to build a bigger template; you get a self-embedded
 * template.
 */
rewriteExternalTemplate(name,args) ::= <%
self.templateLib.getInstanceOf("<name><if(args)>, attributes={<args:{a | "<a.name>": <a.value>}; separator=",
"><endif>")
%>

```

```

/** expr is a string expression that says what template to load */
rewriteIndirectTemplate(expr,args) ::= <%
self.templateLib.getInstanceOf(<expr><if(args)>, attributes={<args:{a | "<a.name>": <a.value>}; separator=",
"><endif>")
%>

```

```

/** Invoke an inline template with a set of attribute name/value pairs */
rewriteInlineTemplate(args, template) ::= <%
stringtemplate3.StringTemplate("<template>", group=self.templateLib<if(args)>, attributes={<args:{a |
"<a.name>": <a.value>}; separator=", "><endif>")
%>

```

```

/** plain -> {foo} action */
rewriteAction(action) ::= <<
<action>
>>

```

```

/** An action has %st.attrName=expr; or % {st}.attrName=expr; */
actionSetAttribute(st,attrName,expr) ::= <<
(<st>)[("<attrName>")] = <expr>
>>

```

```

/** Translate % {stringExpr} */
actionStringConstructor(stringExpr) ::= <<
stringtemplate3.StringTemplate(<stringExpr>, group=self.templateLib)
>>

```

Found in path(s):

```

* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-
jar/org/antlr/codegen/templates/Python3/ST.stg

```

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```

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```

```

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```

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```

```

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```
*/
```

```
/** Template subgroup to add template rewrite output
```

```
* If debugging, then you'll also get STDbg.stg loaded.
```

```
*/
```

```
@outputFile.imports() ::= <<
```

```
<@super.imports(>
```

```
import org.antlr.stringtemplate.*;
```

```
import org.antlr.stringtemplate.language.*;
```

```
import java.util.HashMap;
```

```
>>
```

```
/** Add this to each rule's return value struct */
```

```
@returnScope.ruleReturnMembers() ::= <<
```

```
public StringTemplate st;
```

```
public Object getTemplate() { return st; }
```

```
public String toString() { return st==null?null:st.toString(); }
```

```
>>
```

```
@genericParser.members() ::= <<
```

```
<@super.members(>
```

```
protected StringTemplateGroup templateLib =
```

```
new StringTemplateGroup("<name>Templates", AngleBracketTemplateLexer.class);
```

```
public void setTemplateLib(StringTemplateGroup templateLib) {
```

```
this.templateLib = templateLib;
```

```

}
public StringTemplateGroup getTemplateLib() {
    return templateLib;
}
/** allows convenient multi-value initialization:
 * "new STAttrMap().put(...).put(...)"
 */
@SuppressWarnings("serial")
public static class STAttrMap extends HashMap<String, Object> {
    public STAttrMap put(String attrName, Object value) {
        super.put(attrName, value);
        return this;
    }
}
>>

```

```

/** x+=rule when output=template */
ruleRefAndListLabel(rule,label,elementIndex,args,scope) ::= <<
<ruleRef(rule,label,elementIndex,args,scope)>
<listLabel(label, {<label>.getTemplate()})>
>>

```

```

rewriteTemplate(alts) ::= <<

```

```

// TEMPLATE REWRITE
<if(backtracking)>
if ( <actions.(actionScope).synpredgate> ) {
    <alts:rewriteTemplateAlt(); separator="else ">
    <if(rewriteMode)><replaceTextInLine()><endif>
}
<else>
<alts:rewriteTemplateAlt(); separator="else ">
<if(rewriteMode)><replaceTextInLine()><endif>
<endif>
>>

```

```

replaceTextInLine() ::= <<
<if(TREE_PARSER)>
((TokenRewriteStream)input.getTokenStream()).replace(
    input.getTreeAdaptor().getTokenStartIndex(retval.start),
    input.getTreeAdaptor().getTokenStopIndex(retval.start),
    retval.st);
<else>
((TokenRewriteStream)input).replace(
    ((Token)retval.start).getTokenIndex(),
    input.LT(-1).getTokenIndex(),
    retval.st);
<endif>

```

```
>>
```

```
rewriteTemplateAlt(alt) ::= <<  
// <alt.description>  
<if(alt.pred)>  
<if(alt.pred)> {  
  retval.st = <alt.alt>;  
}<\n>  
<else>  
{  
  retval.st = <alt.alt>;  
}<\n>  
<endif>  
>>
```

```
rewriteEmptyTemplate(alts) ::= <<  
null;  
>>
```

```
/** Invoke a template with a set of attribute name/value pairs.  
 * Set the value of the rule's template after having set  
 * the attributes because the rule's template might be used as  
 * an attribute to build a bigger template; you get a self-embedded  
 * template.  
 */
```

```
rewriteExternalTemplate(name,args) ::= <%  
templateLib.getInstanceOf("<name>"<if(args)>,  
  new STAttrMap()<args:{a | .put("<a.name>", <a.value>)}>  
<endif>)  
>%
```

```
/** expr is a string expression that says what template to load */  
rewriteIndirectTemplate(expr,args) ::= <%  
templateLib.getInstanceOf(<expr><if(args)>,  
  new STAttrMap()<args:{a | .put("<a.name>", <a.value>)}>  
<endif>)  
>%
```

```
/** Invoke an inline template with a set of attribute name/value pairs */  
rewriteInlineTemplate(args, template) ::= <%  
new StringTemplate(templateLib, "<template>"<if(args)>,  
  new STAttrMap()<args:{a | .put("<a.name>", <a.value>)}>  
<endif>)  
>%
```

```
/** plain -> {foo} action */  
rewriteAction(action) ::= <<  
<action>
```

>>

```
/** An action has %st.attrName=expr; or % {st}.attrName=expr; */  
actionSetAttribute(st,attrName,expr) ::= <<  
(<st>).setAttribute("<attrName>",<expr>);  
>>
```

```
/** Translate % {stringExpr} */  
actionStringConstructor(stringExpr) ::= <<  
new StringTemplate(templateLib,<stringExpr>)  
>>
```

Found in path(s):

* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/codegen/templates/Java/ST.stg
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```
*/
```

```
/** Templates for building ASTs during tree parsing.
```

```
*
```

```
* Deal with many combinations. Dimensions are:
```

```
* Auto build or rewrite
```

```

* no label, label, list label (label/no-label handled together)
* child, root
* token, set, rule, wildcard
*
* Each combination has its own template except that label/no label
* is combined into tokenRef, ruleRef, ...
*/

/** Add a variable to track last element matched */
ruleDeclarations() ::= <<
<super.ruleDeclarations()>
var _first_0:<ASTLabelType> = null;
var _last:<ASTLabelType> = null;<\n>
>>

/** What to emit when there is no rewrite rule. For auto build
* mode, does nothing.
*/
noRewrite(rewriteBlockLevel, treeLevel) ::= <<
<if(backtracking)>if ( <actions.(actionScope).synpredgate> ) {<endif>
<if(rewriteMode)>
retval.tree = <ASTLabelType>(_first_0);
if ( adaptor.getParent(retval.tree)!=null && adaptor.isNil( adaptor.getParent(retval.tree) ) )
    retval.tree = <ASTLabelType>(adaptor.getParent(retval.tree));
<endif>
<if(backtracking)>}<endif>
>>

/** match ^(root children) in tree parser; override here to
* add tree construction actions.
*/
tree(root, actionsAfterRoot, children, nullableChildList,
    enclosingTreeLevel, treeLevel) ::= <<
_last = <ASTLabelType>(input.LT(1));
{
var _save_last_<treeLevel>:<ASTLabelType> = _last;
var _first_<treeLevel>:<ASTLabelType> = null;
<if(!rewriteMode)>
var root_<treeLevel>:<ASTLabelType> = <ASTLabelType>(adaptor.nil());
<endif>
<root:element()>
<if(rewriteMode)>
<if(backtracking)>if ( <actions.(actionScope).synpredgate> )<endif>
<if(root.el.rule)>
if ( _first_<enclosingTreeLevel>==null ) _first_<enclosingTreeLevel> = <root.el.label>.tree;
<else>
if ( _first_<enclosingTreeLevel>==null ) _first_<enclosingTreeLevel> = <root.el.label>;
<endif>

```

```

<endif>
<actionsAfterRoot:element()>
<if(nullableChildList)>
if ( input.LA(1)==TokenConstants.DOWN ) {
    matchStream(input, TokenConstants.DOWN, null); <checkRuleBacktrackFailure()>
    <children:element()>
    matchStream(input, TokenConstants.UP, null); <checkRuleBacktrackFailure()>
}
<else>
matchStream(input, TokenConstants.DOWN, null); <checkRuleBacktrackFailure()>
<children:element()>
matchStream(input, TokenConstants.UP, null); <checkRuleBacktrackFailure()>
<endif>
<if(!rewriteMode)>
adaptor.addChild(root_<enclosingTreeLevel>, root_<treeLevel>);
<endif>
_last = _save_last_<treeLevel>;
}<\n>
>>

// TOKEN AST STUFF

/** ID! and output=AST (same as plain tokenRef) 'cept add
 * setting of _last
 */
tokenRefBang(token,label,elementIndex,terminalOptions) ::= <<
_last = <ASTLabelType>(input.LT(1));
<super.tokenRef(...)>
>>

/** ID auto construct */
tokenRef(token,label,elementIndex,terminalOptions) ::= <<
_last = <ASTLabelType>(input.LT(1));
<super.tokenRef(...)>
<if(!rewriteMode)>
<if(backtracking)>if ( <actions.(actionScope).synpredgate> ) {<endif>
<if(terminalOptions.node)>
<label>_tree = new <terminalOptions.node>(<label>);
<else>
<label>_tree = <ASTLabelType>(adaptor.dupNode(<label>));
<endif><\n>
adaptor.addChild(root_<treeLevel>, <label>_tree);
<if(backtracking)>}<endif>
<else> <! rewrite mode !>
<if(backtracking)>if ( <actions.(actionScope).synpredgate> )<endif>
if ( _first_<treeLevel>==null ) _first_<treeLevel> = <label>;
<endif>
>>

```



```

/** label+=TOKEN auto construct */
tokenRefAndListLabel(token,label,elementIndex,terminalOptions) ::= <<
<tokenRef(...)>
<listLabel(elem=label,...)>
>>

/** ^(ID ...) auto construct */
tokenRefRuleRoot(token,label,elementIndex,terminalOptions) ::= <<
_last = <ASTLabelType>(input.LT(1));
<super.tokenRef(...)>
<if(!rewriteMode)>
<if(backtracking)>if ( <actions.(actionScope).synpredgate> ) {<endif>
<if(terminalOptions.node)>
<label>_tree = new <terminalOptions.node>(<label>);
<else>
<label>_tree = <ASTLabelType>(adaptor.dupNode(<label>));
<endif><\n>
root_<treeLevel> = <ASTLabelType>(adaptor.becomeRoot(<label>_tree, root_<treeLevel>));
<if(backtracking)>}<endif>
<endif>
>>

/** Match ^(label+=TOKEN ...) auto construct */
tokenRefRuleRootAndListLabel(token,label,elementIndex,terminalOptions) ::= <<
<tokenRefRuleRoot(...)>
<listLabel(elem=label,...)>
>>

/** Match . wildcard and auto dup the node/subtree */
wildcard(token,label,elementIndex,terminalOptions) ::= <<
_last = (<ASTLabelType>)input.LT(1);
<super.wildcard(...)>
<if(!rewriteMode)>
<if(backtracking)>if ( <actions.(actionScope).synpredgate> ) {<endif>
<label>_tree = (<ASTLabelType>)adaptor.dupTree(<label>);
adaptor.addChild(root_<treeLevel>, <label>_tree);
<if(backtracking)>}<endif>
<else> <! rewrite mode !>
<if(backtracking)>if ( <actions.(actionScope).synpredgate> )<endif>
if ( _first_<treeLevel>==null ) _first_<treeLevel> = <label>;
<endif>
>>

// SET AST

matchSet(s,label,terminalOptions,elementIndex,postmatchCode) ::= <<
_last = <ASTLabelType>(input.LT(1));

```

```

<super.matchSet(postmatchCode={
<if(!rewriteMode)>
<if(backtracking)>if ( <actions.(actionScope).synpredgate> ) {<endif>
<if(terminalOptions.node)>
<label>_tree = new <terminalOptions.node>(<label>);
<else>
<label>_tree = <ASTLabelType>(adaptor.dupNode(<label>));
<endif><\n>
adaptor.addChild(root_<treeLevel>, <label>_tree);
<if(backtracking)>\}<endif>
<endif>
}, ...
)>
>>

matchRuleBlockSet(s,label,terminalOptions,elementIndex,postmatchCode,treeLevel="0") ::= <<
<matchSet(...)>
<noRewrite(...)> <! set return tree !>
>>

matchSetBang(s,label,terminalOptions,elementIndex,postmatchCode) ::= <<
_last = <ASTLabelType>(input.LT(1));
<super.matchSet(...)>
>>

matchSetRuleRoot(s,label,terminalOptions,elementIndex,debug) ::= <<
<super.matchSet(postmatchCode={
<if(!rewriteMode)>
<if(backtracking)>if ( <actions.(actionScope).synpredgate> ) {<endif>
<if(terminalOptions.node)>
<label>_tree = new <terminalOptions.node>(<label>);
<else>
<label>_tree = <ASTLabelType>(adaptor.dupNode(<label>));
<endif><\n>
root_<treeLevel> = <ASTLabelType>(adaptor.becomeRoot(<label>_tree, root_<treeLevel>));
<if(backtracking)>}<endif>
<endif>
}, ...
)>
>>

// RULE REF AST

/** rule auto construct */
ruleRef(rule,label,elementIndex,args,scope) ::= <<
_last = <ASTLabelType>(input.LT(1));
<super.ruleRef(...)>
<if(backtracking)>if ( <actions.(actionScope).synpredgate> ) <endif>

```

```

<if(!rewriteMode)>
adaptor.addChild(root_<treeLevel>, <label>.tree);
<else> <! rewrite mode !>
if ( _first_<treeLevel>==null ) _first_<treeLevel> = <label>.tree;
<endif>
>>

/** x+=rule auto construct */
ruleRefAndListLabel(rule,label,elementIndex,args,scope) ::= <<
<ruleRef(...)>
<listLabel(label, {<label>.tree })>
>>

/** ^(rule ...) auto construct */
ruleRefRuleRoot(rule,label,elementIndex,args,scope) ::= <<
_last = <ASTLabelType>(input.LT(1));
<super.ruleRef(...)>
<if(!rewriteMode)>
<if(backtracking)>if ( <actions.(actionScope).synpredgate> ) <endif>root_<treeLevel> =
<ASTLabelType>(adaptor.becomeRoot(<label>.tree, root_<treeLevel>));
<endif>
>>

/** ^(x+=rule ...) auto construct */
ruleRefRuleRootAndListLabel(rule,label,elementIndex,args,scope) ::= <<
<ruleRefRuleRoot(...)>
<listLabel(label, {<label>.tree })>
>>

/** rule when output=AST and tracking for rewrite */
ruleRefTrack(rule,label,elementIndex,args,scope) ::= <<
_last = <ASTLabelType>(input.LT(1));
<super.ruleRefTrack(...)>
>>

/** x+=rule when output=AST and tracking for rewrite */
ruleRefTrackAndListLabel(rule,label,elementIndex,args,scope) ::= <<
_last = <ASTLabelType>(input.LT(1));
<super.ruleRefTrackAndListLabel(...)>
>>

/** ^(rule ...) rewrite */
ruleRefRuleRootTrack(rule,label,elementIndex,args,scope) ::= <<
_last = <ASTLabelType>(input.LT(1));
<super.ruleRefRootTrack(...)>
>>

/** ^(x+=rule ...) rewrite */

```

```

ruleRefRuleRootTrackAndListLabel(rule,label,elementIndex,args,scope) ::= <<
  _last = <ASTLabelType>(input.LT(1));
  <super.ruleRefRuleRootTrackAndListLabel(...)>
>>

```

```

/** Streams for token refs are tree nodes now; override to
 * change nextToken to nextNode.
 */
createRewriteNodeFromElement(token,terminalOptions,scope) ::= <<
  <if(terminalOptions.node)>
  new <terminalOptions.node>(stream_<token>.nextNode())
  <else>
  stream_<token>.nextNode()
  <endif>
>>

```

```

ruleCleanup() ::= <<
  <super.ruleCleanup()>
  <if(!rewriteMode)>
  <if(backtracking)>if ( <actions.(actionScope).synpredgate> ) {<\n><endif>
  retval.tree = <ASTLabelType>(adaptor.rulePostProcessing(root_0));
  <if(backtracking)>}<endif>
  <endif>
>>

```

Found in path(s):

```

* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-
jar/org/antlr/codegen/templates/ActionScript/ASTTreeParser.stg
No license file was found, but licenses were detected in source scan.

```

```

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*/

/** Templates for building ASTs during tree parsing.

*

* Deal with many combinations. Dimensions are:

* Auto build or rewrite

* no label, label, list label (label/no-label handled together)

* child, root

* token, set, rule, wildcard

*

* Each combination has its own template except that label/no label

* is combined into tokenRef, ruleRef, ...

*/

group ASTTreeParser;

/** Add a variable to track last element matched */

ruleDeclarations() ::= <<

<super.ruleDeclarations()>

_First[0] := nil;

_Last := nil;<\n>

>>

ruleDeclarationVars() ::= <<

<super.ruleDeclarationVars()>

_First, _Save_Last: array [0..63] of I<ASTLabelType>;

_Last: I<ASTLabelType>;

>>

/** What to emit when there is no rewrite rule. For auto build

* mode, does nothing.

*/

noRewrite(rewriteBlockLevel, treeLevel) ::= <<

<if(backtracking)>if (State.Backtracking = 0) then

begin<endif>

<if(rewriteMode)>

RetVal.Tree := _First[0] as I<ASTLabelType>;

if (Adaptor.GetParent(RetVal.Tree) \<\> nil) and (Adaptor.IsNil(Adaptor.GetParent(RetVal.Tree))) then

```

RetVal.Tree := Adaptor.GetParent(RetVal.Tree) as I<ASTLabelType>;
<endif>
<if(backtracking)>end;<endif>
>>

/** match ^(root children) in tree parser; override here to
 * add tree construction actions.
 */
tree(root, actionsAfterRoot, children, nullableChildList,
      enclosingTreeLevel, treeLevel) ::= <<
_Last := Input.LT(1) as I<ASTLabelType>;
begin
_Save_Last[<treeLevel>] := _Last;
_First[<treeLevel>] := nil;
<if(!rewriteMode)>
Root[<treeLevel>] := Adaptor.GetNilNode as I<ASTLabelType>;<\n>
<endif>
<root:element()>
<if(rewriteMode)>
<if(backtracking)>if (State.Backtracking = 0) then <endif>
<if(root.el.rule)>
if (_First[<enclosingTreeLevel>] = nil) then _First[<enclosingTreeLevel>] := <root.el.label>.Tree;
<else>
if (_First[<enclosingTreeLevel>] = nil) then _First[<enclosingTreeLevel>] := <root.el.label>;
<endif>
<endif>
<actionsAfterRoot:element()>
<if(nullableChildList)>
if (Input.LA(1) = TToken.DOWN) then
begin
Match(Input, TToken.DOWN, nil); <checkRuleBacktrackFailure()>
<children:element()>
Match(Input, TToken.UP, nil); <checkRuleBacktrackFailure()>
end;
<else>
Match(Input, TToken.DOWN, nil); <checkRuleBacktrackFailure()>
<children:element()>
Match(Input, TToken.UP, nil); <checkRuleBacktrackFailure()>
<endif>
<if(!rewriteMode)>
Adaptor.AddChild(Root[<enclosingTreeLevel>], Root[<treeLevel>]);
<endif>
_Last := _Save_Last[<treeLevel>];
end;<\n>
>>

// TOKEN AST STUFF

```

```

/** ID! and output=AST (same as plain tokenRef) 'cept add
 * setting of _last
 */
tokenRefBang(token,label,elementIndex) ::= <<
_Last := Input.LT(1) as I<ASTLabelType>;
<super.tokenRef(...)>
>>

/** ID auto construct */
tokenRef(token,label,elementIndex,terminalOptions) ::= <<
_Last := Input.LT(1) as I<ASTLabelType>;
<super.tokenRef(...)>
<if(!rewriteMode)>
<if(backtracking)>
if (State.Backtracking = 0) then
begin<\n>
<endif>
<if(terminalOptions.node)>
<label>_tree := T<terminalOptions.node>.Create(<label>);
<else>
<label>_tree := Adaptor.DupNode(<label>) as I<ASTLabelType>;
<endif><\n>
Adaptor.AddChild(Root[<treeLevel>], <label>_tree);
<if(backtracking)>
end;
<endif>
<else> <! rewrite mode !>
<if(backtracking)>if (State.Backtracking = 0) then <endif>
if (_First[<treeLevel>] = nil) then _First[<treeLevel>] := <label>;
<endif>
>>

/** label+=TOKEN auto construct */
tokenRefAndListLabel(token,label,elementIndex,terminalOptions) ::= <<
<tokenRef(...)>
<listLabel(elem=label,...)>
>>

/** ^(ID ...) auto construct */
tokenRefRuleRoot(token,label,elementIndex,terminalOptions) ::= <<
_Last := Input.LT(1) as I<ASTLabelType>;
<super.tokenRef(...)>
<if(!rewriteMode)>
<if(backtracking)>
if (State.Backtracking = 0) then
begin
<endif>
<if(terminalOptions.node)>

```

```

<label>_tree := T<terminalOptions.node>.Create(<label>);
<else>
<label>_tree := Adaptor.DupNode(<label>) as I<ASTLabelType>;
<endif><\n>
Root[<treeLevel>] := Adaptor.BecomeRoot(<label>_tree, Root[<treeLevel>]) as I<ASTLabelType>;
<if(backtracking)>
end;
<endif>
<endif>
>>

```

```

/** Match ^(label+=TOKEN ...) auto construct */
tokenRefRuleRootAndListLabel(token,label,elementIndex,terminalOptions) ::= <<
<tokenRefRuleRoot(...)>
<listLabel(elem=label,...)>
>>

```

```
// SET AST
```

```

matchSet(s,label,terminalOptions,elementIndex,postmatchCode) ::= <<
_Llast := Input.LT(1) as I<ASTLabelType>;
<super.matchSet(..., postmatchCode={
<if(!rewriteMode)>
<if(backtracking)>if (State.Backtracking = 0) then begin <endif>
<if(terminalOptions.node)>
<label>_tree := T<terminalOptions.node>.Create(<label>);
<else>
<label>_tree := Adaptor.DupNode(<label>) as I<ASTLabelType>;
<endif><\n>
Adaptor.AddChild(Root[<treeLevel>], <label>_tree);
<if(backtracking)>end;<endif>
<endif>
}
)>
>>

```

```

matchRuleBlockSet(s,label,terminalOptions,elementIndex,postmatchCode,treeLevel="0") ::= <<
<matchSet(...)>
<noRewrite()> <! set return tree !>
>>

```

```

matchSetBang(s,label,elementIndex,postmatchCode) ::= <<
_Last := Input.LT(1) as I<ASTLabelType>;
<super.matchSet(...)>
>>

```

```

matchSetRuleRoot(s,label,terminalOptions,elementIndex,debug) ::= <<
<super.matchSet(..., postmatchCode={

```



```

<if(!rewriteMode)>
<if(backtracking)>if (State.Backtracking = 0) then begin <endif>
<if(terminalOptions.node)>
<label>_tree := T<terminalOptions.node>.Create(<label>);
<else>
<label>_tree := Adaptor.DupNode(<label>) as I<ASTLabelType>;
<endif><\n>
Root[<treeLevel>] := Adaptor.BecomeRoot(<label>_tree, Root[<treeLevel>]) as I<ASTLabelType>;
<if(backtracking)>end;<endif>
<endif>
}
)>
>>

```

```
// RULE REF AST
```

```

/** rule auto construct */
ruleRef(rule,label,elementIndex,args,scope) ::= <<
_Last := Input.LT(1) as I<ASTLabelType>;
<super.ruleRef(...)>
<if(backtracking)>if (State.Backtracking = 0) then <endif>
<if(!rewriteMode)>
Adaptor.AddChild(Root[<treeLevel>], <label>.Tree);
<else> <! rewrite mode !>
if (_First[<treeLevel>] = nil) then _First[<treeLevel>] := <label>.Tree;
<endif>
>>

```

```

/** x+=rule auto construct */
ruleRefAndListLabel(rule,label,elementIndex,args,scope) ::= <<
<ruleRef(...)>
<listLabel(elem=label+".Tree",...)>
>>

```

```

/** ^(rule ...) auto construct */
ruleRefRuleRoot(rule,label,elementIndex,args,scope) ::= <<
_Last := Input.LT(1) as I<ASTLabelType>;
<super.ruleRef(...)>
<if(!rewriteMode)>
<if(backtracking)>if (State.Backtracking = 0) then <endif>Root[<treeLevel>] :=
Adaptor.BecomeRoot(<label>.Tree, Root[<treeLevel>]) as I<ASTLabelType>;
<endif>
>>

```

```

/** ^(x+=rule ...) auto construct */
ruleRefRuleRootAndListLabel(rule,label,elementIndex,args,scope) ::= <<
<ruleRefRuleRoot(...)>
<listLabel(elem=label+".Tree",...)>

```

```

>>

/** rule when output=AST and tracking for rewrite */
ruleRefTrack(rule,label,elementIndex,args,scope) ::= <<
  _Last := Input.LT(1) as I<ASTLabelType>;
  <super.ruleRefTrack(...)>
>>

/** x+=rule when output=AST and tracking for rewrite */
ruleRefTrackAndListLabel(rule,label,elementIndex,args,scope) ::= <<
  _Last := Input.LT(1) as I<ASTLabelType>;
  <super.ruleRefTrackAndListLabel(...)>
>>

/** ^(rule ...) rewrite */
ruleRefRuleRootTrack(rule,label,elementIndex,args,scope) ::= <<
  _Last := Input.LT(1) as I<ASTLabelType>;
  <super.ruleRefRootTrack(...)>
>>

/** ^(x+=rule ...) rewrite */
ruleRefRuleRootTrackAndListLabel(rule,label,elementIndex,args,scope) ::= <<
  _Last := Input.LT(1) as I<ASTLabelType>;
  <super.ruleRefRuleRootTrackAndListLabel(...)>
>>

/** Streams for token refs are tree nodes now; override to
 * change nextToken to nextNode.
 */
createRewriteNodeFromElement(token,terminalOptions,scope) ::= <<
  <if(terminalOptions.node)>
  T<terminalOptions.node>.Create((Locals['Stream_<token>'] as IRewriteRuleElementStream).NextNode)
  <else>
  (Locals['Stream_<token>'] as IRewriteRuleElementStream).NextNode
  <endif>
>>

ruleCleanUp() ::= <<
  <super.ruleCleanUp()>
  <if(!rewriteMode)>
  <if(backtracking)>
  if (State.Backtracking = 0) then
  begin<\n>
  <endif>
  RetVal.Tree := Adaptor.RulePostProcessing(Root[0]) as I<ASTLabelType>;
  <if(backtracking)>
  end;
  <endif>

```

<endif>

>>

Found in path(s):

* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/codegen/templates/Delphi/ASTTreeParser.stg

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*

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*/

/** Templates for building ASTs during tree parsing.

*

* Deal with many combinations. Dimensions are:

* Auto build or rewrite

* no label, label, list label (label/no-label handled together)

* child, root

* token, set, rule, wildcard

*

```

* Each combination has its own template except that label/no label
* is combined into tokenRef, ruleRef, ...
*/

```

```

/** Add a variable to track last element matched */
ruleDeclarations() ::= <<
<super.ruleDeclarations()>
<if(!ruleDescriptor.isSynPred)>
<ASTLabelType> _first_0 = default(<ASTLabelType>);
<ASTLabelType> _last = default(<ASTLabelType>);
<endif>
>>

```

```

/** What to emit when there is no rewrite rule. For auto build
* mode, does nothing.
*/
noRewrite(rewriteBlockLevel=false, treeLevel=false) ::= <<
<if(!ruleDescriptor.isSynPred)>
<if(backtracking)>if (<actions.(actionScope).synpredgate>) {<endif>
<if(rewriteMode)>
retval.Tree = (<ASTLabelType>)_first_0;
if (adaptor.GetParent(retval.Tree)!=null && adaptor.IsNil(adaptor.GetParent(retval.Tree)))
retval.Tree = (<ASTLabelType>)adaptor.GetParent(retval.Tree);
<endif>
<if(backtracking)>}<endif>
<endif>
>>

```

```

/** match ^(root children) in tree parser; override here to
* add tree construction actions.
*/
tree(root, actionsAfterRoot, children, nullableChildList,
enclosingTreeLevel, treeLevel) ::= <<
<if(!ruleDescriptor.isSynPred)>
_last = (<ASTLabelType>)input.LT(1);
{
<ASTLabelType> _save_last_<treeLevel> = _last;
<ASTLabelType> _first_<treeLevel> = default(<ASTLabelType>);
<if(!rewriteMode)>
<ASTLabelType> root_<treeLevel> = (<ASTLabelType>)adaptor.Nil();
<endif>
<root:element()>
<if(rewriteMode)>
<if(backtracking)>if (<actions.(actionScope).synpredgate>)<endif>
<if(root.el.rule)>
if (_first_<enclosingTreeLevel> == null) _first_<enclosingTreeLevel> = <root.el.label>.Tree;
<else>
if (_first_<enclosingTreeLevel> == null) _first_<enclosingTreeLevel> = <root.el.label>;

```

```

<endif>
<endif>
<actionsAfterRoot:element()>
<if(nullableChildList)>
if (input.LA(1) == TokenType.Down) {
    Match(input, TokenType.Down, null); <checkRuleBacktrackFailure()>
    <children:element()>
    Match(input, TokenType.Up, null); <checkRuleBacktrackFailure()>
}
<else>
Match(input, TokenType.Down, null); <checkRuleBacktrackFailure()>
<children:element()>
Match(input, TokenType.Up, null); <checkRuleBacktrackFailure()>
<endif>
<if(!rewriteMode)>
adaptor.AddChild(root_<enclosingTreeLevel>, root_<treeLevel>);
<endif>
_last = _save_last_<treeLevel>;
}
<else>
<super.tree(...)>
<endif>
>>

// TOKEN AST STUFF

/** ID! and output=AST (same as plain tokenRef) 'cept add
 * setting of _last
 */
tokenRefBang(token,label,elementIndex,terminalOptions) ::= <<
<if(!ruleDescriptor.isSynPred)>
_last = (<ASTLabelType>)input.LT(1);
<super.tokenRef(...)>
<else>
<super.tokenRefBang(...)>
<endif>
>>

/** ID auto construct */
tokenRef(token,label,elementIndex,terminalOptions) ::= <<
<if(!ruleDescriptor.isSynPred)>
_last = (<ASTLabelType>)input.LT(1);
<super.tokenRef(...)>
<if(!rewriteMode)>
<if(backtracking)>if (<actions.(actionScope).synpredgate>) {<endif>
<if(terminalOptions.node)>
<label>_tree = new
<terminalOptions.node>(<if(terminalOptions.type)><terminalOptions.type>,<endif><label><if(terminalOptions.tex

```

```

t)>,<terminalOptions.text; format="string"><endif>;
<else>
<label>_tree =
(<ASTLabelType>)adaptor.DupNode(<if(terminalOptions.type)><terminalOptions.type>,<endif><label><if(terminalOptions.text)>,<terminalOptions.text; format="string"><endif>;
<endif><\n>
adaptor.AddChild(root_<treeLevel>, <label>_tree);
<if(backtracking)>}<endif>
<else> <! rewrite mode !>
<if(backtracking)>if (<actions.(actionScope).synpredgate>)<endif>
if (_first_<treeLevel> == null) _first_<treeLevel> = <label>;
<endif>
<else>
<super.tokenRef(...)>
<endif>
>>

/** label+=TOKEN auto construct */
tokenRefAndListLabel(token,label,elementIndex,terminalOptions) ::= <<
<if(!ruleDescriptor.isSynPred)>
<tokenRef(...)>
<listLabelElem(elem=label,...)>
<else>
<super.tokenRefAndListLabel(...)>
<endif>
>>

/** ^(ID ...) auto construct */
tokenRefRuleRoot(token,label,elementIndex,terminalOptions) ::= <<
<if(!ruleDescriptor.isSynPred)>
_last = (<ASTLabelType>)input.LT(1);
<super.tokenRef(...)>
<if(!rewriteMode)>
<if(backtracking)>if (<actions.(actionScope).synpredgate>) {<endif>
<if(terminalOptions.node)>
<label>_tree = new
<terminalOptions.node>(<if(terminalOptions.type)><terminalOptions.type>,<endif><label><if(terminalOptions.text)>,<terminalOptions.text; format="string"><endif>;
<else>
<label>_tree =
(<ASTLabelType>)adaptor.DupNode(<if(terminalOptions.type)><terminalOptions.type>,<endif><label><if(terminalOptions.text)>,<terminalOptions.text; format="string"><endif>;
<endif><\n>
root_<treeLevel> = (<ASTLabelType>)adaptor.BecomeRoot(<label>_tree, root_<treeLevel>);
<if(backtracking)>}<endif>
<endif>
<else>
<super.tokenRefRuleRoot(...)>

```

```

<endif>
>>

/** Match ^(label+=TOKEN ...) auto construct */
tokenRefRuleRootAndListLabel(token,label,elementIndex,terminalOptions) ::= <<
<if(!ruleDescriptor.isSynPred)>
<tokenRefRuleRoot(...)>
<listLabelElem(elem=label,...)>
<else>
<super.tokenRefRuleRootAndListLabel(...)>
<endif>
>>

/** Match . wildcard and auto dup the node/subtree */
wildcard(token,label,elementIndex,terminalOptions) ::= <<
<if(!ruleDescriptor.isSynPred)>
_last = (<ASTLabelType>)input.LT(1);
<super.wildcard(...)>
<if(!rewriteMode)>
<if(backtracking)>if (<actions.(actionScope).synpredgate>) {<endif>
<label>_tree = (<ASTLabelType>)adaptor.DupTree(<label>);
adaptor.AddChild(root_<treeLevel>, <label>_tree);
<if(backtracking)>}<endif>
<else> <! rewrite mode !>
<if(backtracking)>if (<actions.(actionScope).synpredgate>)<endif>
if (_first_<treeLevel> == null) _first_<treeLevel> = <label>;
<endif>
<else>
<super.wildcard(...)>
<endif>
>>

// SET AST

matchSet(s,label,terminalOptions,elementIndex,postmatchCode) ::= <<
<if(!ruleDescriptor.isSynPred)>
_last = (<ASTLabelType>)input.LT(1);
<super.matchSet(postmatchCode={
<if(!rewriteMode)>
<if(backtracking)>if (<actions.(actionScope).synpredgate>) {<endif>
<if(terminalOptions.node)>
<label>_tree = new
<terminalOptions.node><(if(terminalOptions.type)><terminalOptions.type>,<endif><label><(if(terminalOptions.tex
t)>,<terminalOptions.text; format="string"><endif>);
<else>
<label>_tree =
(<ASTLabelType>)adaptor.DupNode(<(if(terminalOptions.type)><terminalOptions.type>,<endif><label><(termin
alOptions.text)>,<terminalOptions.text; format="string"><endif>);

```

```

<endif><\n>
adaptor.AddChild(root_<treeLevel>, <label>_tree);
<if(backtracking)>\}<endif>
<endif>
}, ...
)>
<else>
<super.matchSet(...)>
<endif>
>>

matchRuleBlockSet(s,label,terminalOptions,elementIndex,postmatchCode,treeLevel="0") ::= <<
<if(!ruleDescriptor.isSynPred)>
<matchSet(...)>
<noRewrite(...)> <! set return tree !>
<else>
<super.matchRuleBlockSet(...)>
<endif>
>>

matchSetBang(s,label,terminalOptions,elementIndex,postmatchCode) ::= <<
<if(!ruleDescriptor.isSynPred)>
_last = (<ASTLabelType>)input.LT(1);
<super.matchSet(...)>
<else>
<super.matchSetBang(...)>
<endif>
>>

matchSetRuleRoot(s,label,terminalOptions,elementIndex,debug) ::= <<
<if(!ruleDescriptor.isSynPred)>
<super.matchSet(postmatchCode={
<if(!rewriteMode)>
<if(backtracking)>if (<actions.(actionScope).synpredgate>) {<endif>
<if(terminalOptions.node)>
<label>_tree = new
<terminalOptions.node>(<if(terminalOptions.type)><terminalOptions.type>,<endif><label><if(terminalOptions.tex
t)>,<terminalOptions.text; format="string"><endif>);
<else>
<label>_tree =
(<ASTLabelType>)adaptor.DupNode(<if(terminalOptions.type)><terminalOptions.type>,<endif><label><if(termin
alOptions.text)>,<terminalOptions.text; format="string"><endif>);
<endif><\n>
root_<treeLevel> = (<ASTLabelType>)adaptor.BecomeRoot(<label>_tree, root_<treeLevel>);
<if(backtracking)>\}<endif>
<endif>
}, ...
)>

```



```

<else>
<super.matchSetRuleRoot(...)>
<endif>
>>

// RULE REF AST

/** rule auto construct */
ruleRef(rule,label,elementIndex,args,scope) ::= <<
<if(!ruleDescriptor.isSynPred)>
_last = (<ASTLabelType>)input.LT(1);
<super.ruleRef(...)>
<if(backtracking)>if (<actions.(actionScope).synpredgate>)<endif>
<if(!rewriteMode)>
adaptor.AddChild(root_<treeLevel>, <label>.Tree);
<else> <! rewrite mode !>
if (_first_<treeLevel> == null) _first_<treeLevel> = <label>.Tree;
<endif>
<else>
<super.ruleRef(...)>
<endif>
>>

/** x+=rule auto construct */
ruleRefAndListLabel(rule,label,elementIndex,args,scope) ::= <<
<if(!ruleDescriptor.isSynPred)>
<ruleRef(...)>
<listLabelElem(elem={<label>.Tree},...)>
<else>
<super.ruleRefAndListLabel(...)>
<endif>
>>

/** ^(rule ...) auto construct */
ruleRefRuleRoot(rule,label,elementIndex,args,scope) ::= <<
<if(!ruleDescriptor.isSynPred)>
_last = (<ASTLabelType>)input.LT(1);
<super.ruleRef(...)>
<if(!rewriteMode)>
<if(backtracking)>if (<actions.(actionScope).synpredgate>) <endif>root_<treeLevel> =
(<ASTLabelType>)adaptor.BecomeRoot(<label>.Tree, root_<treeLevel>);
<endif>
<else>
<super.ruleRefRuleRoot(...)>
<endif>
>>

/** ^(x+=rule ...) auto construct */

```

```

ruleRefRuleRootAndListLabel(rule,label,elementIndex,args,scope) ::= <<
<if(!ruleDescriptor.isSynPred)>
<ruleRefRuleRoot(...)>
<listLabelElem(elem={<label>.Tree},...)>
<else>
<super.ruleRefRuleRootAndListLabel(...)>
<endif>
>>

/** rule when output=AST and tracking for rewrite */
ruleRefTrack(rule,label,elementIndex,args,scope) ::= <<
_last = (<ASTLabelType>)input.LT(1);
<super.ruleRefTrack(...)>
>>

/** x+=rule when output=AST and tracking for rewrite */
ruleRefTrackAndListLabel(rule,label,elementIndex,args,scope) ::= <<
<if(!ruleDescriptor.isSynPred)>
_last = (<ASTLabelType>)input.LT(1);
<super.ruleRefTrackAndListLabel(...)>
<else>
<super.ruleRefTrackAndListLabel(...)>
<endif>
>>

/** ^(rule ...) rewrite */
ruleRefRuleRootTrack(rule,label,elementIndex,args,scope) ::= <<
<if(!ruleDescriptor.isSynPred)>
_last = (<ASTLabelType>)input.LT(1);
<super.ruleRefRootTrack(...)>
<else>
<super.ruleRefRuleRootTrack(...)>
<endif>
>>

/** ^(x+=rule ...) rewrite */
ruleRefRuleRootTrackAndListLabel(rule,label,elementIndex,args,scope) ::= <<
<if(!ruleDescriptor.isSynPred)>
_last = (<ASTLabelType>)input.LT(1);
<super.ruleRefRuleRootTrackAndListLabel(...)>
<else>
<super.ruleRefRuleRootTrackAndListLabel(...)>
<endif>
>>

/** Streams for token refs are tree nodes now; override to
* change NextToken to NextNode.
*/

```

```

createRewriteNodeFromElement(token,terminalOptions,args) ::= <%
<if(terminalOptions.node)>
new
<terminalOptions.node>(<if(terminalOptions.type)><terminalOptions.type>,<endif>stream_<token>.NextNode())
<else>
stream_<token>.NextNode()
<endif>
%>

```

```

ruleCleanup() ::= <<
<super.ruleCleanup()>
<if(!ruleDescriptor.isSynPred)>
<if(!rewriteMode)>
<if(backtracking)>if (<actions.(actionScope).synpredgate>) {<endif>
retval.Tree = (<ASTLabelType>)adaptor.RulePostProcessing(root_0);
<if(backtracking)>}<endif>
<endif>
<endif>
>>

```

Found in path(s):

```
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-
jar/org/antlr/codegen/templates/CSharp3/ASTTreeParser.stg
```

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```
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```

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*/

/** Templates for building ASTs during tree parsing.

*

* Deal with many combinations. Dimensions are:

* Auto build or rewrite

* no label, label, list label (label/no-label handled together)

* child, root

* token, set, rule, wildcard

*

* Each combination has its own template except that label/no label

* is combined into tokenRef, ruleRef, ...

*/

finishedBacktracking(block) ::= <<

<if(backtracking)>

if <actions.(actionScope).synpredgate>:

 <block>

<else>

<block>

<endif>

>>

/** Add a variable to track last element matched */

ruleDeclarations() ::= <<

<super.ruleDeclarations()>

 _first_0 = None

 _last = None<\n>

>>

/** What to emit when there is no rewrite rule. For auto build

* mode, does nothing.

*/

noRewrite(rewriteBlockLevel, treeLevel) ::= <<

<finishedBacktracking({

<if(rewriteMode)>

 retval.tree = _first_0

 if self._adaptor.getParent(retval.tree) is not None and self._adaptor.isNil(self._adaptor.getParent(retval.tree)):

 retval.tree = self._adaptor.getParent(retval.tree)

<endif>

 })>

>>

/** match ^(root children) in tree parser; override here to

* add tree construction actions.

```

*/
tree(root, actionsAfterRoot, children, nullableChildList,
  enclosingTreeLevel, treeLevel) ::= <<
  _last = self.input.LT(1)
  _save_last_<treeLevel> = _last
  _first_<treeLevel> = None
  <if(!rewriteMode)>
  root_<treeLevel> = self._adaptor.nil()<\n>
  <endif>
  <root:element()>
  <if(rewriteMode)>
  <finishedBacktracking({
  <if(root.el.rule)>
  if _first_<enclosingTreeLevel> is None:
    _first_<enclosingTreeLevel> = <root.el.label>.tree<\n>
  <else>
  if _first_<enclosingTreeLevel> is None:
    _first_<enclosingTreeLevel> = <root.el.label><\n>
  <endif>
  })>
  <endif>
  <actionsAfterRoot:element()>
  <if(nullableChildList)>
  if self.input.LA(1) == DOWN:
    self.match(self.input, DOWN, None)
    <children:element()>
    self.match(self.input, UP, None)

  <else>
  self.match(self.input, DOWN, None)
  <children:element()>
  self.match(self.input, UP, None)<\n>
  <endif>
  <if(!rewriteMode)>
  self._adaptor.addChild(root_<enclosingTreeLevel>, root_<treeLevel>)<\n>
  <endif>
  _last = _save_last_<treeLevel>

  >>

// TOKEN AST STUFF

/** ID! and output=AST (same as plain tokenRef) 'cept add
 * setting of _last
 */
tokenRefBang(token,label,elementIndex,terminalOptions={ }) ::= <<
  _last = self.input.LT(1)
  <super.tokenRef(...)>

```

>>

```
/** ID auto construct */
tokenRef(token,label,elementIndex,terminalOptions={}) ::= <<
  _last = self.input.LT(1)
  <super.tokenRef(...)>
  <if(!rewriteMode)>
  <finishedBacktracking({
  <if(terminalOptions.node)>
  <label>_tree = <terminalOptions.node>(<label>)
  <else>
  <label>_tree = self._adaptor.dupNode(<label>)
  <endif><\n>
  self._adaptor.addChild(root_<treeLevel>, <label>_tree)
  })>
  <else> <! rewrite mode !>
  <finishedBacktracking({
  if _first_<treeLevel> is None:
    _first_<treeLevel> = <label><\n>
  })>
  <endif>
>>
```

```
/** label+=TOKEN auto construct */
tokenRefAndListLabel(token,label,elementIndex,terminalOptions={}) ::= <<
  <tokenRef(...)>
  <listLabel(elem=label,...)>
>>
```

```
/** ^(ID ...) auto construct */
tokenRefRuleRoot(token,label,elementIndex,terminalOptions={}) ::= <<
  _last = self.input.LT(1)
  <super.tokenRef(...)>
  <if(!rewriteMode)>
  <finishedBacktracking({
  <if(terminalOptions.node)>
  <label>_tree = <terminalOptions.node>(<label>)
  <else>
  <label>_tree = self._adaptor.dupNode(<label>)
  <endif><\n>
  root_<treeLevel> = self._adaptor.becomeRoot(<label>_tree, root_<treeLevel>)
  })>
  <endif>
>>
```

```
/** Match ^(label+=TOKEN ...) auto construct */
tokenRefRuleRootAndListLabel(token,label,elementIndex,terminalOptions={}) ::= <<
  <tokenRefRuleRoot(...)>
```

```

<listLabel(elem=label,...)>
>>

/** Match . wildcard and auto dup the node/subtree */
wildcard(token,label,elementIndex,terminalOptions={ }) ::= <<
  _last = self.input.LT(1)
  <super.wildcard(...)>
  <if(!rewriteMode)>
  <finishedBacktracking({
  <label>_tree = self._adaptor.dupTree(<label>)
  self._adaptor.addChild(root_<treeLevel>, <label>_tree)
  })>
  <else> <! rewrite mode !>
  <finishedBacktracking({
  if _first_<treeLevel> is None:
    _first_<treeLevel> = <label>
  })>
  <endif>
>>

// SET AST
matchSet(s,label,elementIndex,postmatchCode,terminalOptions={ }) ::= <<
  _last = self.input.LT(1)
  <super.matchSet(postmatchCode={
  <if(!rewriteMode)>
  <finishedBacktracking({
  <if(terminalOptions.node)>
  <label>_tree = <terminalOptions.node>(<label>)
  <else>
  <label>_tree = self._adaptor.dupNode(<label>)
  <endif><\n>
  self._adaptor.addChild(root_<treeLevel>, <label>_tree)
  })>
  <endif>
  }, ...)>
>>

matchRuleBlockSet(s,label,elementIndex,postmatchCode,treeLevel="0",terminalOptions={ }) ::= <<
  <matchSet(...)>
  <noRewrite(...)> <! set return tree !>
>>

matchSetBang(s,label,elementIndex,postmatchCode,terminalOptions={ }) ::= <<
  _last = self.input.LT(1)
  <super.matchSet(...)>
>>

matchSetRuleRoot(s,label,elementIndex,debug,terminalOptions={ }) ::= <<

```

```

<super.matchSet(postmatchCode={
<if(!rewriteMode)>
<finishedBacktracking({
<if(terminalOptions.node)>
<label>_tree = <terminalOptions.node>(<label>)
<else>
<label>_tree = self._adaptor.dupNode(<label>)
<endif><\n>
root_<treeLevel> = self._adaptor.becomeRoot(<label>_tree, root_<treeLevel>)
})>
<endif>
}, ...)>
>>

```

// RULE REF AST

```

/** rule auto construct */
ruleRef(rule,label,elementIndex,args,scope) ::= <<
  _last = self.input.LT(1)
  <super.ruleRef(...)>
  <finishedBacktracking({
  <if(!rewriteMode)>
  self._adaptor.addChild(root_<treeLevel>, <label>.tree)
  <else> <! rewrite mode !>
  if _first_<treeLevel> is None:
    _first_<treeLevel> = <label>.tree<\n>
  <endif>
  })>
>>

```

```

/** x+=rule auto construct */
ruleRefAndListLabel(rule,label,elementIndex,args,scope) ::= <<
  <ruleRef(...)>
  <listLabel(label, {<label>.tree})>
>>

```

```

/** ^(rule ...) auto construct */
ruleRefRuleRoot(rule,label,elementIndex,args,scope) ::= <<
  _last = self.input.LT(1)
  <super.ruleRef(...)>
  <if(!rewriteMode)>
  <finishedBacktracking({
  root_<treeLevel> = self._adaptor.becomeRoot(<label>.tree, root_<treeLevel>)
  })>
  <endif>
>>

```

```

/** ^(x+=rule ...) auto construct */

```



```

ruleRefRuleRootAndListLabel(rule,label,elementIndex,args,scope) ::= <<
<ruleRefRuleRoot(...)>
<listLabel(label, {<label>.tree})>
>>

/** rule when output=AST and tracking for rewrite */
ruleRefTrack(rule,label,elementIndex,args,scope) ::= <<
_last = self.input.LT(1)
<super.ruleRefTrack(...)>
>>

/** x+=rule when output=AST and tracking for rewrite */
ruleRefTrackAndListLabel(rule,label,elementIndex,args,scope) ::= <<
_last = self.input.LT(1)
<super.ruleRefTrackAndListLabel(...)>
>>

/** ^(rule ...) rewrite */
ruleRefRuleRootTrack(rule,label,elementIndex,args,scope) ::= <<
_last = self.input.LT(1)
<super.ruleRefRootTrack(...)>
>>

/** ^(x+=rule ...) rewrite */
ruleRefRuleRootTrackAndListLabel(rule,label,elementIndex,args,scope) ::= <<
_last = self.input.LT(1)
<super.ruleRefRuleRootTrackAndListLabel(...)>
>>

/** Streams for token refs are tree nodes now; override to
* change nextToken to nextNode.
*/
createRewriteNodeFromElement(token,scope,terminalOptions={}) ::= <<
<if(terminalOptions.node)>
<terminalOptions.node>(stream_<token>.nextNode())
<else>
stream_<token>.nextNode()
<endif>
>>

ruleCleanup() ::= <<
<super.ruleCleanup()>
<if(!rewriteMode)>
<finishedBacktracking({
retval.tree = self._adaptor.rulePostProcessing(root_0)
})>
<endif>
>>

```

Found in path(s):

* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/codegen/templates/Python/ASTTreeParser.stg

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* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/misc/MultiMap.java

* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/misc/Utils.java

* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/tool/RuleLabelScope.java

* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/codegen/Python3Target.java

* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/analysis/StateCluster.java

* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/misc/IntervalSet.java

* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/tool/GrammarSerializerFoo.java

* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/analysis/DFAOptimizer.java

* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/tool/GrammarSyntaxMessage.java

* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/tool/NFAFactory.java

* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/tool/Message.java

* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/analysis/NFAState.java

* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/codegen/CTarget.java
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/tool/GrammarUnreachableAltsMessage.java
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/Tool.java
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/analysis/NFAContext.java
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/tool/Grammar.java
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/analysis/NFAToDFAConverter.java
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/tool/NameSpaceChecker.java
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/tool/GrammarReport2.java
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/misc/IntArrayList.java
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/codegen/DelphiTarget.java
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/analysis/AnalysisTimeoutException.java
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/codegen/Perl5Target.java
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/analysis/LookaheadSet.java
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/misc/BitSet.java
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/analysis/LL1Analyzer.java
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/analysis/NFA.java
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/misc/MutableInteger.java
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/tool/GrammarSpelunker.java
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/codegen/ActionScriptTarget.java
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/tool/GrammarDanglingStateMessage.java
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/tool/BuildDependencyGenerator.java
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/tool/CompositeGrammar.java
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/analysis/DecisionProbe.java
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/codegen/CSharp2Target.java
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/tool/CompositeGrammarTree.java
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/analysis/NFAConfiguration.java
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/tool/Interpreter.java
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/analysis/SemanticContext.java
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/codegen/JavaScriptTarget.java
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/tool/GrammarSemanticsMessage.java
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/tool/GrammarInsufficientPredicatesMessage.java
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/analysis/NFAConversionThread.java
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/analysis/RuleClosureTransition.java
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/tool/Rule.java
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/tool/Attribute.java
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/misc/Barrier.java
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/codegen/PythonTarget.java
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/tool/DOTGenerator.java

* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/tool/ToolMessage.java
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/tool/RandomPhrase.java
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/tool/Strip.java
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/analysis/State.java
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/analysis/AnalysisRecursionOverflowException.java
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/analysis/Label.java
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/tool/LeftRecursionCyclesMessage.java
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/codegen/CppTarget.java
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/tool/AssignTokenTypesBehavior.java
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/tool/AttributeScope.java
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/misc/Interval.java
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/tool/GrammarNonDeterminismMessage.java
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/analysis/DFASState.java
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/misc/IntSet.java
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/analysis/Transition.java
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/codegen/Target.java
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/tool/Interp.java
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/analysis/LL1DFA.java
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/tool/RecursionOverflowMessage.java
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/tool/GrammarAnalysisAbortedMessage.java
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/tool/ANTLRErrorListener.java
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/tool/NonRegularDecisionMessage.java
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/tool/GrammarSanity.java
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/analysis/PredicateLabel.java
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/analysis/NonLLStarDecisionException.java
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/codegen/ACyclicDFACodeGenerator.java
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/codegen/JavaTarget.java
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/tool/GrammarAST.java
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/tool/GrammarReport.java
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/analysis/ActionLabel.java
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/misc/Graph.java
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/tool/ErrorMessageManager.java
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/analysis/DFA.java
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/tool/FASerializer.java
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/misc/OrderedHashSet.java
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/analysis/MachineProbe.java
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/*

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*/

/** Templates for building ASTs during tree parsing.

*

* Deal with many combinations. Dimensions are:

* Auto build or rewrite

* no label, label, list label (label/no-label handled together)

* child, root

* token, set, rule, wildcard

*

* Each combination has its own template except that label/no label

* is combined into tokenRef, ruleRef, ...

*/

```
finishedBacktracking(block) ::= <<
```

```
<if(backtracking)>
```

```
if <actions.(actionScope).synpredgate>:
```

```
  <block>
```

```
<else>
```

```
<block>
```

```
<endif>
```

```
>>
```

```

/** Add a variable to track last element matched */
ruleDeclarations() ::= <<
<super.ruleDeclarations()>
_first_0 = None
_last = None<\n>
>>

/** What to emit when there is no rewrite rule. For auto build
* mode, does nothing.
*/
noRewrite(rewriteBlockLevel, treeLevel) ::= <<
<finishedBacktracking({
<if(rewriteMode)>
retval.tree = _first_0
if self._adaptor.getParent(retval.tree) is not None and self._adaptor.isNil(self._adaptor.getParent(retval.tree)):
    retval.tree = self._adaptor.getParent(retval.tree)
<endif>
})>
>>

/** match ^(root children) in tree parser; override here to
* add tree construction actions.
*/
tree(root, actionsAfterRoot, children, nullableChildList,
    enclosingTreeLevel, treeLevel) ::= <<
_last = self.input.LT(1)
_save_last_<treeLevel> = _last
_first_<treeLevel> = None
<if(!rewriteMode)>
root_<treeLevel> = self._adaptor.nil()<\n>
<endif>
<root:element()>
<if(rewriteMode)>
<finishedBacktracking({
<if(root.el.rule)>
if _first_<enclosingTreeLevel> is None:
    _first_<enclosingTreeLevel> = <root.el.label>.tree<\n>
<else>
if _first_<enclosingTreeLevel> is None:
    _first_<enclosingTreeLevel> = <root.el.label><\n>
<endif>
})>
<endif>
<actionsAfterRoot:element()>
<if(nullableChildList)>
if self.input.LA(1) == DOWN:
    self.match(self.input, DOWN, None)
<children:element()>

```

```

    self.match(self.input, UP, None)

<else>
self.match(self.input, DOWN, None)
<children:element()>
self.match(self.input, UP, None)<\n>
<endif>
<if(!rewriteMode)>
self._adaptor.addChild(root_<enclosingTreeLevel>, root_<treeLevel>)<\n>
<endif>
_last = _save_last_<treeLevel>

>>

// TOKEN AST STUFF

/** ID! and output=AST (same as plain tokenRef) 'cept add
 * setting of _last
 */
tokenRefBang(token,label,elementIndex,terminalOptions={}) ::= <<
_last = self.input.LT(1)
<super.tokenRef(...)>
>>

/** ID auto construct */
tokenRef(token,label,elementIndex,terminalOptions={}) ::= <<
_last = self.input.LT(1)
<super.tokenRef(...)>
<if(!rewriteMode)>
<finishedBacktracking({
<if(terminalOptions.node)>
<label>_tree = <terminalOptions.node>(<label>)
<else>
<label>_tree = self._adaptor.dupNode(<label>)
<endif><\n>
self._adaptor.addChild(root_<treeLevel>, <label>_tree)
})>
<else> <! rewrite mode !>
<finishedBacktracking({
if _first_<treeLevel> is None:
_first_<treeLevel> = <label><\n>
})>
<endif>
>>

/** label+=TOKEN auto construct */
tokenRefAndListLabel(token,label,elementIndex,terminalOptions={}) ::= <<
<tokenRef(...)>

```

```

<listLabel(elem=label,...)>
>>

/** ^(ID ...) auto construct */
tokenRefRuleRoot(token,label,elementIndex,terminalOptions={ }) ::= <<
  _last = self.input.LT(1)
  <super.tokenRef(...)>
  <if(!rewriteMode)>
  <finishedBacktracking({
  <if(terminalOptions.node)>
  <label>_tree = <terminalOptions.node>(<label>)
  <else>
  <label>_tree = self._adaptor.dupNode(<label>)
  <endif><\n>
  root_<treeLevel> = self._adaptor.becomeRoot(<label>_tree, root_<treeLevel>)
  })>
  <endif>
>>

/** Match ^(label+=TOKEN ...) auto construct */
tokenRefRuleRootAndListLabel(token,label,elementIndex,terminalOptions={ }) ::= <<
  <tokenRefRuleRoot(...)>
  <listLabel(elem=label,...)>
>>

/** Match . wildcard and auto dup the node/subtree */
wildcard(token,label,elementIndex,terminalOptions={ }) ::= <<
  _last = self.input.LT(1)
  <super.wildcard(...)>
  <if(!rewriteMode)>
  <finishedBacktracking({
  <label>_tree = self._adaptor.dupTree(<label>)
  self._adaptor.addChild(root_<treeLevel>, <label>_tree)
  })>
  <else> <! rewrite mode !>
  <finishedBacktracking({
  if _first_<treeLevel> is None:
    _first_<treeLevel> = <label>
  })>
  <endif>
>>

// SET AST
matchSet(s,label,elementIndex,postmatchCode,terminalOptions={ }) ::= <<
  _last = self.input.LT(1)
  <super.matchSet(postmatchCode={
  <if(!rewriteMode)>
  <finishedBacktracking({

```



```

<if(terminalOptions.node)>
<label>_tree = <terminalOptions.node>( <label>)
<else>
<label>_tree = self._adaptor.dupNode(<label>)
<endif><\n>
self._adaptor.addChild(root_<treeLevel>, <label>_tree)
}>
<endif>
}, ...>
>>

matchRuleBlockSet(s,label,elementIndex,postmatchCode,treeLevel="0",terminalOptions={}) ::= <<
<matchSet(...)>
<noRewrite(...)> <! set return tree !>
>>

matchSetBang(s,label,elementIndex,postmatchCode,terminalOptions={}) ::= <<
_last = self.input.LT(1)
<super.matchSet(...)>
>>

matchSetRuleRoot(s,label,elementIndex,debug,terminalOptions={}) ::= <<
<super.matchSet(postmatchCode={
<if(!rewriteMode)>
<finishedBacktracking({
<if(terminalOptions.node)>
<label>_tree = <terminalOptions.node>( <label>)
<else>
<label>_tree = self._adaptor.dupNode(<label>)
<endif><\n>
root_<treeLevel> = self._adaptor.becomeRoot(<label>_tree, root_<treeLevel>)
})>
<endif>
}, ...)>
>>

// RULE REF AST

/** rule auto construct */
ruleRef(rule,label,elementIndex,args,scope) ::= <<
_last = self.input.LT(1)
<super.ruleRef(...)>
<finishedBacktracking({
<if(!rewriteMode)>
self._adaptor.addChild(root_<treeLevel>, <label>.tree)
<else> <! rewrite mode !>
if _first_<treeLevel> is None:
_first_<treeLevel> = <label>.tree<\n>

```

```

<endif>
})>
>>

/** x+=rule auto construct */
ruleRefAndListLabel(rule,label,elementIndex,args,scope) ::= <<
<ruleRef(...)>
<listLabel(label, {<label>.tree})>
>>

/** ^(rule ...) auto construct */
ruleRefRuleRoot(rule,label,elementIndex,args,scope) ::= <<
_last = self.input.LT(1)
<super.ruleRef(...)>
<if(!rewriteMode)>
<finishedBacktracking({
root_<treeLevel> = self._adaptor.becomeRoot(<label>.tree, root_<treeLevel>)
})>
<endif>
>>

/** ^(x+=rule ...) auto construct */
ruleRefRuleRootAndListLabel(rule,label,elementIndex,args,scope) ::= <<
<ruleRefRuleRoot(...)>
<listLabel(label, {<label>.tree})>
>>

/** rule when output=AST and tracking for rewrite */
ruleRefTrack(rule,label,elementIndex,args,scope) ::= <<
_last = self.input.LT(1)
<super.ruleRefTrack(...)>
>>

/** x+=rule when output=AST and tracking for rewrite */
ruleRefTrackAndListLabel(rule,label,elementIndex,args,scope) ::= <<
_last = self.input.LT(1)
<super.ruleRefTrackAndListLabel(...)>
>>

/** ^(rule ...) rewrite */
ruleRefRuleRootTrack(rule,label,elementIndex,args,scope) ::= <<
_last = self.input.LT(1)
<super.ruleRefRootTrack(...)>
>>

/** ^(x+=rule ...) rewrite */
ruleRefRuleRootTrackAndListLabel(rule,label,elementIndex,args,scope) ::= <<
_last = self.input.LT(1)

```

```

<super.ruleRefRuleRootTrackAndListLabel(...)>
>>

/** Streams for token refs are tree nodes now; override to
 * change nextToken to nextNode.
 */
createRewriteNodeFromElement(token,scope,terminalOptions={ }) ::= <<
<if(terminalOptions.node)>
<terminalOptions.node>(stream_<token>.nextNode())
<else>
stream_<token>.nextNode()
<endif>
>>

ruleCleanUp() ::= <<
<super.ruleCleanUp()>
<if(!rewriteMode)>
<finishedBacktracking({
retval.tree = self._adaptor.rulePostProcessing(root_0)
})>
<endif>
>>

```

Found in path(s):

```
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-
jar/org/antlr/codegen/templates/Python3/ASTTreeParser.stg
```

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```

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```

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*/

/** Templates for building ASTs during tree parsing.

*

* Deal with many combinations. Dimensions are:

* Auto build or rewrite

* no label, label, list label (label/no-label handled together)

* child, root

* token, set, rule, wildcard

*

* Each combination has its own template except that label/no label

* is combined into tokenRef, ruleRef, ...

*/

group ASTTreeParser;

/** Add a variable to track last element matched */

ruleDeclarations() ::= <<

<super.ruleDeclarations()>

<ASTLabelType> _first_0 = null;

<ASTLabelType> _last = null;<\n>

>>

/** What to emit when there is no rewrite rule. For auto build

* mode, does nothing.

*/

noRewrite(rewriteBlockLevel, treeLevel) ::= <<

<if(backtracking)>if (state.backtracking==0) {<endif>

<if(rewriteMode)>

retval.tree = (<ASTLabelType>)_first_0;

if (adaptor.getParent(retval.tree)!=null && adaptor.isNil(adaptor.getParent(retval.tree)))

retval.tree = (<ASTLabelType>)adaptor.getParent(retval.tree);

<endif>

<if(backtracking)>}<endif>

>>

/** match ^(root children) in tree parser; override here to

* add tree construction actions.

*/

tree(root, actionsAfterRoot, children, nullableChildList,

enclosingTreeLevel, treeLevel) ::= <<

_last = (<ASTLabelType>)input.LT(1);

```

{
<ASTLabelType> _save_last_<treeLevel> = _last;
<ASTLabelType> _first_<treeLevel> = null;
<if(!rewriteMode)>
<ASTLabelType> root_<treeLevel> = (<ASTLabelType>)adaptor.nil();
<endif>
<root:element()>
<if(rewriteMode)>
<if(backtracking)>if ( state.backtracking==0 )<endif>
<if(root.el.rule)>
if ( _first_<enclosingTreeLevel>===null ) _first_<enclosingTreeLevel> = <root.el.label>.tree;
<else>
if ( _first_<enclosingTreeLevel>===null ) _first_<enclosingTreeLevel> = <root.el.label>;
<endif>
<endif>
<actionsAfterRoot:element()>
<if(nullableChildList)>
if ( input.LA(1)==Token.DOWN ) {
  match(input, Token.DOWN, null); <checkRuleBacktrackFailure()>
  <children:element()>
  match(input, Token.UP, null); <checkRuleBacktrackFailure()>
}
<else>
match(input, Token.DOWN, null); <checkRuleBacktrackFailure()>
<children:element()>
match(input, Token.UP, null); <checkRuleBacktrackFailure()>
<endif>
<if(!rewriteMode)>
adaptor.addChild(root_<enclosingTreeLevel>, root_<treeLevel>);
<endif>
_last = _save_last_<treeLevel>;
}<\n>
>>

```

```
// TOKEN AST STUFF
```

```

/** ID! and output=AST (same as plain tokenRef) 'cept add
 * setting of _last
 */
tokenRefBang(token,label,elementIndex) ::= <<
_last = (<ASTLabelType>)input.LT(1);
<super.tokenRef(...)>
>>

```

```

/** ID auto construct */
tokenRef(token,label,elementIndex,terminalOptions) ::= <<
_last = (<ASTLabelType>)input.LT(1);
<super.tokenRef(...)>

```

```

<if(!rewriteMode)>
<if(backtracking)>if ( state.backtracking==0 ) {<endif>
<if(terminalOptions.node)>
<label>_tree = new <terminalOptions.node>(<label>);
<else>
<label>_tree = (<ASTLabelType>)adaptor.dupNode(<label>);
<endif><\n>
adaptor.addChild(root_<treeLevel>, <label>_tree);
<if(backtracking)>}<endif>
<else><! rewrite mode !>
<if(backtracking)>if ( state.backtracking==0 )<endif>
if ( _first_<treeLevel>==null ) _first_<treeLevel> = <label>;
<endif>
>>

/** label+=TOKEN auto construct */
tokenRefAndListLabel(token,label,elementIndex,terminalOptions) ::= <<
<tokenRef(...)>
<listLabel(elem=label,...)>
>>

/** ^(ID ...) auto construct */
tokenRefRuleRoot(token,label,elementIndex,terminalOptions) ::= <<
_last = (<ASTLabelType>)input.LT(1);
<super.tokenRef(...)>
<if(!rewriteMode)>
<if(backtracking)>if ( state.backtracking==0 ) {<endif>
<if(terminalOptions.node)>
<label>_tree = new <terminalOptions.node>(<label>);
<else>
<label>_tree = (<ASTLabelType>)adaptor.dupNode(<label>);
<endif><\n>
root_<treeLevel> = (<ASTLabelType>)adaptor.becomeRoot(<label>_tree, root_<treeLevel>);
<if(backtracking)>}<endif>
<endif>
>>

/** Match ^(label+=TOKEN ...) auto construct */
tokenRefRuleRootAndListLabel(token,label,elementIndex,terminalOptions) ::= <<
<tokenRefRuleRoot(...)>
<listLabel(elem=label,...)>
>>

// SET AST

matchSet(s,label,terminalOptions,elementIndex,postmatchCode) ::= <<
_last = (<ASTLabelType>)input.LT(1);
<super.matchSet(..., postmatchCode={

```

```

<if(!rewriteMode)>
<if(backtracking)>if ( state.backtracking==0 ) {<endif>
<if(terminalOptions.node)>
<label>_tree = new <terminalOptions.node>(<label>);
<else>
<label>_tree = (<ASTLabelType>)adaptor.dupNode(<label>);
<endif><\n>
adaptor.addChild(root_<treeLevel>, <label>_tree);
<if(backtracking)>}<endif>
<endif>
}
)>
>>

matchRuleBlockSet(s,label,terminalOptions,elementIndex,postmatchCode,treeLevel="0") ::= <<
<matchSet(...)>
<noRewrite()> <! set return tree !>
>>

matchSetBang(s,label,elementIndex,postmatchCode) ::= <<
_last = (<ASTLabelType>)input.LT(1);
<super.matchSet(...)>
>>

matchSetRuleRoot(s,label,terminalOptions,elementIndex,debug) ::= <<
<super.matchSet(..., postmatchCode={
<if(!rewriteMode)>
<if(backtracking)>if ( state.backtracking==0 ) {<endif>
<if(terminalOptions.node)>
<label>_tree = new <terminalOptions.node>(<label>);
<else>
<label>_tree = (<ASTLabelType>)adaptor.dupNode(<label>);
<endif><\n>
root_<treeLevel> = (<ASTLabelType>)adaptor.becomeRoot(<label>_tree, root_<treeLevel>);
<if(backtracking)>}<endif>
<endif>
}
)>
>>

// RULE REF AST

/** rule auto construct */
ruleRef(rule,label,elementIndex,args,scope) ::= <<
_last = (<ASTLabelType>)input.LT(1);
<super.ruleRef(...)>
<if(backtracking)>if ( state.backtracking==0 ) <endif>
<if(!rewriteMode)>

```

```

adaptor.addChild(root_<treeLevel>, <label>.getTree());
<else> <! rewrite mode !>
if ( _first_<treeLevel>==null ) _first_<treeLevel> = <label>.tree;
<endif>
>>

/** x+=rule auto construct */
ruleRefAndListLabel(rule,label,elementIndex,args,scope) ::= <<
<ruleRef(...)>
<listLabel(elem=label+".getTree()",...)>
>>

/** ^(rule ...) auto construct */
ruleRefRuleRoot(rule,label,elementIndex,args,scope) ::= <<
_last = (<ASTLabelType>)input.LT(1);
<super.ruleRef(...)>
<if(!rewriteMode)>
<if(backtracking)>if ( state.backtracking==0 ) <endif>root_<treeLevel> =
(<ASTLabelType>)adaptor.becomeRoot(<label>.getTree(), root_<treeLevel>);
<endif>
>>

/** ^(x+=rule ...) auto construct */
ruleRefRuleRootAndListLabel(rule,label,elementIndex,args,scope) ::= <<
<ruleRefRuleRoot(...)>
<listLabel(elem=label+".getTree()",...)>
>>

/** Streams for token refs are tree nodes now; override to
 * change nextToken to nextNode.
 */
createRewriteNodeFromElement(token,terminalOptions,scope) ::= <<
<if(terminalOptions.node)>
new <terminalOptions.node>(stream_<token>.nextNode())
<else>
stream_<token>.nextNode()
<endif>
>>

ruleCleanUp() ::= <<
<super.ruleCleanUp()>
<if(!rewriteMode)>
<if(backtracking)>if ( state.backtracking==0 ) {<\n><endif>
retval.tree = (<ASTLabelType>)adaptor.rulePostProcessing(root_0);
<if(backtracking)>}<endif>
<endif>
>>

```


Found in path(s):

```
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-  
jar/org/antlr/codegen/templates/Perl5/ASTTreeParser.stg
```

No license file was found, but licenses were detected in source scan.

```
/*
```

```
[The "BSD license"]
```

```
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```

```
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```

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```
*/
```

```
/*
```

New style messages. This file contains the actual layout of the messages emitted by ANTLR.

The text itself is coming out of the languages/*stg files, according to the chosen locale.

This file contains the format that mimicks GCC output.

```
*/
```

```
group gnu;
```

```
location(file, line, column) ::= "<file>:<line>:"
```

```
message(id, text) ::= "<text> (<id>)"
```

```
report(location, message, type) ::= "<location> <type>: <message>"
```

```
wantsSingleLineMessage() ::= "true"
```

Found in path(s):

* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/tool/templates/messages/formats/gnu.stg

No license file was found, but licenses were detected in source scan.

/*

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*/

/*

New style messages. This file only contains the messages in English, but no information about which file, line, or column it occurred in.

The location and message ids are taken out of the formats directory.

Kay Roepke

*/

group en_US;

// TOOL ERRORS

// file errors

CANNOT_WRITE_FILE(arg,exception,stackTrace) ::= <<

cannot write file <arg>: <exception>

<stackTrace; separator="\n">

>>

CANNOT_CLOSE_FILE(arg,exception,stackTrace) ::= "cannot close file <arg>: <exception>"

CANNOT_FIND_TOKENS_FILE(arg) ::= "cannot find tokens file <arg>"

```

ERROR_READING_TOKENS_FILE(arg,exception,stackTrace) ::= <<
problem reading token vocabulary file <arg>: <exception>
<stackTrace; separator="\n">
>>
DIR_NOT_FOUND(arg,exception,stackTrace) ::= "directory not found: <arg>"
OUTPUT_DIR_IS_FILE(arg,exception,stackTrace) ::= "output directory is a file: <arg>"
CANNOT_OPEN_FILE(arg,exception,stackTrace) ::= "cannot find or open file: <arg><if(exception)>; reason:
<exception><endif>"
CIRCULAR_DEPENDENCY() ::= "your grammars contain a circular dependency and cannot be sorted into a valid
build order."

INTERNAL_ERROR(arg,arg2,exception,stackTrace) ::= <<
internal error: <arg> <arg2><if(exception)>: <exception><endif>
<stackTrace; separator="\n">
>>
INTERNAL_WARNING(arg) ::= "internal warning: <arg>"
ERROR_CREATING_ARTIFICIAL_RULE(arg,exception,stackTrace) ::= <<
problems creating lexer rule listing all tokens: <exception>
<stackTrace; separator="\n">
>>
TOKENS_FILE_SYNTAX_ERROR(arg,arg2) ::=
"problems parsing token vocabulary file <arg> on line <arg2>"
CANNOT_GEN_DOT_FILE(arg,exception,stackTrace) ::=
"cannot write DFA DOT file <arg>: <exception>"
BAD_ACTION_AST_STRUCTURE(exception,stackTrace) ::=
"bad internal tree structure for action '<arg>': <exception>"
BAD_AST_STRUCTURE(arg,exception,stackTrace) ::= <<
bad internal tree structure '<arg>': <exception>
<stackTrace; separator="\n">
>>
FILE_AND_GRAMMAR_NAME_DIFFER(arg,arg2) ::=
"file <arg2> contains grammar <arg>; names must be identical"
FILENAME_EXTENSION_ERROR(arg) ::=
"file <arg> must end in a file extension, normally .g"

// code gen errors
MISSING_CODE_GEN_TEMPLATES(arg) ::=
"cannot find code generation templates <arg>.stg"
MISSING_CYCLIC_DFA_CODE_GEN_TEMPLATES() ::=
"cannot find code generation cyclic DFA templates for language <arg>"
CODE_GEN_TEMPLATES_INCOMPLETE(arg) ::=
"at least one code generation template missing for language <arg>"
CANNOT_CREATE_TARGET_GENERATOR(arg,exception,stackTrace) ::=
"cannot create target <arg> code generator: <exception>"
STRING_TEMPLATE_ERROR(arg,exception,stackTrace) ::=
"template error: <arg>"
CANNOT_COMPUTE_SAMPLE_INPUT_SEQ() ::=
"cannot generate a sample input sequence from lookahead DFA"

```

```

// grammar interpretation errors
/*
NO_VIABLE_DFA_ALT(arg,arg2) ::=
    "no viable transition from state <arg> on <arg2> while interpreting DFA"
*/

// GRAMMAR ERRORS
SYNTAX_ERROR(arg) ::= "syntax error: <arg>"
RULE_REDEFINITION(arg) ::=
    "rule <arg> redefinition"
LEXER_RULES_NOT_ALLOWED(arg) ::=
    "lexer rule <arg> not allowed in parser"
PARSER_RULES_NOT_ALLOWED(arg) ::=
    "parser rule <arg> not allowed in lexer"
CANNOT_FIND_ATTRIBUTE_NAME_IN_DECL(arg) ::=
    "cannot find an attribute name in attribute declaration"
NO_TOKEN_DEFINITION(arg) ::=
    "no lexer rule corresponding to token: <arg>"
UNDEFINED_RULE_REF(arg) ::=
    "reference to undefined rule: <arg>"
LITERAL_NOT_ASSOCIATED_WITH_LEXER_RULE(arg) ::=
    "literal has no associated lexer rule: <arg>"
CANNOT_ALIAS_TOKENS_IN_LEXER(arg) ::=
    "literals are illegal in lexer tokens{ } section: <arg>"
ATTRIBUTE_REF_NOT_IN_RULE(arg,arg2) ::=
    "reference to attribute outside of a rule: <arg><if(arg2)>.<arg2><endif>"
UNKNOWN_ATTRIBUTE_IN_SCOPE(arg,arg2) ::=
    "unknown attribute for <arg>: <arg2>"
UNKNOWN_RULE_ATTRIBUTE(arg,arg2) ::=
    "unknown attribute for rule <arg>: <arg2>"
UNKNOWN_SIMPLE_ATTRIBUTE(arg,args2) ::=
    "attribute is not a token, parameter, or return value: <arg>"
ISOLATED_RULE_SCOPE(arg) ::=
    "missing attribute access on rule scope: <arg>"
INVALID_RULE_PARAMETER_REF(arg,arg2) ::=
    "cannot access rule <arg>'s parameter: <arg2>"
INVALID_RULE_SCOPE_ATTRIBUTE_REF(arg,arg2) ::=
    "cannot access rule <arg>'s dynamically-scoped attribute: <arg2>"
SYMBOL_CONFLICTS_WITH_GLOBAL_SCOPE(arg) ::=
    "symbol <arg> conflicts with global dynamic scope with same name"
WRITE_TO_READONLY_ATTR(arg,arg2,arg3) ::=
    "cannot write to read only attribute: <arg><if(arg2)>.<arg2><endif>"
LABEL_CONFLICTS_WITH_RULE(arg) ::=
    "label <arg> conflicts with rule with same name"
LABEL_CONFLICTS_WITH_TOKEN(arg) ::=
    "label <arg> conflicts with token with same name"
LABEL_CONFLICTS_WITH_RULE_SCOPE_ATTRIBUTE(arg,arg2) ::=

```

"label <arg> conflicts with rule <arg2>'s dynamically-scoped attribute with same name"

LABEL_CONFLICTS_WITH_RULE_ARG_RETVAL(arg,arg2) ::=

"label <arg> conflicts with rule <arg2>'s return value or parameter with same name"

ATTRIBUTE_CONFLICTS_WITH_RULE(arg,arg2) ::=

"rule <arg2>'s dynamically-scoped attribute <arg> conflicts with the rule name"

ATTRIBUTE_CONFLICTS_WITH_RULE_ARG_RETVAL(arg,arg2) ::=

"rule <arg2>'s dynamically-scoped attribute <arg> conflicts with<arg2>'s return value or parameter with same name"

LABEL_TYPE_CONFLICT(arg,arg2) ::=

"label <arg> type mismatch with previous definition: <arg2>"

ARG_RETVAL_CONFLICT(arg,arg2) ::=

"rule <arg2>'s argument <arg> conflicts a return value with same name"

NONUNIQUE_REF(arg) ::=

"<arg> is a non-unique reference"

FORWARD_ELEMENT_REF(arg) ::=

"illegal forward reference: <arg>"

MISSING_RULE_ARGS(arg) ::=

"missing parameter(s) on rule reference: <arg>"

RULE_HAS_NO_ARGS(arg) ::=

"rule <arg> has no defined parameters"

ARGS_ON_TOKEN_REF(arg) ::=

"token reference <arg> may not have parameters"

ILLEGAL_OPTION(arg) ::=

"illegal option <arg>"

LIST_LABEL_INVALID_UNLESS_RETVAL_STRUCT(arg) ::=

"rule '+=' list labels are not allowed w/o output option: <arg>"

UNDEFINED_TOKEN_REF_IN_REWRITE(arg) ::=

"reference to undefined token in rewrite rule: <arg>"

REWRITE_ELEMENT_NOT_PRESENT_ON_LHS(arg) ::=

"reference to rewrite element <arg> without reference on left of ->"

UNDEFINED_LABEL_REF_IN_REWRITE(arg) ::=

"reference to undefined label in rewrite rule: \$<arg>"

NO_GRAMMAR_START_RULE (arg) ::=

"grammar <arg>: no start rule (no rule can obviously be followed by EOF)"

EMPTY_COMPLEMENT(arg) ::= <<

<if(arg)>

set complement ~<arg> is empty

<else>

set complement is empty

<endif>

>>

UNKNOWN_DYNAMIC_SCOPE(arg) ::=

"unknown dynamic scope: <arg>"

UNKNOWN_DYNAMIC_SCOPE_ATTRIBUTE(arg,arg2) ::=

"unknown dynamically-scoped attribute for scope <arg>: <arg2>"

RULE_REF_AMBIG_WITH_RULE_IN_ALT(arg) ::=

"reference \$<arg> is ambiguous; rule <arg> is enclosing rule and referenced in the production (assuming enclosing rule)"

ISOLATED_RULE_ATTRIBUTE(arg) ::=
 "reference to locally-defined rule scope attribute without rule name: <arg>"

INVALID_ACTION_SCOPE(arg,arg2) ::=
 "unknown or invalid action scope for <arg2> grammar: <arg>"

ACTION_REDEFINITION(arg) ::=
 "redefinition of <arg> action"

DOUBLE_QUOTES_ILLEGAL(arg) ::=
 "string literals must use single quotes (such as '\begin\'): <arg>"

INVALID_TEMPLATE_ACTION(arg) ::=
 "invalid StringTemplate % shorthand syntax: '<arg>'"

MISSING_ATTRIBUTE_NAME() ::=
 "missing attribute name on \$ reference"

ARG_INIT_VALUES_ILLEGAL(arg) ::=
 "rule parameters may not have init values: <arg>"

REWRITE_OR_OP_WITH_NO_OUTPUT_OPTION(arg) ::=
 "<if(arg)>rule <arg> uses <endif>rewrite syntax or operator with no output option; setting output=AST"

AST_OP_WITH_NON_AST_OUTPUT_OPTION(arg) ::=
 "AST operator with non-AST output option: <arg>"

NO_RULES(arg) ::= "grammar file <arg> has no rules"

MISSING_AST_TYPE_IN_TREE_GRAMMAR(arg) ::=
 "tree grammar <arg> has no ASTLabelType option"

REWRITE_FOR_MULTI_ELEMENT_ALT(arg) ::=
 "with rewrite=true, alt <arg> not simple node or obvious tree element; text attribute for rule not guaranteed to be correct"

RULE_INVALID_SET(arg) ::=
 "Cannot complement rule <arg>; not a simple set or element"

HETERO_ILLEGAL_IN_REWRITE_ALT(arg) ::=
 "alts with rewrites can't use heterogeneous types left of ->"

NO_SUCH_GRAMMAR_SCOPE(arg,arg2) ::=
 "reference to undefined grammar in rule reference: <arg>.<arg2>"

NO_SUCH_RULE_IN_SCOPE(arg,arg2) ::=
 "rule <arg2> is not defined in grammar <arg>"

TOKEN_ALIAS_CONFLICT(arg,arg2) ::=
 "cannot alias <arg>; string already assigned to <arg2>"

TOKEN_ALIAS_REASSIGNMENT(arg,arg2) ::=
 "cannot alias <arg>; token name already assigned to <arg2>"

TOKEN_VOCAB_IN_DELEGATE(arg,arg2) ::=
 "tokenVocab option ignored in imported grammar <arg>"

INVALID_IMPORT(arg,arg2) ::=
 "<arg.grammarTypeString> grammar <arg.name> cannot import <arg2.grammarTypeString> grammar <arg2.name>"

IMPORTED_TOKENS_RULE_EMPTY(arg,arg2) ::=
 "no lexer rules contributed to <arg> from imported grammar <arg2>"

IMPORT_NAME_CLASH(arg,arg2) ::=
 "combined grammar <arg.name> and imported <arg2.grammarTypeString> grammar <arg2.name> both generate <arg2.recognizerName>; import ignored"

AST_OP_IN_ALT_WITH_REWRITE(arg,arg2) ::=
 "rule <arg> alt <arg2> uses rewrite syntax and also an AST operator"

WILDCARD_AS_ROOT(arg) ::= "Wildcard invalid as root; wildcard can itself be a tree"
CONFLICTING_OPTION_IN_TREE_FILTER(arg,arg2) ::= "option <arg>=<arg2> conflicts with tree grammar filter mode"
ILLEGAL_OPTION_VALUE(arg, arg2) ::= "value '<arg2>' invalid for option <arg>"
ALL_OPS_NEED_SAME_ASSOC(arg) ::= "all operators of alt <alt> of left-recursive rule must have same associativity"
RANGE_OP_ILLEGAL(arg) ::= "the .. range operator isn't allowed in parser rules"

// GRAMMAR WARNINGS

GRAMMAR_NONDETERMINISM(input,conflictingAlts,paths,disabled,hasPredicateBlockedByAction) ::= <<
<if(paths)>
Decision can match input such as "<input>" using multiple alternatives:
<paths:{ it | alt <it.alt> via NFA path <it.states; separator=","><\n>}>
<else>
Decision can match input such as "<input>" using multiple alternatives: <conflictingAlts; separator=",">
<endif>
<if(disabled)><\n>As a result, alternative(s) <disabled; separator=","> were disabled for that input<endif><if(hasPredicateBlockedByAction)><\n>Semantic predicates were present but were hidden by actions.<endif>
>>

DANGLING_STATE(danglingAlts,input) ::= <<
the decision cannot distinguish between alternative(s) <danglingAlts; separator=","> for input such as "<input>"
>>

UNREACHABLE_ALTS(alts) ::= <<
The following alternatives can never be matched: <alts; separator=","><\n>
>>

INSUFFICIENT_PREDICATES(upon,altToLocations,hasPredicateBlockedByAction) ::= <<
Input such as "<upon>" is insufficiently covered with predicates at locations: <altToLocations.keys:{ alt|alt <alt>:
<altToLocations.(alt):{loc| line <loc.line>:<loc.column> at <loc.text>}>; separator=",">; separator=",">
>><if(hasPredicateBlockedByAction)><\n>Semantic predicates were present but were hidden by actions.<endif>
>>

DUPLICATE_SET_ENTRY(arg) ::=
"duplicate token type <arg> when collapsing subrule into set"

ANALYSIS_ABORTED(enclosingRule) ::= <<
ANTLR could not analyze this decision in rule <enclosingRule>; often this is because of recursive rule references visible from the left edge of alternatives. ANTLR will re-analyze the decision with a fixed lookahead of k=1. Consider using "options {k=1;}" for that decision and possibly adding a syntactic predicate.
>>

RECURSION_OVERFLOW(alt,input,targetRules,callSiteStates) ::= <<
Alternative <alt>: after matching input such as <input> decision cannot predict what comes next due to recursion

```
overflow <targetRules,callSiteStates:{t,c|to <|> from <c:{s|<s.enclosingRule.name>};separator=", ">; separator="
and ">
>>
```

```
LEFT_RECURSION(targetRules,alt,callSiteStates) ::= <<
Alternative <alt> discovers infinite left-recursion <targetRules,callSiteStates:{t,c|to <|> from
<c:{s|<s.enclosingRule>};separator=", ">; separator=" and ">
>>
```

```
UNREACHABLE_TOKENS(tokens) ::= <<
The following token definitions can never be matched because prior tokens match the same input: <tokens;
separator=", ">
>>
```

```
TOKEN_NONDETERMINISM(input,conflictingTokens,paths,disabled,hasPredicateBlockedByAction) ::=
<<
<if(paths)>
Decision can match input such as "<input>" using multiple alternatives:
<paths:{ it | alt <it.alt> via NFA path <it.states; separator=", "><\n>}>
<else>
Multiple token rules can match input such as "<input>": <conflictingTokens; separator=", "><\n>
<endif>
<if(disabled)><\n>As a result, token(s) <disabled; separator=", "> were disabled for that
input<endif><if(hasPredicateBlockedByAction)><\n>Semantic predicates were present but were hidden by
actions.<endif>
>>
```

```
LEFT_RECURSION_CYCLES(listOfCycles) ::= <<
The following sets of rules are mutually left-recursive <listOfCycles:{c| [<c:{r|<r.name>}; separator=", ">];
separator=" and ">
>>
```

```
NONREGULAR_DECISION(ruleName,alts) ::= <<
[fatal] rule <ruleName> has non-LL(*) decision due to recursive rule invocations reachable from alts <alts;
separator=", ">. Resolve by left-factoring or using syntactic predicates or using backtrack=true option.
>>
```

```
/* 110n for message levels */
warning() ::= "warning"
error() ::= "error"
```

```
Found in path(s):
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-
jar/org/antlr/tool/templates/messages/languages/en.stg
No license file was found, but licenses were detected in source scan.
```

```
/*
* [The "BSD license"]
```



```

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*/
/** ANTLR's code generator.
*
* Generate recognizers derived from grammars. Language independence
* achieved through the use of STGroup objects. All output
* strings are completely encapsulated in the group files such as Java.stg.
* Some computations are done that are unused by a particular language.
* This generator just computes and sets the values into the templates;
* the templates are free to use or not use the information.
*
* To make a new code generation target, define X.stg for language X
* by copying from existing Y.stg most closely related to your language;
* e.g., to do CSharp.stg copy Java.stg. The template group file has a
* bunch of templates that are needed by the code generator. You can add
* a new target w/o even recompiling ANTLR itself. The language=X option
* in a grammar file dictates which templates get loaded/used.
*
* Some language like C need both parser files and header files. Java needs
* to have a separate file for the cyclic DFA as ANTLR generates bytcodes
* directly (which cannot be in the generated parser Java file). To facilitate
* this,
*
* cyclic can be in same file, but header, output must be searpate. recognizer
* is in outptufile.

```

*/

Found in path(s):

* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/codegen/CodeGenerator.java

No license file was found, but licenses were detected in source scan.

/*

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*/

/*

New style messages. This file contains the actual layout of the messages emitted by ANTLR.

The text itself is coming out of the languages/*stg files, according to the chosen locale.

This file contains the default format ANTLR uses.

*/

group antlr;

location(file, line, column) ::= "<file>(<line>,<column>)"

message(id, text) ::= "error <id> : <text>"

report(location, message, type) ::= "<location> : <type> <message.id> : <message.text>"

wantsSingleLineMessage() ::= "true"

Found in path(s):

```
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-  
jar/org/antlr/tool/templates/messages/formats/vs2005.stg
```

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group Dbg;

```
/*
```

```
[The "BSD license"]
```

```
Copyright (c) 2005-2009 Terence Parr
```

```
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```

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```
*/
```

```
@parserBody.mixins() ::= <<
```

```
include ANTLR3::<if(profile)>Profile<else>Debug<endif>::ParserEvents
```

```
>>
```

```
@parserBody.additionalMembers() ::= <<
```

```
<if(grammar.grammarIsRoot)>
```

```
RULE_NAMES = [
```

```
:invalid_rule, <grammar.allImportedRules:{rST|:<rST.name>}; wrap="\n ", separator=", ">
```

```
].freeze
```

```
<endif>
```

```
>>
```

```

@rule.body() ::= <<
in_rule(grammar_file_name, "<ruleName>") do
  @debug_listener.location(<ruleDescriptor.tree.line>, <ruleDescriptor.tree.column>)

  <@super.body()>

  @debug_listener.location(<ruleDescriptor.EORNode.line>, <ruleDescriptor.EORNode.column>)
end
>>

// Common debug event triggers used by region overrides below
enterSubRule() ::= <<
in_subrule(<decisionNumber>) do<\n>
>>

exitSubRule() ::= <<
end<\n>
>>

enterDecision() ::= <<
in_decision(<decisionNumber>) do<\n>
>>

exitDecision() ::= <<
end<\n>
>>

enterAlt(n) ::= <<
in_alternative(<n>)<\n>
>>

// Region overrides that tell various constructs to add debugging triggers
@block.body() ::= <<
in_subrule(<decisionNumber>) do
  <@super.body()>
end
>>

// @blockBody.predecision() ::= "<enterSubRule()>"

```

```
// @blockBody.postdecision() ::= "<exitDecision>"
// @blockBody.postbranch() ::= "<exitSubRule>"
@blockBody.decision() ::= <<
in_decision(<decisionNumber>) do
  <@super.decision()>
end
>>
```

```
@ruleBlock.decision() ::= <<
in_decision(<decisionNumber>) do
  <@super.decision()>
end<\n>
>>
```

```
@ruleBlockSingleAlt.preal() ::= "<enterAlt(n={ 1 })>"
```

```
@blockSingleAlt.preal() ::= "<enterAlt(n={ 1 })>"
```

```
@positiveClosureBlock.loopBody() ::= <<
in_subrule(<decisionNumber>) do
  <@super.loopBody()>
end
>>
```

```
@positiveClosureBlockLoop.decisionBody() ::= <<
in_decision(<decisionNumber>) do
  <@super.decisionBody()>
end
>>
```

```
@positiveClosureBlockLoop.earlyExitException() ::= <<
@debug_listener.recognition_exception(eee)
>>
```

```
@closureBlock.loopBody() ::= <<
in_subrule(<decisionNumber>) do
  <@super.loopBody()>
end
>>
```

```

@closureBlockLoop.decisionBody() ::= <<
in_decision(<decisionNumber>) do
  <@super.decisionBody()>
end
>>

```

```

@altSwitchCase.preatt() ::= "<enterAlt(altNum)>" // altNum is arg of altSwitchCase

```

```

element(e) ::= <<
@debug_listener.location(<e.line>, <e.pos>) // e is arg of element
<super.element(e)>
>>

```

```

@matchSet.mismatchedSetException() ::= "@debug_listener.recognition_exception(mse)"

```

```

@dfaState.noViableAltException() ::= <<
nvae = NoViableAlternative( "<description>", <decisionNumber>, <stateNumber> )
@debug_listener.recognition_exception( nvae )
raise( nvae )<\n>
>>

```

```

@dfaStateSwitch.noViableAltException() ::= <<
nvae = NoViableAlternative( "<description>", <decisionNumber>, <stateNumber> )
@debug_listener.recognition_exception( nvae )
raise( nvae )<\n>
>>

```

```

dfaDecision(decisionNumber,description) ::= <<
begin
  @state.cyclic_decision = true
  <super.dfaDecision(...)>
rescue ANTLR3::Error::NoViableAlternative => nvae
  @debug_listener.recognition_exception(nvae)
  raise
end
>>

```

```

@cyclicDFA.errorMethod() ::= <<
def error(nvae)
  @recognizer.debug_listener.recognition_exception(nvae)
  super
end
>>

```

```
/** Force predicate validation to trigger an event */  
evalPredicate(pred,description) ::= <<  
predicate?("<description>") { <pred> }  
>>
```

Found in path(s):

```
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/codegen/templates/Ruby/Dbg.stg  
No license file was found, but licenses were detected in source scan.
```

```
/*
```

```
[The "BSD license"]
```

```
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```

```
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```

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```
*/
```

Found in path(s):

```
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/codegen/RubyTarget.java  
No license file was found, but licenses were detected in source scan.
```

```
/*
```

```
[The "BSD license"]
```

```
Copyright (c) 2005-2009 Jim Idle, Temporal Wave LLC
```

```
http://www.temporal-wave.com
```

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http://www.linkedin.com/in/jimidle
```

```
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```

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```
*/
```

```
/** Add an adaptor property that knows how to build trees */
```

```
@headerFile.members() ::= <<
```

```
/* @headerFile.members() */
```

```
pANTLR3_BASE_TREE_ADAPTOR adaptor;
```

```
pANTLR3_VECTOR_FACTORY vectors;
```

```
/* End @headerFile.members() */
```

```
>>
```

```
/** Install the tree adaptor interface pointer and anything else that
```

```
* tree parsers and producers require.
```

```
*/
```

```
@genericParser.apifuncs() ::= <<
```

```
<if(PARSER)>
```

```
ADAPTOR = ANTLR3_TREE_ADAPTORNew(instream->tstream->tokenSource->strFactory);<\n>
```

```
<endif>
```

```
ctx->vectors = antlr3VectorFactoryNew(0);
```

```
>>
```

```
@genericParser.cleanup() ::= <<
```

```
ctx->vectors->close(ctx->vectors);
```

```
<if(PARSER)>
```

```
/* We created the adaptor so we must free it
```

```
*/
```

```
ADAPTOR->free(ADAPTOR);
```

```
<endif>
```



```

>>

@returnScope.ruleReturnMembers() ::= <<

<super.ASTLabelType()> tree;

>>

/** Add a variable to track rule's return AST */
ruleDeclarations() ::= <<
<super.ruleDeclarations()>
<ASTLabelType> root_0;<\n>
>>

ruleInitializations() ::= <<
<super.ruleInitializations()>
root_0 = NULL;<\n>
>>

ruleLabelDefs() ::= <<
<super.ruleLabelDefs()>
<ruleDescriptor.tokenLabels:{it | <ASTLabelType> <it.label.text>_tree;}; separator="\n">
<ruleDescriptor.tokenListLabels:{it | <ASTLabelType> <it.label.text>_tree;}; separator="\n">
<ruleDescriptor.allTokenRefsInAltsWithRewrites
  :{it | pANTLR3_REWRITE_RULE_<rewriteElementType>_STREAM stream_<it>;}; separator="\n">
<ruleDescriptor.allRuleRefsInAltsWithRewrites
  :{it | pANTLR3_REWRITE_RULE_SUBTREE_STREAM stream_<it>;}; separator="\n">
>>

/* Note that we defer the actual creation of any rewrite streams we need here and just initialize
 * them to NULL. This saves creating huge numbers of rewrite streams that cannot be used as only
 * one alt will be taken in a rule, but we are declaring all the streams here. So we define
 * a macro that conatins the create code, then use this macro later to check if the stream
 * has been created yet. Checking for NULL is almost free in C.
 */
ruleLabelInitializations() ::= <<
<super.ruleLabelInitializations()>
<ruleDescriptor.tokenLabels:{it | <it.label.text>_tree = NULL;}; separator="\n">
<ruleDescriptor.tokenListLabels:{it | <it.label.text>_tree = NULL;}; separator="\n">

<ruleDescriptor.allTokenRefsInAltsWithRewrites
  :{it | stream_<it> = NULL;
  #define CREATE_stream_<it> if (stream_<it> == NULL) {stream_<it> =
  antlr3RewriteRule<rewriteElementType>StreamNewAE(ADAPTOR, RECOGNIZER, (pANTLR3_UINT8)"token
  <it>"); \} }; separator="\n">
<ruleDescriptor.allRuleRefsInAltsWithRewrites
  :{it | stream_<it> = NULL;
  #define CREATE_stream_<it> if (stream_<it> == NULL) {stream_<it> =

```

```
antlr3RewriteRuleSubtreeStreamNewAE(ADAPTOR, RECOGNIZER, (pANTLR3_UINT8)"rule <it>"); \}};
separator="\n">
```

```
<if(ruleDescriptor.hasMultipleReturnValues)>
retval.tree = NULL;
<endif>
>>
```

```
/** a rule label including default value */
ruleLabelInitVal(label) ::= <<
<super.ruleLabelInitVal(...)>
<label.label.text>.tree = NULL;
>>
```

```
/** When doing auto AST construction, we must define some variables;
 * These should be turned off if doing rewrites. This must be a "mode"
 * as a rule could have both rewrite and AST within the same alternative
 * block.
 */
@alt.declarations() ::= <<
<if(autoAST)>
<if(outerAlt)>
<endif>
<endif>
>>
```

```
@alt.initializations() ::= <<
<if(autoAST)>
<if(outerAlt)>
<if(!rewriteMode)>
root_0 = (<ASTLabelType>)(ADAPTOR->nilNode(ADAPTOR));<\n>
<endif>
<endif>
<endif>
>>
```

```
// Tracking Rule Elements
//
```

```
/** ID but track it for use in a rewrite rule */
tokenRefTrack(token,label,elementIndex,terminalOptions) ::= <<
<tokenRefBang(...)> <! Track implies no auto AST construction!>
<if(backtracking)>if ( <actions.(actionScope).synpredgate> ) { <endif>CREATE_stream_<token>;
stream_<token>->add(stream_<token>, <label>, NULL);<if(backtracking)> }<endif><\n>
>>
```

```
/** ids+=ID and track it for use in a rewrite rule; adds to ids *and*
```

```

* to the tracking list stream_ID for use in the rewrite.
*/
tokenRefTrackAndListLabel(token,label,elementIndex,terminalOptions) ::= <<
<tokenRefTrack(...)>
<listLabel(elem=label,...)>
>>

/** ^(ID ...) track for rewrite */
tokenRefRuleRootTrack(token,label,elementIndex,terminalOptions) ::= <<
<tokenRefBang(...)>
<if(backtracking)>if ( <actions.(actionScope).synpredgate> ) { <endif>CREATE_stream_<token>; stream_<token>-
>add(stream_<token>, <label>, NULL);<if(backtracking)> }<endif><\n>
>>

wildcardTrack(label,elementIndex) ::= <<
<super.wildcard(...)>
>>

/** rule when output=AST and tracking for rewrite */
ruleRefTrack(rule,label,elementIndex,args,scope) ::= <<
<super.ruleRef(...)>
<if(backtracking)>if ( <actions.(actionScope).synpredgate> ) { <endif>CREATE_stream_<rule.name>;
stream_<rule.name>->add(stream_<rule.name>, <label>.tree, NULL);<if(backtracking)> }<endif>
>>

/** x+=rule when output=AST and tracking for rewrite */
ruleRefTrackAndListLabel(rule,label,elementIndex,args,scope) ::= <<
<ruleRefTrack(...)>
<listLabelTrack(...)>
>>

/** ^(rule ...) rewrite */
ruleRefRuleRootTrack(rule,label,elementIndex,args,scope) ::= <<
<ruleRefRuleRoot(...)>
<if(backtracking)>if ( <actions.(actionScope).synpredgate> ) { <endif>CREATE_stream_<rule.name>;
stream_<rule.name>->add(stream_<rule.name>, <label>.tree, NULL);<if(backtracking)> }<endif>
>>

/** ^(x+=rule ...) rewrite */
ruleRefRuleRootTrackAndListLabel(rule,label,elementIndex,args,scope) ::= <<
<ruleRefRuleRootTrack(...)>
<listLabelAST(...)>
>>

// RULE REF AST

```

```

/** Match ^(label+=TOKEN ...) track for rewrite */
tokenRefRuleRootTrackAndListLabel(token,label,elementIndex,terminalOptions) ::= <<
<tokenRefRuleRootTrack(...)>
<listLabel(elem=label,...)>
>>

/* How to accumulate lists when we are doing rewrite tracking...
*/
listLabelTrack(label) ::= <<
/* listLabelTrack(label)
*/
if (list_<label> == NULL)
{
    list_<label>=ctx->vectors->newVector(ctx->vectors);
}
list_<label>->add(list_<label>, <label>.tree, NULL);
>>

/* How to accumulate lists of rule outputs (only allowed with AST
* option but if the user is going to walk the tree, they will want
* all their custom elements from rule returns.
*
* Normally, we use inline structures (which the compiler lays down
* code to copy from heap allocations. However, here we want to accumulate copies
* of the returned structures because we are adding them to a list. This only makes sense if the
* grammar is not rewriting the tree as a tree rewrite only preserves the tree, not the object/structure
* returned from the rule. The rewrite will extract the tree pointer. However, if we are not going to
* do a tree re-write, then the user may wish to iterate the structures returned by the rule in
* action code and will expect the user defined returns[] elements to be available when they do this.
* Hence we cannot just preserve the tree that was returned. So, we must copy the local structure and provide
* a function that can free the allocated space. We cannot know how to free user allocated elements and
* presume that the user will know to do this using their own factories for the structures they allocate.
*/
listLabelAST(label) ::= <<
if (list_<label> == NULL)
{
    list_<label>=ctx->vectors->newVector(ctx->vectors);
}
{
    RETURN_TYPE_<label> * tcopy;

    tcopy = (RETURN_TYPE_<label> *)ANTLR3_MALLOC(sizeof(RETURN_TYPE_<label>)); /* Note no
memory allocation checks! */
    ANTLR3_MEMCPY((void *)tcopy, (const void *)<label>, sizeof(RETURN_TYPE_<label>));
    list_<label>->add(list_<label>, (void *)tcopy, freeScope); /* Add whatever the return type is */<n>
}

```

```

>>

// R e w r i t e

rewriteCode(
  alts,
  description,
  referencedElementsDeep, // ALL referenced elements to right of ->
  referencedTokenLabels,
  referencedTokenListLabels,
  referencedRuleLabels,
  referencedRuleListLabels,
  referencedWildcardLabels,
  referencedWildcardListLabels,
  rewriteBlockLevel,
  enclosingTreeLevel,
  treeLevel) ::=
<<

/* AST REWRITE
* elements      : <referencedElementsDeep; separator=", ">
* token labels  : <referencedTokenLabels; separator=", ">
* rule labels   : <referencedRuleLabels; separator=", ">
* token list labels : <referencedTokenListLabels; separator=", ">
* rule list labels : <referencedRuleListLabels; separator=", ">
*/
<if(backtracking)>
if ( <actions.(actionScope).synpredgate> ) <\n>
<endif>
{
  <rewriteCodeLabelsDecl()>
  <rewriteCodeLabelsInit()>
  root_0    = (<ASTLabelType>)(ADAPTOR->nilNode(ADAPTOR));
  <prevRuleRootRef()>.tree = root_0;
  <alts:rewriteAlt(); separator="else ">
  <if(TREE_PARSER)>
  <if(rewriteMode)>
  <prevRuleRootRef()>.tree = (<ASTLabelType>)(ADAPTOR->rulePostProcessing(ADAPTOR, root_0));
  INPUT->replaceChildren(INPUT, ADAPTOR->getParent(ADAPTOR, retval.start),
    ADAPTOR->getChildIndex(ADAPTOR, retval.start),
    ADAPTOR->getChildIndex(ADAPTOR, _last),
    retval.tree);
  <endif>
  <endif>
  <prevRuleRootRef()>.tree = root_0; // set result root
  <rewriteCodeLabelsFree()>
}

```

>>

rewriteCodeLabelsDecl() ::= <<

<referencedTokenLabels

:{it | pANTLR3_REWRITE_RULE_<rewriteElementType>_STREAM stream_<it>;}
separator="\n"

>

<referencedTokenListLabels

:{it | pANTLR3_REWRITE_RULE_<rewriteElementType>_STREAM stream_<it>;}
separator="\n"

>

<referencedRuleLabels

:{it | pANTLR3_REWRITE_RULE_SUBTREE_STREAM stream_<it>;}
separator="\n"

>

<referencedRuleListLabels

:{it | pANTLR3_REWRITE_RULE_SUBTREE_STREAM stream_<it>;}
separator="\n"

>

>>

rewriteCodeLabelsInit() ::= <<

<referencedTokenLabels

:{it | stream_<it>=antlr3RewriteRule<rewriteElementType>StreamNewAEE(ADAPTOR, RECOGNIZER,
(pANTLR3_UINT8)"token <it>", <it>);}
separator="\n"

>

<referencedTokenListLabels

:{it | stream_<it>=antlr3RewriteRule<rewriteElementType>StreamNewAEV(ADAPTOR, RECOGNIZER,
(pANTLR3_UINT8)"token <it>", list_<it>); }
separator="\n"

>

<referencedRuleLabels

:{it | stream_<it>=antlr3RewriteRuleSubtreeStreamNewAEE(ADAPTOR, RECOGNIZER,
(pANTLR3_UINT8)"token <it>", <it>.tree != NULL ? <it>.tree : NULL);}
separator="\n"

>

<referencedRuleListLabels

:{it | stream_<it>=antlr3RewriteRuleSubtreeStreamNewAEV(ADAPTOR, RECOGNIZER,
(pANTLR3_UINT8)"token <it>", list_<it>); }
separator="\n"

>

>>

rewriteCodeLabelsFree() ::= <<

<referencedTokenLabels

:{it | if (stream_<it> != NULL) stream_<it>->free(stream_<it>); }
separator="\n"

>

```

<referencedTokenListLabels
:{it | if (stream_<it> != NULL) stream_<it>->free(stream_<it>)};
separator="\n"
>
<referencedRuleLabels
:{it | if (stream_<it> != NULL) stream_<it>->free(stream_<it>)};
separator="\n"
>
<referencedRuleListLabels
:{it | if (stream_<it> != NULL) stream_<it>->free(stream_<it>)};
separator="\n"
>
>>

/** Generate code for an optional rewrite block; note it uses the deep ref'd element
 * list rather shallow like other blocks.
 */
rewriteOptionalBlock(
alt,
rewriteBlockLevel,
referencedElementsDeep, // all nested refs
referencedElements, // elements in immediately block; no nested blocks
description) ::=
<<
// <fileName>:<description>
{
if ( <referencedElementsDeep:{el | (stream_<el> != NULL && stream_<el>->hasNext(stream_<el>)) } ;
separator="|| "> )
{
<alt>
}
<referencedElementsDeep:{el | if ( stream_<el> != NULL) stream_<el>->reset(stream_<el>);<n>}>
}<n>
>>

rewriteClosureBlock(
alt,
rewriteBlockLevel,
referencedElementsDeep, // all nested refs
referencedElements, // elements in immediately block; no nested blocks
description) ::=
<<
// <fileName>:<description>
{
while ( <referencedElements:{el | (stream_<el> != NULL && stream_<el>->hasNext(stream_<el>)) } ; separator="||
"> )
{
<alt>

```

```

}
<referencedElements:{el | if (stream_<el> != NULL) stream_<el>->reset(stream_<el>);<\n>}>
}<\n>
>>
RewriteEarlyExitException() ::=
<<
CONSTRUCTEX();
EXCEPTION->type      = ANTLR3_REWRITE_EARLY_EXCEPTION;
EXCEPTION->name      = (void *)ANTLR3_REWRITE_EARLY_EXCEPTION_NAME;
>>
rewritePositiveClosureBlock(
alt,
rewriteBlockLevel,
referencedElementsDeep, // all nested refs
referencedElements, // elements in immediately block; no nested blocks
description) ::=
<<
if (<referencedElements:{el | (stream_<el> == NULL || !stream_<el>->hasNext(stream_<el>)) }; separator="|| ">)
{
  <RewriteEarlyExitException()>
}
else
{
  while (<referencedElements:{el | (stream_<el>->hasNext(stream_<el>)) }; separator="|| ">) {
    <alt>
  }
  <referencedElements:{el | stream_<el>->reset(stream_<el>);<\n>}>
}
>>

rewriteAlt(a) ::= <<
// <a.description>
<if(a.pred)>
if (<a.pred>)
{
  <a.alt>
}<\n>
<else>
{
  <a.alt>
}<\n>
<endif>
>>

/** For empty rewrites: "r : ... -> ;" */
rewriteEmptyAlt() ::= "root_0 = NULL; /* \<-- rewriteEmptyAlt() */"

rewriteTree(root,children,description,enclosingTreeLevel,treeLevel) ::= <<

```



```

// <fileName>:<description>
{
  <ASTLabelType> root_<treeLevel> = (<ASTLabelType>)(ADAPTOR->nilNode(ADAPTOR));
  <root:rewriteElement()>
  <children:rewriteElement()>
  ADAPTOR->addChild(ADAPTOR, root_<enclosingTreeLevel>, root_<treeLevel>);
}<\n>
>>

rewriteElementList(elements) ::= "<elements:rewriteElement()>"

rewriteElement(e) ::= <<
<@pregen()>
<e.el>
>>

/** Gen ID or ID[args] */
rewriteTokenRef(token,elementIndex,terminalOptions,args) ::= <<
ADAPTOR->addChild(ADAPTOR, root_<treeLevel>, <createRewriteNodeFromElement(...)>);<\n>
>>

/** Gen $label ... where defined via label=ID */
rewriteTokenLabelRef(label,elementIndex) ::= <<
ADAPTOR->addChild(ADAPTOR, root_<treeLevel>, stream_<label> == NULL ? NULL : stream_<label>-
>nextNode(stream_<label>));<\n>
>>

/** Gen $label ... where defined via label+=ID */
rewriteTokenListLabelRef(label,elementIndex) ::= <<
ADAPTOR->addChild(ADAPTOR, root_<treeLevel>, stream_<label> == NULL ? NULL : stream_<label>-
>nextNode(stream_<label>));<\n>
>>

/** Gen ^($label ...) */
rewriteTokenLabelRefRoot(label,elementIndex) ::= <<
root_<treeLevel> = (<ASTLabelType>)(ADAPTOR->becomeRootToken(ADAPTOR, stream_<label> == NULL ?
NULL : stream_<label>->nextToken(stream_<label>), root_<treeLevel>));<\n>
>>

/** Gen ^($label ...) where label+=... */
rewriteTokenListLabelRefRoot ::= rewriteTokenLabelRefRoot

/** Gen ^(ID ...) or ^(ID[args] ...) */
rewriteTokenRefRoot(token,elementIndex,terminalOptions,args) ::= <<
root_<treeLevel> = (<ASTLabelType>)(ADAPTOR->becomeRoot(ADAPTOR,
<createRewriteNodeFromElement(...)>, root_<treeLevel>));<\n>
>>

```

```

rewriteImaginaryTokenRef(args,token,terminalOptions,elementIndex) ::= <<
ADAPTOR->addChild(ADAPTOR, root_<treeLevel>, <createImaginaryNode(tokenType=token, ...)>);<\n>
>>

rewriteImaginaryTokenRefRoot(args,token,terminalOptions,elementIndex) ::= <<
root_<treeLevel> = (<ASTLabelType>)(ADAPTOR->becomeRoot(ADAPTOR,
<createImaginaryNode(tokenType=token, ...)>, root_<treeLevel>));<\n>
>>

/** plain -> {foo} action */
rewriteAction(action) ::= <<
root_0 = <action>;<\n>
>>

/** What is the name of the previous value of this rule's root tree? This
* let's us refer to $rule to mean previous value. I am reusing the
* variable 'tree' sitting in retval struct to hold the value of root_0 right
* before I set it during rewrites. The assign will be to retval.tree.
*/
prevRuleRootRef() ::= "retval"

rewriteRuleRef(rule,dup) ::= <<
ADAPTOR->addChild(ADAPTOR, root_<treeLevel>, stream_<rule> == NULL ? NULL : stream_<rule>-
>nextTree(stream_<rule>));<\n>
>>

rewriteRuleRefRoot(rule,dup) ::= <<
root_<treeLevel> = (<ASTLabelType>)(ADAPTOR->becomeRoot(ADAPTOR, stream_<rule> == NULL ? NULL
: stream_<rule>->nextNode(stream_<rule>), root_<treeLevel>));<\n>
>>

rewriteNodeAction(action) ::= <<
ADAPTOR->addChild(ADAPTOR, root_<treeLevel>, <action>);<\n>
>>

rewriteNodeActionRoot(action) ::= <<
root_<treeLevel> = (<ASLabelType>)(ADAPTOR->becomeRoot(ADAPTOR, <action>, root_<treeLevel>));<\n>
>>

/** Gen $ruleLabel ... where defined via ruleLabel=rule */
rewriteRuleLabelRef(label) ::= <<
ADAPTOR->addChild(ADAPTOR, root_<treeLevel>, stream_<label> == NULL ? NULL : stream_<label>-
>nextTree(stream_<label>));<\n>
>>

/** Gen $ruleLabel ... where defined via ruleLabel+=rule */
rewriteRuleListLabelRef(label) ::= <<
ADAPTOR->addChild(ADAPTOR, root_<treeLevel>, stream_<label> == NULL ? NULL : stream_<label>-

```

```

>nextTree(stream_<label>));<\n>
>>

/** Gen ^($ruleLabel ...) where ruleLabel=rule */
rewriteRuleLabelRefRoot(label) ::= <<
root_<treeLevel> = (<ASTLabelType>)(ADAPTOR->becomeRoot(ADAPTOR, stream_<label> == NULL ? NULL
: stream_<label>->nextNode(stream_<label>), root_<treeLevel>));<\n>
>>

/** Gen ^($ruleLabel ...) where ruleLabel+=rule */
rewriteRuleListLabelRefRoot(label) ::= <<
root_<treeLevel> = (<ASTLabelType>)(ADAPTOR->becomeRoot((<ASTLabelType>)(stream_<label> == NULL
? NULL : stream_<label>->nextNode(stream_<label>), root_<treeLevel>));<\n>
>>

rewriteWildcardLabelRef(label) ::= <<
ADAPTOR->addChild(ADAPTOR, root_<treeLevel>, stream_<label> == NULL ? NULL : stream_<label>-
>nextTree(stream_<label>));<\n>
>>

createImaginaryNode(tokenType,terminalOptions,args) ::= <<
<if(terminalOptions.node)>
<! new MethodNode(IDLabel, args) !>
<terminalOptions.node>New(<tokenType><if(args)>, <args; separator=", "><endif>)
<else>
<if(args)>

#if <length(args)> == 2
(<ASTLabelType>)ADAPTOR->createTypeTokenText(ADAPTOR, <tokenType>, TOKTEXT(<args; separator=",
">))
#else
(<ASTLabelType>)ADAPTOR->createTypeText(ADAPTOR, <tokenType>, (pANTLR3_UINT8)<args;
separator=", ">)
#endif

<else>
(<ASTLabelType>)ADAPTOR->createTypeText(ADAPTOR, <tokenType>, (pANTLR3_UINT8)"<tokenType>")
<endif>
<endif>
>>

createRewriteNodeFromElement(token,terminalOptions,args) ::= <<
<if(terminalOptions.node)>
<terminalOptions.node>New(stream_<token>->nextToken(stream_<token>)<if(args)>, <args; separator=",
"><endif>)
<else>
<if(args)> <! must create new node from old !>

```

```

#if <length(args)> == 2
ADAPTOR->createTypeTokenText(ADAPTOR, <token>->getType(<token>, TOKTEXT(<token>, <args;
separator=", ">)) /* JIMI */
#else
ADAPTOR->createTypeToken(ADAPTOR, <token>->getType(<token>, <token>, <args; separator=", ">)
#endif

<else>
stream_<token> == NULL ? NULL : stream_<token>->nextNode(stream_<token>)
<endif>
<endif>
>>

```

Found in path(s):

* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/codegen/templates/C/AST.stg

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```

/*
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 */
/** Template subgroup to add template rewrite output

```

```

* If debugging, then you'll also get STDbg.stg loaded.
*/

@outputFile.imports() ::= <<
<@super.imports()>
using Antlr.StringTemplate;
using Antlr.StringTemplate.Language;
<if(!backtracking)>
using Hashtable = System.Collections.Hashtable;
<endif>

>>

/** Add this to each rule's return value struct */
@returnScope.ruleReturnMembers() ::= <<
private StringTemplate _st;
public StringTemplate Template { get { return _st; } set { _st = value; } }
public override string ToString() { return (Template==null) ? string.Empty : Template.ToString(); }
>>

@genericParser.members() ::= <<
<@super.members()>
protected StringTemplateGroup templateLib = new StringTemplateGroup("<name>Templates",
typeof(AngleBracketTemplateLexer) );

public StringTemplateGroup TemplateLib
{
    get { return this.templateLib; }
    set { this.templateLib = value; }
}

/// \<summary> Allows convenient multi-value initialization:
/// "new STAttrMap().Add(...).Add(...)"
/// \</summary>
protected class STAttrMap : Hashtable
{
    public STAttrMap Add(string attrName, object value)
    {
        base.Add(attrName, value);
        return this;
    }
    public STAttrMap Add(string attrName, int value)
    {
        base.Add(attrName, value);
        return this;
    }
}
>>

```

```

/** x+=rule when output=template */
ruleRefAndListLabel(rule,label,elementIndex,args,scope) ::= <<
<ruleRef(...)>
<listLabel(elem=label+".Template",...)>
>>

```

```

rewriteTemplate(alts) ::= <<

```

```

// TEMPLATE REWRITE
<if(backtracking)>
if ( <actions.(actionScope).synpredgate> )
{
<alts:rewriteTemplateAlt(); separator="else ">
<if(rewriteMode)><replaceTextInLine()><endif>
}
<else>
<alts:rewriteTemplateAlt(); separator="else ">
<if(rewriteMode)><replaceTextInLine()><endif>
<endif>
>>

```

```

replaceTextInLine() ::= <<
<if(TREE_PARSER)>
((TokenRewriteStream)input.TokenStream).Replace(
input.TreeAdaptor.GetTokenStartIndex(retval.Start),
input.TreeAdaptor.GetTokenStopIndex(retval.Start),
retval.Template);
<else>
((TokenRewriteStream)input).Replace(
((IToken)retval.Start).TokenIndex,
input.LT(-1).TokenIndex,
retval.Template);
<endif>
>>

```

```

rewriteTemplateAlt() ::= <<
// <it.description>
<if(it.pred)>
if (<it.pred> ) {
retval.Template = <it.alt>;
}<\n>
<else>
{
retval.Template = <it.alt>;
}<\n>
<endif>
>>

```

```

rewriteEmptyTemplate(alts) ::= <<
null;
>>

/** Invoke a template with a set of attribute name/value pairs.
 * Set the value of the rule's template after having set
 * the attributes because the rule's template might be used as
 * an attribute to build a bigger template; you get a self-embedded
 * template.
 */
rewriteExternalTemplate(name,args) ::= <<
templateLib.GetInstanceOf("<name>"<if(args)>,
new STAttrMap()<args:{a | .Add("<a.name>", <a.value>)}>
<endif>)
>>

/** expr is a string expression that says what template to load */
rewriteIndirectTemplate(expr,args) ::= <<
templateLib.GetInstanceOf(<expr><if(args)>,
new STAttrMap()<args:{a | .Add("<a.name>", <a.value>)}>
<endif>)
>>

/** Invoke an inline template with a set of attribute name/value pairs */
rewriteInlineTemplate(args, template) ::= <<
new StringTemplate(templateLib, "<template>"<if(args)>,
new STAttrMap()<args:{a | .Add("<a.name>", <a.value>)}>
<endif>)
>>

/** plain -> {foo} action */
rewriteAction(action) ::= <<
<action>
>>

/** An action has %st.attrName=expr; or % {st}.attrName=expr; */
actionSetAttribute(st,attrName,expr) ::= <<
(<st>).SetAttribute("<attrName>",<expr>);
>>

/** Translate % {stringExpr} */
actionStringConstructor(stringExpr) ::= <<
new StringTemplate(templateLib,<stringExpr>)
>>

```

Found in path(s):

* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-

jar/org/antlr/codegen/templates/CSharp2/ST.stg

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*/

/** Templates for building ASTs during tree parsing.

*

* Deal with many combinations. Dimensions are:

* Auto build or rewrite

* no label, label, list label (label/no-label handled together)

* child, root

* token, set, rule, wildcard

*

* Each combination has its own template except that label/no label

* is combined into tokenRef, ruleRef, ...

*/

/** Add a variable to track last element matched */

ruleDeclarations() ::= <<


```

<super.ruleDeclarations()>
<if(!ruleDescriptor.isSynPred)>
<ASTLabelType> _first_0 = default(<ASTLabelType>);
<ASTLabelType> _last = default(<ASTLabelType>);
<endif>
>>

/** What to emit when there is no rewrite rule. For auto build
 * mode, does nothing.
 */
noRewrite(rewriteBlockLevel=false, treeLevel=false) ::= <<
<if(!ruleDescriptor.isSynPred)>
<if(backtracking)>if (<actions.(actionScope).synpredgate>) {<endif>
<if(rewriteMode)>
retval.Tree = (<ASTLabelType>)_first_0;
if (adaptor.GetParent(retval.Tree)!=null && adaptor.IsNil(adaptor.GetParent(retval.Tree)))
    retval.Tree = (<ASTLabelType>)adaptor.GetParent(retval.Tree);
<endif>
<if(backtracking)>}<endif>
<endif>
>>

/** match ^(root children) in tree parser; override here to
 * add tree construction actions.
 */
tree(root, actionsAfterRoot, children, nullableChildList,
    enclosingTreeLevel, treeLevel) ::= <<
<if(!ruleDescriptor.isSynPred)>
_last = (<ASTLabelType>)input.LT(1);
{
<ASTLabelType> _save_last_<treeLevel> = _last;
<ASTLabelType> _first_<treeLevel> = default(<ASTLabelType>);
<if(!rewriteMode)>
<ASTLabelType> root_<treeLevel> = (<ASTLabelType>)adaptor.Nil();
<endif>
<root:element()>
<if(rewriteMode)>
<if(backtracking)>if (<actions.(actionScope).synpredgate>)<endif>
<if(root.el.rule)>
if (_first_<enclosingTreeLevel> == null) _first_<enclosingTreeLevel> = <root.el.label>.Tree;
<else>
if (_first_<enclosingTreeLevel> == null) _first_<enclosingTreeLevel> = <root.el.label>;
<endif>
<endif>
<actionsAfterRoot:element()>
<if(nullableChildList)>
if (input.LA(1) == TokenTypes.Down) {
    Match(input, TokenTypes.Down, null); <checkRuleBacktrackFailure()>

```

```

    <children:element()>
    Match(input, TokenType.Up, null); <checkRuleBacktrackFailure()>
  }
<else>
Match(input, TokenType.Down, null); <checkRuleBacktrackFailure()>
<children:element()>
Match(input, TokenType.Up, null); <checkRuleBacktrackFailure()>
<endif>
<if(!rewriteMode)>
adaptor.AddChild(root_<enclosingTreeLevel>, root_<treeLevel>);
<endif>
_last = _save_last_<treeLevel>;
}
<else>
<super.tree(...)>
<endif>
>>

// TOKEN AST STUFF

/** ID! and output=AST (same as plain tokenRef) 'cept add
 * setting of _last
 */
tokenRefBang(token,label,elementIndex,terminalOptions) ::= <<
<if(!ruleDescriptor.isSynPred)>
_last = (<ASTLabelType>)input.LT(1);
<super.tokenRef(...)>
<else>
<super.tokenRefBang(...)>
<endif>
>>

/** ID auto construct */
tokenRef(token,label,elementIndex,terminalOptions) ::= <<
<if(!ruleDescriptor.isSynPred)>
_last = (<ASTLabelType>)input.LT(1);
<super.tokenRef(...)>
<if(!rewriteMode)>
<if(backtracking)>if (<actions.(actionScope).synpredgate>) {<endif>
<if(terminalOptions.node)>
<label>_tree = new
<terminalOptions.node>(<if(terminalOptions.type)><terminalOptions.type>,<endif><label><if(terminalOptions.tex
t)>,<terminalOptions.text; format="string"><endif>);
<else>
<label>_tree =
(<ASTLabelType>)adaptor.DupNode(<if(terminalOptions.type)><terminalOptions.type>,<endif><label><if(termin
alOptions.text)>,<terminalOptions.text; format="string"><endif>);
<endif><\n>

```

```

adaptor.AddChild(root_<treeLevel>, <label>_tree);
<if(backtracking)>}<endif>
<else> <! rewrite mode !>
<if(backtracking)>if (<actions.(actionScope).synpredgate>)<endif>
if (_first_<treeLevel> == null) _first_<treeLevel> = <label>;
<endif>
<else>
<super.tokenRef(...)>
<endif>
>>

/** label+=TOKEN auto construct */
tokenRefAndListLabel(token,label,elementIndex,terminalOptions) ::= <<
<if(!ruleDescriptor.isSynPred)>
<tokenRef(...)>
<listLabelElem(elem=label,...)>
<else>
<super.tokenRefAndListLabel(...)>
<endif>
>>

/** ^(ID ...) auto construct */
tokenRefRuleRoot(token,label,elementIndex,terminalOptions) ::= <<
<if(!ruleDescriptor.isSynPred)>
_last = (<ASTLabelType>)input.LT(1);
<super.tokenRef(...)>
<if(!rewriteMode)>
<if(backtracking)>if (<actions.(actionScope).synpredgate>) {<endif>
<if(terminalOptions.node)>
<label>_tree = new
<terminalOptions.node><(if(terminalOptions.type)><terminalOptions.type>,<endif><label><(if(terminalOptions.tex
t)>,<terminalOptions.text; format="string"><endif>);
<else>
<label>_tree =
(<ASTLabelType>)adaptor.DupNode(<(if(terminalOptions.type)><terminalOptions.type>,<endif><label><(termin
alOptions.text)>,<terminalOptions.text; format="string"><endif>);
<endif><\n>
root_<treeLevel> = (<ASTLabelType>)adaptor.BecomeRoot(<label>_tree, root_<treeLevel>);
<if(backtracking)>}<endif>
<endif>
<else>
<super.tokenRefRuleRoot(...)>
<endif>
>>

/** Match ^(label+=TOKEN ...) auto construct */
tokenRefRuleRootAndListLabel(token,label,elementIndex,terminalOptions) ::= <<
<if(!ruleDescriptor.isSynPred)>

```

```

<tokenRefRuleRoot(...)>
<listLabelElem(elem=label,...)>
<else>
<super.tokenRefRuleRootAndListLabel(...)>
<endif>
>>

/** Match . wildcard and auto dup the node/subtree */
wildcard(token,label,elementIndex,terminalOptions) ::= <<
<if(!ruleDescriptor.isSynPred)>
_last = (<ASTLabelType>)input.LT(1);
<super.wildcard(...)>
<if(!rewriteMode)>
<if(backtracking)>if (<actions.(actionScope).synpredgate>) {<endif>
<label>_tree = (<ASTLabelType>)adaptor.DupTree(<label>);
adaptor.AddChild(root_<treeLevel>, <label>_tree);
<if(backtracking)>}<endif>
<else> <! rewrite mode !>
<if(backtracking)>if (<actions.(actionScope).synpredgate>)<endif>
if (_first_<treeLevel> == null) _first_<treeLevel> = <label>;
<endif>
<else>
<super.wildcard(...)>
<endif>
>>

// SET AST

matchSet(s,label,terminalOptions,elementIndex,postmatchCode) ::= <<
<if(!ruleDescriptor.isSynPred)>
_last = (<ASTLabelType>)input.LT(1);
<super.matchSet(postmatchCode={
<if(!rewriteMode)>
<if(backtracking)>if (<actions.(actionScope).synpredgate>) {<endif>
<if(terminalOptions.node)>
<label>_tree = new
<terminalOptions.node>(<if(terminalOptions.type)><terminalOptions.type>,<endif><label><if(terminalOptions.tex
t)>,<terminalOptions.text; format="string"><endif>);
<else>
<label>_tree =
(<ASTLabelType>)adaptor.DupNode(<if(terminalOptions.type)><terminalOptions.type>,<endif><label><if(termin
alOptions.text)>,<terminalOptions.text; format="string"><endif>);
<endif><\n>
adaptor.AddChild(root_<treeLevel>, <label>_tree);
<if(backtracking)>}\}<endif>
<endif>
}, ...
)>

```

```

<else>
<super.matchSet(...)>
<endif>
>>

matchRuleBlockSet(s,label,terminalOptions,elementIndex,postmatchCode,treeLevel="0") ::= <<
<if(!ruleDescriptor.isSynPred)>
<matchSet(...)>
<noRewrite(...)> <! set return tree !>
<else>
<super.matchRuleBlockSet(...)>
<endif>
>>

matchSetBang(s,label,terminalOptions,elementIndex,postmatchCode) ::= <<
<if(!ruleDescriptor.isSynPred)>
_last = (<ASTLabelType>)input.LT(1);
<super.matchSet(...)>
<else>
<super.matchSetBang(...)>
<endif>
>>

matchSetRuleRoot(s,label,terminalOptions,elementIndex,debug) ::= <<
<if(!ruleDescriptor.isSynPred)>
<super.matchSet(postmatchCode={
<if(!rewriteMode)>
<if(backtracking)>if (<actions.(actionScope).synpredgate>) {<endif>
<if(terminalOptions.node)>
<label>_tree = new
<terminalOptions.node><(if(terminalOptions.type)><terminalOptions.type>,<endif><label><(if(terminalOptions.tex
t)>,<terminalOptions.text; format="string"><endif>);
<else>
<label>_tree =
(<ASTLabelType>)adaptor.DupNode(<(if(terminalOptions.type)><terminalOptions.type>,<endif><label><(termin
alOptions.text)>,<terminalOptions.text; format="string"><endif>);
<endif><\n>
root_<treeLevel> = (<ASTLabelType>)adaptor.BecomeRoot(<label>_tree, root_<treeLevel>);
<if(backtracking)>}\}<endif>
<endif>
}, ...
)>
<else>
<super.matchSetRuleRoot(...)>
<endif>
>>

// RULE REF AST

```

```

/** rule auto construct */
ruleRef(rule,label,elementIndex,args,scope) ::= <<
<if(!ruleDescriptor.isSynPred)>
_last = (<ASTLabelType>)input.LT(1);
<super.ruleRef(...)>
<if(backtracking)>if (<actions.(actionScope).synpredgate><endif>
<if(!rewriteMode)>
adaptor.AddChild(root_<treeLevel>, <label>.Tree);
<else> <! rewrite mode !>
if (_first_<treeLevel> == null) _first_<treeLevel> = <label>.Tree;
<endif>
<else>
<super.ruleRef(...)>
<endif>
>>

/** x+=rule auto construct */
ruleRefAndListLabel(rule,label,elementIndex,args,scope) ::= <<
<if(!ruleDescriptor.isSynPred)>
<ruleRef(...)>
<listLabelElem(elem={<label>.Tree},...)>
<else>
<super.ruleRefAndListLabel(...)>
<endif>
>>

/** ^(rule ...) auto construct */
ruleRefRuleRoot(rule,label,elementIndex,args,scope) ::= <<
<if(!ruleDescriptor.isSynPred)>
_last = (<ASTLabelType>)input.LT(1);
<super.ruleRef(...)>
<if(!rewriteMode)>
<if(backtracking)>if (<actions.(actionScope).synpredgate> <endif>root_<treeLevel> =
(<ASTLabelType>)adaptor.BecomeRoot(<label>.Tree, root_<treeLevel>);
<endif>
<else>
<super.ruleRefRuleRoot(...)>
<endif>
>>

/** ^(x+=rule ...) auto construct */
ruleRefRuleRootAndListLabel(rule,label,elementIndex,args,scope) ::= <<
<if(!ruleDescriptor.isSynPred)>
<ruleRefRuleRoot(...)>
<listLabelElem(elem={<label>.Tree},...)>
<else>
<super.ruleRefRuleRootAndListLabel(...)>

```

```

<endif>
>>

/** rule when output=AST and tracking for rewrite */
ruleRefTrack(rule,label,elementIndex,args,scope) ::= <<
<if(!ruleDescriptor.isSynPred)>
  _last = (<ASTLabelType>)input.LT(1);
<super.ruleRefTrack(...)>
<else>
<super.ruleRefTrack(...)>
<endif>
>>

/** x+=rule when output=AST and tracking for rewrite */
ruleRefTrackAndListLabel(rule,label,elementIndex,args,scope) ::= <<
<if(!ruleDescriptor.isSynPred)>
  _last = (<ASTLabelType>)input.LT(1);
<super.ruleRefTrackAndListLabel(...)>
<else>
<super.ruleRefTrackAndListLabel(...)>
<endif>
>>

/** ^(rule ...) rewrite */
ruleRefRuleRootTrack(rule,label,elementIndex,args,scope) ::= <<
<if(!ruleDescriptor.isSynPred)>
  _last = (<ASTLabelType>)input.LT(1);
<super.ruleRefRuleRootTrack(...)>
<else>
<super.ruleRefRuleRootTrack(...)>
<endif>
>>

/** ^(x+=rule ...) rewrite */
ruleRefRuleRootTrackAndListLabel(rule,label,elementIndex,args,scope) ::= <<
<if(!ruleDescriptor.isSynPred)>
  _last = (<ASTLabelType>)input.LT(1);
<super.ruleRefRuleRootTrackAndListLabel(...)>
<else>
<super.ruleRefRuleRootTrackAndListLabel(...)>
<endif>
>>

/** Streams for token refs are tree nodes now; override to
 * change NextToken to NextNode.
 */
createRewriteNodeFromElement(token,terminalOptions,args) ::= <%
<if(terminalOptions.node)>

```

```
new
<terminalOptions.node>(<if(terminalOptions.type)><terminalOptions.type>,<endif>stream_<token>.NextNode())
<else>
stream_<token>.NextNode()
<endif>
%>
```

```
ruleCleanUp() ::= <<
<super.ruleCleanUp()>
<if(!ruleDescriptor.isSynPred)>
<if(!rewriteMode)>
<if(backtracking)>if (<actions.(actionScope).synpredgate>) {<endif>
retval.Tree = (<ASTLabelType>)adaptor.RulePostProcessing(root_0);
<if(backtracking)>}<endif>
<endif>
<endif>
>>
```

Found in path(s):

```
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-
jar/org/antlr/codegen/templates/CSharp2/ASTTreeParser.stg
No license file was found, but licenses were detected in source scan.
```

```
/*
```

```
[The "BSD license"]
```

```
Copyright (c) 2005-2012 Terence Parr
```

```
All rights reserved.
```

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THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

*/

/** The API version of the runtime that recognizers generated by this runtime

* need.

*/

apiVersion() ::= "1"

/** The overall file structure of a recognizer; stores methods for rules

* and cyclic DFAs plus support code.

*/

outputFile(LEXER,PARSER,TREE_PARSER, actionScope, actions,
docComment, recognizer,
name, tokens, tokenNames, rules, cyclicDFAs,
bitsets, buildTemplate, buildAST, rewriteMode, profile,
backtracking, synpreds, memoize, numRules,
fileName, ANTLRVersion, generatedTimestamp, trace,
scopes, superClass, literals) ::=

<<

\$ANTLR <ANTLRVersion> <fileName> <generatedTimestamp>

<@imports>

import sys

from antlr3 import *

<if(TREE_PARSER)>

from antlr3.tree import *<\n>

<endif>

<@end>

<actions.(actionScope).header>

<! <docComment> !>

for convenience in actions

HIDDEN = BaseRecognizer.HIDDEN

token types

<tokens:{it | <it.name>=<it.type>}; separator="\n">

token names

tokenNamesMap = {

0: "\<invalid>", 1: "\<EOR>", 2: "\<DOWN>", 3: "\<UP>",

<tokens:{it | <it.type>: "<it.name>"}; wrap, separator=", ">

}

Token.registerTokenNamesMap(tokenNamesMap)

<recognizer>

```

<if(actions.(actionScope).main)>
<actions.(actionScope).main>
<else>
def main(argv, stdin=sys.stdin, stdout=sys.stdout, stderr=sys.stderr):
<if(LEXER)>
    from antlr3.main import LexerMain
    main = LexerMain(<recognizer.name>)<\n>
<endif>
<if(PARSER)>
    from antlr3.main import ParserMain
    main = ParserMain("<recognizer.grammar.name>Lexer", <recognizer.name>)<\n>
<endif>
<if(TREE_PARSER)>
    from antlr3.main import WalkerMain
    main = WalkerMain(<recognizer.name>)<\n>
<endif>
    main.stdin = stdin
    main.stdout = stdout
    main.stderr = stderr
    main.execute(argv)<\n>
<endif>

<actions.(actionScope).footer>

if __name__ == '__main__':
    main(sys.argv)

>>

lexer(grammar, name, tokens, scopes, rules, numRules, filterMode,
    labelType="CommonToken", superClass="Lexer") ::= <<
<if(grammar.directDelegates)>
# path hack to allow absolute import of related grammars.
from os.path import dirname
__path__ = [dirname(__file__)]
del dirname

<grammar.directDelegates:
{g|from .<g.recognizerName> import <g.recognizerName>}; separator="\n">
<endif>

class <grammar.recognizerName>(<@superClassName><superClass><@end>):
    <scopes: {it|<if(it.isDynamicGlobalScope)><globalAttributeScope(scope=it)><endif>}>

    grammarFileName = "<fileName>"
    api_version = <apiVersion()>

    def __init__(self<grammar.delegators: {g|, <g:delegateName()>}>, input=None, state=None):

```

```

    if state is None:
        state = RecognizerSharedState()
    super().__init__(input, state)

<if(memoize)>
<if(grammar.grammarIsRoot)>
    self._state.ruleMemo = {}
<endif>
<endif>

    <grammar.directDelegates:
        {g|self.<g:delegateName()> = <g.recognizerName>(<trunc(g.delegates):{p|<p:delegateName()>, }>self, input,
state)}; separator="\n">
    <grammar.directDelegates:
        {g|<g.delegates:{h|self.<h:delegateName()> = self.<g:delegateName()>.<h:delegateName()>};
separator="\n">}; separator="\n">
    <grammar.delegates:
        {g|self.<g:delegateName()> = <g:delegateName()>}; separator="\n">
    <last(grammar.delegates):
        {g|self.gParent = <g:delegateName()>}; separator="\n">
    self.delegates = [<grammar.delegates: {g|self.<g:delegateName()>}; separator = ", ">]

    <cyclicDFAs:{ dfa | <cyclicDFAInit(dfa)>}; separator="\n">

    <actions.lexer.init>

    <actions.lexer.members>

<if(filterMode)>
    <filteringNextToken()>
<endif>
    <rules; separator="\n\n">

    <synpreds:{ p | <lexerSynpred(p)>}>

    <cyclicDFAs:cyclicDFA()> <! dump tables for all DFA !>

>>

/** A override of Lexer.nextToken() that backtracks over mTokens() looking
 * for matches. No error can be generated upon error; just rewind, consume
 * a token and then try again. backtracking needs to be set as well.
 * Make rule memoization happen only at levels above 1 as we start mTokens
 * at backtracking==1.
 */

```

```

filteringNextToken() ::= <<
def nextToken(self):
    while True:
        if self.input.LA(1) == EOF:
            return self.makeEOFToken()

        self._state.token = None
        self._state.channel = DEFAULT_CHANNEL
        self._state.tokenStartCharIndex = self.input.index()
        self._state.tokenStartCharPositionInLine = self.input.charPositionInLine
        self._state.tokenStartLine = self.input.line
        self._state._text = None
        try:
            m = self.input.mark()
            try:
                # means we won't throw slow exception
                self._state.backtracking = 1
                try:
                    self.mTokens()
                finally:
                    self._state.backtracking = 0

            except BacktrackingFailed:
                # mTokens backtracks with synpred at backtracking==2
                # and we set the synpredgate to allow actions at level 1.
                self.input.rewind(m)
                self.input.consume() # advance one char and try again

        else:
            self.emit()
            return self._state.token

    except RecognitionException as re:
        # shouldn't happen in backtracking mode, but...
        self.reportError(re)
        self.recover(re)

def memoize(self, input, ruleIndex, ruleStartIndex, success):
    if self._state.backtracking > 1:
        # is Lexer always superclass?
        super().memoize(input, ruleIndex, ruleStartIndex, success)

def alreadyParsedRule(self, input, ruleIndex):
    if self._state.backtracking > 1:
        return super().alreadyParsedRule(input, ruleIndex)
    return False

```

```

>>

actionGate() ::= "self._state.backtracking == 0"

filteringActionGate() ::= "self._state.backtracking == 1"

/** How to generate a parser */

genericParser(grammar, name, scopes, tokens, tokenNames, rules, numRules,
              bitsets, inputStreamType, superClass, labelType, members,
              rewriteElementType, filterMode, init, ASTLabelType="Object") ::= <<
# token names
tokenNames = [
  "\<invalid>", "\<EOR>", "\<DOWN>", "\<UP>",
  <tokenNames; wrap, separator=", ">
]

<scopes:{it|<if(it.isDynamicGlobalScope)><globalAttributeScopeClass(scope=it)><endif>>>

<if(grammar.directDelegates)>
# path hack to allow absolute import of related grammars.
from os.path import dirname
__path__ = [dirname(__file__)]
del dirname

<grammar.directDelegates:
{g|from .<g.recognizerName> import <g.recognizerName>}; separator="\n">
<endif>

<rules:{it|<ruleAttributeScopeClass(scope=it.ruleDescriptor.ruleScope)>>>

class <grammar.recognizerName>(<@superClassName><superClass><@end>):
  grammarFileName = "<fileName>"
  api_version = <apiVersion()>
  tokenNames = tokenNames

  def __init__(self<grammar.delegates:{g|, <g.delegateName()>>, input, state=None, *args, **kwargs):
    if state is None:
      state = RecognizerSharedState()

    <@args()>
    super().__init__(input, state, *args, **kwargs)

<if(memoize)>
<if(grammar.grammarIsRoot)>
  self._state.ruleMemo = {}

```

```

<endif>
<endif>

<cyclicDFAs:{ dfa | <cyclicDFAInit(dfa)>}; separator="\n">

<scopes:{it | <if(it.isDynamicGlobalScope)><globalAttributeScopeStack(scope=it)><endif>}>
<rules:{it | <ruleAttributeScopeStack(scope=it.ruleDescriptor.ruleScope)>}>

<init>

<grammar.delegators:
  {g|self.<g.delegateName()> = <g.delegateName()>}; separator="\n">
<grammar.directDelegates:
  {g|self.<g.delegateName()> = <g.recognizerName>(<trunc(g.delegators):{p|<p.delegateName()>, }>self, input,
state)); separator="\n">
<grammar.directDelegates:
  {g|<g.delegates:{h|self.<h.delegateName()> = self.<g.delegateName()>.<h.delegateName()>};
separator="\n">}; separator="\n">
<last(grammar.delegators):
  {g|self.gParent = self.<g.delegateName()>}; separator="\n">
self.delegates = [<grammar.delegates: {g|self.<g.delegateName()>}; separator = ", ">]

<@init><@end>

<@members><@end>

<members>

<rules; separator="\n\n">

<! generate rule/method definitions for imported rules so they
  appear to be defined in this recognizer. !>
<grammar.delegatedRules:{ ruleDescriptor| <delegateRule(ruleDescriptor)> }; separator="\n">

<synpreds:{p | <synpred(p)>}>

<cyclicDFAs:cyclicDFA()> <! dump tables for all DFA !>

<bitsets:{it | FOLLOW_<it.name>_in_<it.inName><it.tokenIndex> = frozenset([<it.tokenTypes:{it |
<it>};separator=", ">])<n>}>

>>

delegateRule(ruleDescriptor) ::= <<
def <ruleDescriptor.name>(self, <ruleDescriptor.parameterScope:parameterScope()>):
<\> <if(ruleDescriptor.hasReturnValue)>return
<endif>self.<ruleDescriptor.grammar:delegateName()>.<ruleDescriptor.name>(<if(ruleDescriptor.parameterScope)

```

```
><ruleDescriptor.parameterScope.attributes:{a|<a.name>}; separator=", "><endif>
```

```
>>
```

```
parser(grammar, name, scopes, tokens, tokenNames, rules, numRules, bitsets,  
  ASTLabelType="Object", superClass="Parser", labelType="Token",  
  members={<actions.parser.members>},  
  init={<actions.parser.init>}  
  ) ::= <<
```

```
<genericParser(grammar, name, scopes, tokens, tokenNames, rules, numRules,  
  bitsets, "TokenStream", superClass,  
  labelType, members, "Token",  
  false, init, ASTLabelType)>
```

```
>>
```

```
/** How to generate a tree parser; same as parser except the input
```

```
* stream is a different type.
```

```
*/
```

```
treeParser(grammar, name, scopes, tokens, tokenNames, globalAction, rules,  
  numRules, bitsets, filterMode, labelType={<ASTLabelType>}, ASTLabelType="Object",  
  superClass={<if(filterMode)><if(buildAST)>TreeRewriter<else>TreeFilter<endif><else>TreeParser<endif>},  
  members={<actions.treeparser.members>},  
  init={<actions.treeparser.init>}  
  ) ::= <<
```

```
<genericParser(grammar, name, scopes, tokens, tokenNames, rules, numRules,  
  bitsets, "TreeNodeStream", superClass,  
  labelType, members, "Node",  
  filterMode, init, ASTLabelType)>
```

```
>>
```

```
/** A simpler version of a rule template that is specific to the imaginary
```

```
* rules created for syntactic predicates. As they never have return values
```

```
* nor parameters etc..., just give simplest possible method. Don't do
```

```
* any of the normal memoization stuff in here either; it's a waste.
```

```
* As predicates cannot be inlined into the invoking rule, they need to
```

```
* be in a rule by themselves.
```

```
*/
```

```
synpredRule(ruleName, ruleDescriptor, block, description, nakedBlock) ::=
```

```
<<
```

```
# $ANTLR start "<ruleName>"
```

```
def <ruleName>_fragment(self, <ruleDescriptor.parameterScope:parameterScope()):
```

```
  <ruleLabelDefs(>
```

```
<if(trace)>
```

```
  self.traceIn("<ruleName>_fragment", <ruleDescriptor.index>)
```

```
  try:
```

```
    <block>
```

```

    finally:
        self.traceOut("<ruleName>_fragment", <ruleDescriptor.index>)

<else>
    <block>
<endif>
# $ANTLR end "<ruleName>"

>>

synpred(name) ::= <<
def <name>(self):
    self._state.backtracking += 1
    <@start()>
    start = self.input.mark()
    try:
        self.<name>_fragment()
    except BacktrackingFailed:
        success = False
    else:
        success = True
    self.input.rewind(start)
    <@stop()>
    self._state.backtracking -= 1
    return success

>>

lexerSynpred(name) ::= <<
<synpred(name)>
>>

ruleMemoization(name) ::= <<
<if(memoize)>
if self._state.backtracking > 0 and self.alreadyParsedRule(self.input, <ruleDescriptor.index>):
    # for cached failed rules, alreadyParsedRule will raise an exception
    success = True
    return <ruleReturnValue()>

<endif>
>>

/** This rule has failed, exit indicating failure during backtrack */
ruleBacktrackFailure() ::= <<
<if(backtracking)>
if self._state.backtracking > 0:

```



```

    raise BacktrackingFailed

<endif>
>>

/** How to generate code for a rule. This includes any return type
 * data aggregates required for multiple return values.
 */
rule(ruleName,ruleDescriptor,block,emptyRule,description,exceptions,finally,memoize) ::= <<
<returnScope(scope=ruleDescriptor.returnScope)>

# $ANTLR start "<ruleName>"
# <fileName>:<description>
<ruleDescriptor.actions.decorate>
def <ruleName>(self, <ruleDescriptor.parameterScope:parameterScope()):
<if(trace)>
    self.traceIn("<ruleName>", <ruleDescriptor.index>)\n
<endif>
    <ruleScopeSetUp()>
    <ruleDeclarations()>
    <ruleLabelDefs()>
    <ruleDescriptor.actions.init>
    <@preamble()>
    <@body><ruleBody()><@end>
    <@postamble()>
    return <ruleReturnValue()>

# $ANTLR end "<ruleName>"
>>

ruleBody() ::= <<
<if(memoize)>
<if(backtracking)>
success = False\n
<endif>
<endif>
try:
    try:
        <ruleMemoization(name=ruleName)>
        <block>
        <ruleCleanUp()>
        <(ruleDescriptor.actions.after):execAction()>

<if(memoize)>
<if(backtracking)>
    success = True\n
<endif>
<endif>

```

```

<if(exceptions)>
  <exceptions:{e|<catch(decl=e.decl,action=e.action)><\n>}>
<else>
<if(!emptyRule)>
<if(actions.(actionScope).rulecatch)>
  <actions.(actionScope).rulecatch>
<else>
  except RecognitionException as re:
    self.reportError(re)
    self.recover(self.input, re)
    <@setErrorReturnValue()>

<endif>
<else>
  finally:
    pass

<endif>
<endif>
finally:
<if(trace)>
  self.traceOut("<ruleName>", <ruleDescriptor.index>)<\n>
<endif>
  <memoize()>
  <ruleScopeCleanUp()>
  <finally>
  pass
>>

catch(decl,action) ::= <<
except <e.decl>:
  <e.action>

>>

ruleDeclarations() ::= <<
<if(ruleDescriptor.hasMultipleReturnValues)>
retval = self.<ruleDescriptor.name>_return()
retval.start = self.input.LT(1)<\n>
<elseif(ruleDescriptor.returnScope)>
<ruleDescriptor.returnScope.attributes:{ a |
<a.name> = <if(a.initValue)><a.initValue><else>None<endif>
}>
<endif>
<if(memoize)>
<ruleDescriptor.name>_startIndex = self.input.index()
<endif>
>>

```

```

ruleScopeSetUp() ::= <<
<ruleDescriptor.useScopes:{it | self.<it>_stack.append(<it>_scope()); separator="\n">
<ruleDescriptor.ruleScope:{it | self.<it.name>_stack.append(<it.name>_scope()); separator="\n">
>>

```

```

ruleScopeCleanUp() ::= <<
<ruleDescriptor.useScopes:{it | self.<it>_stack.pop(); separator="\n">
<ruleDescriptor.ruleScope:{it | self.<it.name>_stack.pop(); separator="\n">
>>

```

```

ruleLabelDefs() ::= <<
<[ruleDescriptor.tokenLabels,ruleDescriptor.tokenListLabels,
ruleDescriptor.wildcardTreeLabels,ruleDescriptor.wildcardTreeListLabels]
: {it | <it.label.text> = None }; separator="\n"
>
<[ruleDescriptor.tokenListLabels,ruleDescriptor.ruleListLabels,
ruleDescriptor.wildcardTreeListLabels]
: {it | list_<it.label.text> = None }; separator="\n"
>
<ruleDescriptor.ruleLabels:ruleLabelDef(); separator="\n">
<ruleDescriptor.ruleListLabels:{it | <it.label.text> = None }; separator="\n">
>>

```

```

lexerRuleLabelDefs() ::= <<
<[ruleDescriptor.tokenLabels,
ruleDescriptor.tokenListLabels,
ruleDescriptor.ruleLabels]
: {it | <it.label.text> = None }; separator="\n"
>
<ruleDescriptor.charLabels:{it | <it.label.text> = None }; separator="\n">
<[ruleDescriptor.tokenListLabels,
ruleDescriptor.ruleListLabels]
: {it | list_<it.label.text> = None }; separator="\n"
>
>>

```

```

ruleReturnValue() ::= <%
<if(!ruleDescriptor.isSynPred)>
<if(ruleDescriptor.hasReturnValue)>
<if(ruleDescriptor.hasSingleReturnValue)>
<ruleDescriptor.singleValueReturnName>
<else>
retval
<endif>
<endif>
<endif>
%>

```

```

ruleCleanup() ::= <<
<if(ruleDescriptor.hasMultipleReturnValues)>
<if(!TREE_PARSER)>
retval.stop = self.input.LT(-1)<\n>
<endif>
<endif>
>>

memoize() ::= <<
<if(memoize)>
<if(backtracking)>
if self._state.backtracking > 0:
    self.memoize(self.input, <ruleDescriptor.index>, <ruleDescriptor.name>_StartIndex, success)

<endif>
<endif>
>>

/** How to generate a rule in the lexer; naked blocks are used for
 * fragment rules.
 */
lexerRule(ruleName,nakedBlock,ruleDescriptor,block,memoize) ::= <<
# $ANTLR start "<ruleName>"
def m<ruleName>(self, <ruleDescriptor.parameterScope:parameterScope()>):
<if(trace)>
    self.traceIn("<ruleName>", <ruleDescriptor.index>)<\n>
<endif>
    <ruleScopeSetUp()>
    <ruleDeclarations()>
<if(memoize)>
<if(backtracking)>
    success = False<\n>
<endif>
<endif>
    try:
<if(nakedBlock)>
        <ruleMemoization(name=ruleName)>
        <lexerRuleLabelDefs()>
        <ruleDescriptor.actions.init>
        <block><\n>
<else>
        _type = <ruleName>
        _channel = DEFAULT_CHANNEL

        <ruleMemoization(name=ruleName)>
        <lexerRuleLabelDefs()>
        <ruleDescriptor.actions.init>

```

```

    <block>
    <ruleCleanUp()>
    self._state.type = _type
    self._state.channel = _channel
    <(ruleDescriptor.actions.after):execAction()>
<endif>
<if(memoize)>
<if(backtracking)>
    success = True<\n>
<endif>
<endif>

    finally:
<if(trace)>
    self.traceOut("<ruleName>", <ruleDescriptor.index>)<\n>
<endif>
    <ruleScopeCleanUp()>
    <memoize()>
    pass

# $ANTLR end "<ruleName>"

>>

/** How to generate code for the implicitly-defined lexer grammar rule
 * that chooses between lexer rules.
 */
tokensRule(ruleName,nakedBlock,args,block,ruleDescriptor) ::= <<
def mTokens(self):
    <block><\n>

>>

// S U B R U L E S

/** A (...) subrule with multiple alternatives */
block(alts,decls,decision,enclosingBlockLevel,blockLevel,decisionNumber,maxK,maxAlt,description) ::= <<
# <fileName>:<description>
alt<decisionNumber> = <maxAlt>
<decls>
<@body><blockBody()><@end>
>>

blockBody() ::= <<
<@predecision()>
<@decision><decision><@end>

```

```

<@postdecision(>
<@prebranch(>
<alts:{ a | <altSwitchCase(i, a)> }; separator="\nel">
<@postbranch(>
>>

/** A rule block with multiple alternatives */
ruleBlock(alts,decls,decision,enclosingBlockLevel,blockLevel,decisionNumber,maxK,maxAlt,description) ::= <<
# <fileName>:<description>
alt<decisionNumber> = <maxAlt>
<decls>
<@predecision(>
<@decision><decision><@end>
<@postdecision(>
<alts:{ a | <altSwitchCase(i, a)> }; separator="\nel">
>>

ruleBlockSingleAlt(alts,decls,decision,enclosingBlockLevel,blockLevel,decisionNumber,description) ::= <<
# <fileName>:<description>
<decls>
<@prealt(>
<alts>
<@postalt(>
>>

/** A special case of a (...) subrule with a single alternative */
blockSingleAlt(alts,decls,decision,enclosingBlockLevel,blockLevel,decisionNumber,description) ::= <<
# <fileName>:<description>
<decls>
<@prealt(>
<alts>
<@postalt(>
>>

/** A (..)+ block with 1 or more alternatives */
positiveClosureBlock(alts,decls,decision,enclosingBlockLevel,blockLevel,decisionNumber,maxK,maxAlt,description) ::= <<
# <fileName>:<description>
cnt<decisionNumber> = 0
<decls>
<@preloop(>
<@loopBody>
<positiveClosureBlockLoop(>
<@end>
<@postloop(>
>>

positiveClosureBlockLoop() ::= <<

```

```

while True: #loop<decisionNumber>
  alt<decisionNumber> = <maxAlt>
  <@predecision()>
  <@decisionBody><decision><@end>
  <@postdecision()>
  <alts:{a | <altSwitchCase(i, a)>}; separator="\nel">
  else:
    if cnt<decisionNumber> >= 1:
      break #loop<decisionNumber>

  <ruleBacktrackFailure()>
  eee = EarlyExitException(<decisionNumber>, self.input)
  <@earlyExitException()>
  raise eee

  cnt<decisionNumber> += 1
>>

positiveClosureBlockSingleAlt ::= positiveClosureBlock

/** A (..)* block with 1 or more alternatives */
closureBlock(alts,decls,decision,enclosingBlockLevel,blockLevel,decisionNumber,maxK,maxAlt,description) ::=
<<
# <fileName>:<description>
<decls>
<@preloop()>
<@loopBody>
<closureBlockLoop()>
<@end>
<@postloop()>
>>

closureBlockLoop() ::= <<
while True: #loop<decisionNumber>
  alt<decisionNumber> = <maxAlt>
  <@predecision()>
  <@decisionBody><decision><@end>
  <@postdecision()>
  <alts:{a | <altSwitchCase(i, a)>}; separator="\nel">
  else:
    break #loop<decisionNumber>
>>

closureBlockSingleAlt ::= closureBlock

/** Optional blocks (x)? are translated to (x|) by before code generation
* so we can just use the normal block template
*/

```

```
optionalBlock ::= block
```

```
optionalBlockSingleAlt ::= block
```

```
/** A case in a switch that jumps to an alternative given the alternative  
 * number. A DFA predicts the alternative and then a simple switch  
 * does the jump to the code that actually matches that alternative.  
 */
```

```
altSwitchCase(altNum,alt) ::= <<  
if alt<decisionNumber> == <altNum>:  
  <@prealt()>  
  <alt>  
>>
```

```
/** An alternative is just a list of elements; at outermost level */  
alt(elements,altNum,description,autoAST,outerAlt, treeLevel,rew) ::= <<  
# <fileName>:<description>  
pass <! so empty alternatives are a valid block !>  
<@declarations()>  
<elements:element()>  
<rew>  
<@cleanup()>  
>>
```

```
/** What to emit when there is no rewrite. For auto build  
 * mode, does nothing.  
 */  
noRewrite(rewriteBlockLevel, treeLevel) ::= ""
```

```
// E L E M E N T S
```

```
/** Dump the elements one per line */  
element(e) ::= <<  
<@prematch()>  
<e.el><\n>  
>>
```

```
/** match a token optionally with a label in front */  
tokenRef(token,label,elementIndex,terminalOptions={}) ::= <<  
<if(label)><label> = <endif>self.match(self.input, <token>,  
self.FOLLOW_<token>_in_<ruleName><elementIndex>  
>>
```

```
/** ids+=ID */  
tokenRefAndListLabel(token,label,elementIndex,terminalOptions={}) ::= <<  
<tokenRef(token,label,elementIndex,terminalOptions)>  
<listLabel(label, label)>  
>>
```



```

listLabel(label, elem) ::= <<
if list_<label> is None:
    list_<label> = []
list_<label>.append(<elem>)<\n>
>>

/** match a character */
charRef(char,label) ::= <<
<if(label)>
<label> = self.input.LA(1)<\n>
<endif>
self.match(<char>)
>>

/** match a character range */
charRangeRef(a,b,label) ::= <<
<if(label)>
<label> = self.input.LA(1)<\n>
<endif>
self.matchRange(<a>, <b>)
>>

/** For now, sets are interval tests and must be tested inline */
matchSet(s,label,elementIndex,postmatchCode="",terminalOptions={}) ::= <<
<if(label)>
<label> = self.input.LT(1)<\n>
<endif>
if <s>:
    self.input.consume()
    <postmatchCode>
<if(!LEXER)>
    self._state.errorRecovery = False<\n>
<endif>

else:
    <ruleBacktrackFailure()>
    mse = MismatchedSetException(None, self.input)
    <@mismatchedSetException()>
<if(LEXER)>
    self.recover(mse)
    raise mse
<else>
    raise mse
<! use following code to make it recover inline; remove throw mse;
self.recoverFromMismatchedSet(
    self.input, mse, self.FOLLOW_set_in_<ruleName><elementIndex>
)

```

```

!>
<endif>
<\n>
>>

matchRuleBlockSet ::= matchSet

matchSetAndListLabel(s,label,elementIndex,postmatchCode) ::= <<
<matchSet(...)>
<listLabel(label, label)>
>>

/** Match a string literal */
lexerStringRef(string,label,elementIndex="0") ::= <<
<if(label)>
<label>Start = self.getCharIndex()
self.match(<string>)
<label>StartLine<elementIndex> = self.getLine()
<label>StartCharPos<elementIndex> = self.getCharPositionInLine()
<label> = <labelType>(input=self.input, type=INVALID_TOKEN_TYPE, channel=DEFAULT_CHANNEL,
start=<label>Start, stop=self.getCharIndex()-1)
<label>.line = <label>StartLine<elementIndex>
<label>.charPositionInLine = <label>StartCharPos<elementIndex>
<else>
self.match(<string>)
<endif>
>>

wildcard(token,label,elementIndex,terminalOptions={ }) ::= <<
<if(label)>
<label> = self.input.LT(1)<\n>
<endif>
self.matchAny()
>>

wildcardAndListLabel(token,label,elementIndex,terminalOptions={ }) ::= <<
<wildcard(...)>
<listLabel(label,label)>
>>

/** Match . wildcard in lexer */
wildcardChar(label, elementIndex) ::= <<
<if(label)>
<label> = self.input.LA(1)<\n>
<endif>
self.matchAny()
>>

```

```

wildcardCharListLabel(label, elementIndex) ::= <<
<wildcardChar(label, elementIndex)>
<listLabel(label, label)>
>>

/** Match a rule reference by invoking it possibly with arguments
 * and a return value or values. The 'rule' argument was the
 * target rule name, but now is type Rule, whose toString is
 * same: the rule name. Now though you can access full rule
 * descriptor stuff.
 */
ruleRef(rule,label,elementIndex,args,scope) ::= <<
self._state.following.append(self.FOLLOW_<rule.name>_in_<ruleName><elementIndex>)
<if(label)><label> = <endif>self.<if(scope)><scope:delegateName()>.<endif><rule.name><(<args; separator=",
"><\n>
self._state.following.pop()
>>

/** ids+=rule */
ruleRefAndListLabel(rule,label,elementIndex,args,scope) ::= <<
<ruleRef(rule,label,elementIndex,args,scope)>
<listLabel(label, label)>
>>

/** A lexer rule reference
 * The 'rule' argument was the target rule name, but now
 * is type Rule, whose toString is same: the rule name.
 * Now though you can access full rule descriptor stuff.
 */
lexerRuleRef(rule,label,args,elementIndex,scope) ::= <<
<if(label)>
<label>Start<elementIndex> = self.getCharIndex()
self.<if(scope)><scope:delegateName()>.<endif>m<rule.name><(<args; separator=", ">)
<label>StartLine<elementIndex> = self.getLine()
<label>StartCharPos<elementIndex> = self.getCharPositionInLine()
<label> = <labelType>(
  input=self.input,
  type=INVALID_TOKEN_TYPE,
  channel=DEFAULT_CHANNEL,
  start=<label>Start<elementIndex>,
  stop=self.getCharIndex()-1)
<label>.line = <label>StartLine<elementIndex>
<label>.charPositionInLine = <label>StartCharPos<elementIndex>
<else>
self.<if(scope)><scope:delegateName()>.<endif>m<rule.name><(<args; separator=", ">)
<endif>
>>

```

```

/** i+=INT in lexer */
lexerRuleRefAndListLabel(rule,label,args,elementIndex,scope) ::= <<
<lexerRuleRef(rule,label,args,elementIndex,scope)>
<listLabel(label, label)>
>>

/** EOF in the lexer */
lexerMatchEOF(label,elementIndex) ::= <<
<if(label)>
<label>Start<elementIndex> = self.getCharIndex()
<label>StartLine<elementIndex> = self.getLine()
<label>StartCharPos<elementIndex> = self.getCharPositionInLine()
self.match(EOF)
<label> = <labelType>(input=self.input, type=EOF, channel=DEFAULT_CHANNEL,
start=<label>Start<elementIndex>, stop=self.getCharIndex()-1)
<label>.line = <label>StartLine<elementIndex>
<label>.charPositionInLine = <label>StartCharPos<elementIndex>
<else>
self.match(EOF)
<endif>
>>

// used for left-recursive rules
recRuleDefArg()          ::= "<recRuleArg()>"
recRuleArg()             ::= "_p"
recRuleAltPredicate(ruleName, opPrec) ::= "<recRuleArg()> \<= <opPrec>"
recRuleSetResultAction() ::= "root_0 = $<ruleName>_primary.tree"
recRuleSetReturnAction(src, name)    ::= "$<name> = $<src>.<name>"

/** match ^(root children) in tree parser */
tree(root, actionsAfterRoot, children, nullableChildList,
enclosingTreeLevel, treeLevel) ::= <<
<root:element()>
<actionsAfterRoot:element()>
<if(nullableChildList)>
if self.input.LA(1) == DOWN:
self.match(self.input, DOWN, None)
<children:element()>
self.match(self.input, UP, None)

<else>
self.match(self.input, DOWN, None)
<children:element()>
self.match(self.input, UP, None)
<endif>
>>

/** Every predicate is used as a validating predicate (even when it is

```

```

* also hoisted into a prediction expression).
*/
validateSemanticPredicate(pred,description) ::= <<
if not (<evalPredicate(pred, description)>):
  <ruleBacktrackFailure()>
  raise FailedPredicateException(self.input, "<ruleName>", "<description>")

>>

// F i x e d D F A (if-then-else)

dfaState(k,edges,eotPredictsAlt,description,stateNumber,semPredState) ::= <<
LA<decisionNumber>_<stateNumber> = self.input.LA(<k>)<\n>
<edges; separator="\n" >
else:
<if(eotPredictsAlt)>
  alt<decisionNumber> = <eotPredictsAlt>
<else>
  <ruleBacktrackFailure()>
  nvae = NoViableAltException("<description>", <decisionNumber>, <stateNumber>, self.input)<\n>
  <@noViableAltException()>
  raise nvae<\n>
<endif>
>>

/** Same as a normal DFA state except that we don't examine lookahead
* for the bypass alternative. It delays error detection but this
* is faster, smaller, and more what people expect. For (X)? people
* expect "if ( LA(1)==X ) match(X);" and that's it.
*/
dfaOptionalBlockState(k,edges,eotPredictsAlt,description,stateNumber,semPredState) ::= <<
LA<decisionNumber>_<stateNumber> = self.input.LA(<k>)<\n>
<edges; separator="\n" >
>>

/** A DFA state that is actually the loopback decision of a closure
* loop. If end-of-token (EOT) predicts any of the targets then it
* should act like a default clause (i.e., no error can be generated).
* This is used only in the lexer so that for ('a')* on the end of a rule
* anything other than 'a' predicts exiting.
*/
dfaLoopbackState(k,edges,eotPredictsAlt,description,stateNumber,semPredState) ::= <<
LA<decisionNumber>_<stateNumber> = self.input.LA(<k>)<\n>
<edges; separator="\n"><\n>
<if(eotPredictsAlt)>
<if(!edges)>
alt<decisionNumber> = <eotPredictsAlt> <! if no edges, don't gen ELSE !>
<else>

```

```

else:
    alt<decisionNumber> = <eotPredictsAlt>
<\n>
<endif>
<endif>
>>

/** An accept state indicates a unique alternative has been predicted */
dfaAcceptState(alt) ::= "alt<decisionNumber> = <alt>"

/** A simple edge with an expression. If the expression is satisfied,
 * enter to the target state. To handle gated productions, we may
 * have to evaluate some predicates for this edge.
 */
dfaEdge(labelExpr, targetState, predicates) ::= <<
if (<labelExpr>) <if(predicates)>and (<predicates>)<endif>:
    <targetState>
>>

// F i x e d D F A (switch case)

/** A DFA state where a SWITCH may be generated. The code generator
 * decides if this is possible: CodeGenerator.canGenerateSwitch().
 */
dfaStateSwitch(k,edges,eotPredictsAlt,description,stateNumber,semPredState) ::= <<
<!
    FIXME: this is one of the few occasion, where I miss a switch statement
    in Python. ATM this is implemented as a list of if .. elif ..
    This may be replaced by faster a dictionary lookup, when I find a solution
    for the cases when an edge is not a plain dfaAcceptState.
!>
LA<decisionNumber> = self.input.LA(<k>)
<edges; separator="\n">
else:
<if(eotPredictsAlt)>
    alt<decisionNumber> = <eotPredictsAlt>
<else>
    <ruleBacktrackFailure()>
    nvae = NoViableAltException("<description>", <decisionNumber>, <stateNumber>, self.input)<\n>
    <@noViableAltException()>
    raise nvae<\n>
<endif>

>>

dfaOptionalBlockStateSwitch(k,edges,eotPredictsAlt,description,stateNumber,semPredState) ::= <<
LA<decisionNumber> = self.input.LA(<k>)
<edges; separator="\n">

```

```

>>

dfaLoopbackStateSwitch(k, edges,eotPredictsAlt,description,stateNumber,semPredState) ::= <<
LA<decisionNumber> = self.input.LA(<k>)
<edges; separator="\n">
<if(eotPredictsAlt)>
else:
    alt<decisionNumber> = <eotPredictsAlt>
<endif>
>>

dfaEdgeSwitch(labels, targetState) ::= <<
if LA<decisionNumber> in {<labels; separator=",">}:
    <targetState>
>>

// C y c l i c D F A

/** The code to initiate execution of a cyclic DFA; this is used
 * in the rule to predict an alt just like the fixed DFA case.
 * The <name> attribute is inherited via the parser, lexer, ...
 */
dfaDecision(decisionNumber,description) ::= <<
alt<decisionNumber> = self.dfa<decisionNumber>.predict(self.input)
>>

/* Dump DFA tables as run-length-encoded Strings of octal values.
 * Can't use hex as compiler translates them before compilation.
 * These strings are split into multiple, concatenated strings.
 * Java puts them back together at compile time thankfully.
 * Java cannot handle large static arrays, so we're stuck with this
 * encode/decode approach. See analysis and runtime DFA for
 * the encoding methods.
 */
cyclicDFA(dfa) ::= <<
# lookup tables for DFA #<dfa.decisionNumber>

DFA<dfa.decisionNumber>_eot = DFA.unpack(
    "<dfa.javaCompressedEOT; wrap="\n \>"
)

DFA<dfa.decisionNumber>_eof = DFA.unpack(
    "<dfa.javaCompressedEOF; wrap="\n \>"
)

DFA<dfa.decisionNumber>_min = DFA.unpack(
    "<dfa.javaCompressedMin; wrap="\n \>"
)

```

```

DFA<dfa.decisionNumber>_max = DFA.unpack(
    "<dfa.javaCompressedMax; wrap=\"\\n \\\">"
)

DFA<dfa.decisionNumber>_accept = DFA.unpack(
    "<dfa.javaCompressedAccept; wrap=\"\\n \\\">"
)

DFA<dfa.decisionNumber>_special = DFA.unpack(
    "<dfa.javaCompressedSpecial; wrap=\"\\n \\\">"
)

DFA<dfa.decisionNumber>_transition = [
    <dfa.javaCompressedTransition:{s|DFA.unpack("<s; wrap=\"\\n\\\">"); separator=",\n">
]

# class definition for DFA #<dfa.decisionNumber>

class DFA<dfa.decisionNumber>(DFA):
    pass

    <@errorMethod()>

    <if(dfa.specialStateSTs)>
    def specialStateTransition(self_, s, input):
        # convince pylint that my self_ magic is ok ;
        # pylint: disable-msg=E0213

        # pretend we are a member of the recognizer
        # thus semantic predicates can be evaluated
        self = self_.recognizer

        _s = s

        <dfa.specialStateSTs:{state | if s == <i0>: <! compressed special state numbers 0..n-1 !>
        <state>}; separator="\n!">

    <if(backtracking)>
        if self._state.backtracking > 0:
            raise BacktrackingFailed

    <endif>
        nvae = NoViableAltException(self_.getDescription(), <dfa.decisionNumber>, _s, input)
        self_.error(nvae)
        raise nvae<\n>
    <endif>

```



```
>>
```

```
cyclicDFAInit(dfa) ::= <<  
self.dfa<dfa.decisionNumber> = self.DFA<dfa.decisionNumber>(  
  self, <dfa.decisionNumber>,  
  eot = self.DFA<dfa.decisionNumber>_eot,  
  eof = self.DFA<dfa.decisionNumber>_eof,  
  min = self.DFA<dfa.decisionNumber>_min,  
  max = self.DFA<dfa.decisionNumber>_max,  
  accept = self.DFA<dfa.decisionNumber>_accept,  
  special = self.DFA<dfa.decisionNumber>_special,  
  transition = self.DFA<dfa.decisionNumber>_transition  
)<\n>  
>>
```

```
/** A state in a cyclic DFA; it's a special state and part of a big switch on  
 * state.  
 */  
cyclicDFAState(decisionNumber,stateNumber,edges,needErrorClause,semPredState) ::= <<  
LA<decisionNumber>_<stateNumber> = input.LA(1)<\n>  
<if(semPredState)> <! get next lookahead symbol to test edges, then rewind !>  
index<decisionNumber>_<stateNumber> = input.index()  
input.rewind()<\n>  
<endif>  
s = -1  
<edges; separator="\n!">  
<if(semPredState)> <! return input cursor to state before we rewound !>  
input.seek(index<decisionNumber>_<stateNumber>)<\n>  
<endif>  
if s >= 0:  
  return s  
>>
```

```
/** Just like a fixed DFA edge, test the lookahead and indicate what  
 * state to jump to next if successful.  
 */  
cyclicDFAEdge(labelExpr, targetStateNumber, edgeNumber, predicates) ::= <<  
if (<labelExpr><if(predicates)> and (<predicates>)<endif>:  
  s = <targetStateNumber><\n>  
>>
```

```
/** An edge pointing at end-of-token; essentially matches any char;  
 * always jump to the target.  
 */  
eotDFAEdge(targetStateNumber,edgeNumber, predicates) ::= <<  
se:  
  s = <targetStateNumber><\n>
```

>>

// D F A E X P R E S S I O N S

andPredicates(left,right) ::= "((<left>) and (<right>))"

orPredicates(operands) ::= "<operands; separator=\" or \">"

notPredicate(pred) ::= "not (<evalPredicate(pred, { })>)"

evalPredicate(pred,description) ::= "<pred>"

evalSynPredicate(pred,description) ::= "self.<pred>()"

lookaheadTest(atom,k,atomAsInt) ::= "LA<decisionNumber>_<stateNumber> == <atom>"

/** Sometimes a lookahead test cannot assume that LA(k) is in a temp variable

* somewhere. Must ask for the lookahead directly.

*/

isolatedLookaheadTest(atom,k,atomAsInt) ::= "self.input.LA(<k>) == <atom>"

lookaheadRangeTest(lower,upper,k,rangeNumber,lowerAsInt,upperAsInt) ::= <%

<lower> \<= LA<decisionNumber>_<stateNumber> \<= <upper>

%>

isolatedLookaheadRangeTest(lower,upper,k,rangeNumber,lowerAsInt,upperAsInt) ::= "<lower> \<= self.input.LA(<k>) \<= <upper>)"

lookaheadSetTest(values,k,valuesAsInt) ::= <%

LA<decisionNumber>_<stateNumber> in {<values; separator=" ">}

%>

isolatedLookaheadSetTest(values,k,valuesAsInt) ::= <%

self.input.LA(<k>) in {<values; separator=" ">}

%>

lookaheadVarName(k) ::= "LA<decisionNumber>_<stateNumber>"

isolatedLookaheadVarName(k) ::= "self.input.LA(<k>)"

setTest(ranges) ::= "<ranges; separator=\" or \">"

// A T T R I B U T E S

globalAttributeScopeClass(scope) ::= <<

<if(scope)>

<if(scope.attributes)>

class <scope.name>_scope(object):

```

def __init__(self):
    <scope.attributes:{it | self.<it.decl> = None}; separator="\n">

<endif>
<endif>
>>

globalAttributeScopeStack(scope) ::= <<
<if(scope)>
<if(scope.attributes)>
self.<scope.name>_stack = []<\n>
<endif>
<endif>
>>

ruleAttributeScopeClass(scope) ::= <<
<if(scope)>
<if(scope.attributes)>
class <scope.name>_scope(object):
    def __init__(self):
        <scope.attributes:{it | self.<it.decl> = None}; separator="\n">

<endif>
<endif>
>>

ruleAttributeScopeStack(scope) ::= <<
<if(scope)>
<if(scope.attributes)>
self.<scope.name>_stack = []<\n>
<endif>
<endif>
>>

delegateName(d) ::= <<
<if(d.label)><d.label><else>g<d.name><endif>
>>

/** Define a rule label including default value */
ruleLabelDef(label) ::= <<
<label.label.text> = None
>>

returnStructName(r) ::= "<r.name>_return"

/** Define a return struct for a rule if the code needs to access its
* start/stop tokens, tree stuff, attributes, ... Leave a hole for
* subgroups to stick in members.

```

```

*/
returnScope(scope) ::= <<
<if(ruleDescriptor.hasMultipleReturnValues)>
class <ruleDescriptor:returnStructName()>(<if(TREE_PARSER)>Tree<else>Parser<endif>RuleReturnScope):
  def __init__(self):
    super().__init__()

    <if(scope)><scope.attributes:{it | self.<it.decl> = None }; separator="\n"><endif>
    <@ruleReturnInit()>

    <@ruleReturnMembers()>

<endif>
>>

parameterScope(scope) ::= <<
<if(scope)><scope.attributes:{it | <it.decl> }; separator=", "><endif>
>>

parameterAttributeRef(attr) ::= "<attr.name>"
parameterSetAttributeRef(attr,expr) ::= "<attr.name> = <expr>"

scopeAttributeRef(scope,attr,index,negIndex) ::= <%
<if(negIndex)>
self.<scope>_stack[-<negIndex>].<attr.name>
<else>
<if(index)>
self.<scope>_stack[<index>].<attr.name>
<else>
self.<scope>_stack[-1].<attr.name>
<endif>
<endif>
%>

/* not applying patch because of bug in action parser!

<if(negIndex)>
((len(self.<scope>_stack) - <negIndex> - 1) >= 0 and [self.<scope>_stack[-<negIndex>].<attr.name>] or [None])[0]
<else>
<if(index)>
((<index> < len(self.<scope>_stack)) and [self.<scope>_stack[<index>].<attr.name>] or [None])[0]
<else>
((len(self.<scope>_stack) > 0) and [self.<scope>_stack[-1].<attr.name>] or [None])[0]
<endif>
<endif>

*/

```

```

scopeSetAttributeRef(scope,attr,expr,index,negIndex) ::= <%
<if(negIndex)>
<!FIXME: this seems not to be used by ActionTranslator...!>
self.<scope>_stack[-<negIndex>].<attr.name> = <expr>
<else>
<if(index)>
<!FIXME: this seems not to be used by ActionTranslator...!>
self.<scope>_stack[<index>].<attr.name> = <expr>
<else>
self.<scope>_stack[-1].<attr.name> = <expr>
<endif>
<endif>
%>

/** $x is either global scope or x is rule with dynamic scope; refers
 * to stack itself not top of stack. This is useful for predicates
 * like { $function.size()>0 && $function::name.equals("foo") }?
 */
isolatedDynamicScopeRef(scope) ::= "self.<scope>_stack"

/** reference an attribute of rule; might only have single return value */
ruleLabelRef(referencedRule,scope,attr) ::= <%
<if(referencedRule.hasMultipleReturnValues)>
((<scope> is not None) and [<scope>.<attr.name>] or [None])[0]
<else>
<scope>
<endif>
%>

returnAttributeRef(ruleDescriptor,attr) ::= <%
<if(ruleDescriptor.hasMultipleReturnValues)>
retval.<attr.name>
<else>
<attr.name>
<endif>
%>

returnSetAttributeRef(ruleDescriptor,attr,expr) ::= <%
<if(ruleDescriptor.hasMultipleReturnValues)>
retval.<attr.name> = <expr>
<else>
<attr.name> = <expr>
<endif>
%>

/** How to translate $tokenLabel */
tokenLabelRef(label) ::= "<label>"

```

```

/** ids+=ID {$ids} or e+=expr {$e} */
listLabelRef(label) ::= "list_<label>"

// not sure the next are the right approach; and they are evaluated early;
// they cannot see TREE_PARSER or PARSER attributes for example. :(

tokenLabelPropertyRef_text(scope,attr) ::= "<scope>.text"
tokenLabelPropertyRef_type(scope,attr) ::= "<scope>.type"
tokenLabelPropertyRef_line(scope,attr) ::= "<scope>.line"
tokenLabelPropertyRef_pos(scope,attr) ::= "<scope>.charPositionInLine"
tokenLabelPropertyRef_channel(scope,attr) ::= "<scope>.channel"
tokenLabelPropertyRef_index(scope,attr) ::= "<scope>.index"
tokenLabelPropertyRef_tree(scope,attr) ::= "<scope>_tree"

ruleLabelPropertyRef_start(scope,attr) ::= "<scope>.start"
ruleLabelPropertyRef_stop(scope,attr) ::= "<scope>.stop"
ruleLabelPropertyRef_tree(scope,attr) ::= "<scope>.tree"
ruleLabelPropertyRef_text(scope,attr) ::= <%
<if(TREE_PARSER)>
((<scope> is not None) and [self.input.getTokenStream().toString(
  self.input.getTreeAdaptor().getTokenStartIndex(<scope>.start),
  self.input.getTreeAdaptor().getTokenStopIndex(<scope>.start)
)] or [None])[0]
<else>
((<scope> is not None) and [self.input.toString(<scope>.start,<scope>.stop)] or [None])[0]
<endif>
%>
ruleLabelPropertyRef_st(scope,attr) ::= "((<scope> is not None) and [<scope>.st] or [None])[0]"

/** Isolated $RULE ref ok in lexer as it's a Token */
lexerRuleLabel(label) ::= "<label>"

lexerRuleLabelPropertyRef_type(scope,attr) ::= "((<scope> is not None) and [<scope>.type] or [0])[0]"
lexerRuleLabelPropertyRef_line(scope,attr) ::= "((<scope> is not None) and [<scope>.line] or [0])[0]"
lexerRuleLabelPropertyRef_pos(scope,attr) ::= "((<scope> is not None) and [<scope>.charPositionInLine] or [0])[0]"
lexerRuleLabelPropertyRef_channel(scope,attr) ::= "((<scope> is not None) and [<scope>.channel] or [0])[0]"
lexerRuleLabelPropertyRef_index(scope,attr) ::= "((<scope> is not None) and [<scope>.index] or [0])[0]"
lexerRuleLabelPropertyRef_text(scope,attr) ::= "((<scope> is not None) and [<scope>.text] or [None])[0]"
lexerRuleLabelPropertyRef_int(scope,attr) ::= "((<scope> is not None) and [int(<scope>.text)] or [0])[0]"

// Somebody may ref $template or $tree or $stop within a rule:
rulePropertyRef_start(scope,attr) ::= "retval.start"
rulePropertyRef_stop(scope,attr) ::= "retval.stop" //mmm... or input.LT(-1)??
rulePropertyRef_tree(scope,attr) ::= "retval.tree"
rulePropertyRef_text(scope,attr) ::= "self.input.toString(retval.start, self.input.LT(-1))"

```

```

rulePropertyRef_st(scope,attr) ::= "retval.st"

lexerRulePropertyRef_text(scope,attr) ::= "self.text"
lexerRulePropertyRef_type(scope,attr) ::= "_type"
lexerRulePropertyRef_line(scope,attr) ::= "self._state.tokenStartLine"
lexerRulePropertyRef_pos(scope,attr) ::= "self._state.tokenStartCharPositionInLine"
lexerRulePropertyRef_index(scope,attr) ::= "-1" // undefined token index in lexer
lexerRulePropertyRef_channel(scope,attr) ::= "_channel"
lexerRulePropertyRef_start(scope,attr) ::= "self._state.tokenStartCharIndex"
lexerRulePropertyRef_stop(scope,attr) ::= "(self.getCharIndex()-1)"
lexerRulePropertyRef_int(scope,attr) ::= "int(<scope>.text)"

// setting $st and $tree is allowed in local rule. everything else
// is flagged as error
ruleSetPropertyRef_tree(scope,attr,expr) ::= "retval.tree =<expr>"
ruleSetPropertyRef_st(scope,attr,expr) ::= "retval.st =<expr>"

/** How to execute an action (only when not backtracking) */
execAction(action) ::= <<
<if(backtracking)>
<if(actions.(actionScope).synpredgate)>
if <actions.(actionScope).synpredgate>:
    pass
    <action>

<else>
if <actions.(actionScope).synpredgate>:
    pass
    <action>

<endif>
<else>
#action start
<action>
#action end
<endif>
>>

/** How to always execute an action even when backtracking */
execForcedAction(action) ::= "<action>"

// M I S C (properties, etc...)

codeFileExtension() ::= ".py"

true_value() ::= "True"

```

false_value() ::= "False"

Found in path(s):

* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/codegen/templates/Python3/Python3.stg

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*

* Conversion to C#:

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*/

/** Templates for building ASTs during normal parsing.

*

* Deal with many combinations. Dimensions are:

* Auto build or rewrite

* no label, label, list label (label/no-label handled together)

* child, root

* token, set, rule, wildcard

*

* The situation is not too bad as rewrite (->) usage makes ^ and !

* invalid. There is no huge explosion of combinations.

*/

```
@rule.setErrorReturnValue() ::= <<
retval.Tree = (<ASTLabelType>)adaptor.ErrorNode(input, retval.Start, input.LT(-1), re);
<! System.out.WriteLine("<ruleName> returns "+((CommonTree)retval.tree).toStringTree()); !>
>>
```

// TOKEN AST STUFF

/** ID and output=AST */

```
tokenRef(token,label,elementIndex,terminalOptions={}) ::= <%
```

```
<super.tokenRef(...)>
```

```
<if(!ruleDescriptor.isSynPred)>
```

```
<if(backtracking)><\n>if (state.backtracking == 0) {<endif>
```

```
<\n><label>_tree = <createNodeFromToken(...)>;
```

```
<\n>adaptor.AddChild(root_0, <label>_tree);
```

```
<if(backtracking)><\n>}<endif>
```

```
<endif>
```

```
%>
```

/** ID! and output=AST (same as plain tokenRef) */

```
tokenRefBang(token,label,elementIndex,terminalOptions={}) ::= "<super.tokenRef(...)>"
```

/** ID^ and output=AST */

```
tokenRefRuleRoot(token,label,elementIndex,terminalOptions={}) ::= <%
```

```
<super.tokenRef(...)>
```

```
<if(!ruleDescriptor.isSynPred)>
```

```
<if(backtracking)><\n>if (<actions.(actionScope).synpredgate>) {<endif>
```

```
<\n><label>_tree = <createNodeFromToken(...)>;
```

```
<\n>root_0 = (<ASTLabelType>)adaptor.BecomeRoot(<label>_tree, root_0);
```

```
<if(backtracking)><\n>}<endif>
```

```
<endif>
```

```
%>
```

/** ids+=ID! and output=AST */

```
tokenRefBangAndListLabel(token,label,elementIndex,terminalOptions={}) ::= <<
```

```
<tokenRefBang(...)>
```

```
<listLabelElem(elem=label,elemType=labelType,...)>
```

```
>>
```

/** label+=TOKEN when output=AST but not rewrite alt */

```
tokenRefAndListLabel(token,label,elementIndex,terminalOptions={}) ::= <<
```

```
<tokenRef(...)>
```

```
<listLabelElem(elem=label,elemType=labelType,...)>
```

```
>>
```

/** Match label+=TOKEN^ when output=AST but not rewrite alt */

```

tokenRefRuleRootAndListLabel(token,label,elementIndex,terminalOptions={ }) ::= <<
<tokenRefRuleRoot(...)>
<listLabelElem(elem=label,elemType=labelType,...)>
>>

// SET AST

// the match set stuff is interesting in that it uses an argument list
// to pass code to the default matchSet; another possible way to alter
// inherited code. I don't use the region stuff because I need to pass
// different chunks depending on the operator. I don't like making
// the template name have the operator as the number of templates gets
// large but this is the most flexible--this is as opposed to having
// the code generator call matchSet then add root code or ruleroot code
// plus list label plus ... The combinations might require complicated
// rather than just added on code. Investigate that refactoring when
// I have more time.

matchSet(s,label,elementIndex,postmatchCode,terminalOptions={ }) ::= <<
<super.matchSet(postmatchCode={ <if(!ruleDescriptor.isSynPred)><if(backtracking)>if
(<actions.(actionScope).synpredgate>) <endif>adaptor.AddChild(root_0, <createNodeFromToken(...)>);<endif>},
...)>
>>

matchRuleBlockSet(s,label,elementIndex,postmatchCode,treeLevel="0",terminalOptions={ }) ::= <<
<matchSet(...)>
>>

matchSetBang(s,label,elementIndex,postmatchCode,terminalOptions={ }) ::= "<super.matchSet(...)>"

// note there is no matchSetTrack because -> rewrites force sets to be
// plain old blocks of alts: (A|B|...|C)

matchSetRuleRoot(s,label,elementIndex,debug,terminalOptions={ }) ::= <<
<if(label)>
<label>=(<labelType>)input.LT(1);
<endif>
<super.matchSet(postmatchCode={ <if(!ruleDescriptor.isSynPred)><if(backtracking)>if
(<actions.(actionScope).synpredgate>) <endif>root_0 =
(<ASTLabelType>)adaptor.BecomeRoot(<createNodeFromToken(...)>, root_0);<endif>}, ...)>
>>

// RULE REF AST

/** rule when output=AST */
ruleRef(rule,label,elementIndex,args,scope) ::= <%
<super.ruleRef(...)>
<if(!ruleDescriptor.isSynPred)>

```

```

<\n><if(backtracking)>if (<actions.(actionScope).synpredgate>) <endif>adaptor.AddChild(root_0, <label>.Tree);
<endif>
%>

/** rule! is same as normal rule ref */
ruleRefBang(rule,label,elementIndex,args,scope) ::= "<super.ruleRef(...)>"

/** rule^ */
ruleRefRuleRoot(rule,label,elementIndex,args,scope) ::= <<
<super.ruleRef(...)>
<if(backtracking)>if (<actions.(actionScope).synpredgate>) <endif>root_0 =
(<ASTLabelType>)adaptor.BecomeRoot(<label>.Tree, root_0);
>>

/** x+=rule when output=AST */
ruleRefAndListLabel(rule,label,elementIndex,args,scope) ::= <<
<ruleRef(...)>
<listLabelElem(elem={<label>.Tree},elemType=ASTLabelType,...)>
>>

/** x+=rule! when output=AST is a rule ref with list addition */
ruleRefBangAndListLabel(rule,label,elementIndex,args,scope) ::= <<
<ruleRefBang(...)>
<listLabelElem(elem={<label>.Tree},elemType=ASTLabelType,...)>
>>

/** x+=rule^ */
ruleRefRuleRootAndListLabel(rule,label,elementIndex,args,scope) ::= <<
<ruleRefRuleRoot(...)>
<listLabelElem(elem={<label>.Tree},elemType=ASTLabelType,...)>
>>

// WILDCARD AST

wildcard(token,label,elementIndex,terminalOptions={ }) ::= <<
<super.wildcard(...)>
<if(!ruleDescriptor.isSynPred)>
<if(backtracking)>if (<actions.(actionScope).synpredgate>) {<endif>
<label>_tree = (<ASTLabelType>)adaptor.Create(<label>);
adaptor.AddChild(root_0, <label>_tree);
<if(backtracking)>}<endif>
<endif>
>>

wildcardBang(label,elementIndex) ::= "<super.wildcard(token=[],...)>"

wildcardRuleRoot(token,label,elementIndex,terminalOptions={ }) ::= <<
<super.wildcard(...)>

```

```

<if(!ruleDescriptor.isSynPred)>
<if(backtracking)>if (<actions.(actionScope).synpredgate>) {<endif>
<label>_tree = (<ASTLabelType>)adaptor.Create(<label>);
root_0 = (<ASTLabelType>)adaptor.BecomeRoot(<label>_tree, root_0);
<if(backtracking)>}<endif>
<endif>
>>

createNodeFromToken(label,terminalOptions={ }) ::= <%
<if(terminalOptions.node)>
new
<terminalOptions.node><(if(terminalOptions.type))<terminalOptions.type>,<endif><label><(if(terminalOptions.text))>,<terminalOptions.text; format="string"><endif>
<else>
(<ASTLabelType>)adaptor.Create(<(if(terminalOptions.type))<terminalOptions.type>,<endif><label><(if(terminalOptions.text))>,<terminalOptions.text; format="string"><endif>)
<endif>
%>

ruleCleanUp() ::= <<
<super.ruleCleanUp()>
<if(backtracking)>if (<actions.(actionScope).synpredgate>) {<endif>
retval.Tree = (<ASTLabelType>)adaptor.RulePostProcessing(root_0);
adaptor.SetTokenBoundaries(retval.Tree, retval.Start, retval.Stop);
<if(backtracking)>}<endif>
>>

```

Found in path(s):

* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/codegen/templates/CSharp3/ASTParser.stg

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*/

/*

* This code generating template and the associated C runtime was produced by:

* Jim Idle jim|hereisanat|idle|dotgoeshere|ws.

* If it causes the destruction of the Universe, it will be pretty cool so long as

* I am in a different one at the time.

*/

cTypeInitMap ::= [

"int" : "0", // Integers start out being 0

"long" : "0", // Longs start out being 0

"float" : "0.0", // Floats start out being 0

"double" : "0.0", // Doubles start out being 0

"ANTLR3_BOOLEAN" : "ANTLR3_FALSE", // Booleans start out being Antlr C for false

"byte" : "0", // Bytes start out being 0

"short" : "0", // Shorts start out being 0

"char" : "0" // Chars start out being 0

]

leadIn(type) ::=

<<

/** \file

* This <type> file was generated by \$ANTLR version <ANTLRVersion>

*

* - From the grammar source file : <fileName>

* - On : <generatedTimestamp>

<if(LEXER)>

* - for the lexer : <name>Lexer

<endif>

<if(PARSER)>

* - for the parser : <name>Parser

<endif>

<if(TREE_PARSER)>

* - for the tree parser : <name>TreeParser

<endif>

```

*
* Editing it, at least manually, is not wise.
*
* C language generator and runtime by Jim Idle, jimi|hereisanat|idle|dotgoeshere|ws.
*
*
>>

/** The overall file structure of a recognizer; stores methods for rules
* and cyclic DFAs plus support code.
*/
outputFile( LEXER,
            PARSEr,
            TREE_PARSER,
            actionScope,
            actions,
            docComment,
            recognizer,
            name,
            tokens,
            tokenNames,
            rules,
            cyclicDFAs,
            bitsets,
            buildTemplate,
            buildAST,
            rewriteMode,
            profile,
            backtracking,
            synpreds,
            memoize,
            numRules,
            fileName,
            ANTLRVersion,
            generatedTimestamp,
            trace,
            scopes,
            superClass,
            literals
        ) ::=
<<
<leadIn("C source")>
*/
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// http://www.temporal-wave.com
// http://www.linkedin.com/in/jimidle
//

```

```

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```

```
<if(actions.(actionScope).header)>
```

```

/* =====
* This is what the grammar programmer asked us to put at the top of every file.
*/

```

```
<actions.(actionScope).header>
```

```
/* End of Header action.
```

```

* =====
*/

```

```
<endif>
```

```

/* -----
* Include the ANTLR3 generated header file.
*/

```

```
#include "<name>.h"
```

```
<actions.(actionScope).postinclude>
```

```
/* ----- */
```

```
<docComment>
```

```
<if(literals)>
```

```
/** String literals used by <name> that we must do things like MATCHS() with.
```

```
* C will normally just lay down 8 bit characters, and you can use L"xxx" to
```

```
* get wchar_t, but wchar_t is 16 bits on Windows, which is not UTF32 and so
```

```

* we perform this little trick of defining the literals as arrays of UINT32
* and passing in the address of these.
*/
<literals:{it | static ANTLR3_UCHAR lit_<i>[] = <it>;}; separator="\n">

<endif>

/* MACROS that hide the C interface implementations from the
* generated code, which makes it a little more understandable to the human eye.
* I am very much against using C pre-processor macros for function calls and bits
* of code as you cannot see what is happening when single stepping in debuggers
* and so on. The exception (in my book at least) is for generated code, where you are
* not maintaining it, but may wish to read and understand it. If you single step it, you know that input()
* hides some indirect calls, but is always referring to the input stream. This is
* probably more readable than ctx->input->istream->input(snarfle0->blarg) and allows me to rejig
* the runtime interfaces without changing the generated code too often, without
* confusing the reader of the generated output, who may not wish to know the gory
* details of the interface inheritance.
*/

#define CTX ctx

/* Aids in accessing scopes for grammar programmers
*/
#undef SCOPE_TYPE
#undef SCOPE_STACK
#undef SCOPE_TOP
#define SCOPE_TYPE(scope) p<name>_##scope##_SCOPE
#define SCOPE_STACK(scope) p<name>_##scope##_Stack
#define SCOPE_TOP(scope) ctx->p<name>_##scope##_Top
#define SCOPE_SIZE(scope) ctx->p<name>_##scope##_Stack_limit
#define SCOPE_INSTANCE(scope, i) (ctx->SCOPE_STACK(scope)->get(ctx->SCOPE_STACK(scope),i))

<if(LEXER)>

/* Macros for accessing things in a lexer
*/
#undef LEXER
#undef RECOGNIZER
#undef RULEMEMO
#undef GETCHARINDEX
#undef GETLINE
#undef GETCHARPOSITIONINLINE
#undef EMIT
#undef EMITNEW

```



```

#undef MATCHC
#undef MATCHS
#undef MATCHRANGE
#undef LTOKEN
#undef HASFAILED
#undef FAILEDFLAG
#undef INPUT
#undef STRSTREAM
#undef LA
#undef HASEXCEPTION
#undef EXCEPTION
#undef CONSTRUCTEX
#undef CONSUME
#undef LRECOVER
#undef MARK
#undef REWIND
#undef REWINDLAST
#undef BACKTRACKING
#undef MATCHANY
#undef MEMOIZE
#undef HAVEPARSEDRULE
#undef GETTEXT
#undef INDEX
#undef SEEK
#undef PUSHSTREAM
#undef POPSTREAM
#undef SETTEXT
#undef SETTEXT8

#define LEXER ctx->pLexer
#define RECOGNIZER LEXER->rec
#define LEXSTATE RECOGNIZER->state
#define TOKSOURCE LEXSTATE->tokSource
#define GETCHARINDEX() LEXER->getCharIndex(LEXER)
#define GETLINE() LEXER->getLine(LEXER)
#define GETTEXT() LEXER->getText(LEXER)
#define GETCHARPOSITIONINLINE() LEXER->getCharPositionInLine(LEXER)
#define EMIT() LEXSTATE->type = _type; LEXER->emit(LEXER)
#define EMITNEW(t) LEXER->emitNew(LEXER, t)
#define MATCHC(c) LEXER->matchc(LEXER, c)
#define MATCHS(s) LEXER->matchs(LEXER, s)
#define MATCHRANGE(c1,c2) LEXER->matchRange(LEXER, c1, c2)
#define MATCHANY() LEXER->matchAny(LEXER)
#define LTOKEN LEXSTATE->token
#define HASFAILED() (LEXSTATE->failed == ANTLR3_TRUE)
#define BACKTRACKING LEXSTATE->backtracking
#define FAILEDFLAG LEXSTATE->failed
#define INPUT LEXER->input

```

```

#define STRSTREAM INPUT
#define ISTREAM INPUT->istream
#define INDEX() ISTREAM->index(ISTREAM)
#define SEEK(n) ISTREAM->seek(ISTREAM, n)
#define EOF_TOKEN &(LEXSTATE->tokSource->eofToken)
#define HASEXCEPTION() (LEXSTATE->error == ANTLR3_TRUE)
#define EXCEPTION LEXSTATE->exception
#define CONSTRUCTEX() RECOGNIZER->exConstruct(RECOGNIZER)
#define LRECOVER() LEXER->recover(LEXER)
#define MARK() ISTREAM->mark(ISTREAM)
#define REWIND(m) ISTREAM->rewind(ISTREAM, m)
#define REWINDLAST() ISTREAM->rewindLast(ISTREAM)
#define MEMOIZE(ri,si) RECOGNIZER->memoize(RECOGNIZER, ri, si)
#define HAVEPARSEDRULE(r) RECOGNIZER->alreadyParsedRule(RECOGNIZER, r)
#define PUSHSTREAM(str) LEXER->pushCharStream(LEXER, str)
#define POPSTREAM() LEXER->popCharStream(LEXER)
#define SETTEXT(str) LEXSTATE->text = str
#define SKIP() LEXSTATE->token = &(TOKSOURCE->skipToken)
#define USER1 LEXSTATE->user1
#define USER2 LEXSTATE->user2
#define USER3 LEXSTATE->user3
#define CUSTOM LEXSTATE->custom
#define RULEMEMO LEXSTATE->ruleMemo
#define DBG RECOGNIZER->debugger

/* If we have been told we can rely on the standard 8 bit or UTF16 input
 * stream, then we can define our macros to use the direct pointers
 * in the input object, which is much faster than indirect calls. This
 * is really only significant to lexers with a lot of fragment rules (which
 * do not place LA(1) in a temporary at the moment) and even then
 * only if there is a lot of input (order of say 1M or so).
 */
#if defined(ANTLR3_INLINE_INPUT_8BIT) || defined(ANTLR3_INLINE_INPUT_UTF16)

# ifdef ANTLR3_INLINE_INPUT_8BIT

/* 8 bit character set */

# define NEXTCHAR ((pANTLR3_UINT8)(INPUT->nextChar))
# define DATAP ((pANTLR3_UINT8)(INPUT->data))

# else

# define NEXTCHAR ((pANTLR3_UINT16)(INPUT->nextChar))
# define DATAP ((pANTLR3_UINT16)(INPUT->data))

# endif

```

```

#define LA(n) ((NEXTCHAR + n) > (DATAP + INPUT->sizeBuf) ? ANTLR3_CHARSTREAM_EOF :
(ANTLR3_UCHAR)(*NEXTCHAR + n - 1))
#define CONSUME()
{
    if (NEXTCHAR < (DATAP + INPUT->sizeBuf))
    {
        INPUT->charPositionInLine++;
        if ((ANTLR3_UCHAR)(*NEXTCHAR) == INPUT->newlineChar)
        {
            INPUT->line++;
            INPUT->charPositionInLine = 0;
            INPUT->currentLine = (void *) (NEXTCHAR + 1);
        }
        INPUT->nextChar = (void *) (NEXTCHAR + 1);
    }
}

#else

// Pick up the input character by calling the input stream implementation.
//
#define CONSUME() INPUT->istream->consume(INPUT->istream)
#define LA(n) INPUT->istream->_LA(INPUT->istream, n)

#endif
<endif>

<if(PARSER)>
/* Macros for accessing things in the parser
*/

#undef PARSE
#undef RECOGNIZER
#undef HAVEPARSEDRULE
#undef MEMOIZE
#undef INPUT
#undef STRSTREAM
#undef HASEXCEPTION
#undef EXCEPTION
#undef MATCHT
#undef MATCHANYT
#undef FOLLOWSTACK
#undef FOLLOWPUSH
#undef FOLLOWPOP
#undef PRECOVER
#undef PREPORTERROR
#undef LA
#undef LT

```

```

#undef CONSTRUCTEX
#undef CONSUME
#undef MARK
#undef REWIND
#undef REWINDLAST
#undef PERRORRECOVERY
#undef HASFAILED
#undef FAILEDFLAG
#undef RECOVERFROMMISMATCHEDSET
#undef RECOVERFROMMISMATCHEDELEMENT
#undef INDEX
#undef ADAPTOR
#undef SEEK
#undef RULEMEMO
#undef DBG

#define PARSER ctx->pParser
#define RECOGNIZER PARSER->rec
#define PSRSTATE RECOGNIZER->state
#define HAVEPARSEDRULE(r) RECOGNIZER->alreadyParsedRule(RECOGNIZER, r)
#define MEMOIZE(ri,si) RECOGNIZER->memoize(RECOGNIZER, ri, si)
#define INPUT PARSER->tstream
#define STRSTREAM INPUT
#define ISTREAM INPUT->istream
#define INDEX() ISTREAM->index(INPUT->istream)
#define HASEXCEPTION() (PSRSTATE->error == ANTLR3_TRUE)
#define EXCEPTION PSRSTATE->exception
#define MATCHT(t, fs) RECOGNIZER->match(RECOGNIZER, t, fs)
#define MATCHANYT() RECOGNIZER->matchAny(RECOGNIZER)
#define FOLLOWSTACK PSRSTATE->following
#ifdef SKIP_FOLLOW_SETS
#define FOLLOWPUSH(x)
#define FOLLOWPOP()
#else
#define FOLLOWPUSH(x) FOLLOWSTACK->push(FOLLOWSTACK, ((void *)&(x))), NULL)
#define FOLLOWPOP() FOLLOWSTACK->pop(FOLLOWSTACK)
#endif
#define PRECOVER() RECOGNIZER->recover(RECOGNIZER)
#define PREPORTERROR() RECOGNIZER->reportError(RECOGNIZER)
#define LA(n) INPUT->istream->_LA(ISTREAM, n)
#define LT(n) INPUT->_LT(INPUT, n)
#define CONSTRUCTEX() RECOGNIZER->exConstruct(RECOGNIZER)
#define CONSUME() ISTREAM->consume(ISTREAM)
#define MARK() ISTREAM->mark(ISTREAM)
#define REWIND(m) ISTREAM->rewind(ISTREAM, m)
#define REWINDLAST() ISTREAM->rewindLast(ISTREAM)
#define SEEK(n) ISTREAM->seek(ISTREAM, n)
#define PERRORRECOVERY PSRSTATE->errorRecovery

```

```
#define FAILEDFLAG PSRSTATE->failed
#define HASFAILED() (FAILEDFLAG == ANTLR3_TRUE)
#define BACKTRACKING PSRSTATE->backtracking
#define RECOVERFROMMISMATCHEDSET(s) RECOGNIZER->recoverFromMismatchedSet(RECOGNIZER,
s)
#define RECOVERFROMMISMATCHEDELEMENT(e) RECOGNIZER-
>recoverFromMismatchedElement(RECOGNIZER, s)
#define ADAPTOR          ctx->adaptor
#define RULEMEMO         PSRSTATE->ruleMemo
#define DBG              RECOGNIZER->debugger
```

```
<endif>
```

```
<if(TREE_PARSER)>
```

```
/* Macros for accessing things in the parser
```

```
*/
```

```
#undef  PARSER
#undef  RECOGNIZER
#undef  HAVEPARSEDRULE
#undef  INPUT
#undef  STRSTREAM
#undef  HASEXCEPTION
#undef  EXCEPTION
#undef  MATCHT
#undef  MATCHANYT
#undef  FOLLOWSTACK
#undef  FOLLOWPUSH
#undef  FOLLOWPOP
#undef  PRECOVER
#undef  PREPORTERROR
#undef  LA
#undef  LT
#undef  CONSTRUCTEX
#undef  CONSUME
#undef  MARK
#undef  REWIND
#undef  REWINDLAST
#undef  PERRORRECOVERY
#undef  HASFAILED
#undef  FAILEDFLAG
#undef  RECOVERFROMMISMATCHEDSET
#undef  RECOVERFROMMISMATCHEDELEMENT
#undef  BACKTRACKING
#undef  ADAPTOR
#undef  RULEMEMO
#undef  SEEK
#undef  INDEX
```

```

#undef DBG

#define PARSER    ctx->pTreeParser
#define RECOGNIZER  PARSER->rec
#define PSRSTATE  RECOGNIZER->state
#define HAVEPARSEDRULE(r)  RECOGNIZER->alreadyParsedRule(RECOGNIZER, r)
#define INPUT    PARSER->ctnstream
#define ISTREAM  INPUT->tnstream->istream
#define STRSTREAM  INPUT->tnstream
#define HASEXCEPTION()  (PSRSTATE->error == ANTLR3_TRUE)
#define EXCEPTION  PSRSTATE->exception
#define MATCHT(t, fs)  RECOGNIZER->match(RECOGNIZER, t, fs)
#define MATCHANYT()  RECOGNIZER->matchAny(RECOGNIZER)
#define FOLLOWSTACK  PSRSTATE->following
#define FOLLOWPUSH(x)  FOLLOWSTACK->push(FOLLOWSTACK, ((void *)&(x)), NULL)
#define FOLLOWPOP()  FOLLOWSTACK->pop(FOLLOWSTACK)
#define PRECOVER()  RECOGNIZER->recover(RECOGNIZER)
#define PREPORTERROR()  RECOGNIZER->reportError(RECOGNIZER)
#define LA(n)  ISTREAM->_LA(ISTREAM, n)
#define LT(n)  INPUT->tnstream->_LT(INPUT->tnstream, n)
#define CONSTRUCTEX()  RECOGNIZER->exConstruct(RECOGNIZER)
#define CONSUME()  ISTREAM->consume(ISTREAM)
#define MARK()  ISTREAM->mark(ISTREAM)
#define REWIND(m)  ISTREAM->rewind(ISTREAM, m)
#define REWINDLAST()  ISTREAM->rewindLast(ISTREAM)
#define PERRORRECOVERY  PSRSTATE->errorRecovery
#define FAILEDFLAG  PSRSTATE->failed
#define HASFAILED()  (FAILEDFLAG == ANTLR3_TRUE)
#define BACKTRACKING  PSRSTATE->backtracking
#define RECOVERFROMMISMATCHEDSET(s)  RECOGNIZER->recoverFromMismatchedSet(RECOGNIZER,
s)
#define RECOVERFROMMISMATCHEDELEMENT(e)  RECOGNIZER-
>recoverFromMismatchedElement(RECOGNIZER, s)
#define ADAPTOR  INPUT->adaptor
#define RULEMEMO  PSRSTATE->ruleMemo
#define SEEK(n)  ISTREAM->seek(ISTREAM, n)
#define INDEX()  ISTREAM->index(ISTREAM)
#define DBG  RECOGNIZER->debugger

<endif>

#define TOKTEXT(tok, txt)  tok, (pANTLR3_UINT8)txt

/* The 4 tokens defined below may well clash with your own #defines or token types. If so
* then for the present you must use different names for your defines as these are hard coded
* in the code generator. It would be better not to use such names internally, and maybe
* we can change this in a forthcoming release. I deliberately do not #undef these

```

```

* here as this will at least give you a redefined error somewhere if they clash.
*/
#define UP ANTLR3_TOKEN_UP
#define DOWN ANTLR3_TOKEN_DOWN
#define EOR ANTLR3_TOKEN_EOR
#define INVALID ANTLR3_TOKEN_INVALID

/* =====
* Functions to create and destroy scopes. First come the rule scopes, followed
* by the global declared scopes.
*/

<rules: {r |<if(r.ruleDescriptor.ruleScope)>
<ruleAttributeScopeFuncDecl(scope=r.ruleDescriptor.ruleScope)>
<ruleAttributeScopeFuncs(scope=r.ruleDescriptor.ruleScope)>
<endif>}>

<recognizer.scopes:{it | <if(it.isDynamicGlobalScope)>
<globalAttributeScopeFuncDecl(it)>
<globalAttributeScopeFuncs(it)>
<endif>}>

/* ===== */

/* =====
* Start of recognizer
*/

<recognizer>

/* End of code
* =====
*/

>>
headerFileExtension() ::= ".h"

headerFile( LEXER,
            PARSER,
            TREE_PARSER,
            actionScope,
            actions,
            docComment,
            recognizer,
            name,
            tokens,
            tokenNames,

```

```

    rules,
    cyclicDFAs,
    bitsets,
    buildTemplate,
    buildAST,
    rewriteMode,
    profile,
    backtracking,
    synpreds,
    memoize,
    numRules,
    fileName,
    ANTLRVersion,
    generatedTimestamp,
    trace,
    scopes,
    superClass,
    literals
) ::=
<<
<leadIn("C header")>
<if(PARSER)>
* The parser <mainName()>
<endif>
<if(LEXER)>
* The lexer <mainName()>
<endif>
<if(TREE_PARSER)>
* The tree parser <mainName()>
<endif>
has the callable functions (rules) shown below,
* which will invoke the code for the associated rule in the source grammar
* assuming that the input stream is pointing to a token/text stream that could begin
* this rule.
*
* For instance if you call the first (topmost) rule in a parser grammar, you will
* get the results of a full parse, but calling a rule half way through the grammar will
* allow you to pass part of a full token stream to the parser, such as for syntax checking
* in editors and so on.
*
* The parser entry points are called indirectly (by function pointer to function) via
* a parser context typedef p<name>, which is returned from a call to <name>New().
*
<if(LEXER)>
* As this is a generated lexer, it is unlikely you will call it 'manually'. However
* the methods are provided anyway.
*
<endif>

```



```

* The methods in p<name> are as follows:
*
* <rules:{r | <if(!r.ruleDescriptor.isSynPred)> - <headerReturnType(ruleDescriptor=r.ruleDescriptor,...)>
p<name>-><r.ruleDescriptor.name>(p<name><endif>}; separator="\n * ">
*
* The return type for any particular rule is of course determined by the source
* grammar file.
*/
// [The "BSD license"]
// Copyright (c) 2005-2009 Jim Idle, Temporal Wave LLC
// http://www.temporal-wave.com
// http://www.linkedin.com/in/jimidle
//
// All rights reserved.
//
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// IN NO EVENT SHALL THE AUTHOR BE LIABLE FOR ANY DIRECT, INDIRECT,
// INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
// NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE,
// DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY
// THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT
// (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF
// THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

#ifndef _<name>_H
#define _<name>_H
<actions.(actionScope).preincludes>
/* =====
* Standard antlr3 C runtime definitions
*/
#include \<antlr3.h>

/* End of standard antlr 3 runtime definitions
* =====
*/

```

```

<actions.(actionScope).includes>

#ifdef __cplusplus
extern "C" {
#endif

// Forward declare the context typedef so that we can use it before it is
// properly defined. Delegators and delegates (from import statements) are
// interdependent and their context structures contain pointers to each other
// C only allows such things to be declared if you pre-declare the typedef.
//
typedef struct <name>_Ctx_struct <name>, * p<name>;

<if(recognizer.grammar.delegates)>
// Include delegate definition header files
//
<recognizer.grammar.delegates: {g|#include \<<g.recognizerName>.h>}; separator="\n">

<endif>

<actions.(actionScope).header>

#ifdef ANTLR3_WINDOWS
// Disable: Unreferenced parameter, - Rules with parameters that are not used
// constant conditional, - ANTLR realizes that a prediction is always true (synpred usually)
// initialized but unused variable - tree rewrite variables declared but not needed
// Unreferenced local variable - lexer rule declares but does not always use _type
// potentially uninitialized variable used - retval always returned from a rule
// unreferenced local function has been removed - susually getTokenNames or freeScope, they can go without
warnigns
//
// These are only really displayed at warning level /W4 but that is the code ideal I am aiming at
// and the codegen must generate some of these warnings by necessity, apart from 4100, which is
// usually generated when a parser rule is given a parameter that it does not use. Mostly though
// this is a matter of orthogonality hence I disable that one.
//
#pragma warning( disable : 4100 )
#pragma warning( disable : 4101 )
#pragma warning( disable : 4127 )
#pragma warning( disable : 4189 )
#pragma warning( disable : 4505 )
#pragma warning( disable : 4701 )
#endif
<if(backtracking)>

/* =====
* BACKTRACKING IS ENABLED

```

```

* =====
*/
<endif>

<rules:{r |<headerReturnScope(ruleDescriptor=r.ruleDescriptor,...)>>

<scopes:{it | <if(it.isDynamicGlobalScope)><globalAttributeScopeDecl(it)><endif>>
<rules:{r |<ruleAttributeScopeDecl(scope=r.ruleDescriptor.ruleScope)>>
<if(recognizer.grammar.delegators)>
// Include delegator definition header files
//
<recognizer.grammar.delegators: {g#include \<<g.recognizerName>.h>; separator="\n">

<endif>

/** Context tracking structure for <mainName()>
*/
struct <name>_Ctx_struct
{
    /** Built in ANTLR3 context tracker contains all the generic elements
    * required for context tracking.
    */
<if(PARSER)>
    pANTLR3_PARSER  pParser;
<endif>
<if(LEXER)>
    pANTLR3_LEXER  pLexer;
<endif>
<if(TREE_PARSER)>
    pANTLR3_TREE_PARSER  pTreeParser;
<endif>

<if(recognizer.grammar.delegates)>
<recognizer.grammar.delegates:
    {g|p<g.recognizerName> <g:delegateName(>;}; separator="\n">
<endif>
<if(recognizer.grammar.delegators)>
<recognizer.grammar.delegators:
    {g|p<g.recognizerName> <g:delegateName(>;}; separator="\n">
<endif>
<scopes:{it | <if(it.isDynamicGlobalScope)>
    <globalAttributeScopeDef(it)>
<endif>}; separator="\n\n">
<rules: {r |<if(r.ruleDescriptor.ruleScope)>
    <ruleAttributeScopeDef(scope=r.ruleDescriptor.ruleScope)>
<endif>}>

<if(LEXER)>

```

```

    <rules:{r | <if(!r.ruleDescriptor.isSynPred)><headerReturnType(ruleDescriptor=r.ruleDescriptor)>
(*m<r.ruleDescriptor.name>) (struct <name>_Ctx_struct * ctx<if(r.ruleDescriptor.parameterScope)>,
<endif><r.ruleDescriptor.parameterScope:parameterScope(>>);<endif>}; separator="\n">
<endif>
<if(!LEXER)>
    <rules:{r | <headerReturnType(ruleDescriptor=r.ruleDescriptor)> (*<r.ruleDescriptor.name>) (struct
<name>_Ctx_struct * ctx<if(r.ruleDescriptor.parameterScope)>,
<endif><r.ruleDescriptor.parameterScope:parameterScope(>>);}; separator="\n">
<! generate rule/method definitions for imported rules so they
appear to be defined in this recognizer. !>
    // Delegated rules
<recognizer.grammar.delegatedRules:{ruleDescriptor|
    <headerReturnType(ruleDescriptor)> (*<ruleDescriptor.name>)(struct <name>_Ctx_struct *
ctx<if(ruleDescriptor.parameterScope)>, <endif><ruleDescriptor.parameterScope:parameterScope(>>);};
separator="\n">
<endif>

    const char * (*getGrammarFileName());
    void (*reset) (struct <name>_Ctx_struct * ctx);
    void (*free) (struct <name>_Ctx_struct * ctx);
    <@members>
    <@end>
    <actions.(actionScope).context>
};

// Function prototypes for the constructor functions that external translation units
// such as delegators and delegates may wish to call.
//
ANTLR3_API p<name> <name>New (<inputType(>> instream<recognizer.grammar.delegators:{g|,
p<g.recognizerName> <g.delegateName(>>}&>);
ANTLR3_API p<name> <name>NewSSD (<inputType(>> instream,
pANTLR3_RECOGNIZER_SHARED_STATE state<recognizer.grammar.delegators:{g|, p<g.recognizerName>
<g.delegateName(>>}&>);
<if(!recognizer.grammar.grammarIsRoot)>
extern pANTLR3_UINT8 <recognizer.grammar.composite.rootGrammar.recognizerName>TokenNames[];
<endif>

/** Symbolic definitions of all the tokens that the <grammarType(>> will work with.
* \{
*
* Antlr will define EOF, but we can't use that as it is too common in
* in C header files and that would be confusing. There is no way to filter this out at the moment
* so we just undef it here for now. That isn't the value we get back from C recognizers
* anyway. We are looking for ANTLR3_TOKEN_EOF.
*/
#ifdef EOF
#undef EOF

```

```

#endif
#ifdef Tokens
#undef Tokens
#endif
<tokens:{it | #define <it.name>    <it.type>}; separator="\n">
#ifdef EOF
#undef EOF
#define EOF ANTLR3_TOKEN_EOF
#endif

#ifndef TOKENSOURCE
#define TOKENSOURCE(lxr) lxr->pLexer->rec->state->tokSource
#endif

/* End of token definitions for <name>
* =====
*/
/** \} */

#ifdef __cplusplus
}
#endif

#endif

/* END - Note:Keep extra line feed to satisfy UNIX systems */

>>

inputType() ::= <<
<if(LEXER)>
pANTLR3_INPUT_STREAM
<endif>
<if(PARSER)>
pANTLR3_COMMON_TOKEN_STREAM
<endif>
<if(TREE_PARSER)>
pANTLR3_COMMON_TREE_NODE_STREAM
<endif>
>>

grammarType() ::= <<
<if(PARSER)>
parser
<endif>
<if(LEXER)>
lexer
<endif>

```

```

<if(TREE_PARSER)>
tree parser
<endif>
>>

mainName() ::= <<
<if(PARSER)>
<name>
<endif>
<if(LEXER)>
<name>
<endif>
<if(TREE_PARSER)>
<name>
<endif>
>>

headerReturnScope(ruleDescriptor) ::= "<returnScope(...)>"

headerReturnType(ruleDescriptor) ::= <<
<if(LEXER)>
<if(!ruleDescriptor.isSynPred)>
void
<else>
<returnType()>
<endif>
<else>
<returnType()>
<endif>
>>

// Produce the lexer output
//
lexer( grammar,
      name,
      tokens,
      scopes,
      rules,
      numRules,
      filterMode,
      superClass,
      labelType="pANTLR3_COMMON_TOKEN") ::= <<

<if(filterMode)>
/* Forward declare implementation function for ANTLR3_TOKEN_SOURCE interface when
 * this is a filter mode lexer.
 */
static pANTLR3_COMMON_TOKEN <name>NextToken (pANTLR3_TOKEN_SOURCE toksource);

```

```

/* Override the normal MEMOIZE and HAVEALREADYPARSED macros as this is a filtering
* lexer. In filter mode, the memoizing and backtracking are gated at BACKTRACKING > 1 rather
* than just BACKTRACKING. In some cases this might generate code akin to:
* if (BACKTRACKING) if (BACKTRACKING > 1) memoize.
* However, I assume that the C compilers/optimizers are smart enough to work this one out
* these days - Jim
*/
#undef MEMOIZE
#define MEMOIZE(ri,si) if (BACKTRACKING>1) { RECOGNIZER->memoize(RECOGNIZER, ri, si) }
#undef HAVEPARSEDRULE
#define HAVEPARSEDRULE(r) if (BACKTRACKING>1) { RECOGNIZER->alreadyParsedRule(RECOGNIZER,
r) }
<endif>

/* Forward declare the locally static matching functions we have generated and any predicate functions.
*/
<rules:{r | static ANTLR3_INLINE <headerReturnType(ruleDescriptor=r.ruleDescriptor)>
<if(!r.ruleDescriptor.isSynPred)>m<endif><r.ruleDescriptor.name> (p<name>
ctx<if(r.ruleDescriptor.parameterScope)>, <endif><r.ruleDescriptor.parameterScope:parameterScope(>>);};
separator="\n">
static void <name>Free(p<name> ctx);

/* =====
* Lexer matching rules end.
* =====
*/

<scopes:{it |<if(it.isDynamicGlobalScope)><globalAttributeScope(it)><endif>}>

<actions.lexer.members>

static void
<name>Free (p<name> ctx)
{
<if(memoize)>
if (RULEMEMO != NULL)
{
RULEMEMO->free(RULEMEMO);
RULEMEMO = NULL;
}
<endif>
<if(grammar.directDelegates)>
// Free the lexers that we delegated to
// functions to. NULL the state so we only free it once.
//
<grammar.directDelegates:
{g|ctx-><g:delegateName(>->pLexer->rec->state = NULL;

```

```

    ctx-><g:delegateName(>->free(ctx-><g:delegateName(>));}; separator="\n">
<endif>
    LEXER->free(LEXER);

    ANTLR3_FREE(ctx);
}

static void
<name>Reset (p<name> ctx)
{
    RECOGNIZER->reset(RECOGNIZER);
}

/** \brief Name of the grammar file that generated this code
*/
static const char fileName[] = "<fileName>";

/** \brief Return the name of the grammar file that generated this code.
*/
static const char * getGrammarFileName()
{
    return fileName;
}

<if(filterMode)>
    <filteringNextToken(>
<endif>

/** \brief Create a new lexer called <name>
*
* \param[in] instream Pointer to an initialized input stream
* \return
* - Success p<name> initialized for the lex start
* - Fail NULL
*/
ANTLR3_API p<name> <name>New
(<inputType(> instream<grammar.delegators:{g|, p<g.recognizerName> <g:delegateName(>}>>)
{
    // See if we can create a new lexer with the standard constructor
    //
    return <name>NewSSD(instream, NULL<grammar.delegators:{g|, <g:delegateName(>}>>);
}

/** \brief Create a new lexer called <name>
*
* \param[in] instream Pointer to an initialized input stream
* \param[state] state Previously created shared recognizer stat
* \return

```



```

* - Success p<name> initialized for the lex start
* - Fail NULL
*/
ANTLR3_API p<name> <name>NewSSD
(pANTLR3_INPUT_STREAM instream, pANTLR3_RECOGNIZER_SHARED_STATE
state<grammar.delegators:{g|, p<g.recognizerName> <g.delegateName()>>})
{
    p<name> ctx; // Context structure we will build and return

    ctx = (p<name>) ANTLR3_CALLOC(1, sizeof(<name>));

    if (ctx == NULL)
    {
        // Failed to allocate memory for lexer context
        return NULL;
    }

    /* -----
    * Memory for basic structure is allocated, now to fill in
    * in base ANTLR3 structures. We initialize the function pointers
    * for the standard ANTLR3 lexer function set, but upon return
    * from here, the programmer may set the pointers to provide custom
    * implementations of each function.
    *
    * We don't use the macros defined in <name>.h here so you can get a sense
    * of what goes where.
    */

    /* Create a base lexer, using the supplied input stream
    */
    ctx->pLexer = antlr3LexerNewStream(ANTLR3_SIZE_HINT, instream, state);

    /* Check that we allocated the memory correctly
    */
    if (ctx->pLexer == NULL)
    {
        ANTLR3_FREE(ctx);
        return NULL;
    }
<if(memoize)>
<if(grammar.grammarIsRoot)>
    // Create a LIST for recording rule memos.
    //
    ctx->pLexer->rec->ruleMemo = antlr3IntTrieNew(15); /* 16 bit depth is enough for 32768 rules! */
<endif>
<endif>

    /* Install the implementation of our <name> interface

```

```

*/
<rules: {r | <if(!r.ruleDescriptor.isSynPred)>ctx->m<r.ruleDescriptor.name> =
m<r.ruleDescriptor.name>;<endif>} ; separator="\n">

/** When the nextToken() call is made to this lexer's pANTLR3_TOKEN_SOURCE
 * it will call mTokens() in this generated code, and will pass it the ctx
 * pointer of this lexer, not the context of the base lexer, so store that now.
 */
ctx->pLexer->ctx = ctx;

/**Install the token matching function
 */
ctx->pLexer->mTokens = (void (*)(void *))(mTokens);

ctx->getGrammarFileName = getGrammarFileName;
ctx->free = <name>Free;
ctx->reset = <name>Reset;

<if(grammar.directDelegates)>
// Initialize the lexers that we are going to delegate some
// functions to.
//
<grammar.directDelegates:
    {g|ctx-><g:delegateName()> = <g.recognizerName>NewSSD(instream, ctx->pLexer->rec->state,
ctx->grammar.delegates: {g|, <g:delegateName()>}>);}; separator="\n">
<endif>
<if(grammar.delegates)>
// Install the pointers back to lexers that will delegate us to perform certain functions
// for them.
//
<grammar.delegates:
    {g|ctx-><g:delegateName()> = <g:delegateName()>;}; separator="\n">
<endif>
<if(filterMode)>
/* We have filter mode turned on, so install the filtering nextToken function
 */
ctx->pLexer->rec->state->tokSource->nextToken = <name>NextToken;
<endif>
<actions.lexer.apifuncs>

/* Return the newly built lexer to the caller
 */
return ctx;
}
<if(cyclicDFAs)>

/* =====
 * DFA tables for the lexer

```

```

*/
<cyclicDFAs:cyclicDFA(>< ! dump tables for all DFA !>
/* =====
* End of DFA tables for the lexer
*/
<endif>

/* =====
* Functions to match the lexer grammar defined tokens from the input stream
*/

<rules; separator="\n\n">

/* =====
* Lexer matching rules end.
* =====
*/
<if(synpreds)>

/* =====
* Lexer syntactic predicates
*/
<synpreds:{p | <lexerSynpred(predname=p)>}>
/* =====
* Lexer syntactic predicates end.
* =====
*/
<endif>

/* End of Lexer code
* =====
* =====
*/

>>

```

```

filteringNextToken() ::= <<
/** An override of the lexer's nextToken() method that backtracks over mTokens() looking
* for matches in lexer filterMode. No error can be generated upon error; just rewind, consume
* a token and then try again. BACKTRACKING needs to be set as well.
* Make rule memoization happen only at levels above 1 as we start mTokens
* at BACKTRACKING==1.
*/
static pANTLR3_COMMON_TOKEN
<name>NextToken(pANTLR3_TOKEN_SOURCE toksource)
{
    pANTLR3_LEXER lexer;

```

```

pANTLR3_RECOGNIZER_SHARED_STATE state;

lexer = (pANTLR3_LEXER)(toksource->super);
state = lexer->rec->state;

/* Get rid of any previous token (token factory takes care of
 * any deallocation when this token is finally used up.
 */
state ->token = NULL;
state ->error = ANTLR3_FALSE; /* Start out without an exception */
state ->failed = ANTLR3_FALSE;

/* Record the start of the token in our input stream.
 */
state->tokenStartCharIndex = lexer->input->istream->index(lexer->input->istream);
state->tokenStartCharPositionInLine = lexer->input->getCharPositionInLine(lexer->input);
state->tokenStartLine = lexer->input->getLine(lexer->input);
state->text = NULL;

/* Now call the matching rules and see if we can generate a new token
 */
for (;;)
{
if (lexer->input->istream->_LA(lexer->input->istream, 1) == ANTLR3_CHARSTREAM_EOF)
{
/* Reached the end of the stream, nothing more to do.
 */
pANTLR3_COMMON_TOKEN teof = &(toksource->eofToken);

teof->setStartIndex (teof, lexer->getCharIndex(lexer));
teof->setStopIndex (teof, lexer->getCharIndex(lexer));
teof->setLine (teof, lexer->getLine(lexer));
return teof;
}

state->token = NULL;
state->error = ANTLR3_FALSE; /* Start out without an exception */

{
ANTLR3_MARKER m;

m = lexer->input->istream->mark(lexer->input->istream);
state->backtracking = 1; /* No exceptions */
state->failed = ANTLR3_FALSE;

/* Call the generated lexer, see if it can get a new token together.
 */
lexer->mTokens(lexer->ctx);

```

```

state->backtracking = 0;

<! mTokens backtracks with synpred at BACKTRACKING==2
and we set the synpredgate to allow actions at level 1. !>

if (state->failed == ANTLR3_TRUE)
{
lexer->input->istream->rewind(lexer->input->istream, m);
lexer->input->istream->consume(lexer->input->istream); <! advance one char and try again !>
}
else
{
lexer->emit(lexer); /* Assemble the token and emit it to the stream */
return state->token;
}
}
}
}
>>

```

```

actionGate() ::= "BACKTRACKING==0"

```

```

filteringActionGate() ::= "BACKTRACKING==1"

```

```

/** How to generate a parser */
genericParser( grammar,
name,
scopes,
tokens,
tokenNames,
rules,
numRules,
bitsets,
inputStreamType,
superClass,
labelType,
members,
rewriteElementType, filterMode,
ASTLabelType="pANTLR3_BASE_TREE"
) ::= <<

```

```

<if(grammar.grammarIsRoot)>
/** \brief Table of all token names in symbolic order, mainly used for
* error reporting.
*/
pANTLR3_UINT8 <name>TokenNames[<length(tokenNames)>+4]
= {

```

```

    (pANTLR3_UINT8) "\\<invalid>",    /* String to print to indicate an invalid token */
    (pANTLR3_UINT8) "\\<EOR>",
    (pANTLR3_UINT8) "\\<DOWN>",
    (pANTLR3_UINT8) "\\<UP>",
    <tokenNames:{it |(pANTLR3_UINT8) <it>}; separator=",\n">
};
<endif>

<@members>

<@end>
<rules:{r |<ruleAttributeScopeFuncMacro(scope=r.ruleDescriptor.ruleScope)>>}>
<scopes:{it |<if(it.isDynamicGlobalScope)><globalAttributeScopeFuncMacro(it)><endif>}>

// Forward declare the locally static matching functions we have generated.
//
<rules:{r | static <headerReturnType(ruleDescriptor=r.ruleDescriptor)> <r.ruleDescriptor.name> (p<name>
ctx<if(r.ruleDescriptor.parameterScope)>, <endif><r.ruleDescriptor.parameterScope:parameterScope()>);};
separator="\n">
static void <name>Free(p<name> ctx);
static void <name>Reset (p<name> ctx);

<if(!LEXER)>
<! generate rule/method definitions for imported rules so they
appear to be defined in this recognizer. !>
<if(recognizer.grammar.delegatedRules)>
// Delegated rules
//
<recognizer.grammar.delegatedRules:{ruleDescriptor|static <headerReturnType(ruleDescriptor)>
<ruleDescriptor.name>(p<name> ctx<if(ruleDescriptor.parameterScope)>,
<endif><r.ruleDescriptor.parameterScope:parameterScope()>);}; separator="\n">

<endif>
<endif>

/* For use in tree output where we are accumulating rule labels via label += ruleRef
* we need a function that knows how to free a return scope when the list is destroyed.
* We cannot just use ANTLR3_FREE because in debug tracking mode, this is a macro.
*/
static void ANTLR3_CDECL freeScope(void * scope)
{
    ANTLR3_FREE(scope);
}

/** \brief Name of the grammar file that generated this code
*/
static const char fileName[] = "<fileName>";

```

```

/** \brief Return the name of the grammar file that generated this code.
*/
static const char * getGrammarFileName()
{
    return fileName;
}

/** \brief Create a new <name> parser and return a context for it.
*
* \param[in] instream Pointer to an input stream interface.
*
* \return Pointer to new parser context upon success.
*/
ANTLR3_API p<name>
<name>New (<inputStreamType> instream<grammar.delegators:{g|, p<g.recognizerName>
<g.delegateName(>>>)
{
    // See if we can create a new parser with the standard constructor
    //
    return <name>NewSSD(instream, NULL<grammar.delegators:{g|, <g.delegateName(>>>));
}

/** \brief Create a new <name> parser and return a context for it.
*
* \param[in] instream Pointer to an input stream interface.
*
* \return Pointer to new parser context upon success.
*/
ANTLR3_API p<name>
<name>NewSSD (<inputStreamType> instream, pANTLR3_RECOGNIZER_SHARED_STATE
state<grammar.delegators:{g|, p<g.recognizerName> <g.delegateName(>>>)
{
    p<name> ctx;    /* Context structure we will build and return */

    ctx = (p<name>) ANTLR3_CALLOC(1, sizeof(<name>));

    if (ctx == NULL)
    {
        // Failed to allocate memory for parser context
        //
        return NULL;
    }

    /* -----
    * Memory for basic structure is allocated, now to fill in
    * the base ANTLR3 structures. We initialize the function pointers
    * for the standard ANTLR3 parser function set, but upon return
    * from here, the programmer may set the pointers to provide custom
    * implementations of each function.

```

```

*
* We don't use the macros defined in <name>.h here, in order that you can get a sense
* of what goes where.
*/

<if(PARSER)>
  /* Create a base parser/recognizer, using the supplied token stream
  */
  ctx->pParser = antlr3ParserNewStream(ANTLR3_SIZE_HINT, instream->tstream, state);
<endif>
<if(TREE_PARSER)>
  /* Create a base Tree parser/recognizer, using the supplied tree node stream
  */
  ctx->pTreeParser = antlr3TreeParserNewStream(ANTLR3_SIZE_HINT, instream, state);
<endif>

  /* Install the implementation of our <name> interface
  */
  <rules:{r | ctx-><r.ruleDescriptor.name> = <r.ruleDescriptor.name>;}; separator="\n">
<if(grammar.delegatedRules)>
  // Install the delegated methods so that they appear to be a part of this
  // parser
  //
  <grammar.delegatedRules:{ruleDescriptor | ctx-><ruleDescriptor.name> = <ruleDescriptor.name>;};
separator="\n">
<endif>

  ctx->free = <name>Free;
  ctx->reset = <name>Reset;
  ctx->getGrammarFileName = getGrammarFileName;

  /* Install the scope pushing methods.
  */
  <rules: {r |<if(r.ruleDescriptor.ruleScope)>
<ruleAttributeScope(scope=r.ruleDescriptor.ruleScope)><\n>
<endif>}>
  <recognizer.scopes:{it |<if(it.isDynamicGlobalScope)>
<globalAttributeScope(it)><\n>
<endif>}>
  <@apifuncs>

  <@end>
<if(grammar.directDelegates)>
  // Initialize the parsers that we are going to delegate some
  // functions to.
  //
  <grammar.directDelegates:
    {g|ctx-><g.delegateName()> = <g.recognizerName>NewSSD(instream, PSRSTATE,

```



```

ctx<grammar.delegators:{g|,<g:delegateName()>>}; separator="\n">
<endif>
<if(grammar.delegators)>
// Install the pointers back to parsers that will delegate us to perform certain functions
// for them.
//
<grammar.delegators:
    {g|ctx-><g:delegateName()> = <g:delegateName()>; separator="\n">
<endif>
    <actions.parser.apifuncs>
    <actions.treeparser.apifuncs>
<if(memoize)>
<if(grammar.grammarIsRoot)>
    /* Create a LIST for recording rule memos.
    */
    RULEMEMO = antlr3IntTrieNew(15); /* 16 bit depth is enough for 32768 rules! */<\n>
<endif>
<endif>
    /* Install the token table
    */
    PSRSTATE->tokenNames = <grammar.composite.rootGrammar.recognizerName>TokenNames;

<@debugStuff()>

    /* Return the newly built parser to the caller
    */
    return ctx;
}

static void
<name>Reset (p<name> ctx)
{
    RECOGNIZER->reset(RECOGNIZER);
}

/** Free the parser resources
*/
static void
<name>Free(p<name> ctx)
{
    /* Free any scope memory
    */
    <rules: {r
|<if(r.ruleDescriptor.ruleScope)><ruleAttributeScopeFree(scope=r.ruleDescriptor.ruleScope)><\n><endif>}>
    <recognizer.scopes:{it |<if(it.isDynamicGlobalScope)><globalAttributeScopeFree(it)><\n><endif>}>

<@cleanup>
<@end>

```

```

<if(grammar.directDelegates)>
// Free the parsers that we delegated to
// functions to.NULL the state so we only free it once.
//
<grammar.directDelegates:
    {g| ctx-><g:delegateName()-><if(TREE_PARSER)>pTreeParser<else>pParser<endif->rec->state = NULL;
    ctx-><g:delegateName()->free(ctx-><g:delegateName()->);}; separator="\n">
<endif>
<if(memoize)>
<if(grammar.grammarIsRoot)>
if (RULEMEMO != NULL)
{
    RULEMEMO->free(RULEMEMO);
    RULEMEMO = NULL;
}
<endif>
<endif>
// Free this parser
//
<if(TREE_PARSER)>
    ctx->pTreeParser->free(ctx->pTreeParser);<\n>
<else>
    ctx->pParser->free(ctx->pParser);<\n>
<endif>

    ANTLR3_FREE(ctx);

    /* Everything is released, so we can return
    */
    return;
}

/** Return token names used by this <grammarType()>
*
* The returned pointer is used as an index into the token names table (using the token
* number as the index).
*
* \return Pointer to first char * in the table.
*/
static pANTLR3_UINT8 *getTokenNames()
{
    return <grammar.composite.rootGrammar.recognizerName>TokenNames;
}

<members>

/* Declare the bitsets
*/

```

```
<bitsets:{it | <bitsetDeclare(name={FOLLOW_<it.name>_in_<it.inName><it.tokenIndex>},
    words64=it.bits)>>>
```

```
<if(cyclicDFAs)>
```

```
/* =====
 * DFA tables for the parser
 */
<cyclicDFAs:cyclicDFA() <! dump tables for all DFA !>
/* =====
 * End of DFA tables for the parser
 */
<endif>
```

```
/* =====
 * Parsing rules
 */
<rules; separator="\n\n">
<if(grammar.delegatedRules)>
// Delegated methods that appear to be a part of this
// parser
//
<grammar.delegatedRules:{ruleDescriptor|
    <returnType()> <ruleDescriptor.name>(p<name> ctx<if(ruleDescriptor.parameterScope.attributes)>,
<endif><ruleDescriptor.parameterScope:parameterScope()>)
    \{
        <if(ruleDescriptor.hasReturn Value)>return <endif>ctx-><ruleDescriptor.grammar:delegateName()>-
    <ruleDescriptor.name>(ctx-
    ><ruleDescriptor.grammar:delegateName()><if(ruleDescriptor.parameterScope.attributes)>,
<endif><ruleDescriptor.parameterScope.attributes:{a|<a.name>}; separator=", ">);
    \}}; separator="\n\n">
```

```
<endif>
```

```
/* End of parsing rules
```

```
* =====
*/
```

```
/* =====
 * Syntactic predicates
 */
<synpreds:{p | <synpred(predname=p)>>
/* End of syntactic predicates
 * =====
*/
```

>>

```
parser( grammar,  
  name,  
  scopes,  
  tokens,  
  tokenNames,  
  rules,  
  numRules,  
  bitsets,  
  ASTLabelType,  
  superClass="Parser",  
  labelType="pANTLR3_COMMON_TOKEN",  
  members={<actions.parser.members>}  
  ) ::= <<  
<genericParser(inputStreamType="pANTLR3_COMMON_TOKEN_STREAM", rewriteElementType="TOKEN",  
  ...)>  
>>
```

```
/** How to generate a tree parser; same as parser except the input  
 * stream is a different type.  
 */
```

```
treeParser( grammar,  
  name,  
  scopes,  
  tokens,  
  tokenNames,  
  globalAction,  
  rules,  
  numRules,  
  bitsets,  
  filterMode,  
  labelType={<ASTLabelType>},  
  ASTLabelType="pANTLR3_BASE_TREE",  
  superClass="TreeParser",  
  members={<actions.treeparser.members>}  
  ) ::= <<  
<genericParser(inputStreamType="pANTLR3_COMMON_TREE_NODE_STREAM",  
  rewriteElementType="NODE", ...)>  
>>
```

```
/** A simpler version of a rule template that is specific to the imaginary  
 * rules created for syntactic predicates. As they never have return values  
 * nor parameters etc..., just give simplest possible method. Don't do  
 * any of the normal memoization stuff in here either; it's a waste.  
 * As predicates cannot be inlined into the invoking rule, they need to
```

```

* be in a rule by themselves.
*/
synpredRule(ruleName, ruleDescriptor, block, description, nakedBlock) ::=
<<
// $ANTLR start <ruleName>
static void <ruleName>_fragment(p<name> ctx <ruleDescriptor.parameterScope:parameterScope(>
{
<ruleLabelDefs(>
<ruleLabelInitializations(>
<if(trace)>
    ANTLR3_PRINTF("enter <ruleName> %d failed = %d, backtracking = %d\n",LT(1),failed,BACKTRACKING);
    <block>
    ANTLR3_PRINTF("exit <ruleName> %d, failed = %d, backtracking = %d\n",LT(1),failed,BACKTRACKING);

<else>
    <block>
<endif>
<ruleCleanUp(>
}
// $ANTLR end <ruleName>
>>

synpred(predname) ::= <<
static ANTLR3_BOOLEAN <predname>(p<name> ctx)
{
    ANTLR3_MARKER start;
    ANTLR3_BOOLEAN success;

    BACKTRACKING++;
    <@start(>
    start = MARK();
    <predname>_fragment(ctx); // can never throw exception
    success = !(FAILEDFLAG);
    REWIND(start);
    <@stop(>
    BACKTRACKING--;
    FAILEDFLAG = ANTLR3_FALSE;
    return success;
}<\n>
>>

lexerSynpred(predname) ::= <<
<synpred(predname)>
>>

ruleMemoization(rname) ::= <<
<if(memoize)>
if ( ( BACKTRACKING>0) && (HAVEPARSEDRULE(<ruleDescriptor.index>))) )

```

```

{
<if(ruleDescriptor.hasMultipleReturnValues)>
<if(!ruleDescriptor.isSynPred)>
    retval.start = 0;<\n>
<endif>
<endif>
    <(ruleDescriptor.actions.after):execAfter()>
    <finalCode(finalBlock=finally)>
<if(!ruleDescriptor.isSynPred)>
    <scopeClean()><\n>
<endif>
    return <ruleReturnValue()>;
}
<endif>
>>

```

/** How to test for failure and return from rule */

```

checkRuleBacktrackFailure() ::= <<
if (HASEXCEPTION())
{
    goto rule<ruleDescriptor.name>Ex;
}
<if(backtracking)>
if (HASFAILED())
{
    <scopeClean()>
    <@debugClean()>
    return <ruleReturnValue()>;
}
<endif>
>>

```

/** This rule has failed, exit indicating failure during backtrack */

```

ruleBacktrackFailure() ::= <<
<if(backtracking)>
if (BACKTRACKING>0)
{
    FAILEDFLAG = <>true_value()>;
    <scopeClean()>
    return <ruleReturnValue()>;
}
<endif>
>>

```

/** How to generate code for a rule. This includes any return type

* data aggregates required for multiple return values.

*/

```

rule(ruleName,ruleDescriptor,block,emptyRule,description,exceptions,finally,memoize) ::= <<

```

```

/**
 * $ANTLR start <ruleName>
 * <fileName>:<description>
 */
static <returnType>
<ruleName>(p<name> ctx<if(ruleDescriptor.parameterScope)>,
<endif><ruleDescriptor.parameterScope:parameterScope()>)
{
    <if(trace)>ANTLR3_PRINTF("enter <ruleName> %s failed=%d, backtracking=%d\n", LT(1),
BACKTRACKING);<endif>
    <ruleDeclarations()>
    <ruleDescriptor.actions.declarations>
    <ruleLabelDefs()>
    <ruleInitializations()>
    <ruleDescriptor.actions.init>
    <ruleMemoization(rname=ruleName)>
    <ruleLabelInitializations()>
    <@preamble()>
    {
        <block>
    }

    <ruleCleanUp()>
<if(exceptions)>
    if (HASEXCEPTION())
    {
<exceptions: {e|<catch(decl=e.decl,action=e.action)><\n>}>
    }
    else
    {
<(ruleDescriptor.actions.after):execAfter()>
    }
<else>
    <if(!emptyRule)>
        <if(actions.(actionScope).rulecatch)>
            <actions.(actionScope).rulecatch>
        <else>
            if (HASEXCEPTION())
            {
                PREPORTERROR();
                PRECOVER();
                <@setErrorReturnValue()>
            }
            <if(ruleDescriptor.actions.after)>
            else
            {
                <(ruleDescriptor.actions.after):execAfter()>
            }<\n>

```

```

    <endif>
  <endif>
<endif>
<endif>

  <if(trace)>ANTLR3_PRINTF("exit <ruleName> %d failed=%s backtracking=%s\n", LT(1), failed,
BACKTRACKING);<endif>
  <memoize()>
<if(finally)>
  <finalCode(finalBlock=finally)>
<endif>
  <scopeClean()>
  <@postamble()>
  return <ruleReturnValue()>;
}
/* $ANTLR end <ruleName> */
>>

finalCode(finalBlock) ::= <<
{
  <finalBlock>
}

>>

catch(decl,action) ::= <<
/* catch(decl,action)
*/
{
  <e.action>
}

>>

ruleDeclarations() ::= <<
<if(ruleDescriptor.hasMultipleReturnValues)>
<returnType()> retval;<\n>
<else>
<ruleDescriptor.returnScope.attributes:{ a |
<a.type> <a.name>;
}>
<endif>
<if(memoize)>
ANTLR3_MARKER <ruleDescriptor.name>_startIndex;
<endif>
>>

ruleInitializations() ::= <<

```



```

/* Initialize rule variables
*/
<if(ruleDescriptor.hasMultipleReturnValues)>
<ruleDescriptor.returnScope.attributes:{ a |
<if(a.initValue)>retval.<a.name> = <a.initValue>;<endif>
}>
<else>
<ruleDescriptor.returnScope.attributes:{ a |
<if(a.initValue)><a.name> = <a.initValue>;<endif>
}>
<endif>
<if(memoize)>
<ruleDescriptor.name>_startIndex = INDEX();<\n>
<endif>
<ruleDescriptor.useScopes:{ it |<scopeTop(it)> = <scopePush(it)>;}; separator="\n">
<ruleDescriptor.ruleScope:{ it |<scopeTop(it.name)> = <scopePush(it.name)>;}; separator="\n">
>>

ruleLabelDefs() ::= <<
<[ruleDescriptor.tokenLabels,ruleDescriptor.tokenListLabels]
: {it |<labelType> <it.label.text>;}; separator="\n"
>
<[ruleDescriptor.tokenListLabels,ruleDescriptor.ruleListLabels]
: {it |pANTLR3_VECTOR list_<it.label.text>;}; separator="\n"
>
<[ruleDescriptor.ruleLabels,ruleDescriptor.ruleListLabels]
: ruleLabelDef(); separator="\n"
>
>>

ruleLabelInitializations() ::= <<
<[ruleDescriptor.tokenLabels,ruleDescriptor.tokenListLabels]
: {it |<it.label.text> = NULL;}; separator="\n"
>
<[ruleDescriptor.tokenListLabels,ruleDescriptor.ruleListLabels]
: {it |list_<it.label.text> = NULL;}; separator="\n"
>
<[ruleDescriptor.ruleLabels,ruleDescriptor.ruleListLabels]
: ruleLabelInitVal(); separator="\n"
>
<if(ruleDescriptor.hasMultipleReturnValues)>
<if(!ruleDescriptor.isSynPred)>
retval.start = LT(1); retval.stop = retval.start;<\n>
<endif>
<endif>
>>

lexerRuleLabelDefs() ::= <<

```

```

<[ruleDescriptor.tokenLabels,
ruleDescriptor.tokenListLabels,
ruleDescriptor.ruleLabels]
: {it |<labelType> <it.label.text>;}; separator="\n"
>
<ruleDescriptor.charLabels: {it |ANTLR3_UINT32 <it.label.text>;}; separator="\n">
<[ruleDescriptor.tokenListLabels,
ruleDescriptor.ruleListLabels,
ruleDescriptor.ruleListLabels]
: {it |pANTLR3_INT_TRIE list_<it.label.text>;}; separator="\n"
>
>>

```

```

lexerRuleLabelInit() ::= <<
<[ruleDescriptor.tokenLabels,
ruleDescriptor.tokenListLabels,
ruleDescriptor.ruleLabels]
: {it |<it.label.text> = NULL;}; separator="\n"
>
<[ruleDescriptor.tokenListLabels,
ruleDescriptor.ruleListLabels,
ruleDescriptor.ruleListLabels]
: {it |list_<it.label.text> = antlr3IntTrieNew(31);}; separator="\n"
>
>>

```

```

lexerRuleLabelFree() ::= <<
<[ruleDescriptor.tokenLabels,
ruleDescriptor.tokenListLabels,
ruleDescriptor.ruleLabels]
: {it |<it.label.text> = NULL;}; separator="\n"
>
<[ruleDescriptor.tokenListLabels,
ruleDescriptor.ruleListLabels,
ruleDescriptor.ruleListLabels]
: {it |list_<it.label.text>->free(list_<it.label.text>);}; separator="\n"
>
>>

```

```

ruleReturnValue() ::= <%
<if(!ruleDescriptor.isSynPred)>
<if(ruleDescriptor.hasReturnValue)>
<if(ruleDescriptor.hasSingleReturnValue)>
<ruleDescriptor.singleValueReturnName>
<else>
retval
<endif>
<endif>
<endif>

```

```

<endif>
%>

memoize() ::= <<
<if(memoize)>
<if(backtracking)>
if ( BACKTRACKING>0 ) { MEMOIZE(<ruleDescriptor.index>, <ruleDescriptor.name>_StartIndex); }
<endif>
<endif>
>>

ruleCleanUp() ::= <<

// This is where rules clean up and exit
//
goto rule<ruleDescriptor.name>Ex; /* Prevent compiler warnings */
rule<ruleDescriptor.name>Ex; ;
<if(ruleDescriptor.hasMultipleReturnValues)>
<if(!TREE_PARSER)>
<if(!ruleDescriptor.isSynPred)>
retval.stop = LT(-1);<\n>
<endif>
<endif>
<endif>
>>

scopeClean() ::= <<
<ruleDescriptor.useScopes:{it |<scopePop(it)>}; separator="\n">
<ruleDescriptor.ruleScope:{it |<scopePop(it.name)>}; separator="\n">

>>

/** How to generate a rule in the lexer; naked blocks are used for
 * fragment rules, which do not produce tokens.
 */
lexerRule(ruleName,nakedBlock,ruleDescriptor,block,memoize) ::= <<
// Comes from: <block.description>
/** \brief Lexer rule generated by ANTLR3
 *
 * $ANTLR start <ruleName>
 *
 * Looks to match the characters the constitute the token <ruleName>
 * from the attached input stream.
 *
 *
 * \remark
 * - lexer->error == ANTLR3_TRUE if an exception was thrown.
 */
static ANTLR3_INLINE

```

```

void m<ruleName>(p<name> ctx<if(ruleDescriptor.parameterScope)>,
<endif><ruleDescriptor.parameterScope:parameterScope()>)
{
    ANTLR3_UINT32 _type;
    <ruleDeclarations()>
    <ruleDescriptor.actions.declarations>
    <lexerRuleLabelDefs()>
    <if(trace)>System.out.println("enter <ruleName> "+(char)LA(1)+"
line="+GETLINE()+": "+GETCHARPOSITIONINLINE()+" failed="+failed+"
backtracking="+BACKTRACKING);<endif>

    <if(nakedBlock)>
        <ruleMemoization(rname=ruleName)>
        <lexerRuleLabelInit()>
        <ruleDescriptor.actions.init>

        <block><\n>
    <else>
        <ruleMemoization(rname=ruleName)>
        <lexerRuleLabelInit()>
        _type = <ruleName>;

        <ruleDescriptor.actions.init>

        <block>
        LEXSTATE->type = _type;
    <endif>
    <if(trace)> ANTLR3_FPRINTF(stderr, "exit <ruleName> '%c' line=%d:%d failed = %d, backtracking
=%d\n",LA(1),GETLINE(),GETCHARPOSITIONINLINE(),failed,BACKTRACKING);<endif>
    <ruleCleanUp()>
    <lexerRuleLabelFree()>
    <(ruleDescriptor.actions.after):execAfter()>
    <memoize>
}
// $ANTLR end <ruleName>
>>

/** How to generate code for the implicitly-defined lexer grammar rule
 * that chooses between lexer rules.
 */
tokensRule(ruleName,nakedBlock,args,block,ruleDescriptor) ::= <<
/** This is the entry point in to the lexer from an object that
 * wants to generate the next token, such as a pCOMMON_TOKEN_STREAM
 */
static void
mTokens(p<name> ctx)
{
    <block><\n>

```

```

    goto ruleTokensEx; /* Prevent compiler warnings */
ruleTokensEx :
}
>>

// S U B R U L E S

/** A (...) subrule with multiple alternatives */
block(alts,decls,decision,enclosingBlockLevel,blockLevel,decisionNumber,maxK,maxAlt,description) ::= <<

// <fileName>:<description>
{
    int alt<decisionNumber>=<maxAlt>;
    <decls>
    <@predecision()>
    <decision>
    <@postdecision()>
    <@prebranch()>
    switch (alt<decisionNumber>)
    {
    <alts:{ a | <altSwitchCase(i,a)> }>
    }
    <@postbranch()>
}
>>

/** A rule block with multiple alternatives */
ruleBlock(alts,decls,decision,enclosingBlockLevel,blockLevel,decisionNumber,maxK,maxAlt,description) ::= <<
{
    // <fileName>:<description>

    ANTLR3_UINT32 alt<decisionNumber>;

    alt<decisionNumber>=<maxAlt>;

    <decls>
    <@predecision()>
    <decision>
    <@postdecision()>
    switch (alt<decisionNumber>)
    {
    <alts:{ a | <altSwitchCase(i,a)> }>
    }
}
>>

ruleBlockSingleAlt(alts,decls,decision,enclosingBlockLevel,blockLevel,decisionNumber,description) ::= <<

```

```

// <fileName>:<description>
<decls>
<@prealt()>
<alts>
<@postalt()>
>>

/** A special case of a (...) subrule with a single alternative */
blockSingleAlt(alts,decls,decision,enclosingBlockLevel,blockLevel,decisionNumber,description) ::= <<
// <fileName>:<description>
<decls>
<@prealt()>
<alts>
<@postalt()>
>>

/** A (..)+ block with 1 or more alternatives */
positiveClosureBlock(alts,decls,decision,enclosingBlockLevel,blockLevel,decisionNumber,maxK,maxAlt,descriptio
n) ::= <<
// <fileName>:<description>
{
  int cnt<decisionNumber>=0;
  <decls>
  <@preloop()>

  for (;;)
  {
    int alt<decisionNumber>=<maxAlt>;
    <@predecision()>
    <decision>
    <@postdecision()>
    switch (alt<decisionNumber>)
    {
      <alts:{a | <altSwitchCase(i,a)>}>
      default:

      if ( cnt<decisionNumber> >= 1 )
      {
        goto loop<decisionNumber>;
      }
      <ruleBacktrackFailure()>
      <earlyExitEx()>
      <@earlyExitException()>
      goto rule<ruleDescriptor.name>Ex;
    }
    cnt<decisionNumber>++;
  }
  loop<decisionNumber>; /* Jump to here if this rule does not match */
}

```

```

    <@postloop()>
}
>>

earlyExitEx() ::= <<
/* mismatchedSetEx()
*/
CONSTRUCTEX();
EXCEPTION->type = ANTLR3_EARLY_EXIT_EXCEPTION;
EXCEPTION->name = (void *)ANTLR3_EARLY_EXIT_NAME;
<\n>
>>
positiveClosureBlockSingleAlt ::= positiveClosureBlock

/** A (..)* block with 1 or more alternatives */
closureBlock(alts,decls,decision,enclosingBlockLevel,blockLevel,decisionNumber,maxK,maxAlt,description) ::=
<<

// <fileName>:<description>
<decls>

<@preloop()>
for (;;)
{
    int alt<decisionNumber>=<maxAlt>;
    <@predecision()>
    <decision>
    <@postdecision()>
    switch (alt<decisionNumber>)
    {
    <alts:{ a | <altSwitchCase(i,a)> }>
    default:
        goto loop<decisionNumber>; /* break out of the loop */
        break;
    }
}
loop<decisionNumber>; /* Jump out to here if this rule does not match */
<@postloop()>
>>

closureBlockSingleAlt ::= closureBlock

/** Optional blocks (x)? are translated to (x|) by antlr before code generation
* so we can just use the normal block template
*/
optionalBlock ::= block

optionalBlockSingleAlt ::= block

```

```

/** A case in a switch that jumps to an alternative given the alternative
 * number. A DFA predicts the alternative and then a simple switch
 * does the jump to the code that actually matches that alternative.
 */
altSwitchCase(altNum,alt) ::= <<
case <altNum>:
  <@prealt()>
  <alt>
  break;<\n>
>>

/** An alternative is just a list of elements; at outermost level */
alt(elements,altNum,description,autoAST,outerAlt,treeLevel,rew) ::= <<
// <fileName>:<description>
{
  <@declarations()>
  <@initializations()>
  <elements:element()>
  <rew>
  <@cleanup()>
}
>>

// E L E M E N T S
/** What to emit when there is no rewrite. For auto build
 * mode, does nothing.
 */
noRewrite(rewriteBlockLevel, treeLevel) ::= ""

/** Dump the elements one per line */
element(e) ::= <<
<@prematch()>
<e.el><\n>
>>

/** match a token optionally with a label in front */
tokenRef(token,label,elementIndex,terminalOptions) ::= <<
<if(label)><label> = (<labelType>)<endif> MATCHT(<token>,
&FOLLOW_<token>_in_<ruleName><elementIndex>);
<checkRuleBacktrackFailure()>
>>

/** ids+=ID */
tokenRefAndListLabel(token,label,elementIndex,terminalOptions) ::= <<
<tokenRef(...)>
<listLabel(elem=label,...)>
>>

```



```

listLabel(label,elem) ::= <<
if (list_<label> == NULL)
{
    list_<label>=ctx->vectors->newVector(ctx->vectors);
}
list_<label>->add(list_<label>, <elem>, NULL);
>>

/** match a character */
charRef(char,label) ::= <<
<if(label)>
<label> = LA(1);<\n>
<endif>
MATCHC(<char>);
<checkRuleBacktrackFailure()>
>>

/** match a character range */
charRangeRef(a,b,label) ::= <<
<if(label)>
<label> = LA(1);<\n>
<endif>
MATCHRANGE(<a>, <b>);
<checkRuleBacktrackFailure()>
>>

/** For now, sets are interval tests and must be tested inline */
matchSet(s,label,elementIndex,terminalOptions,postmatchCode="") ::= <<
<if(label)>
<if(LEXER)>
<label>= LA(1);<\n>
<else>
<label>=(<labelType>)LT(1);<\n>
<endif>
<endif>
if ( <s> )
{
    CONSUME();
    <postmatchCode>
<if(!LEXER)>
    PERRORRECOVERY=ANTLR3_FALSE;
<endif>
    <if(backtracking)>FAILEDFLAG=ANTLR3_FALSE;<\n><endif>
}
else
{

```

```

    <ruleBacktrackFailure()>
    <mismatchedSetEx()>
    <@mismatchedSetException()>
<if(LEXER)>
    LRECOVER();
<else>
    RECOVERFROMMISMATCHEDSET(&FOLLOW_set_in_<ruleName><elementIndex>);
<endif>
    goto rule<ruleDescriptor.name>Ex;
}<\n>
>>

```

```

mismatchedSetEx() ::= <<
CONSTRUCTEX();
EXCEPTION->type      = ANTLR3_MISMATCHED_SET_EXCEPTION;
EXCEPTION->name      = (void *)ANTLR3_MISMATCHED_SET_NAME;
<if(PARSER)>
EXCEPTION->expectingSet = &FOLLOW_set_in_<ruleName><elementIndex>;
<endif>
>>

```

```

matchRuleBlockSet ::= matchSet

```

```

matchSetAndListLabel(s,label,elementIndex,postmatchCode) ::= <<
<matchSet(...)>
<listLabel(elem=label,...)>
>>

```

```

/** Match a string literal */
lexerStringRef(string,label,elementIndex) ::= <<
<if(label)>
<label>Start = GETCHARINDEX();
MATCHS(<string>);
<checkRuleBacktrackFailure()>
<label> = LEXSTATE->tokFactory->newToken(LEXSTATE->tokFactory);
<label>->setType(<label>, ANTLR3_TOKEN_INVALID);
<label>->setStartIndex(<label>, <label>Start);
<label>->setStopIndex(<label>, GETCHARINDEX()-1);
<label>->input = INPUT->tstream->istream;
<else>
MATCHS(<string>);
<checkRuleBacktrackFailure()><\n>
<endif>
>>

```

```

wildcard(token,label,elementIndex,terminalOptions) ::= <<
<if(label)>
<label>=(<labelType>)LT(1);<\n>

```

```

<endif>
MATCHANYT();
<checkRuleBacktrackFailure()>
>>

wildcardAndListLabel(token,label,elementIndex,terminalOptions) ::= <<
<wildcard(...)>
<listLabel(elem=label,...)>
>>

/** Match . wildcard in lexer */
wildcardChar(label, elementIndex) ::= <<
<if(label)>
<label> = LA(1);<\n>
<endif>
MATCHANY();
<checkRuleBacktrackFailure()>
>>

wildcardCharListLabel(label, elementIndex) ::= <<
<wildcardChar(...)>
<listLabel(elem=label,...)>
>>

/** Match a rule reference by invoking it possibly with arguments
 * and a return value or values. The 'rule' argument was the
 * target rule name, but now is type Rule, whose toString is
 * same: the rule name. Now though you can access full rule
 * descriptor stuff.
 */
ruleRef(rule,label,elementIndex,args,scope) ::= <<
FOLLOWPUSH(FOLLOW_<rule.name>_in_<ruleName><elementIndex>);
<if(label)><label>=<endif><if(scope)>ctx-><scope:delegateName()-><endif><rule.name>(ctx<if(scope)->
-><scope:delegateName()-><endif><if(args)>, <args; separator=","><endif>);<\n>
FOLLOWPOP();
<checkRuleBacktrackFailure()>
>>

/** ids+=1 */
ruleRefAndListLabel(rule,label,elementIndex,args,scope) ::= <<
<ruleRef(...)>
<listLabel(elem=label,...)>
>>

/** A lexer rule reference
 * The 'rule' argument was the target rule name, but now
 * is type Rule, whose toString is same: the rule name.
 * Now though you can access full rule descriptor stuff.

```

```

*/
lexerRuleRef(rule,label,args,elementIndex,scope) ::= <<
/* <description> */
<if(label)>
{
    ANTLR3_MARKER <label>Start<elementIndex> = GETCHARINDEX();
    <if(scope)>ctx-><scope:delegateName()-><endif>m<rule.name>(ctx<if(scope)>-
><scope:delegateName()-><endif> <if(args)>, <endif><args; separator=", ">;
    <checkRuleBacktrackFailure()->
    <label> = LEXSTATE->tokFactory->newToken(LEXSTATE->tokFactory);
    <label>->setType(<label>, ANTLR3_TOKEN_INVALID);
    <label>->setStartIndex(<label>, <label>Start<elementIndex>);
    <label>->setStopIndex(<label>, GETCHARINDEX()-1);
    <label>->input = INPUT;
}
<else>
<if(scope)>ctx-><scope:delegateName()-><endif>m<rule.name>(ctx<if(scope)>-
><scope:delegateName()-><endif> <if(args)>, <endif><args; separator=", ">;
<checkRuleBacktrackFailure()->
<endif>
>>

/** i+=INT in lexer */
lexerRuleRefAndListLabel(rule,label,args,elementIndex,scope) ::= <<
<lexerRuleRef(...)>
<listLabel(elem=label,...)>
>>

/** EOF in the lexer */
lexerMatchEOF(label,elementIndex) ::= <<
<if(label)>
{
    ANTLR3_UINT32 <label>Start<elementIndex>;
    <labelType> <label>;
    <label>Start<elementIndex> = GETCHARINDEX();
    MATCHC(ANTLR3_CHARSTREAM_EOF);
    <checkRuleBacktrackFailure()->
    <label> = LEXSTATE->tokFactory->newToken(LEXSTATE->tokFactory);
    <label>->setType(<label>, ANTLR3_TOKEN_EOF);
    <label>->setStartIndex(<label>, <label>Start<elementIndex>);
    <label>->setStopIndex(<label>, GETCHARINDEX()-1);
    <label>->input = INPUT->tnstream->istream;
}
<else>
    MATCHC(ANTLR3_CHARSTREAM_EOF);
    <checkRuleBacktrackFailure()->
    <endif>
>>

```

```

// used for left-recursive rules
recRuleDefArg()          ::= "int <recRuleArg(>"
recRuleArg()            ::= "_p"
recRuleAltPredicate(ruleName,opPrec) ::= "<recRuleArg(> |<= <opPrec>"
recRuleSetResultAction() ::= "root_0=$<ruleName>_primary.tree;"
recRuleSetReturnAction(src,name)    ::= "$<name>=$<src>.<name>;"

/** match ^(root children) in tree parser */
tree(root, actionsAfterRoot, children, nullableChildList, enclosingTreeLevel, treeLevel) ::= <<
<root:element(>
<actionsAfterRoot:element(>
<if(nullableChildList)>
if ( LA(1)==ANTLR3_TOKEN_DOWN ) {
    MATCHT(ANTLR3_TOKEN_DOWN, NULL);
    <checkRuleBacktrackFailure(>
    <children:element(>
    MATCHT(ANTLR3_TOKEN_UP, NULL);
    <checkRuleBacktrackFailure(>
}
<else>
MATCHT(ANTLR3_TOKEN_DOWN, NULL);
<checkRuleBacktrackFailure(>
<children:element(>
MATCHT(ANTLR3_TOKEN_UP, NULL);
<checkRuleBacktrackFailure(>
<endif>
>>

/** Every predicate is used as a validating predicate (even when it is
* also hoisted into a prediction expression).
*/
validateSemanticPredicate(pred,description) ::= <<
if ( !(<evalPredicate(...)> )
{
    <ruleBacktrackFailure(>
    <newFPE(...)>
}
>>

newFPE() ::= <<
    CONSTRUCTEX();
    EXCEPTION->type      = ANTLR3_FAILED_PREDICATE_EXCEPTION;
    EXCEPTION->message   = (void *)"<description>";
    EXCEPTION->ruleName = (void *)"<ruleName>";
    <\n>
>>

```

```

// F i x e d D F A (if-then-else)

dfaState(k,edges,eotPredictsAlt,description,stateNumber,semPredState) ::= <<

{
  int LA<decisionNumber>_<stateNumber> = LA(<k>);
  <edges; separator="\nelse ">
  else
  {
<if(eotPredictsAlt)>
    alt<decisionNumber>=<eotPredictsAlt>;
<else>
    <ruleBacktrackFailure()>

    <newNVException()>
    goto rule<ruleDescriptor.name>Ex;

<endif>
  }
}
>>

newNVException() ::= <<
CONSTRUCTEX();
EXCEPTION->type      = ANTLR3_NO_VIABLE_ALT_EXCEPTION;
EXCEPTION->message   = (void *)"<description>";
EXCEPTION->decisionNum = <decisionNumber>;
EXCEPTION->state     = <stateNumber>;
<@noViableAltException()>
<\n>
>>

/** Same as a normal DFA state except that we don't examine lookahead
 * for the bypass alternative. It delays error detection but this
 * is faster, smaller, and more what people expect. For (X)? people
 * expect "if ( LA(1)==X ) match(X);" and that's it.
 */
dfaOptionalBlockState(k,edges,eotPredictsAlt,description,stateNumber,semPredState) ::= <<
{
  int LA<decisionNumber>_<stateNumber> = LA(<k>);
  <edges; separator="\nelse ">
}
>>

/** A DFA state that is actually the loopback decision of a closure
 * loop. If end-of-token (EOT) predicts any of the targets then it
 * should act like a default clause (i.e., no error can be generated).
 * This is used only in the lexer so that for ('a')* on the end of a rule

```

```

* anything other than 'a' predicts exiting.
*/

dfaLoopbackStateDecls() ::= <<
ANTLR3_UINT32 LA<decisionNumber>_<stateNumber>;
>>

dfaLoopbackState(k,edges,eotPredictsAlt,description,stateNumber,semPredState) ::= <<
{
/* dfaLoopbackState(k,edges,eotPredictsAlt,description,stateNumber,semPredState)
*/
int LA<decisionNumber>_<stateNumber> = LA(<k>);
<edges; separator="\nelse "><<\n>
<if(eotPredictsAlt)>
<if(!edges)>
alt<decisionNumber>=<eotPredictsAlt>; <! if no edges, don't gen ELSE !>
<else>
else
{
alt<decisionNumber>=<eotPredictsAlt>;
}<\n>
<endif>
<endif>
}
>>

/** An accept state indicates a unique alternative has been predicted */
dfaAcceptState(alt) ::= "alt<decisionNumber>=<alt>";

/** A simple edge with an expression. If the expression is satisfied,
* enter to the target state. To handle gated productions, we may
* have to evaluate some predicates for this edge.
*/
dfaEdge(labelExpr, targetState, predicates) ::= <<
if ( <if(predicates)>(<predicates>) && <endif>(<labelExpr>))
{
<targetState>
}
>>

// F i x e d D F A (switch case)

/** A DFA state where a SWITCH may be generated. The code generator
* decides if this is possible: CodeGenerator.canGenerateSwitch().
*/
dfaStateSwitch(k,edges,eotPredictsAlt,description,stateNumber,semPredState) ::= <<
switch ( LA(<k>) )
{
<edges; separator="\n">

```

```

default:
<if(eotPredictsAlt)>
  alt<decisionNumber>=<eotPredictsAlt>;
<else>
  <ruleBacktrackFailure()>
  <newNVException()>
  goto rule<ruleDescriptor.name>Ex;<\n>
<endif>
}<\n>
>>

dfaOptionalBlockStateSwitch(k,edges,eotPredictsAlt,description,stateNumber,semPredState) ::= <<
switch ( LA(<k> )
{
  <edges; separator="\n">
}<\n>
>>

dfaLoopbackStateSwitch(k, edges,eotPredictsAlt,description,stateNumber,semPredState) ::= <<
switch ( LA(<k> )
{
<edges; separator="\n"><\n>
<if(eotPredictsAlt)>
default:
  alt<decisionNumber>=<eotPredictsAlt>;
  break;<\n>
<endif>
}<\n>
>>

dfaEdgeSwitch(labels, targetState) ::= <<
<labels:{it |case <it>:}; separator="\n">
{
  <targetState>
}
  break;
>>

// C y c l i c D F A

/** The code to initiate execution of a cyclic DFA; this is used
 * in the rule to predict an alt just like the fixed DFA case.
 * The <name> attribute is inherited via the parser, lexer, ...
 */
dfaDecision(decisionNumber,description) ::= <<
alt<decisionNumber> = cdfa<decisionNumber>.predict(ctx, RECOGNIZER, ISTREAM,
&cdfa<decisionNumber>);

```



```

<checkRuleBacktrackFailure()>
>>

/* Dump DFA tables as static initialized arrays of shorts(16 bits)/characters(8 bits)
 * which are then used to statically initialize the dfa structure, which means that there
 * is no runtime initialization whatsoever, other than anything the C compiler might
 * need to generate. In general the C compiler will lay out memory such that there is no
 * runtime code required.
 */
cyclicDFA(dfa) ::= <<
/** Static dfa state tables for Cyclic dfa:
 * <dfa.description>
 */
static const ANTLR3_INT32 dfa<dfa.decisionNumber>_eot[<dfa.numberofStates>] =
{
<dfa.eot; wrap="\n", separator=", ", null="-1">
};
static const ANTLR3_INT32 dfa<dfa.decisionNumber>_eof[<dfa.numberofStates>] =
{
<dfa.eof; wrap="\n", separator=", ", null="-1">
};
static const ANTLR3_INT32 dfa<dfa.decisionNumber>_min[<dfa.numberofStates>] =
{
<dfa.min; wrap="\n", separator=", ", null="-1">
};
static const ANTLR3_INT32 dfa<dfa.decisionNumber>_max[<dfa.numberofStates>] =
{
<dfa.max; wrap="\n", separator=", ", null="-1">
};
static const ANTLR3_INT32 dfa<dfa.decisionNumber>_accept[<dfa.numberofStates>] =
{
<dfa.accept; wrap="\n", separator=", ", null="-1">
};
static const ANTLR3_INT32 dfa<dfa.decisionNumber>_special[<dfa.numberofStates>] =
{
<dfa.special; wrap="\n", separator=", ", null="-1">
};

/** Used when there is no transition table entry for a particular state */
#define dfa<dfa.decisionNumber>_T_empty NULL

<dfa.edgeTransitionClassMap.keys:{ table |
static const ANTLR3_INT32 dfa<dfa.decisionNumber>_T<i0>[] =
{
<table; separator=", ", wrap="\n", null="-1">
\};}; null = "">

/* Transition tables are a table of sub tables, with some tables

```

```

* reused for efficiency.
*/
static const ANTLR3_INT32 * const dfa<dfa.decisionNumber>_transitions[] =
{
  <dfa.transitionEdgeTables:{ xref[dfa<dfa.decisionNumber>_T<xref>]; separator=", ", wrap="\n", null="_empty">
};

<if(dfa.specialStateSTs)>
static ANTLR3_INT32 dfa<dfa.decisionNumber>_sst(p<name> ctx, pANTLR3_BASE_RECOGNIZER recognizer,
pANTLR3_INT_STREAM is, pANTLR3_CYCLIC_DFA dfa, ANTLR3_INT32 s)
{
  ANTLR3_INT32  _s;

  _s = s;
  switch (s)
  {
    <dfa.specialStateSTs:{ state |
    case <i0>:

    <state> }; separator="\n">
  }
  <if(backtracking)>
    if (BACKTRACKING > 0)
    {
      FAILEDFLAG = ANTLR3_TRUE;
      return -1;
    }
  <endif>

  CONSTRUCTEX();
  EXCEPTION->type = ANTLR3_NO_VIABLE_ALT_EXCEPTION;
  EXCEPTION->message = (void *)"<dfa.description>";
  EXCEPTION->decisionNum = <dfa.decisionNumber>;
  EXCEPTION->state = _s;
  <@noViableAltException()>
  return -1;
}
<endif>

<@errorMethod()>

/* Declare tracking structure for Cyclic DFA <dfa.decisionNumber>
*/
static
ANTLR3_CYCLIC_DFA cdfa<dfa.decisionNumber>
= {
  <dfa.decisionNumber>, /* Decision number of this dfa */
  /* Which decision this represents: */

```

```

    (const pANTLR3_UCHAR)"<dfa.description>",
<if(dfa.specialStateSTs)>
    (CDFA_SPECIAL_FUNC) dfa<dfa.decisionNumber>_sst,
<else>
    (CDFA_SPECIAL_FUNC) antlr3dfaspecialStateTransition, /* Default special state transition function */
<endif>

    antlr3dfaspecialTransition, /* DFA specialTransition is currently just a default function in the runtime */
    antlr3dfapredict, /* DFA simulator function is in the runtime */
    dfa<dfa.decisionNumber>_eot, /* EOT table */
    dfa<dfa.decisionNumber>_eof, /* EOF table */
    dfa<dfa.decisionNumber>_min, /* Minimum tokens for each state */
    dfa<dfa.decisionNumber>_max, /* Maximum tokens for each state */
    dfa<dfa.decisionNumber>_accept, /* Accept table */
    dfa<dfa.decisionNumber>_special, /* Special transition states */
    dfa<dfa.decisionNumber>_transitions /* Table of transition tables */

};
/* End of Cyclic DFA <dfa.decisionNumber>
* -----
*/
>>

/** A state in a cyclic DFA; it's a special state and part of a big switch on
* state.
*/
cyclicDFAState(decisionNumber,stateNumber,edges,needErrorClause,semPredState) ::= <<
{
    ANTLR3_UINT32 LA<decisionNumber>_<stateNumber>;<\n>
    ANTLR3_MARKER index<decisionNumber>_<stateNumber>;<\n>

    LA<decisionNumber>_<stateNumber> = LA(1);<\n>
    <if(semPredState)> <! get next lookahead symbol to test edges, then rewind !>
    index<decisionNumber>_<stateNumber> = INDEX();<\n>
    REWINDLAST();<\n>
    <endif>
    s = -1;
    <edges; separator="\nelse ">
    <if(semPredState)> <! return input cursor to state before we rewound !>
    SEEK(index<decisionNumber>_<stateNumber>);<\n>
    <endif>
    if ( s>=0 )
    {
    return s;
    }
}
break;
>>

```

```

/** Just like a fixed DFA edge, test the lookahead and indicate what
 * state to jump to next if successful.
 */
cyclicDFAEdge(labelExpr, targetStateNumber, edgeNumber, predicates) ::= <<
if ( <if(predicates)><predicates> ) && <endif><labelExpr> )
{
    s = <targetStateNumber>;
}<\n>
>>

/** An edge pointing at end-of-token; essentially matches any char;
 * always jump to the target.
 */
eotDFAEdge(targetStateNumber,edgeNumber, predicates) ::= <<
s = <targetStateNumber>;<\n>
>>

// D F A E X P R E S S I O N S

andPredicates(left,right) ::= "( (<left> ) && (<right> ) )"

orPredicates(operands) ::= "(<operands:{o|(<o>)}; separator=\"||\">)"

notPredicate(pred) ::= "!(<evalPredicate(pred,{})>)"

evalPredicate(pred,description) ::= "<pred>"

evalSynPredicate(pred,description) ::= "<pred>(ctx)"

lookaheadTest(atom,k,atomAsInt) ::= "LA<decisionNumber>_<stateNumber> == <atom>"

/** Sometimes a lookahead test cannot assume that LA(k) is in a temp variable
 * somewhere. Must ask for the lookahead directly.
 */
isolatedLookaheadTest(atom,k,atomAsInt) ::= "LA(<k>) == <atom>"

lookaheadRangeTest(lower,upper,k,rangeNumber,lowerAsInt,upperAsInt) ::= <%
((LA<decisionNumber>_<stateNumber> >= <lower>) && (LA<decisionNumber>_<stateNumber> \<= <upper>))
%>

isolatedLookaheadRangeTest(lower,upper,k,rangeNumber,lowerAsInt,upperAsInt) ::= "((LA(<k>) >= <lower>) &&
(LA(<k>) \<= <upper>))"

setTest(ranges) ::= "<ranges; separator=\" || \">"

// A T T R I B U T E S

```

```

makeScopeSet() ::= <<
/* makeScopeSet()
*/
/** Definition of the <scope.name> scope variable tracking
* structure. An instance of this structure is created by calling
* <name>_<scope.name>Push().
*/
typedef struct <scopeStruct(sname=scope.name,...)>_struct
{
    /** Function that the user may provide to be called when the
    * scope is destroyed (so you can free pANTLR3_HASH_TABLES and so on)
    *
    * \param POinter to an instance of this typedef/struct
    */
    void (ANTLR3_CDECL *free) (struct <scopeStruct(sname=scope.name,...)>_struct * frame);

    /* =====
    * Programmer defined variables...
    */
    <scope.attributes:{it |<it.decl>;}; separator="\n">

    /* End of programmer defined variables
    * =====
    */
}
<scopeStruct(sname=scope.name,...)>, * <scopeType(sname=scope.name,...)>;

>>

globalAttributeScopeDecl(scope) ::= <<
<if(scope.attributes)>
/* globalAttributeScopeDecl(scope)
*/
<makeScopeSet(...)>
<endif>
>>

ruleAttributeScopeDecl(scope) ::= <<
<if(scope.attributes)>
/* ruleAttributeScopeDecl(scope)
*/
<makeScopeSet(...)>
<endif>
>>

globalAttributeScopeFuncDecl(scope) ::=
<<

```

```

/* globalAttributeScopeFuncDecl(scope)
*/
<if(scope.attributes)>
/* -----
* Function declaration for creating a <name>_<scope.name> scope set
*/
static <scopeType(sname=scope.name,...)> <scopePushName(sname=scope.name,...)>(p<name> ctx);
static void ANTLR3_CDECL <scope.name>Free(<scopeType(sname=scope.name)> scope);
/* ----- */

<endif>
>>

globalAttributeScopeFuncMacro(scope) ::= <<
<if(scope.attributes)>
/* globalAttributeScopeFuncMacro(scope)
*/
/** Function for popping the top value from a <scopeStack(sname=scope.name)>
*/
void
<scopePopName(sname=scope.name,...)>(p<name> ctx)
{
// First see if the user defined a function they want to be called when a
// scope is popped/freed.
//
// If the user supplied the scope entries with a free function, then call it first
//
if (SCOPE_TOP(<scope.name>)->free != NULL)
{
SCOPE_TOP(<scope.name>)->free(SCOPE_TOP(<scope.name>));
}

// Now we decrement the scope's upper limit bound. We do not actually pop the scope as
// we want to reuse scope entries if we do continuous push and pops. Most scopes don't
// next too far so we don't want to keep freeing and allocating them
//
ctx-><scopeStack(sname=scope.name,...)>_limit--;
SCOPE_TOP(<scope.name>) = (<scopeType(sname=scope.name)>)(ctx-><scopeStack(sname=scope.name,...)>-
>get(ctx-><scopeStack(sname=scope.name,...)>, ctx-><scopeStack(sname=scope.name,...)>_limit - 1));
}
<endif>
>>

ruleAttributeScopeFuncDecl(scope) ::= <<
<if(scope.attributes)>
/* ruleAttributeScopeFuncDecl(scope)
*/
/* -----

```

```

* Function declarations for creating a <name>_<scope.name> scope set
*/
static <scopeType(sname=scope.name,...)> <scopePushName(sname=scope.name,...)>(p<name> ctx);
static void ANTLR3_CDECL <scope.name>Free(<scopeType(sname=scope.name)> scope);
/* ----- */

<endif>
>>

ruleAttributeScopeFuncMacro(scope) ::= <<
<if(scope.attributes)>
/* ruleAttributeScopeFuncMacro(scope)
*/
/** Function for popping the top value from a <scopeStack(sname=scope.name,...)>
*/
void
<scopePopName(sname=scope.name,...)>(p<name> ctx)
{
    // First see if the user defined a function they want to be called when a
    // scope is popped/freed.
    //
    // If the user supplied the scope entries with a free function, then call it first
    //
    if (SCOPE_TOP(<scope.name>)->free != NULL)
    {
        SCOPE_TOP(<scope.name>)->free(SCOPE_TOP(<scope.name>));
    }

    // Now we decrement the scope's upper limit bound. We do not actually pop the scope as
    // we want to reuse scope entries if we do continuous push and pops. Most scopes don't
    // next too far so we don't want to keep freeing and allocating them
    //
    ctx-><scopeStack(sname=scope.name,...)>_limit--;
    SCOPE_TOP(<scope.name>) = (<scopeType(sname=scope.name)>)(ctx-><scopeStack(sname=scope.name,...)>-
>get(ctx-><scopeStack(sname=scope.name,...)>, ctx-><scopeStack(sname=scope.name,...)>_limit - 1));
}

<endif>
>>

globalAttributeScopeDef(scope) ::=
<<
/* globalAttributeScopeDef(scope)
*/
<if(scope.attributes)>
/** Pointer to the <scope.name> stack for use by <scopePushName(sname=scope.name)>()
* and <scopePopName(sname=scope.name,...)>()
*/

```

```

pANTLR3_STACK <scopeStack(sname=scope.name)>;
ANTLR3_UINT32 <scopeStack(sname=scope.name)>_limit;
/** Pointer to the top of the stack for the global scope <scopeStack(sname=scope.name)>
*/
<scopeType(sname=scope.name,...)> (*<scopePushName(sname=scope.name,...)>)(struct <name>_Ctx_struct *
ctx);
<scopeType(sname=scope.name,...)> <scopeTopDecl(sname=scope.name,...)>;

<endif>
>>

ruleAttributeScopeDef(scope) ::= <<
<if(scope.attributes)>
/* ruleAttributeScopeDef(scope)
*/
/** Pointer to the <scope.name> stack for use by <scopePushName(sname=scope.name)>()
* and <scopePopName(sname=scope.name,...)>()
*/
pANTLR3_STACK <scopeStack(sname=scope.name,...)>;
ANTLR3_UINT32 <scopeStack(sname=scope.name,...)>_limit;
<scopeType(sname=scope.name,...)> (*<scopePushName(sname=scope.name,...)>)(struct <name>_Ctx_struct *
ctx);
<scopeType(sname=scope.name,...)> <scopeTopDecl(sname=scope.name,...)>;

<endif>
>>

globalAttributeScopeFuncs(scope) ::= <<
<if(scope.attributes)>
/* globalAttributeScopeFuncs(scope)
*/
<attributeFuncs(scope)>
<endif>
>>

ruleAttributeScopeFuncs(scope) ::= <<
<if(scope.attributes)>
/* ruleAttributeScopeFuncs(scope)
*/
<attributeFuncs(scope)>
<endif>
>>

globalAttributeScope(scope) ::= <<
<if(scope.attributes)>
/* globalAttributeScope(scope)
*/
ctx-><scopePushName(sname=scope.name,...)> = <scopePushName(sname=scope.name,...)>;

```



```

ctx-><scopeStack(sname=scope.name,...)> = antlr3StackNew(0);
ctx-><scopeStack(sname=scope.name,...)>_limit = 0;
<scopeTop(sname=scope.name,...)> = NULL;
<endif>
>>

ruleAttributeScope(scope) ::=
<<
<if(scope.attributes)>
/* ruleAttributeScope(scope)
*/
ctx-><scopePushName(sname=scope.name,...)> = <scopePushName(sname=scope.name,...)>;
ctx-><scopeStack(sname=scope.name,...)> = antlr3StackNew(0);
ctx-><scopeStack(sname=scope.name,...)>_limit = 0;
<scopeTop(sname=scope.name,...)> = NULL;
<endif>
>>
globalAttributeScopeFree(scope) ::= <<
<if(scope.attributes)>
/* globalAttributeScope(scope)
*/
ctx-><scopeStack(sname=scope.name,...)>->free(ctx-><scopeStack(sname=scope.name,...)>);
<endif>
>>

ruleAttributeScopeFree(scope) ::=
<<
<if(scope.attributes)>
/* ruleAttributeScope(scope)
*/
ctx-><scopeStack(sname=scope.name,...)>->free(ctx-><scopeStack(sname=scope.name,...)>);
<endif>
>>

scopeTopDecl(sname) ::= <<
p<name>_<sname>Top
>>

scopeTop(sname) ::= <<
ctx-><scopeTopDecl(sname=sname,...)>
>>

scopePop(sname) ::= <<
<scopePopName(sname=sname,...)>(ctx);
>>

scopePush(sname) ::= <<
p<name>_<sname>Push(ctx)

```

>>

```
scopePopName(sname) ::= <<
p<name>_<sname>Pop
>>
```

```
scopePushName(sname) ::= <<
p<name>_<sname>Push
>>
```

```
scopeType(sname) ::= <<
p<name>_<sname>_SCOPE
>>
```

```
scopeStruct(sname) ::= <<
<name>_<sname>_SCOPE
>>
```

```
scopeStack(sname) ::= <<
p<name>_<sname>Stack
>>
```

```
attributeFuncs(scope) ::= <<
<if(scope.attributes)>
/* attributeFuncs(scope)
*/
```

```
static void ANTLR3_CDECL <scope.name>Free(<scopeType(sname=scope.name)> scope)
{
    ANTLR3_FREE(scope);
}
```

```
/** \brief Allocate initial memory for a <name> <scope.name> scope variable stack entry and
 *     add it to the top of the stack.
 *
 * \remark
 * By default the structure is freed with ANTLR_FREE(), but you can use the
 * the \@init action to install a pointer to a custom free() routine by
 * adding the code:
 * \code
 * <scopeTop(sname=scope.name)>->free = myroutine;
 * \endcode
 *
 * With lots of comments of course! The routine should be declared in
 * \@members { } as:
 * \code
 * void ANTLR3_CDECL myfunc( <scopeType(sname=scope.name)> ptr).
 * \endcode
```

```

*
* It should perform any custom freeing stuff that you need (call ANTLR_FREE3, not free())
* NB: It should not free the pointer it is given, which is the scope stack entry itself
* and will be freed by the function that calls your custom free routine.
*
*/
static <scopeType(sname=scope.name)>
<scopePushName(sname=scope.name)>(p<name> ctx)
{
    /* Pointer used to create a new set of attributes
    */
    <scopeType(sname=scope.name)>    newAttributes;

    /* Allocate the memory for a new structure if we need one.
    */
    if (ctx-><scopeStack(sname=scope.name)>->size(ctx-><scopeStack(sname=scope.name)>) > ctx-
    ><scopeStack(sname=scope.name)>_limit)
    {
        // The current limit value was less than the number of scopes available on the stack so
        // we can just reuse one. Our limit tracks the stack count, so the index of the entry we want
        // is one less than that, or conveniently, the current value of limit.
        //
        newAttributes = (<scopeType(sname=scope.name)>)ctx-><scopeStack(sname=scope.name)>->get(ctx-
    ><scopeStack(sname=scope.name)>, ctx-><scopeStack(sname=scope.name)>_limit);
    }
    else
    {
        // Need a new allocation
        //
        newAttributes = (<scopeType(sname=scope.name)>)
    ANTLR3_MALLOC(sizeof(<scopeStruct(sname=scope.name)>));
        if (newAttributes != NULL)
        {
            /* Standard ANTLR3 library implementation
            */
            ctx-><scopeStack(sname=scope.name)>->push(ctx-><scopeStack(sname=scope.name)>, newAttributes,
    (void (*)(void *))<scope.name>Free);
        }
    }

    // Blank out any previous free pointer, the user might or might install a new one.
    //
    newAttributes->free = NULL;

    // Indicate the position in the available stack that the current level is at
    //
    ctx-><scopeStack(sname=scope.name)>_limit++;
}

```

```

/* Return value is the pointer to the new entry, which may be used locally
 * without de-referencing via the context.
 */
return newAttributes;
}<\n>

<endif>
>>
returnStructName(r) ::= "<r.name>_return"

returnType() ::= <%
<if(!ruleDescriptor.isSynPred)>
<if(ruleDescriptor.hasMultipleReturnValues)>
<ruleDescriptor.grammar.recognizerName>_<ruleDescriptor:returnStructName()>
<else>
<if(ruleDescriptor.hasSingleReturnValue)>
<ruleDescriptor.singleValueReturnType>
<else>
void
<endif>
<endif>
<else>
ANTLR3_BOOLEAN
<endif>
%>

/** Generate the C type associated with a single or multiple return
 * value(s).
 */
ruleLabelType(referencedRule) ::= <%
<if(referencedRule.hasMultipleReturnValues)>
<referencedRule.grammar.recognizerName>_<referencedRule.name>_return
<else>
<if(referencedRule.hasSingleReturnValue)>
<referencedRule.singleValueReturnType>
<else>
void
<endif>
<endif>
%>

delegateName(d) ::= <<
<if(d.label)><d.label><else>g<it.name><endif>
>>

/** Using a type to init value map, try to init a type; if not in table
 * must be an object, default value is "0".
 */

```

```

initValue(typeName) ::= <<
= <<TypeInitMap.(typeName)>
>>

/** Define a rule label */
ruleLabelDef(label) ::= <<
<ruleLabelType(referencedRule=label.referencedRule)> <label.label.text>;
#undef RETURN_TYPE_<label.label.text>
#define RETURN_TYPE_<label.label.text> <ruleLabelType(referencedRule=label.referencedRule)><\n>
>>
/** Rule label default value */
ruleLabelInitVal(label) ::= <<
>>

ASTLabelType() ::=
"<if(recognizer.ASTLabelType)><recognizer.ASTLabelType><else>pANTLR3_BASE_TREE<endif>"

/** Define a return struct for a rule if the code needs to access its
 * start/stop tokens, tree stuff, attributes, ... Leave a hole for
 * subgroups to stick in members.
 */
returnScope(scope) ::= <<
<if(!ruleDescriptor.isSynPred)>
<if(ruleDescriptor.hasMultipleReturnValues)>
typedef struct <ruleDescriptor.grammar.recognizerName>_<ruleDescriptor:returnStructName()>_struct
{
<if(!TREE_PARSER)>
/** Generic return elements for ANTLR3 rules that are not in tree parsers or returning trees
 */
pANTLR3_COMMON_TOKEN start;
pANTLR3_COMMON_TOKEN stop;
<else>
<recognizer.ASTLabelType> start;
<recognizer.ASTLabelType> stop;
<endif>
<@ruleReturnMembers()>
<ruleDescriptor.returnScope.attributes:{it |<it.type> <it.name>;}; separator="\n">
}
<ruleDescriptor.grammar.recognizerName>_<ruleDescriptor:returnStructName()>;<\n><\n>
<endif>
<endif>
>>

parameterScope(scope) ::= <<
<scope.attributes:{it |<it.decl>}; separator=", ">
>>

parameterAttributeRef(attr) ::= "<attr.name>"

```

```

parameterSetAttributeRef(attr,expr) ::= "<attr.name>=<expr>";

/** Note that the scopeAttributeRef does not have access to the
 * grammar name directly
 */
scopeAttributeRef(scope,attr,index,negIndex) ::= <%
<if(negIndex)>
((SCOPE_TYPE(<scope>))(ctx->SCOPE_STACK(<scope>)->get( ctx->SCOPE_STACK(<scope>), ctx-
>SCOPE_STACK(<scope>)->size(ctx->SCOPE_STACK(<scope>)) - <negIndex> - 1 ))-><attr.name>
<else>
<if(index)>
((SCOPE_TYPE(<scope>))(ctx->SCOPE_STACK(<scope>)->get(ctx->SCOPE_STACK(<scope>),
(ANTLR3_UINT32)<index> ) ))-><attr.name>
<else>
(SCOPE_TOP(<scope>))-><attr.name>
<endif>
<endif>
%>

scopeSetAttributeRef(scope,attr,expr,index,negIndex) ::= <%
<if(negIndex)>
((SCOPE_TYPE(<scope>))(ctx->SCOPE_STACK(<scope>)->get( ctx->SCOPE_STACK(<scope>), ctx-
>SCOPE_STACK(<scope>)->size(ctx->SCOPE_STACK(<scope>)) - <negIndex> - 1 ))-><attr.name> = <expr>;
<else>
<if(index)>
((SCOPE_TYPE(<scope>))(ctx->SCOPE_STACK(<scope>)->get(ctx->SCOPE_STACK(<scope>),
(ANTLR3_UINT32)<index> ) ))-><attr.name> = <expr>;
<else>
(SCOPE_TOP(<scope>))-><attr.name>=<expr>;
<endif>
<endif>
%>

/** $x is either global scope or x is rule with dynamic scope; refers
 * to stack itself not top of stack. This is useful for predicates
 * like {$function.size(>0 && $function::name.equals("foo"))?
 */
isolatedDynamicScopeRef(scope) ::= "ctx->SCOPE_STACK(<scope>)"

/** reference an attribute of rule; might only have single return value */
ruleLabelRef(referencedRule,scope,attr) ::= <<
<if(referencedRule.hasMultipleReturnValues)>
<scope>.<attr.name>
<else>
<scope>
<endif>
>>

```

```

returnAttributeRef(ruleDescriptor,attr) ::= <<
<if(ruleDescriptor.hasMultipleReturnValues)>
retval.<attr.name>
<else>
<attr.name>
<endif>
>>

returnSetAttributeRef(ruleDescriptor,attr,expr) ::= <<
<if(ruleDescriptor.hasMultipleReturnValues)>
retval.<attr.name>=<expr>;
<else>
<attr.name>=<expr>;
<endif>
>>

/** How to translate $tokenLabel */
tokenLabelRef(label) ::= "<label>"

/** ids+=ID {$ids} or e+=expr {$e} */
listLabelRef(label) ::= "list_<label>"

// not sure the next are the right approach
//
tokenLabelPropertyRef_text(scope,attr) ::= "(<scope>->getText(<scope>))"
tokenLabelPropertyRef_type(scope,attr) ::= "(<scope>->getType(<scope>))"
tokenLabelPropertyRef_line(scope,attr) ::= "(<scope>->getLine(<scope>))"
tokenLabelPropertyRef_pos(scope,attr) ::= "(<scope>->getCharPositionInLine(<scope>))"
tokenLabelPropertyRef_channel(scope,attr) ::= "(<scope>->getChannel(<scope>))"
tokenLabelPropertyRef_index(scope,attr) ::= "(<scope>->getTokenIndex(<scope>))"
tokenLabelPropertyRef_tree(scope,attr) ::= "(<scope>->tree)"
tokenLabelPropertyRef_int(scope,attr) ::= "(<scope>->getText(<scope>->toInt32(<scope>->getText(<scope>)))"

ruleLabelPropertyRef_start(scope,attr) ::= "<scope>.start"
ruleLabelPropertyRef_stop(scope,attr) ::= "<scope>.stop"
ruleLabelPropertyRef_tree(scope,attr) ::= "<scope>.tree"
ruleLabelPropertyRef_text(scope,attr) ::= <<
<if(TREE_PARSER)>
(STRSTREAM->toStringSS(STRSTREAM, <scope>.start, <scope>.start))
<else>
(STRSTREAM->toStringTT(STRSTREAM, <scope>.start, <scope>.stop))
<endif>
>>

ruleLabelPropertyRef_st(scope,attr) ::= "<scope>.st"

/** Isolated $RULE ref ok in lexer as it's a Token */

```

```

lexerRuleLabel(label) ::= "<label>"

lexerRuleLabelPropertyRef_type(scope,attr) ::= "(<scope>->getType(<scope>))"
lexerRuleLabelPropertyRef_line(scope,attr) ::= "(<scope>->getLine(<scope>))"
lexerRuleLabelPropertyRef_pos(scope,attr) ::= "(<scope>->getCharPositionInLine(<scope>))"
lexerRuleLabelPropertyRef_channel(scope,attr) ::= "(<scope>->getChannel(<scope>))"
lexerRuleLabelPropertyRef_index(scope,attr) ::= "(<scope>->getTokenIndex(<scope>))"
lexerRuleLabelPropertyRef_text(scope,attr) ::= "(<scope>->getText(<scope>))"

// Somebody may ref $template or $tree or $stop within a rule:
rulePropertyRef_start(scope,attr) ::= "retval.start"
rulePropertyRef_stop(scope,attr) ::= "retval.stop"
rulePropertyRef_tree(scope,attr) ::= "retval.tree"
rulePropertyRef_text(scope,attr) ::= <<
<if(TREE_PARSER)>
INPUT->toStringSS(INPUT, ADAPTOR->getTokenStartIndex(ADAPTOR, retval.start), ADAPTOR-
>getTokenStopIndex(ADAPTOR, retval.start))
<else>
STRSTREAM->toStringTT(STRSTREAM, retval.start, LT(-1))
<endif>
>>
rulePropertyRef_st(scope,attr) ::= "retval.st"

lexerRulePropertyRef_text(scope,attr) ::= "LEXER->getText(LEXER)"
lexerRulePropertyRef_type(scope,attr) ::= "_type"
lexerRulePropertyRef_line(scope,attr) ::= "LEXSTATE->tokenStartLine"
lexerRulePropertyRef_pos(scope,attr) ::= "LEXSTATE->tokenStartCharPositionInLine"
lexerRulePropertyRef_channel(scope,attr) ::= "LEXSTATE->channel"
lexerRulePropertyRef_start(scope,attr) ::= "LEXSTATE->tokenStartCharIndex"
lexerRulePropertyRef_stop(scope,attr) ::= "(LEXER->getCharIndex(LEXER)-1)"
lexerRulePropertyRef_index(scope,attr) ::= "-1" // undefined token index in lexer
lexerRulePropertyRef_int(scope,attr) ::= "LEXER->getText(LEXER)->toInt32(LEXER->getText(LEXER))"

// setting $st and $tree is allowed in local rule. everything else is flagged as error
ruleSetPropertyRef_tree(scope,attr,expr) ::= "retval.tree=<expr>;"
ruleSetPropertyRef_st(scope,attr,expr) ::= "retval.st=<expr>;"

/** How to deal with an @after for C targets. Because we cannot rely on
 * any garbage collection, after code is executed even in backtracking
 * mode. Must be documented clearly.
 */
execAfter(action) ::= <<
{
  <action>
}
>>

```



```

/** How to execute an action (when not backtracking) */
execAction(action) ::= <<
<if(backtracking)>
<if(actions.(actionScope).synpredgate)>
if ( <actions.(actionScope).synpredgate> )
{
    <action>
}
<else>
if ( BACKTRACKING == 0 )
{
    <action>
}
<endif>
<else>
{
    <action>
}
<endif>
>>

// M I S C (properties, etc...)

bitsetDeclare(name, words64) ::= <<

/** Bitset defining follow set for error recovery in rule state: <name> */
static ANTLR3_BITWORD <name>_bits[] = { <words64:{it |ANTLR3_UINT64_LIT(<it>)}; separator=", "> };
static ANTLR3_BITSET_LIST <name> = { <name>_bits, <length(words64)> };
>>

bitset(name, words64) ::= <<
antlr3BitsetSetAPI(&<name>);<\n>
>>

codeFileExtension() ::= ".c"

true_value() ::= "ANTLR3_TRUE"
false_value() ::= "ANTLR3_FALSE"

Found in path(s):
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/codegen/templates/C/C.stg
No license file was found, but licenses were detected in source scan.

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```

```

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*/
/** Template subgroup to add template rewrite output
* If debugging, then you'll also get STDbg.stg loaded.
*/

@outputFile.imports() ::= <<
<@super.imports()>
using Antlr3.ST;
using Antlr3.ST.Language;
>>

@genericParser.members() ::= <<
<@super.members()>
private StringTemplateGroup _templateGroup = new StringTemplateGroup("<name>Templates",
typeof(AngleBracketTemplateLexer) );

public StringTemplateGroup TemplateGroup
{
get { return _templateGroup; }
set { _templateGroup = value; }
}
>>

```

```

ruleReturnBaseType() ::= <%
Template<if(TREE_PARSER)>Tree<else>Parser<endif>RuleReturnScope\<StringTemplate, <labelType>>
%>

/** x+=rule when output=template */
ruleRefAndListLabel(rule,label,elementIndex,args,scope) ::= <<
<ruleRef(...)>
<listLabelElem(elem={<label>.Template},elemType="StringTemplate",...)>
>>

rewriteTemplate(alts) ::= <<

// TEMPLATE REWRITE
<if(backtracking)>
if (<actions.(actionScope).synpredgate>)
{
<alts:rewriteTemplateAlt(); separator="else ">
<if(rewriteMode)><replaceTextInLine()><endif>
}
<else>
<alts:rewriteTemplateAlt(); separator="else ">
<if(rewriteMode)><replaceTextInLine()><endif>
<endif>
>>

replaceTextInLine() ::= <<
<if(TREE_PARSER)>
((TokenRewriteStream)input.TokenStream).Replace(
input.TreeAdaptor.GetTokenStartIndex(retval.Start),
input.TreeAdaptor.GetTokenStopIndex(retval.Start),
retval.Template);
<else>
((TokenRewriteStream)input).Replace(
retval.Start.TokenIndex,
input.LT(-1).TokenIndex,
retval.Template);
<endif>
>>

rewriteTemplateAlt(it) ::= <<
// <it.description>
<if(it.pred)>
if (<it.pred>)
{
retval.Template = <it.alt>;
}<\n>
<else>

```

```

{
    retval.Template = <it.alt>;
}
<\n>
<endif>
>>

rewriteEmptyTemplate(alts) ::= <<
null;
>>

/** Invoke a template with a set of attribute name/value pairs.
 * Set the value of the rule's template *after* having set
 * the attributes because the rule's template might be used as
 * an attribute to build a bigger template; you get a self-embedded
 * template.
 */
rewriteExternalTemplate(name,args) ::= <%
TemplateGroup.GetInstanceOf("<name>"<optionalArguments(args)>)
%>

/** expr is a string expression that says what template to load */
rewriteIndirectTemplate(expr,args) ::= <%
TemplateGroup.GetInstanceOf(<expr>"<optionalArguments(args)>"
%>

/** Invoke an inline template with a set of attribute name/value pairs */
rewriteInlineTemplate(args, template) ::= <%
new StringTemplate(TemplateGroup, "<template>"<optionalArguments(args)>)
%>

optionalArguments(args) ::= <<
<if(args)>,
    new Dictionary<string, object>() { <args:optionalArgument(); separator=", "> }
<endif>
>>

optionalArgument(it) ::= <<
{"<it.name>", <it.value>}
>>

/** plain -> {foo} action */
rewriteAction(action) ::= <<
<action>
>>

/** An action has %st.attrName=expr; or % {st}.attrName=expr; */
actionSetAttribute(st,attrName,expr) ::= <<
(<st>).SetAttribute("<attrName>",<expr>);

```

>>

```
/** Translate %{stringExpr} */  
actionStringConstructor(stringExpr) ::= <<  
new StringTemplate(TemplateGroup,<stringExpr>)  
>>
```

Found in path(s):

```
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-  
jar/org/antlr/codegen/templates/CSharp3/ST.stg  
No license file was found, but licenses were detected in source scan.
```

```
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```
*/  
group AST;
```

```
@outputFile.imports() ::= <<  
<@super.imports()>  
>>
```

```
@genericParser.members() ::= <<  
<@super.members()>  
<parserMembers()>
```

```

>>

/** Add an adaptor property that knows how to build trees */
parserMembers() ::= <<
<!protected TreeAdaptor adaptor = new CommonTreeAdaptor();<\n!>
setTreeAdaptor: function(adaptor) {
    this.adaptor = adaptor;
    <grammar.directDelegates: {g|<g:delegateName()>.setTreeAdaptor(this.adaptor);}>
},
getTreeAdaptor: function() {
    return this.adaptor;
},
>>

@returnScope.ruleReturnMembers() ::= <<
getTree: function() { return this.tree; }
>>

/** Add a variable to track rule's return AST */
ruleDeclarations() ::= <<
<super.ruleDeclarations()>
var root_0 = null;<\n>
>>

ruleLabelDefs() ::= <<
<super.ruleLabelDefs()>
<ruleDescriptor.tokenLabels: { var <it.label.text>_tree=null; }; separator="\n">
<ruleDescriptor.tokenListLabels: { var <it.label.text>_tree=null; }; separator="\n">
<ruleDescriptor.allTokenRefsInAltsWithRewrites
    : { var stream_<it>=new org.antlr.runtime.tree.RewriteRuleTokenStream(this.adaptor,"token <it>"); };
separator="\n">
<ruleDescriptor.allRuleRefsInAltsWithRewrites
    : { var stream_<it>=new org.antlr.runtime.tree.RewriteRuleSubtreeStream(this.adaptor,"rule <it>"); };
separator="\n">
>>

/** When doing auto AST construction, we must define some variables;
 * These should be turned off if doing rewrites. This must be a "mode"
 * as a rule could have both rewrite and AST within the same alternative
 * block.
 */
@alt.declarations() ::= <<
<if(autoAST)>
<if(outerAlt)>
<if(!rewriteMode)>
root_0 = this.adaptor.nil();<\n>
<endif>
<endif>
>>

```

```

<endif>
>>

// Tracking Rule Elements

/** ID and track it for use in a rewrite rule */
tokenRefTrack(token,label,elementIndex,terminalOptions) ::= <<
<tokenRefBang(...)> <! Track implies no auto AST construction!>
<if(backtracking)>if ( <actions.(actionScope).synpredgate> ) <endif>stream_<token>.add(<label>);<\n>
>>

/** ids+=ID and track it for use in a rewrite rule; adds to ids *and*
 * to the tracking list stream_ID for use in the rewrite.
 */
tokenRefTrackAndListLabel(token,label,elementIndex,terminalOptions) ::= <<
<tokenRefTrack(...)>
<listLabel(elem=label,...)>
>>

/** ^(ID ...) track for rewrite */
tokenRefRuleRootTrack(token,label,elementIndex,terminalOptions) ::= <<
<tokenRefBang(...)>
<if(backtracking)>if ( <actions.(actionScope).synpredgate> ) <endif>stream_<token>.add(<label>);<\n>
>>

/** Match ^(label+=TOKEN ...) track for rewrite */
tokenRefRuleRootTrackAndListLabel(token,label,elementIndex,terminalOptions) ::= <<
<tokenRefRuleRootTrack(...)>
<listLabel(elem=label,...)>
>>

wildcardTrack(label,elementIndex) ::= <<
<super.wildcard(...)>
>>

/** rule when output=AST and tracking for rewrite */
ruleRefTrack(rule,label,elementIndex,args,scope) ::= <<
<super.ruleRef(...)>
<if(backtracking)>if ( <actions.(actionScope).synpredgate> ) <endif>stream_<rule.name>.add(<label>.getTree());
>>

/** x+=rule when output=AST and tracking for rewrite */
ruleRefTrackAndListLabel(rule,label,elementIndex,args,scope) ::= <<
<ruleRefTrack(...)>
<listLabel(elem=label+".getTree()",...)>
>>

/** ^(rule ...) rewrite */

```

```

ruleRefRuleRootTrack(rule,label,elementIndex,args,scope) ::= <<
<ruleRefRuleRoot(...)>
<if(backtracking)>if ( <actions.(actionScope).synpredgate> ) <endif>stream_<rule>.add(<label>.getTree());
>>

/** ^(x+=rule ...) rewrite */
ruleRefRuleRootTrackAndListLabel(rule,label,elementIndex,args,scope) ::= <<
<ruleRefRuleRootTrack(...)>
<listLabel(elem=label+".getTree()",...)>
>>

// R e w r i t e

rewriteCode(
alts, description,
referencedElementsDeep, // ALL referenced elements to right of ->
referencedTokenLabels,
referencedTokenListLabels,
referencedRuleLabels,
referencedRuleListLabels,
referencedWildcardLabels,
referencedWildcardListLabels,
rewriteBlockLevel, enclosingTreeLevel, treeLevel) ::=
<<

// AST REWRITE
// elements: <referencedElementsDeep; separator=", ">
// token labels: <referencedTokenLabels; separator=", ">
// rule labels: <referencedRuleLabels; separator=", ">
// token list labels: <referencedTokenListLabels; separator=", ">
// rule list labels: <referencedRuleListLabels; separator=", ">
<if(backtracking)>
if ( <actions.(actionScope).synpredgate> ) {<n>
<endif>
<prevRuleRootRef(>).tree = root_0;
<rewriteCodeLabels(>
root_0 = this.adaptor.nil();
<alts:rewriteAlt(); separator="else ">
<! if tree parser and rewrite=true !>
<if(TREE_PARSER)>
<if(rewriteMode)>
<prevRuleRootRef(>).tree = this.adaptor.rulePostProcessing(root_0);
this.input.replaceChildren(this.adaptor.getParent(retval.start),
this.adaptor.getChildIndex(retval.start),
this.adaptor.getChildIndex(_last),
retval.tree);

<endif>
<endif>

```



```

<! if parser or tree-parser && rewrite!=true, we need to set result !>
<if(!TREE_PARSER)>
<prevRuleRootRef(>).tree = root_0;
<else>
<if(!rewriteMode)>
<prevRuleRootRef(>).tree = root_0;
<endif>
<endif>
<if(backtracking)>
}
<endif>
>>

rewriteCodeLabels() ::= <<
<referencedTokenLabels
  :{var stream_<it>=new org.antlr.runtime.tree.RewriteRule<rewriteElementType>Stream(this.adaptor,"token
<it>",<it>)};
  separator="\n"
>
<referencedTokenListLabels
  :{var stream_<it>=new org.antlr.runtime.tree.RewriteRule<rewriteElementType>Stream(this.adaptor,"token
<it>",<it>);};
  separator="\n"
>
<referencedWildcardLabels
  :{var stream_<it>=new org.antlr.runtime.tree.RewriteRuleSubtreeStream(this.adaptor,"wildcard <it>",<it>)};
  separator="\n"
>
<referencedWildcardListLabels
  :{var stream_<it>=new org.antlr.runtime.tree.RewriteRuleSubtreeStream(this.adaptor,"wildcard <it>",<it>)};
  separator="\n"
>
<referencedRuleLabels
  :{var stream_<it>=new org.antlr.runtime.tree.RewriteRuleSubtreeStream(this.adaptor,"token
<it>",<it>!=null?<it>.tree:null)};
  separator="\n"
>
<referencedRuleListLabels
  :{var stream_<it>=new org.antlr.runtime.tree.RewriteRuleSubtreeStream(this.adaptor,"token <it>",<it>)};
  separator="\n"
>
>>

/** Generate code for an optional rewrite block; note it uses the deep ref'd element
 * list rather shallow like other blocks.
 */
rewriteOptionalBlock(
alt,rewriteBlockLevel,

```

```

referencedElementsDeep, // all nested refs
referencedElements, // elements in immediately block; no nested blocks
description) ::=
<<
// <fileName>:<description>
if ( <referencedElementsDeep:{el | stream_<el>.hasNext()}; separator="||"> ) {
    <alt>
}
<referencedElementsDeep:{el | stream_<el>.reset();<\n>}>
>>

```

```

rewriteClosureBlock(
alt,rewriteBlockLevel,
referencedElementsDeep, // all nested refs
referencedElements, // elements in immediately block; no nested blocks
description) ::=
<<
// <fileName>:<description>
while ( <referencedElements:{el | stream_<el>.hasNext()}; separator="||"> ) {
    <alt>
}
<referencedElements:{el | stream_<el>.reset();<\n>}>
>>

```

```

rewritePositiveClosureBlock(
alt,rewriteBlockLevel,
referencedElementsDeep, // all nested refs
referencedElements, // elements in immediately block; no nested blocks
description) ::=
<<
if ( !( <referencedElements:{el | stream_<el>.hasNext()}; separator="||"> ) ) {
    throw new org.antlr.runtime.tree.RewriteEarlyExitException();
}
while ( <referencedElements:{el | stream_<el>.hasNext()}; separator="||"> ) {
    <alt>
}
<referencedElements:{el | stream_<el>.reset();<\n>}>
>>

```

```

rewriteAlt(a) ::= <<
// <a.description>
<if(a.pred)>
if (<a.pred> ) {
    <a.alt>
}<\n>
<else>
{
    <a.alt>
}
}

```

```

}<\n>
<endif>
>>

/** For empty rewrites: "r : ... -> ;" */
rewriteEmptyAlt() ::= "root_0 = null;"

rewriteTree(root,children,description,enclosingTreeLevel,treeLevel) ::= <<
// <fileName>:<description>
{
var root_<treeLevel> = this.adaptor.nil();
<root:rewriteElement()>
<children:rewriteElement()>
this.adaptor.addChild(root_<enclosingTreeLevel>, root_<treeLevel>);
}<\n>
>>

rewriteElementList(elements) ::= "<elements:rewriteElement()>"

rewriteElement(e) ::= <<
<@pregen()>
<e.el>
>>

/** Gen ID or ID[args] */
rewriteTokenRef(token,elementIndex,terminalOptions,args) ::= <<
this.adaptor.addChild(root_<treeLevel>, <createRewriteNodeFromElement(...)>);<\n>
>>

/** Gen $label ... where defined via label=ID */
rewriteTokenLabelRef(label,elementIndex) ::= <<
this.adaptor.addChild(root_<treeLevel>, stream_<label>.nextNode());<\n>
>>

/** Gen $label ... where defined via label+=ID */
rewriteTokenListLabelRef(label,elementIndex) ::= <<
this.adaptor.addChild(root_<treeLevel>, stream_<label>.nextNode());<\n>
>>

/** Gen ^($label ...) */
rewriteTokenLabelRefRoot(label,elementIndex) ::= <<
root_<treeLevel> = this.adaptor.becomeRoot(stream_<label>.nextNode(), root_<treeLevel>);<\n>
>>

/** Gen ^($label ...) where label+=... */
rewriteTokenListLabelRefRoot ::= rewriteTokenLabelRefRoot

/** Gen ^(ID ...) or ^(ID[args] ...) */

```

```

rewriteTokenRefRoot(token,elementIndex,terminalOptions,args) ::= <<
root_<treeLevel> = this.adaptor.becomeRoot(<createRewriteNodeFromElement(...)>, root_<treeLevel>);<\n>
>>

rewriteImaginaryTokenRef(args,token,terminalOptions,elementIndex) ::= <<
this.adaptor.addChild(root_<treeLevel>, <createImaginaryNode(tokenType=token, ...)>);<\n>
>>

rewriteImaginaryTokenRefRoot(args,token,terminalOptions,elementIndex) ::= <<
root_<treeLevel> = this.adaptor.becomeRoot(<createImaginaryNode(tokenType=token, ...)>,
root_<treeLevel>);<\n>
>>

/** plain -> {foo} action */
rewriteAction(action) ::= <<
root_0 = <action>;<\n>
>>

/** What is the name of the previous value of this rule's root tree? This
* let's us refer to $rule to mean previous value. I am reusing the
* variable 'tree' sitting in retval struct to hold the value of root_0 right
* before I set it during rewrites. The assign will be to retval.tree.
*/
prevRuleRootRef() ::= "retval"

rewriteRuleRef(rule) ::= <<
this.adaptor.addChild(root_<treeLevel>, stream_<rule>.nextTree());<\n>
>>

rewriteRuleRefRoot(rule) ::= <<
root_<treeLevel> = this.adaptor.becomeRoot(stream_<rule>.nextNode(), root_<treeLevel>);<\n>
>>

rewriteNodeAction(action) ::= <<
this.adaptor.addChild(root_<treeLevel>, <action>);<\n>
>>

rewriteNodeActionRoot(action) ::= <<
root_<treeLevel> = this.adaptor.becomeRoot(<action>, root_<treeLevel>);<\n>
>>

/** Gen $ruleLabel ... where defined via ruleLabel=rule */
rewriteRuleLabelRef(label) ::= <<
this.adaptor.addChild(root_<treeLevel>, stream_<label>.nextTree());<\n>
>>

/** Gen $ruleLabel ... where defined via ruleLabel+=rule */
rewriteRuleListLabelRef(label) ::= <<

```

```

this.adaptor.addChild(root_<treeLevel>, stream_<label>.nextTree());<\n>
>>

/** Gen ^($ruleLabel ...) where ruleLabel=rule */
rewriteRuleLabelRefRoot(label) ::= <<
root_<treeLevel> = this.adaptor.becomeRoot(stream_<label>.nextNode(), root_<treeLevel>);<\n>
>>

/** Gen ^($ruleLabel ...) where ruleLabel+=rule */
rewriteRuleListLabelRefRoot(label) ::= <<
root_<treeLevel> = this.adaptor.becomeRoot(stream_<label>.nextNode(), root_<treeLevel>);<\n>
>>

rewriteWildcardLabelRef(label) ::= <<
this.adaptor.addChild(root_<treeLevel>, stream_<label>.nextTree());<\n>
>>

createImaginaryNode(tokenType,terminalOptions,args) ::= <<
<if(terminalOptions.node)>
<! new MethodNode(IDLabel, args) !>
new <terminalOptions.node>(<tokenType><if(args)>, <args; separator=","><endif>)
<else>
this.adaptor.create(<tokenType>, <args; separator=","><if(!args)>"<tokenType>"<endif>)
<endif>
>>

createRewriteNodeFromElement(token,terminalOptions,args) ::= <<
<if(terminalOptions.node)>
new <terminalOptions.node>(stream_<token>.nextToken(<if(args)>, <args; separator=","><endif>))
<else>
<if(args)> <! must create new node from old !>
this.adaptor.create(<token>, <args; separator=",">)
<else>
stream_<token>.nextNode()
<endif>
<endif>
>>

```

Found in path(s):

```

* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-
jar/org/antlr/codegen/templates/JavaScript/AST.stg

```

No license file was found, but licenses were detected in source scan.

```

/*
* [The "BSD license"]
* Copyright (c) 2010 Terence Parr and Alan Condit
* Copyright (c) 2006 Kay Roepke (Objective-C runtime)
* All rights reserved.

```

```

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* THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.
*/

```

Found in path(s):

```

* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-jar/org/antlr/codegen/ObjCTarget.java

```

No license file was found, but licenses were detected in source scan.

```

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```

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* (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF
* THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.
*/

```

```

csharpVisibilityMap ::= [
  "private":"private",
  "protected":"protected",
  "public":"public",
  "fragment":"private",
  default:"private"
]

```

```

/** The overall file structure of a recognizer; stores methods for rules
* and cyclic DFAs plus support code.
*/

```

```

outputFile( LEXER,PARSER,TREE_PARSER, actionScope, actions,
  docComment, recognizer,
  name, tokens, tokenNames, rules, cyclicDFAs,
  bitsets, buildTemplate, buildAST, rewriteMode, profile,
  backtracking, synpreds, memoize, numRules,
  fileName, ANTLRVersion, generatedTimestamp, trace,
  scopes, superClass, literals) ::=

```

```
<<
```

```

//-----
// \<auto-generated>
//   This code was generated by a tool.
//   ANTLR Version: <ANTLRVersion>
//
//   Changes to this file may cause incorrect behavior and will be lost if
//   the code is regenerated.
// \</auto-generated>
//-----

```

```
// $ANTLR <ANTLRVersion> <fileName> <generatedTimestamp>
```

```

<if(trace)>
#define ANTLR_TRACE
<endif>
<@debugPreprocessor()>
// The variable 'variable' is assigned but its value is never used.
#pragma warning disable 168, 219

```

```

// Unreachable code detected.
#pragma warning disable 162
// Missing XML comment for publicly visible type or member 'Type_or_Member'
#pragma warning disable 1591

<actions.(actionScope).header>

<@imports>
using System.Collections.Generic;
using Antlr.Runtime;
using Antlr.Runtime.Misc;
<if(TREE_PARSER)>
using Antlr.Runtime.Tree;
using RewriteRuleITokenStream = Antlr.Runtime.Tree.RewriteRuleTokenStream;
<endif>
using ConditionalAttribute = System.Diagnostics.ConditionalAttribute;
<@end>
<if(actions.(actionScope).namespace)>
namespace <actions.(actionScope).namespace>
{
<endif>
<docComment>
<recognizer>
<if(actions.(actionScope).namespace)>

} // namespace <actions.(actionScope).namespace>
<endif>
>>

lexerInputStreamType() ::= <<
<actions.(actionScope).inputStreamType; null="ICharStream">
>>

lexer(grammar, name, tokens, scopes, rules, numRules, filterMode, labelType="CommonToken",
superClass={ <if(actions.(actionScope).superClass)><actions.(actionScope).superClass><else>Antlr.Runtime.Lexer
<endif>} ) ::= <<
[System.CodeDom.Compiler.GeneratedCode("ANTLR", "<ANTLRVersion>")]
[System.CLSCompliant(false)]
<parserModifier(grammar=grammar, actions=actions)> partial class <grammar.recognizerName> :
<@superClassName><superClass><@end>
{
<tokens:{it|public const int <it.name; format="id">=<it.type>;}; separator="\n">
<scopes:{it|<if(it.isDynamicGlobalScope)><globalAttributeScope(scope=it)><endif>}>
<actions.lexer.members>

// delegates
<grammar.delegates:
{g|private <g.recognizerName> <g.delegateName()>;}; separator="\n">

```



```

// delegators
<grammar.delegators:
  {g|private <g.recognizerName> <g.delegateName(>);}; separator="\n">
<last(grammar.delegators):{g|private <g.recognizerName> gParent;}>

<actions.(actionScope).ctorModifier; null="public"> <grammar.recognizerName>(<! needed by subclasses !>
{
  OnCreated();
}

<actions.(actionScope).ctorModifier; null="public"> <grammar.recognizerName>(<lexerInputStreamType()>
input<grammar.delegators:{g|, <g.recognizerName> <g.delegateName(>}&> )
: this(input, new RecognizerSharedState(<grammar.delegators:{g|, <g.delegateName(>}&>))
{
}

<actions.(actionScope).ctorModifier; null="public"> <grammar.recognizerName>(<lexerInputStreamType()> input,
RecognizerSharedState state<grammar.delegators:{g|, <g.recognizerName> <g.delegateName(>}&> )
: base(input, state)
{
<if(memoize)>
<if(grammar.grammarIsRoot)>
  state.ruleMemo = new System.Collections.Generic.Dictionary<int, int>[<numRules>+1];<\n><! index from 1..n !>
<endif>
<endif>
<grammar.directDelegates:
  {g|<g.delegateName(> = new <g.recognizerName>(input, this.state<trunc(g.delegators):{p|,
<p.delegateName(>}&>, this);}; separator="\n">
<grammar.delegators:
  {g|this.<g.delegateName(> = <g.delegateName(>);}; separator="\n">
<last(grammar.delegators):{g|gParent = <g.delegateName(>};}>

  OnCreated();
}
public override string GrammarFileName { get { return "<fileName>"; } }

private static readonly bool[] decisionCanBacktrack = new bool[0];

<if(grammar.hasDelegates)>
public override <lexerInputStreamType()> CharStream
{
  get
  {
    return base.CharStream;
  }
  set
  {
    base.CharStream = value;
  }
}

```

```

    <grammar.directDelegates:
      {g|<g.delegateName()> = new <g.recognizerName>(input, state<trunc(g.delegators):{p|, <p.delegateName()>}>,
this);}; separator="\n">
    <grammar.delegators:
      {g|this.<g.delegateName()> = <g.delegateName()>;}; separator="\n">
      <last(grammar.delegators):{g|gParent = <g.delegateName()>;}>
    }
  }

<if(grammar.delegates)>
public override void SetState(RecognizerSharedState state)
{
  base.SetState(state);
  <grammar.delegates:{g|<g.delegateName()>.SetState(state);}; separator="\n">
}
<endif>

<endif>
<if(filterMode)>
  <filteringNextToken()>
<endif>

[Conditional("ANTLR_TRACE")]
protected virtual void OnCreated() {}
[Conditional("ANTLR_TRACE")]
protected virtual void EnterRule(string ruleName, int ruleIndex) {}
[Conditional("ANTLR_TRACE")]
protected virtual void LeaveRule(string ruleName, int ruleIndex) {}

  <rules; separator="\n">

  <insertLexerSynpreds(synpreds)>

  #region DFA
  <cyclicDFAs:{ dfa | DFA<dfa.decisionNumber> dfa<dfa.decisionNumber>;}; separator="\n">

  protected override void InitDFAs()
  {
    base.InitDFAs();
    <cyclicDFAs:{ dfa | dfa<dfa.decisionNumber> = new DFA<dfa.decisionNumber>(this<if(dfa.specialStateSTs)>,
SpecialStateTransition<dfa.decisionNumber><endif>;);}; separator="\n">
  }

  <cyclicDFAs:cyclicDFA()> <! dump tables for all DFA !>
  #endregion

  }
  >>

```

```

/** A override of Lexer.nextToken() that backtracks over mTokens() looking
 * for matches. No error can be generated upon error; just rewind, consume
 * a token and then try again. backtracking needs to be set as well.
 * Make rule memoization happen only at levels above 1 as we start mTokens
 * at backtracking==1.
 */
filteringNextToken() ::= <<
public override IToken NextToken()
{
    while (true)
    {
        if (input.LA(1) == CharStreamConstants.EndOfFile)
        {
            IToken eof = new CommonToken((ICharStream)input, CharStreamConstants.EndOfFile, TokenChannels.Default,
input.Index, input.Index);
            eof.Line = Line;
            eof.CharPositionInLine = CharPositionInLine;
            return eof;
        }
        state.token = null;
        state.channel = TokenChannels.Default;
        state.tokenStartCharIndex = input.Index;
        state.tokenStartCharPositionInLine = input.CharPositionInLine;
        state.tokenStartLine = input.Line;
        state.text = null;
        try
        {
            int m = input.Mark();
            state.backtracking=1;<!-- means we won't throw slow exception !>
            state.failed=false;
            mTokens();
            state.backtracking=0;
            <!-- mTokens backtracks with synpred at backtracking==2
            and we set the synpredgate to allow actions at level 1. !>
            if (state.failed)
            {
                input.Rewind(m);
                input.Consume();<!-- advance one char and try again !>
            }
            else
            {
                Emit();
                return state.token;
            }
        }
        catch (RecognitionException re)
        {

```

```

// shouldn't happen in backtracking mode, but...
ReportError(re);
Recover(re);
}
}
}

public override void Memoize(IIntStream input, int ruleIndex, int ruleStartIndex)
{
    if (state.backtracking > 1)
        base.Memoize(input, ruleIndex, ruleStartIndex);
}

public override bool AlreadyParsedRule(IIntStream input, int ruleIndex)
{
    if (state.backtracking > 1)
        return base.AlreadyParsedRule(input, ruleIndex);

    return false;
}
>>

actionGate() ::= "state.backtracking == 0"

filteringActionGate() ::= "state.backtracking == 1"

/** How to generate a parser */
genericParser(grammar, name, scopes, tokens, tokenNames, rules, numRules,
    bitsets, inputStreamType, superClass,
    labelType, members, rewriteElementType,
    filterMode, ASTLabelType="object") ::= <<
[System.CodeDom.Compiler.GeneratedCode("ANTLR", "<ANTLRVersion>")]
[System.CLSCompliant(false)]
<parserModifier(grammar=grammar, actions=actions)> partial class <grammar.recognizerName> :
<@superClassName><superClass><@end>
{
<if(grammar.grammarIsRoot)>
    internal static readonly string[] tokenNames = new string[] {
        "\<invalid>", "\<EOR>", "\<DOWN>", "\<UP>", <tokenNames; separator=", ">
    };
<endif>
    <tokens:{it|public const int <it.name; format="id">=<it.type>;}; separator="\n">

<if(grammar.delegates)>
    // delegates
    <grammar.delegates:
        {g|private <g.recognizerName> <g.delegateName()>;}; separator="\n">
<endif>

```

```

<if(grammar.delegators)>
// delegators
<grammar.delegators:
  { g|private <g.recognizerName> <g.delegateName(>); separator="\n">
<last(grammar.delegators):{ g|private <g.recognizerName> gParent; }>
<endif>

<if(grammar.delegates)>
public override void SetState(RecognizerSharedState state)
{
  base.SetState(state);
  <grammar.delegates: { g|<g.delegateName(>.SetState(state); }; separator="\n">
}

<if(TREE_PARSER)>
public override void SetTreeNodeStream(ITreeNodeStream input)
{
  base.SetTreeNodeStream(input);
  <grammar.delegates: { g|<g.delegateName(>.SetTreeNodeStream(input); }; separator="\n">
}
<endif>
<endif>

<scopes: { it|<if(it.isDynamicGlobalScope)><globalAttributeScope(scope=it)><endif> }>
<@members()>

public override string[] TokenNames { get { return
<grammar.composite.rootGrammar.recognizerName>.tokenNames; } }
public override string GrammarFileName { get { return "<fileName>"; } }

<members>

[Conditional("ANTLR_TRACE")]
protected virtual void OnCreated() {}
[Conditional("ANTLR_TRACE")]
protected virtual void EnterRule(string ruleName, int ruleIndex) {}
[Conditional("ANTLR_TRACE")]
protected virtual void LeaveRule(string ruleName, int ruleIndex) {}

#region Rules
<rules; separator="\n">
#endregion Rules

<if(grammar.delegatedRules)>
<! generate rule/method definitions for imported rules so they
  appear to be defined in this recognizer. !>
#region Delegated rules
<grammar.delegatedRules: { ruleDescriptor|

```

```

<ruleModifier(grammar=grammar,ruleDescriptor=ruleDescriptor)> <returnType(ruleDescriptor)>
<ruleDescriptor.name; format="id"><ruleDescriptor.parameterScope:parameterScope()> <!throws
RecognitionException !>{ <if(ruleDescriptor.hasReturnValue)>return
<endif><ruleDescriptor.grammar:delegateName()>.<ruleDescriptor.name;
format="id"><ruleDescriptor.parameterScope><ruleDescriptor.parameterScope.attributes:{ a|<a.name;
format="id">}; separator=", "><endif>}; \}}; separator="\n">
#endregion Delegated rules
<endif>

<insertSynpreds(synpreds)>

<if(cyclicDFAs)>
#region DFA
<cyclicDFAs:{ dfa | private DFA<dfa.decisionNumber> dfa<dfa.decisionNumber>;}; separator="\n">

protected override void InitDFAs()
{
base.InitDFAs();
<cyclicDFAs:{ dfa | dfa<dfa.decisionNumber> = new DFA<dfa.decisionNumber>( this<if(dfa.specialStateSTs)>,
SpecialStateTransition<dfa.decisionNumber><endif> );}; separator="\n">
}

<cyclicDFAs:cyclicDFA()><! dump tables for all DFA !>
#endregion DFA
<endif>

<if(bitsets)>
#region Follow sets
private static class Follow
{
<bitsets:{ it|<bitset(name={ _<it.name>_in_<it.inName><it.tokenIndex>}, words64=it.bits)>}; separator="\n">
}
#endregion Follow sets
<endif>
}
>>

@genericParser.members() ::= <<
#if ANTLR_DEBUG
private static readonly bool[] decisionCanBacktrack =
new bool[]
{
false, // invalid decision
<grammar.decisions:{ d | <d.dfa.hasSynPred>}; wrap="\n", separator=", ">
};
#else
private static readonly bool[] decisionCanBacktrack = new bool[0];
#endif

```

```

<! WARNING. bug in ST: this is cut-n-paste into Dbg.stg !>
<actions.(actionScope).ctorModifier; null="public"> <grammar.recognizerName>(<inputStreamType>
input<grammar.delegators:{g|, <g.recognizerName> <g.delegateName()>}>)
: this(input, new RecognizerSharedState()<grammar.delegators:{g|, <g.delegateName()>}>)
{
}
<actions.(actionScope).ctorModifier; null="public"> <grammar.recognizerName>(<inputStreamType> input,
RecognizerSharedState state<grammar.delegators:{g|, <g.recognizerName> <g.delegateName()>}>)
: base(input, state)
{
<if(grammar.directDelegates)>
<grammar.directDelegates:
{g|<g.delegateName()> = new <g.recognizerName>(input, state<trunc(g.delegators):{p|, <p.delegateName()>}>,
this);}; separator="\n">
<endif>
<if(grammar.indirectDelegates)>
<grammar.indirectDelegates:{g | <g.delegateName()> = <g.delegator.delegateName()>.<g.delegateName()>};
separator="\n">
<endif>
<if(grammar.delegators)>
<last(grammar.delegators):{g|gParent = <g.delegateName()>};>
<endif>
<parserCtorBody()>
OnCreated();
}
>>

// imported grammars are 'public' (can't be internal because their return scope classes must be accessible)
parserModifier(grammar, actions) ::= <<
<if(grammar.grammarIsRoot)><actions.(actionScope).modifier; null="public"><else>public<endif>
>>

parserCtorBody() ::= <<
<if(memoize)>
<if(grammar.grammarIsRoot)>
this.state.ruleMemo = new System.Collections.Generic.Dictionary<int,
int>[<length(grammar.allImportedRules)>+1];<\n><! index from 1..n !>
<endif>
<endif>
<grammar.delegators:
{g|this.<g.delegateName()> = <g.delegateName()>}; separator="\n">
>>

parser(grammar, name, scopes, tokens, tokenNames, rules, numRules, bitsets,
ASTLabelType="object",
superClass={<if(actions.(actionScope).superClass)><actions.(actionScope).superClass><else>Antlr.Runtime.Parser
<endif>}, labelType="IToken",
members={<actions.parser.members>}) ::= <<

```

```

<genericParser(inputStreamType="ITokenStream", rewriteElementType="IToken", ...)>
>>

/** How to generate a tree parser; same as parser except the input
 * stream is a different type.
 */
treeParser(grammar, name, scopes, tokens, tokenNames, globalAction, rules,
    numRules, bitsets, filterMode, labelType={<ASTLabelType>}, ASTLabelType="object",
    superClass={<if(actions.(actionScope).superClass)><actions.(actionScope).superClass><else>Antlr.Runtime.Tree.<
if(filterMode)><if(buildAST)>TreeRewriter<else>TreeFilter<endif><else>TreeParser<endif><endif>},
    members={<actions.treeparser.members>}) ::= <<
<genericParser(inputStreamType="ITreeNodeStream", rewriteElementType="Node", ...)>
>>

/** A simpler version of a rule template that is specific to the imaginary
 * rules created for syntactic predicates. As they never have return values
 * nor parameters etc..., just give simplest possible method. Don't do
 * any of the normal memoization stuff in here either; it's a waste.
 * As predicates cannot be inlined into the invoking rule, they need to
 * be in a rule by themselves.
 */
synpredRule(ruleName, ruleDescriptor, block, description, nakedBlock) ::=
<<
[Conditional("ANTLR_TRACE")]
protected virtual void EnterRule_<ruleName>_fragment() {}
[Conditional("ANTLR_TRACE")]
protected virtual void LeaveRule_<ruleName>_fragment() {}

// $ANTLR start <ruleName>
<ruleModifier(grammar,ruleDescriptor)> void
<ruleName>_fragment(<ruleDescriptor.parameterScope:parameterScope()>)
{
    <ruleLabelDefs()>
    EnterRule_<ruleName>_fragment();
    EnterRule("<ruleName>_fragment", <ruleDescriptor.index>);
    TraceIn("<ruleName>_fragment", <ruleDescriptor.index>);
    try
    {
        <block>
    }
    finally
    {
        TraceOut("<ruleName>_fragment", <ruleDescriptor.index>);
        LeaveRule("<ruleName>_fragment", <ruleDescriptor.index>);
        LeaveRule_<ruleName>_fragment();
    }
}
// $ANTLR end <ruleName>

```


>>

```
insertLexerSynpreds(synpreds) ::= <<  
<insertSynpreds(synpreds)>  
>>
```

```
insertSynpreds(synpreds) ::= <<  
<if(synpreds)>  
#region Synpreds  
private bool EvaluatePredicate(System.Action fragment)  
{  
    bool success = false;  
    state.backtracking++;  
    <@start(>  
    try { DebugBeginBacktrack(state.backtracking);  
        int start = input.Mark();  
        try  
        {  
            fragment();  
        }  
        catch ( RecognitionException re )  
        {  
            System.Console.Error.WriteLine("impossible: "+re);  
        }  
        success = !state.failed;  
        input.Rewind(start);  
    } finally { DebugEndBacktrack(state.backtracking, success); }  
    <@stop(>  
    state.backtracking--;  
    state.failed=false;  
    return success;  
}  
#endregion Synpreds  
<endif>  
>>
```

```
ruleMemoization(name) ::= <<  
<if(memoize)>  
if (state.backtracking > 0 && AlreadyParsedRule(input, <ruleDescriptor.index>)) { <returnFromRule(> }  
<endif>  
>>
```

```
/** How to test for failure and return from rule */  
checkRuleBacktrackFailure() ::= <<  
<if(backtracking)>if (state.failed) <returnFromRule(><endif>  
>>
```

```
/** This rule has failed, exit indicating failure during backtrack */
```

```

ruleBacktrackFailure() ::= <<
<if(backtracking)>if (state.backtracking>0) {state.failed=true; <returnFromRule(>><endif>
>>

ruleWrapperMap ::= [
"bottomup":{<ruleWrapperBottomup(>>},
"topdown":{<ruleWrapperTopdown(>>},
default:""
]

ruleWrapperBottomup() ::= <<
<if(TREE_PARSER && filterMode)>
protected override <if(buildAST)>IAstRuleReturnScope<else>void<endif> Bottomup() { return bottomup(); }
<endif>
>>

ruleWrapperTopdown() ::= <<
<if(TREE_PARSER && filterMode)>
protected override <if(buildAST)>IAstRuleReturnScope<else>void<endif> Topdown() { return topdown(); }
<endif>
>>

/** How to generate code for a rule. This includes any return type
 * data aggregates required for multiple return values.
 */
rule(ruleName,ruleDescriptor,block,emptyRule,description,exceptions,finally,memoize) ::= <<
<ruleAttributeScope(scope=ruleDescriptor.ruleScope)>
<returnScope(ruleDescriptor.returnScope)>

[Conditional("ANTLR_TRACE")]
protected virtual void EnterRule_<ruleName>() { }
[Conditional("ANTLR_TRACE")]
protected virtual void LeaveRule_<ruleName>() {}
<ruleWrapperMap.(ruleName)>
// $ANTLR start "<ruleName>"
// <fileName>:<description>
[GrammarRule("<ruleName>")]
<ruleModifier(grammar=grammar,ruleDescriptor=ruleDescriptor)> <returnType(ruleDescriptor)> <ruleName;
format="id">(<ruleDescriptor.parameterScope:parameterScope(>>)
{
EnterRule_<ruleName>();
EnterRule("<ruleName>", <ruleDescriptor.index>);
TraceIn("<ruleName>", <ruleDescriptor.index>);
<ruleScopeSetUp(>
<ruleDeclarations(>
<ruleLabelDefs(>
<ruleDescriptor.actions.init>
try { DebugEnterRule(GrammarFileName, "<ruleName>");

```

```

DebugLocation(<ruleDescriptor.tree.line>, <ruleDescriptor.EORNode.charPositionInLine>);
<@preamble()>
try
{
<ruleMemoization(name=ruleName)>
<block>
<ruleCleanUp()>
<(ruleDescriptor.actions.after):execAction()>
}
<if(exceptions)>
<exceptions:{e|<catch(decl=e.decl,action=e.action)><\n>}>
<else>
<if(!emptyRule)>
<if(actions.(actionScope).rulecatch)>
<actions.(actionScope).rulecatch>
<else>
catch (RecognitionException re)
{
ReportError(re);
Recover(input,re);
<@setErrorReturnValue()>
}
<endif>
<endif>
<endif>
finally
{
TraceOut("<ruleName>", <ruleDescriptor.index>);
LeaveRule("<ruleName>", <ruleDescriptor.index>);
LeaveRule_<ruleName>();
<memoize()>
<ruleScopeCleanUp()>
<finally>
}
DebugLocation(<ruleDescriptor.EORNode.line>, <ruleDescriptor.EORNode.charPositionInLine>);
} finally { DebugExitRule(GrammarFileName, "<ruleName>"); }
<@postamble()>
<returnFromRule()><\n>
}
// $ANTLR end "<ruleName>"
>>

// imported grammars need to have internal rules
ruleModifier(grammar,ruleDescriptor) ::= <<
<if(grammar.grammarIsRoot)><csharpVisibilityMap.(ruleDescriptor.modifier);
null="private"><else>internal<endif>
>>

```

```

// imported grammars need to have public return scopes
returnScopeModifier(grammar,ruleDescriptor) ::= <<
<if(grammar.grammarIsRoot)><csharpVisibilityMap.(ruleDescriptor.modifier);
null="private"><else>public<endif>
>>

catch(decl,action) ::= <<
catch (<e.decl>)
{
<e.action>
}
>>

ruleDeclarations() ::= <<
<if(ruleDescriptor.hasMultipleReturnValues)>
<returnType(ruleDescriptor)> retval = new <returnType(ruleDescriptor)>();
retval.Start = (<labelType>)input.LT(1);
<elseif(ruleDescriptor.returnScope)>
<ruleDescriptor.returnScope.attributes: { a |
<a.type> <a.name; format="id"> = <if(a.initValue)><a.initValue><else><initValue(a.type)><endif>;
}>
<endif>
<if(memoize)>
int <ruleDescriptor.name>_startIndex = input.Index;
<endif>
>>

ruleScopeSetUp() ::= <<
<ruleDescriptor.useScopes: {it|<it>_stack.Push(new <it>_scope());<it>_scopeInit(<it>_stack.Peek());};
separator="\n">
<ruleDescriptor.ruleScope: {it|<it.name>_stack.Push(new
<it.name>_scope());<it.name>_scopeInit(<it.name>_stack.Peek());}; separator="\n">
>>

ruleScopeCleanUp() ::= <<
<ruleDescriptor.useScopes: {it|<it>_scopeAfter(<it>_stack.Peek());<it>_stack.Pop();}; separator="\n">
<ruleDescriptor.ruleScope: {it|<it.name>_scopeAfter(<it.name>_stack.Peek());<it.name>_stack.Pop();};
separator="\n">
>>

ruleLabelDefs() ::= <<
<[ruleDescriptor.tokenLabels,ruleDescriptor.tokenListLabels,ruleDescriptor.wildcardTreeLabels,ruleDescriptor.wil
dcardTreeListLabels]
: {it|<labelType> <it.label.text> = default(<labelType>);}; separator="\n"
>
<ruleDescriptor.tokenListLabels
: {it|List<<labelType>> list_<it.label.text> = null;}; separator="\n"
>

```

```

<[ruleDescriptor.ruleListLabels,ruleDescriptor.wildcardTreeListLabels]
  :{it|List\<<ASTLabelType>> list_<it.label.text> = null;}; separator="\n"
>
<ruleDescriptor.ruleLabels:ruleLabelDef(); separator="\n">
<ruleDescriptor.ruleListLabels:ruleLabelDef(); separator="\n">
>>

lexerRuleLabelDefs() ::= <<
<[ruleDescriptor.tokenLabels,
  ruleDescriptor.tokenListLabels,
  ruleDescriptor.ruleLabels]
  :{it|<labelType> <it.label.text> = default(<labelType>);}; separator="\n"
>
<[ruleDescriptor.charListLabels,
  ruleDescriptor.charLabels]
  :{it|int <it.label.text> = 0;}; separator="\n"
>
<[ruleDescriptor.tokenListLabels,
  ruleDescriptor.ruleListLabels]
  :{it|List\<<labelType>> list_<it.label.text> = null;}; separator="\n"
>
<ruleDescriptor.charListLabels:{it|List\<int> list_<it.label.text> = null;}; separator="\n"
>
>>

returnFromRule() ::= <%
return
<if(!ruleDescriptor.isSynPred)>
<if(ruleDescriptor.hasReturnValue)>
<if(ruleDescriptor.hasSingleReturnValue)>
<! This comment is a hack to make sure the following
  single space appears in the output. !> <ruleDescriptor.singleValueReturnName>
<else>
<!!> retval
<endif>
<endif>
<endif>
<endif>
;
%>

ruleCleanup() ::= <<
<if(ruleDescriptor.hasMultipleReturnValues)>
<if(!TREE_PARSER)>
retval.Stop = (<labelType>)input.LT(-1);
<endif>
<endif>
>>

```

```

memoize() ::= <<
<if(memoize)>
<if(backtracking)>
if (state.backtracking > 0) { Memoize(input, <ruleDescriptor.index>, <ruleDescriptor.name>_StartIndex); }
<endif>
<endif>
>>

/** How to generate a rule in the lexer; naked blocks are used for
 * fragment rules.
 */
lexerRule(ruleName,nakedBlock,ruleDescriptor,block,memoize) ::= <<

[Conditional("ANTLR_TRACE")]
protected virtual void EnterRule_<ruleName>() {}
[Conditional("ANTLR_TRACE")]
protected virtual void LeaveRule_<ruleName>() {}

// $ANTLR start "<ruleName>"
[GrammarRule("<ruleName>")]
<ruleModifier(grammar=grammar,ruleDescriptor=ruleDescriptor)> void
m<ruleName>(<ruleDescriptor.parameterScope:parameterScope(>>)
{
EnterRule_<ruleName>();
EnterRule("<ruleName>", <ruleDescriptor.index>);
TraceIn("<ruleName>", <ruleDescriptor.index>);
<ruleScopeSetUp(>
<ruleDeclarations(>
try
{
<if(nakedBlock)>
<ruleMemoization(name=ruleName)>
<lexerRuleLabelDefs(>
<ruleDescriptor.actions.init>
<block>
<else>
int _type = <ruleName>;
int _channel = DefaultTokenChannel;
<ruleMemoization(name=ruleName)>
<lexerRuleLabelDefs(>
<ruleDescriptor.actions.init>
<block>
<ruleCleanUp(>
state.type = _type;
state.channel = _channel;
<(ruleDescriptor.actions.after):execAction(>
<endif>
}

```

```

finally
{
    TraceOut("<ruleName>", <ruleDescriptor.index>);
    LeaveRule("<ruleName>", <ruleDescriptor.index>);
    LeaveRule_<ruleName>();
    <ruleScopeCleanUp()>
    <memoize()>
}
}
// $ANTLR end "<ruleName>"
>>

/** How to generate code for the implicitly-defined lexer grammar rule
 * that chooses between lexer rules.
 */
tokensRule(ruleName,nakedBlock,args,block,ruleDescriptor) ::= <<

public override void mTokens()
{
    <block><\n>
}
>>

// S U B R U L E S

/** A (...) subrule with multiple alternatives */
block(alts,decls,decision,enclosingBlockLevel,blockLevel,decisionNumber,maxK,maxAlt,description) ::= <<
// <fileName>:<description>
int alt<decisionNumber>=<maxAlt>;
<decls>
<@predecision()>
try { DebugEnterSubRule(<decisionNumber>);
try { DebugEnterDecision(<decisionNumber>, decisionCanBacktrack[<decisionNumber>]);
<decision>
} finally { DebugExitDecision(<decisionNumber>); }
<@postdecision()>
<@prebranch()>
switch (alt<decisionNumber>)
{
<alts:{a|altSwitchCase(i,a)}>
}
} finally { DebugExitSubRule(<decisionNumber>); }
<@postbranch()>
>>

/** A rule block with multiple alternatives */
ruleBlock(alts,decls,decision,enclosingBlockLevel,blockLevel,decisionNumber,maxK,maxAlt,description) ::= <<
// <fileName>:<description>

```

```

int alt<decisionNumber>=<maxAlt>;
<decls>
<@predecision()>
try { DebugEnterDecision(<decisionNumber>, decisionCanBacktrack[<decisionNumber>]);
<decision>
} finally { DebugExitDecision(<decisionNumber>); }
<@postdecision()>
switch (alt<decisionNumber>)
{
<alts:{a|altSwitchCase(i,a)}>
}
>>

```

```

ruleBlockSingleAlt(alts,decls,decision,enclosingBlockLevel,blockLevel,decisionNumber,description) ::= <<
// <fileName>:<description>
<decls>
<@prealt()>
DebugEnterAlt(1);
<alts>
<@postalt()>
>>

```

```

/** A special case of a (...) subrule with a single alternative */
blockSingleAlt(alts,decls,decision,enclosingBlockLevel,blockLevel,decisionNumber,description) ::= <<
// <fileName>:<description>
<decls>
<@prealt()>
DebugEnterAlt(1);
<alts>
<@postalt()>
>>

```

```

/** A (..)+ block with 1 or more alternatives */
positiveClosureBlock(alts,decls,decision,enclosingBlockLevel,blockLevel,decisionNumber,maxK,maxAlt,description) ::= <<
// <fileName>:<description>
int cnt<decisionNumber>=0;
<decls>
<@preloop()>
try { DebugEnterSubRule(<decisionNumber>);
while (true)
{
int alt<decisionNumber>=<maxAlt>;
<@predecision()>
try { DebugEnterDecision(<decisionNumber>, decisionCanBacktrack[<decisionNumber>]);
<decision>
} finally { DebugExitDecision(<decisionNumber>); }
<@postdecision()>

```



```

switch (alt<decisionNumber>)
{
<alts:{a|<altSwitchCase(i,a)>}>
default:
if (cnt<decisionNumber> >= 1)
goto loop<decisionNumber>;

<ruleBacktrackFailure()>
EarlyExitException eee<decisionNumber> = new EarlyExitException( <decisionNumber>, input );
DebugRecognitionException(eee<decisionNumber>);
<@earlyExitException()>
throw eee<decisionNumber>;
}
cnt<decisionNumber>++;
}
loop<decisionNumber>:
;

} finally { DebugExitSubRule(<decisionNumber>); }
<@postloop()>
>>

positiveClosureBlockSingleAlt ::= positiveClosureBlock

/** A (..)* block with 1 or more alternatives */
closureBlock(alts,decls,decision,enclosingBlockLevel,blockLevel,decisionNumber,maxK,maxAlt,description) ::=
<<
// <fileName>:<description>
<decls>
<@preloop()>
try { DebugEnterSubRule(<decisionNumber>);
while (true)
{
int alt<decisionNumber>=<maxAlt>;
<@predecision()>
try { DebugEnterDecision(<decisionNumber>, decisionCanBacktrack[<decisionNumber>]);
<decision>
} finally { DebugExitDecision(<decisionNumber>); }
<@postdecision()>
switch ( alt<decisionNumber> )
{
<alts:{a|<altSwitchCase(i,a)>}>
default:
goto loop<decisionNumber>;
}
}

loop<decisionNumber>:

```

```

;

} finally { DebugExitSubRule(<decisionNumber>); }
<@postloop()>
>>

closureBlockSingleAlt ::= closureBlock

/** Optional blocks (x)? are translated to (x|) by before code generation
 * so we can just use the normal block template
 */
optionalBlock ::= block

optionalBlockSingleAlt ::= block

/** A case in a switch that jumps to an alternative given the alternative
 * number. A DFA predicts the alternative and then a simple switch
 * does the jump to the code that actually matches that alternative.
 */
altSwitchCase(altNum,alt) ::= <<
case <altNum>:
<@prealt()>
DebugEnterAlt(<altNum>);
<alt>
break;<\n>
>>

/** An alternative is just a list of elements; at outermost level */
alt(elements,altNum,description,autoAST,outerAlt,treeLevel,rew) ::= <<
// <fileName>:<description>
{
<@declarations()>
<elements:element()>
<rew>
<@cleanup()>
}
>>

/** What to emit when there is no rewrite. For auto build
 * mode, does nothing.
 */
noRewrite(rewriteBlockLevel, treeLevel) ::= ""

// E L E M E N T S

/** Dump the elements one per line */
element(it) ::= <%
<@prematch()>

```

```

DebugLocation(<it.line>, <it.pos>);<\n>
<it.el><\n>
%>

/** match a token optionally with a label in front */
tokenRef(token,label,elementIndex,terminalOptions={}) ::= <<
<if(label)><label>=(<labelType>)<endif>Match(input,<token>,Follow._<token>_in_<ruleName><elementIndex>);
<checkRuleBacktrackFailure()>
>>

/** ids+=ID */
tokenRefAndListLabel(token,label,elementIndex,terminalOptions={}) ::= <<
<tokenRef(...)>
<listLabelElem(elem=label,elemType=labelType,...)>
>>

listLabelElem(label,elem,elemType) ::= <<
if (list_<label>==null) list_<label>=new List<<elemType; null={<labelType>}>>();
list_<label>.Add(<elem>);<\n>
>>

/** match a character */
charRef(char,label) ::= <<
<if(label)>
<label> = input.LA(1);<\n>
<endif>
Match(<char>); <checkRuleBacktrackFailure()>
>>

/** match a character range */
charRangeRef(a,b,label) ::= <<
<if(label)>
<label> = input.LA(1);<\n>
<endif>
MatchRange(<a>,<b>); <checkRuleBacktrackFailure()>
>>

/** For now, sets are interval tests and must be tested inline */
matchSet(s,label,elementIndex,postmatchCode="",terminalOptions={}) ::= <<
<if(label)>
<matchSetLabel()>
<endif>
if (<s>)
{
input.Consume();
<postmatchCode>
<if(!LEXER)>state.errorRecovery=false;<endif><if(backtracking)>state.failed=false;<endif>
}

```

```

else
{
<ruleBacktrackFailure()>
MismatchedSetException mse = new MismatchedSetException(null,input);
DebugRecognitionException(mse);
<@mismatchedSetException()>
<if(LEXER)>
Recover(mse);
throw mse;
<else>
throw mse;
<! use following code to make it recover inline; remove throw mse;
recoverFromMismatchedSet(input,mse,Follow._set_in_<ruleName><elementIndex>);
!>
<endif>
}<\n>
>>

matchSetUnchecked(s,label,elementIndex,postmatchCode=false) ::= <%
<if(label)>
<matchSetLabel()><\n>
<endif>
input.Consume();<\n>
<if(postmatchCode)>
<postmatchCode><\n>
<endif>
<if(!LEXER)>state.errorRecovery=false;<endif><if(backtracking)>state.failed=false;<endif>
%>

matchSetLabel() ::= <%
<if(LEXER)>
<label>= input.LA(1);
<else>
<label>=(<labelType>)input.LT(1);
<endif>
%>

matchRuleBlockSet ::= matchSet

matchSetAndListLabel(s,label,elementIndex,postmatchCode) ::= <<
<matchSet(...)>
<listLabelElem(elem=label,elemType=labelType,...)>
>>

/** Match a string literal */
lexerStringRef(string,label,elementIndex) ::= <%
<if(label)>
int <label>Start = CharIndex;<\n>

```

```

Match(<string>); <checkRuleBacktrackFailure()><\n>
int <label>StartLine<elementIndex> = Line;<\n>
int <label>StartCharPos<elementIndex> = CharPositionInLine;<\n>
<label> = new <labelType>(input, TokenTypes.Invalid, TokenChannels.Default, <label>Start, CharIndex-1);<\n>
<label>.Line = <label>StartLine<elementIndex>;<\n>
<label>.CharPositionInLine = <label>StartCharPos<elementIndex>;
<else>
Match(<string>); <checkRuleBacktrackFailure()><\n>
<endif>
%>

```

```

wildcard(token,label,elementIndex,terminalOptions={ }) ::= <<
<if(label)>
<label>=<labelType>input.LT(1);<\n>
<endif>
MatchAny(input); <checkRuleBacktrackFailure()>
>>

```

```

wildcardAndListLabel(token,label,elementIndex,terminalOptions={ }) ::= <<
<wildcard(...)>
<listLabelElem(elem=label,elemType=labelType,...)>
>>

```

```

/** Match . wildcard in lexer */
wildcardChar(label, elementIndex) ::= <<
<if(label)>
<label> = input.LA(1);<\n>
<endif>
MatchAny(); <checkRuleBacktrackFailure()>
>>

```

```

wildcardCharListLabel(label, elementIndex) ::= <<
<wildcardChar(...)>
<listLabelElem(elem=label,elemType=labelType,...)>
>>

```

```

/** Match a rule reference by invoking it possibly with arguments
 * and a return value or values. The 'rule' argument was the
 * target rule name, but now is type Rule, whose toString is
 * same: the rule name. Now though you can access full rule
 * descriptor stuff.
 */
ruleRef(rule,label,elementIndex,args,scope) ::= <<
PushFollow(Follow._<rule.name>_in_<ruleName><elementIndex>);
<if(label)><label>=<endif><if(scope)><scope:delegateName()>.<endif><rule.name; format="id"><args;
separator=", ">;
PopFollow();
<checkRuleBacktrackFailure()>

```

```

>>

/** ids+=r */
ruleRefAndListLabel(rule,label,elementIndex,args,scope) ::= <<
<ruleRef(...)>
<listLabelElem(elem=label,elemType={<ASTLabelType>},...)>
>>

/** A lexer rule reference.
 *
 * The 'rule' argument was the target rule name, but now
 * is type Rule, whose toString is same: the rule name.
 * Now though you can access full rule descriptor stuff.
 */
lexerRuleRef(rule,label,args,elementIndex,scope) ::= <%
<if(label)>
int <label>Start<elementIndex> = CharIndex;<\n>
int <label>StartLine<elementIndex> = Line;<\n>
int <label>StartCharPos<elementIndex> = CharPositionInLine;<\n>
<if(scope)><scope:delegateName().<endif>m<rule.name>(<args; separator="," ">);
<checkRuleBacktrackFailure()><\n>
<label> = new <labelType>(input, TokenTypes.Invalid, TokenChannels.Default, <label>Start<elementIndex>,
CharIndex-1);<\n>
<label>.Line = <label>StartLine<elementIndex>;<\n>
<label>.CharPositionInLine = <label>StartCharPos<elementIndex>;
<else>
<if(scope)><scope:delegateName().<endif>m<rule.name>(<args; separator="," ">);
<checkRuleBacktrackFailure()>
<endif>
%>

/** i+=INT in lexer */
lexerRuleRefAndListLabel(rule,label,args,elementIndex,scope) ::= <<
<lexerRuleRef(...)>
<listLabelElem(elem=label,elemType=labelType,...)>
>>

/** EOF in the lexer */
lexerMatchEOF(label,elementIndex) ::= <%
<if(label)>
int <label>Start<elementIndex> = CharIndex;<\n>
int <label>StartLine<elementIndex> = Line;<\n>
int <label>StartCharPos<elementIndex> = CharPositionInLine;<\n>
Match(EOF); <checkRuleBacktrackFailure()><\n>
<labelType> <label> = new <labelType>(input, EOF, TokenChannels.Default, <label>Start<elementIndex>,
CharIndex-1);<\n>
<label>.Line = <label>StartLine<elementIndex>;<\n>
<label>.CharPositionInLine = <label>StartCharPos<elementIndex>;

```

```

<else>
Match(EOF); <checkRuleBacktrackFailure()>
<endif>
%>

// used for left-recursive rules
recRuleDefArg()          ::= "int <recRuleArg()>"
recRuleArg()             ::= "_p"
recRuleAltPredicate(ruleName,opPrec) ::= "<recRuleArg()> |<= <opPrec>"
recRuleSetResultAction() ::= "root_0=$<ruleName>_primary.tree;"
recRuleSetReturnAction(src,name)  ::= "$<name>=$<src>.<name>;"

/** match ^(root children) in tree parser */
tree(root, actionsAfterRoot, children, nullableChildList,
    enclosingTreeLevel, treeLevel) ::= <<
<root:element()>
<actionsAfterRoot:element()>
<if(nullableChildList)>
if (input.LA(1) == TokenType.Down)
{
    Match(input, TokenType.Down, null); <checkRuleBacktrackFailure()>
    <children:element()>
    Match(input, TokenType.Up, null); <checkRuleBacktrackFailure()>
}
<else>
Match(input, TokenType.Down, null); <checkRuleBacktrackFailure()>
<children:element()>
Match(input, TokenType.Up, null); <checkRuleBacktrackFailure()>
<endif>
>>

/** Every predicate is used as a validating predicate (even when it is
 * also hoisted into a prediction expression).
 */
validateSemanticPredicate(pred,description) ::= <<
if (!(<evalPredicate(...)>))
{
    <ruleBacktrackFailure()>
    throw new FailedPredicateException(input, "<ruleName>", "<description>");
}
>>

// F i x e d D F A (if-then-else)

dfaState(k,edges,eotPredictsAlt,description,stateNumber,semPredState) ::= <<
int LA<decisionNumber>_<k> = input.LA(<k>);<n>
<edges; separator="\nelse ">
<if(!isTrue.(last(edges).labelExpr) && (!last(edges).predicates))>

```

```

else
{
<if(eotPredictsAlt)>
alt<decisionNumber> = <eotPredictsAlt>;
<else>
<ruleBacktrackFailure()>
NoViableAltException nvae = new NoViableAltException("<description>", <decisionNumber>, <stateNumber>,
input, <k>);
DebugRecognitionException(nvae);
<@noViableAltException()>
throw nvae;
<endif>
}
<endif>
>>

```

```

/** Same as a normal DFA state except that we don't examine lookahead
 * for the bypass alternative. It delays error detection but this
 * is faster, smaller, and more what people expect. For (X)? people
 * expect "if ( LA(1)==X ) match(X);" and that's it.
 */
dfaOptionalBlockState(k,edges,eotPredictsAlt,description,stateNumber,semPredState) ::= <<
int LA<decisionNumber>_<k> = input.LA(<k>);<\n>
<edges; separator="\nelse ">
>>

```

```

/** A DFA state that is actually the loopback decision of a closure
 * loop. If end-of-token (EOT) predicts any of the targets then it
 * should act like a default clause (i.e., no error can be generated).
 * This is used only in the lexer so that for ('a')* on the end of a rule
 * anything other than 'a' predicts exiting.
 */
dfaLoopbackState(k,edges,eotPredictsAlt,description,stateNumber,semPredState) ::= <<
int LA<decisionNumber>_<k> = input.LA(<k>);<\n>
<edges; separator="\nelse "><\n>
<if(eotPredictsAlt)>
<if(!edges)>
alt<decisionNumber> = <eotPredictsAlt>;<! if no edges, don't gen ELSE !>
<else>
else
{
alt<decisionNumber> = <eotPredictsAlt>;
}<\n>
<endif>
<endif>
>>

```

```

/** An accept state indicates a unique alternative has been predicted */

```



```
dfaAcceptState(alt) ::= "alt<decisionNumber> = <alt>";
```

```
/** A simple edge with an expression. If the expression is satisfied,  
 * enter to the target state. To handle gated productions, we may  
 * have to evaluate some predicates for this edge.  
 */
```

```
dfaEdge(labelExpr, targetState, predicates) ::= <<  
if ((<labelExpr><if(predicates)> && (<predicates><endif>)  
{  
  <targetState>  
}  
>>
```

```
// F i x e d D F A (switch case)
```

```
/** A DFA state where a SWITCH may be generated. The code generator  
 * decides if this is possible: CodeGenerator.canGenerateSwitch().  
 */
```

```
dfaStateSwitch(k,edges,eotPredictsAlt,description,stateNumber,semPredState) ::= <<  
switch (input.LA(<k>))  
{  
  <edges; separator="\n">  
  default:  
  <if(eotPredictsAlt)>  
    alt<decisionNumber>=<eotPredictsAlt>;  
    break;<\n>  
  <else>  
  {  
    <ruleBacktrackFailure()>  
    NoViableAltException nvae = new NoViableAltException("<description>", <decisionNumber>, <stateNumber>,  
input, <k>);  
    DebugRecognitionException(nvae);  
    <@noViableAltException()>  
    throw nvae;  
  }  
  <endif>  
}<\n>  
>>
```

```
dfaOptionalBlockStateSwitch(k,edges,eotPredictsAlt,description,stateNumber,semPredState) ::= <<  
switch (input.LA(<k>))  
{  
  <edges; separator="\n">  
}<\n>  
>>
```

```
dfaLoopbackStateSwitch(k, edges,eotPredictsAlt,description,stateNumber,semPredState) ::= <<  
switch (input.LA(<k>))
```

```

{
<edges; separator="\n">
<if(eotPredictsAlt)>
default:
alt<decisionNumber>=<eotPredictsAlt>;
break;<\n>
<endif>
}<\n>
>>

dfaEdgeSwitch(labels, targetState) ::= <<
<labels: {it|case <it>:}; separator="\n">
{
<targetState>
}
break;
>>

// C y c l i c D F A

/** The code to initiate execution of a cyclic DFA; this is used
 * in the rule to predict an alt just like the fixed DFA case.
 * The <name> attribute is inherited via the parser, lexer, ...
 */
dfaDecision(decisionNumber,description) ::= <<
try
{
alt<decisionNumber> = dfa<decisionNumber>.Predict(input);
}
catch (NoViableAltException nvae)
{
DebugRecognitionException(nvae);
throw;
}
>>

/* Dump DFA tables as run-length-encoded Strings of octal values.
 * Can't use hex as compiler translates them before compilation.
 * These strings are split into multiple, concatenated strings.
 * Java puts them back together at compile time thankfully.
 * Java cannot handle large static arrays, so we're stuck with this
 * encode/decode approach. See analysis and runtime DFA for
 * the encoding methods.
 */
cyclicDFA(dfa) ::= <<
private class DFA<dfa.decisionNumber> : DFA
{
private const string DFA<dfa.decisionNumber>_eotS =

```

```

"<dfa.javaCompressedEOT; wrap="\n\t\>";
private const string DFA<dfa.decisionNumber>_eofS =
"<dfa.javaCompressedEOF; wrap="\n\t\>";
private const string DFA<dfa.decisionNumber>_minS =
"<dfa.javaCompressedMin; wrap="\n\t\>";
private const string DFA<dfa.decisionNumber>_maxS =
"<dfa.javaCompressedMax; wrap="\n\t\>";
private const string DFA<dfa.decisionNumber>_acceptS =
"<dfa.javaCompressedAccept; wrap="\n\t\>";
private const string DFA<dfa.decisionNumber>_specialS =
"<dfa.javaCompressedSpecial; wrap="\n\t\>>";
private static readonly string[] DFA<dfa.decisionNumber>_transitionS =
{
    <dfa.javaCompressedTransition: {s|<s; wrap="\n\t\>"; separator=",\n">
};

private static readonly short[] DFA<dfa.decisionNumber>_eot =
DFA.UnpackEncodedString(DFA<dfa.decisionNumber>_eotS);
private static readonly short[] DFA<dfa.decisionNumber>_eof =
DFA.UnpackEncodedString(DFA<dfa.decisionNumber>_eofS);
private static readonly char[] DFA<dfa.decisionNumber>_min =
DFA.UnpackEncodedStringToUnsignedChars(DFA<dfa.decisionNumber>_minS);
private static readonly char[] DFA<dfa.decisionNumber>_max =
DFA.UnpackEncodedStringToUnsignedChars(DFA<dfa.decisionNumber>_maxS);
private static readonly short[] DFA<dfa.decisionNumber>_accept =
DFA.UnpackEncodedString(DFA<dfa.decisionNumber>_acceptS);
private static readonly short[] DFA<dfa.decisionNumber>_special =
DFA.UnpackEncodedString(DFA<dfa.decisionNumber>_specialS);
private static readonly short[][] DFA<dfa.decisionNumber>_transition;

static DFA<dfa.decisionNumber>()
{
    int numStates = DFA<dfa.decisionNumber>_transitionS.Length;
    DFA<dfa.decisionNumber>_transition = new short[numStates][];
    for ( int i=0; i < numStates; i++ )
    {
        DFA<dfa.decisionNumber>_transition[i] =
DFA.UnpackEncodedString(DFA<dfa.decisionNumber>_transitionS[i]);
    }
}

public DFA<dfa.decisionNumber>( BaseRecognizer recognizer<if(dfa.specialStateSTs)>,
SpecialStateTransitionHandler specialStateTransition<endif> )
<if(dfa.specialStateSTs)>
    : base(specialStateTransition)
<endif>
{
    this.recognizer = recognizer;
}

```

```

this.decisionNumber = <dfa.decisionNumber>;
this.eot = DFA<dfa.decisionNumber>_eot;
this.eof = DFA<dfa.decisionNumber>_eof;
this.min = DFA<dfa.decisionNumber>_min;
this.max = DFA<dfa.decisionNumber>_max;
this.accept = DFA<dfa.decisionNumber>_accept;
this.special = DFA<dfa.decisionNumber>_special;
this.transition = DFA<dfa.decisionNumber>_transition;
}

public override string Description { get { return "<dfa.description>"; } }

public override void Error(NoViableAltException nvae)
{
    DebugRecognitionException(nvae);
}
}<\n>
<if(dfa.specialStateSTs)>
private int SpecialStateTransition<dfa.decisionNumber>(DFA dfa, int s, IIntStream _input)<! throws
NoViableAltException!>
{
    <if(LEXER)>
    IIntStream input = _input;
    <endif>
    <if(PARSER)>
    ITokenStream input = (ITokenStream)_input;
    <endif>
    <if(TREE_PARSER)>
    ITreeNodeStream input = (ITreeNodeStream)_input;
    <endif>
    int _s = s;
    s = -1;
    <! pull these outside the switch cases to save space on locals !>
    int LA<dfa.decisionNumber>_1 = input.LA(1);
    int index<dfa.decisionNumber>_1 = input.Index;
    switch (_s)
    {
        <dfa.specialStateSTs: {state |case <i0>:<! compressed special state numbers 0..n-1 !>
        <state>}; separator="\n">

        default:
            break;
    }

    if (s >= 0)
        return s;

    <if(backtracking)>

```

```

if (state.backtracking > 0) {state.failed=true; return -1;}
<endif>
NoViableAltException nvae = new NoViableAltException(dfa.Description, <dfa.decisionNumber>, _s, input);
dfa.Error(nvae);
throw nvae;
}
<endif>
>>

/** A state in a cyclic DFA; it's a special state and part of a big switch on
 * state.
 */
cyclicDFAState(decisionNumber,stateNumber,edges,needErrorClause,semPredState) ::= <<
{
<if(semPredState)>
<! get next lookahead symbol to test edges, then rewind !>
input.Rewind();
<endif>
<edges; separator="\nelse ">
<if(semPredState)>
<! return input cursor to state before we rewound !>
input.Seek(index<decisionNumber>_1);
<endif>
break;
}
>>

/** Just like a fixed DFA edge, test the lookahead and indicate what
 * state to jump to next if successful.
 */
cyclicDFAEdge(labelExpr, targetStateNumber, edgeNumber, predicates) ::= <<
if ((<labelExpr><if(predicates)> && (<predicates><endif>)) {s = <targetStateNumber>;}<\n>
>>

/** An edge pointing at end-of-token; essentially matches any char;
 * always jump to the target.
 */
eotDFAEdge(targetStateNumber,edgeNumber, predicates) ::= <<
s = <targetStateNumber>;<\n>
>>

// D F A E X P R E S S I O N S

andPredicates(left,right) ::= "(<left>&&<right>)"

orPredicates(operands) ::= "(<operands; separator=\\|\\>)"

```

```

notPredicate(pred) ::= "!(<evalPredicate(...)>)"

evalPredicate(pred,description) ::= "<pred>"

evalSynPredicate(pred,description) ::= "EvaluatePredicate(<pred>_fragment)"

lookaheadTest(atom,k,atomAsInt) ::= "LA<decisionNumber>_<k>===<atom>"

/** Sometimes a lookahead test cannot assume that LA(k) is in a temp variable
 * somewhere. Must ask for the lookahead directly.
 */
isolatedLookaheadTest(atom,k,atomAsInt) ::= "input.LA(<k>)==<atom>"

lookaheadRangeTest(lower,upper,k,rangeNumber,lowerAsInt,upperAsInt) ::= <%
(LA<decisionNumber>_<k><ge()><lower> && LA<decisionNumber>_<k><le()><upper>)
%>

isolatedLookaheadRangeTest(lower,upper,k,rangeNumber,lowerAsInt,upperAsInt) ::=
"(input.LA(<k><ge()><lower> && input.LA(<k><le()><upper>))"

le() ::= "\<="
ge() ::= ">="

setTest(ranges) ::= <<
<ranges; separator="|">
>>

// A T T R I B U T E S

attributeScope(scope) ::= <<
<if(scope)>
<if(scope.attributes)>
protected sealed partial class <scope.name>_scope
{
<scope.attributes:{ it|public <it.decl>;}; separator="\n">
}
<if(scope.actions.scopeinit)>
protected void <scope.name>_scopeInit( <scope.name>_scope scope )
{
<scope.actions.scopeinit>
}
<else>
protected virtual void <scope.name>_scopeInit( <scope.name>_scope scope ) { }
<endif>
<if(scope.actions.scopeafter)>
protected void <scope.name>_scopeAfter( <scope.name>_scope scope )
{
<scope.actions.scopeafter>
}
}

```

```

}
<else>
protected virtual void <scope.name>_scopeAfter( <scope.name>_scope scope ) {}
<endif>
protected readonly ListStack\<<scope.name>_scope> <scope.name>_stack = new
ListStack\<<scope.name>_scope>();
<endif>
<endif>
>>

globalAttributeScope(scope) ::= <<
<attributeScope(...)>
>>

ruleAttributeScope(scope) ::= <<
<attributeScope(...)>
>>

returnStructName(it) ::= "<it.name>_return"

returnType(ruleDescriptor) ::= <%
<if(ruleDescriptor.returnScope.attributes && ruleDescriptor.hasMultipleReturnValues)>
<ruleDescriptor.grammar.recognizerName>.<ruleDescriptor:returnStructName()>
<elseif(ruleDescriptor.hasMultipleReturnValues)>
<ruleReturnBaseType()>
<elseif(ruleDescriptor.hasSingleReturnValue)>
<ruleDescriptor.singleValueReturnType>
<else>
void
<endif>
%>

/** Generate the C# type associated with a single or multiple return
 * values.
 */
ruleLabelType(referencedRule) ::= <%
<if(referencedRule.hasMultipleReturnValues)>
<ruleReturnBaseType()>
<elseif(referencedRule.hasSingleReturnValue)>
<referencedRule.singleValueReturnType>
<else>
void
<endif>
%>

delegateName(it) ::= <<
<if(it.label)><it.label><else>g<it.name><endif>
>>

```

```

/** Using a type to init value map, try to init a type; if not in table
 * must be an object, default value is "null".
 */
initValue(typeName) ::= <<
default(<typeName>)
>>

/** Define a rule label including default value */
ruleLabelDef(label) ::= <%
<ruleLabelType(referencedRule=label.referencedRule)> <label.label.text> =
<initValue(typeName=ruleLabelType(referencedRule=label.referencedRule))>;
%>

/** Define a return struct for a rule if the code needs to access its
 * start/stop tokens, tree stuff, attributes, ... Leave a hole for
 * subgroups to stick in members.
 */
returnScope(scope) ::= <<
<if(scope.attributes && ruleDescriptor.hasMultipleReturnValues)>
<returnScopeModifier(grammar=grammar,ruleDescriptor=ruleDescriptor)> sealed partial class
<ruleDescriptor:returnStructName()> : <ruleReturnBaseType()><@ruleReturnInterfaces()>
{
<scope.attributes: {it|public <it.decl>;}; separator="\n">
<@ruleReturnMembers()>
}
<endif>
>>

ruleReturnBaseType() ::= <%
<if(TREE_PARSER)>Tree<else>Parser<endif>RuleReturnScope\<<labelType>>
%>

@returnScope.ruleReturnMembers() ::= <<
>>

parameterScope(scope) ::= <<
<scope.attributes: {it|<it.decl>;}; separator=", ">
>>

parameterAttributeRef(attr) ::= <<
<attr.name; format="id">
>>

parameterSetAttributeRef(attr,expr) ::= <<
<attr.name; format="id"> =<expr>;
>>

```



```

scopeAttributeRef(scope,attr,index,negIndex) ::= <%
<if(negIndex)>
<scope>_stack[<scope>_stack.Count - <negIndex> - 1].<attr.name; format="id">
<else>
<if(index)>
<scope>_stack[<index>].<attr.name; format="id">
<else>
<scope>_stack.Peek().<attr.name; format="id">
<endif>
<endif>
%>

```

```

scopeSetAttributeRef(scope,attr,expr,index,negIndex) ::= <%
<if(negIndex)>
<scope>_stack[<scope>_stack.Count - <negIndex> - 1].<attr.name; format="id"> = <expr>;
<else>
<if(index)>
<scope>_stack[<index>].<attr.name; format="id"> = <expr>;
<else>
<scope>_stack.Peek().<attr.name; format="id"> = <expr>;
<endif>
<endif>
%>

```

```

/** $x is either global scope or x is rule with dynamic scope; refers
 * to stack itself not top of stack. This is useful for predicates
 * like {$function.Count>0 && $function::name.Equals("foo")}?
 */
isolatedDynamicScopeRef(scope) ::= "<scope>_stack"

```

```

/** reference an attribute of rule; might only have single return value */
ruleLabelRef(referencedRule,scope,attr) ::= <%
<if(referencedRule.hasMultipleReturnValues)>
(<scope>!=null?(<<returnType(referencedRule)>><scope>).<attr.name; format="id">:<initValue(attr.type)>)
<else>
<scope>
<endif>
%>

```

```

returnAttributeRef(ruleDescriptor,attr) ::= <%
<if(ruleDescriptor.hasMultipleReturnValues)>
retval.<attr.name; format="id">
<else>
<attr.name; format="id">
<endif>
%>

```

```

returnSetAttributeRef(ruleDescriptor,attr,expr) ::= <%

```

```

<if(ruleDescriptor.hasMultipleReturnValues)>
retval.<attr.name; format="id"> =<expr>;
<else>
<attr.name; format="id"> =<expr>;
<endif>
%>

/** How to translate $tokenLabel */
tokenLabelRef(label) ::= "<label>"

/** ids+=ID {$ids} or e+=expr {$e} */
listLabelRef(label) ::= "list_<label>"

// not sure the next are the right approach

tokenLabelPropertyRef_text(scope,attr) ::= "(<scope>!=null?<scope>.Text:default(string))"
tokenLabelPropertyRef_type(scope,attr) ::= "(<scope>!=null?<scope>.Type:0)"
tokenLabelPropertyRef_line(scope,attr) ::= "(<scope>!=null?<scope>.Line:0)"
tokenLabelPropertyRef_pos(scope,attr) ::= "(<scope>!=null?<scope>.CharPositionInLine:0)"
tokenLabelPropertyRef_channel(scope,attr) ::= "(<scope>!=null?<scope>.Channel:0)"
tokenLabelPropertyRef_index(scope,attr) ::= "(<scope>!=null?<scope>.TokenIndex:0)"
tokenLabelPropertyRef_tree(scope,attr) ::= "<scope>_tree"
tokenLabelPropertyRef_int(scope,attr) ::= "(<scope>!=null?int.Parse(<scope>.Text):0)"

ruleLabelPropertyRef_start(scope,attr) ::= "(<scope>!=null?((<labelType><scope>.Start):default(<labelType>))"
ruleLabelPropertyRef_stop(scope,attr) ::= "(<scope>!=null?((<labelType><scope>.Stop):default(<labelType>))"
ruleLabelPropertyRef_tree(scope,attr) ::=
"(<scope>!=null?((<ASTLabelType><scope>.Tree):default(<ASTLabelType>))"
ruleLabelPropertyRef_text(scope,attr) ::= <%
<if(TREE_PARSER)>
(<scope>!=null?(input.TokenStream.ToString(
input.TreeAdaptor.GetTokenStartIndex(<scope>.Start),
input.TreeAdaptor.GetTokenStopIndex(<scope>.Start))):default(string))
<else>
(<scope>!=null?input.ToString(<scope>.Start,<scope>.Stop):default(string))
<endif>
%>

ruleLabelPropertyRef_st(scope,attr) ::= "(<scope>!=null?<scope>.Template:null)"

/** Isolated $RULE ref ok in lexer as it's a Token */
lexerRuleLabel(label) ::= "<label>"

lexerRuleLabelPropertyRef_type(scope,attr) ::=
"(<scope>!=null?<scope>.Type:0)"

lexerRuleLabelPropertyRef_line(scope,attr) ::=

```

```

"(<scope>!=null?<scope>.Line:0)"

lexerRuleLabelPropertyRef_pos(scope,attr) ::=
"(<scope>!=null?<scope>.CharPositionInLine:-1)"

lexerRuleLabelPropertyRef_channel(scope,attr) ::=
"(<scope>!=null?<scope>.Channel:0)"

lexerRuleLabelPropertyRef_index(scope,attr) ::=
"(<scope>!=null?<scope>.TokenIndex:0)"

lexerRuleLabelPropertyRef_text(scope,attr) ::=
"(<scope>!=null?<scope>.Text:default(string))"

lexerRuleLabelPropertyRef_int(scope,attr) ::=
"(<scope>!=null?int.Parse(<scope>.Text):0)"

// Somebody may ref $template or $tree or $stop within a rule:
rulePropertyRef_start(scope,attr) ::= "retval.Start"
rulePropertyRef_stop(scope,attr) ::= "retval.Stop"
rulePropertyRef_tree(scope,attr) ::= "retval.Tree"
rulePropertyRef_text(scope,attr) ::= <%
<if(TREE_PARSER)>
input.TokenStream.ToString(
input.TreeAdaptor.GetTokenStartIndex(retval.Start),
input.TreeAdaptor.GetTokenStopIndex(retval.Start))
<else>
input.ToString(retval.Start,input.LT(-1))
<endif>
%>
rulePropertyRef_st(scope,attr) ::= "retval.Template"

lexerRulePropertyRef_text(scope,attr) ::= "Text"
lexerRulePropertyRef_type(scope,attr) ::= "_type"
lexerRulePropertyRef_line(scope,attr) ::= "state.tokenStartLine"
lexerRulePropertyRef_pos(scope,attr) ::= "state.tokenStartCharPositionInLine"
lexerRulePropertyRef_index(scope,attr) ::= "-1" // undefined token index in lexer
lexerRulePropertyRef_channel(scope,attr) ::= "_channel"
lexerRulePropertyRef_start(scope,attr) ::= "state.tokenStartCharIndex"
lexerRulePropertyRef_stop(scope,attr) ::= "(CharIndex-1)"
lexerRulePropertyRef_int(scope,attr) ::= "int.Parse(<scope>.Text)"

// setting $st and $tree is allowed in local rule. everything else
// is flagged as error
ruleSetPropertyRef_tree(scope,attr,expr) ::= "retval.Tree = <expr>;"
ruleSetPropertyRef_st(scope,attr,expr) ::= "retval.Template =<expr>;"

/** How to execute an action (only when not backtracking) */

```

```

execAction(action) ::= <%
<if(backtracking)>
if (<actions.(actionScope).synpredgate><\n>
{<\n>
<@indentedAction()><\n>
}
<else>
<action>
<endif>
%>

@execAction.indentedAction() ::= <<
<action>
>>

/** How to always execute an action even when backtracking */
execForcedAction(action) ::= "<action>"

// M I S C (properties, etc...)

bitset(name, words64) ::= <<
public static readonly BitSet <name> = new BitSet(new ulong[] { <words64: {it|<it>UL}; separator="," > });
>>

codeFileExtension() ::= ".cs"

true_value() ::= "true"
false_value() ::= "false"

isTrue ::= [
"true" : true,
default : false
]

Found in path(s):
* /opt/cola/permits/1274703855_1645234694.1/0/antlr-3-5-2-sources-
jar/org/antlr/codegen/templates/CSharp2/CSharp2.stg

```

1.24 guava 31.1-jre

1.24.1 Available under license :

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* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
jar/com/google/common/collect/SortedMultiset.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
jar/com/google/common/collect/SortedMultisets.java
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jar/com/google/common/base/Strings.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
jar/com/google/common/base/Ascii.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
jar/com/google/common/primitives/package-info.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
jar/com/google/common/annotations/Beta.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
jar/com/google/common/net/package-info.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
jar/com/google/common/collect/ContiguousSet.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-

jar/com/google/common/collect/SortedLists.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
jar/com/google/common/util/concurrent/ListeningExecutorService.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
jar/com/google/common/util/concurrent/UncaughtExceptionHandler.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
jar/com/google/common/base/Equivalence.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
jar/com/google/common/util/concurrent/ThreadFactoryBuilder.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
jar/com/google/common/util/concurrent/ForwardingBlockingQueue.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
jar/com/google/common/util/concurrent/Atomics.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
jar/com/google/common/util/concurrent/Monitor.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
jar/com/google/common/annotations/package-info.java
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*/
/**
* Not supported. You are attempting to create a map that may contain a non-{@code Comparable}
* key. Proper calls will resolve to the version in {@code ImmutableSortedMap}, not this dummy
* version.
*
* @throws UnsupportedOperationException always
* @deprecated Pass a key of type {@code Comparable} to use {@link

* ImmutableSortedMap#of(Comparable, Object)}.

*/

Found in path(s):

* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/ImmutableSortedMapFauxverideShim.java

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* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/hash/Java8Compatibility.java

* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/math/BigDecimalMath.java

* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/base/Java8Compatibility.java

* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/util/concurrent/OverflowAvoidingLockSupport.java

* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/io/Java8Compatibility.java

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* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/io/CharSequenceReader.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/util/concurrent/WrappingScheduledExecutorService.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/reflect/TypeVisitor.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/FilteredMultimapValues.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/thirdparty/publicsuffix/PublicSuffixType.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/AbstractTable.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/base/VerifyException.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/eventbus/SubscriberExceptionHandler.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/eventbus/SubscriberExceptionContext.java
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* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/hash/HashingInputStream.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/util/concurrent/Runnables.java

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* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/util/concurrent/SimpleTimeLimiter.java

* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/escape/CharEscaper.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/util/concurrent/GwtFuturesCatchingSpecialization.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/io/AppendableWriter.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/base/CaseFormat.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/util/concurrent/TimeoutFuture.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/annotations/VisibleForTesting.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/util/concurrent/FluentFuture.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/util/concurrent/AbstractTransformFuture.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/util/concurrent/UncheckedTimeoutException.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/util/concurrent/TimeLimiter.java
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* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/escape/CharEscaperBuilder.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/util/concurrent/GwtFluentFutureCatchingSpecialization.java
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* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/util/concurrent/AbstractCatchingFuture.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/util/concurrent/ImmediateFuture.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/util/concurrent/FakeTimeLimiter.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/util/concurrent/Futures.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/io/PatternFilenameFilter.java

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* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/ForwardingSortedSetMultimap.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/ForwardingImmutableCollection.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/RowSortedTable.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/ForwardingSetMultimap.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/AbstractSequentialIterator.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/UnmodifiableListIterator.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/ForwardingListMultimap.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/MinMaxPriorityQueue.java
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jar/com/google/common/collect/ImmutableSortedAsList.java

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* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/io/MoreFiles.java

* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/ImmutableMapEntry.java

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* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/util/concurrent/ParametricNullness.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/hash/ParametricNullness.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/eventbus/ParametricNullness.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/math/ElementTypesAreNonnullByDefault.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/xml/ParametricNullness.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/net/ElementTypesAreNonnullByDefault.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/eventbus/ElementTypesAreNonnullByDefault.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/primitives/ParametricNullness.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/reflect/ElementTypesAreNonnullByDefault.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/hash/ElementTypesAreNonnullByDefault.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/escape/ParametricNullness.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/cache/ParametricNullness.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/io/ParametricNullness.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/primitives/ElementTypesAreNonnullByDefault.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/graph/ParametricNullness.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/math/ParametricNullness.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/net/ParametricNullness.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/ElementTypesAreNonnullByDefault.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/io/ElementTypesAreNonnullByDefault.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/graph/ElementTypesAreNonnullByDefault.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/util/concurrent/ElementTypesAreNonnullByDefault.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/ParametricNullness.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/escape/ElementTypesAreNonnullByDefault.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/cache/ElementTypesAreNonnullByDefault.java

* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/xml/ElementTypesAreNonnullByDefault.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/reflect/ParametricNullness.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/html/ParametricNullness.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/base/ElementTypesAreNonnullByDefault.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/base/ParametricNullness.java

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* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/primitives/Booleans.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/FluentIterable.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/base/Joiner.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/primitives/Shorts.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/base/Stopwatch.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/primitives/Floats.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/thirdparty/publicsuffix/TrieParser.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/base/CharMatcher.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/util/concurrent/ListenableFutureTask.java

* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/primitives/Ints.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/base/Converter.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/primitives/Longs.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/util/concurrent/SequentialExecutor.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/net/InetAddresses.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/primitives/Doubles.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/escape/Escaper.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/net/PercentEscaper.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/base/internal/Finalizer.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/primitives/Chars.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/escape/UnicodeEscaper.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/io/FileBackedOutputStream.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/io/MultiReader.java

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```
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
jar/com/google/common/base/JdkPattern.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
jar/com/google/common/base/CommonMatcher.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
jar/com/google/common/base/CommonPattern.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
jar/com/google/common/base/PatternCompiler.java
```

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```
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
jar/com/google/common/math/Quantiles.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
jar/com/google/common/eventbus/SubscriberRegistry.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
jar/com/google/common/base/MoreObjects.java
```

* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/eventbus/Subscriber.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/util/concurrent/TrustedListenableFutureTask.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/eventbus/Dispatcher.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/util/concurrent/ListenerCallQueue.java

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*

* As of 2010/06/11, this method is identical to the (package private) hash method in OpenJDK 7's
* `java.util.HashMap` class.

*/

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* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/util/concurrent/Striped.java

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- * /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/AbstractRangeSet.java
- * /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/GeneralRange.java
- * /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/ForwardingSortedMultiset.java
- * /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/ImmutableSortedMultisetFauxverideShim.java
- * /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/RegularImmutableSortedMultiset.java
- * /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/ImmutableSortedMultiset.java
- * /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/SortedIterables.java
- * /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/SortedIterable.java
- * /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/RangeSet.java
- * /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/Count.java

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- * /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/graph/package-info.java
- * /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-

jar/com/google/common/collect/CollectSpliterators.java

* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-

jar/com/google/common/collect/ImmutableBiMapFauxverideShim.java

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jar/com/google/common/collect/AbstractBiMap.java

* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-

jar/com/google/common/collect/SetMultimap.java

* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-

jar/com/google/common/collect/ImmutableSet.java

* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-

jar/com/google/common/collect/ForwardingMultimap.java

* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-

jar/com/google/common/collect/ForwardingCollection.java

* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-

jar/com/google/common/collect/ForwardingMapEntry.java

* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-

jar/com/google/common/collect/Multimap.java

* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-

jar/com/google/common/collect/TreeMultimap.java

* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-

jar/com/google/common/collect/ReverseOrdering.java

* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-

jar/com/google/common/collect/ForwardingIterator.java

* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-

jar/com/google/common/collect/LinkedHashMultimap.java

* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-

jar/com/google/common/collect/ForwardingMap.java

* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-

jar/com/google/common/collect/ReverseNaturalOrdering.java

* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/NullsFirstOrdering.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/AbstractIterator.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/AbstractMapEntry.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/MutableClassToInstanceMap.java
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* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/Multisets.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/ArrayListMultimap.java
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* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/MapDifference.java
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* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/Iterables.java
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* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/ForwardingListIterator.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/Iterators.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/ComparatorOrdering.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/UsingToStringOrdering.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/ForwardingMultiset.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/AbstractListMultimap.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/ForwardingConcurrentMap.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/SortedSetMultimap.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/Multimaps.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/ForwardingList.java

* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/Synchronized.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/package-info.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/Lists.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/TreeMultiset.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/AbstractSetMultimap.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/AbstractMultiset.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/CompoundOrdering.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/ConcurrentHashMultiset.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/ListMultimap.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/RegularImmutableSet.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/SingletonImmutableSet.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/ByFunctionOrdering.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/EnumBiMap.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/AbstractMapBasedMultimap.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/ForwardingObject.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/AbstractSortedSetMultimap.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/HashMultimap.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/ImmutableList.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/Maps.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/ClassToInstanceMap.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/ExplicitOrdering.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/Interner.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/EnumHashBiMap.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/ForwardingSortedSet.java

* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/LinkedListMultimap.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/ForwardingSortedMap.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/Multiset.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/HashMultiset.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/ForwardingSet.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/NaturalOrdering.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/LinkedHashMultiset.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/ForwardingQueue.java

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*/
/*
* This method was rewritten in Java from an intermediate step of the Murmur hash function in
* http://code.google.com/p/smhasher/source/browse/trunk/MurmurHash3.cpp, which contained the
* following header:
*
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* hereby disclaims copyright to this source code.
*/
```

Found in path(s):

```
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
jar/com/google/common/collect/Hashing.java
```

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*/
/**
* Holder for web specializations of methods of { @code Ints }. Intended to be empty for regular
* version.
*/
```

Found in path(s):

```
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
jar/com/google/common/primitives/IntsMethodsForWeb.java
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* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/util/concurrent/AtomicLongMap.java
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* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/graph/AbstractBaseGraph.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/graph/Traverser.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/util/concurrent/ClosingFuture.java
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* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/CompactHashing.java

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* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/io/LittleEndianDataInputStream.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/base/FinalizablePhantomReference.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/eventbus/EventBus.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/base/FinalizableReferenceQueue.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-

jar/com/google/common/eventbus/package-info.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
jar/com/google/common/eventbus/AllowConcurrentEvents.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
jar/com/google/common/io/Files.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
jar/com/google/common/base/Defaults.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
jar/com/google/common/base/Throwables.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
jar/com/google/common/io/CountingOutputStream.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
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* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
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* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
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jar/com/google/common/util/concurrent/AbstractFuture.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
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* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
jar/com/google/common/eventbus/AsyncEventBus.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
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* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
jar/com/google/common/base/Predicate.java
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jar/com/google/common/base/Objects.java
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* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
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* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
jar/com/google/common/util/concurrent/ExecutionList.java
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* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
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* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
jar/com/google/common/collect/Interners.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
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* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
jar/com/google/common/base/Predicates.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
jar/com/google/common/eventbus/Subscribe.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
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* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
jar/com/google/common/util/concurrent/package-info.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
jar/com/google/common/io/Closeables.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
jar/com/google/common/base/Suppliers.java

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/**
* Holder for web specializations of methods of { @code Floats }. Intended to be empty for regular
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*/

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* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
jar/com/google/common/collect/RegularImmutableBiMap.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
jar/com/google/common/collect/Table.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
jar/com/google/common/collect/ImmutableCollection.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
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* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
jar/com/google/common/collect/UnmodifiableIterator.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
jar/com/google/common/collect/TreeBasedTable.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
jar/com/google/common/collect/Tables.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
jar/com/google/common/collect/EmptyImmutableListMultimap.java

* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/ImmutableMapKeySet.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/StandardTable.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/SingletonImmutableBiMap.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/ImmutableListMultimap.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/thirdparty/publicsuffix/PublicSuffixPatterns.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/Platform.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/PeekingIterator.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/Collections2.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/ImmutableEntry.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/ImmutableMapEntrySet.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/HashBasedTable.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/ImmutableSortedSet.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/ImmutableBiMap.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/ImmutableMapValues.java
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* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/StandardRowSortedTable.java
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- * /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/hash/LongAdder.java
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- * /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/ArrayTable.java
- * /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/RegularImmutableSortedSet.java
- * /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/SingletonImmutableTable.java
- * /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/TableCollectors.java
- * /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/ImmutableSortedSetFauxverideShim.java
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* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/RegularImmutableList.java
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* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/io/Closer.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/util/concurrent/ListenableScheduledFuture.java
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* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/util/concurrent/SmoothRateLimiter.java
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* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/graph/StandardValueGraph.java
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* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/RegularContiguousSet.java
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*/

/*

* This following method is a modified version of one found in

* <http://gee.cs.oswego.edu/cgi-bin/viewcvs.cgi/jsr166/src/test/tck/AbstractExecutorServiceTest.java?revision=1.30>

* which contained the following notice:

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*/

Found in path(s):

* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-

jar/com/google/common/util/concurrent/MoreExecutors.java

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*/

/**

* Holder for extra methods of { @code Objects } only in web. Intended to be empty for regular

* version.

*/

Found in path(s):

* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-

jar/com/google/common/base/ExtraObjectsMethodsForWeb.java

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* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/TransformedListIterator.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/AllEqualOrdering.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/UnmodifiableSortedMultiset.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/ImmutableEnumMap.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/RangeMap.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/FilteredKeyListMultimap.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/EvictingQueue.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/ForwardingNavigableSet.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/ForwardingImmutableList.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/FilteredMultimap.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/FilteredSetMultimap.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/TreeTraverser.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/TreeRangeMap.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/FilteredEntrySetMultimap.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/CompactLinkedHashSet.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/FilteredEntryMultimap.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/ForwardingNavigableMap.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/CompactLinkedHashMap.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-

jar/com/google/common/collect/DescendingMultiset.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
jar/com/google/common/collect/FilteredKeySetMultimap.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
jar/com/google/common/collect/ForwardingBlockingDeque.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
jar/com/google/common/collect/AbstractNavigableMap.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
jar/com/google/common/collect/ForwardingDeque.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
jar/com/google/common/collect/TransformedIterator.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
jar/com/google/common/collect/ForwardingImmutableSet.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
jar/com/google/common/collect/AbstractMultimap.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
jar/com/google/common/collect/CompactHashSet.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
jar/com/google/common/collect/SortedMultisetBridge.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
jar/com/google/common/collect/CompactHashMap.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
jar/com/google/common/collect/RegularImmutableAsList.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
jar/com/google/common/collect/ForwardingImmutableMap.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
jar/com/google/common/collect/AbstractSortedKeySortedSetMultimap.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
jar/com/google/common/util/concurrent/ForwardingBlockingDeque.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
jar/com/google/common/collect/DescendingImmutableSortedSet.java
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Found in path(s):

```
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
jar/com/google/common/hash/ImmutableSupplier.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
jar/com/google/common/collect/JdkBackedImmutableMultiset.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
jar/com/google/common/util/concurrent/ExecutionSequencer.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
jar/com/google/common/collect/JdkBackedImmutableSet.java
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*/

/**

* Holder for web specializations of methods of { @code Shorts }. Intended to be empty for regular
* version.

*/

Found in path(s):

```
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
jar/com/google/common/primitives/ShortsMethodsForWeb.java
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* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/IndexedImmutableSet.java

* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/JdkBackedImmutableBiMap.java

* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/BaseImmutableMultimap.java

* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/JdkBackedImmutableMap.java

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*/

/**

* Outer class that exists solely to let us write { @code Partially.GwtIncompatible } instead of plain
* { @code GwtIncompatible }. This is more accurate for { @link Futures#catching }, which is available
* under GWT but with a slightly different signature.

*

* <p>We can't use { @code PartiallyGwtIncompatible } because then the GWT compiler wouldn't recognize
* it as a { @code GwtIncompatible } annotation. And for { @code Futures.catching }, we need the GWT
* compiler to autostrip the normal server method in order to expose the special, inherited GWT
* version.

*/

Found in path(s):

* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/util/concurrent/Partially.java

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*/
/**
* Holder for web specializations of methods of { @code Doubles }. Intended to be empty for regular
* version.
*/
```

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```
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
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```
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
jar/com/google/common/primitives/ImmutableDoubleArray.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
jar/com/google/common/hash/AbstractHashFunction.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
jar/com/google/common/util/concurrent/ForwardingCondition.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
jar/com/google/common/primitives/ImmutableIntArray.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
jar/com/google/common/primitives/ImmutableLongArray.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
jar/com/google/common/util/concurrent/ForwardingLock.java
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```

```
*/
```

```
/**
```

```
 * Returns an array containing all of the elements in the specified collection. This method
 * returns the elements in the order they are returned by the collection's iterator. The returned
 * array is "safe" in that no references to it are maintained by the collection. The caller is
 * thus free to modify the returned array.
 *
 * <p>This method assumes that the collection size doesn't change while the method is running.
 *
 * <p>TODO(kevinb): support concurrently modified collections?
 *
 * @param c the collection for which to return an array of elements
 */
```

Found in path(s):

```
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-
jar/com/google/common/collect/ObjectArrays.java
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*/

Found in path(s):

* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/hash/FarmHashFingerprint64.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/util/concurrent/AsyncCallable.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/io/ReaderInputStream.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/util/concurrent/AggregateFutureState.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/hash/MacHashFunction.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/util/concurrent/CombinedFuture.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/util/concurrent/InterruptibleTask.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/hash/LittleEndianByteArray.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/util/concurrent/Platform.java
* /opt/cola/permits/1331474186_1653068600.1248574/0/guava-31-1-jre-sources-3-jar/com/google/common/collect/ConsumingQueueIterator.java

1.25 launchdarkly-sdk-for-java 5.7.1

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src/test/org/apache/commons/codec/language/DoubleMetaphoneTest.java

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1.26 jackson-databind 2.13.4.2

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1.27 apache-httpcomponents-core 4.4.13

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1.29 io-projectreactor 3.4.23

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1.31 metrics-health-checks 4.0.5

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1.32 metrics-integration-for-apache- httpasyncclient 4.0.5

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Manifest-Version: 1.0

Bnd-LastModified: 1545937994519

Build-Jdk: 1.8.0_191

Built-By: artem

Bundle-Description: An Apache HttpAsyncClient wrapper providing Metric
s instrumentation of connection pools, request durations and r
ates, and other useful information.

Bundle-License: <http://www.apache.org/licenses/LICENSE-2.0.html>

Bundle-ManifestVersion: 2

Bundle-Name: Metrics Integration for Apache HttpAsyncClient

Bundle-SymbolicName: io.dropwizard.metrics.httpasyncclient

Bundle-Version: 4.0.5

Created-By: Apache Maven Bundle Plugin

Export-Package: com.codahale.metrics.httpasyncclient;uses:="com.codaha
le.metrics,com.codahale.metrics.httpclient,org.apache.http.config,org
.apache.http.conn,org.apache.http.impl.nio.client,org.apache.http.imp
l.nio.conn,org.apache.http.nio.conn,org.apache.http.nio.reactor";vers
ion="4.0.5"

Implementation-Title: Metrics Integration for Apache HttpAsyncClient

Implementation-URL: [http://metrics.dropwizard.io/metrics-httpasyncclie
nt](http://metrics.dropwizard.io/metrics-httpasyncclie
nt)

Implementation-Vendor-Id: io.dropwizard.metrics

Implementation-Version: 4.0.5
Import-Package: com.codahale.metrics;version="[4.0,5)",com.codahale.me
trics.httpClient;version="[4.0,5)",org.apache.http,org.apache.http.co
ncurrent,org.apache.http.config,org.apache.http.conn,org.apache.http.
impl.nio.client,org.apache.http.impl.nio.conn,org.apache.http.nio.con
n,org.apache.http.nio.protocol,org.apache.http.nio.reactor,org.apache
.http.pool,org.apache.http.protocol
Require-Capability: osgi.ee;filter="(&(osgi.ee=JavaSE)(version=1.8))"
Tool: Bnd-3.3.0.201609221906

Found in path(s):

* /opt/cola/permits/1340031649_1654689479.4970224/0/metrics-httpasyncclient-4-0-5-jar/META-
INF/MANIFEST.MF

1.33 jul-to-slf4j-bridge 1.7.26

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1.35 micronaut-rxjava-2 1.2.1

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1.36 jackson-integration-for-metrics 4.0.5

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Manifest-Version: 1.0

Bnd-LastModified: 1545938158164

Build-Jdk: 1.8.0_191

Built-By: artem

Bundle-Description: A set of Jackson modules which provide serializers for most Metrics classes.

Bundle-License: <http://www.apache.org/licenses/LICENSE-2.0.html>

Bundle-ManifestVersion: 2

Bundle-Name: Jackson Integration for Metrics

Bundle-SymbolicName: io.dropwizard.metrics.json

Bundle-Version: 4.0.5

Created-By: Apache Maven Bundle Plugin
Export-Package: com.codahale.metrics.json;uses:="com.codahale.metrics, com.fasterxml.jackson.core,com.fasterxml.jackson.databind";version="4.0.5"
Implementation-Title: Jackson Integration for Metrics
Implementation-URL: http://metrics.dropwizard.io/metrics-json
Implementation-Vendor-Id: io.dropwizard.metrics
Implementation-Version: 4.0.5
Import-Package: com.codahale.metrics;version="[4.0,5)",com.codahale.metrics.health;version="[4.0,5)";resolution:=optional,com.fasterxml.jackson.core;version="[2.9,3)",com.fasterxml.jackson.databind;version="[2.9,3)",com.fasterxml.jackson.databind.module;version="[2.9,3)",com.fasterxml.jackson.databind.ser;version="[2.9,3)",com.fasterxml.jackson.databind.ser.std;version="[2.9,3)"
Require-Capability: osgi.ee;filter:="(&(osgi.ee=JavaSE)(version=1.8))"
Tool: Bnd-3.3.0.201609221906

Found in path(s):

* /opt/cola/permits/1274705522_1648836004.08/0/metrics-json-4-0-5-jar/META-INF/MANIFEST.MF

1.37 cloudevents---core 2.2.0

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* /opt/cola/permits/1340815883_1654861257.1698394/0/cloudevents-core-2-2-0-sources-jar/META-INF/maven/io.cloudevents/cloudevents-core/pom.xml

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* /opt/cola/permits/1340815883_1654861257.1698394/0/cloudevents-core-2-2-0-sources-jar/io/cloudevents/core/v03/CloudEventBuilder.java
* /opt/cola/permits/1340815883_1654861257.1698394/0/cloudevents-core-2-2-0-sources-jar/io/cloudevents/core/v1/V03ToV1AttributesConverter.java
* /opt/cola/permits/1340815883_1654861257.1698394/0/cloudevents-core-2-2-0-sources-jar/io/cloudevents/core/impl/CloudEventContextReaderAdapter.java
* /opt/cola/permits/1340815883_1654861257.1698394/0/cloudevents-core-2-2-0-sources-jar/io/cloudevents/core/v1/CloudEventBuilder.java
* /opt/cola/permits/1340815883_1654861257.1698394/0/cloudevents-core-2-2-0-sources-jar/io/cloudevents/core/CloudEventUtils.java
* /opt/cola/permits/1340815883_1654861257.1698394/0/cloudevents-core-2-2-0-sources-jar/io/cloudevents/core/builder/CloudEventBuilder.java
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* /opt/cola/permits/1340815883_1654861257.1698394/0/cloudevents-core-2-2-0-sources-jar/io/cloudevents/core/v1/CloudEventV1.java

* /opt/cola/permits/1340815883_1654861257.1698394/0/cloudevents-core-2-2-0-sources-jar/io/cloudevents/core/message/MessageReader.java
* /opt/cola/permits/1340815883_1654861257.1698394/0/cloudevents-core-2-2-0-sources-jar/io/cloudevents/core/format/EventFormat.java
* /opt/cola/permits/1340815883_1654861257.1698394/0/cloudevents-core-2-2-0-sources-jar/io/cloudevents/core/v03/CloudEventV03.java
* /opt/cola/permits/1340815883_1654861257.1698394/0/cloudevents-core-2-2-0-sources-jar/io/cloudevents/core/impl/BaseCloudEventBuilder.java
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* /opt/cola/permits/1340815883_1654861257.1698394/0/cloudevents-core-2-2-0-sources-jar/io/cloudevents/core/format/EventDeserializationException.java
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* /opt/cola/permits/1340815883_1654861257.1698394/0/cloudevents-core-2-2-0-sources-jar/io/cloudevents/core/format/EventSerializationException.java
* /opt/cola/permits/1340815883_1654861257.1698394/0/cloudevents-core-2-2-0-sources-jar/io/cloudevents/core/extensions/DistributedTracingExtension.java
* /opt/cola/permits/1340815883_1654861257.1698394/0/cloudevents-core-2-2-0-sources-jar/io/cloudevents/core/message/impl/MessageUtils.java
* /opt/cola/permits/1340815883_1654861257.1698394/0/cloudevents-core-2-2-0-sources-jar/io/cloudevents/core/message/impl/BaseBinaryMessageReader.java
* /opt/cola/permits/1340815883_1654861257.1698394/0/cloudevents-core-2-2-0-sources-jar/io/cloudevents/core/message/StructuredMessageWriter.java
* /opt/cola/permits/1340815883_1654861257.1698394/0/cloudevents-core-2-2-0-sources-jar/io/cloudevents/core/impl/BaseCloudEvent.java

1.38 apache-log4j-slf4j-binding 2.17.1

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1.39 caffeine-cache 2.8.0

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File: orm-busy.trace.xz

Description: Database object access of a e-commerce web application during a busy daytime.

File: orm-night.trace.xz

Description: Database object access of a e-commerce web application during the night time.

File: web07.trace.xz

Description: Normalized access trace (HTTP requests) a product detail page in July 2013.

File: web12.trace.xz

Description: Normalized access trace (HTTP requests) on a product detail page in December 2013.

Format: The accessed objects comprise of a mixture of product inventory, availability per price and also customer data. Objects are keyed by type, id and a index (e.g. the 3rd price of a product). All data is normalized into numbers starting at 0 (or 1 for sub-ids) and then collapsed into a single integer consisting of,

- Bits 27-31: type
- Bits 9-26: id
- Bits 0-9: index

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1.40 vavr-match 0.10.2

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`/opt/cola/permits/1446188441_1666171093.7016084/0/vavr-match-0-10-2-sources-2-jar/io/vavr/match/annotation/Unapply.java`

* /opt/cola/permits/1446188441_1666171093.7016084/0/vavr-match-0-10-2-sources-2-jar/io/vavr/match/annotation/Patterns.java

1.41 project-lombok 1.18.8

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1.42 error_prone_annotations 2.11.0

1.42.1 Available under license :

No license file was found, but licenses were detected in source scan.

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Found in path(s):

* /opt/cola/permits/1319213440_1651231696.76/0/error-prone-annotations-2-11-0-2-jar/META-INF/maven/com.google.errorprone/error_prone_annotations/pom.xml

1.43 kotlin 1.6.21

1.43.1 Available under license :

No license file was found, but licenses were detected in source scan.

```
{ "version":3,"file":"kotlin.js","sources":["wrapper.js","js/arrayUtils.js","js/callableReferenceUtils.js","js/conversions.js","js/core.js","js/long.js","js/markerFunctions.js","js/misc.js","js/polyfills.js","js/rtti.js","runtime/arrayUtils.kt","runtime/Enum.kt","primitiveCompanionObjects.kt","common/src/generated/_Arrays.kt","common/src/generated/_Ranges.kt","unsigned/src/kotlin/UByte.kt","unsigned/src/kotlin/UInt.kt","unsigned/src/kotlin/UShort.kt","builtin-sources/Ranges.kt","src/kotlin/collections/Collections.kt","src/kotlin/collections/Maps.kt","src/kotlin/collections/Sets.kt","src/kotlin/text/StringNumberConversions.kt","src/kotlin/time/Duration.kt","unsigned/src/kotlin/UnsignedUtils.kt","src/kotlin/collections/Iterables.kt","src/kotlin/collections/Sequences.kt","src/kotlin/util/Preconditions.kt","js/src/generated/_ArraysJs.kt","src/kotlin/comparisons/Comparisons.kt","src/kotlin/util/Standard.kt","js/src/generated/_ComparisonsJs.kt","unsigned/src/kotlin/ULong.kt","common/src/generated/_Collections.kt","js/src/kotlin/collections.kt","src/kotlin/collections/Iterators.kt","common/src/generated/_Comparisons.kt","common/src/generated/_Maps.kt","common/src/generated/_OneToManyTitlecaseMappings.kt","js/src/kotlin/text/char.kt","js/src/kotlin/text/string.kt","src/kotlin/text/Char.kt","src/kotlin/CharCode.kt","common/src/generated/_Sequences.kt","common/src/generated/_Sets.kt","common/src/generated/_Strings.kt","src/kotlin/text/Strings.kt","unsigned/src/kotlin/UByteArray.kt","unsigned/src/kotlin/UIntArray.kt","unsigned/src/kotlin/ULongArray.kt","unsigned/src/kotlin/UShortArray.kt","common/src/generated/_UArrays.kt","common/src/generated/_UCollections.kt","common/src/generated/_UComparisons.kt","common/src/generated/_URanges.kt","common/src/generated/_USequences.kt","common/src/kotlin/ExceptionsH.kt","common/src/kotlin/JsAnnotationsH.kt","common/src/kotlin/ioH.kt","builtin-sources/Collections.kt","builtin-sources/Iterators.kt","builtin-sources/ProgressionIterators.kt","builtin-sources/Progressions.kt","builtin-sources/Range.kt","builtin-sources/Unit.kt","builtin-sources/annotation/Annotations.kt","builtin-sources/internal/InternalAnnotations.kt","builtin-sources/internal/progressionUtil.kt","src/kotlin/builtins.kt","src/kotlin/jsTypeOf.kt","src/kotlin/kotlin.kt","src/kotlin/CharCode_js-v1.kt","src/kotlin/coroutines/CoroutineImpl.kt","src/kotlin/util/Result.kt","src/kotlin/coroutines/Continuation.kt","src/kotlin/coroutines/intrinsics/IntrinsicsJs.kt","src/kotlin/currentBeMisc.kt","src/kotlin/exceptions.kt","src/kotlin/jsOperators.kt","src/kotlin/math_js-v1.kt","src/kotlin/numbers_js-v1.kt","src/kotlin/reflection_js-v1.kt","src/kotlin/text/numberConversions_js-v1.kt","js/src/generated/_CharCategories.kt","js/src/generated/_CollectionsJs.kt","js/src/generated/_DigitChars.kt","js/src/generated/_LetterChars.kt","js/src/generated/_OtherLowercaseChars.kt","js/src/generated/_OtherUppercaseChars.kt","js/src/generated/_StringsJs.kt","js/src/generated/_TitlecaseMappings.kt","js/src/generated/_UArraysJs.kt","js/src/generated/_WhitespaceChars.kt","js/src/kotlin/Comparator.kt","js/src/kotlin/annotations.kt","js/src/kotlin/annotationsJVM.kt","js/src/kotlin/collections/AbstractMutableCollection.kt","js/src/kotlin/collections/AbstractMutableList.kt","js/src/kotlin/collections/AbstractMutableMap.kt","js/src/kotlin/collections/AbstractMutableSet.kt","js/src/kotlin/collections/ArrayList.kt","js/src/kotlin/collections/ArraySorting.kt","js/src/kotlin/collections/ArraysJs.kt","js/src/kotlin/collections/EqualityComparator.kt","js/src/kotlin/collections/HashMap.kt","js/src/kotlin/collections/HashSet.kt","js/src/kotlin/collections/InternalHashCodeMap.kt","js/src/kotlin/collections/InternalMap.kt","js/src/kotlin/collections/InternalStringMap.kt","js/src/kotlin/collections/LinkedHashMap.kt","js/src/kotlin/collections/LinkedHashSet.kt","js/src/kotlin/concurrent.kt","js/src/kotlin/console.kt","js/src/kotlin/coroutines/SafeContinuationJs.kt","js/src/kotlin/coroutines/cancellation/CancellationException.kt","js/src/kotlin/coroutines/js/internal/EmptyContinuation.kt","js/src
```

/kotlin/date.kt", "js/src/kotlin/dom/Builders.kt", "js/src/kotlin/dom/Classes.kt", "js/src/kotlin/dom/Dom.kt", "js/src/kotlin/dom/EventListener.kt", "js/src/kotlin/dom/ItemArrayLike.kt", "js/src/kotlin/dom/Mutations.kt", "js/src/kotlin/dynamic.kt", "js/src/kotlin/exceptionUtils.kt", "js/src/kotlin/grouping.kt", "src/kotlin/collections/Grouping.kt", "js/src/kotlin/internalAnnotations.kt", "js/src/kotlin/json.kt", "js/src/kotlin/math.kt", "js/src/kotlin/numbers.kt", "js/src/kotlin/promise.kt", "js/src/kotlin/random/PlatformRandom.kt", "js/src/kotlin/reflect/AssociatedObjects.kt", "js/src/kotlin/reflect/JsClasses.kt", "js/src/kotlin/reflect/KClassImpl.kt", "js/src/kotlin/reflect/KClassesImpl.kt", "js/src/kotlin/reflect/KTypeHelpers.kt", "js/src/kotlin/reflect/KTypeImpl.kt", "js/src/kotlin/reflect/KTypeParameterImpl.kt", "js/src/kotlin/reflect/primitives.kt", "js/src/kotlin/reflect/reflection.kt", "js/src/kotlin/regexp.kt", "js/src/kotlin/sequence.kt", 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"js/src/org.w3c/org.w3c.dom.mediasource.kt", "js/src/org.w3c/org.w3c.dom.pointerevents.kt", "js/src/org.w3c/org.w3c.dom.svg.kt", "js/src/org.w3c/org.w3c.files.kt", "js/src/org.w3c/org.w3c.notifications.kt", "js/src/org.w3c/org.w3c.workers.kt", "js/src/org.w3c/org.w3c.xhr.kt", "src/kotlin/annotations/Experimental.kt", "src/kotlin/annotations/ExperimentalStdlibApi.kt", "src/kotlin/annotations/Inference.kt", "src/kotlin/annotations/Multiplatform.kt", "src/kotlin/annotations/OptIn.kt", "src/kotlin/collections/AbstractCollection.kt", "src/kotlin/collections/AbstractIterator.kt", "src/kotlin/collections/AbstractList.kt", "src/kotlin/collections/AbstractMap.kt", "src/kotlin/collections/AbstractSet.kt", "src/kotlin/collections/ArrayDeque.kt", "src/kotlin/collections/Arrays.kt", "src/kotlin/collections/BrittleContainsOptimization.kt", "src/kotlin/collections/IndexedValue.kt", "src/kotlin/collections/MapAccessors.kt", "src/kotlin/collections/MapWithDefault.kt", "src/kotlin/collections/MutableCollections.kt", "src/kotlin/collections/ReversedViews.kt", "src/kotlin/collections/SequenceBuilder.kt", "src/kotlin/collections/SlidingWindow.kt", "src/kotlin/collections/UArraySorting.kt", "src/kotlin/comparisons/compareTo.kt", "src/kotlin/contracts/ContractBuilder.kt", "src/kotlin/coroutines/ContinuationInterceptor.kt", "src/kotlin/coroutines/CoroutineContext.kt", "src/kotlin/coroutines/CoroutineContextImpl.kt", "src/kotlin/coroutines/intrinsics/Intrinsics.kt", "src/kotlin/experimental/bitwiseOperations.kt", "src/kotlin/experimental/inferenceMarker.kt", "src/kotlin/internal/Annotations.kt", "src/kotlin/properties/Delegates.kt", "src/kotlin/properties/Interfaces.kt", "src/kotlin/properties/ObservableProperty.kt", "src/kotlin/properties/PropertyReferenceDelegates.kt", "src/kotlin/random/Random.kt", "src/kotlin/random/URandom.kt", "src/kotlin/random/XorWowRandom.kt", "src/kotlin/ranges/Ranges.kt", "src/kotlin/reflect/KClasses.kt", "src/kotlin/reflect/KTypeProjection.kt", "src/kotlin/reflect/KVariance.kt", "src/kotlin/reflect/typeOf.kt", "src/kotlin/text/Appendable.kt", "src/kotlin/text/Indent.kt", "src/kotlin/text/Typography.kt", "src/kotlin/text/regex/MatchResult.kt", "src/kotlin/time/DurationUnit.kt", "src/kotlin/time/ExperimentalTime.kt", "src/kotlin/time/TimeSource.kt", "src/kotlin/time/TimeSources.kt", "src/kotlin/time/measureTime.kt", "src/kotlin/util/DeepRecursive.kt", "src/kotlin/util/FloorDivMod.kt", "src/kotlin/util/HashCode.kt", "src/kotlin/util/KotlinVersion.kt", "src/kotlin/util/Lateinit.kt", "src/kotlin/util/Lazy.kt", "src/kotlin/util/Numbers.kt", "src/kotlin/util/Suspend.kt", "src/kotlin/util/Tuples.kt", "unsigned/src/kotlin/UIntRange.kt", "unsigned/src/kotlin/UIterators.kt", "unsigned/src/kotlin/ULongRange.kt", "unsigned/src/kotlin/UMath.kt", "unsigned/src/kotlin/UNumbers.kt", "unsigned/src/kotlin/UProgressionUtil.kt", "unsigned/src/kotlin/UStrings.kt", "unsigned/src/kotlin/annotations/Unsigned.kt", "common/src/kotlin/MathH.kt"], "sourcesContent": ["(function (root, factory) {\n if (typeof define === 'function' && define.amd) {\n define('kotlin', ['exports'], factory);\n }\n else if (typeof exports === 'object') {\n factory(module.exports);\n }\n else {\n root.kotlin = {};\n factory(root.kotlin);\n }\n})(this, function (Kotlin) {\n var _ = Kotlin;\n \n insertContent();\n});\n\n", "/*\n * Copyright 2010-2018 JetBrains s.r.o. and Kotlin Programming Language contributors.\n * Use of this source code is governed by the Apache 2.0 license that can be found in the license/LICENSE.txt file.\n *\n Kotlin.isBooleanArray = function (a) {\n return (Array.isArray(a) || a instanceof Int8Array) && a.\$type\$ === \"BooleanArray\";\n }\n Kotlin.isByteArray = function (a) {\n return a

```

instanceof Int8Array && a.$type$ !== "BooleanArray"\n};\n\nKotlin.isShortArray = function (a) {\n  return a
instanceof Int16Array\n};\n\nKotlin.isCharArray = function (a) {\n  return a instanceof Uint16Array && a.$type$
=== "CharArray"\n};\n\nKotlin.isIntArray = function (a) {\n  return a instanceof
Int32Array\n};\n\nKotlin.isFloatArray = function (a) {\n  return a instanceof
Float32Array\n};\n\nKotlin.isDoubleArray = function (a) {\n  return a instanceof
Float64Array\n};\n\nKotlin.isLongArray = function (a) {\n  return Array.isArray(a) && a.$type$ ===
"LongArray"\n};\n\nKotlin.isArray = function (a) {\n  return Array.isArray(a) &&
!a.$type$;\n};\n\nKotlin.isArrayish = function (a) {\n  return Array.isArray(a) ||
ArrayBuffer.isView(a)\n};\n\nKotlin.arrayToString = function (a) {\n  if (a === null) return "null"\n  var
toString = Kotlin.isCharArray(a) ? String.fromCharCode : Kotlin.toString;\n  return "[" +
Array.prototype.map.call(a, function(e) { return toString(e); }).join(", ") + "]";\n};\n\nKotlin.arrayDeepToString
= function (arr) {\n  return Kotlin.kotlin.collections.contentDeepToStringImpl(arr);\n};\n\nKotlin.arrayEquals =
function (a, b) {\n  if (a === b) {\n    return true;\n  }\n  if (a === null || b === null || !Kotlin.isArrayish(b) ||
a.length !== b.length) {\n    return false;\n  }\n  for (var i = 0, n = a.length; i < n; i++) {\n    if
(!Kotlin.equals(a[i], b[i])) {\n      return false;\n    }\n  }\n  return true;\n};\n\nKotlin.arrayDeepEquals =
function (a, b) {\n  return Kotlin.kotlin.collections.contentDeepEqualsImpl(a, b);\n};\n\nKotlin.arrayHashCode =
function (arr) {\n  if (arr === null) return 0\n  var result = 1;\n  for (var i = 0, n = arr.length; i < n; i++) {\n
result = ((31 * result | 0) + Kotlin.hashCode(arr[i])) | 0;\n  }\n  return result;\n};\n\nKotlin.arrayDeepHashCode =
function (arr) {\n  return
Kotlin.kotlin.collections.contentDeepHashCodeImpl(arr);\n};\n\nKotlin.primitiveArraySort = function (array) {\n
array.sort(Kotlin.doubleCompareTo)\n};\n\n"/*\n * Copyright 2010-2018 JetBrains s.r.o. and Kotlin Programming
Language contributors. \n * Use of this source code is governed by the Apache 2.0 license that can be found in the
license/LICENSE.txt file.\n */\n\nKotlin.getCallableRef = function(name, f) {\n  f.callableName = name;\n  return
f;\n};\n\nKotlin.getPropertyCallableRef = function(name, paramCount, getter, setter) {\n  getter.get = getter;\n
getter.set = setter;\n  getter.callableName = name;\n  return getPropertyRefClass(getter, setter,
propertyRefClassMetadataCache[paramCount]);\n};\n\nfunction getPropertyRefClass(obj, setter, cache) {\n
obj.$metadata$ = getPropertyRefMetadata(typeof setter === "function" ? cache.mutable : cache.immutable);\n
obj.constructor = obj;\n  return obj;\n}\n\nvar propertyRefClassMetadataCache = [\n  {\n    mutable: { value:
null, implementedInterface: function () {\n      return Kotlin.kotlin.reflect.KMutableProperty0 }\n    },\n
immutable: { value: null, implementedInterface: function () {\n      return Kotlin.kotlin.reflect.KProperty0 }\n
  }\n  },\n  {\n    mutable: { value: null, implementedInterface: function () {\n      return
Kotlin.kotlin.reflect.KMutableProperty1 }\n    },\n    immutable: { value: null, implementedInterface: function
() {\n      return Kotlin.kotlin.reflect.KProperty1 }\n    }\n  }\n];\n\nfunction getPropertyRefMetadata(cache)
{\n  if (cache.value === null) {\n    cache.value = {\n      interfaces: [cache.implementedInterface()],\n
baseClass: null,\n      functions: {},\n      properties: {},\n      types: {},\n      staticMembers: {}\n
};\n  }\n  return cache.value;\n}\n\n"/*\n * Copyright 2010-2018 JetBrains s.r.o. and Kotlin Programming
Language contributors. \n * Use of this source code is governed by the Apache 2.0 license that can be found in the
license/LICENSE.txt file.\n */\n\nKotlin.toShort = function (a) {\n  return (a & 0xFFFF) << 16 >>
16;\n};\n\nKotlin.toByte = function (a) {\n  return (a & 0xFF) << 24 >> 24;\n};\n\nKotlin.toChar = function (a) {\n
return a & 0xFFFF;\n};\n\nKotlin.numberToLong = function (a) {\n  return a instanceof Kotlin.Long ? a :
Kotlin.Long.fromNumber(a);\n};\n\nKotlin.numberToInt = function (a) {\n  return a instanceof Kotlin.Long ?
a.toInt() : Kotlin.doubleToInt(a);\n};\n\nKotlin.numberToShort = function (a) {\n  return
Kotlin.toShort(Kotlin.numberToInt(a));\n};\n\nKotlin.numberToByte = function (a) {\n  return
Kotlin.toByte(Kotlin.numberToInt(a));\n};\n\nKotlin.numberToDouble = function (a) {\n  return
+a;\n};\n\nKotlin.numberToChar = function (a) {\n  return
Kotlin.toChar(Kotlin.numberToInt(a));\n};\n\nKotlin.doubleToInt = function(a) {\n  if (a > 2147483647) return
2147483647;\n  if (a < -2147483648) return -2147483648;\n  return a | 0;\n};\n\nKotlin.toBoxedChar = function
(a) {\n  if (a == null) return a;\n  if (a instanceof Kotlin.BoxedChar) return a;\n  return new

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Kotlin.BoxedChar(a);\n};\n\nKotlin.unboxChar = function(a) {\n  if (a == null) return a;\n  return
Kotlin.toChar(a);\n};\n", "/*\n * Copyright 2010-2018 JetBrains s.r.o. and Kotlin Programming Language
contributors. \n * Use of this source code is governed by the Apache 2.0 license that can be found in the
license/LICENSE.txt file.\n */\n\nKotlin.equals = function (obj1, obj2) {\n  if (obj1 == null) {\n    return obj2 ==
null;\n  }\n\n  if (obj2 == null) {\n    return false;\n  }\n\n  if (obj1 !== obj2) {\n    return obj2 !== obj2;\n
}\n\n  if (typeof obj1 === "object" && typeof obj1.equals === "function") {\n    return obj1.equals(obj2);\n
}\n\n  if (typeof obj1 === "number" && typeof obj2 === "number") {\n    return obj1 === obj2 && (obj1 !==
0 || 1 / obj1 === 1 / obj2);\n  }\n\n  return obj1 === obj2;\n};\n\nKotlin.hashCode = function (obj) {\n  if (obj ==
null) {\n    return 0;\n  }\n\n  var objType = typeof obj;\n  if ("object" === objType) {\n    return "function"
=== typeof obj.hashCode ? obj.hashCode() : getObjectHashCode(obj);\n  }\n  if ("function" === objType) {\n
return getObjectHashCode(obj);\n  }\n  if ("number" === objType) {\n    return
Kotlin.numberHashCode(obj);\n  }\n  if ("boolean" === objType) {\n    return Number(obj)\n  }\n\n  var str
= String(obj);\n  return getStringHashCode(str);\n};\n\nKotlin.toString = function (o) {\n  if (o == null) {\n
return "null";\n  }\n  else if (Kotlin.isArrayish(o)) {\n    return "[...]";\n  }\n  else {\n    return
o.toString();\n  }\n};\n\n/**\n * @const *\n * @nvar POW_2_32 = 4294967296;\n * // TODO: consider switching to Symbol
type once we are on ES6.\n * **\n * @const *\n * @nvar OBJECT_HASH_CODE_PROPERTY_NAME =
"kotlinHashCodeValue$";\n * \n * function getObjectHashCode(obj) {\n  if
(! (OBJECT_HASH_CODE_PROPERTY_NAME in obj)) {\n    var hash = (Math.random() * POW_2_32) | 0; //
Make 32-bit signed integer.\n    Object.defineProperty(obj, OBJECT_HASH_CODE_PROPERTY_NAME, {\n
value: hash, enumerable: false });\n  }\n  return
obj[OBJECT_HASH_CODE_PROPERTY_NAME];\n * \n * function getStringHashCode(str) {\n  var hash = 0;\n
for (var i = 0; i < str.length; i++) {\n    var code = str.charCodeAt(i);\n    hash = (hash * 31 + code) | 0; // Keep
it 32-bit.\n  }\n  return hash;\n * \n * Kotlin.identityHashCode = getObjectHashCode;\n * \n * Copyright 2010-
2018 JetBrains s.r.o. and Kotlin Programming Language contributors. \n * Use of this source code is governed by
the Apache 2.0 license that can be found in the license/LICENSE.txt file.\n * \n * // Copyright 2009 The Closure
Library Authors. All Rights Reserved.\n * \n * // Licensed under the Apache License, Version 2.0 (the "License");\n *
// you may not use this file except in compliance with the License.\n * // You may obtain a copy of the License at\n *
// http://www.apache.org/licenses/LICENSE-2.0\n * \n * // Unless required by applicable law or agreed to in writing,
software\n * // distributed under the License is distributed on an "AS-IS" BASIS,\n * // WITHOUT WARRANTIES OR
CONDITIONS OF ANY KIND, either express or implied.\n * \n * **\n * * Constructs a 64-bit two's-complement integer,
given its low and high 32-bit\n * * values as *signed* integers. See the from* functions below for more\n * *
convenient ways of constructing Longs.\n * * \n * * The internal representation of a long is the two given signed, 32-bit
values.\n * * We use 32-bit pieces because these are the size of integers on which\n * * Javascript performs bit-
operations. For operations like addition and\n * * multiplication, we split each number into 16-bit pieces, which can
easily be\n * * multiplied within Javascript's floating-point representation without overflow\n * * or change in sign.\n
* \n * * In the algorithms below, we frequently reduce the negative case to the\n * * positive case by negating the
input(s) and then post-processing the result.\n * * Note that we must ALWAYS check specially whether those values
are MIN_VALUE\n * * (-2^63) because -MIN_VALUE == MIN_VALUE (since 2^63 cannot be represented as\n * * a
positive number, it overflows back into a negative). Not handling this\n * * case would often result in infinite
recursion.\n * * \n * * @param {number} low The low (signed) 32 bits of the long.\n * * @param {number} high The
high (signed) 32 bits of the long.\n * * @constructor\n * * @final\n * * \n * * Kotlin.Long = function(low, high) {\n * * /**\n * *
* @type {number}\n * * @private\n * * \n * * this.low_ = low | 0; // force into 32 signed bits.\n * * \n * * /**\n * *
* @type
{number}\n * * @private\n * * \n * * this.high_ = high | 0; // force into 32 signed bits.\n * * \n * * \n * * \n *
Kotlin.Long.$metadata$ =
{\n  kind: "class",\n  simpleName: "Long",\n  interfaces: []\n};\n * \n * // NOTE: Common constant values
ZERO, ONE, NEG_ONE, etc. are defined below the\n * // from* methods on which they depend.\n * \n * \n * **\n * * A cache
of the Long representations of small integer values.\n * * @type {!Object}\n * * @private\n * * \n * * Kotlin.Long.IntCache_
= {};\n * \n * \n * **\n * * Returns a Long representing the given (32-bit) integer value.\n * * @param {number} value The
32-bit integer in question.\n * * @return {!Kotlin.Long} The corresponding Long value.\n * * \n * * Kotlin.Long.fromInt =

```

```

function(value) {
    if (-128 <= value && value < 128) {
        var cachedObj = Kotlin.Long.IntCache_[value];
        if (cachedObj) {
            return cachedObj;
        }
        var obj = new Kotlin.Long(value | 0, value < 0 ? -1 : 0);
        if (-128 <= value && value < 128) {
            Kotlin.Long.IntCache_[value] = obj;
        }
        return obj;
    };
}

Converts this number value to `Long`.
The fractional part, if any, is rounded down towards zero.
Returns zero if this `Double` value is `NaN`, `Long.MIN_VALUE` if it's less than `Long.MIN_VALUE`,
`Long.MAX_VALUE` if it's bigger than `Long.MAX_VALUE`.
@param {number} value The number in question.
@return {!Kotlin.Long} The corresponding Long value.

Kotlin.Long.fromNumber = function(value) {
    if (isNaN(value)) {
        return Kotlin.Long.ZERO;
    } else if (value <= -Kotlin.Long.TWO_PWR_63_DBL_) {
        return Kotlin.Long.MIN_VALUE;
    } else if (value + 1 >= Kotlin.Long.TWO_PWR_63_DBL_) {
        return Kotlin.Long.MAX_VALUE;
    } else if (value < 0) {
        return Kotlin.Long.fromNumber(-value).negate();
    } else {
        return new Kotlin.Long(
            (value % Kotlin.Long.TWO_PWR_32_DBL_) | 0,
            (value / Kotlin.Long.TWO_PWR_32_DBL_) | 0);
    };
}

Returns a Long representing the 64-bit integer that comes by concatenating
the given high and low bits. Each is assumed to use 32 bits.
@param {number} lowBits The low 32-bits.
@param {number} highBits The high 32-bits.
@return {!Kotlin.Long} The corresponding Long value.

Kotlin.Long.fromBits = function(lowBits, highBits) {
    return new Kotlin.Long(lowBits, highBits);
};

Returns a Long representation of the given string, written using the given
radix.
@param {string} str The textual representation of the Long.
@param {number=} opt_radix The radix in which the text is written.
@return {!Kotlin.Long} The corresponding Long value.

Kotlin.Long.fromString = function(str, opt_radix) {
    if (str.length == 0) {
        throw Error('number format error: empty string');
    }
    var radix = opt_radix || 10;
    if (radix < 2 || 36 < radix) {
        throw Error('radix out of range: ' + radix);
    }
    if (str.charAt(0) == '-') {
        return Kotlin.Long.fromString(str.substring(1), radix).negate();
    } else if (str.indexOf('-') >= 0) {
        throw Error('number format error: interior "-" character: ' + str);
    }
    // Do several (8) digits each time through the loop, so as to
    // minimize the calls to the very expensive emulated div.
    var radixToPower = Kotlin.Long.fromNumber(Math.pow(radix, 8));
    var result = Kotlin.Long.ZERO;
    for (var i = 0; i < str.length; i += 8) {
        var size = Math.min(8, str.length - i);
        var value = parseInt(str.substring(i, i + size), radix);
        if (size < 8) {
            var power = Kotlin.Long.fromNumber(Math.pow(radix, size));
            result = result.multiply(power).add(Kotlin.Long.fromNumber(value));
        } else {
            result = result.multiply(radixToPower).add(Kotlin.Long.fromNumber(value));
        }
    }
    return result;
};

// NOTE: the compiler should inline these constant values below and then remove
// these variables, so there should be no runtime penalty for these.

Number used repeated below in calculations.
This must appear before the first call to any from* function below.
@type {number}
@private
Kotlin.Long.TWO_PWR_16_DBL_ = 1 << 16;
@type {number}
@private
Kotlin.Long.TWO_PWR_24_DBL_ = 1 << 24;
@type {number}
@private
Kotlin.Long.TWO_PWR_32_DBL_ = Kotlin.Long.TWO_PWR_16_DBL_ *
Kotlin.Long.TWO_PWR_16_DBL_;
@type {number}
@private
Kotlin.Long.TWO_PWR_31_DBL_ = Kotlin.Long.TWO_PWR_32_DBL_ / 2;
@type
{number}
@private
Kotlin.Long.TWO_PWR_48_DBL_ = Kotlin.Long.TWO_PWR_32_DBL_ *
Kotlin.Long.TWO_PWR_16_DBL_;
@type {number}
@private
Kotlin.Long.TWO_PWR_64_DBL_ = Kotlin.Long.TWO_PWR_32_DBL_ *
Kotlin.Long.TWO_PWR_32_DBL_;
@type {number}
@private
Kotlin.Long.TWO_PWR_63_DBL_ = Kotlin.Long.TWO_PWR_64_DBL_ / 2;
@type
{!Kotlin.Long}
Kotlin.Long.ZERO = Kotlin.Long.fromInt(0);
@type {!Kotlin.Long}
Kotlin.Long.ONE = Kotlin.Long.fromInt(1);
@type {!Kotlin.Long}
Kotlin.Long.NEG_ONE = Kotlin.Long.fromInt(-1);
@type {!Kotlin.Long}
Kotlin.Long.MAX_VALUE = Kotlin.Long.fromBits(0xFFFFFFFF | 0, 0x7FFFFFFF | 0);
@type {!Kotlin.Long}
Kotlin.Long.MIN_VALUE = Kotlin.Long.fromBits(0, 0x80000000 | 0);
@type {!Kotlin.Long}
@private
Kotlin.Long.TWO_PWR_24_ = Kotlin.Long.fromInt(1 << 24);
@return {number} The

```



```

value, assuming it is a 32-bit integer. */
Kotlin.Long.prototype.toInt = function() {
    return this.low_;
};

/**
 * @return {number} The closest floating-point representation to this value.
 */
Kotlin.Long.prototype.toNumber = function() {
    return this.high_ * Kotlin.Long.TWO_PWR_32_DBL_ +
        this.getLowBitsUnsigned();
};

/**
 * @return {number} The 32-bit hashCode of this value.
 */
Kotlin.Long.prototype.hashCode = function() {
    return this.high_ ^ this.low_;
};

/**
 * @param {number=} opt_radix The radix in which the text should be written.
 * @return {string} The textual representation of this value.
 */
Kotlin.Long.prototype.toString = function(opt_radix) {
    var radix = opt_radix || 10;
    if (radix < 2 || 36 < radix) {
        throw Error('radix out of range: ' + radix);
    }
    if (this.isZero()) {
        return '0';
    }
    if (this.isNegative()) {
        if (this.equalsLong(Kotlin.Long.MIN_VALUE)) {
            // We need to change the Long value before it can be negated, so we remove
            // the bottom-most digit in this base and then recurse to do the rest.
            var radixLong = Kotlin.Long.fromNumber(radix);
            var div = this.div(radixLong);
            var rem = div.multiply(radixLong).subtract(this);
            return div.toString(radix) + rem.toInt().toString(radix);
        }
        else {
            return '-' + this.negate().toString(radix);
        }
    }
    // Do several (6) digits each time through the loop, so as to
    // minimize the calls to the very expensive emulated div.
    var radixToPower = Kotlin.Long.fromNumber(Math.pow(radix, 6));
    var rem = this;
    var result = '';
    while (true) {
        var remDiv = rem.div(radixToPower);
        var intval = rem.subtract(remDiv.multiply(radixToPower)).toInt();
        var digits = intval.toString(radix);
        rem = remDiv;
        if (rem.isZero()) {
            return digits + result;
        }
        else {
            while (digits.length < 6) {
                digits = '0' + digits;
            }
            result = ' ' + digits + result;
        }
    }
};

/**
 * @return {number} The high 32-bits as a signed value.
 */
Kotlin.Long.prototype.getHighBits = function() {
    return this.high_;
};

/**
 * @return {number} The low 32-bits as a signed value.
 */
Kotlin.Long.prototype.getLowBits = function() {
    return this.low_;
};

/**
 * @return {number} The low 32-bits as an unsigned value.
 */
Kotlin.Long.prototype.getLowBitsUnsigned = function() {
    return (this.low_ >= 0) ?
        this.low_ : Kotlin.Long.TWO_PWR_32_DBL_ + this.low_;
};

/**
 * @return {number} Returns the number of bits needed to represent the absolute
 * value of this Long.
 */
Kotlin.Long.prototype.getNumBitsAbs = function() {
    if (this.isNegative()) {
        if (this.equalsLong(Kotlin.Long.MIN_VALUE)) {
            return 64;
        }
        else {
            return this.negate().getNumBitsAbs();
        }
    }
    else {
        var val = this.high_ != 0 ? this.high_ : this.low_;
        for (var bit = 31; bit > 0; bit--) {
            if ((val & (1 << bit)) != 0) {
                break;
            }
        }
        return this.high_ != 0 ? bit + 33 : bit + 1;
    }
};

/**
 * @return {boolean} Whether this value is zero.
 */
Kotlin.Long.prototype.isZero = function() {
    return this.high_ == 0 && this.low_ == 0;
};

/**
 * @return {boolean} Whether this value is negative.
 */
Kotlin.Long.prototype.isNegative = function() {
    return this.high_ < 0;
};

/**
 * @return {boolean} Whether this value is odd.
 */
Kotlin.Long.prototype.isOdd = function() {
    return (this.low_ & 1) == 1;
};

/**
 * @param {Kotlin.Long} other Long to compare against.
 * @return {boolean} Whether this Long equals the other.
 */
Kotlin.Long.prototype.equalsLong = function(other) {
    return (this.high_ == other.high_) && (this.low_ == other.low_);
};

/**
 * @param {Kotlin.Long} other Long to compare against.
 * @return {boolean} Whether this Long does not equal the other.
 */
Kotlin.Long.prototype.notEqualsLong = function(other) {
    return (this.high_ != other.high_) || (this.low_ != other.low_);
};

/**
 * @param {Kotlin.Long} other Long to compare against.
 * @return {boolean} Whether this Long is less than the other.
 */
Kotlin.Long.prototype.lessThan = function(other) {
    return this.compare(other) < 0;
};

/**
 * @param {Kotlin.Long} other Long to compare against.
 * @return {boolean} Whether this Long is less than or equal to the other.
 */
Kotlin.Long.prototype.lessThanOrEqual = function(other) {
    return this.compare(other) <= 0;
};

/**
 * @param {Kotlin.Long} other Long to compare against.
 * @return {boolean} Whether this Long is greater than the other.
 */
Kotlin.Long.prototype.greaterThan = function(other) {
    return this.compare(other) > 0;
};

/**
 * @param {Kotlin.Long} other Long to compare against.
 * @return {boolean} Whether this Long is greater than or equal to the other.
 */
Kotlin.Long.prototype.greaterThanOrEqual = function(other) {
    return this.compare(other) >= 0;
};

/**
 * @param {Kotlin.Long} other Long to compare against.
 * @return {number} 0 if they are the same, 1 if this is greater, and -1 if

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the given one is greater.\n *\nKotlin.Long.prototype.compare = function(other) {\n if (this.equalsLong(other)) {\n
return 0;\n }\n\n var thisNeg = this.isNegative();\n var otherNeg = other.isNegative();\n if (thisNeg &&
!otherNeg) {\n return -1;\n }\n if (!thisNeg && otherNeg) {\n return 1;\n }\n\n // at this point, the signs are the
same, so subtraction will not overflow\n if (this.subtract(other).isNegative()) {\n return -1;\n } else {\n return
1;\n }\n};\n\n/** @return {!Kotlin.Long} The negation of this value. *\nKotlin.Long.prototype.negate =
function() {\n if (this.equalsLong(Kotlin.Long.MIN_VALUE)) {\n return Kotlin.Long.MIN_VALUE;\n } else
{\n return this.not().add(Kotlin.Long.ONE);\n }\n};\n\n/**\n * Returns the sum of this and the given Long.\n *
@param {Kotlin.Long} other Long to add to this one.\n * @return {!Kotlin.Long} The sum of this and the given
Long.\n *\nKotlin.Long.prototype.add = function(other) {\n // Divide each number into 4 chunks of 16 bits, and
then sum the chunks.\n\n var a48 = this.high_ >>> 16;\n var a32 = this.high_ & 0xFFFF;\n var a16 = this.low_
>>> 16;\n var a00 = this.low_ & 0xFFFF;\n\n var b48 = other.high_ >>> 16;\n var b32 = other.high_ & 0xFFFF;\n
var b16 = other.low_ >>> 16;\n var b00 = other.low_ & 0xFFFF;\n\n var c48 = 0, c32 = 0, c16 = 0, c00 = 0;\n c00
+= a00 + b00;\n c16 += c00 >>> 16;\n c00 &= 0xFFFF;\n c16 += a16 + b16;\n c32 += c16 >>> 16;\n c16 &=
0xFFFF;\n c32 += a32 + b32;\n c48 += c32 >>> 16;\n c32 &= 0xFFFF;\n c48 += a48 + b48;\n c48 &=
0xFFFF;\n return Kotlin.Long.fromBits((c16 << 16) | c00, (c48 << 16) | c32);\n};\n\n/**\n * Returns the
difference of this and the given Long.\n * @param {Kotlin.Long} other Long to subtract from this.\n * @return
{!Kotlin.Long} The difference of this and the given Long.\n *\nKotlin.Long.prototype.subtract = function(other)
{\n return this.add(other.negate());\n};\n\n/**\n * Returns the product of this and the given long.\n * @param
{Kotlin.Long} other Long to multiply with this.\n * @return {!Kotlin.Long} The product of this and the other.\n
*\nKotlin.Long.prototype.multiply = function(other) {\n if (this.isZero()) {\n return Kotlin.Long.ZERO;\n } else
if (other.isZero()) {\n return Kotlin.Long.ZERO;\n }\n\n if (this.equalsLong(Kotlin.Long.MIN_VALUE)) {\n
return other.isOdd() ? Kotlin.Long.MIN_VALUE : Kotlin.Long.ZERO;\n } else if
(other.equalsLong(Kotlin.Long.MIN_VALUE)) {\n return this.isOdd() ? Kotlin.Long.MIN_VALUE :
Kotlin.Long.ZERO;\n }\n\n if (this.isNegative()) {\n if (other.isNegative()) {\n return
this.negate().multiply(other.negate());\n } else {\n return this.negate().multiply(other).negate();\n }\n } else if
(other.isNegative()) {\n return this.multiply(other.negate()).negate();\n }\n\n // If both longs are small, use float
multiplication\n if (this.lessThan(Kotlin.Long.TWO_PWR_24_) &&\n
other.lessThan(Kotlin.Long.TWO_PWR_24_)) {\n return Kotlin.Long.fromNumber(this.toNumber() *
other.toNumber());\n }\n\n // Divide each long into 4 chunks of 16 bits, and then add up 4x4 products.\n // We can
skip products that would overflow.\n\n var a48 = this.high_ >>> 16;\n var a32 = this.high_ & 0xFFFF;\n var a16 =
this.low_ >>> 16;\n var a00 = this.low_ & 0xFFFF;\n\n var b48 = other.high_ >>> 16;\n var b32 = other.high_ &
0xFFFF;\n var b16 = other.low_ >>> 16;\n var b00 = other.low_ & 0xFFFF;\n\n var c48 = 0, c32 = 0, c16 = 0, c00
= 0;\n c00 += a00 * b00;\n c16 += c00 >>> 16;\n c00 &= 0xFFFF;\n c16 += a16 * b00;\n c32 += c16 >>> 16;\n
c16 &= 0xFFFF;\n c16 += a00 * b16;\n c32 += c16 >>> 16;\n c16 &= 0xFFFF;\n c32 += a32 * b00;\n c48 +=
c32 >>> 16;\n c32 &= 0xFFFF;\n c32 += a16 * b16;\n c48 += c32 >>> 16;\n c32 &= 0xFFFF;\n c32 += a00 *
b32;\n c48 += c32 >>> 16;\n c32 &= 0xFFFF;\n c48 += a48 * b00 + a32 * b16 + a16 * b32 + a00 * b48;\n c48
&= 0xFFFF;\n return Kotlin.Long.fromBits((c16 << 16) | c00, (c48 << 16) | c32);\n};\n\n/**\n * Returns this
Long divided by the given one.\n * @param {Kotlin.Long} other Long by which to divide.\n * @return
{!Kotlin.Long} This Long divided by the given one.\n *\nKotlin.Long.prototype.div = function(other) {\n if
(other.isZero()) {\n throw Error('division by zero');\n } else if (this.isZero()) {\n return Kotlin.Long.ZERO;\n
}\n\n if (this.equalsLong(Kotlin.Long.MIN_VALUE)) {\n if (other.equalsLong(Kotlin.Long.ONE) ||\n
other.equalsLong(Kotlin.Long.NEG_ONE)) {\n return Kotlin.Long.MIN_VALUE; // recall that -MIN_VALUE
== MIN_VALUE\n } else if (other.equalsLong(Kotlin.Long.MIN_VALUE)) {\n return Kotlin.Long.ONE;\n }
else {\n // At this point, we have |other| >= 2, so |this/other| < |MIN_VALUE|.\n var halfThis =
this.shiftRight(1);\n var approx = halfThis.div(other).shiftLeft(1);\n if
(approx.equalsLong(Kotlin.Long.ZERO)) {\n return other.isNegative() ? Kotlin.Long.ONE :
Kotlin.Long.NEG_ONE;\n } else {\n var rem = this.subtract(other.multiply(approx));\n var result =
approx.add(rem.div(other));\n return result;\n }\n }\n } else if

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(other.equalsLong(Kotlin.Long.MIN_VALUE)) {\n  return Kotlin.Long.ZERO;\n } \n\n if (this.isNegative()) {\n
if (other.isNegative()) {\n  return this.negate().div(other.negate());\n } else {\n  return
this.negate().div(other.negate());\n } } else if (other.isNegative()) {\n  return
this.div(other.negate()).negate();\n } \n\n // Repeat the following until the remainder is less than other: find a\n //
floating-point that approximates remainder / other *from below*, add this\n // into the result, and subtract it from
the remainder. It is critical that\n // the approximate value is less than or equal to the real value so that the\n //
remainder never becomes negative.\n  var res = Kotlin.Long.ZERO;\n  var rem = this;\n  while
(rem.greaterThanOrEqual(other)) {\n  // Approximate the result of division. This may be a little greater or\n //
smaller than the actual value.\n  var approx = Math.max(1, Math.floor(rem.toNumber() / other.toNumber()));\n\n
// We will tweak the approximate result by changing it in the 48-th digit or\n // the smallest non-fractional digit,
whichever is larger.\n  var log2 = Math.ceil(Math.log(approx) / Math.LN2);\n  var delta = (log2 <= 48) ? 1 :
Math.pow(2, log2 - 48);\n  // Decrease the approximation until it is smaller than the remainder. Note\n // that if
it is too large, the product overflows and is negative.\n  var approxRes = Kotlin.Long.fromNumber(approx);\n
var approxRem = approxRes.multiply(other);\n  while (approxRem.isNegative() || approxRem.greaterThan(rem))
{\n  approx -= delta;\n  approxRes = Kotlin.Long.fromNumber(approx);\n  approxRem =
approxRes.multiply(other);\n } \n\n // We know the answer can't be zero... and actually, zero would cause\n //
infinite recursion since we would make no progress.\n  if (approxRes.isZero()) {\n  approxRes =
Kotlin.Long.ONE;\n } \n\n res = res.add(approxRes);\n  rem = rem.subtract(approxRem);\n } \n return
res;\n};\n\n\n/**\n * Returns this Long modulo the given one.\n * @param {Kotlin.Long} other Long by which to
mod.\n * @return {!Kotlin.Long} This Long modulo the given one.\n */\nKotlin.Long.prototype.modulo =
function(other) {\n  return this.subtract(this.div(other).multiply(other));\n};\n\n\n/**\n * @return {!Kotlin.Long} The
bitwise-NOT of this value. */\nKotlin.Long.prototype.not = function() {\n  return Kotlin.Long.fromBits(~this.low_,
~this.high_);\n};\n\n\n/**\n * Returns the bitwise-AND of this Long and the given one.\n * @param {Kotlin.Long}
other The Long with which to AND.\n * @return {!Kotlin.Long} The bitwise-AND of this and the other.\n */\n
Kotlin.Long.prototype.and = function(other) {\n  return Kotlin.Long.fromBits(this.low_ & other.low_,\n
this.high_ & other.high_);\n};\n\n\n/**\n * Returns the bitwise-OR of this Long and the given one.\n *
@param {Kotlin.Long} other The Long with which to OR.\n * @return {!Kotlin.Long} The bitwise-OR of this and
the other.\n */\nKotlin.Long.prototype.or = function(other) {\n  return Kotlin.Long.fromBits(this.low_ |
other.low_,\n this.high_ | other.high_);\n};\n\n\n/**\n * Returns the bitwise-XOR of this Long
and the given one.\n * @param {Kotlin.Long} other The Long with which to XOR.\n * @return {!Kotlin.Long}
The bitwise-XOR of this and the other.\n */\nKotlin.Long.prototype.xor = function(other) {\n  return
Kotlin.Long.fromBits(this.low_ ^ other.low_,\n this.high_ ^ other.high_);\n};\n\n\n/**\n * Returns this Long with bits shifted to the left by the given amount.\n * @param {number} numBits The number of
bits by which to shift.\n * @return {!Kotlin.Long} This shifted to the left by the given amount.\n */\n
Kotlin.Long.prototype.shiftLeft = function(numBits) {\n  numBits &= 63;\n  if (numBits == 0) {\n  return
this;\n } else {\n  var low = this.low_;\n  if (numBits < 32) {\n  var high = this.high_;\n  return
Kotlin.Long.fromBits(\n low << numBits,\n (high << numBits) | (low >>> (32 - numBits));\n } else
{\n  return Kotlin.Long.fromBits(0, low << (numBits - 32));\n } \n } \n};\n\n\n/**\n * Returns this Long with
bits shifted to the right by the given amount.\n * @param {number} numBits The number of bits by which to shift.\n
* @return {!Kotlin.Long} This shifted to the right by the given amount.\n */\nKotlin.Long.prototype.shiftRight =
function(numBits) {\n  numBits &= 63;\n  if (numBits == 0) {\n  return this;\n } else {\n  var high = this.high_;\n
if (numBits < 32) {\n  var low = this.low_;\n  return Kotlin.Long.fromBits(\n (low >>> numBits) | (high
<<< (32 - numBits)),\n high >> numBits);\n } else {\n  return Kotlin.Long.fromBits(\n high >>
(numBits - 32),\n high >= 0 ? 0 : -1);\n } \n } \n};\n\n\n/**\n * Returns this Long with bits shifted to the right
by the given amount, with\n * zeros placed into the new leading bits.\n * @param {number} numBits The number
of bits by which to shift.\n * @return {!Kotlin.Long} This shifted to the right by the given amount, with\n *
zeros placed into the new leading bits.\n */\nKotlin.Long.prototype.shiftRightUnsigned = function(numBits) {\n
numBits &= 63;\n  if (numBits == 0) {\n  return this;\n } else {\n  var high = this.high_;\n  if (numBits < 32) {\n
var

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Kotlin.Long.fromBits(bufInt32[lowIndex], bufInt32[highIndex]);\n
};\n\n Kotlin.doubleFromBits =
function(value) {\n    bufInt32[lowIndex] = value.low_;\n    bufInt32[highIndex] = value.high_;\n    return
bufFloat64[0];\n};\n\n Kotlin.floatToBits = function(value) {\n    return Kotlin.floatToRawBits(isNaN(value)
? NaN : value);\n};\n\n Kotlin.floatToRawBits = function(value) {\n    bufFloat32[0] = value;\n    return
bufInt32[0];\n};\n\n Kotlin.floatFromBits = function(value) {\n    bufInt32[0] = value;\n    return
bufFloat32[0];\n};\n\n // returns zero value for number with positive sign bit and non-zero value for number
with negative sign bit.\n Kotlin.doubleSignBit = function(value) {\n    bufFloat64[0] = value;\n    return
bufInt32[highIndex] & 0x80000000;\n};\n\n Kotlin.numberHashCode = function(obj) {\n    if ((obj | 0) ===
obj) {\n        return obj | 0;\n    } else {\n        bufFloat64[0] = obj;\n        return (bufInt32[highIndex]
* 31 | 0) + bufInt32[lowIndex] | 0;\n    }\n};\n\n Kotlin.ensureNotNull = function(x) {\n    return x != null
? x : Kotlin.throwNPE();\n};\n\n"/*\n * Copyright 2010-2020 JetBrains s.r.o. and Kotlin Programming Language
contributors.\n * Use of this source code is governed by the Apache 2.0 license that can be found in the
license/LICENSE.txt file.\n */\n\nif (typeof String.prototype.startsWith === "undefined") {\n
Object.defineProperty(String.prototype, "startsWith", {\n    value: function (searchString, position) {\n
position = position || 0;\n        return this.lastIndexOf(searchString, position) === position;\n    }\n});\n\nif
(typeof String.prototype.endsWith === "undefined") {\n    Object.defineProperty(String.prototype, "endsWith",
{\n        value: function (searchString, position) {\n            var subjectString = this.toString();\n            if (position
=== undefined || position > subjectString.length) {\n                position = subjectString.length;\n            }\n
position -= searchString.length;\n            var lastIndex = subjectString.indexOf(searchString, position);\n
return lastIndex !== -1 && lastIndex === position;\n        }\n    });\n\n// ES6 Math polyfills\n\nif (typeof Math.sign
=== "undefined") {\n    Math.sign = function(x) {\n        x = +x; // convert to a number\n        if (x === 0 ||
isNaN(x)) {\n            return Number(x);\n        }\n        return x > 0 ? 1 : -1;\n    };}\n\nif (typeof Math.trunc
=== "undefined") {\n    Math.trunc = function(x) {\n        if (isNaN(x)) {\n            return NaN;\n        }\n        if (x > 0)
{\n            return Math.floor(x);\n        }\n        return Math.ceil(x);\n    };}\n\n(function() {\n    var epsilon =
2.220446049250313E-16;\n    var taylor_2_bound = Math.sqrt(epsilon);\n    var taylor_n_bound =
Math.sqrt(taylor_2_bound);\n    var upper_taylor_2_bound = 1/taylor_2_bound;\n    var upper_taylor_n_bound =
1/taylor_n_bound;\n\n    if (typeof Math.sinh === "undefined") {\n        Math.sinh = function(x) {\n            if
(Math.abs(x) < taylor_n_bound) {\n                var result = x;\n                if (Math.abs(x) > taylor_2_bound) {\n
                    result += (x * x * x) / 6;\n                }\n                return result;\n            } else {\n                var y =
Math.exp(x);\n                var y1 = 1 / y;\n                if (!isFinite(y)) return Math.exp(x - Math.LN2);\n                if
(!isFinite(y1)) return -Math.exp(-x - Math.LN2);\n                return (y - y1) / 2;\n            }\n        }\n    }\n\n    if
(typeof Math.cosh === "undefined") {\n        Math.cosh = function(x) {\n            var y = Math.exp(x);\n            var
y1 = 1 / y;\n            if (!isFinite(y) || !isFinite(y1)) return Math.exp(Math.abs(x) - Math.LN2);\n            return (y +
y1) / 2;\n        }\n    }\n\n    if (typeof Math.tanh === "undefined") {\n        Math.tanh = function(x) {\n            if
(Math.abs(x) < taylor_n_bound) {\n                var result = x;\n                if (Math.abs(x) > taylor_2_bound) {\n
                    result -= (x * x * x) / 3;\n                }\n                return result;\n            } else {\n                var a =
Math.exp(+x), b = Math.exp(-x);\n                return a === Infinity ? 1 : b === Infinity ? -1 : (a - b) / (a + b);\n            }\n        }\n    }\n\n    // Inverse hyperbolic function implementations derived from boost special math functions,\n
// Copyright Eric Ford & Hubert Holin 2001.\n\n    if (typeof Math.asinh === "undefined") {\n        var asinh =
function(x) {\n            if (x >= +taylor_n_bound)\n                {\n                    if (x > upper_taylor_n_bound)\n                        {\n                            // approximation by laurent series in
1/x at 0+ order from -1 to 0\n                            return Math.log(x) + Math.LN2;\n                        }\n                    {\n                            // approximation by laurent series in 1/x at 0+ order from -1 to 1\n                            return
Math.log(x * 2 + (1 / (x * 2)));\n                        }\n                    }\n                }\n            else\n                {\n                    return
Math.log(x + Math.sqrt(x * x + 1));\n                }\n            else if (x <= -taylor_n_bound)\n                {\n                    return
-asinh(-x);\n                }\n            else\n                {\n                    // approximation by taylor series in x at 0 up to
order 2\n                    var result = x;\n                    if (Math.abs(x) >= taylor_2_bound)\n                        {\n                            var x3 =
x * x * x;\n                            // approximation by taylor series in x at 0 up to order 4\n                            result -= x3 / 6;\n                        }\n                }\n        }\n    }\n\n}

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    }\n        return result;\n    }\n    };\n    Math.asinh = asinh;\n    }\n    if (typeof Math.acosh ===
\"undefined\") {\n        Math.acosh = function(x) {\n            if (x < 1)\n                {\n                    return NaN;\n                }\n            else if (x - 1 >= taylor_n_bound)\n                {\n                    if (x > upper_taylor_2_bound)\n                        {\n
// approximation by laurent series in 1/x at 0+ order from -1 to 0\n                            return Math.log(x) + Math.LN2;\n
                        }\n                    else\n                        {\n                            return Math.log(x + Math.sqrt(x * x - 1));\n                        }\n                    }\n                }\n            else\n                {\n                    var y = Math.sqrt(x - 1);\n                    // approximation by taylor series in y at 0
up to order 2\n                        var result = y;\n                        if (y >= taylor_2_bound)\n                            {\n                                var y3 = y *
y * y;\n                                // approximation by taylor series in y at 0 up to order 4\n                                    result -= y3 / 12;\n
                            }\n                        }\n                    }\n                }\n            return Math.sqrt(2) * result;\n        }\n    };\n    }\n    if (typeof Math.atanh === \"undefined\")
{\n        Math.atanh = function(x) {\n            if (Math.abs(x) < taylor_n_bound) {\n                var result = x;\n
            if (Math.abs(x) > taylor_2_bound) {\n                result += (x * x * x) / 3;\n            }\n            return result;\n
        }\n        return Math.log((1 + x) / (1 - x)) / 2;\n    };\n    }\n    if (typeof Math.log1p === \"undefined\") {\n
Math.log1p = function(x) {\n        if (Math.abs(x) < taylor_n_bound) {\n            var x2 = x * x;\n
var x3 = x2 * x;\n            var x4 = x3 * x;\n            // approximation by taylor series in x at 0 up to order 4\n
return (-x4 / 4 + x3 / 3 - x2 / 2 + x);\n        }\n        return Math.log(x + 1);\n    };\n    }\n    if (typeof
Math.expm1 === \"undefined\") {\n        Math.expm1 = function(x) {\n            if (Math.abs(x) < taylor_n_bound)
{\n                var x2 = x * x;\n                var x3 = x2 * x;\n                var x4 = x3 * x;\n                // approximation by
taylor series in x at 0 up to order 4\n                return (x4 / 24 + x3 / 6 + x2 / 2 + x);\n            }\n            return
Math.exp(x) - 1;\n        };\n    }\n    }\n    }\n    if (typeof Math.hypot === \"undefined\") {\n        Math.hypot = function() {\n
var y = 0;\n        var length = arguments.length;\n        for (var i = 0; i < length; i++) {\n            if (arguments[i]
=== Infinity || arguments[i] === -Infinity) {\n                return Infinity;\n            }\n            y += arguments[i] *
arguments[i];\n        }\n        return Math.sqrt(y);\n    };\n    }\n    }\n    if (typeof Math.log10 === \"undefined\") {\n
Math.log10 = function(x) {\n        return Math.log(x) * Math.LOG10E;\n    };\n    }\n    if (typeof Math.log2 ===
\"undefined\") {\n        Math.log2 = function(x) {\n            return Math.log(x) * Math.LOG2E;\n        };\n    }\n    }\n    if (typeof
Math.clz32 === \"undefined\") {\n        Math.clz32 = (function(log, LN2) {\n            return function(x) {\n                var
asUint = x >>> 0;\n                if (asUint === 0) {\n                    return 32;\n                }\n                return 31 - (log(asUint) /
LN2 | 0) | 0; // the \"| 0\" acts like math.floor\n            };\n        })(Math.log, Math.LN2);\n    }\n    }\n    }\n    }\n    if (typeof ArrayBuffer.isView === \"undefined\") {\n        ArrayBuffer.isView = function(a) {\n
return a != null && a.__proto__ != null && a.__proto__.__proto__ === Int8Array.prototype.__proto__;\n
    };\n    }\n    }\n    if (typeof Array.prototype.fill === \"undefined\") {\n        // Polyfill from https://developer.mozilla.org/en-
US/docs/Web/JavaScript/Reference/Global_Objects/Array/fill#Polyfill\n        Object.defineProperty(Array.prototype,
'fill', {\n            value: function (value) {\n                // Steps 1-2.\n                if (this == null) {\n                    throw new
TypeError('this is null or not defined');\n                }\n                var O = Object(this);\n                // Steps 3-5.\n
var len = O.length >>> 0;\n                // Steps 6-7.\n                var start = arguments[1];\n                var relativeStart = start
>>> 0;\n                // Step 8.\n                var k = relativeStart < 0 ?\n                    Math.max(len + relativeStart, 0) :\n                    Math.min(relativeStart, len);\n                // Steps 9-10.\n                var end = arguments[2];\n                var
relativeEnd = end === undefined ?\n                    len : end >>> 0;\n                // Step 11.\n                var finalValue
= relativeEnd < 0 ?\n                    Math.max(len + relativeEnd, 0) :\n                    Math.min(relativeEnd,
len);\n                // Step 12.\n                while (k < finalValue) {\n                    O[k] = value;\n                    k++;\n                }\n
                // Step 13.\n                return O;\n            };\n        };\n    }\n    }\n    }\n    }\n    if (typeof function normalizeOffset(offset, length)
{\n        if (offset < 0) return Math.max(0, offset + length);\n        return Math.min(offset, length);\n    } function
typedArraySlice(begin, end) {\n        if (typeof end === \"undefined\") {\n            end = this.length;\n        }\n
begin = normalizeOffset(begin || 0, this.length);\n        end = Math.max(begin, normalizeOffset(end, this.length));\n
return new this.constructor(this.subarray(begin, end));\n    } {\n        var arrays = [Int8Array, Int16Array,
Uint16Array, Int32Array, Float32Array, Float64Array];\n        for (var i = 0; i < arrays.length; ++i) {\n            var
TypedArray = arrays[i];\n            if (typeof TypedArray.prototype.fill === \"undefined\") {\n
Object.defineProperty(TypedArray.prototype, 'fill', {\n                value: Array.prototype.fill\n            });\n        }\n
        if (typeof TypedArray.prototype.slice === \"undefined\") {\n            Object.defineProperty(TypedArray.prototype,

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'slice', {\n      value: typedArraySlice\n    });\n  }\n }\n\n // Patch apply to work with TypedArrays
if needed.\n try {\n   (function() {}).apply(null, new Int32Array(0))\n } catch (e) {\n   var apply =
Function.prototype.apply;\n   Object.defineProperty(Function.prototype, 'apply', {\n     value: function(self,
array) {\n       return apply.call(this, self, [].slice.call(array));\n     }\n   });\n }\n\n // Patch map to
work with TypedArrays if needed.\n for (var i = 0; i < arrays.length; ++i) {\n   var TypedArray = arrays[i];\n   if (typeof TypedArray.prototype.map === "undefined") {\n     Object.defineProperty(TypedArray.prototype,
'map', {\n       value: function(callback, self) {\n         return [].slice.call(this).map(callback, self);\n       }\n     });\n   }\n }\n\n // Patch sort to work with TypedArrays if needed.\n // TODO: consider to
remove following function and replace it with `Kotlin.doubleCompareTo` (see misc.js)\n var
totalOrderComparator = function (a, b) {\n   if (a < b) return -1;\n   if (a > b) return 1;\n\n   if (a === b) {\n     if (a !== 0) return 0;\n     var ia = 1 / a;\n     return ia === 1 / b ? 0 : (ia < 0 ? -1 : 1);\n   }\n\n   return a !== a ? (b !== b ? 0 : 1) : -1\n };
\n\n for (var i = 0; i < arrays.length; ++i) {\n   var TypedArray =
arrays[i];\n   if (typeof TypedArray.prototype.sort === "undefined") {\n     Object.defineProperty(TypedArray.prototype, 'sort', {\n       value: function(compareFunction) {\n         return Array.prototype.sort.call(this, compareFunction || totalOrderComparator);\n       }\n     });\n   }\n }\n\n }
\n\n});\n", /*\n * Copyright 2010-2018 JetBrains s.r.o. and Kotlin Programming Language contributors. \n * Use
of this source code is governed by the Apache 2.0 license that can be found in the license/LICENSE.txt file.\n
*\n\nKotlin.Kind = {\n  CLASS: "class",\n  INTERFACE: "interface",\n  OBJECT:
"object"\n};\n\nKotlin.callGetter = function (thisObject, klass, propertyName) {\n  var propertyDescriptor =
Object.getOwnPropertyDescriptor(klass, propertyName);\n  if (propertyDescriptor != null &&
propertyDescriptor.get != null) {\n    return propertyDescriptor.get.call(thisObject);\n  }\n\n  propertyDescriptor
= Object.getOwnPropertyDescriptor(thisObject, propertyName);\n  if (propertyDescriptor != null && "value" in
propertyDescriptor) {\n    return thisObject[propertyName];\n  }\n\n  return Kotlin.callGetter(thisObject,
Object.getPrototypeOf(klass), propertyName);\n};\n\nKotlin.callSetter = function (thisObject, klass, propertyName,
value) {\n  var propertyDescriptor = Object.getOwnPropertyDescriptor(klass, propertyName);\n  if
(propertyDescriptor != null && propertyDescriptor.set != null) {\n    propertyDescriptor.set.call(thisObject,
value);\n    return;\n  }\n\n  propertyDescriptor = Object.getOwnPropertyDescriptor(thisObject,
propertyName);\n  if (propertyDescriptor != null && "value" in propertyDescriptor) {\n    thisObject[propertyName] = value;\n    return\n  }\n\n  Kotlin.callSetter(thisObject,
Object.getPrototypeOf(klass), propertyName, value);\n};\n\nfunction isInheritanceFromInterface(ctor, iface) {\n  if
(ctor === iface) return true;\n\n  var metadata = ctor.$metadata$;\n  if (metadata != null) {\n    var interfaces =
metadata.interfaces;\n    for (var i = 0; i < interfaces.length; i++) {\n      if
(isInheritanceFromInterface(interfaces[i], iface)) {\n        return true;\n      }\n    }\n  }\n\n  var
superPrototype = ctor.prototype != null ? Object.getPrototypeOf(ctor.prototype) : null;\n  var superConstructor =
superPrototype != null ? superPrototype.constructor : null;\n  return superConstructor != null &&
isInheritanceFromInterface(superConstructor, iface);\n}\n\n/**\n * @param {*} object\n * @param
{Function|Object} klass\n * @returns {Boolean}\n *\nKotlin.isType = function (object, klass) {\n  if (klass ===
Object) {\n    switch (typeof object) {\n      case "string":\n      case "number":\n      case
"boolean":\n      case "function":\n        return true;\n      default:\n        return object instanceof
Object;\n    }\n  }\n\n  if (object == null || klass == null || (typeof object !== 'object' && typeof object !==
'function')) {\n    return false;\n  }\n\n  if (typeof klass === "function" && object instanceof klass) {\n
return true;\n  }\n\n  var proto = Object.getPrototypeOf(klass);\n  var constructor = proto != null ?
proto.constructor : null;\n  if (constructor != null && "$metadata$" in constructor) {\n    var metadata =
constructor.$metadata$;\n    if (metadata.kind === Kotlin.Kind.OBJECT) {\n      return object === klass;\n    }\n  }\n\n  var classMetadata = klass.$metadata$;\n\n  // In WebKit (JavaScriptCore) for some interfaces from
DOM typeof returns "object", nevertheless they can be used in RHS of instanceof\n  if (classMetadata == null) {\n
return object instanceof klass;\n  }\n\n  if (classMetadata.kind === Kotlin.Kind.INTERFACE &&
object.constructor != null) {\n    return isInheritanceFromInterface(object.constructor, klass);\n  }\n\n  return

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false;\n};\n\nKotlin.isNumber = function (a) {\n    return typeof a === \"number\" || a instanceof
Kotlin.Long;\n};\n\nKotlin.isChar = function (value) {\n    return value instanceof
Kotlin.BoxedChar;\n};\n\nKotlin.isComparable = function (value) {\n    var type = typeof value;\n    return type
=== \"string\" ||\n        type === \"boolean\" ||\n        Kotlin.isNumber(value) ||\n        Kotlin.isType(value,
Kotlin.kotlin.Comparable);\n};\n\nKotlin.isCharSequence = function (value) {\n    return typeof value === \"string\"
|| Kotlin.isType(value, Kotlin.kotlin.CharSequence);\n};\n\n\"/*\n * Copyright 2010-2020 JetBrains s.r.o. and Kotlin
Programming Language contributors.\n * Use of this source code is governed by the Apache 2.0 license that can be
found in the license/LICENSE.txt file.\n *^\n\n// a package is omitted to get declarations directly under the
module\n\n@PublishedApi\n\ninternal fun <T> Array(size: Int): Array<T>\n\n@JsName(\"newArray\")\n\nfun
<T> newArray(size: Int, initialValue: T) = fillArrayVal(Array<T>(size),
initialValue)\n\n@JsName(\"newArrayF\")\n\ninline fun <T> arrayWithFun(size: Int, init: (Int) -> T) =
fillArrayFun(Array<T>(size), init)\n\n@JsName(\"fillArray\")\n\ninline fun <T> fillArrayFun(array: Array<T>, init:
(Int) -> T): Array<T> {\n    for (i in 0..array.size - 1) {\n        array[i] = init(i)\n    }\n    return
array\n}\n\n@JsName(\"booleanArray\")\n\nfun booleanArray(size: Int, init: dynamic): Array<Boolean> {\n    val
result: dynamic = Array<Boolean>(size)\n    result.`$type$` = \"BooleanArray\"\n    return when (init) {\n        null,
true -> fillArrayVal(result, false)\n        false -> result\n        else -> fillArrayFun<Boolean>(result, init)\n
}\n}\n\n@JsName(\"booleanArrayF\")\n\ninline fun booleanArrayWithFun(size: Int, init: (Int) -> Boolean):
Array<Boolean> = fillArrayFun(booleanArray(size, false),
init)\n\n@JsName(\"charArray\")\n\n@Suppress(\"UNUSED_PARAMETER\")\n\nfun charArray(size: Int, init:
dynamic): Array<Char> {\n    val result = js(\"new Uint16Array(size)\")\n    result.`$type$` = \"CharArray\"\n    return
when (init) {\n        null, true, false -> result // For consistency\n        else -> fillArrayFun<Char>(result,
init)\n    }\n}\n\n@JsName(\"charArrayF\")\n\ninline fun charArrayWithFun(size: Int, init: (Int) -> Char):
Array<Char> {\n    val array = charArray(size, null)\n    for (i in 0..array.size - 1) {\n
@Suppress(\"UNUSED_VARIABLE\") // used in js block\n        val value = init(i)\n        js(\"array[i] = value;\")\n
}\n    return array\n}\n\n@JsName(\"untypedCharArrayF\")\n\ninline fun untypedCharArrayWithFun(size: Int, init:
(Int) -> Char): Array<Char> {\n    val array = Array<Char>(size)\n    for (i in 0..array.size - 1) {\n
@Suppress(\"UNUSED_VARIABLE\") // used in js block\n        val value = init(i)\n        js(\"array[i] = value;\")\n
}\n    return array\n}\n\n@JsName(\"longArray\")\n\nfun longArray(size: Int, init: dynamic): Array<Long> {\n    val
result: dynamic = Array<Long>(size)\n    result.`$type$` = \"LongArray\"\n    return when (init) {\n        null, true ->
fillArrayVal(result, 0L)\n        false -> result\n        else -> fillArrayFun<Long>(result, init)\n
}\n}\n\n@JsName(\"longArrayF\")\n\ninline fun longArrayWithFun(size: Int, init: (Int) -> Long): Array<Long> =
fillArrayFun(longArray(size, false), init)\n\nprivate fun <T> fillArrayVal(array: Array<T>, initialValue: T): Array<T>
{\n    for (i in 0..array.size - 1) {\n        array[i] = initialValue\n    }\n    return array\n}\n\n\"/*\n * Copyright 2010-2018
JetBrains s.r.o. and Kotlin Programming Language contributors.\n * Use of this source code is governed by the
Apache 2.0 license that can be found in the license/LICENSE.txt file.\n *^\n\npackage kotlin\n\npublic class
Enum<T : Enum<T>> : Comparable<Enum<T>> {\n    @JsName(\"name$\") private var _name: String = \"\"\n    @JsName(\"ordinal$\") private var _ordinal: Int = 0\n\n    val name: String\n        get() = _name\n\n    val ordinal:
Int\n        get() = _ordinal\n\n    override fun compareTo(other: Enum<T>) = ordinal.compareTo(other.ordinal)\n\n    override fun equals(other: Any?) = this === other\n\n    override fun hashCode(): Int =
js(\"Kotlin.identityHashCode\")(this)\n\n    override fun toString() = name\n\n    companion object {\n\n    *
Copyright 2010-2018 JetBrains s.r.o. and Kotlin Programming Language contributors.\n * Use of this source code is
governed by the Apache 2.0 license that can be found in the license/LICENSE.txt file.\n *^\n\npackage
kotlin.js.internal\n\n@JsName(\"DoubleCompanionObject\")\n\ninternal object DoubleCompanionObject {\n\n    @JsName(\"MIN_VALUE\")\n    const val MIN_VALUE: Double = 4.9E-324\n\n    @JsName(\"MAX_VALUE\")\n    const val MAX_VALUE: Double = 1.7976931348623157E308\n\n    @JsName(\"POSITIVE_INFINITY\")\n    @Suppress(\"DIVISION_BY_ZERO\")\n    const val
POSITIVE_INFINITY: Double = 1.0 / 0.0\n\n    @JsName(\"NEGATIVE_INFINITY\")\n    @Suppress(\"DIVISION_BY_ZERO\")\n    const val NEGATIVE_INFINITY: Double = -1.0 / 0.0\n
}

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@JsName("NaN")\n @Suppress("DIVISION_BY_ZERO")\n const val NaN: Double = -(0.0 / 0.0)\n\n@JsName("SIZE_BYTES")\n const val SIZE_BYTES = 8\n\n @JsName("SIZE_BITS")\n const val SIZE_BITS = 64\n}\n\n@JsName("FloatCompanionObject")\ninternal object FloatCompanionObject {\n\n @JsName("MIN_VALUE")\n const val MIN_VALUE: Float = 1.4E-45F\n\n @JsName("MAX_VALUE")\n const val MAX_VALUE: Float = 3.4028235E38F\n\n @JsName("POSITIVE_INFINITY")\n @Suppress("DIVISION_BY_ZERO")\n const val POSITIVE_INFINITY: Float = 1.0F / 0.0F\n\n @JsName("NEGATIVE_INFINITY")\n @Suppress("DIVISION_BY_ZERO")\n const val NEGATIVE_INFINITY: Float = -1.0F / 0.0F\n\n @JsName("NaN")\n @Suppress("DIVISION_BY_ZERO")\n const val NaN: Float = -(0.0F / 0.0F)\n\n @JsName("SIZE_BYTES")\n const val SIZE_BYTES = 4\n\n @JsName("SIZE_BITS")\n const val SIZE_BITS = 32\n}\n\n@JsName("IntCompanionObject")\ninternal object IntCompanionObject {\n\n @JsName("MIN_VALUE")\n val MIN_VALUE: Int = -2147483647 - 1\n\n @JsName("MAX_VALUE")\n val MAX_VALUE: Int = 2147483647\n\n @JsName("SIZE_BYTES")\n const val SIZE_BYTES = 4\n\n @JsName("SIZE_BITS")\n const val SIZE_BITS = 32\n}\n\n@JsName("LongCompanionObject")\ninternal object LongCompanionObject {\n\n @JsName("MIN_VALUE")\n val MIN_VALUE: Long = js("Kotlin.Long.MIN_VALUE")\n\n @JsName("MAX_VALUE")\n val MAX_VALUE: Long = js("Kotlin.Long.MAX_VALUE")\n\n @JsName("SIZE_BYTES")\n const val SIZE_BYTES = 8\n\n @JsName("SIZE_BITS")\n const val SIZE_BITS = 64\n}\n\n@JsName("ShortCompanionObject")\ninternal object ShortCompanionObject {\n\n @JsName("MIN_VALUE")\n val MIN_VALUE: Short = -32768\n\n @JsName("MAX_VALUE")\n val MAX_VALUE: Short = 32767\n\n @JsName("SIZE_BYTES")\n const val SIZE_BYTES = 2\n\n @JsName("SIZE_BITS")\n const val SIZE_BITS = 16\n}\n\n@JsName("ByteCompanionObject")\ninternal object ByteCompanionObject {\n\n @JsName("MIN_VALUE")\n val MIN_VALUE: Byte = -128\n\n @JsName("MAX_VALUE")\n val MAX_VALUE: Byte = 127\n\n @JsName("SIZE_BYTES")\n const val SIZE_BYTES = 1\n\n @JsName("SIZE_BITS")\n const val SIZE_BITS = 8\n}\n\n@JsName("CharCompanionObject")\ninternal object CharCompanionObject {\n\n @JsName("MIN_VALUE")\n public const val MIN_VALUE: Char = "\u0000"\n\n @JsName("MAX_VALUE")\n public const val MAX_VALUE: Char = "\uFFFF"\n\n @JsName("MIN_HIGH_SURROGATE")\n public const val MIN_HIGH_SURROGATE: Char = "\uD800"\n\n @JsName("MAX_HIGH_SURROGATE")\n public const val MAX_HIGH_SURROGATE: Char = "\uDBFF"\n\n @JsName("MIN_LOW_SURROGATE")\n public const val MIN_LOW_SURROGATE: Char = "\uDC00"\n\n @JsName("MAX_LOW_SURROGATE")\n public const val MAX_LOW_SURROGATE: Char = "\uDFFF"\n\n @JsName("MIN_SURROGATE")\n public const val MIN_SURROGATE: Char = MIN_HIGH_SURROGATE\n\n @JsName("MAX_SURROGATE")\n public const val MAX_SURROGATE: Char = MAX_LOW_SURROGATE\n\n @JsName("SIZE_BYTES")\n const val SIZE_BYTES = 2\n\n @JsName("SIZE_BITS")\n const val SIZE_BITS = 16\n}\n\ninternal object StringCompanionObject\n\n}\n\ninternal object BooleanCompanionObject\n\n}\n\n\n", /*\n * Copyright 2010-2021 JetBrains s.r.o. and Kotlin\n * Programming Language contributors.\n * Use of this source code is governed by the Apache 2.0 license that can be\n * found in the license/LICENSE.txt file.\n *\n *\n @file:kotlin.jvm.JvmMultifileClass\n @file:kotlin.jvm.JvmName("ArraysKt")\n\npackage\nkotlin.collections\n\n/\n\n// NOTE: THIS FILE IS AUTO-GENERATED by the GenerateStandardLib.kt\n// See:\nhttps://github.com/JetBrains/kotlin/tree/master/libraries/stdlib\n\n/\n\n\nimport kotlin.random.*\nimport\nkotlin.ranges.contains\nimport kotlin.ranges.reversed\n\n\n/**\n * Returns 1st *element* from the array.\n * \n * \n * If the\n * size of this array is less than 1, throws an [IndexOutOfBoundsException] except in Kotlin/JS\n * where the behavior is unspecified.\n * \n *\n @kotlin.internal.InlineOnly\n public inline operator fun <T> Array<out T>.component1(): T\n {\n return get(0)\n}\n\n/**\n * Returns 1st *element* from the array.\n * \n * \n * If the\n * size of this array is less than 1,\n * throws an [IndexOutOfBoundsException] except in Kotlin/JS\n * where the behavior is unspecified.\n *\n @kotlin.internal.InlineOnly\n public inline operator fun ByteArray.component1(): Byte {\n return\n get(0)\n}\n\n/**\n * Returns 1st *element* from the array.\n * \n * \n * If the\n * size of this array is less than 1, throws an

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[IndexOutOfBoundsException] except in Kotlin/JS\n * where the behavior is unspecified.\n

```
*\n@kotlin.internal.InlineOnly\npublic inline operator fun ShortArray.component1(): Short {\n    return  
get(0)\n}\n\n/**\n * Returns 1st *element* from the array.\n * \n * If the size of this array is less than 1, throws an  
[IndexOutOfBoundsException] except in Kotlin/JS\n * where the behavior is unspecified.\n
```

```
*\n@kotlin.internal.InlineOnly\npublic inline operator fun IntArray.component1(): Int {\n    return  
get(0)\n}\n\n/**\n * Returns 1st *element* from the array.\n * \n * If the size of this array is less than 1, throws an  
[IndexOutOfBoundsException] except in Kotlin/JS\n * where the behavior is unspecified.\n
```

```
*\n@kotlin.internal.InlineOnly\npublic inline operator fun LongArray.component1(): Long {\n    return  
get(0)\n}\n\n/**\n * Returns 1st *element* from the array.\n * \n * If the size of this array is less than 1, throws an  
[IndexOutOfBoundsException] except in Kotlin/JS\n * where the behavior is unspecified.\n
```

```
*\n@kotlin.internal.InlineOnly\npublic inline operator fun FloatArray.component1(): Float {\n    return  
get(0)\n}\n\n/**\n * Returns 1st *element* from the array.\n * \n * If the size of this array is less than 1, throws an  
[IndexOutOfBoundsException] except in Kotlin/JS\n * where the behavior is unspecified.\n
```

```
*\n@kotlin.internal.InlineOnly\npublic inline operator fun DoubleArray.component1(): Double {\n    return  
get(0)\n}\n\n/**\n * Returns 1st *element* from the array.\n * \n * If the size of this array is less than 1, throws an  
[IndexOutOfBoundsException] except in Kotlin/JS\n * where the behavior is unspecified.\n
```

```
*\n@kotlin.internal.InlineOnly\npublic inline operator fun BooleanArray.component1(): Boolean {\n    return  
get(0)\n}\n\n/**\n * Returns 1st *element* from the array.\n * \n * If the size of this array is less than 1, throws an  
[IndexOutOfBoundsException] except in Kotlin/JS\n * where the behavior is unspecified.\n
```

```
*\n@kotlin.internal.InlineOnly\npublic inline operator fun CharArray.component1(): Char {\n    return  
get(0)\n}\n\n/**\n * Returns 2nd *element* from the array.\n * \n * If the size of this array is less than 2, throws an  
[IndexOutOfBoundsException] except in Kotlin/JS\n * where the behavior is unspecified.\n
```

```
*\n@kotlin.internal.InlineOnly\npublic inline operator fun <T> Array<out T>.component2(): T {\n    return  
get(1)\n}\n\n/**\n * Returns 2nd *element* from the array.\n * \n * If the size of this array is less than 2, throws an  
[IndexOutOfBoundsException] except in Kotlin/JS\n * where the behavior is unspecified.\n
```

```
*\n@kotlin.internal.InlineOnly\npublic inline operator fun ByteArray.component2(): Byte {\n    return  
get(1)\n}\n\n/**\n * Returns 2nd *element* from the array.\n * \n * If the size of this array is less than 2, throws an  
[IndexOutOfBoundsException] except in Kotlin/JS\n * where the behavior is unspecified.\n
```

```
*\n@kotlin.internal.InlineOnly\npublic inline operator fun ShortArray.component2(): Short {\n    return  
get(1)\n}\n\n/**\n * Returns 2nd *element* from the array.\n * \n * If the size of this array is less than 2, throws an  
[IndexOutOfBoundsException] except in Kotlin/JS\n * where the behavior is unspecified.\n
```

```
*\n@kotlin.internal.InlineOnly\npublic inline operator fun IntArray.component2(): Int {\n    return  
get(1)\n}\n\n/**\n * Returns 2nd *element* from the array.\n * \n * If the size of this array is less than 2, throws an  
[IndexOutOfBoundsException] except in Kotlin/JS\n * where the behavior is unspecified.\n
```

```
*\n@kotlin.internal.InlineOnly\npublic inline operator fun LongArray.component2(): Long {\n    return  
get(1)\n}\n\n/**\n * Returns 2nd *element* from the array.\n * \n * If the size of this array is less than 2, throws an  
[IndexOutOfBoundsException] except in Kotlin/JS\n * where the behavior is unspecified.\n
```

```
*\n@kotlin.internal.InlineOnly\npublic inline operator fun FloatArray.component2(): Float {\n    return  
get(1)\n}\n\n/**\n * Returns 2nd *element* from the array.\n * \n * If the size of this array is less than 2, throws an  
[IndexOutOfBoundsException] except in Kotlin/JS\n * where the behavior is unspecified.\n
```

```
*\n@kotlin.internal.InlineOnly\npublic inline operator fun DoubleArray.component2(): Double {\n    return  
get(1)\n}\n\n/**\n * Returns 2nd *element* from the array.\n * \n * If the size of this array is less than 2, throws an  
[IndexOutOfBoundsException] except in Kotlin/JS\n * where the behavior is unspecified.\n
```

```
*\n@kotlin.internal.InlineOnly\npublic inline operator fun BooleanArray.component2(): Boolean {\n    return  
get(1)\n}\n\n/**\n * Returns 2nd *element* from the array.\n * \n * If the size of this array is less than 2, throws an  
[IndexOutOfBoundsException] except in Kotlin/JS\n * where the behavior is unspecified.\n
```

```
*\n@kotlin.internal.InlineOnly\npublic inline operator fun CharArray.component2(): Char {\n    return  
get(1)\n}\n\n/**\n * Returns 3rd *element* from the array.\n * \n * If the size of this array is less than 3, throws an
```

[IndexOutOfBoundsException] except in Kotlin/JS\n * where the behavior is unspecified.\n

```
*\n@kotlin.internal.InlineOnly\npublic inline operator fun <T> Array<out T>.component3(): T {\n    return\n    get(2)\n}\n\n/**\n * Returns 3rd *element* from the array.\n * \n * If the size of this array is less than 3, throws an\n [IndexOutOfBoundsException] except in Kotlin/JS\n * where the behavior is unspecified.\n
```

```
*\n@kotlin.internal.InlineOnly\npublic inline operator fun ByteArray.component3(): Byte {\n    return\n    get(2)\n}\n\n/**\n * Returns 3rd *element* from the array.\n * \n * If the size of this array is less than 3, throws an\n [IndexOutOfBoundsException] except in Kotlin/JS\n * where the behavior is unspecified.\n
```

```
*\n@kotlin.internal.InlineOnly\npublic inline operator fun ShortArray.component3(): Short {\n    return\n    get(2)\n}\n\n/**\n * Returns 3rd *element* from the array.\n * \n * If the size of this array is less than 3, throws an\n [IndexOutOfBoundsException] except in Kotlin/JS\n * where the behavior is unspecified.\n
```

```
*\n@kotlin.internal.InlineOnly\npublic inline operator fun IntArray.component3(): Int {\n    return\n    get(2)\n}\n\n/**\n * Returns 3rd *element* from the array.\n * \n * If the size of this array is less than 3, throws an\n [IndexOutOfBoundsException] except in Kotlin/JS\n * where the behavior is unspecified.\n
```

```
*\n@kotlin.internal.InlineOnly\npublic inline operator fun LongArray.component3(): Long {\n    return\n    get(2)\n}\n\n/**\n * Returns 3rd *element* from the array.\n * \n * If the size of this array is less than 3, throws an\n [IndexOutOfBoundsException] except in Kotlin/JS\n * where the behavior is unspecified.\n
```

```
*\n@kotlin.internal.InlineOnly\npublic inline operator fun FloatArray.component3(): Float {\n    return\n    get(2)\n}\n\n/**\n * Returns 3rd *element* from the array.\n * \n * If the size of this array is less than 3, throws an\n [IndexOutOfBoundsException] except in Kotlin/JS\n * where the behavior is unspecified.\n
```

```
*\n@kotlin.internal.InlineOnly\npublic inline operator fun DoubleArray.component3(): Double {\n    return\n    get(2)\n}\n\n/**\n * Returns 3rd *element* from the array.\n * \n * If the size of this array is less than 3, throws an\n [IndexOutOfBoundsException] except in Kotlin/JS\n * where the behavior is unspecified.\n
```

```
*\n@kotlin.internal.InlineOnly\npublic inline operator fun BooleanArray.component3(): Boolean {\n    return\n    get(2)\n}\n\n/**\n * Returns 3rd *element* from the array.\n * \n * If the size of this array is less than 3, throws an\n [IndexOutOfBoundsException] except in Kotlin/JS\n * where the behavior is unspecified.\n
```

```
*\n@kotlin.internal.InlineOnly\npublic inline operator fun CharArray.component3(): Char {\n    return\n    get(2)\n}\n\n/**\n * Returns 4th *element* from the array.\n * \n * If the size of this array is less than 4, throws an\n [IndexOutOfBoundsException] except in Kotlin/JS\n * where the behavior is unspecified.\n
```

```
*\n@kotlin.internal.InlineOnly\npublic inline operator fun <T> Array<out T>.component4(): T {\n    return\n    get(3)\n}\n\n/**\n * Returns 4th *element* from the array.\n * \n * If the size of this array is less than 4, throws an\n [IndexOutOfBoundsException] except in Kotlin/JS\n * where the behavior is unspecified.\n
```

```
*\n@kotlin.internal.InlineOnly\npublic inline operator fun ByteArray.component4(): Byte {\n    return\n    get(3)\n}\n\n/**\n * Returns 4th *element* from the array.\n * \n * If the size of this array is less than 4, throws an\n [IndexOutOfBoundsException] except in Kotlin/JS\n * where the behavior is unspecified.\n
```

```
*\n@kotlin.internal.InlineOnly\npublic inline operator fun ShortArray.component4(): Short {\n    return\n    get(3)\n}\n\n/**\n * Returns 4th *element* from the array.\n * \n * If the size of this array is less than 4, throws an\n [IndexOutOfBoundsException] except in Kotlin/JS\n * where the behavior is unspecified.\n
```

```
*\n@kotlin.internal.InlineOnly\npublic inline operator fun IntArray.component4(): Int {\n    return\n    get(3)\n}\n\n/**\n * Returns 4th *element* from the array.\n * \n * If the size of this array is less than 4, throws an\n [IndexOutOfBoundsException] except in Kotlin/JS\n * where the behavior is unspecified.\n
```

```
*\n@kotlin.internal.InlineOnly\npublic inline operator fun LongArray.component4(): Long {\n    return\n    get(3)\n}\n\n/**\n * Returns 4th *element* from the array.\n * \n * If the size of this array is less than 4, throws an\n [IndexOutOfBoundsException] except in Kotlin/JS\n * where the behavior is unspecified.\n
```

```
*\n@kotlin.internal.InlineOnly\npublic inline operator fun FloatArray.component4(): Float {\n    return\n    get(3)\n}\n\n/**\n * Returns 4th *element* from the array.\n * \n * If the size of this array is less than 4, throws an\n [IndexOutOfBoundsException] except in Kotlin/JS\n * where the behavior is unspecified.\n
```

```
*\n@kotlin.internal.InlineOnly\npublic inline operator fun DoubleArray.component4(): Double {\n    return\n    get(3)\n}\n\n/**\n * Returns 4th *element* from the array.\n * \n * If the size of this array is less than 4, throws an
```

[IndexOutOfBoundsException] except in Kotlin/JS\n * where the behavior is unspecified.\n

```

*\n@kotlin.internal.InlineOnly\npublic inline operator fun BooleanArray.component4(): Boolean {\n    return
get(3)\n}\n\n/**\n * Returns 4th *element* from the array.\n * \n * If the size of this array is less than 4, throws an
[IndexOutOfBoundsException] except in Kotlin/JS\n * where the behavior is unspecified.\n
*\n@kotlin.internal.InlineOnly\npublic inline operator fun CharArray.component4(): Char {\n    return
get(3)\n}\n\n/**\n * Returns 5th *element* from the array.\n * \n * If the size of this array is less than 5, throws an
[IndexOutOfBoundsException] except in Kotlin/JS\n * where the behavior is unspecified.\n
*\n@kotlin.internal.InlineOnly\npublic inline operator fun <T> Array<out T>.component5(): T {\n    return
get(4)\n}\n\n/**\n * Returns 5th *element* from the array.\n * \n * If the size of this array is less than 5, throws an
[IndexOutOfBoundsException] except in Kotlin/JS\n * where the behavior is unspecified.\n
*\n@kotlin.internal.InlineOnly\npublic inline operator fun ByteArray.component5(): Byte {\n    return
get(4)\n}\n\n/**\n * Returns 5th *element* from the array.\n * \n * If the size of this array is less than 5, throws an
[IndexOutOfBoundsException] except in Kotlin/JS\n * where the behavior is unspecified.\n
*\n@kotlin.internal.InlineOnly\npublic inline operator fun ShortArray.component5(): Short {\n    return
get(4)\n}\n\n/**\n * Returns 5th *element* from the array.\n * \n * If the size of this array is less than 5, throws an
[IndexOutOfBoundsException] except in Kotlin/JS\n * where the behavior is unspecified.\n
*\n@kotlin.internal.InlineOnly\npublic inline operator fun IntArray.component5(): Int {\n    return
get(4)\n}\n\n/**\n * Returns 5th *element* from the array.\n * \n * If the size of this array is less than 5, throws an
[IndexOutOfBoundsException] except in Kotlin/JS\n * where the behavior is unspecified.\n
*\n@kotlin.internal.InlineOnly\npublic inline operator fun LongArray.component5(): Long {\n    return
get(4)\n}\n\n/**\n * Returns 5th *element* from the array.\n * \n * If the size of this array is less than 5, throws an
[IndexOutOfBoundsException] except in Kotlin/JS\n * where the behavior is unspecified.\n
*\n@kotlin.internal.InlineOnly\npublic inline operator fun FloatArray.component5(): Float {\n    return
get(4)\n}\n\n/**\n * Returns 5th *element* from the array.\n * \n * If the size of this array is less than 5, throws an
[IndexOutOfBoundsException] except in Kotlin/JS\n * where the behavior is unspecified.\n
*\n@kotlin.internal.InlineOnly\npublic inline operator fun DoubleArray.component5(): Double {\n    return
get(4)\n}\n\n/**\n * Returns 5th *element* from the array.\n * \n * If the size of this array is less than 5, throws an
[IndexOutOfBoundsException] except in Kotlin/JS\n * where the behavior is unspecified.\n
*\n@kotlin.internal.InlineOnly\npublic inline operator fun BooleanArray.component5(): Boolean {\n    return
get(4)\n}\n\n/**\n * Returns 5th *element* from the array.\n * \n * If the size of this array is less than 5, throws an
[IndexOutOfBoundsException] except in Kotlin/JS\n * where the behavior is unspecified.\n
*\n@kotlin.internal.InlineOnly\npublic inline operator fun CharArray.component5(): Char {\n    return
get(4)\n}\n\n/**\n * Returns `true` if [element] is found in the array.\n */\n\npublic operator fun
<@kotlin.internal.OnlyInputTypes T> Array<out T>.contains(element: T): Boolean {\n    return indexOf(element)
>= 0\n}\n\n/**\n * Returns `true` if [element] is found in the array.\n */\n\npublic operator fun
ByteArray.contains(element: Byte): Boolean {\n    return indexOf(element) >= 0\n}\n\n/**\n * Returns `true` if
[element] is found in the array.\n */\n\npublic operator fun ShortArray.contains(element: Short): Boolean {\n    return
indexOf(element) >= 0\n}\n\n/**\n * Returns `true` if [element] is found in the array.\n */\n\npublic operator fun
IntArray.contains(element: Int): Boolean {\n    return indexOf(element) >= 0\n}\n\n/**\n * Returns `true` if
[element] is found in the array.\n */\n\npublic operator fun LongArray.contains(element: Long): Boolean {\n    return
indexOf(element) >= 0\n}\n\n/**\n * Returns `true` if [element] is found in the array.\n */\n\n@Deprecated("The
function has unclear behavior when searching for NaN or zero values and will be removed soon. Use 'any { it ==
element }' instead to continue using this behavior, or '.asList().contains(element: T)' to get the same search behavior
as in a list.", ReplaceWith("any { it == element }"))\n@DeprecatedSinceKotlin(warningSince = "1.4", errorSince = "1.6")\n@Suppress("DEPRECATION_ERROR")\npublic operator fun FloatArray.contains(element: Float):
Boolean {\n    return indexOf(element) >= 0\n}\n\n/**\n * Returns `true` if [element] is found in the array.\n
*/\n\n@Deprecated("The function has unclear behavior when searching for NaN or zero values and will be removed
soon. Use 'any { it == element }' instead to continue using this behavior, or '.asList().contains(element: T)' to get the

```

```

same search behavior as in a list.\", ReplaceWith(\\any { it == element
})\\")\n@DeprecatedSinceKotlin(warningSince = \\\"1.4\\\", errorSince =
\\\"1.6\\\")\n@Suppress(\\\"DEPRECATION_ERROR\\\")\npublic operator fun DoubleArray.contains(element: Double):
Boolean {\n    return indexOf(element) >= 0\n}\n\n/**\n * Returns `true` if [element] is found in the array.\n */\npublic operator fun BooleanArray.contains(element: Boolean): Boolean {\n    return indexOf(element) >=
0\n}\n\n/**\n * Returns `true` if [element] is found in the array.\n */\npublic operator fun
CharArray.contains(element: Char): Boolean {\n    return indexOf(element) >= 0\n}\n\n/**\n * Returns an element
at the given [index] or throws an [IndexOutOfBoundsException] if the [index] is out of bounds of this array.\n */\n */
\n * @sample samples.collections.Collections.Elements.elementAt\n */\npublic expect fun <T> Array<out
T>.elementAt(index: Int): T\n\n/**\n * Returns an element at the given [index] or throws an
[IndexOutOfBoundsException] if the [index] is out of bounds of this array.\n */\n */\n * @sample
samples.collections.Collections.Elements.elementAt\n */\npublic expect fun ByteArray.elementAt(index: Int):
Byte\n\n/**\n * Returns an element at the given [index] or throws an [IndexOutOfBoundsException] if the [index] is
out of bounds of this array.\n */\n */\n * @sample samples.collections.Collections.Elements.elementAt\n */\npublic
expect fun ShortArray.elementAt(index: Int): Short\n\n/**\n * Returns an element at the given [index] or throws an
[IndexOutOfBoundsException] if the [index] is out of bounds of this array.\n */\n */\n * @sample
samples.collections.Collections.Elements.elementAt\n */\npublic expect fun IntArray.elementAt(index: Int):
Int\n\n/**\n * Returns an element at the given [index] or throws an [IndexOutOfBoundsException] if the [index] is
out of bounds of this array.\n */\n */\n * @sample samples.collections.Collections.Elements.elementAt\n */\npublic
expect fun LongArray.elementAt(index: Int): Long\n\n/**\n * Returns an element at the given [index] or throws an
[IndexOutOfBoundsException] if the [index] is out of bounds of this array.\n */\n */\n * @sample
samples.collections.Collections.Elements.elementAt\n */\npublic expect fun FloatArray.elementAt(index: Int):
Float\n\n/**\n * Returns an element at the given [index] or throws an [IndexOutOfBoundsException] if the [index]
is out of bounds of this array.\n */\n */\n * @sample samples.collections.Collections.Elements.elementAt\n */\npublic
expect fun DoubleArray.elementAt(index: Int): Double\n\n/**\n * Returns an element at the given [index] or throws
an [IndexOutOfBoundsException] if the [index] is out of bounds of this array.\n */\n */\n * @sample
samples.collections.Collections.Elements.elementAt\n */\npublic expect fun BooleanArray.elementAt(index: Int):
Boolean\n\n/**\n * Returns an element at the given [index] or throws an [IndexOutOfBoundsException] if the
[index] is out of bounds of this array.\n */\n */\n * @sample samples.collections.Collections.Elements.elementAt\n
*/\n\n */\npublic expect fun CharArray.elementAt(index: Int): Char\n\n/**\n * Returns an element at the given [index] or
the result of calling the [defaultValue] function if the [index] is out of bounds of this array.\n */\n */\n * @sample
samples.collections.Collections.Elements.elementAtOrElse\n */\n\n */\n@kotlin.internal.InlineOnly\npublic inline fun
<T> Array<out T>.elementAtOrElse(index: Int, defaultValue: (Int) -> T): T {\n    return if (index >= 0 && index <=
lastIndex) get(index) else defaultValue(index)\n}\n\n/**\n * Returns an element at the given [index] or the result of
calling the [defaultValue] function if the [index] is out of bounds of this array.\n */\n */\n * @sample
samples.collections.Collections.Elements.elementAtOrElse\n */\n\n */\n@kotlin.internal.InlineOnly\npublic inline fun
ByteArray.elementAtOrElse(index: Int, defaultValue: (Int) -> Byte): Byte {\n    return if (index >= 0 && index <=
lastIndex) get(index) else defaultValue(index)\n}\n\n/**\n * Returns an element at the given [index] or the result of
calling the [defaultValue] function if the [index] is out of bounds of this array.\n */\n */\n * @sample
samples.collections.Collections.Elements.elementAtOrElse\n */\n\n */\n@kotlin.internal.InlineOnly\npublic inline fun
ShortArray.elementAtOrElse(index: Int, defaultValue: (Int) -> Short): Short {\n    return if (index >= 0 && index <=
lastIndex) get(index) else defaultValue(index)\n}\n\n/**\n * Returns an element at the given [index] or the result of
calling the [defaultValue] function if the [index] is out of bounds of this array.\n */\n */\n * @sample
samples.collections.Collections.Elements.elementAtOrElse\n */\n\n */\n@kotlin.internal.InlineOnly\npublic inline fun
IntArray.elementAtOrElse(index: Int, defaultValue: (Int) -> Int): Int {\n    return if (index >= 0 && index <=
lastIndex) get(index) else defaultValue(index)\n}\n\n/**\n * Returns an element at the given [index] or the result of
calling the [defaultValue] function if the [index] is out of bounds of this array.\n */\n */\n * @sample
samples.collections.Collections.Elements.elementAtOrElse\n */\n\n */\n@kotlin.internal.InlineOnly\npublic inline fun

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LongArray.elementAtOrElse(index: Int, defaultValue: (Int) -> Long): Long {\n  return if (index >= 0 && index <=
lastIndex) get(index) else defaultValue(index)\n}\n\n/**\n * Returns an element at the given [index] or the result of
calling the [defaultValue] function if the [index] is out of bounds of this array.\n * \n * @sample
samples.collections.Collections.Elements.elementAtOrElse\n */\n@kotlin.internal.InlineOnly\npublic inline fun
FloatArray.elementAtOrElse(index: Int, defaultValue: (Int) -> Float): Float {\n  return if (index >= 0 && index <=
lastIndex) get(index) else defaultValue(index)\n}\n\n/**\n * Returns an element at the given [index] or the result of
calling the [defaultValue] function if the [index] is out of bounds of this array.\n * \n * @sample
samples.collections.Collections.Elements.elementAtOrElse\n */\n@kotlin.internal.InlineOnly\npublic inline fun
DoubleArray.elementAtOrElse(index: Int, defaultValue: (Int) -> Double): Double {\n  return if (index >= 0 &&
index <= lastIndex) get(index) else defaultValue(index)\n}\n\n/**\n * Returns an element at the given [index] or the
result of calling the [defaultValue] function if the [index] is out of bounds of this array.\n * \n * @sample
samples.collections.Collections.Elements.elementAtOrElse\n */\n@kotlin.internal.InlineOnly\npublic inline fun
BooleanArray.elementAtOrElse(index: Int, defaultValue: (Int) -> Boolean): Boolean {\n  return if (index >= 0 &&
index <= lastIndex) get(index) else defaultValue(index)\n}\n\n/**\n * Returns an element at the given [index] or the
result of calling the [defaultValue] function if the [index] is out of bounds of this array.\n * \n * @sample
samples.collections.Collections.Elements.elementAtOrElse\n */\n@kotlin.internal.InlineOnly\npublic inline fun
CharArray.elementAtOrElse(index: Int, defaultValue: (Int) -> Char): Char {\n  return if (index >= 0 && index <=
lastIndex) get(index) else defaultValue(index)\n}\n\n/**\n * Returns an element at the given [index] or `null` if the
[index] is out of bounds of this array.\n * \n * @sample
samples.collections.Collections.Elements.elementAtOrNull\n */\n@kotlin.internal.InlineOnly\npublic inline fun
<T> Array<out T>.elementAtOrNull(index: Int): T? {\n  return this.getOrNull(index)\n}\n\n/**\n * Returns an
element at the given [index] or `null` if the [index] is out of bounds of this array.\n * \n * @sample
samples.collections.Collections.Elements.elementAtOrNull\n */\n@kotlin.internal.InlineOnly\npublic inline fun
ByteArray.elementAtOrNull(index: Int): Byte? {\n  return this.getOrNull(index)\n}\n\n/**\n * Returns an element
at the given [index] or `null` if the [index] is out of bounds of this array.\n * \n * @sample
samples.collections.Collections.Elements.elementAtOrNull\n */\n@kotlin.internal.InlineOnly\npublic inline fun
ShortArray.elementAtOrNull(index: Int): Short? {\n  return this.getOrNull(index)\n}\n\n/**\n * Returns an element
at the given [index] or `null` if the [index] is out of bounds of this array.\n * \n * @sample
samples.collections.Collections.Elements.elementAtOrNull\n */\n@kotlin.internal.InlineOnly\npublic inline fun
IntArray.elementAtOrNull(index: Int): Int? {\n  return this.getOrNull(index)\n}\n\n/**\n * Returns an element at
the given [index] or `null` if the [index] is out of bounds of this array.\n * \n * @sample
samples.collections.Collections.Elements.elementAtOrNull\n */\n@kotlin.internal.InlineOnly\npublic inline fun
LongArray.elementAtOrNull(index: Int): Long? {\n  return this.getOrNull(index)\n}\n\n/**\n * Returns an element
at the given [index] or `null` if the [index] is out of bounds of this array.\n * \n * @sample
samples.collections.Collections.Elements.elementAtOrNull\n */\n@kotlin.internal.InlineOnly\npublic inline fun
FloatArray.elementAtOrNull(index: Int): Float? {\n  return this.getOrNull(index)\n}\n\n/**\n * Returns an element
at the given [index] or `null` if the [index] is out of bounds of this array.\n * \n * @sample
samples.collections.Collections.Elements.elementAtOrNull\n */\n@kotlin.internal.InlineOnly\npublic inline fun
DoubleArray.elementAtOrNull(index: Int): Double? {\n  return this.getOrNull(index)\n}\n\n/**\n * Returns an
element at the given [index] or `null` if the [index] is out of bounds of this array.\n * \n * @sample
samples.collections.Collections.Elements.elementAtOrNull\n */\n@kotlin.internal.InlineOnly\npublic inline fun
BooleanArray.elementAtOrNull(index: Int): Boolean? {\n  return this.getOrNull(index)\n}\n\n/**\n * Returns an
element at the given [index] or `null` if the [index] is out of bounds of this array.\n * \n * @sample
samples.collections.Collections.Elements.elementAtOrNull\n */\n@kotlin.internal.InlineOnly\npublic inline fun
CharArray.elementAtOrNull(index: Int): Char? {\n  return this.getOrNull(index)\n}\n\n/**\n * Returns the first
element matching the given [predicate], or `null` if no such element was found.\n * \n * @sample
samples.collections.Collections.Elements.find\n */\n@kotlin.internal.InlineOnly\npublic inline fun <T> Array<out
T>.find(predicate: (T) -> Boolean): T? {\n  return firstOrNull(predicate)\n}\n\n/**\n * Returns the first element

```

matching the given [predicate], or `null` if no such element was found. \n * \n * @sample

```

samples.collections.Collections.Elements.find\n */\n@kotlin.internal.InlineOnly\npublic inline fun
ByteArray.find(predicate: (Byte) -> Boolean): Byte? {\n    return firstOrNull(predicate)\n}\n\n/**\n * Returns the
first element matching the given [predicate], or `null` if no such element was found.\n * \n * @sample
samples.collections.Collections.Elements.find\n */\n@kotlin.internal.InlineOnly\npublic inline fun
ShortArray.find(predicate: (Short) -> Boolean): Short? {\n    return firstOrNull(predicate)\n}\n\n/**\n * Returns the
first element matching the given [predicate], or `null` if no such element was found.\n * \n * @sample
samples.collections.Collections.Elements.find\n */\n@kotlin.internal.InlineOnly\npublic inline fun
IntArray.find(predicate: (Int) -> Boolean): Int? {\n    return firstOrNull(predicate)\n}\n\n/**\n * Returns the first
element matching the given [predicate], or `null` if no such element was found.\n * \n * @sample
samples.collections.Collections.Elements.find\n */\n@kotlin.internal.InlineOnly\npublic inline fun
LongArray.find(predicate: (Long) -> Boolean): Long? {\n    return firstOrNull(predicate)\n}\n\n/**\n * Returns the
first element matching the given [predicate], or `null` if no such element was found.\n * \n * @sample
samples.collections.Collections.Elements.find\n */\n@kotlin.internal.InlineOnly\npublic inline fun
FloatArray.find(predicate: (Float) -> Boolean): Float? {\n    return firstOrNull(predicate)\n}\n\n/**\n * Returns the
first element matching the given [predicate], or `null` if no such element was found.\n * \n * @sample
samples.collections.Collections.Elements.find\n */\n@kotlin.internal.InlineOnly\npublic inline fun
DoubleArray.find(predicate: (Double) -> Boolean): Double? {\n    return firstOrNull(predicate)\n}\n\n/**\n *
Returns the first element matching the given [predicate], or `null` if no such element was found.\n * \n * @sample
samples.collections.Collections.Elements.find\n */\n@kotlin.internal.InlineOnly\npublic inline fun
BooleanArray.find(predicate: (Boolean) -> Boolean): Boolean? {\n    return firstOrNull(predicate)\n}\n\n/**\n *
Returns the first element matching the given [predicate], or `null` if no such element was found.\n * \n * @sample
samples.collections.Collections.Elements.find\n */\n@kotlin.internal.InlineOnly\npublic inline fun
CharArray.find(predicate: (Char) -> Boolean): Char? {\n    return firstOrNull(predicate)\n}\n\n/**\n * Returns the
last element matching the given [predicate], or `null` if no such element was found.\n * \n * @sample
samples.collections.Collections.Elements.find\n */\n@kotlin.internal.InlineOnly\npublic inline fun <T> Array<out
T>.findLast(predicate: (T) -> Boolean): T? {\n    return lastOrNull(predicate)\n}\n\n/**\n * Returns the last element
matching the given [predicate], or `null` if no such element was found.\n * \n * @sample
samples.collections.Collections.Elements.find\n */\n@kotlin.internal.InlineOnly\npublic inline fun
ByteArray.findLast(predicate: (Byte) -> Boolean): Byte? {\n    return lastOrNull(predicate)\n}\n\n/**\n * Returns
the last element matching the given [predicate], or `null` if no such element was found.\n * \n * @sample
samples.collections.Collections.Elements.find\n */\n@kotlin.internal.InlineOnly\npublic inline fun
ShortArray.findLast(predicate: (Short) -> Boolean): Short? {\n    return lastOrNull(predicate)\n}\n\n/**\n * Returns
the last element matching the given [predicate], or `null` if no such element was found.\n * \n * @sample
samples.collections.Collections.Elements.find\n */\n@kotlin.internal.InlineOnly\npublic inline fun
IntArray.findLast(predicate: (Int) -> Boolean): Int? {\n    return lastOrNull(predicate)\n}\n\n/**\n * Returns the last
element matching the given [predicate], or `null` if no such element was found.\n * \n * @sample
samples.collections.Collections.Elements.find\n */\n@kotlin.internal.InlineOnly\npublic inline fun
LongArray.findLast(predicate: (Long) -> Boolean): Long? {\n    return lastOrNull(predicate)\n}\n\n/**\n * Returns
the last element matching the given [predicate], or `null` if no such element was found.\n * \n * @sample
samples.collections.Collections.Elements.find\n */\n@kotlin.internal.InlineOnly\npublic inline fun
FloatArray.findLast(predicate: (Float) -> Boolean): Float? {\n    return lastOrNull(predicate)\n}\n\n/**\n * Returns
the last element matching the given [predicate], or `null` if no such element was found.\n * \n * @sample
samples.collections.Collections.Elements.find\n */\n@kotlin.internal.InlineOnly\npublic inline fun
DoubleArray.findLast(predicate: (Double) -> Boolean): Double? {\n    return lastOrNull(predicate)\n}\n\n/**\n *
Returns the last element matching the given [predicate], or `null` if no such element was found.\n * \n * @sample
samples.collections.Collections.Elements.find\n */\n@kotlin.internal.InlineOnly\npublic inline fun
BooleanArray.findLast(predicate: (Boolean) -> Boolean): Boolean? {\n    return lastOrNull(predicate)\n}\n\n/**\n *

```

Returns the last element matching the given [predicate], or `null` if no such element was found.

```

@sample
samples.collections.Collections.Elements.find
*/n@kotlin.internal.InlineOnly
npublic inline fun
CharArray.findLast(predicate: (Char) -> Boolean): Char? {
    return lastOrNull(predicate)
}
n/n/**
n * Returns first element.
n * @throws [NoSuchElementException] if the array is empty.
n */npublic fun <T> Array<out T>.first(): T {
    if (isEmpty())
        throw NoSuchElementException("Array is empty.")
    return this[0]
}
n/n/**
n * Returns first element.
n * @throws [NoSuchElementException] if the array is empty.
n */npublic fun ByteArray.first(): Byte {
    if (isEmpty())
        throw NoSuchElementException("Array is empty.")
    return this[0]
}
n/n/**
n * Returns first element.
n * @throws [NoSuchElementException] if the array is empty.
n */npublic fun ShortArray.first(): Short {
    if (isEmpty())
        throw
        NoSuchElementException("Array is empty.")
    return this[0]
}
n/n/**
n * Returns first element.
n * @throws [NoSuchElementException] if the array is empty.
n */npublic fun IntArray.first(): Int {
    if (isEmpty())
        throw NoSuchElementException("Array is empty.")
    return this[0]
}
n/n/**
n * Returns first element.
n * @throws [NoSuchElementException] if the array is empty.
n */npublic fun LongArray.first(): Long {
    if (isEmpty())
        throw NoSuchElementException("Array is empty.")
    return this[0]
}
n/n/**
n * Returns first element.
n * @throws [NoSuchElementException] if the array is empty.
n */npublic fun FloatArray.first(): Float {
    if (isEmpty())
        throw NoSuchElementException("Array is empty.")
    return this[0]
}
n/n/**
n * Returns first element.
n * @throws [NoSuchElementException] if the array is empty.
n */npublic fun DoubleArray.first(): Double {
    if (isEmpty())
        throw NoSuchElementException("Array is empty.")
    return this[0]
}
n/n/**
n * Returns first element.
n * @throws [NoSuchElementException] if the array is empty.
n */npublic fun BooleanArray.first(): Boolean {
    if (isEmpty())
        throw NoSuchElementException("Array is empty.")
    return this[0]
}
n/n/**
n * Returns first element.
n * @throws [NoSuchElementException] if the array is empty.
n */npublic fun CharArray.first(): Char {
    if (isEmpty())
        throw
        NoSuchElementException("Array is empty.")
    return this[0]
}
n/n/**
n * Returns the first element matching the given [predicate].
n * @throws [NoSuchElementException] if no such element is found.
n */npublic inline fun <T> Array<out T>.first(predicate: (T) -> Boolean): T {
    for (element in this) if (predicate(element)) return element
    throw NoSuchElementException("Array contains no element matching the predicate.")
}
n/n/**
n * Returns the first element matching the given [predicate].
n * @throws [NoSuchElementException] if no such element is found.
n */npublic inline fun ByteArray.first(predicate: (Byte) -> Boolean): Byte {
    for (element in this) if (predicate(element)) return element
    throw NoSuchElementException("Array contains no element matching the predicate.")
}
n/n/**
n * Returns the first element matching the given [predicate].
n * @throws [NoSuchElementException] if no such element is found.
n */npublic inline fun ShortArray.first(predicate: (Short) -> Boolean): Short {
    for (element in this) if (predicate(element)) return element
    throw
    NoSuchElementException("Array contains no element matching the predicate.")
}
n/n/**
n * Returns the first element matching the given [predicate].
n * @throws [NoSuchElementException] if no such element is found.
n */npublic inline fun IntArray.first(predicate: (Int) -> Boolean): Int {
    for (element in this) if (predicate(element)) return element
    throw NoSuchElementException("Array contains no element matching the predicate.")
}
n/n/**
n * Returns the first element matching the given [predicate].
n * @throws [NoSuchElementException] if no such element is found.
n */npublic inline fun LongArray.first(predicate: (Long) -> Boolean): Long {
    for (element in this) if (predicate(element)) return element
    throw
    NoSuchElementException("Array contains no element matching the predicate.")
}
n/n/**
n * Returns the first element matching the given [predicate].
n * @throws [NoSuchElementException] if no such element is found.
n */npublic inline fun FloatArray.first(predicate: (Float) -> Boolean): Float {
    for (element in this) if (predicate(element)) return element
    throw NoSuchElementException("Array contains no element matching the predicate.")
}
n/n/**
n * Returns the first element matching the given [predicate].
n * @throws [NoSuchElementException] if no such element is found.
n */npublic inline fun DoubleArray.first(predicate: (Double) -> Boolean): Double {
    for (element in this) if (predicate(element)) return element
    throw
    NoSuchElementException("Array contains no element matching the predicate.")
}
n/n/**
n * Returns the first element matching the given [predicate].
n * @throws [NoSuchElementException] if no such element is found.
n */

```



```

*^public inline fun BooleanArray.first(predicate: (Boolean) -> Boolean): Boolean {
    for (element in this) if (predicate(element)) return element
    throw NoSuchElementException("Array contains no element matching the predicate.")
}

* Returns the first element matching the given [predicate].
* @throws [NoSuchElementException] if no such element is found.

*^public inline fun CharArray.first(predicate: (Char) -> Boolean): Char {
    for (element in this) if (predicate(element)) return element
    throw NoSuchElementException("Array contains no element matching the predicate.")
}

* Returns the first non-null value produced by [transform] function being applied to elements of this array in iteration order,
* or throws [NoSuchElementException] if no non-null value was produced.
* @sample samples.collections.Collections.Transformations.firstNotNullOf

*^@SinceKotlin("1.5")
@kotlin.internal.InlineOnly
public inline fun <T, R : Any> Array<out T>.firstNotNullOf(transform: (T) -> R?): R {
    return firstNotNullOfOrNull(transform) ?: throw NoSuchElementException("No element of the array was transformed to a non-null value.")
}

* Returns the first non-null value produced by [transform] function being applied to elements of this array in iteration order,
* or `null` if no non-null value was produced.
* @sample samples.collections.Collections.Transformations.firstNotNullOf

*^@SinceKotlin("1.5")
@kotlin.internal.InlineOnly
public inline fun <T, R : Any> Array<out T>.firstNotNullOfOrNull(transform: (T) -> R?): R? {
    for (element in this) {
        val result = transform(element)
        if (result != null) return result
    }
    return null
}

* Returns the first element, or `null` if the array is empty.

*^public fun <T> Array<out T>.firstOrNull(): T? {
    return if (isEmpty()) null else this[0]
}

* Returns the first element, or `null` if the array is empty.

*^public fun ByteArray.firstOrNull(): Byte? {
    return if (isEmpty()) null else this[0]
}

* Returns the first element, or `null` if the array is empty.

*^public fun ShortArray.firstOrNull(): Short? {
    return if (isEmpty()) null else this[0]
}

* Returns the first element, or `null` if the array is empty.

*^public fun IntArray.firstOrNull(): Int? {
    return if (isEmpty()) null else this[0]
}

* Returns the first element, or `null` if the array is empty.

*^public fun FloatArray.firstOrNull(): Float? {
    return if (isEmpty()) null else this[0]
}

* Returns the first element, or `null` if the array is empty.

*^public fun DoubleArray.firstOrNull(): Double? {
    return if (isEmpty()) null else this[0]
}

* Returns the first element, or `null` if the array is empty.

*^public fun BooleanArray.firstOrNull(): Boolean? {
    return if (isEmpty()) null else this[0]
}

* Returns the first element, or `null` if the array is empty.

*^public fun CharArray.firstOrNull(): Char? {
    return if (isEmpty()) null else this[0]
}

* Returns the first element matching the given [predicate], or `null` if element was not found.

*^public inline fun <T> Array<out T>.firstOrNull(predicate: (T) -> Boolean): T? {
    for (element in this) if (predicate(element)) return element
    return null
}

* Returns the first element matching the given [predicate], or `null` if element was not found.

*^public inline fun ByteArray.firstOrNull(predicate: (Byte) -> Boolean): Byte? {
    for (element in this) if (predicate(element)) return element
    return null
}

* Returns the first element matching the given [predicate], or `null` if element was not found.

*^public inline fun ShortArray.firstOrNull(predicate: (Short) -> Boolean): Short? {
    for (element in this) if (predicate(element)) return element
    return null
}

* Returns the first element matching the given [predicate], or `null` if element was not found.

*^public inline fun IntArray.firstOrNull(predicate: (Int) -> Boolean): Int? {
    for (element in this) if (predicate(element)) return element
    return null
}

* Returns the first element matching the given [predicate], or `null` if element was not found.

*^public inline fun LongArray.firstOrNull(predicate: (Long) -> Boolean): Long? {
    for (element in this) if (predicate(element)) return element
    return null
}

* Returns the first element matching the given [predicate], or `null` if element was not found.

*^public inline fun FloatArray.firstOrNull(predicate: (Float) -> Boolean): Float? {
    for (element in this) if (predicate(element)) return element
    return null
}

* Returns the first element matching the given [predicate], or `null` if element was not found.

*^public inline fun DoubleArray.firstOrNull(predicate: (Double) -> Boolean): Double? {
    for (element in this) if

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(predicate(element)) return element\n    return null\n}\n\n/**\n * Returns the first element matching the given
[predicate], or `null` if element was not found.\n */\npublic inline fun BooleanArray.firstOrNull(predicate:
(Boolean) -> Boolean): Boolean? {\n    for (element in this) if (predicate(element)) return element\n    return
null\n}\n\n/**\n * Returns the first element matching the given [predicate], or `null` if element was not found.\n
*/\npublic inline fun CharArray.firstOrNull(predicate: (Char) -> Boolean): Char? {\n    for (element in this) if
(predicate(element)) return element\n    return null\n}\n\n/**\n * Returns an element at the given [index] or the
result of calling the [defaultValue] function if the [index] is out of bounds of this array.\n
*/\n@kotlin.internal.InlineOnly\npublic inline fun <T> Array<out T>.getOrNull(index: Int, defaultValue: (Int) ->
T): T? {\n    return if (index >= 0 && index <= lastIndex) get(index) else defaultValue(index)\n}\n\n/**\n * Returns
an element at the given [index] or the result of calling the [defaultValue] function if the [index] is out of bounds of
this array.\n */\n@kotlin.internal.InlineOnly\npublic inline fun ByteArray.getOrNull(index: Int, defaultValue: (Int) -
> Byte): Byte? {\n    return if (index >= 0 && index <= lastIndex) get(index) else defaultValue(index)\n}\n\n/**\n *
Returns an element at the given [index] or the result of calling the [defaultValue] function if the [index] is out of
bounds of this array.\n */\n@kotlin.internal.InlineOnly\npublic inline fun ShortArray.getOrNull(index: Int,
defaultValue: (Int) -> Short): Short? {\n    return if (index >= 0 && index <= lastIndex) get(index) else
defaultValue(index)\n}\n\n/**\n * Returns an element at the given [index] or the result of calling the [defaultValue]
function if the [index] is out of bounds of this array.\n */\n@kotlin.internal.InlineOnly\npublic inline fun
IntArray.getOrNull(index: Int, defaultValue: (Int) -> Int): Int? {\n    return if (index >= 0 && index <= lastIndex)
get(index) else defaultValue(index)\n}\n\n/**\n * Returns an element at the given [index] or the result of calling the
[defaultValue] function if the [index] is out of bounds of this array.\n */\n@kotlin.internal.InlineOnly\npublic inline
fun LongArray.getOrNull(index: Int, defaultValue: (Int) -> Long): Long? {\n    return if (index >= 0 && index <=
lastIndex) get(index) else defaultValue(index)\n}\n\n/**\n * Returns an element at the given [index] or the result of
calling the [defaultValue] function if the [index] is out of bounds of this array.\n
*/\n@kotlin.internal.InlineOnly\npublic inline fun FloatArray.getOrNull(index: Int, defaultValue: (Int) -> Float):
Float? {\n    return if (index >= 0 && index <= lastIndex) get(index) else defaultValue(index)\n}\n\n/**\n * Returns
an element at the given [index] or the result of calling the [defaultValue] function if the [index] is out of bounds of
this array.\n */\n@kotlin.internal.InlineOnly\npublic inline fun DoubleArray.getOrNull(index: Int, defaultValue:
(Int) -> Double): Double? {\n    return if (index >= 0 && index <= lastIndex) get(index) else
defaultValue(index)\n}\n\n/**\n * Returns an element at the given [index] or the result of calling the [defaultValue]
function if the [index] is out of bounds of this array.\n */\n@kotlin.internal.InlineOnly\npublic inline fun
BooleanArray.getOrNull(index: Int, defaultValue: (Int) -> Boolean): Boolean? {\n    return if (index >= 0 && index
<= lastIndex) get(index) else defaultValue(index)\n}\n\n/**\n * Returns an element at the given [index] or the result
of calling the [defaultValue] function if the [index] is out of bounds of this array.\n
*/\n@kotlin.internal.InlineOnly\npublic inline fun CharArray.getOrNull(index: Int, defaultValue: (Int) -> Char):
Char? {\n    return if (index >= 0 && index <= lastIndex) get(index) else defaultValue(index)\n}\n\n/**\n * Returns
an element at the given [index] or `null` if the [index] is out of bounds of this array.\n */\n * \n * @sample
samples.collections.Collections.Elements.getOrNull\n */\npublic fun <T> Array<out T>.getOrNull(index: Int): T?
{\n    return if (index >= 0 && index <= lastIndex) get(index) else null\n}\n\n/**\n * Returns an element at the
given [index] or `null` if the [index] is out of bounds of this array.\n */\n * \n * @sample
samples.collections.Collections.Elements.getOrNull\n */\npublic fun ByteArray.getOrNull(index: Int): Byte? {\n
return if (index >= 0 && index <= lastIndex) get(index) else null\n}\n\n/**\n * Returns an element at the given
[index] or `null` if the [index] is out of bounds of this array.\n */\n * \n * @sample
samples.collections.Collections.Elements.getOrNull\n */\npublic fun ShortArray.getOrNull(index: Int): Short? {\n
return if (index >= 0 && index <= lastIndex) get(index) else null\n}\n\n/**\n * Returns an element at the given
[index] or `null` if the [index] is out of bounds of this array.\n */\n * \n * @sample
samples.collections.Collections.Elements.getOrNull\n */\npublic fun IntArray.getOrNull(index: Int): Int? {\n
return if (index >= 0 && index <= lastIndex) get(index) else null\n}\n\n/**\n * Returns an element at the given
[index] or `null` if the [index] is out of bounds of this array.\n */\n * \n * @sample

```

```

samples.collections.Collections.Elements.getOrNull\n *^\\npublic fun LongArray.getOrNull(index: Int): Long? {\n
return if (index >= 0 && index <= lastIndex) get(index) else null\n}\n\n/**\n * Returns an element at the given
[index] or `null` if the [index] is out of bounds of this array.\n * \n * @sample
samples.collections.Collections.Elements.getOrNull\n *^\\npublic fun FloatArray.getOrNull(index: Int): Float? {\n
return if (index >= 0 && index <= lastIndex) get(index) else null\n}\n\n/**\n * Returns an element at the given
[index] or `null` if the [index] is out of bounds of this array.\n * \n * @sample
samples.collections.Collections.Elements.getOrNull\n *^\\npublic fun DoubleArray.getOrNull(index: Int): Double?
{\n
return if (index >= 0 && index <= lastIndex) get(index) else null\n}\n\n/**\n * Returns an element at the
given [index] or `null` if the [index] is out of bounds of this array.\n * \n * @sample
samples.collections.Collections.Elements.getOrNull\n *^\\npublic fun BooleanArray.getOrNull(index: Int): Boolean?
{\n
return if (index >= 0 && index <= lastIndex) get(index) else null\n}\n\n/**\n * Returns an element at the
given [index] or `null` if the [index] is out of bounds of this array.\n * \n * @sample
samples.collections.Collections.Elements.getOrNull\n *^\\npublic fun CharArray.getOrNull(index: Int): Char? {\n
return if (index >= 0 && index <= lastIndex) get(index) else null\n}\n\n/**\n * Returns first index of [element], or -
1 if the array does not contain element.\n *^\\npublic fun <@kotlin.internal.OnlyInputTypes T> Array<out
T>.indexOf(element: T): Int {\n
if (element == null) {\n
for (index in indices) {\n
if (this[index] ==
null) {\n
return index\n
}\n
}\n
} else {\n
for (index in indices) {\n
if (element ==
this[index]) {\n
return index\n
}\n
}\n
}\n
return -1\n}\n\n/**\n * Returns first index of
[element], or -1 if the array does not contain element.\n *^\\npublic fun ByteArray.indexOf(element: Byte): Int {\n
for (index in indices) {\n
if (element == this[index]) {\n
return index\n
}\n
}\n
return -
1\n}\n\n/**\n * Returns first index of [element], or -1 if the array does not contain element.\n *^\\npublic fun
ShortArray.indexOf(element: Short): Int {\n
for (index in indices) {\n
if (element == this[index]) {\n
return index\n
}\n
}\n
return -1\n}\n\n/**\n * Returns first index of [element], or -1 if the array does not
contain element.\n *^\\npublic fun IntArray.indexOf(element: Int): Int {\n
for (index in indices) {\n
if (element
== this[index]) {\n
return index\n
}\n
}\n
return -1\n}\n\n/**\n * Returns first index of [element], or -
1 if the array does not contain element.\n *^\\npublic fun LongArray.indexOf(element: Long): Int {\n
for (index in
indices) {\n
if (element == this[index]) {\n
return index\n
}\n
}\n
return -1\n}\n\n/**\n * Returns
first index of [element], or -1 if the array does not contain element.\n *^\\n@Deprecated("The function has unclear
behavior when searching for NaN or zero values and will be removed soon. Use 'indexOfFirst { it == element }'
instead to continue using this behavior, or '.asList().indexOf(element: T)' to get the same search behavior as in a
list.", ReplaceWith("indexOfFirst { it == element }"))\n@DeprecatedSinceKotlin(warningSince = "1.4",
errorSince = "1.6")\npublic fun FloatArray.indexOf(element: Float): Int {\n
for (index in indices) {\n
if
(element == this[index]) {\n
return index\n
}\n
}\n
return -1\n}\n\n/**\n * Returns first index of
[element], or -1 if the array does not contain element.\n *^\\n@Deprecated("The function has unclear behavior when
searching for NaN or zero values and will be removed soon. Use 'indexOfFirst { it == element }' instead to continue
using this behavior, or '.asList().indexOf(element: T)' to get the same search behavior as in a list.",
ReplaceWith("indexOfFirst { it == element }"))\n@DeprecatedSinceKotlin(warningSince = "1.4", errorSince =
"1.6")\npublic fun DoubleArray.indexOf(element: Double): Int {\n
for (index in indices) {\n
if (element ==
this[index]) {\n
return index\n
}\n
}\n
return -1\n}\n\n/**\n * Returns first index of [element], or -1 if
the array does not contain element.\n *^\\npublic fun BooleanArray.indexOf(element: Boolean): Int {\n
for (index
in indices) {\n
if (element == this[index]) {\n
return index\n
}\n
}\n
return -1\n}\n\n/**\n *
Returns first index of [element], or -1 if the array does not contain element.\n *^\\npublic fun
CharArray.indexOf(element: Char): Int {\n
for (index in indices) {\n
if (element == this[index]) {\n
return index\n
}\n
}\n
return -1\n}\n\n/**\n * Returns index of the first element matching the given
[predicate], or -1 if the array does not contain such element.\n *^\\npublic inline fun <T> Array<out
T>.indexOfFirst(predicate: (T) -> Boolean): Int {\n
for (index in indices) {\n
if (predicate(this[index])) {\n
return index\n
}\n
}\n
return -1\n}\n\n/**\n * Returns index of the first element matching the given
[predicate], or -1 if the array does not contain such element.\n *^\\npublic inline fun

```

```

ByteArray.indexOfFirst(predicate: (Byte) -> Boolean): Int {
    for (index in indices) {
        if (predicate(this[index]))
            return index
    }
    return -1
}
/**
 * Returns index of the first element matching the given [predicate], or -1 if the array does not contain such element.
 */
public inline fun ShortArray.indexOfFirst(predicate: (Short) -> Boolean): Int {
    for (index in indices) {
        if (predicate(this[index]))
            return index
    }
    return -1
}
/**
 * Returns index of the first element matching the given [predicate], or -1 if the array does not contain such element.
 */
public inline fun IntArray.indexOfFirst(predicate: (Int) -> Boolean): Int {
    for (index in indices) {
        if (predicate(this[index]))
            return index
    }
    return -1
}
/**
 * Returns index of the first element matching the given [predicate], or -1 if the array does not contain such element.
 */
public inline fun LongArray.indexOfFirst(predicate: (Long) -> Boolean): Int {
    for (index in indices) {
        if (predicate(this[index]))
            return index
    }
    return -1
}
/**
 * Returns index of the first element matching the given [predicate], or -1 if the array does not contain such element.
 */
public inline fun FloatArray.indexOfFirst(predicate: (Float) -> Boolean): Int {
    for (index in indices) {
        if (predicate(this[index]))
            return index
    }
    return -1
}
/**
 * Returns index of the first element matching the given [predicate], or -1 if the array does not contain such element.
 */
public inline fun DoubleArray.indexOfFirst(predicate: (Double) -> Boolean): Int {
    for (index in indices) {
        if (predicate(this[index]))
            return index
    }
    return -1
}
/**
 * Returns index of the first element matching the given [predicate], or -1 if the array does not contain such element.
 */
public inline fun BooleanArray.indexOfFirst(predicate: (Boolean) -> Boolean): Int {
    for (index in indices) {
        if (predicate(this[index]))
            return index
    }
    return -1
}
/**
 * Returns index of the first element matching the given [predicate], or -1 if the array does not contain such element.
 */
public inline fun CharArray.indexOfFirst(predicate: (Char) -> Boolean): Int {
    for (index in indices) {
        if (predicate(this[index]))
            return index
    }
    return -1
}
/**
 * Returns index of the last element matching the given [predicate], or -1 if the array does not contain such element.
 */
public inline fun <T>Array<out T>.indexOfLast(predicate: (T) -> Boolean): Int {
    for (index in indices.reversed()) {
        if (predicate(this[index]))
            return index
    }
    return -1
}
/**
 * Returns index of the last element matching the given [predicate], or -1 if the array does not contain such element.
 */
public inline fun ByteArray.indexOfLast(predicate: (Byte) -> Boolean): Int {
    for (index in indices.reversed()) {
        if (predicate(this[index]))
            return index
    }
    return -1
}
/**
 * Returns index of the last element matching the given [predicate], or -1 if the array does not contain such element.
 */
public inline fun ShortArray.indexOfLast(predicate: (Short) -> Boolean): Int {
    for (index in indices.reversed()) {
        if (predicate(this[index]))
            return index
    }
    return -1
}
/**
 * Returns index of the last element matching the given [predicate], or -1 if the array does not contain such element.
 */
public inline fun IntArray.indexOfLast(predicate: (Int) -> Boolean): Int {
    for (index in indices.reversed()) {
        if (predicate(this[index]))
            return index
    }
    return -1
}
/**
 * Returns index of the last element matching the given [predicate], or -1 if the array does not contain such element.
 */
public inline fun LongArray.indexOfLast(predicate: (Long) -> Boolean): Int {
    for (index in indices.reversed()) {
        if (predicate(this[index]))
            return index
    }
    return -1
}
/**
 * Returns index of the last element matching the given [predicate], or -1 if the array does not contain such element.
 */
public inline fun FloatArray.indexOfLast(predicate: (Float) -> Boolean): Int {
    for (index in indices.reversed()) {
        if (predicate(this[index]))
            return index
    }
    return -1
}
/**
 * Returns index of the last element matching the given [predicate], or -1 if the array does not contain such element.
 */
public inline fun DoubleArray.indexOfLast(predicate: (Double) -> Boolean): Int {
    for (index in indices.reversed()) {
        if (predicate(this[index]))
            return index
    }
    return -1
}
/**
 * Returns index of the last element matching the given [predicate], or -1 if the array does not contain such element.
 */
public inline fun BooleanArray.indexOfLast(predicate: (Boolean) -> Boolean): Int {
    for (index in indices.reversed()) {
        if (predicate(this[index]))
            return index
    }
    return -1
}
/**
 * Returns index of the last element matching the given [predicate], or -1 if the array does not contain such element.
 */
public inline fun

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CharArray.indexOfLast(predicate: (Char) -> Boolean): Int {
    for (index in indices.reversed()) {
        if (predicate(this[index])) {
            return index
        }
    }
    return -1
}
Returns the last element.
@throws NoSuchElementException if the array is empty.
@sample
samples.collections.Collections.Elements.last
public fun <T> Array<out T>.last(): T {
    if (isEmpty())
        throw NoSuchElementException("Array is empty.")
    return this[lastIndex]
}
Returns the last element.
@throws NoSuchElementException if the array is empty.
@sample
samples.collections.Collections.Elements.last
public fun ByteArray.last(): Byte {
    if (isEmpty())
        throw NoSuchElementException("Array is empty.")
    return this[lastIndex]
}
Returns the last element.
@throws NoSuchElementException if the array is empty.
@sample
samples.collections.Collections.Elements.last
public fun ShortArray.last(): Short {
    if (isEmpty())
        throw NoSuchElementException("Array is empty.")
    return this[lastIndex]
}
Returns the last element.
@throws NoSuchElementException if the array is empty.
@sample
samples.collections.Collections.Elements.last
public fun IntArray.last(): Int {
    if (isEmpty())
        throw NoSuchElementException("Array is empty.")
    return this[lastIndex]
}
Returns the last element.
@throws NoSuchElementException if the array is empty.
@sample
samples.collections.Collections.Elements.last
public fun LongArray.last(): Long {
    if (isEmpty())
        throw NoSuchElementException("Array is empty.")
    return this[lastIndex]
}
Returns the last element.
@throws NoSuchElementException if the array is empty.
@sample
samples.collections.Collections.Elements.last
public fun FloatArray.last(): Float {
    if (isEmpty())
        throw NoSuchElementException("Array is empty.")
    return this[lastIndex]
}
Returns the last element.
@throws NoSuchElementException if the array is empty.
@sample
samples.collections.Collections.Elements.last
public fun DoubleArray.last(): Double {
    if (isEmpty())
        throw NoSuchElementException("Array is empty.")
    return this[lastIndex]
}
Returns the last element.
@throws NoSuchElementException if the array is empty.
@sample
samples.collections.Collections.Elements.last
public fun BooleanArray.last(): Boolean {
    if (isEmpty())
        throw NoSuchElementException("Array is empty.")
    return this[lastIndex]
}
Returns the last element.
@throws NoSuchElementException if the array is empty.
@sample
samples.collections.Collections.Elements.last
public fun CharArray.last(predicate: (Char) -> Boolean): Char {
    if (isEmpty())
        throw NoSuchElementException("Array is empty.")
    return this[lastIndex]
}
Returns the last element matching the given [predicate].
@throws NoSuchElementException if no such element is found.
@sample
samples.collections.Collections.Elements.last
public inline fun <T> Array<out T>.last(predicate: (T) -> Boolean): T {
    for (index in this.indices.reversed()) {
        val element = this[index]
        if (predicate(element)) return element
    }
    throw NoSuchElementException("Array contains no element matching the predicate.")
}
Returns the last element matching the given [predicate].
@throws NoSuchElementException if no such element is found.
@sample
samples.collections.Collections.Elements.last
public inline fun ByteArray.last(predicate: (Byte) -> Boolean): Byte {
    for (index in this.indices.reversed()) {
        val element = this[index]
        if (predicate(element)) return element
    }
    throw NoSuchElementException("Array contains no element matching the predicate.")
}
Returns the last element matching the given [predicate].
@throws NoSuchElementException if no such element is found.
@sample
samples.collections.Collections.Elements.last
public inline fun ShortArray.last(predicate: (Short) -> Boolean): Short {
    for (index in this.indices.reversed()) {
        val element = this[index]
        if (predicate(element)) return element
    }
    throw NoSuchElementException("Array contains no element matching the predicate.")
}
Returns the last element matching the given [predicate].
@throws NoSuchElementException if no such element is found.
@sample
samples.collections.Collections.Elements.last
public inline fun IntArray.last(predicate: (Int) -> Boolean): Int {
    for (index in this.indices.reversed()) {
        val element = this[index]
        if (predicate(element)) return element
    }
    throw NoSuchElementException("Array contains no element matching the

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predicate.\")\n}\n\n/**\n * Returns the last element matching the given [predicate].\n * \n * @throws
NoSuchElementException if no such element is found.\n * \n * @sample
samples.collections.Collections.Elements.last\n */\npublic inline fun LongArray.last(predicate: (Long) -> Boolean):
Long {\n for (index in this.indices.reversed()) {\n val element = this[index]\n if (predicate(element))
return element\n }\n throw NoSuchElementException("\nArray contains no element matching the
predicate.\")\n}\n\n/**\n * Returns the last element matching the given [predicate].\n * \n * @throws
NoSuchElementException if no such element is found.\n * \n * @sample
samples.collections.Collections.Elements.last\n */\npublic inline fun FloatArray.last(predicate: (Float) -> Boolean):
Float {\n for (index in this.indices.reversed()) {\n val element = this[index]\n if (predicate(element))
return element\n }\n throw NoSuchElementException("\nArray contains no element matching the
predicate.\")\n}\n\n/**\n * Returns the last element matching the given [predicate].\n * \n * @throws
NoSuchElementException if no such element is found.\n * \n * @sample
samples.collections.Collections.Elements.last\n */\npublic inline fun DoubleArray.last(predicate: (Double) ->
Boolean): Double {\n for (index in this.indices.reversed()) {\n val element = this[index]\n if
(predicate(element)) return element\n }\n throw NoSuchElementException("\nArray contains no element
matching the predicate.\")\n}\n\n/**\n * Returns the last element matching the given [predicate].\n * \n * @throws
NoSuchElementException if no such element is found.\n * \n * @sample
samples.collections.Collections.Elements.last\n */\npublic inline fun BooleanArray.last(predicate: (Boolean) ->
Boolean): Boolean {\n for (index in this.indices.reversed()) {\n val element = this[index]\n if
(predicate(element)) return element\n }\n throw NoSuchElementException("\nArray contains no element
matching the predicate.\")\n}\n\n/**\n * Returns the last element matching the given [predicate].\n * \n * @throws
NoSuchElementException if no such element is found.\n * \n * @sample
samples.collections.Collections.Elements.last\n */\npublic inline fun CharArray.last(predicate: (Char) -> Boolean):
Char {\n for (index in this.indices.reversed()) {\n val element = this[index]\n if (predicate(element))
return element\n }\n throw NoSuchElementException("\nArray contains no element matching the
predicate.\")\n}\n\n/**\n * Returns last index of [element], or -1 if the array does not contain element.\n */\npublic
fun <@kotlin.internal.OnlyInputTypes T> Array<out T>.lastIndexOf(element: T): Int {\n if (element == null) {\n
for (index in indices.reversed()) {\n if (this[index] == null) {\n return index\n }\n }\n } else {\n
for (index in indices.reversed()) {\n if (element == this[index]) {\n return index\n }\n }\n }\n return -1\n}\n\n/**\n * Returns last index of [element], or -1 if the array does not contain
element.\n */\npublic fun ByteArray.lastIndexOf(element: Byte): Int {\n for (index in indices.reversed()) {\n if
(element == this[index]) {\n return index\n }\n }\n return -1\n}\n\n/**\n * Returns last index of
[element], or -1 if the array does not contain element.\n */\npublic fun ShortArray.lastIndexOf(element: Short): Int
{\n for (index in indices.reversed()) {\n if (element == this[index]) {\n return index\n }\n }\n
return -1\n}\n\n/**\n * Returns last index of [element], or -1 if the array does not contain element.\n */\npublic fun
IntArray.lastIndexOf(element: Int): Int {\n for (index in indices.reversed()) {\n if (element == this[index]) {\n
return index\n }\n }\n return -1\n}\n\n/**\n * Returns last index of [element], or -1 if the array does not
contain element.\n */\npublic fun LongArray.lastIndexOf(element: Long): Int {\n for (index in indices.reversed())
{\n if (element == this[index]) {\n return index\n }\n }\n return -1\n}\n\n/**\n * Returns last
index of [element], or -1 if the array does not contain element.\n */\n@Deprecated("\nThe function has unclear
behavior when searching for NaN or zero values and will be removed soon. Use 'indexOfLast { it == element }'
instead to continue using this behavior, or '.asList().lastIndexOf(element: T)' to get the same search behavior as in a
list.\n", ReplaceWith("\nindexOfLast { it == element }"))\n@DeprecatedSinceKotlin(warningSince = "\n1.4",
errorSince = "\n1.6")\npublic fun FloatArray.lastIndexOf(element: Float): Int {\n for (index in indices.reversed())
{\n if (element == this[index]) {\n return index\n }\n }\n return -1\n}\n\n/**\n * Returns last
index of [element], or -1 if the array does not contain element.\n */\n@Deprecated("\nThe function has unclear
behavior when searching for NaN or zero values and will be removed soon. Use 'indexOfLast { it == element }'
instead to continue using this behavior, or '.asList().lastIndexOf(element: T)' to get the same search behavior as in a

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list.", ReplaceWith("indexOfLast { it == element }"))\n@DeprecatedSinceKotlin(warningSince = "1.4",
errorSince = "1.6")\npublic fun DoubleArray.lastIndexOf(element: Double): Int {\n    for (index in
indices.reversed()) {\n        if (element == this[index]) {\n            return index\n        }\n    }
return -1\n}\n\n/**\n * Returns last index of [element], or -1 if the array does not contain element.\n */\npublic fun
BooleanArray.lastIndexOf(element: Boolean): Int {\n    for (index in indices.reversed()) {\n        if (element ==
this[index]) {\n            return index\n        }\n    }
return -1\n}\n\n/**\n * Returns last index of [element], or -1 if
the array does not contain element.\n */\npublic fun CharArray.lastIndexOf(element: Char): Int {\n    for (index in
indices.reversed()) {\n        if (element == this[index]) {\n            return index\n        }\n    }
return -1\n}\n\n/**\n * Returns the last element, or `null` if the array is empty.\n */\n\n * @sample
samples.collections.Collections.Elements.last\n */\npublic fun <T> Array<out T>.lastOrNull(): T? {\n    return if
(isEmpty()) null else this[size - 1]\n}\n\n/**\n * Returns the last element, or `null` if the array is empty.\n */\n\n *
@sample samples.collections.Collections.Elements.last\n */\npublic fun ByteArray.lastOrNull(): Byte? {\n    return
if (isEmpty()) null else this[size - 1]\n}\n\n/**\n * Returns the last element, or `null` if the array is empty.\n */\n\n *
@sample samples.collections.Collections.Elements.last\n */\npublic fun ShortArray.lastOrNull(): Short? {\n    return
if (isEmpty()) null else this[size - 1]\n}\n\n/**\n * Returns the last element, or `null` if the array is empty.\n */\n\n *
@sample samples.collections.Collections.Elements.last\n */\npublic fun IntArray.lastOrNull(): Int? {\n    return
if (isEmpty()) null else this[size - 1]\n}\n\n/**\n * Returns the last element, or `null` if the array is empty.\n */\n\n *
@sample samples.collections.Collections.Elements.last\n */\npublic fun LongArray.lastOrNull(): Long? {\n    return
if (isEmpty()) null else this[size - 1]\n}\n\n/**\n * Returns the last element, or `null` if the array is empty.\n */\n\n *
@sample samples.collections.Collections.Elements.last\n */\npublic fun FloatArray.lastOrNull(): Float? {\n    return
if (isEmpty()) null else this[size - 1]\n}\n\n/**\n * Returns the last element, or `null` if the array is empty.\n */\n\n *
@sample samples.collections.Collections.Elements.last\n */\npublic fun DoubleArray.lastOrNull(): Double? {\n    return
if (isEmpty()) null else this[size - 1]\n}\n\n/**\n * Returns the last element, or `null` if the array is
empty.\n */\n\n * @sample samples.collections.Collections.Elements.last\n */\npublic fun BooleanArray.lastOrNull(): Boolean?
{\n    return if (isEmpty()) null else this[size - 1]\n}\n\n/**\n * Returns the last element, or `null` if the array is
empty.\n */\n\n * @sample samples.collections.Collections.Elements.last\n */\npublic fun CharArray.lastOrNull():
Char? {\n    return if (isEmpty()) null else this[size - 1]\n}\n\n/**\n * Returns the last element matching the given
[predicate], or `null` if no such element was found.\n */\n\n * @sample
samples.collections.Collections.Elements.last\n */\npublic inline fun <T> Array<out T>.lastOrNull(predicate: (T) ->
Boolean): T? {\n    for (index in this.indices.reversed()) {\n        val element = this[index]\n        if
(predicate(element)) return element\n    }\n    return null\n}\n\n/**\n * Returns the last element matching the given
[predicate], or `null` if no such element was found.\n */\n\n * @sample
samples.collections.Collections.Elements.last\n */\npublic inline fun ByteArray.lastOrNull(predicate: (Byte) ->
Boolean): Byte? {\n    for (index in this.indices.reversed()) {\n        val element = this[index]\n        if
(predicate(element)) return element\n    }\n    return null\n}\n\n/**\n * Returns the last element matching the given
[predicate], or `null` if no such element was found.\n */\n\n * @sample
samples.collections.Collections.Elements.last\n */\npublic inline fun ShortArray.lastOrNull(predicate: (Short) ->
Boolean): Short? {\n    for (index in this.indices.reversed()) {\n        val element = this[index]\n        if
(predicate(element)) return element\n    }\n    return null\n}\n\n/**\n * Returns the last element matching the given
[predicate], or `null` if no such element was found.\n */\n\n * @sample
samples.collections.Collections.Elements.last\n */\npublic inline fun IntArray.lastOrNull(predicate: (Int) ->
Boolean): Int? {\n    for (index in this.indices.reversed()) {\n        val element = this[index]\n        if
(predicate(element)) return element\n    }\n    return null\n}\n\n/**\n * Returns the last element matching the given
[predicate], or `null` if no such element was found.\n */\n\n * @sample
samples.collections.Collections.Elements.last\n */\npublic inline fun LongArray.lastOrNull(predicate: (Long) ->
Boolean): Long? {\n    for (index in this.indices.reversed()) {\n        val element = this[index]\n        if
(predicate(element)) return element\n    }\n    return null\n}\n\n/**\n * Returns the last element matching the given
[predicate], or `null` if no such element was found.\n */\n\n * @sample

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samples.collections.Collections.Elements.last\n *\npublic inline fun FloatArray.lastOrNull(predicate: (Float) ->
Boolean): Float? {\n for (index in this.indices.reversed()) {\n val element = this[index]\n if
(predicate(element)) return element\n }\n return null\n}\n\n/**\n * Returns the last element matching the given
[predicate], or `null` if no such element was found.\n * \n * @sample
samples.collections.Collections.Elements.last\n *\npublic inline fun DoubleArray.lastOrNull(predicate: (Double) ->
Boolean): Double? {\n for (index in this.indices.reversed()) {\n val element = this[index]\n if
(predicate(element)) return element\n }\n return null\n}\n\n/**\n * Returns the last element matching the given
[predicate], or `null` if no such element was found.\n * \n * @sample
samples.collections.Collections.Elements.last\n *\npublic inline fun BooleanArray.lastOrNull(predicate: (Boolean)
-> Boolean): Boolean? {\n for (index in this.indices.reversed()) {\n val element = this[index]\n if
(predicate(element)) return element\n }\n return null\n}\n\n/**\n * Returns the last element matching the given
[predicate], or `null` if no such element was found.\n * \n * @sample
samples.collections.Collections.Elements.last\n *\npublic inline fun CharArray.lastOrNull(predicate: (Char) ->
Boolean): Char? {\n for (index in this.indices.reversed()) {\n val element = this[index]\n if
(predicate(element)) return element\n }\n return null\n}\n\n/**\n * Returns a random element from this array.\n
*\n * @throws NoSuchElementException if this array is empty.\n
*\n * @SinceKotlin("1.3")\n * @kotlin.internal.InlineOnly\n * public inline fun <T> Array<out T>.random(): T {\n
return random(Random)\n}\n\n/**\n * Returns a random element from this array.\n * \n * @throws
NoSuchElementException if this array is empty.\n * \n * @SinceKotlin("1.3")\n * @kotlin.internal.InlineOnly\n * public
inline fun ByteArray.random(): Byte {\n return random(Random)\n}\n\n/**\n * Returns a random element from
this array.\n * \n * @throws NoSuchElementException if this array is empty.\n
*\n * @SinceKotlin("1.3")\n * @kotlin.internal.InlineOnly\n * public inline fun ShortArray.random(): Short {\n
return random(Random)\n}\n\n/**\n * Returns a random element from this array.\n * \n * @throws
NoSuchElementException if this array is empty.\n * \n * @SinceKotlin("1.3")\n * @kotlin.internal.InlineOnly\n * public
inline fun IntArray.random(): Int {\n return random(Random)\n}\n\n/**\n * Returns a random element from this
array.\n * \n * @throws NoSuchElementException if this array is empty.\n
*\n * @SinceKotlin("1.3")\n * @kotlin.internal.InlineOnly\n * public inline fun LongArray.random(): Long {\n
return random(Random)\n}\n\n/**\n * Returns a random element from this array.\n * \n * @throws
NoSuchElementException if this array is empty.\n * \n * @SinceKotlin("1.3")\n * @kotlin.internal.InlineOnly\n * public
inline fun FloatArray.random(): Float {\n return random(Random)\n}\n\n/**\n * Returns a random element from
this array.\n * \n * @throws NoSuchElementException if this array is empty.\n
*\n * @SinceKotlin("1.3")\n * @kotlin.internal.InlineOnly\n * public inline fun DoubleArray.random(): Double {\n
return random(Random)\n}\n\n/**\n * Returns a random element from this array.\n * \n * @throws
NoSuchElementException if this array is empty.\n * \n * @SinceKotlin("1.3")\n * @kotlin.internal.InlineOnly\n * public
inline fun BooleanArray.random(): Boolean {\n return random(Random)\n}\n\n/**\n * Returns a random element
from this array.\n * \n * @throws NoSuchElementException if this array is empty.\n
*\n * @SinceKotlin("1.3")\n * @kotlin.internal.InlineOnly\n * public inline fun CharArray.random(): Char {\n
return random(Random)\n}\n\n/**\n * Returns a random element from this array using the specified source of
randomness.\n * \n * @throws NoSuchElementException if this array is empty.\n * \n * @SinceKotlin("1.3")\n * public
fun <T> Array<out T>.random(random: Random): T {\n if (isEmpty())\n throw
NoSuchElementException("Array is empty.")\n return get(random.nextInt(size))\n}\n\n/**\n * Returns a random
element from this array using the specified source of randomness.\n * \n * @throws NoSuchElementException if
this array is empty.\n * \n * @SinceKotlin("1.3")\n * public fun ByteArray.random(random: Random): Byte {\n if
(isEmpty())\n throw NoSuchElementException("Array is empty.")\n return
get(random.nextInt(size))\n}\n\n/**\n * Returns a random element from this array using the specified source of
randomness.\n * \n * @throws NoSuchElementException if this array is empty.\n * \n * @SinceKotlin("1.3")\n * public
fun ShortArray.random(random: Random): Short {\n if (isEmpty())\n throw
NoSuchElementException("Array is empty.")\n return get(random.nextInt(size))\n}\n\n/**\n * Returns a random

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element from this array using the specified source of randomness.\n * \n * @throws NoSuchElementException if
this array is empty.\n */\n@SinceKotlin("1.3")\npublic fun IntArray.random(random: Random): Int {\n    if
(isEmpty())\n        throw NoSuchElementException("Array is empty.")\n    return
get(random.nextInt(size))\n}\n\n/**\n * Returns a random element from this array using the specified source of
randomness.\n * \n * @throws NoSuchElementException if this array is empty.\n */\n@SinceKotlin("1.3")\npublic
fun LongArray.random(random: Random): Long {\n    if (isEmpty())\n        throw
NoSuchElementException("Array is empty.")\n    return get(random.nextInt(size))\n}\n\n/**\n * Returns a random
element from this array using the specified source of randomness.\n * \n * @throws NoSuchElementException if
this array is empty.\n */\n@SinceKotlin("1.3")\npublic fun FloatArray.random(random: Random): Float {\n    if
(isEmpty())\n        throw NoSuchElementException("Array is empty.")\n    return
get(random.nextInt(size))\n}\n\n/**\n * Returns a random element from this array using the specified source of
randomness.\n * \n * @throws NoSuchElementException if this array is empty.\n */\n@SinceKotlin("1.3")\npublic
fun DoubleArray.random(random: Random): Double {\n    if (isEmpty())\n        throw
NoSuchElementException("Array is empty.")\n    return get(random.nextInt(size))\n}\n\n/**\n * Returns a random
element from this array using the specified source of randomness.\n * \n * @throws NoSuchElementException if
this array is empty.\n */\n@SinceKotlin("1.3")\npublic fun BooleanArray.random(random: Random): Boolean {\n
    if (isEmpty())\n        throw NoSuchElementException("Array is empty.")\n    return
get(random.nextInt(size))\n}\n\n/**\n * Returns a random element from this array using the specified source of
randomness.\n * \n * @throws NoSuchElementException if this array is empty.\n */\n@SinceKotlin("1.3")\npublic
fun CharArray.random(random: Random): Char {\n    if (isEmpty())\n        throw NoSuchElementException("Array
is empty.")\n    return get(random.nextInt(size))\n}\n\n/**\n * Returns a random element from this array, or `null` if
this array is empty.\n */\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\n@kotlin.internal.InlineOnly\npubli
c inline fun <T> Array<out T>.randomOrNull(): T? {\n    return randomOrNull(Random)\n}\n\n/**\n * Returns a
random element from this array, or `null` if this array is empty.\n */\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\n@kotlin.internal.InlineOnly\npubli
c inline fun ByteArray.randomOrNull(): Byte? {\n    return randomOrNull(Random)\n}\n\n/**\n * Returns a random
element from this array, or `null` if this array is empty.\n */\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\n@kotlin.internal.InlineOnly\npubli
c inline fun ShortArray.randomOrNull(): Short? {\n    return randomOrNull(Random)\n}\n\n/**\n * Returns a
random element from this array, or `null` if this array is empty.\n */\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\n@kotlin.internal.InlineOnly\npubli
c inline fun IntArray.randomOrNull(): Int? {\n    return randomOrNull(Random)\n}\n\n/**\n * Returns a random
element from this array, or `null` if this array is empty.\n */\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\n@kotlin.internal.InlineOnly\npubli
c inline fun LongArray.randomOrNull(): Long? {\n    return randomOrNull(Random)\n}\n\n/**\n * Returns a
random element from this array, or `null` if this array is empty.\n */\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\n@kotlin.internal.InlineOnly\npubli
c inline fun FloatArray.randomOrNull(): Float? {\n    return randomOrNull(Random)\n}\n\n/**\n * Returns a
random element from this array, or `null` if this array is empty.\n */\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\n@kotlin.internal.InlineOnly\npubli
c inline fun DoubleArray.randomOrNull(): Double? {\n    return randomOrNull(Random)\n}\n\n/**\n * Returns a
random element from this array, or `null` if this array is empty.\n */\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\n@kotlin.internal.InlineOnly\npubli
c inline fun BooleanArray.randomOrNull(): Boolean? {\n    return randomOrNull(Random)\n}\n\n/**\n * Returns a
random element from this array, or `null` if this array is empty.\n */\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\n@kotlin.internal.InlineOnly\npubli
c inline fun CharArray.randomOrNull(): Char? {\n    return randomOrNull(Random)\n}\n\n/**\n * Returns a

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random element from this array using the specified source of randomness, or `null` if this array is empty.\n
*\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\npublic fun <T> Array<out\n
T>.randomOrNull(random: Random): T? {\n if (isEmpty())\n return null\n return\n
get(random.nextInt(size))\n}\n\n/**\n * Returns a random element from this array using the specified source of\n
randomness, or `null` if this array is empty.\n
*\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\npublic fun\n
ByteArray.randomOrNull(random: Random): Byte? {\n if (isEmpty())\n return null\n return\n
get(random.nextInt(size))\n}\n\n/**\n * Returns a random element from this array using the specified source of\n
randomness, or `null` if this array is empty.\n
*\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\npublic fun\n
ShortArray.randomOrNull(random: Random): Short? {\n if (isEmpty())\n return null\n return\n
get(random.nextInt(size))\n}\n\n/**\n * Returns a random element from this array using the specified source of\n
randomness, or `null` if this array is empty.\n
*\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\npublic fun\n
IntArray.randomOrNull(random: Random): Int? {\n if (isEmpty())\n return null\n return\n
get(random.nextInt(size))\n}\n\n/**\n * Returns a random element from this array using the specified source of\n
randomness, or `null` if this array is empty.\n
*\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\npublic fun\n
LongArray.randomOrNull(random: Random): Long? {\n if (isEmpty())\n return null\n return\n
get(random.nextInt(size))\n}\n\n/**\n * Returns a random element from this array using the specified source of\n
randomness, or `null` if this array is empty.\n
*\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\npublic fun\n
FloatArray.randomOrNull(random: Random): Float? {\n if (isEmpty())\n return null\n return\n
get(random.nextInt(size))\n}\n\n/**\n * Returns a random element from this array using the specified source of\n
randomness, or `null` if this array is empty.\n
*\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\npublic fun\n
DoubleArray.randomOrNull(random: Random): Double? {\n if (isEmpty())\n return null\n return\n
get(random.nextInt(size))\n}\n\n/**\n * Returns a random element from this array using the specified source of\n
randomness, or `null` if this array is empty.\n
*\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\npublic fun\n
BooleanArray.randomOrNull(random: Random): Boolean? {\n if (isEmpty())\n return null\n return\n
get(random.nextInt(size))\n}\n\n/**\n * Returns a random element from this array using the specified source of\n
randomness, or `null` if this array is empty.\n
*\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\npublic fun\n
CharArray.randomOrNull(random: Random): Char? {\n if (isEmpty())\n return null\n return\n
get(random.nextInt(size))\n}\n\n/**\n * Returns the single element, or throws an exception if the array is empty or\n
has more than one element.\n *\npublic fun <T> Array<out T>.single(): T {\n return when (size) {\n 0 ->\n
throw NoSuchElementException("Array is empty.")\n 1 -> this[0]\n else -> throw\n
IllegalArgumentException("Array has more than one element.")\n }\n}\n\n/**\n * Returns the single element, or\n
throws an exception if the array is empty or has more than one element.\n *\npublic fun ByteArray.single(): Byte\n
{\n return when (size) {\n 0 -> throw NoSuchElementException("Array is empty.")\n 1 -> this[0]\n\n
else -> throw IllegalArgumentException("Array has more than one element.")\n }\n}\n\n/**\n * Returns the\n
single element, or throws an exception if the array is empty or has more than one element.\n *\npublic fun\n
ShortArray.single(): Short {\n return when (size) {\n 0 -> throw NoSuchElementException("Array is\n
empty.")\n 1 -> this[0]\n else -> throw IllegalArgumentException("Array has more than one element.")\n\n
}\n}\n\n/**\n * Returns the single element, or throws an exception if the array is empty or has more than one\n
element.\n *\npublic fun IntArray.single(): Int {\n return when (size) {\n 0 -> throw\n
NoSuchElementException("Array is empty.")\n 1 -> this[0]\n else -> throw\n

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element.\n */\npublic inline fun FloatArray.single(predicate: (Float) -> Boolean): Float {\n    var single: Float? =
null\n    var found = false\n    for (element in this) {\n        if (predicate(element)) {\n            if (found) throw
IllegalArgumentException("Array contains more than one matching element.")\n            single = element\n
found = true\n        }\n    }\n    if (!found) throw NoSuchElementException("Array contains no element matching
the predicate.")\n    @Suppress("UNCHECKED_CAST")\n    return single as Float\n}\n\n/**\n * Returns the
single element matching the given [predicate], or throws exception if there is no or more than one matching
element.\n */\npublic inline fun DoubleArray.single(predicate: (Double) -> Boolean): Double {\n    var single:
Double? = null\n    var found = false\n    for (element in this) {\n        if (predicate(element)) {\n            if (found)
throw IllegalArgumentException("Array contains more than one matching element.")\n            single = element\n
found = true\n        }\n    }\n    if (!found) throw NoSuchElementException("Array contains no element
matching the predicate.")\n    @Suppress("UNCHECKED_CAST")\n    return single as Double\n}\n\n/**\n *
Returns the single element matching the given [predicate], or throws exception if there is no or more than one
matching element.\n */\npublic inline fun BooleanArray.single(predicate: (Boolean) -> Boolean): Boolean {\n    var
single: Boolean? = null\n    var found = false\n    for (element in this) {\n        if (predicate(element)) {\n            if
(found) throw IllegalArgumentException("Array contains more than one matching element.")\n            single =
element\n            found = true\n        }\n    }\n    if (!found) throw NoSuchElementException("Array contains no
element matching the predicate.")\n    @Suppress("UNCHECKED_CAST")\n    return single as
Boolean\n}\n\n/**\n * Returns the single element matching the given [predicate], or throws exception if there is no
or more than one matching element.\n */\npublic inline fun CharArray.single(predicate: (Char) -> Boolean): Char
{\n    var single: Char? = null\n    var found = false\n    for (element in this) {\n        if (predicate(element)) {\n            if
(found) throw IllegalArgumentException("Array contains more than one matching element.")\n            single =
element\n            found = true\n        }\n    }\n    if (!found) throw NoSuchElementException("Array contains no
element matching the predicate.")\n    @Suppress("UNCHECKED_CAST")\n    return single as Char\n}\n\n/**\n *
Returns single element, or `null` if the array is empty or has more than one element.\n */\npublic fun <T>
Array<out T>.singleOrNull(): T? {\n    return if (size == 1) this[0] else null\n}\n\n/**\n * Returns single element, or
`null` if the array is empty or has more than one element.\n */\npublic fun ByteArray.singleOrNull(): Byte? {\n
return if (size == 1) this[0] else null\n}\n\n/**\n * Returns single element, or `null` if the array is empty or has more
than one element.\n */\npublic fun ShortArray.singleOrNull(): Short? {\n    return if (size == 1) this[0] else
null\n}\n\n/**\n * Returns single element, or `null` if the array is empty or has more than one element.\n */\npublic
fun IntArray.singleOrNull(): Int? {\n    return if (size == 1) this[0] else null\n}\n\n/**\n * Returns single element, or
`null` if the array is empty or has more than one element.\n */\npublic fun LongArray.singleOrNull(): Long? {\n
return if (size == 1) this[0] else null\n}\n\n/**\n * Returns single element, or `null` if the array is empty or has more
than one element.\n */\npublic fun FloatArray.singleOrNull(): Float? {\n    return if (size == 1) this[0] else
null\n}\n\n/**\n * Returns single element, or `null` if the array is empty or has more than one element.\n */\npublic
fun DoubleArray.singleOrNull(): Double? {\n    return if (size == 1) this[0] else null\n}\n\n/**\n * Returns single
element, or `null` if the array is empty or has more than one element.\n */\npublic fun BooleanArray.singleOrNull():
Boolean? {\n    return if (size == 1) this[0] else null\n}\n\n/**\n * Returns single element, or `null` if the array is
empty or has more than one element.\n */\npublic fun CharArray.singleOrNull(): Char? {\n    return if (size == 1)
this[0] else null\n}\n\n/**\n * Returns the single element matching the given [predicate], or `null` if element was not
found or more than one element was found.\n */\npublic inline fun <T> Array<out T>.singleOrNull(predicate: (T) -
> Boolean): T? {\n    var single: T? = null\n    var found = false\n    for (element in this) {\n        if
(predicate(element)) {\n            if (found) return null\n            single = element\n            found = true\n        }\n
    }\n    if (!found) return null\n    return single\n}\n\n/**\n * Returns the single element matching the given [predicate], or
`null` if element was not found or more than one element was found.\n */\npublic inline fun
ByteArray.singleOrNull(predicate: (Byte) -> Boolean): Byte? {\n    var single: Byte? = null\n    var found = false\n
for (element in this) {\n        if (predicate(element)) {\n            if (found) return null\n            single = element\n
found = true\n        }\n    }\n    if (!found) return null\n    return single\n}\n\n/**\n * Returns the single element
matching the given [predicate], or `null` if element was not found or more than one element was found.\n */\npublic

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inline fun ShortArray.singleOrNull(predicate: (Short) -> Boolean): Short? {\n  var single: Short? = null\n  var found = false\n  for (element in this) {\n    if (predicate(element)) {\n      if (found) return null\n      single = element\n      found = true\n    }\n  }\n  if (!found) return null\n  return single\n}\n\n/**\n * Returns the single element matching the given [predicate], or `null` if element was not found or more than one element was found.\n */\npublic inline fun IntArray.singleOrNull(predicate: (Int) -> Boolean): Int? {\n  var single: Int? = null\n  var found = false\n  for (element in this) {\n    if (predicate(element)) {\n      if (found) return null\n      single = element\n      found = true\n    }\n  }\n  if (!found) return null\n  return single\n}\n\n/**\n * Returns the single element matching the given [predicate], or `null` if element was not found or more than one element was found.\n */\npublic inline fun LongArray.singleOrNull(predicate: (Long) -> Boolean): Long? {\n  var single: Long? = null\n  var found = false\n  for (element in this) {\n    if (predicate(element)) {\n      if (found) return null\n      single = element\n      found = true\n    }\n  }\n  if (!found) return null\n  return single\n}\n\n/**\n * Returns the single element matching the given [predicate], or `null` if element was not found or more than one element was found.\n */\npublic inline fun FloatArray.singleOrNull(predicate: (Float) -> Boolean): Float? {\n  var single: Float? = null\n  var found = false\n  for (element in this) {\n    if (predicate(element)) {\n      if (found) return null\n      single = element\n      found = true\n    }\n  }\n  if (!found) return null\n  return single\n}\n\n/**\n * Returns the single element matching the given [predicate], or `null` if element was not found or more than one element was found.\n */\npublic inline fun DoubleArray.singleOrNull(predicate: (Double) -> Boolean): Double? {\n  var single: Double? = null\n  var found = false\n  for (element in this) {\n    if (predicate(element)) {\n      if (found) return null\n      single = element\n      found = true\n    }\n  }\n  if (!found) return null\n  return single\n}\n\n/**\n * Returns the single element matching the given [predicate], or `null` if element was not found or more than one element was found.\n */\npublic inline fun BooleanArray.singleOrNull(predicate: (Boolean) -> Boolean): Boolean? {\n  var single: Boolean? = null\n  var found = false\n  for (element in this) {\n    if (predicate(element)) {\n      if (found) return null\n      single = element\n      found = true\n    }\n  }\n  if (!found) return null\n  return single\n}\n\n/**\n * Returns the single element matching the given [predicate], or `null` if element was not found or more than one element was found.\n */\npublic inline fun CharArray.singleOrNull(predicate: (Char) -> Boolean): Char? {\n  var single: Char? = null\n  var found = false\n  for (element in this) {\n    if (predicate(element)) {\n      if (found) return null\n      single = element\n      found = true\n    }\n  }\n  if (!found) return null\n  return single\n}\n\n/**\n * Returns a list containing all elements except first [n] elements.\n * \n * @throws IllegalArgumentException if [n] is negative.\n * \n * @sample samples.collections.Collections.Transformations.drop\n */\npublic fun <T> Array<out T>.drop(n: Int): List<T> {\n  require(n >= 0) { "Requested element count $n is less than zero." }\n  return takeLast((size - n).coerceAtLeast(0))\n}\n\n/**\n * Returns a list containing all elements except first [n] elements.\n * \n * @throws IllegalArgumentException if [n] is negative.\n * \n * @sample samples.collections.Collections.Transformations.drop\n */\npublic fun ByteArray.drop(n: Int): List<Byte> {\n  require(n >= 0) { "Requested element count $n is less than zero." }\n  return takeLast((size - n).coerceAtLeast(0))\n}\n\n/**\n * Returns a list containing all elements except first [n] elements.\n * \n * @throws IllegalArgumentException if [n] is negative.\n * \n * @sample samples.collections.Collections.Transformations.drop\n */\npublic fun ShortArray.drop(n: Int): List<Short> {\n  require(n >= 0) { "Requested element count $n is less than zero." }\n  return takeLast((size - n).coerceAtLeast(0))\n}\n\n/**\n * Returns a list containing all elements except first [n] elements.\n * \n * @throws IllegalArgumentException if [n] is negative.\n * \n * @sample samples.collections.Collections.Transformations.drop\n */\npublic fun IntArray.drop(n: Int): List<Int> {\n  require(n >= 0) { "Requested element count $n is less than zero." }\n  return takeLast((size - n).coerceAtLeast(0))\n}\n\n/**\n * Returns a list containing all elements except first [n] elements.\n * \n * @throws IllegalArgumentException if [n] is negative.\n * \n * @sample samples.collections.Collections.Transformations.drop\n */\npublic fun LongArray.drop(n: Int): List<Long> {\n  require(n >= 0) { "Requested element count $n is less than zero." }\n  return takeLast((size -

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n).coerceAtLeast(0))\n}\n\n/**\n * Returns a list containing all elements except first [n] elements.\n * \n * @throws
 IllegalArgumentException if [n] is negative.\n * \n * @sample
 samples.collections.Collections.Transformations.drop\n *\npublic fun FloatArray.drop(n: Int): List<Float> {\n
 require(n >= 0) { \"Requested element count \$n is less than zero.\" }\n return takeLast((size -
 n).coerceAtLeast(0))\n}\n\n/**\n * Returns a list containing all elements except first [n] elements.\n * \n * @throws
 IllegalArgumentException if [n] is negative.\n * \n * @sample
 samples.collections.Collections.Transformations.drop\n *\npublic fun DoubleArray.drop(n: Int): List<Double> {\n
 require(n >= 0) { \"Requested element count \$n is less than zero.\" }\n return takeLast((size -
 n).coerceAtLeast(0))\n}\n\n/**\n * Returns a list containing all elements except first [n] elements.\n * \n * @throws
 IllegalArgumentException if [n] is negative.\n * \n * @sample
 samples.collections.Collections.Transformations.drop\n *\npublic fun BooleanArray.drop(n: Int): List<Boolean>
 {\n require(n >= 0) { \"Requested element count \$n is less than zero.\" }\n return takeLast((size -
 n).coerceAtLeast(0))\n}\n\n/**\n * Returns a list containing all elements except first [n] elements.\n * \n * @throws
 IllegalArgumentException if [n] is negative.\n * \n * @sample
 samples.collections.Collections.Transformations.drop\n *\npublic fun CharArray.drop(n: Int): List<Char> {\n
 require(n >= 0) { \"Requested element count \$n is less than zero.\" }\n return takeLast((size -
 n).coerceAtLeast(0))\n}\n\n/**\n * Returns a list containing all elements except last [n] elements.\n * \n * @throws
 IllegalArgumentException if [n] is negative.\n * \n * @sample
 samples.collections.Collections.Transformations.drop\n *\npublic fun <T> Array<out T>.dropLast(n: Int): List<T>
 {\n require(n >= 0) { \"Requested element count \$n is less than zero.\" }\n return take((size -
 n).coerceAtLeast(0))\n}\n\n/**\n * Returns a list containing all elements except last [n] elements.\n * \n * @throws
 IllegalArgumentException if [n] is negative.\n * \n * @sample
 samples.collections.Collections.Transformations.drop\n *\npublic fun ByteArray.dropLast(n: Int): List<Byte> {\n
 require(n >= 0) { \"Requested element count \$n is less than zero.\" }\n return take((size -
 n).coerceAtLeast(0))\n}\n\n/**\n * Returns a list containing all elements except last [n] elements.\n * \n * @throws
 IllegalArgumentException if [n] is negative.\n * \n * @sample
 samples.collections.Collections.Transformations.drop\n *\npublic fun ShortArray.dropLast(n: Int): List<Short> {\n
 require(n >= 0) { \"Requested element count \$n is less than zero.\" }\n return take((size -
 n).coerceAtLeast(0))\n}\n\n/**\n * Returns a list containing all elements except last [n] elements.\n * \n * @throws
 IllegalArgumentException if [n] is negative.\n * \n * @sample
 samples.collections.Collections.Transformations.drop\n *\npublic fun IntArray.dropLast(n: Int): List<Int> {\n
 require(n >= 0) { \"Requested element count \$n is less than zero.\" }\n return take((size -
 n).coerceAtLeast(0))\n}\n\n/**\n * Returns a list containing all elements except last [n] elements.\n * \n * @throws
 IllegalArgumentException if [n] is negative.\n * \n * @sample
 samples.collections.Collections.Transformations.drop\n *\npublic fun LongArray.dropLast(n: Int): List<Long> {\n
 require(n >= 0) { \"Requested element count \$n is less than zero.\" }\n return take((size -
 n).coerceAtLeast(0))\n}\n\n/**\n * Returns a list containing all elements except last [n] elements.\n * \n * @throws
 IllegalArgumentException if [n] is negative.\n * \n * @sample
 samples.collections.Collections.Transformations.drop\n *\npublic fun FloatArray.dropLast(n: Int): List<Float> {\n
 require(n >= 0) { \"Requested element count \$n is less than zero.\" }\n return take((size -
 n).coerceAtLeast(0))\n}\n\n/**\n * Returns a list containing all elements except last [n] elements.\n * \n * @throws
 IllegalArgumentException if [n] is negative.\n * \n * @sample
 samples.collections.Collections.Transformations.drop\n *\npublic fun DoubleArray.dropLast(n: Int): List<Double>
 {\n require(n >= 0) { \"Requested element count \$n is less than zero.\" }\n return take((size -
 n).coerceAtLeast(0))\n}\n\n/**\n * Returns a list containing all elements except last [n] elements.\n * \n * @throws
 IllegalArgumentException if [n] is negative.\n * \n * @sample
 samples.collections.Collections.Transformations.drop\n *\npublic fun BooleanArray.dropLast(n: Int):
 List<Boolean> {\n require(n >= 0) { \"Requested element count \$n is less than zero.\" }\n return take((size -

n).coerceAtLeast(0))\n\n/**\n * Returns a list containing all elements except last [n] elements.\n * \n * @throws
IllegalArgumentException if [n] is negative.\n * \n * @sample
samples.collections.Collections.Transformations.drop\n *\npublic fun CharArray.dropLast(n: Int): List<Char> {\n
require(n >= 0) { \"Requested element count \$n is less than zero.\" }\n return take((size -
n).coerceAtLeast(0))\n\n/**\n * Returns a list containing all elements except last elements that satisfy the given
[predicate].\n * \n * @sample samples.collections.Collections.Transformations.drop\n *\npublic inline fun <T>
Array<out T>.dropLastWhile(predicate: (T) -> Boolean): List<T> {\n for (index in lastIndex downTo 0) {\n if
(!predicate(this[index])) {\n return take(index + 1)\n } }\n return emptyList()\n\n/**\n * Returns
a list containing all elements except last elements that satisfy the given [predicate].\n * \n * @sample
samples.collections.Collections.Transformations.drop\n *\npublic inline fun ByteArray.dropLastWhile(predicate:
(Byte) -> Boolean): List<Byte> {\n for (index in lastIndex downTo 0) {\n if (!predicate(this[index])) {\n
return take(index + 1)\n } }\n return emptyList()\n\n/**\n * Returns a list containing all elements
except last elements that satisfy the given [predicate].\n * \n * @sample
samples.collections.Collections.Transformations.drop\n *\npublic inline fun ShortArray.dropLastWhile(predicate:
(Short) -> Boolean): List<Short> {\n for (index in lastIndex downTo 0) {\n if (!predicate(this[index])) {\n
return take(index + 1)\n } }\n return emptyList()\n\n/**\n * Returns a list containing all elements
except last elements that satisfy the given [predicate].\n * \n * @sample
samples.collections.Collections.Transformations.drop\n *\npublic inline fun IntArray.dropLastWhile(predicate:
(Int) -> Boolean): List<Int> {\n for (index in lastIndex downTo 0) {\n if (!predicate(this[index])) {\n
return take(index + 1)\n } }\n return emptyList()\n\n/**\n * Returns a list containing all elements
except last elements that satisfy the given [predicate].\n * \n * @sample
samples.collections.Collections.Transformations.drop\n *\npublic inline fun LongArray.dropLastWhile(predicate:
(Long) -> Boolean): List<Long> {\n for (index in lastIndex downTo 0) {\n if (!predicate(this[index])) {\n
return take(index + 1)\n } }\n return emptyList()\n\n/**\n * Returns a list containing all elements
except last elements that satisfy the given [predicate].\n * \n * @sample
samples.collections.Collections.Transformations.drop\n *\npublic inline fun FloatArray.dropLastWhile(predicate:
(Float) -> Boolean): List<Float> {\n for (index in lastIndex downTo 0) {\n if (!predicate(this[index])) {\n
return take(index + 1)\n } }\n return emptyList()\n\n/**\n * Returns a list containing all elements
except last elements that satisfy the given [predicate].\n * \n * @sample
samples.collections.Collections.Transformations.drop\n *\npublic inline fun DoubleArray.dropLastWhile(predicate:
(Double) -> Boolean): List<Double> {\n for (index in lastIndex downTo 0) {\n if (!predicate(this[index])) {\n
return take(index + 1)\n } }\n return emptyList()\n\n/**\n * Returns a list containing all elements
except last elements that satisfy the given [predicate].\n * \n * @sample
samples.collections.Collections.Transformations.drop\n *\npublic inline fun
BooleanArray.dropLastWhile(predicate: (Boolean) -> Boolean): List<Boolean> {\n for (index in lastIndex
downTo 0) {\n if (!predicate(this[index])) {\n return take(index + 1)\n } }\n return
emptyList()\n\n/**\n * Returns a list containing all elements except last elements that satisfy the given
[predicate].\n * \n * @sample samples.collections.Collections.Transformations.drop\n *\npublic inline fun
CharArray.dropLastWhile(predicate: (Char) -> Boolean): List<Char> {\n for (index in lastIndex downTo 0) {\n
if (!predicate(this[index])) {\n return take(index + 1)\n } }\n return emptyList()\n\n/**\n *
Returns a list containing all elements except first elements that satisfy the given [predicate].\n * \n * @sample
samples.collections.Collections.Transformations.drop\n *\npublic inline fun <T> Array<out
T>.dropWhile(predicate: (T) -> Boolean): List<T> {\n var yielding = false\n val list = ArrayList<T>()\n for
(item in this)\n if (yielding)\n list.add(item)\n else if (!predicate(item)) {\n list.add(item)\n
yielding = true\n } }\n return list\n\n/**\n * Returns a list containing all elements except first elements that
satisfy the given [predicate].\n * \n * @sample samples.collections.Collections.Transformations.drop\n *\npublic
inline fun ByteArray.dropWhile(predicate: (Byte) -> Boolean): List<Byte> {\n var yielding = false\n val list =
ArrayList<Byte>()\n for (item in this)\n if (yielding)\n list.add(item)\n else if (!predicate(item)) {\n

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list.add(item)\n      yielding = true\n    }\n    return list\n}\n\n/**\n * Returns a list containing all
elements except first elements that satisfy the given [predicate].\n * \n * @sample
samples.collections.Collections.Transformations.drop\n */\npublic inline fun ShortArray.dropWhile(predicate:
(Short) -> Boolean): List<Short> {\n    var yielding = false\n    val list = ArrayList<Short>()\n    for (item in this)\n        if (yielding)\n            list.add(item)\n        else if (!predicate(item)) {\n            list.add(item)\n            yielding =
true\n        }\n    return list\n}\n\n/**\n * Returns a list containing all elements except first elements that satisfy the
given [predicate].\n * \n * @sample samples.collections.Collections.Transformations.drop\n */\npublic inline fun
IntArray.dropWhile(predicate: (Int) -> Boolean): List<Int> {\n    var yielding = false\n    val list =
ArrayList<Int>()\n    for (item in this)\n        if (yielding)\n            list.add(item)\n        else if (!predicate(item)) {\n            list.add(item)\n            yielding = true\n        }\n    return list\n}\n\n/**\n * Returns a list containing all elements
except first elements that satisfy the given [predicate].\n * \n * @sample
samples.collections.Collections.Transformations.drop\n */\npublic inline fun LongArray.dropWhile(predicate:
(Long) -> Boolean): List<Long> {\n    var yielding = false\n    val list = ArrayList<Long>()\n    for (item in this)\n        if (yielding)\n            list.add(item)\n        else if (!predicate(item)) {\n            list.add(item)\n            yielding =
true\n        }\n    return list\n}\n\n/**\n * Returns a list containing all elements except first elements that satisfy the
given [predicate].\n * \n * @sample samples.collections.Collections.Transformations.drop\n */\npublic inline fun
FloatArray.dropWhile(predicate: (Float) -> Boolean): List<Float> {\n    var yielding = false\n    val list =
ArrayList<Float>()\n    for (item in this)\n        if (yielding)\n            list.add(item)\n        else if (!predicate(item)) {\n            list.add(item)\n            yielding = true\n        }\n    return list\n}\n\n/**\n * Returns a list containing all
elements except first elements that satisfy the given [predicate].\n * \n * @sample
samples.collections.Collections.Transformations.drop\n */\npublic inline fun DoubleArray.dropWhile(predicate:
(Double) -> Boolean): List<Double> {\n    var yielding = false\n    val list = ArrayList<Double>()\n    for (item in
this)\n        if (yielding)\n            list.add(item)\n        else if (!predicate(item)) {\n            list.add(item)\n            yielding = true\n        }\n    return list\n}\n\n/**\n * Returns a list containing all elements except first elements that
satisfy the given [predicate].\n * \n * @sample samples.collections.Collections.Transformations.drop\n */\npublic
inline fun BooleanArray.dropWhile(predicate: (Boolean) -> Boolean): List<Boolean> {\n    var yielding = false\n    val list = ArrayList<Boolean>()\n    for (item in this)\n        if (yielding)\n            list.add(item)\n        else if
(!predicate(item)) {\n            list.add(item)\n            yielding = true\n        }\n    return list\n}\n\n/**\n * Returns a list
containing all elements except first elements that satisfy the given [predicate].\n * \n * @sample
samples.collections.Collections.Transformations.drop\n */\npublic inline fun CharArray.dropWhile(predicate:
(Char) -> Boolean): List<Char> {\n    var yielding = false\n    val list = ArrayList<Char>()\n    for (item in this)\n        if (yielding)\n            list.add(item)\n        else if (!predicate(item)) {\n            list.add(item)\n            yielding =
true\n        }\n    return list\n}\n\n/**\n * Returns a list containing only elements matching the given [predicate].\n * \n *
\n * @sample samples.collections.Collections.Filtering.filter\n */\npublic inline fun <T> Array<out
T>.filter(predicate: (T) -> Boolean): List<T> {\n    return filterTo(ArrayList<T>(), predicate)\n}\n\n/**\n * Returns
a list containing only elements matching the given [predicate].\n * \n * @sample
samples.collections.Collections.Filtering.filter\n */\npublic inline fun ByteArray.filter(predicate: (Byte) -> Boolean):
List<Byte> {\n    return filterTo(ArrayList<Byte>(), predicate)\n}\n\n/**\n * Returns a list containing only elements
matching the given [predicate].\n * \n * @sample samples.collections.Collections.Filtering.filter\n */\npublic inline
fun ShortArray.filter(predicate: (Short) -> Boolean): List<Short> {\n    return filterTo(ArrayList<Short>(),
predicate)\n}\n\n/**\n * Returns a list containing only elements matching the given [predicate].\n * \n * @sample
samples.collections.Collections.Filtering.filter\n */\npublic inline fun IntArray.filter(predicate: (Int) -> Boolean):
List<Int> {\n    return filterTo(ArrayList<Int>(), predicate)\n}\n\n/**\n * Returns a list containing only elements
matching the given [predicate].\n * \n * @sample samples.collections.Collections.Filtering.filter\n */\npublic inline
fun LongArray.filter(predicate: (Long) -> Boolean): List<Long> {\n    return filterTo(ArrayList<Long>(),
predicate)\n}\n\n/**\n * Returns a list containing only elements matching the given [predicate].\n * \n * @sample
samples.collections.Collections.Filtering.filter\n */\npublic inline fun FloatArray.filter(predicate: (Float) ->
Boolean): List<Float> {\n    return filterTo(ArrayList<Float>(), predicate)\n}\n\n/**\n * Returns a list containing

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only elements matching the given [predicate].\n * \n * @sample samples.collections.Collections.Filtering.filter\n
*\npublic inline fun DoubleArray.filter(predicate: (Double) -> Boolean): List<Double> {\n return
filterTo(ArrayList<Double>(), predicate)\n}\n\n/**\n * Returns a list containing only elements matching the given
[predicate].\n * \n * @sample samples.collections.Collections.Filtering.filter\n *\npublic inline fun
BooleanArray.filter(predicate: (Boolean) -> Boolean): List<Boolean> {\n return filterTo(ArrayList<Boolean>(),
predicate)\n}\n\n/**\n * Returns a list containing only elements matching the given [predicate].\n * \n * @sample
samples.collections.Collections.Filtering.filter\n *\npublic inline fun CharArray.filter(predicate: (Char) ->
Boolean): List<Char> {\n return filterTo(ArrayList<Char>(), predicate)\n}\n\n/**\n * Returns a list containing
only elements matching the given [predicate].\n * @param [predicate] function that takes the index of an element
and the element itself\n * and returns the result of predicate evaluation on the element.\n * \n * @sample
samples.collections.Collections.Filtering.filterIndexed\n *\npublic inline fun <T> Array<out
T>.filterIndexed(predicate: (index: Int, T) -> Boolean): List<T> {\n return filterIndexedTo(ArrayList<T>(),
predicate)\n}\n\n/**\n * Returns a list containing only elements matching the given [predicate].\n * @param
[predicate] function that takes the index of an element and the element itself\n * and returns the result of predicate
evaluation on the element.\n * \n * @sample samples.collections.Collections.Filtering.filterIndexed\n *\npublic
inline fun ByteArray.filterIndexed(predicate: (index: Int, Byte) -> Boolean): List<Byte> {\n return
filterIndexedTo(ArrayList<Byte>(), predicate)\n}\n\n/**\n * Returns a list containing only elements matching the
given [predicate].\n * @param [predicate] function that takes the index of an element and the element itself\n * and
returns the result of predicate evaluation on the element.\n * \n * @sample
samples.collections.Collections.Filtering.filterIndexed\n *\npublic inline fun ShortArray.filterIndexed(predicate:
(index: Int, Short) -> Boolean): List<Short> {\n return filterIndexedTo(ArrayList<Short>(), predicate)\n}\n\n/**\n
* Returns a list containing only elements matching the given [predicate].\n * @param [predicate] function that takes
the index of an element and the element itself\n * and returns the result of predicate evaluation on the element.\n * \n
* @sample samples.collections.Collections.Filtering.filterIndexed\n *\npublic inline fun
IntArray.filterIndexed(predicate: (index: Int, Int) -> Boolean): List<Int> {\n return
filterIndexedTo(ArrayList<Int>(), predicate)\n}\n\n/**\n * Returns a list containing only elements matching the
given [predicate].\n * @param [predicate] function that takes the index of an element and the element itself\n * and
returns the result of predicate evaluation on the element.\n * \n * @sample
samples.collections.Collections.Filtering.filterIndexed\n *\npublic inline fun LongArray.filterIndexed(predicate:
(index: Int, Long) -> Boolean): List<Long> {\n return filterIndexedTo(ArrayList<Long>(), predicate)\n}\n\n/**\n
* Returns a list containing only elements matching the given [predicate].\n * @param [predicate] function that takes
the index of an element and the element itself\n * and returns the result of predicate evaluation on the element.\n * \n
* @sample samples.collections.Collections.Filtering.filterIndexed\n *\npublic inline fun
FloatArray.filterIndexed(predicate: (index: Int, Float) -> Boolean): List<Float> {\n return
filterIndexedTo(ArrayList<Float>(), predicate)\n}\n\n/**\n * Returns a list containing only elements matching the
given [predicate].\n * @param [predicate] function that takes the index of an element and the element itself\n * and
returns the result of predicate evaluation on the element.\n * \n * @sample
samples.collections.Collections.Filtering.filterIndexed\n *\npublic inline fun DoubleArray.filterIndexed(predicate:
(index: Int, Double) -> Boolean): List<Double> {\n return filterIndexedTo(ArrayList<Double>(),
predicate)\n}\n\n/**\n * Returns a list containing only elements matching the given [predicate].\n * @param
[predicate] function that takes the index of an element and the element itself\n * and returns the result of predicate
evaluation on the element.\n * \n * @sample samples.collections.Collections.Filtering.filterIndexed\n *\npublic
inline fun BooleanArray.filterIndexed(predicate: (index: Int, Boolean) -> Boolean): List<Boolean> {\n return
filterIndexedTo(ArrayList<Boolean>(), predicate)\n}\n\n/**\n * Returns a list containing only elements matching
the given [predicate].\n * @param [predicate] function that takes the index of an element and the element itself\n *
and returns the result of predicate evaluation on the element.\n * \n * @sample
samples.collections.Collections.Filtering.filterIndexed\n *\npublic inline fun CharArray.filterIndexed(predicate:
(index: Int, Char) -> Boolean): List<Char> {\n return filterIndexedTo(ArrayList<Char>(), predicate)\n}\n\n/**\n
*

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Appends all elements matching the given [predicate] to the given [destination].\n * @param [predicate] function that takes the index of an element and the element itself\n * and returns the result of predicate evaluation on the element.\n * \n * @sample samples.collections.Collections.Filtering.filterIndexedTo\n */\npublic inline fun <T, C : MutableCollection<in T>> Array<out T>.filterIndexedTo(destination: C, predicate: (index: Int, T) -> Boolean): C {\n forEachIndexed { index, element ->\n if (predicate(index, element)) destination.add(element)\n }\n return destination\n}\n\n/**\n * Appends all elements matching the given [predicate] to the given [destination].\n * @param [predicate] function that takes the index of an element and the element itself\n * and returns the result of predicate evaluation on the element.\n * \n * @sample samples.collections.Collections.Filtering.filterIndexedTo\n */\npublic inline fun <C : MutableCollection<in Byte>> ByteArray.filterIndexedTo(destination: C, predicate: (index: Int, Byte) -> Boolean): C {\n forEachIndexed { index, element ->\n if (predicate(index, element)) destination.add(element)\n }\n return destination\n}\n\n/**\n * Appends all elements matching the given [predicate] to the given [destination].\n * @param [predicate] function that takes the index of an element and the element itself\n * and returns the result of predicate evaluation on the element.\n * \n * @sample samples.collections.Collections.Filtering.filterIndexedTo\n */\npublic inline fun <C : MutableCollection<in Short>> ShortArray.filterIndexedTo(destination: C, predicate: (index: Int, Short) -> Boolean): C {\n forEachIndexed { index, element ->\n if (predicate(index, element)) destination.add(element)\n }\n return destination\n}\n\n/**\n * Appends all elements matching the given [predicate] to the given [destination].\n * @param [predicate] function that takes the index of an element and the element itself\n * and returns the result of predicate evaluation on the element.\n * \n * @sample samples.collections.Collections.Filtering.filterIndexedTo\n */\npublic inline fun <C : MutableCollection<in Int>> IntArray.filterIndexedTo(destination: C, predicate: (index: Int, Int) -> Boolean): C {\n forEachIndexed { index, element ->\n if (predicate(index, element)) destination.add(element)\n }\n return destination\n}\n\n/**\n * Appends all elements matching the given [predicate] to the given [destination].\n * @param [predicate] function that takes the index of an element and the element itself\n * and returns the result of predicate evaluation on the element.\n * \n * @sample samples.collections.Collections.Filtering.filterIndexedTo\n */\npublic inline fun <C : MutableCollection<in Long>> LongArray.filterIndexedTo(destination: C, predicate: (index: Int, Long) -> Boolean): C {\n forEachIndexed { index, element ->\n if (predicate(index, element)) destination.add(element)\n }\n return destination\n}\n\n/**\n * Appends all elements matching the given [predicate] to the given [destination].\n * @param [predicate] function that takes the index of an element and the element itself\n * and returns the result of predicate evaluation on the element.\n * \n * @sample samples.collections.Collections.Filtering.filterIndexedTo\n */\npublic inline fun <C : MutableCollection<in Float>> FloatArray.filterIndexedTo(destination: C, predicate: (index: Int, Float) -> Boolean): C {\n forEachIndexed { index, element ->\n if (predicate(index, element)) destination.add(element)\n }\n return destination\n}\n\n/**\n * Appends all elements matching the given [predicate] to the given [destination].\n * @param [predicate] function that takes the index of an element and the element itself\n * and returns the result of predicate evaluation on the element.\n * \n * @sample samples.collections.Collections.Filtering.filterIndexedTo\n */\npublic inline fun <C : MutableCollection<in Double>> DoubleArray.filterIndexedTo(destination: C, predicate: (index: Int, Double) -> Boolean): C {\n forEachIndexed { index, element ->\n if (predicate(index, element)) destination.add(element)\n }\n return destination\n}\n\n/**\n * Appends all elements matching the given [predicate] to the given [destination].\n * @param [predicate] function that takes the index of an element and the element itself\n * and returns the result of predicate evaluation on the element.\n * \n * @sample samples.collections.Collections.Filtering.filterIndexedTo\n */\npublic inline fun <C : MutableCollection<in Boolean>> BooleanArray.filterIndexedTo(destination: C, predicate: (index: Int, Boolean) -> Boolean): C {\n forEachIndexed { index, element ->\n if (predicate(index, element)) destination.add(element)\n }\n return destination\n}\n\n/**\n * Appends all elements matching the given [predicate] to the given [destination].\n * @param [predicate] function that takes the index of an element and the element itself\n * and returns the result of predicate evaluation on the element.\n * \n * @sample samples.collections.Collections.Filtering.filterIndexedTo\n */\npublic inline fun <C : MutableCollection<in Char>> CharArray.filterIndexedTo(destination: C, predicate: (index: Int, Char) -> Boolean): C {\n forEachIndexed {

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index, element ->\n    if (predicate(index, element)) destination.add(element)\n } \n return
destination\n}\n\n/**\n * Returns a list containing all elements that are instances of specified type parameter R.\n *
\n * @sample samples.collections.Collections.Filtering.filterIsInstance\n */\npublic inline fun <reified R>
Array<*>.filterIsInstance(): List<@kotlin.internal.NoInfer R> {\n    return
filterIsInstanceTo(ArrayList<R>())\n}\n\n/**\n * Appends all elements that are instances of specified type
parameter R to the given [destination].\n * \n * @sample
samples.collections.Collections.Filtering.filterIsInstanceTo\n */\npublic inline fun <reified R, C :
MutableCollection<in R>> Array<*>.filterIsInstanceTo(destination: C): C {\n    for (element in this) if (element is
R) destination.add(element)\n    return destination\n}\n\n/**\n * Returns a list containing all elements not matching
the given [predicate].\n * \n * @sample samples.collections.Collections.Filtering.filter\n */\npublic inline fun <T>
Array<out T>.filterNot(predicate: (T) -> Boolean): List<T> {\n    return filterNotTo(ArrayList<T>(),
predicate)\n}\n\n/**\n * Returns a list containing all elements not matching the given [predicate].\n * \n * @sample
samples.collections.Collections.Filtering.filter\n */\npublic inline fun ByteArray.filterNot(predicate: (Byte) ->
Boolean): List<Byte> {\n    return filterNotTo(ArrayList<Byte>(), predicate)\n}\n\n/**\n * Returns a list containing
all elements not matching the given [predicate].\n * \n * @sample samples.collections.Collections.Filtering.filter\n
*/\npublic inline fun ShortArray.filterNot(predicate: (Short) -> Boolean): List<Short> {\n    return
filterNotTo(ArrayList<Short>(), predicate)\n}\n\n/**\n * Returns a list containing all elements not matching the
given [predicate].\n * \n * @sample samples.collections.Collections.Filtering.filter\n */\npublic inline fun
IntArray.filterNot(predicate: (Int) -> Boolean): List<Int> {\n    return filterNotTo(ArrayList<Int>(),
predicate)\n}\n\n/**\n * Returns a list containing all elements not matching the given [predicate].\n * \n * @sample
samples.collections.Collections.Filtering.filter\n */\npublic inline fun LongArray.filterNot(predicate: (Long) ->
Boolean): List<Long> {\n    return filterNotTo(ArrayList<Long>(), predicate)\n}\n\n/**\n * Returns a list
containing all elements not matching the given [predicate].\n * \n * @sample
samples.collections.Collections.Filtering.filter\n */\npublic inline fun FloatArray.filterNot(predicate: (Float) ->
Boolean): List<Float> {\n    return filterNotTo(ArrayList<Float>(), predicate)\n}\n\n/**\n * Returns a list
containing all elements not matching the given [predicate].\n * \n * @sample
samples.collections.Collections.Filtering.filter\n */\npublic inline fun DoubleArray.filterNot(predicate: (Double) ->
Boolean): List<Double> {\n    return filterNotTo(ArrayList<Double>(), predicate)\n}\n\n/**\n * Returns a list
containing all elements not matching the given [predicate].\n * \n * @sample
samples.collections.Collections.Filtering.filter\n */\npublic inline fun BooleanArray.filterNot(predicate: (Boolean) -
> Boolean): List<Boolean> {\n    return filterNotTo(ArrayList<Boolean>(), predicate)\n}\n\n/**\n * Returns a list
containing all elements not matching the given [predicate].\n * \n * @sample
samples.collections.Collections.Filtering.filter\n */\npublic inline fun CharArray.filterNot(predicate: (Char) ->
Boolean): List<Char> {\n    return filterNotTo(ArrayList<Char>(), predicate)\n}\n\n/**\n * Returns a list containing
all elements that are not `null`.\n * \n * @sample samples.collections.Collections.Filtering.filterNotNull\n */\npublic
fun <T : Any> Array<out T?>.filterNotNull(): List<T> {\n    return filterNotNullTo(ArrayList<T>())\n}\n\n/**\n *
Appends all elements that are not `null` to the given [destination].\n * \n * @sample
samples.collections.Collections.Filtering.filterNotNullTo\n */\npublic fun <C : MutableCollection<in T>, T : Any>
Array<out T?>.filterNotNullTo(destination: C): C {\n    for (element in this) if (element != null)
destination.add(element)\n    return destination\n}\n\n/**\n * Appends all elements not matching the given
[predicate] to the given [destination].\n * \n * @sample samples.collections.Collections.Filtering.filterTo\n
*/\npublic inline fun <T, C : MutableCollection<in T>> Array<out T>.filterNotTo(destination: C, predicate: (T) ->
Boolean): C {\n    for (element in this) if (!predicate(element)) destination.add(element)\n    return
destination\n}\n\n/**\n * Appends all elements not matching the given [predicate] to the given [destination].\n * \n *
@sample samples.collections.Collections.Filtering.filterTo\n */\npublic inline fun <C : MutableCollection<in
Byte>> ByteArray.filterNotTo(destination: C, predicate: (Byte) -> Boolean): C {\n    for (element in this) if
(!predicate(element)) destination.add(element)\n    return destination\n}\n\n/**\n * Appends all elements not
matching the given [predicate] to the given [destination].\n * \n * @sample

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samples.collections.Collections.Filtering.filterTo\n *\npublic inline fun <C : MutableCollection<in Short>>
ShortArray.filterNotTo(destination: C, predicate: (Short) -> Boolean): C {\n  for (element in this) if
(!predicate(element)) destination.add(element)\n  return destination\n}\n\n/**\n * Appends all elements not
matching the given [predicate] to the given [destination].\n * \n * @sample
samples.collections.Collections.Filtering.filterTo\n *\npublic inline fun <C : MutableCollection<in Int>>
IntArray.filterNotTo(destination: C, predicate: (Int) -> Boolean): C {\n  for (element in this) if
(!predicate(element)) destination.add(element)\n  return destination\n}\n\n/**\n * Appends all elements not
matching the given [predicate] to the given [destination].\n * \n * @sample
samples.collections.Collections.Filtering.filterTo\n *\npublic inline fun <C : MutableCollection<in Long>>
LongArray.filterNotTo(destination: C, predicate: (Long) -> Boolean): C {\n  for (element in this) if
(!predicate(element)) destination.add(element)\n  return destination\n}\n\n/**\n * Appends all elements not
matching the given [predicate] to the given [destination].\n * \n * @sample
samples.collections.Collections.Filtering.filterTo\n *\npublic inline fun <C : MutableCollection<in Float>>
FloatArray.filterNotTo(destination: C, predicate: (Float) -> Boolean): C {\n  for (element in this) if
(!predicate(element)) destination.add(element)\n  return destination\n}\n\n/**\n * Appends all elements not
matching the given [predicate] to the given [destination].\n * \n * @sample
samples.collections.Collections.Filtering.filterTo\n *\npublic inline fun <C : MutableCollection<in Double>>
DoubleArray.filterNotTo(destination: C, predicate: (Double) -> Boolean): C {\n  for (element in this) if
(!predicate(element)) destination.add(element)\n  return destination\n}\n\n/**\n * Appends all elements not
matching the given [predicate] to the given [destination].\n * \n * @sample
samples.collections.Collections.Filtering.filterTo\n *\npublic inline fun <C : MutableCollection<in Boolean>>
BooleanArray.filterNotTo(destination: C, predicate: (Boolean) -> Boolean): C {\n  for (element in this) if
(!predicate(element)) destination.add(element)\n  return destination\n}\n\n/**\n * Appends all elements not
matching the given [predicate] to the given [destination].\n * \n * @sample
samples.collections.Collections.Filtering.filterTo\n *\npublic inline fun <C : MutableCollection<in Char>>
CharArray.filterNotTo(destination: C, predicate: (Char) -> Boolean): C {\n  for (element in this) if
(!predicate(element)) destination.add(element)\n  return destination\n}\n\n/**\n * Appends all elements matching
the given [predicate] to the given [destination].\n * \n * @sample
samples.collections.Collections.Filtering.filterTo\n
*\npublic inline fun <T, C : MutableCollection<in T>> Array<out T>.filterTo(destination: C, predicate: (T) ->
Boolean): C {\n  for (element in this) if (predicate(element)) destination.add(element)\n  return
destination\n}\n\n/**\n * Appends all elements matching the given [predicate] to the given [destination].\n * \n *
@sample
samples.collections.Collections.Filtering.filterTo\n *\npublic inline fun <C : MutableCollection<in
Byte>> ByteArray.filterTo(destination: C, predicate: (Byte) -> Boolean): C {\n  for (element in this) if
(predicate(element)) destination.add(element)\n  return destination\n}\n\n/**\n * Appends all elements matching
the given [predicate] to the given [destination].\n * \n * @sample
samples.collections.Collections.Filtering.filterTo\n
*\npublic inline fun <C : MutableCollection<in Short>> ShortArray.filterTo(destination: C, predicate: (Short) ->
Boolean): C {\n  for (element in this) if (predicate(element)) destination.add(element)\n  return
destination\n}\n\n/**\n * Appends all elements matching the given [predicate] to the given [destination].\n * \n *
@sample
samples.collections.Collections.Filtering.filterTo\n *\npublic inline fun <C : MutableCollection<in Int>>
IntArray.filterTo(destination: C, predicate: (Int) -> Boolean): C {\n  for (element in this) if (predicate(element))
destination.add(element)\n  return destination\n}\n\n/**\n * Appends all elements matching the given [predicate] to
the given [destination].\n * \n * @sample
samples.collections.Collections.Filtering.filterTo\n *\npublic inline fun
<C : MutableCollection<in Long>> LongArray.filterTo(destination: C, predicate: (Long) -> Boolean): C {\n  for
(element in this) if (predicate(element)) destination.add(element)\n  return destination\n}\n\n/**\n * Appends all
elements matching the given [predicate] to the given [destination].\n * \n * @sample
samples.collections.Collections.Filtering.filterTo\n *\npublic inline fun <C : MutableCollection<in Float>>
FloatArray.filterTo(destination: C, predicate: (Float) -> Boolean): C {\n  for (element in this) if
(predicate(element)) destination.add(element)\n  return destination\n}\n\n/**\n * Appends all elements matching

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the given [predicate] to the given [destination].\n * \n * @sample samples.collections.Collections.Filtering.filterTo\n
*\npublic inline fun <C : MutableCollection<in Double>> DoubleArray.filterTo(destination: C, predicate: (Double)\n
-> Boolean): C {\n  for (element in this) if (predicate(element)) destination.add(element)\n  return\n
destination\n}\n\n/**\n * Appends all elements matching the given [predicate] to the given [destination].\n * \n * @sample samples.collections.Collections.Filtering.filterTo\n
*\npublic inline fun <C : MutableCollection<in Boolean>> BooleanArray.filterTo(destination: C, predicate: (Boolean) -> Boolean): C {\n  for (element in this) if\n
(predicate(element)) destination.add(element)\n  return destination\n}\n\n/**\n * Appends all elements matching\n
the given [predicate] to the given [destination].\n * \n * @sample samples.collections.Collections.Filtering.filterTo\n
*\npublic inline fun <C : MutableCollection<in Char>> CharArray.filterTo(destination: C, predicate: (Char) ->\n
Boolean): C {\n  for (element in this) if (predicate(element)) destination.add(element)\n  return\n
destination\n}\n\n/**\n * Returns a list containing elements at indices in the specified [indices] range.\n * \npublic\n
fun <T> Array<out T>.slice(indices: IntRange): List<T> {\n  if (indices.isEmpty()) return listOf()\n  return\n
copyOfRange(indices.start, indices.endInclusive + 1).asList()\n}\n\n/**\n * Returns a list containing elements at\n
indices in the specified [indices] range.\n * \npublic fun ByteArray.slice(indices: IntRange): List<Byte> {\n  if\n
(indices.isEmpty()) return listOf()\n  return copyOfRange(indices.start, indices.endInclusive +\n
1).asList()\n}\n\n/**\n * Returns a list containing elements at indices in the specified [indices] range.\n * \npublic\n
fun ShortArray.slice(indices: IntRange): List<Short> {\n  if (indices.isEmpty()) return listOf()\n  return\n
copyOfRange(indices.start, indices.endInclusive + 1).asList()\n}\n\n/**\n * Returns a list containing elements at\n
indices in the specified [indices] range.\n * \npublic fun IntArray.slice(indices: IntRange): List<Int> {\n  if\n
(indices.isEmpty()) return listOf()\n  return copyOfRange(indices.start, indices.endInclusive +\n
1).asList()\n}\n\n/**\n * Returns a list containing elements at indices in the specified [indices] range.\n * \npublic\n
fun LongArray.slice(indices: IntRange): List<Long> {\n  if (indices.isEmpty()) return listOf()\n  return\n
copyOfRange(indices.start, indices.endInclusive + 1).asList()\n}\n\n/**\n * Returns a list containing elements at\n
indices in the specified [indices] range.\n * \npublic fun FloatArray.slice(indices: IntRange): List<Float> {\n  if\n
(indices.isEmpty()) return listOf()\n  return copyOfRange(indices.start, indices.endInclusive +\n
1).asList()\n}\n\n/**\n * Returns a list containing elements at indices in the specified [indices] range.\n * \npublic\n
fun DoubleArray.slice(indices: IntRange): List<Double> {\n  if (indices.isEmpty()) return listOf()\n  return\n
copyOfRange(indices.start, indices.endInclusive + 1).asList()\n}\n\n/**\n * Returns a list containing elements at\n
indices in the specified [indices] range.\n * \npublic fun BooleanArray.slice(indices: IntRange): List<Boolean> {\n  if\n
(indices.isEmpty()) return listOf()\n  return copyOfRange(indices.start, indices.endInclusive +\n
1).asList()\n}\n\n/**\n * Returns a list containing elements at indices in the specified [indices] range.\n * \npublic\n
fun CharArray.slice(indices: IntRange): List<Char> {\n  if (indices.isEmpty()) return listOf()\n  return\n
copyOfRange(indices.start, indices.endInclusive + 1).asList()\n}\n\n/**\n * Returns a list containing elements at\n
specified [indices].\n * \npublic fun <T> Array<out T>.slice(indices: Iterable<Int>): List<T> {\n  val size =\n
indices.collectionSizeOrDefault(10)\n  if (size == 0) return emptyList()\n  val list = ArrayList<T>(size)\n  for\n
(index in indices) {\n    list.add(get(index))\n  }\n  return list\n}\n\n/**\n * Returns a list containing elements at\n
specified [indices].\n * \npublic fun ByteArray.slice(indices: Iterable<Int>): List<Byte> {\n  val size =\n
indices.collectionSizeOrDefault(10)\n  if (size == 0) return emptyList()\n  val list = ArrayList<Byte>(size)\n  for\n
(index in indices) {\n    list.add(get(index))\n  }\n  return list\n}\n\n/**\n * Returns a list containing elements at\n
specified [indices].\n * \npublic fun ShortArray.slice(indices: Iterable<Int>): List<Short> {\n  val size =\n
indices.collectionSizeOrDefault(10)\n  if (size == 0) return emptyList()\n  val list = ArrayList<Short>(size)\n  for\n
(index in indices) {\n    list.add(get(index))\n  }\n  return list\n}\n\n/**\n * Returns a list containing\n
elements at specified [indices].\n * \npublic fun IntArray.slice(indices: Iterable<Int>): List<Int> {\n  val size =\n
indices.collectionSizeOrDefault(10)\n  if (size == 0) return emptyList()\n  val list = ArrayList<Int>(size)\n  for\n
(index in indices) {\n    list.add(get(index))\n  }\n  return list\n}\n\n/**\n * Returns a list containing elements at\n
specified [indices].\n * \npublic fun LongArray.slice(indices: Iterable<Int>): List<Long> {\n  val size =\n
indices.collectionSizeOrDefault(10)\n  if (size == 0) return emptyList()\n  val list = ArrayList<Long>(size)\n  for\n
(index in indices) {\n    list.add(get(index))\n  }\n  return list\n}\n\n/**\n * Returns a list containing

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elements at specified [indices].\n *\npublic fun FloatArray.slice(indices: Iterable<Int>): List<Float> {\n    val size =
indices.collectionSizeOrDefault(10)\n    if (size == 0) return emptyList()\n    val list = ArrayList<Float>(size)\n
for (index in indices) {\n        list.add(get(index))\n    }\n    return list\n}\n\n/**\n * Returns a list containing
elements at specified [indices].\n *\npublic fun DoubleArray.slice(indices: Iterable<Int>): List<Double> {\n    val
size = indices.collectionSizeOrDefault(10)\n    if (size == 0) return emptyList()\n    val list =
ArrayList<Double>(size)\n    for (index in indices) {\n        list.add(get(index))\n    }\n    return list\n}\n\n/**\n *
Returns a list containing elements at specified [indices].\n *\npublic fun BooleanArray.slice(indices: Iterable<Int>):
List<Boolean> {\n    val size = indices.collectionSizeOrDefault(10)\n    if (size == 0) return emptyList()\n    val list
= ArrayList<Boolean>(size)\n    for (index in indices) {\n        list.add(get(index))\n    }\n    return list\n}\n\n/**\n *
Returns a list containing elements at specified [indices].\n *\npublic fun CharArray.slice(indices: Iterable<Int>):
List<Char> {\n    val size = indices.collectionSizeOrDefault(10)\n    if (size == 0) return emptyList()\n    val list =
ArrayList<Char>(size)\n    for (index in indices) {\n        list.add(get(index))\n    }\n    return list\n}\n\n/**\n *
Returns an array containing elements of this array at specified [indices].\n *\npublic fun <T>
Array<T>.sliceArray(indices: Collection<Int>): Array<T> {\n    val result = arrayOfNulls(this, indices.size)\n    var
targetIndex = 0\n    for (sourceIndex in indices) {\n        result[targetIndex++] = this[sourceIndex]\n    }\n    return
result\n}\n\n/**\n * Returns an array containing elements of this array at specified [indices].\n *\npublic fun
ByteArray.sliceArray(indices: Collection<Int>): ByteArray {\n    val result = ByteArray(indices.size)\n    var
targetIndex = 0\n    for (sourceIndex in indices) {\n        result[targetIndex++] = this[sourceIndex]\n    }\n    return
result\n}\n\n/**\n * Returns an array containing elements of this array at specified [indices].\n *\npublic fun
ShortArray.sliceArray(indices: Collection<Int>): ShortArray {\n    val result = ShortArray(indices.size)\n    var
targetIndex = 0\n    for (sourceIndex in indices) {\n        result[targetIndex++] = this[sourceIndex]\n    }\n    return
result\n}\n\n/**\n * Returns an array containing elements of this array at specified [indices].\n *\npublic fun
IntArray.sliceArray(indices: Collection<Int>): IntArray {\n    val result = IntArray(indices.size)\n    var targetIndex
= 0\n    for (sourceIndex in indices) {\n        result[targetIndex++] = this[sourceIndex]\n    }\n    return
result\n}\n\n/**\n * Returns an array containing elements of this array at specified [indices].\n *\npublic fun
LongArray.sliceArray(indices: Collection<Int>): LongArray {\n    val result = LongArray(indices.size)\n    var
targetIndex = 0\n    for (sourceIndex in indices) {\n        result[targetIndex++] = this[sourceIndex]\n    }\n    return
result\n}\n\n/**\n * Returns an array containing elements of this array at specified [indices].\n *\npublic fun
FloatArray.sliceArray(indices: Collection<Int>): FloatArray {\n    val result = FloatArray(indices.size)\n    var
targetIndex = 0\n    for (sourceIndex in indices) {\n        result[targetIndex++] = this[sourceIndex]\n    }\n    return
result\n}\n\n/**\n * Returns an array containing elements of this array at specified [indices].\n *\npublic fun
DoubleArray.sliceArray(indices: Collection<Int>): DoubleArray {\n    val result = DoubleArray(indices.size)\n    var
targetIndex = 0\n    for (sourceIndex in indices) {\n        result[targetIndex++] = this[sourceIndex]\n    }\n    return
result\n}\n\n/**\n * Returns an array containing elements of this array at specified [indices].\n *\npublic fun
BooleanArray.sliceArray(indices: Collection<Int>): BooleanArray {\n    val result = BooleanArray(indices.size)\n    var
targetIndex = 0\n    for (sourceIndex in indices) {\n        result[targetIndex++] = this[sourceIndex]\n    }\n    return
result\n}\n\n/**\n * Returns an array containing elements of this array at specified [indices].\n *\npublic fun
CharArray.sliceArray(indices: Collection<Int>): CharArray {\n    val result = CharArray(indices.size)\n    var
targetIndex = 0\n    for (sourceIndex in indices) {\n        result[targetIndex++] = this[sourceIndex]\n    }\n    return
result\n}\n\n/**\n * Returns an array containing elements at indices in the specified [indices] range.\n *\npublic fun
<T> Array<T>.sliceArray(indices: IntRange): Array<T> {\n    if (indices.isEmpty()) return copyOfRange(0, 0)\n    return
copyOfRange(indices.start, indices.endInclusive + 1)\n}\n\n/**\n * Returns an array containing elements at
indices in the specified [indices] range.\n *\npublic fun ByteArray.sliceArray(indices: IntRange): ByteArray {\n    if
(indices.isEmpty()) return ByteArray(0)\n    return copyOfRange(indices.start, indices.endInclusive + 1)\n}\n\n/**\n *
Returns an array containing elements at indices in the specified [indices] range.\n *\npublic fun
ShortArray.sliceArray(indices: IntRange): ShortArray {\n    if (indices.isEmpty()) return ShortArray(0)\n    return
copyOfRange(indices.start, indices.endInclusive + 1)\n}\n\n/**\n * Returns an array containing elements at indices
in the specified [indices] range.\n *\npublic fun IntArray.sliceArray(indices: IntRange): IntArray {\n    if

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(indices.isEmpty()) return IntArray(0)\n    return copyOfRange(indices.start, indices.endInclusive + 1)\n}\n\n/**\n * Returns an array containing elements at indices in the specified [indices] range.\n */\npublic fun
LongArray.sliceArray(indices: IntRange): LongArray {\n    if (indices.isEmpty()) return LongArray(0)\n    return
copyOfRange(indices.start, indices.endInclusive + 1)\n}\n\n/**\n * Returns an array containing elements at indices
in the specified [indices] range.\n */\npublic fun FloatArray.sliceArray(indices: IntRange): FloatArray {\n    if
(indices.isEmpty()) return FloatArray(0)\n    return copyOfRange(indices.start, indices.endInclusive + 1)\n}\n\n/**\n * Returns an array containing elements at indices in the specified [indices] range.\n */\npublic fun
DoubleArray.sliceArray(indices: IntRange): DoubleArray {\n    if (indices.isEmpty()) return DoubleArray(0)\n
return copyOfRange(indices.start, indices.endInclusive + 1)\n}\n\n/**\n * Returns an array containing elements at
indices in the specified [indices] range.\n */\npublic fun BooleanArray.sliceArray(indices: IntRange): BooleanArray
{\n    if (indices.isEmpty()) return BooleanArray(0)\n    return copyOfRange(indices.start, indices.endInclusive +
1)\n}\n\n/**\n * Returns an array containing elements at indices in the specified [indices] range.\n */\npublic fun
CharArray.sliceArray(indices: IntRange): CharArray {\n    if (indices.isEmpty()) return CharArray(0)\n    return
copyOfRange(indices.start, indices.endInclusive + 1)\n}\n\n/**\n * Returns a list containing first [n] elements.\n */\n * @throws IllegalArgumentException if [n] is negative.\n */\n * @sample
samples.collections.Collections.Transformations.take\n */\npublic fun <T> Array<out T>.take(n: Int): List<T> {\n
require(n >= 0) { \"Requested element count $n is less than zero.\" }\n    if (n == 0) return emptyList()\n    if (n >=
size) return toList()\n    if (n == 1) return listOf(this[0])\n    var count = 0\n    val list = ArrayList<T>(n)\n    for
(item in this) {\n        list.add(item)\n        if (++count == n)\n            break\n    }\n    return list\n}\n\n/**\n * Returns
a list containing first [n] elements.\n */\n * @throws IllegalArgumentException if [n] is negative.\n */\n * @sample
samples.collections.Collections.Transformations.take\n */\npublic fun ByteArray.take(n: Int): List<Byte> {\n
require(n >= 0) { \"Requested element count $n is less than zero.\" }\n    if (n == 0) return emptyList()\n    if (n >=
size) return toList()\n    if (n == 1) return listOf(this[0])\n    var count = 0\n    val list = ArrayList<Byte>(n)\n    for
(item in this) {\n        list.add(item)\n        if (++count == n)\n            break\n    }\n    return list\n}\n\n/**\n * Returns
a list containing first [n] elements.\n */\n * @throws IllegalArgumentException if [n] is negative.\n */\n * @sample
samples.collections.Collections.Transformations.take\n */\npublic fun ShortArray.take(n: Int): List<Short> {\n
require(n >= 0) { \"Requested element count $n is less than zero.\" }\n    if (n == 0) return emptyList()\n    if (n >=
size) return toList()\n    if (n == 1) return listOf(this[0])\n    var count = 0\n    val list = ArrayList<Short>(n)\n    for
(item in this) {\n        list.add(item)\n        if (++count == n)\n            break\n    }\n    return list\n}\n\n/**\n * Returns
a list containing first [n] elements.\n */\n * @throws IllegalArgumentException if [n] is negative.\n */\n * @sample
samples.collections.Collections.Transformations.take\n */\npublic fun IntArray.take(n: Int): List<Int> {\n
require(n >= 0) { \"Requested element count $n is less than zero.\" }\n    if (n == 0) return emptyList()\n    if (n >=
size) return toList()\n    if (n == 1) return listOf(this[0])\n    var count = 0\n    val list = ArrayList<Int>(n)\n    for
(item in this) {\n        list.add(item)\n        if (++count == n)\n            break\n    }\n    return list\n}\n\n/**\n * Returns
a list containing first [n] elements.\n */\n * @throws IllegalArgumentException if [n] is negative.\n */\n * @sample
samples.collections.Collections.Transformations.take\n */\npublic fun LongArray.take(n: Int): List<Long> {\n
require(n >= 0) { \"Requested element count $n is less than zero.\" }\n    if (n == 0) return emptyList()\n    if (n >=
size) return toList()\n    if (n == 1) return listOf(this[0])\n    var count = 0\n    val list = ArrayList<Long>(n)\n    for
(item in this) {\n        list.add(item)\n        if (++count == n)\n            break\n    }\n    return list\n}\n\n/**\n * Returns
a list containing first [n] elements.\n */\n * @throws IllegalArgumentException if [n] is negative.\n */\n * @sample
samples.collections.Collections.Transformations.take\n */\npublic fun FloatArray.take(n: Int): List<Float> {\n
require(n >= 0) { \"Requested element count $n is less than zero.\" }\n    if (n == 0) return emptyList()\n    if (n >=
size) return toList()\n    if (n == 1) return listOf(this[0])\n    var count = 0\n    val list = ArrayList<Float>(n)\n    for
(item in this) {\n        list.add(item)\n        if (++count == n)\n            break\n    }\n    return list\n}\n\n/**\n * Returns
a list containing first [n] elements.\n */\n * @throws IllegalArgumentException if [n] is negative.\n */\n * @sample
samples.collections.Collections.Transformations.take\n */\npublic fun DoubleArray.take(n: Int): List<Double> {\n
require(n >= 0) { \"Requested element count $n is less than zero.\" }\n    if (n == 0) return emptyList()\n    if (n >=
size) return toList()\n    if (n == 1) return listOf(this[0])\n    var count = 0\n    val list = ArrayList<Double>(n)\n

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for (item in this) {\n    list.add(item)\n    if (++count == n)\n        break\n    }\n    return list\n}\n\n/**\n * Returns a list containing first [n] elements.\n * \n * @throws IllegalArgumentException if [n] is negative.\n * \n * @sample samples.collections.Collections.Transformations.take\n */\npublic fun BooleanArray.take(n: Int):\nList<Boolean> {\n    require(n >= 0) { \"Requested element count $n is less than zero.\" }\n    if (n == 0) return\nemptyList()\n    if (n >= size) return toList()\n    if (n == 1) return listOf(this[0])\n    var count = 0\n    val list =\nArrayList<Boolean>(n)\n    for (item in this) {\n        list.add(item)\n        if (++count == n)\n            break\n    }\n    return list\n}\n\n/**\n * Returns a list containing first [n] elements.\n * \n * @throws IllegalArgumentException if\n[n] is negative.\n * \n * @sample samples.collections.Collections.Transformations.take\n */\npublic fun\nCharArray.take(n: Int): List<Char> {\n    require(n >= 0) { \"Requested element count $n is less than zero.\" }\n    if (n == 0) return emptyList()\n    if (n >= size) return toList()\n    if (n == 1) return listOf(this[0])\n    var count = 0\n    val list = ArrayList<Char>(n)\n    for (item in this) {\n        list.add(item)\n        if (++count == n)\n            break\n    }\n    return list\n}\n\n/**\n * Returns a list containing last [n] elements.\n * \n * @throws\nIllegalArgumentException if [n] is negative.\n * \n * @sample\nsamples.collections.Collections.Transformations.take\n */\npublic fun <T> Array<out T>.takeLast(n: Int): List<T>\n{\n    require(n >= 0) { \"Requested element count $n is less than zero.\" }\n    if (n == 0) return emptyList()\n    val\nsize = size\n    if (n >= size) return toList()\n    if (n == 1) return listOf(this[size - 1])\n    val list =\nArrayList<T>(n)\n    for (index in size - n until size)\n        list.add(this[index])\n    return list\n}\n\n/**\n * Returns\na list containing last [n] elements.\n * \n * @throws IllegalArgumentException if [n] is negative.\n * \n * @sample\nsamples.collections.Collections.Transformations.take\n */\npublic fun ByteArray.takeLast(n: Int): List<Byte> {\n   \nrequire(n >= 0) { \"Requested element count $n is less than zero.\" }\n    if (n == 0) return emptyList()\n    val size =\nsize\n    if (n >= size) return toList()\n    if (n == 1) return listOf(this[size - 1])\n    val list = ArrayList<Byte>(n)\n    for (index in size - n until size)\n        list.add(this[index])\n    return list\n}\n\n/**\n * Returns a list containing last\n[n] elements.\n * \n * @throws IllegalArgumentException if [n] is negative.\n * \n * @sample\nsamples.collections.Collections.Transformations.take\n */\npublic fun ShortArray.takeLast(n: Int): List<Short> {\n   \nrequire(n >= 0) { \"Requested element count $n is less than zero.\" }\n    if (n == 0) return emptyList()\n    val size =\nsize\n    if (n >= size) return toList()\n    if (n == 1) return listOf(this[size - 1])\n    val list = ArrayList<Short>(n)\n    for (index in size - n until size)\n        list.add(this[index])\n    return list\n}\n\n/**\n * Returns a list containing last\n[n] elements.\n * \n * @throws IllegalArgumentException if [n] is negative.\n * \n * @sample\nsamples.collections.Collections.Transformations.take\n */\npublic fun IntArray.takeLast(n: Int): List<Int> {\n   \nrequire(n >= 0) { \"Requested element count $n is less than zero.\" }\n    if (n == 0) return emptyList()\n    val size =\nsize\n    if (n >= size) return toList()\n    if (n == 1) return listOf(this[size - 1])\n    val list = ArrayList<Int>(n)\n    for (index in size - n until size)\n        list.add(this[index])\n    return list\n}\n\n/**\n * Returns a list containing last\n[n] elements.\n * \n * @throws IllegalArgumentException if [n] is negative.\n * \n * @sample\nsamples.collections.Collections.Transformations.take\n */\npublic fun LongArray.takeLast(n: Int): List<Long> {\n   \nrequire(n >= 0) { \"Requested element count $n is less than zero.\" }\n    if (n == 0) return emptyList()\n    val size =\nsize\n    if (n >= size) return toList()\n    if (n == 1) return listOf(this[size - 1])\n    val list = ArrayList<Long>(n)\n    for (index in size - n until size)\n        list.add(this[index])\n    return list\n}\n\n/**\n * Returns a list containing last\n[n] elements.\n * \n * @throws IllegalArgumentException if [n] is negative.\n * \n * @sample\nsamples.collections.Collections.Transformations.take\n */\npublic fun FloatArray.takeLast(n: Int): List<Float> {\n   \nrequire(n >= 0) { \"Requested element count $n is less than zero.\" }\n    if (n == 0) return emptyList()\n    val size =\nsize\n    if (n >= size) return toList()\n    if (n == 1) return listOf(this[size - 1])\n    val list = ArrayList<Float>(n)\n    for (index in size - n until size)\n        list.add(this[index])\n    return list\n}\n\n/**\n * Returns a list containing last\n[n] elements.\n * \n * @throws IllegalArgumentException if [n] is negative.\n * \n * @sample\nsamples.collections.Collections.Transformations.take\n */\npublic fun DoubleArray.takeLast(n: Int): List<Double>\n{\n    require(n >= 0) { \"Requested element count $n is less than zero.\" }\n    if (n == 0) return emptyList()\n    val\nsize = size\n    if (n >= size) return toList()\n    if (n == 1) return listOf(this[size - 1])\n    val list =\nArrayList<Double>(n)\n    for (index in size - n until size)\n        list.add(this[index])\n    return list\n}\n\n/**\n * Returns a list containing last [n] elements.\n * \n * @throws IllegalArgumentException if [n] is negative.\n * \n *

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@sample samples.collections.Collections.Transformations.take\n *\npublic fun BooleanArray.takeLast(n: Int):
List<Boolean> {\n  require(n >= 0) {\n    \"Requested element count $n is less than zero.\" }\n  if (n == 0) return
emptyList()\n  val size = size\n  if (n >= size) return toList()\n  if (n == 1) return listOf(this[size - 1])\n  val list
= ArrayList<Boolean>(n)\n  for (index in size - n until size)\n    list.add(this[index])\n  return list\n}\n\n/**\n *
Returns a list containing last [n] elements.\n * \n * @throws IllegalArgumentException if [n] is negative.\n * \n *
@sample samples.collections.Collections.Transformations.take\n *\npublic fun CharArray.takeLast(n: Int):
List<Char> {\n  require(n >= 0) {\n    \"Requested element count $n is less than zero.\" }\n  if (n == 0) return
emptyList()\n  val size = size\n  if (n >= size) return toList()\n  if (n == 1) return listOf(this[size - 1])\n  val list
= ArrayList<Char>(n)\n  for (index in size - n until size)\n    list.add(this[index])\n  return list\n}\n\n/**\n *
Returns a list containing last elements satisfying the given [predicate].\n * \n * @sample
samples.collections.Collections.Transformations.take\n *\npublic inline fun <T> Array<out
T>.takeLastWhile(predicate: (T) -> Boolean): List<T> {\n  for (index in lastIndex downTo 0) {\n    if
(!predicate(this[index])) {\n      return drop(index + 1)\n    }\n  }\n  return toList()\n}\n\n/**\n * Returns a
list containing last elements satisfying the given [predicate].\n * \n * @sample
samples.collections.Collections.Transformations.take\n *\npublic inline fun ByteArray.takeLastWhile(predicate:
(Byte) -> Boolean): List<Byte> {\n  for (index in lastIndex downTo 0) {\n    if (!predicate(this[index])) {\n
return drop(index + 1)\n    }\n  }\n  return toList()\n}\n\n/**\n * Returns a list containing last elements
satisfying the given [predicate].\n * \n * @sample samples.collections.Collections.Transformations.take\n *\npublic
inline fun ShortArray.takeLastWhile(predicate: (Short) -> Boolean): List<Short> {\n  for (index in lastIndex
downTo 0) {\n    if (!predicate(this[index])) {\n      return drop(index + 1)\n    }\n  }\n  return
toList()\n}\n\n/**\n * Returns a list containing last elements satisfying the given [predicate].\n * \n * @sample
samples.collections.Collections.Transformations.take\n *\npublic inline fun IntArray.takeLastWhile(predicate: (Int)
-> Boolean): List<Int> {\n  for (index in lastIndex downTo 0) {\n    if (!predicate(this[index])) {\n      return
drop(index + 1)\n    }\n  }\n  return toList()\n}\n\n/**\n * Returns a list containing last elements satisfying the
given [predicate].\n * \n * @sample samples.collections.Collections.Transformations.take\n *\npublic inline fun
LongArray.takeLastWhile(predicate: (Long) -> Boolean): List<Long> {\n  for (index in lastIndex downTo 0) {\n
if (!predicate(this[index])) {\n      return drop(index + 1)\n    }\n  }\n  return toList()\n}\n\n/**\n * Returns
a list containing last elements satisfying the given [predicate].\n * \n * @sample
samples.collections.Collections.Transformations.take\n *\npublic inline fun FloatArray.takeLastWhile(predicate:
(Float) -> Boolean): List<Float> {\n  for (index in lastIndex downTo 0) {\n    if (!predicate(this[index])) {\n
return drop(index + 1)\n    }\n  }\n  return toList()\n}\n\n/**\n * Returns a list containing last elements
satisfying the given [predicate].\n * \n * @sample samples.collections.Collections.Transformations.take\n *\npublic
inline fun DoubleArray.takeLastWhile(predicate: (Double) -> Boolean): List<Double> {\n  for (index in lastIndex
downTo 0) {\n    if (!predicate(this[index])) {\n      return drop(index + 1)\n    }\n  }\n  return
toList()\n}\n\n/**\n * Returns a list containing last elements satisfying the given [predicate].\n * \n * @sample
samples.collections.Collections.Transformations.take\n *\npublic inline fun
BooleanArray.takeLastWhile(predicate: (Boolean) -> Boolean): List<Boolean> {\n  for (index in lastIndex
downTo 0) {\n    if (!predicate(this[index])) {\n      return drop(index + 1)\n    }\n  }\n  return
toList()\n}\n\n/**\n * Returns a list containing last elements satisfying the given [predicate].\n * \n * @sample
samples.collections.Collections.Transformations.take\n *\npublic inline fun CharArray.takeLastWhile(predicate:
(Char) -> Boolean): List<Char> {\n  for (index in lastIndex downTo 0) {\n    if (!predicate(this[index])) {\n
return drop(index + 1)\n    }\n  }\n  return toList()\n}\n\n/**\n * Returns a list containing first elements
satisfying the given [predicate].\n * \n * @sample samples.collections.Collections.Transformations.take\n *\npublic
inline fun <T> Array<out T>.takeWhile(predicate: (T) -> Boolean): List<T> {\n  val list = ArrayList<T>()\n  for
(item in this) {\n    if (!predicate(item))\n      break\n    list.add(item)\n  }\n  return list\n}\n\n/**\n *
Returns a list containing first elements satisfying the given [predicate].\n * \n * @sample
samples.collections.Collections.Transformations.take\n *\npublic inline fun ByteArray.takeWhile(predicate: (Byte)
-> Boolean): List<Byte> {\n  val list = ArrayList<Byte>()\n  for (item in this) {\n    if (!predicate(item))\n

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break\n    list.add(item)\n    }\n    return list\n}\n\n/**\n * Returns a list containing first elements satisfying the
given [predicate].\n * \n * @sample samples.collections.Collections.Transformations.take\n *^\npublic inline fun
ShortArray.takeWhile(predicate: (Short) -> Boolean): List<Short> {\n    val list = ArrayList<Short>()\n    for (item
in this) {\n        if (!predicate(item))\n            break\n        list.add(item)\n    }\n    return list\n}\n\n/**\n * Returns a
list containing first elements satisfying the given [predicate].\n * \n * @sample
samples.collections.Collections.Transformations.take\n *^\npublic inline fun IntArray.takeWhile(predicate: (Int) ->
Boolean): List<Int> {\n    val list = ArrayList<Int>()\n    for (item in this) {\n        if (!predicate(item))\n            break\n        list.add(item)\n    }\n    return list\n}\n\n/**\n * Returns a list containing first elements satisfying the
given [predicate].\n * \n * @sample samples.collections.Collections.Transformations.take\n *^\npublic inline fun LongArray.takeWhile(predicate: (Long) -> Boolean): List<Long> {\n    val list = ArrayList<Long>()\n    for (item
in this) {\n        if (!predicate(item))\n            break\n        list.add(item)\n    }\n    return list\n}\n\n/**\n * Returns a
list containing first elements satisfying the given [predicate].\n * \n * @sample
samples.collections.Collections.Transformations.take\n *^\npublic inline fun FloatArray.takeWhile(predicate:
(Float) -> Boolean): List<Float> {\n    val list = ArrayList<Float>()\n    for (item in this) {\n        if
(!predicate(item))\n            break\n        list.add(item)\n    }\n    return list\n}\n\n/**\n * Returns a list containing first
elements satisfying the given [predicate].\n * \n * @sample samples.collections.Collections.Transformations.take\n
*^\npublic inline fun DoubleArray.takeWhile(predicate: (Double) -> Boolean): List<Double> {\n    val list =
ArrayList<Double>()\n    for (item in this) {\n        if (!predicate(item))\n            break\n        list.add(item)\n    }\n    return list\n}\n\n/**\n * Returns a list containing first elements satisfying the given [predicate].\n * \n * @sample
samples.collections.Collections.Transformations.take\n *^\npublic inline fun BooleanArray.takeWhile(predicate:
(Boolean) -> Boolean): List<Boolean> {\n    val list = ArrayList<Boolean>()\n    for (item in this) {\n        if
(!predicate(item))\n            break\n        list.add(item)\n    }\n    return list\n}\n\n/**\n * Returns a list containing first
elements satisfying the given [predicate].\n * \n * @sample samples.collections.Collections.Transformations.take\n
*^\npublic inline fun CharArray.takeWhile(predicate: (Char) -> Boolean): List<Char> {\n    val list =
ArrayList<Char>()\n    for (item in this) {\n        if (!predicate(item))\n            break\n        list.add(item)\n    }\n    return list\n}\n\n/**\n * Reverses elements in the array in-place.\n *^\npublic fun <T> Array<T>.reverse(): Unit {\n    val
midPoint = (size / 2) - 1\n    if (midPoint < 0) return\n    var reverseIndex = lastIndex\n    for (index in
0..midPoint) {\n        val tmp = this[index]\n        this[index] = this[reverseIndex]\n        this[reverseIndex] = tmp\n        reverseIndex--\n    }\n}\n\n/**\n * Reverses elements in the array in-place.\n *^\npublic fun ByteArray.reverse():
Unit {\n    val midPoint = (size / 2) - 1\n    if (midPoint < 0) return\n    var reverseIndex = lastIndex\n    for (index in
0..midPoint) {\n        val tmp = this[index]\n        this[index] = this[reverseIndex]\n        this[reverseIndex] = tmp\n        reverseIndex--\n    }\n}\n\n/**\n * Reverses elements in the array in-place.\n *^\npublic fun ShortArray.reverse():
Unit {\n    val midPoint = (size / 2) - 1\n    if (midPoint < 0) return\n    var reverseIndex = lastIndex\n    for (index in
0..midPoint) {\n        val tmp = this[index]\n        this[index] = this[reverseIndex]\n        this[reverseIndex] = tmp\n        reverseIndex--\n    }\n}\n\n/**\n * Reverses elements in the array in-place.\n *^\npublic fun IntArray.reverse():
Unit {\n    val midPoint = (size / 2) - 1\n    if (midPoint < 0) return\n    var reverseIndex = lastIndex\n    for (index in
0..midPoint) {\n        val tmp = this[index]\n        this[index] = this[reverseIndex]\n        this[reverseIndex] = tmp\n        reverseIndex--\n    }\n}\n\n/**\n * Reverses elements in the array in-place.\n *^\npublic fun LongArray.reverse():
Unit {\n    val midPoint = (size / 2) - 1\n    if (midPoint < 0) return\n    var reverseIndex = lastIndex\n    for (index in
0..midPoint) {\n        val tmp = this[index]\n        this[index] = this[reverseIndex]\n        this[reverseIndex] = tmp\n        reverseIndex--\n    }\n}\n\n/**\n * Reverses elements in the array in-place.\n *^\npublic fun FloatArray.reverse():
Unit {\n    val midPoint = (size / 2) - 1\n    if (midPoint < 0) return\n    var reverseIndex = lastIndex\n    for (index in
0..midPoint) {\n        val tmp = this[index]\n        this[index] = this[reverseIndex]\n        this[reverseIndex] = tmp\n        reverseIndex--\n    }\n}\n\n/**\n * Reverses elements in the array in-place.\n *^\npublic fun
DoubleArray.reverse(): Unit {\n    val midPoint = (size / 2) - 1\n    if (midPoint < 0) return\n    var reverseIndex =
lastIndex\n    for (index in 0..midPoint) {\n        val tmp = this[index]\n        this[index] = this[reverseIndex]\n        this[reverseIndex] = tmp\n        reverseIndex--\n    }\n}\n\n/**\n * Reverses elements in the array in-place.\n *^\npublic fun BooleanArray.reverse(): Unit {\n    val midPoint = (size / 2) - 1\n    if (midPoint < 0) return\n    var

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reverseIndex = lastIndex\n  for (index in 0..midPoint) {\n    val tmp = this[index]\n    this[index] =
this[reverseIndex]\n    this[reverseIndex] = tmp\n    reverseIndex--\n  }\n}\n\n/**\n * Reverses elements in the
array in-place.\n */\npublic fun CharArray.reverse(): Unit {\n  val midPoint = (size / 2) - 1\n  if (midPoint < 0)
return\n  var reverseIndex = lastIndex\n  for (index in 0..midPoint) {\n    val tmp = this[index]\n    this[index]
= this[reverseIndex]\n    this[reverseIndex] = tmp\n    reverseIndex--\n  }\n}\n\n/**\n * Reverses elements of
the array in the specified range in-place.\n */\n * @param fromIndex the start of the range (inclusive) to reverse.\n *
@param toIndex the end of the range (exclusive) to reverse.\n * @throws IndexOutOfBoundsException if
[fromIndex] is less than zero or [toIndex] is greater than the size of this array.\n * @throws
IllegalArgumentException if [fromIndex] is greater than [toIndex].\n */\n\n@SinceKotlin("1.4")\npublic fun <T>
Array<T>.reverse(fromIndex: Int, toIndex: Int): Unit {\n  AbstractList.checkRangeIndexes(fromIndex, toIndex,
size)\n  val midPoint = (fromIndex + toIndex) / 2\n  if (fromIndex == midPoint) return\n  var reverseIndex =
toIndex - 1\n  for (index in fromIndex until midPoint) {\n    val tmp = this[index]\n    this[index] =
this[reverseIndex]\n    this[reverseIndex] = tmp\n    reverseIndex--\n  }\n}\n\n/**\n * Reverses elements of the
array in the specified range in-place.\n */\n * @param fromIndex the start of the range (inclusive) to reverse.\n *
@param toIndex the end of the range (exclusive) to reverse.\n * @throws IndexOutOfBoundsException if
[fromIndex] is less than zero or [toIndex] is greater than the size of this array.\n * @throws
IllegalArgumentException if [fromIndex] is greater than [toIndex].\n */\n\n@SinceKotlin("1.4")\npublic fun
ByteArray.reverse(fromIndex: Int, toIndex: Int): Unit {\n  AbstractList.checkRangeIndexes(fromIndex, toIndex,
size)\n  val midPoint = (fromIndex + toIndex) / 2\n  if (fromIndex == midPoint) return\n  var reverseIndex =
toIndex - 1\n  for (index in fromIndex until midPoint) {\n    val tmp = this[index]\n    this[index] =
this[reverseIndex]\n    this[reverseIndex] = tmp\n    reverseIndex--\n  }\n}\n\n/**\n * Reverses elements of the
array in the specified range in-place.\n */\n * @param fromIndex the start of the range (inclusive) to reverse.\n *
@param toIndex the end of the range (exclusive) to reverse.\n * @throws IndexOutOfBoundsException if
[fromIndex] is less than zero or [toIndex] is greater than the size of this array.\n * @throws
IllegalArgumentException if [fromIndex] is greater than [toIndex].\n */\n\n@SinceKotlin("1.4")\npublic fun
ShortArray.reverse(fromIndex: Int, toIndex: Int): Unit {\n  AbstractList.checkRangeIndexes(fromIndex, toIndex,
size)\n  val midPoint = (fromIndex + toIndex) / 2\n  if (fromIndex == midPoint) return\n  var reverseIndex =
toIndex - 1\n  for (index in fromIndex until midPoint) {\n    val tmp = this[index]\n    this[index] =
this[reverseIndex]\n    this[reverseIndex] = tmp\n    reverseIndex--\n  }\n}\n\n/**\n * Reverses elements of the
array in the specified range in-place.\n */\n * @param fromIndex the start of the range (inclusive) to reverse.\n *
@param toIndex the end of the range (exclusive) to reverse.\n * @throws IndexOutOfBoundsException if
[fromIndex] is less than zero or [toIndex] is greater than the size of this array.\n * @throws
IllegalArgumentException if [fromIndex] is greater than [toIndex].\n */\n\n@SinceKotlin("1.4")\npublic fun
IntArray.reverse(fromIndex: Int, toIndex: Int): Unit {\n  AbstractList.checkRangeIndexes(fromIndex, toIndex,
size)\n  val midPoint = (fromIndex + toIndex) / 2\n  if (fromIndex == midPoint) return\n  var reverseIndex =
toIndex - 1\n  for (index in fromIndex until midPoint) {\n    val tmp = this[index]\n    this[index] =
this[reverseIndex]\n    this[reverseIndex] = tmp\n    reverseIndex--\n  }\n}\n\n/**\n * Reverses elements of the
array in the specified range in-place.\n */\n * @param fromIndex the start of the range (inclusive) to reverse.\n *
@param toIndex the end of the range (exclusive) to reverse.\n * @throws IndexOutOfBoundsException if
[fromIndex] is less than zero or [toIndex] is greater than the size of this array.\n * @throws
IllegalArgumentException if [fromIndex] is greater than [toIndex].\n */\n\n@SinceKotlin("1.4")\npublic fun
LongArray.reverse(fromIndex: Int, toIndex: Int): Unit {\n  AbstractList.checkRangeIndexes(fromIndex, toIndex,
size)\n  val midPoint = (fromIndex + toIndex) / 2\n  if (fromIndex == midPoint) return\n  var reverseIndex =
toIndex - 1\n  for (index in fromIndex until midPoint) {\n    val tmp = this[index]\n    this[index] =
this[reverseIndex]\n    this[reverseIndex] = tmp\n    reverseIndex--\n  }\n}\n\n/**\n * Reverses elements of the
array in the specified range in-place.\n */\n * @param fromIndex the start of the range (inclusive) to reverse.\n *
@param toIndex the end of the range (exclusive) to reverse.\n * @throws IndexOutOfBoundsException if
[fromIndex] is less than zero or [toIndex] is greater than the size of this array.\n * @throws
IllegalArgumentException if [fromIndex] is less than zero or [toIndex] is greater than the size of this array.\n * @throws

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IllegalArgumentException if [fromIndex] is greater than [toIndex].\n *\n@SinceKotlin("1.4")\npublic fun
FloatArray.reverse(fromIndex: Int, toIndex: Int): Unit {\n  AbstractList.checkRangeIndexes(fromIndex, toIndex,
size)\n  val midPoint = (fromIndex + toIndex) / 2\n  if (fromIndex == midPoint) return\n  var reverseIndex =
toIndex - 1\n  for (index in fromIndex until midPoint) {\n    val tmp = this[index]\n    this[index] =
this[reverseIndex]\n    this[reverseIndex] = tmp\n    reverseIndex--\n  }\n}\n\n/**\n * Reverses elements of the
array in the specified range in-place.\n *\n * @param fromIndex the start of the range (inclusive) to reverse.\n *\n *
@param toIndex the end of the range (exclusive) to reverse.\n *\n * @throws IndexOutOfBoundsException if
[fromIndex] is less than zero or [toIndex] is greater than the size of this array.\n *\n * @throws
IllegalArgumentException if [fromIndex] is greater than [toIndex].\n *\n@SinceKotlin("1.4")\npublic fun
DoubleArray.reverse(fromIndex: Int, toIndex: Int): Unit {\n  AbstractList.checkRangeIndexes(fromIndex, toIndex,
size)\n  val midPoint = (fromIndex + toIndex) / 2\n  if (fromIndex == midPoint) return\n  var reverseIndex =
toIndex - 1\n  for (index in fromIndex until midPoint) {\n    val tmp = this[index]\n    this[index] =
this[reverseIndex]\n    this[reverseIndex] = tmp\n    reverseIndex--\n  }\n}\n\n/**\n * Reverses elements of the
array in the specified range in-place.\n *\n * @param fromIndex the start of the range (inclusive) to reverse.\n *\n *
@param toIndex the end of the range (exclusive) to reverse.\n *\n * @throws IndexOutOfBoundsException if
[fromIndex] is less than zero or [toIndex] is greater than the size of this array.\n *\n * @throws
IllegalArgumentException if [fromIndex] is greater than [toIndex].\n *\n@SinceKotlin("1.4")\npublic fun
BooleanArray.reverse(fromIndex: Int, toIndex: Int): Unit {\n  AbstractList.checkRangeIndexes(fromIndex,
toIndex, size)\n  val midPoint = (fromIndex + toIndex) / 2\n  if (fromIndex == midPoint) return\n  var
reverseIndex = toIndex - 1\n  for (index in fromIndex until midPoint) {\n    val tmp = this[index]\n
this[index] = this[reverseIndex]\n    this[reverseIndex] = tmp\n    reverseIndex--\n  }\n}\n\n/**\n * Reverses
elements of the array in the specified range in-place.\n *\n * @param fromIndex the start of the range (inclusive) to
reverse.\n *\n * @param toIndex the end of the range (exclusive) to reverse.\n *\n * @throws
IndexOutOfBoundsException if [fromIndex] is less than zero or [toIndex] is greater than the size of this array.\n *\n *
@throws IllegalArgumentException if [fromIndex] is greater than [toIndex].\n *\n@SinceKotlin("1.4")\npublic
fun CharArray.reverse(fromIndex: Int, toIndex: Int): Unit {\n  AbstractList.checkRangeIndexes(fromIndex,
toIndex, size)\n  val midPoint = (fromIndex + toIndex) / 2\n  if (fromIndex == midPoint) return\n  var
reverseIndex = toIndex - 1\n  for (index in fromIndex until midPoint) {\n    val tmp = this[index]\n
this[index] = this[reverseIndex]\n    this[reverseIndex] = tmp\n    reverseIndex--\n  }\n}\n\n/**\n * Returns a
list with elements in reversed order.\n *\n@public fun <T> Array<out T>.reversed(): List<T> {\n  if (isEmpty())
return emptyList()\n  val list = toMutableList()\n  list.reverse()\n  return list\n}\n\n/**\n * Returns a list with
elements in reversed order.\n *\n@public fun ByteArray.reversed(): List<Byte> {\n  if (isEmpty()) return
emptyList()\n  val list = toMutableList()\n  list.reverse()\n  return list\n}\n\n/**\n * Returns a list with elements
in reversed order.\n *\n@public fun ShortArray.reversed(): List<Short> {\n  if (isEmpty()) return emptyList()\n
val list = toMutableList()\n  list.reverse()\n  return list\n}\n\n/**\n * Returns a list with elements in reversed
order.\n *\n@public fun IntArray.reversed(): List<Int> {\n  if (isEmpty()) return emptyList()\n  val list =
toMutableList()\n  list.reverse()\n  return list\n}\n\n/**\n * Returns a list with elements in reversed order.\n *\n@public fun
LongArray.reversed(): List<Long> {\n  if (isEmpty()) return emptyList()\n  val list = toMutableList()\n
list.reverse()\n  return list\n}\n\n/**\n * Returns a list with elements in reversed order.\n *\n@public fun
FloatArray.reversed(): List<Float> {\n  if (isEmpty()) return emptyList()\n  val list = toMutableList()\n
list.reverse()\n  return list\n}\n\n/**\n * Returns a list with elements in reversed order.\n *\n@public fun
DoubleArray.reversed(): List<Double> {\n  if (isEmpty()) return emptyList()\n  val list = toMutableList()\n
list.reverse()\n  return list\n}\n\n/**\n * Returns a list with elements in reversed order.\n *\n@public fun
BooleanArray.reversed(): List<Boolean> {\n  if (isEmpty()) return emptyList()\n  val list = toMutableList()\n
list.reverse()\n  return list\n}\n\n/**\n * Returns a list with elements in reversed order.\n *\n@public fun
CharArray.reversed(): List<Char> {\n  if (isEmpty()) return emptyList()\n  val list = toMutableList()\n
list.reverse()\n  return list\n}\n\n/**\n * Returns an array with elements of this array in reversed order.\n *\n@public
fun <T> Array<T>.reversedArray(): Array<T> {\n  if (isEmpty()) return this\n  val result = arrayOfNulls(this,

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https://en.wikipedia.org/wiki/Fisher%E2%80%93Yates_shuffle#The_modern_algorithm
*\n@SinceKotlin("1.4")\npublic fun ShortArray.shuffle(random: Random): Unit {\n for (i in lastIndex downTo 1) {\n val j = random.nextInt(i + 1)\n val copy = this[i]\n this[i] = this[j]\n this[j] = copy\n }\n}\n\n/**\n * Randomly shuffles elements in this array in-place using the specified [random] instance as the source of randomness.\n * \n * See:

https://en.wikipedia.org/wiki/Fisher%E2%80%93Yates_shuffle#The_modern_algorithm
*\n@SinceKotlin("1.4")\npublic fun IntArray.shuffle(random: Random): Unit {\n for (i in lastIndex downTo 1) {\n val j = random.nextInt(i + 1)\n val copy = this[i]\n this[i] = this[j]\n this[j] = copy\n }\n}\n\n/**\n * Randomly shuffles elements in this array in-place using the specified [random] instance as the source of randomness.\n * \n * See:

https://en.wikipedia.org/wiki/Fisher%E2%80%93Yates_shuffle#The_modern_algorithm
*\n@SinceKotlin("1.4")\npublic fun LongArray.shuffle(random: Random): Unit {\n for (i in lastIndex downTo 1) {\n val j = random.nextInt(i + 1)\n val copy = this[i]\n this[i] = this[j]\n this[j] = copy\n }\n}\n\n/**\n * Randomly shuffles elements in this array in-place using the specified [random] instance as the source of randomness.\n * \n * See:

https://en.wikipedia.org/wiki/Fisher%E2%80%93Yates_shuffle#The_modern_algorithm
*\n@SinceKotlin("1.4")\npublic fun FloatArray.shuffle(random: Random): Unit {\n for (i in lastIndex downTo 1) {\n val j = random.nextInt(i + 1)\n val copy = this[i]\n this[i] = this[j]\n this[j] = copy\n }\n}\n\n/**\n * Randomly shuffles elements in this array in-place using the specified [random] instance as the source of randomness.\n * \n * See:

https://en.wikipedia.org/wiki/Fisher%E2%80%93Yates_shuffle#The_modern_algorithm
*\n@SinceKotlin("1.4")\npublic fun DoubleArray.shuffle(random: Random): Unit {\n for (i in lastIndex downTo 1) {\n val j = random.nextInt(i + 1)\n val copy = this[i]\n this[i] = this[j]\n this[j] = copy\n }\n}\n\n/**\n * Randomly shuffles elements in this array in-place using the specified [random] instance as the source of randomness.\n * \n * See:

https://en.wikipedia.org/wiki/Fisher%E2%80%93Yates_shuffle#The_modern_algorithm
*\n@SinceKotlin("1.4")\npublic fun BooleanArray.shuffle(random: Random): Unit {\n for (i in lastIndex downTo 1) {\n val j = random.nextInt(i + 1)\n val copy = this[i]\n this[i] = this[j]\n this[j] = copy\n }\n}\n\n/**\n * Randomly shuffles elements in this array in-place using the specified [random] instance as the source of randomness.\n * \n * See:

https://en.wikipedia.org/wiki/Fisher%E2%80%93Yates_shuffle#The_modern_algorithm
*\n@SinceKotlin("1.4")\npublic fun CharArray.shuffle(random: Random): Unit {\n for (i in lastIndex downTo 1) {\n val j = random.nextInt(i + 1)\n val copy = this[i]\n this[i] = this[j]\n this[j] = copy\n }\n}\n\n/**\n * Sorts elements in the array in-place according to natural sort order of the value returned by specified [selector] function.\n * \n * The sort is `_stable_`. It means that equal elements preserve their order relative to each other after sorting.\n * \npublic inline fun <T, R : Comparable<R>> Array<out T>.sortBy(crossinline selector: (T) -> R?): Unit {\n if (size > 1) sortWith(compareBy(selector))\n}\n\n/**\n * Sorts elements in the array in-place descending according to natural sort order of the value returned by specified [selector] function.\n * \n * The sort is `_stable_`. It means that equal elements preserve their order relative to each other after sorting.\n * \npublic inline fun <T, R : Comparable<R>> Array<out T>.sortByDescending(crossinline selector: (T) -> R?): Unit {\n if (size > 1) sortWith(compareByDescending(selector))\n}\n\n/**\n * Sorts elements in the array in-place descending according to their natural sort order.\n * \n * The sort is `_stable_`. It means that equal elements preserve their order relative to each other after sorting.\n * \npublic fun <T : Comparable<T>> Array<out T>.sortDescending(): Unit {\n sortWith(reverseOrder())\n}\n\n/**\n * Sorts elements in the array in-place descending according to their natural sort order.\n * \npublic fun ByteArray.sortDescending(): Unit {\n if (size > 1) {\n sort()\n reverse()\n }\n}\n\n/**\n * Sorts elements in the array in-place descending according to their natural sort order.\n * \npublic fun ShortArray.sortDescending(): Unit {\n if (size > 1) {\n sort()\n reverse()\n }\n}\n\n/**\n * Sorts elements in the array in-place descending according to their natural sort order.\n * \npublic fun

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IntArray.sortDescending(): Unit {\n  if (size > 1) {\n    sort()\n    reverse()\n  }\n}\n\n/**\n * Sorts elements
in the array in-place descending according to their natural sort order.\n */\npublic fun LongArray.sortDescending():
Unit {\n  if (size > 1) {\n    sort()\n    reverse()\n  }\n}\n\n/**\n * Sorts elements in the array in-place
descending according to their natural sort order.\n */\npublic fun FloatArray.sortDescending(): Unit {\n  if (size >
1) {\n    sort()\n    reverse()\n  }\n}\n\n/**\n * Sorts elements in the array in-place descending according to
their natural sort order.\n */\npublic fun DoubleArray.sortDescending(): Unit {\n  if (size > 1) {\n    sort()\n
reverse()\n  }\n}\n\n/**\n * Sorts elements in the array in-place descending according to their natural sort order.\n
*/\npublic fun CharArray.sortDescending(): Unit {\n  if (size > 1) {\n    sort()\n    reverse()\n  }\n}\n\n/**\n *
Returns a list of all elements sorted according to their natural sort order.\n */\n * The sort is _stable_. It means that
equal elements preserve their order relative to each other after sorting.\n */\npublic fun <T : Comparable<T>>
Array<out T>.sorted(): List<T> {\n  return sortedArray().asList()\n}\n\n/**\n * Returns a list of all elements sorted
according to their natural sort order.\n */\npublic fun ByteArray.sorted(): List<Byte> {\n  return
toTypedArray().apply { sort() }.asList()\n}\n\n/**\n * Returns a list of all elements sorted according to their natural
sort order.\n */\npublic fun ShortArray.sorted(): List<Short> {\n  return toTypedArray().apply { sort()
}.asList()\n}\n\n/**\n * Returns a list of all elements sorted according to their natural sort order.\n */\npublic fun
IntArray.sorted(): List<Int> {\n  return toTypedArray().apply { sort() }.asList()\n}\n\n/**\n * Returns a list of all
elements sorted according to their natural sort order.\n */\npublic fun LongArray.sorted(): List<Long> {\n  return
toTypedArray().apply { sort() }.asList()\n}\n\n/**\n * Returns a list of all elements sorted according to their natural
sort order.\n */\npublic fun FloatArray.sorted(): List<Float> {\n  return toTypedArray().apply { sort()
}.asList()\n}\n\n/**\n * Returns a list of all elements sorted according to their natural sort order.\n */\npublic fun
DoubleArray.sorted(): List<Double> {\n  return toTypedArray().apply { sort() }.asList()\n}\n\n/**\n * Returns a
list of all elements sorted according to their natural sort order.\n */\npublic fun CharArray.sorted(): List<Char> {\n
return toTypedArray().apply { sort() }.asList()\n}\n\n/**\n * Returns an array with all elements of this array sorted
according to their natural sort order.\n */\n * The sort is _stable_. It means that equal elements preserve their order
relative to each other after sorting.\n */\npublic fun <T : Comparable<T>> Array<T>.sortedArray(): Array<T> {\n
if (isEmpty()) return this\n  return this.copyOf().apply { sort() }\n}\n\n/**\n * Returns an array with all elements of
this array sorted according to their natural sort order.\n */\npublic fun ByteArray.sortedArray(): ByteArray {\n  if
(isEmpty()) return this\n  return this.copyOf().apply { sort() }\n}\n\n/**\n * Returns an array with all elements of
this array sorted according to their natural sort order.\n */\npublic fun ShortArray.sortedArray(): ShortArray {\n  if
(isEmpty()) return this\n  return this.copyOf().apply { sort() }\n}\n\n/**\n * Returns an array with all elements of
this array sorted according to their natural sort order.\n */\npublic fun IntArray.sortedArray(): IntArray {\n  if
(isEmpty()) return this\n  return this.copyOf().apply { sort() }\n}\n\n/**\n * Returns an array with all elements of
this array sorted according to their natural sort order.\n */\npublic fun LongArray.sortedArray(): LongArray {\n  if
(isEmpty()) return this\n  return this.copyOf().apply { sort() }\n}\n\n/**\n * Returns an array with all elements of
this array sorted according to their natural sort order.\n */\npublic fun FloatArray.sortedArray(): FloatArray {\n  if
(isEmpty()) return this\n  return this.copyOf().apply { sort() }\n}\n\n/**\n * Returns an array with all elements of
this array sorted according to their natural sort order.\n */\npublic fun DoubleArray.sortedArray(): DoubleArray {\n
if (isEmpty()) return this\n  return this.copyOf().apply { sort() }\n}\n\n/**\n * Returns an array with all elements
of this array sorted according to their natural sort order.\n */\npublic fun CharArray.sortedArray(): CharArray {\n
if (isEmpty()) return this\n  return this.copyOf().apply { sort() }\n}\n\n/**\n * Returns an array with all elements
of this array sorted descending according to their natural sort order.\n */\n * The sort is _stable_. It means that equal
elements preserve their order relative to each other after sorting.\n */\npublic fun <T : Comparable<T>>
Array<T>.sortedArrayDescending(): Array<T> {\n  if (isEmpty()) return this\n  return this.copyOf().apply {
sortWith(reverseOrder()) }\n}\n\n/**\n * Returns an array with all elements of this array sorted descending
according to their natural sort order.\n */\npublic fun ByteArray.sortedArrayDescending(): ByteArray {\n  if
(isEmpty()) return this\n  return this.copyOf().apply { sortDescending() }\n}\n\n/**\n * Returns an array with all
elements of this array sorted descending according to their natural sort order.\n */\npublic fun
ShortArray.sortedArrayDescending(): ShortArray {\n  if (isEmpty()) return this\n  return this.copyOf().apply {

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sortDescending() } } } \n\n/** \n * Returns an array with all elements of this array sorted descending according to
their natural sort order. \n */ \n public fun IntArray.sortedArrayDescending(): IntArray { \n if (isEmpty()) return
this \n return this.copyOf().apply { sortDescending() } } } } \n\n/** \n * Returns an array with all elements of this
array sorted descending according to their natural sort order. \n */ \n public fun LongArray.sortedArrayDescending():
LongArray { \n if (isEmpty()) return this \n return this.copyOf().apply { sortDescending() } } } } \n\n/** \n * Returns
an array with all elements of this array sorted descending according to their natural sort order. \n */ \n public fun
FloatArray.sortedArrayDescending(): FloatArray { \n if (isEmpty()) return this \n return this.copyOf().apply {
sortDescending() } } } } \n\n/** \n * Returns an array with all elements of this array sorted descending according to
their natural sort order. \n */ \n public fun DoubleArray.sortedArrayDescending(): DoubleArray { \n if (isEmpty())
return this \n return this.copyOf().apply { sortDescending() } } } } \n\n/** \n * Returns an array with all elements of
this array sorted descending according to their natural sort order. \n */ \n public fun
CharArray.sortedArrayDescending(): CharArray { \n if (isEmpty()) return this \n return this.copyOf().apply {
sortDescending() } } } } \n\n/** \n * Returns an array with all elements of this array sorted according the specified
[comparator]. \n * \n * The sort is _stable_. It means that equal elements preserve their order relative to each other
after sorting. \n */ \n public fun <T> Array<out T>.sortedArrayWith(comparator: Comparator<in T>): Array<out T>
{ \n if (isEmpty()) return this \n return this.copyOf().apply { sortWith(comparator) } } } } \n\n/** \n * Returns a list
of all elements sorted according to natural sort order of the value returned by specified [selector] function. \n * \n *
The sort is _stable_. It means that equal elements preserve their order relative to each other after sorting. \n * \n *
@sample samples.collections.Collections.Sorting.sortedBy \n */ \n public inline fun <T, R : Comparable<R>>
Array<out T>.sortedBy(crossinline selector: (T) -> R?): List<T> { \n return
sortedWith(compareBy(selector)) } } } \n\n/** \n * Returns a list of all elements sorted according to natural sort order
of the value returned by specified [selector] function. \n * \n * @sample
samples.collections.Collections.Sorting.sortedBy \n */ \n public inline fun <R : Comparable<R>>
ByteArray.sortedBy(crossinline selector: (Byte) -> R?): List<Byte> { \n return
sortedWith(compareBy(selector)) } } } \n\n/** \n * Returns a list of all elements sorted according to natural sort order
of the value returned by specified [selector] function. \n * \n * @sample
samples.collections.Collections.Sorting.sortedBy \n */ \n public inline fun <R : Comparable<R>>
ShortArray.sortedBy(crossinline selector: (Short) -> R?): List<Short> { \n return
sortedWith(compareBy(selector)) } } } \n\n/** \n * Returns a list of all elements sorted according to natural sort order
of the value returned by specified [selector] function. \n * \n * @sample
samples.collections.Collections.Sorting.sortedBy \n */ \n public inline fun <R : Comparable<R>>
IntArray.sortedBy(crossinline selector: (Int) -> R?): List<Int> { \n return
sortedWith(compareBy(selector)) } } } \n\n/** \n * Returns a list of all elements sorted according to natural sort order
of the value returned by specified [selector] function. \n * \n * @sample
samples.collections.Collections.Sorting.sortedBy \n */ \n public inline fun <R : Comparable<R>>
LongArray.sortedBy(crossinline selector: (Long) -> R?): List<Long> { \n return
sortedWith(compareBy(selector)) } } } \n\n/** \n * Returns a list of all elements sorted according to natural sort order
of the value returned by specified [selector] function. \n * \n * @sample
samples.collections.Collections.Sorting.sortedBy \n */ \n public inline fun <R : Comparable<R>>
FloatArray.sortedBy(crossinline selector: (Float) -> R?): List<Float> { \n return
sortedWith(compareBy(selector)) } } } \n\n/** \n * Returns a list of all elements sorted according to natural sort order
of the value returned by specified [selector] function. \n * \n * @sample
samples.collections.Collections.Sorting.sortedBy \n */ \n public inline fun <R : Comparable<R>>
DoubleArray.sortedBy(crossinline selector: (Double) -> R?): List<Double> { \n return
sortedWith(compareBy(selector)) } } } \n\n/** \n * Returns a list of all elements sorted according to natural sort order
of the value returned by specified [selector] function. \n * \n * @sample
samples.collections.Collections.Sorting.sortedBy \n */ \n public inline fun <R : Comparable<R>>
BooleanArray.sortedBy(crossinline selector: (Boolean) -> R?): List<Boolean> { \n return

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sortedWith(compareBy(selector))\n}\n\n/**\n * Returns a list of all elements sorted according to natural sort order of the value returned by specified [selector] function.\n * \n * @sample samples.collections.Collections.Sorting.sortedBy\n */\npublic inline fun <R : Comparable<R>> CharArray.sortedBy(crossinline selector: (Char) -> R?): List<Char> {\n return sortedWith(compareBy(selector))\n}\n\n/**\n * Returns a list of all elements sorted descending according to natural sort order of the value returned by specified [selector] function.\n * \n * The sort is `_stable_`. It means that equal elements preserve their order relative to each other after sorting.\n */\npublic inline fun <T, R : Comparable<R>> Array<out T>.sortedByDescending(crossinline selector: (T) -> R?): List<T> {\n return sortedWith(compareByDescending(selector))\n}\n\n/**\n * Returns a list of all elements sorted descending according to natural sort order of the value returned by specified [selector] function.\n */\npublic inline fun <R : Comparable<R>> ByteArray.sortedByDescending(crossinline selector: (Byte) -> R?): List<Byte> {\n return sortedWith(compareByDescending(selector))\n}\n\n/**\n * Returns a list of all elements sorted descending according to natural sort order of the value returned by specified [selector] function.\n */\npublic inline fun <R : Comparable<R>> ShortArray.sortedByDescending(crossinline selector: (Short) -> R?): List<Short> {\n return sortedWith(compareByDescending(selector))\n}\n\n/**\n * Returns a list of all elements sorted descending according to natural sort order of the value returned by specified [selector] function.\n */\npublic inline fun <R : Comparable<R>> IntArray.sortedByDescending(crossinline selector: (Int) -> R?): List<Int> {\n return sortedWith(compareByDescending(selector))\n}\n\n/**\n * Returns a list of all elements sorted descending according to natural sort order of the value returned by specified [selector] function.\n */\npublic inline fun <R : Comparable<R>> LongArray.sortedByDescending(crossinline selector: (Long) -> R?): List<Long> {\n return sortedWith(compareByDescending(selector))\n}\n\n/**\n * Returns a list of all elements sorted descending according to natural sort order of the value returned by specified [selector] function.\n */\npublic inline fun <R : Comparable<R>> FloatArray.sortedByDescending(crossinline selector: (Float) -> R?): List<Float> {\n return sortedWith(compareByDescending(selector))\n}\n\n/**\n * Returns a list of all elements sorted descending according to natural sort order of the value returned by specified [selector] function.\n */\npublic inline fun <R : Comparable<R>> DoubleArray.sortedByDescending(crossinline selector: (Double) -> R?): List<Double> {\n return sortedWith(compareByDescending(selector))\n}\n\n/**\n * Returns a list of all elements sorted descending according to natural sort order of the value returned by specified [selector] function.\n */\npublic inline fun <R : Comparable<R>> BooleanArray.sortedByDescending(crossinline selector: (Boolean) -> R?): List<Boolean> {\n return sortedWith(compareByDescending(selector))\n}\n\n/**\n * Returns a list of all elements sorted descending according to their natural sort order.\n * \n * The sort is `_stable_`. It means that equal elements preserve their order relative to each other after sorting.\n */\npublic fun <T : Comparable<T>> Array<out T>.sortedDescending(): List<T> {\n return sortedWith(reverseOrder())\n}\n\n/**\n * Returns a list of all elements sorted descending according to their natural sort order.\n */\npublic fun ByteArray.sortedDescending(): List<Byte> {\n return copyOf().apply { sort() }.reversed()\n}\n\n/**\n * Returns a list of all elements sorted descending according to their natural sort order.\n */\npublic fun ShortArray.sortedDescending(): List<Short> {\n return copyOf().apply { sort() }.reversed()\n}\n\n/**\n * Returns a list of all elements sorted descending according to their natural sort order.\n */\npublic fun IntArray.sortedDescending(): List<Int> {\n return copyOf().apply { sort() }.reversed()\n}\n\n/**\n * Returns a list of all elements sorted descending according to their natural sort order.\n */\npublic fun LongArray.sortedDescending(): List<Long> {\n return copyOf().apply { sort() }.reversed()\n}\n\n/**\n * Returns a list of all elements sorted descending according to their natural sort order.\n */\npublic fun FloatArray.sortedDescending(): List<Float> {\n return copyOf().apply { sort() }.reversed()\n}\n\n/**\n * Returns a list of all elements sorted descending according to their natural sort order.\n */\npublic fun DoubleArray.sortedDescending(): List<Double> {\n return copyOf().apply { sort() }.reversed()\n}\n\n/**\n * Returns a list of all elements sorted descending according to their natural sort order.\n */\npublic fun

CharArray.sortedDescending(): List<Char> {\n return copyOf().apply { sort() }.reversed()\n}\n\n/**\n * Returns a list of all elements sorted according to the specified [comparator].\n * \n * The sort is `_stable_`. It means that equal elements preserve their order relative to each other after sorting.\n */\npublic fun <T> Array<out T>.sortedWith(comparator: Comparator<in T>): List<T> {\n return sortedArrayWith(comparator).asList()\n}\n\n/**\n * Returns a list of all elements sorted according to the specified [comparator].\n */\npublic fun ByteArray.sortedWith(comparator: Comparator<in Byte>): List<Byte> {\n return toTypedArray().apply { sortWith(comparator) }.asList()\n}\n\n/**\n * Returns a list of all elements sorted according to the specified [comparator].\n */\npublic fun ShortArray.sortedWith(comparator: Comparator<in Short>): List<Short> {\n return toTypedArray().apply { sortWith(comparator) }.asList()\n}\n\n/**\n * Returns a list of all elements sorted according to the specified [comparator].\n */\npublic fun IntArray.sortedWith(comparator: Comparator<in Int>): List<Int> {\n return toTypedArray().apply { sortWith(comparator) }.asList()\n}\n\n/**\n * Returns a list of all elements sorted according to the specified [comparator].\n */\npublic fun LongArray.sortedWith(comparator: Comparator<in Long>): List<Long> {\n return toTypedArray().apply { sortWith(comparator) }.asList()\n}\n\n/**\n * Returns a list of all elements sorted according to the specified [comparator].\n */\npublic fun FloatArray.sortedWith(comparator: Comparator<in Float>): List<Float> {\n return toTypedArray().apply { sortWith(comparator) }.asList()\n}\n\n/**\n * Returns a list of all elements sorted according to the specified [comparator].\n */\npublic fun DoubleArray.sortedWith(comparator: Comparator<in Double>): List<Double> {\n return toTypedArray().apply { sortWith(comparator) }.asList()\n}\n\n/**\n * Returns a list of all elements sorted according to the specified [comparator].\n */\npublic fun BooleanArray.sortedWith(comparator: Comparator<in Boolean>): List<Boolean> {\n return toTypedArray().apply { sortWith(comparator) }.asList()\n}\n\n/**\n * Returns a list of all elements sorted according to the specified [comparator].\n */\npublic fun CharArray.sortedWith(comparator: Comparator<in Char>): List<Char> {\n return toTypedArray().apply { sortWith(comparator) }.asList()\n}\n\n/**\n * Returns a [List] that wraps the original array.\n */\npublic expect fun <T> Array<out T>.asList(): List<T>\n\n/**\n * Returns a [List] that wraps the original array.\n */\npublic expect fun ByteArray.asList(): List<Byte>\n\n/**\n * Returns a [List] that wraps the original array.\n */\npublic expect fun ShortArray.asList(): List<Short>\n\n/**\n * Returns a [List] that wraps the original array.\n */\npublic expect fun IntArray.asList(): List<Int>\n\n/**\n * Returns a [List] that wraps the original array.\n */\npublic expect fun LongArray.asList(): List<Long>\n\n/**\n * Returns a [List] that wraps the original array.\n */\npublic expect fun FloatArray.asList(): List<Float>\n\n/**\n * Returns a [List] that wraps the original array.\n */\npublic expect fun DoubleArray.asList(): List<Double>\n\n/**\n * Returns a [List] that wraps the original array.\n */\npublic expect fun BooleanArray.asList(): List<Boolean>\n\n/**\n * Returns a [List] that wraps the original array.\n */\npublic expect fun CharArray.asList(): List<Char>\n\n/**\n * Returns `true` if the two specified arrays are *deeply* equal to one another,\n * i.e. contain the same number of the same elements in the same order.\n * \n * If two corresponding elements are nested arrays, they are also compared deeply.\n * If any of arrays contains itself on any nesting level the behavior is undefined.\n * \n * The elements of other types are compared for equality with the [equals][Any.equals] function.\n * For floating point numbers it means that `NaN` is equal to itself and `-0.0` is not equal to `0.0`.\n */\n@SinceKotlin("1.1")\n@kotlin.internal.LowPriorityInOverloadResolution\npublic expect infix fun <T> Array<out T>.contentDeepEquals(other: Array<out T>): Boolean\n\n/**\n * Returns `true` if the two specified arrays are *deeply* equal to one another,\n * i.e. contain the same number of the same elements in the same order.\n * \n * The specified arrays are also considered deeply equal if both are `null`.\n * \n * If two corresponding elements are nested arrays, they are also compared deeply.\n * If any of arrays contains itself on any nesting level the behavior is undefined.\n * \n * The elements of other types are compared for equality with the [equals][Any.equals] function.\n * For floating point numbers it means that `NaN` is equal to itself and `-0.0` is not equal to `0.0`.\n */\n@SinceKotlin("1.4")\npublic expect infix fun <T> Array<out T>?.contentDeepEquals(other: Array<out T>?): Boolean\n\n/**\n * Returns a hash code based on the contents of this array as if it is [List].\n * \n * Nested arrays are treated as lists too.\n * \n * If any of arrays contains itself on any nesting level the behavior is undefined.\n */\n@SinceKotlin("1.1")\n@kotlin.internal.LowPriorityInOverloadResolution\npublic expect fun <T> Array<out T>.contentDeepHashCode(): Int\n\n/**\n * Returns a hash code based on the contents of this array

as if it is [List].\n * Nested arrays are treated as lists too.\n * \n * If any of arrays contains itself on any nesting level the behavior is undefined.\n */\n@SinceKotlin("1.4")\npublic expect fun <T> Array<out T>?.contentDeepHashCode(): Int\n\n/**\n * Returns a string representation of the contents of this array as if it is a [List].\n * Nested arrays are treated as lists too.\n * \n * If any of arrays contains itself on any nesting level that reference\n * is rendered as `\"[...]\"` to prevent recursion.\n * \n * @sample samples.collections.Arrays.ContentOperations.contentDeepToString\n */\n@SinceKotlin("1.1")\n@kotlin.internal.LowPriorityInOverloadResolution\npublic expect fun <T> Array<out T>.contentDeepToString(): String\n\n/**\n * Returns a string representation of the contents of this array as if it is a [List].\n * Nested arrays are treated as lists too.\n * \n * If any of arrays contains itself on any nesting level that reference\n * is rendered as `\"[...]\"` to prevent recursion.\n * \n * @sample samples.collections.Arrays.ContentOperations.contentDeepToString\n */\n@SinceKotlin("1.4")\npublic expect fun <T> Array<out T>?.contentDeepToString(): String\n\n/**\n * Returns `true` if the two specified arrays are *structurally* equal to one another,\n * i.e. contain the same number of the same elements in the same order.\n * \n * The elements are compared for equality with the [equals][Any.equals] function.\n * For floating point numbers it means that `NaN` is equal to itself and `-0.0` is not equal to `0.0`.\n */\n@Deprecated("Use Kotlin compiler 1.4 to avoid deprecation warning.")\n@SinceKotlin("1.1")\n@DeprecatedSinceKotlin(hiddenSince = "1.4")\npublic expect infix fun <T> Array<out T>.contentEquals(other: Array<out T>): Boolean\n\n/**\n * Returns `true` if the two specified arrays are *structurally* equal to one another,\n * i.e. contain the same number of the same elements in the same order.\n * \n * The elements are compared for equality with the [equals][Any.equals] function.\n * For floating point numbers it means that `NaN` is equal to itself and `-0.0` is not equal to `0.0`.\n */\n@Deprecated("Use Kotlin compiler 1.4 to avoid deprecation warning.")\n@SinceKotlin("1.1")\n@DeprecatedSinceKotlin(hiddenSince = "1.4")\npublic expect infix fun ByteArray.contentEquals(other: ByteArray): Boolean\n\n/**\n * Returns `true` if the two specified arrays are *structurally* equal to one another,\n * i.e. contain the same number of the same elements in the same order.\n * \n * The elements are compared for equality with the [equals][Any.equals] function.\n * For floating point numbers it means that `NaN` is equal to itself and `-0.0` is not equal to `0.0`.\n */\n@Deprecated("Use Kotlin compiler 1.4 to avoid deprecation warning.")\n@SinceKotlin("1.1")\n@DeprecatedSinceKotlin(hiddenSince = "1.4")\npublic expect infix fun ShortArray.contentEquals(other: ShortArray): Boolean\n\n/**\n * Returns `true` if the two specified arrays are *structurally* equal to one another,\n * i.e. contain the same number of the same elements in the same order.\n * \n * The elements are compared for equality with the [equals][Any.equals] function.\n * For floating point numbers it means that `NaN` is equal to itself and `-0.0` is not equal to `0.0`.\n */\n@Deprecated("Use Kotlin compiler 1.4 to avoid deprecation warning.")\n@SinceKotlin("1.1")\n@DeprecatedSinceKotlin(hiddenSince = "1.4")\npublic expect infix fun IntArray.contentEquals(other: IntArray): Boolean\n\n/**\n * Returns `true` if the two specified arrays are *structurally* equal to one another,\n * i.e. contain the same number of the same elements in the same order.\n * \n * The elements are compared for equality with the [equals][Any.equals] function.\n * For floating point numbers it means that `NaN` is equal to itself and `-0.0` is not equal to `0.0`.\n */\n@Deprecated("Use Kotlin compiler 1.4 to avoid deprecation warning.")\n@SinceKotlin("1.1")\n@DeprecatedSinceKotlin(hiddenSince = "1.4")\npublic expect infix fun LongArray.contentEquals(other: LongArray): Boolean\n\n/**\n * Returns `true` if the two specified arrays are *structurally* equal to one another,\n * i.e. contain the same number of the same elements in the same order.\n * \n * The elements are compared for equality with the [equals][Any.equals] function.\n * For floating point numbers it means that `NaN` is equal to itself and `-0.0` is not equal to `0.0`.\n */\n@Deprecated("Use Kotlin compiler 1.4 to avoid deprecation warning.")\n@SinceKotlin("1.1")\n@DeprecatedSinceKotlin(hiddenSince = "1.4")\npublic expect infix fun FloatArray.contentEquals(other: FloatArray): Boolean

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\`1.4\`)npublic expect infix fun DoubleArray.contentEquals(other: DoubleArray): Boolean\n\n**\n * Returns
`true` if the two specified arrays are *structurally* equal to one another,\n * i.e. contain the same number of the
same elements in the same order.\n * \n * The elements are compared for equality with the [equals][Any.equals]
function.\n * For floating point numbers it means that `NaN` is equal to itself and `-0.0` is not equal to `0.0`.\n
*\n@Deprecated("Use Kotlin compiler 1.4 to avoid deprecation
warning.\`")\n@SinceKotlin("1.1")\n@DeprecatedSinceKotlin(hiddenSince = "`1.4`")npublic expect infix fun
BooleanArray.contentEquals(other: BooleanArray): Boolean\n\n**\n * Returns `true` if the two specified arrays are
*structurally* equal to one another,\n * i.e. contain the same number of the same elements in the same order.\n * \n
* The elements are compared for equality with the [equals][Any.equals] function.\n * For floating point numbers it
means that `NaN` is equal to itself and `-0.0` is not equal to `0.0`.\n *\n@Deprecated("Use Kotlin compiler 1.4 to
avoid deprecation warning.\`")\n@SinceKotlin("1.1")\n@DeprecatedSinceKotlin(hiddenSince = "`1.4`")npublic
expect infix fun CharArray.contentEquals(other: CharArray): Boolean\n\n**\n * Returns `true` if the two specified
arrays are *structurally* equal to one another,\n * i.e. contain the same number of the same elements in the same
order.\n * \n * The elements are compared for equality with the [equals][Any.equals] function.\n * For floating point
numbers it means that `NaN` is equal to itself and `-0.0` is not equal to `0.0`.\n *\n@SinceKotlin("1.4")npublic
expect infix fun <T> Array<out T>?.contentEquals(other: Array<out T>?): Boolean\n\n**\n * Returns `true` if the
two specified arrays are *structurally* equal to one another,\n * i.e. contain the same number of the same elements
in the same order.\n * \n * The elements are compared for equality with the [equals][Any.equals] function.\n * For
floating point numbers it means that `NaN` is equal to itself and `-0.0` is not equal to `0.0`.\n
*\n@SinceKotlin("1.4")npublic expect infix fun ByteArray?.contentEquals(other: ByteArray?): Boolean\n\n**\n
* Returns `true` if the two specified arrays are *structurally* equal to one another,\n * i.e. contain the same number
of the same elements in the same order.\n * \n * The elements are compared for equality with the
[equals][Any.equals] function.\n * For floating point numbers it means that `NaN` is equal to itself and `-0.0` is not
equal to `0.0`.\n *\n@SinceKotlin("1.4")npublic expect infix fun ShortArray?.contentEquals(other: ShortArray?):
Boolean\n\n**\n * Returns `true` if the two specified arrays are *structurally* equal to one another,\n * i.e. contain
the same number of the same elements in the same order.\n * \n * The elements are compared for equality with the
[equals][Any.equals] function.\n * For floating point numbers it means that `NaN` is equal to itself and `-0.0` is not
equal to `0.0`.\n *\n@SinceKotlin("1.4")npublic expect infix fun IntArray?.contentEquals(other: IntArray?):
Boolean\n\n**\n * Returns `true` if the two specified arrays are *structurally* equal to one another,\n * i.e. contain
the same number of the same elements in the same order.\n * \n * The elements are compared for equality with the
[equals][Any.equals] function.\n * For floating point numbers it means that `NaN` is equal to itself and `-0.0` is not
equal to `0.0`.\n *\n@SinceKotlin("1.4")npublic expect infix fun LongArray?.contentEquals(other: LongArray?):
Boolean\n\n**\n * Returns `true` if the two specified arrays are *structurally* equal to one another,\n * i.e. contain
the same number of the same elements in the same order.\n * \n * The elements are compared for equality with the
[equals][Any.equals] function.\n * For floating point numbers it means that `NaN` is equal to itself and `-0.0` is not
equal to `0.0`.\n *\n@SinceKotlin("1.4")npublic expect infix fun FloatArray?.contentEquals(other: FloatArray?):
Boolean\n\n**\n * Returns `true` if the two specified arrays are *structurally* equal to one another,\n * i.e. contain
the same number of the same elements in the same order.\n * \n * The elements are compared for equality with the
[equals][Any.equals] function.\n * For floating point numbers it means that `NaN` is equal to itself and `-0.0` is not
equal to `0.0`.\n *\n@SinceKotlin("1.4")npublic expect infix fun DoubleArray?.contentEquals(other:
DoubleArray?): Boolean\n\n**\n * Returns `true` if the two specified arrays are *structurally* equal to one
another,\n * i.e. contain the same number of the same elements in the same order.\n * \n * The elements are
compared for equality with the [equals][Any.equals] function.\n * For floating point numbers it means that `NaN` is
equal to itself and `-0.0` is not equal to `0.0`.\n *\n@SinceKotlin("1.4")npublic expect infix fun
BooleanArray?.contentEquals(other: BooleanArray?): Boolean\n\n**\n * Returns `true` if the two specified arrays
are *structurally* equal to one another,\n * i.e. contain the same number of the same elements in the same order.\n
*\n * The elements are compared for equality with the [equals][Any.equals] function.\n * For floating point numbers
it means that `NaN` is equal to itself and `-0.0` is not equal to `0.0`.\n *\n@SinceKotlin("1.4")npublic expect

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infix fun CharArray?.contentEquals(other: CharArray?): Boolean\n\n/**\n * Returns a hash code based on the
contents of this array as if it is [List].\n *^\n@Deprecated("\nUse Kotlin compiler 1.4 to avoid deprecation
warning.\n")\n@SinceKotlin("1.1")\n@DeprecatedSinceKotlin(hiddenSince = "1.4")\npublic expect fun <T>
Array<out T>.contentHashCode(): Int\n\n/**\n * Returns a hash code based on the contents of this array as if it is
[List].\n *^\n@Deprecated("\nUse Kotlin compiler 1.4 to avoid deprecation
warning.\n")\n@SinceKotlin("1.1")\n@DeprecatedSinceKotlin(hiddenSince = "1.4")\npublic expect fun
ByteArray.contentHashCode(): Int\n\n/**\n * Returns a hash code based on the contents of this array as if it is
[List].\n *^\n@Deprecated("\nUse Kotlin compiler 1.4 to avoid deprecation
warning.\n")\n@SinceKotlin("1.1")\n@DeprecatedSinceKotlin(hiddenSince = "1.4")\npublic expect fun
ShortArray.contentHashCode(): Int\n\n/**\n * Returns a hash code based on the contents of this array as if it is
[List].\n *^\n@Deprecated("\nUse Kotlin compiler 1.4 to avoid deprecation
warning.\n")\n@SinceKotlin("1.1")\n@DeprecatedSinceKotlin(hiddenSince = "1.4")\npublic expect fun
IntArray.contentHashCode(): Int\n\n/**\n * Returns a hash code based on the contents of this array as if it is
[List].\n *^\n@Deprecated("\nUse Kotlin compiler 1.4 to avoid deprecation
warning.\n")\n@SinceKotlin("1.1")\n@DeprecatedSinceKotlin(hiddenSince = "1.4")\npublic expect fun
LongArray.contentHashCode(): Int\n\n/**\n * Returns a hash code based on the contents of this array as if it is
[List].\n *^\n@Deprecated("\nUse Kotlin compiler 1.4 to avoid deprecation
warning.\n")\n@SinceKotlin("1.1")\n@DeprecatedSinceKotlin(hiddenSince = "1.4")\npublic expect fun
FloatArray.contentHashCode(): Int\n\n/**\n * Returns a hash code based on the contents of this array as if it is
[List].\n *^\n@Deprecated("\nUse Kotlin compiler 1.4 to avoid deprecation
warning.\n")\n@SinceKotlin("1.1")\n@DeprecatedSinceKotlin(hiddenSince = "1.4")\npublic expect fun
DoubleArray.contentHashCode(): Int\n\n/**\n * Returns a hash code based on the contents of this array as if it is
[List].\n *^\n@Deprecated("\nUse Kotlin compiler 1.4 to avoid deprecation
warning.\n")\n@SinceKotlin("1.1")\n@DeprecatedSinceKotlin(hiddenSince = "1.4")\npublic expect fun
BooleanArray.contentHashCode(): Int\n\n/**\n * Returns a hash code based on the contents of this array as if it is
[List].\n *^\n@Deprecated("\nUse Kotlin compiler 1.4 to avoid deprecation
warning.\n")\n@SinceKotlin("1.1")\n@DeprecatedSinceKotlin(hiddenSince = "1.4")\npublic expect fun
CharArray.contentHashCode(): Int\n\n/**\n * Returns a hash code based on the contents of this array as if it is
[List].\n *^\n@SinceKotlin("1.4")\npublic expect fun <T> Array<out T>?.contentHashCode(): Int\n\n/**\n *
Returns a hash code based on the contents of this array as if it is [List].\n *^\n@SinceKotlin("1.4")\npublic expect
fun ByteArray?.contentHashCode(): Int\n\n/**\n * Returns a hash code based on the contents of this array as if it is
[List].\n *^\n@SinceKotlin("1.4")\npublic expect fun ShortArray?.contentHashCode(): Int\n\n/**\n * Returns a
hash code based on the contents of this array as if it is [List].\n *^\n@SinceKotlin("1.4")\npublic expect fun
IntArray?.contentHashCode(): Int\n\n/**\n * Returns a hash code based on the contents of this array as if it is
[List].\n *^\n@SinceKotlin("1.4")\npublic expect fun LongArray?.contentHashCode(): Int\n\n/**\n * Returns a
hash code based on the contents of this array as if it is [List].\n *^\n@SinceKotlin("1.4")\npublic expect fun
FloatArray?.contentHashCode(): Int\n\n/**\n * Returns a hash code based on the contents of this array as if it is
[List].\n *^\n@SinceKotlin("1.4")\npublic expect fun DoubleArray?.contentHashCode(): Int\n\n/**\n * Returns a
hash code based on the contents of this array as if it is [List].\n *^\n@SinceKotlin("1.4")\npublic expect fun
BooleanArray?.contentHashCode(): Int\n\n/**\n * Returns a hash code based on the contents of this array as if it is
[List].\n *^\n@SinceKotlin("1.4")\npublic expect fun CharArray?.contentHashCode(): Int\n\n/**\n * Returns a
string representation of the contents of the specified array as if it is [List].\n * \n * @sample
samples.collections.Arrays.ContentOperations.contentToString\n *^\n@Deprecated("\nUse Kotlin compiler 1.4 to
avoid deprecation warning.\n")\n@SinceKotlin("1.1")\n@DeprecatedSinceKotlin(hiddenSince = "1.4")\npublic
expect fun <T> Array<out T>.contentToString(): String\n\n/**\n * Returns a string representation of the contents of
the specified array as if it is [List].\n * \n * @sample
samples.collections.Arrays.ContentOperations.contentToString\n *^\n@Deprecated("\nUse Kotlin compiler 1.4 to
avoid deprecation warning.\n")\n@SinceKotlin("1.1")\n@DeprecatedSinceKotlin(hiddenSince = "1.4")\npublic

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expect fun ByteArray.contentToString(): String\n\n/**\n * Returns a string representation of the contents of the
specified array as if it is [List].\n * \n * @sample samples.collections.Arrays.ContentOperations.contentToString\n
*/\n@Deprecated("Use Kotlin compiler 1.4 to avoid deprecation
warning.")\n@SinceKotlin("1.1")\n@DeprecatedSinceKotlin(hiddenSince = "1.4")\npublic expect fun
ShortArray.contentToString(): String\n\n/**\n * Returns a string representation of the contents of the specified array
as if it is [List].\n * \n * @sample samples.collections.Arrays.ContentOperations.contentToString\n
*/\n@Deprecated("Use Kotlin compiler 1.4 to avoid deprecation
warning.")\n@SinceKotlin("1.1")\n@DeprecatedSinceKotlin(hiddenSince = "1.4")\npublic expect fun
IntArray.contentToString(): String\n\n/**\n * Returns a string representation of the contents of the specified array as
if it is [List].\n * \n * @sample samples.collections.Arrays.ContentOperations.contentToString\n
*/\n@Deprecated("Use Kotlin compiler 1.4 to avoid deprecation
warning.")\n@SinceKotlin("1.1")\n@DeprecatedSinceKotlin(hiddenSince = "1.4")\npublic expect fun
LongArray.contentToString(): String\n\n/**\n * Returns a string representation of the contents of the specified array
as if it is [List].\n * \n * @sample samples.collections.Arrays.ContentOperations.contentToString\n
*/\n@Deprecated("Use Kotlin compiler 1.4 to avoid deprecation
warning.")\n@SinceKotlin("1.1")\n@DeprecatedSinceKotlin(hiddenSince = "1.4")\npublic expect fun
FloatArray.contentToString(): String\n\n/**\n * Returns a string representation of the contents of the specified array
as if it is [List].\n * \n * @sample samples.collections.Arrays.ContentOperations.contentToString\n
*/\n@Deprecated("Use Kotlin compiler 1.4 to avoid deprecation
warning.")\n@SinceKotlin("1.1")\n@DeprecatedSinceKotlin(hiddenSince = "1.4")\npublic expect fun
DoubleArray.contentToString(): String\n\n/**\n * Returns a string representation of the contents of the specified
array as if it is [List].\n * \n * @sample samples.collections.Arrays.ContentOperations.contentToString\n
*/\n@Deprecated("Use Kotlin compiler 1.4 to avoid deprecation
warning.")\n@SinceKotlin("1.1")\n@DeprecatedSinceKotlin(hiddenSince = "1.4")\npublic expect fun
BooleanArray.contentToString(): String\n\n/**\n * Returns a string representation of the contents of the specified
array as if it is [List].\n * \n * @sample samples.collections.Arrays.ContentOperations.contentToString\n
*/\n@Deprecated("Use Kotlin compiler 1.4 to avoid deprecation
warning.")\n@SinceKotlin("1.1")\n@DeprecatedSinceKotlin(hiddenSince = "1.4")\npublic expect fun
CharArray.contentToString(): String\n\n/**\n * Returns a string representation of the contents of the specified array
as if it is [List].\n * \n * @sample samples.collections.Arrays.ContentOperations.contentToString\n
*/\n@SinceKotlin("1.4")\npublic expect fun <T> Array<out T>?.contentToString(): String\n\n/**\n * Returns a
string representation of the contents of the specified array as if it is [List].\n * \n * @sample
samples.collections.Arrays.ContentOperations.contentToString\n */\n@SinceKotlin("1.4")\npublic expect fun
ByteArray?.contentToString(): String\n\n/**\n * Returns a string representation of the contents of the specified array
as if it is [List].\n * \n * @sample samples.collections.Arrays.ContentOperations.contentToString\n
*/\n@SinceKotlin("1.4")\npublic expect fun ShortArray?.contentToString(): String\n\n/**\n * Returns a string
representation of the contents of the specified array as if it is [List].\n * \n * @sample
samples.collections.Arrays.ContentOperations.contentToString\n */\n@SinceKotlin("1.4")\npublic expect fun
IntArray?.contentToString(): String\n\n/**\n * Returns a string representation of the contents of the specified array
as if it is [List].\n * \n * @sample samples.collections.Arrays.ContentOperations.contentToString\n
*/\n@SinceKotlin("1.4")\npublic expect fun LongArray?.contentToString(): String\n\n/**\n * Returns a string
representation of the contents of the specified array as if it is [List].\n * \n * @sample
samples.collections.Arrays.ContentOperations.contentToString\n */\n@SinceKotlin("1.4")\npublic expect fun
FloatArray?.contentToString(): String\n\n/**\n * Returns a string representation of the contents of the specified
array as if it is [List].\n * \n * @sample samples.collections.Arrays.ContentOperations.contentToString\n
*/\n@SinceKotlin("1.4")\npublic expect fun DoubleArray?.contentToString(): String\n\n/**\n * Returns a string
representation of the contents of the specified array as if it is [List].\n * \n * @sample
samples.collections.Arrays.ContentOperations.contentToString\n */\n@SinceKotlin("1.4")\npublic expect fun

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BooleanArray?.contentToString(): String\n\n/**\n * Returns a string representation of the contents of the specified array as if it is [List].\n * \n * @sample samples.collections.Arrays.ContentOperations.contentToString\n */\n@SinceKotlin("1.4")\npublic expect fun CharArray?.contentToString(): String\n\n/**\n * Copies this array or its subrange into the [destination] array and returns that array.\n * \n * It's allowed to pass the same array in the [destination] and even specify the subrange so that it overlaps with the destination range.\n * \n * @param destination the array to copy to.\n * @param destinationOffset the position in the [destination] array to copy to, 0 by default.\n * @param startIndex the beginning (inclusive) of the subrange to copy, 0 by default.\n * @param endIndex the end (exclusive) of the subrange to copy, size of this array by default.\n * \n * @throws IndexOutOfBoundsException or [IllegalArgumentException] when [startIndex] or [endIndex] is out of range of this array indices or when `startIndex > endIndex`.\n * @throws IndexOutOfBoundsException when the subrange doesn't fit into the [destination] array starting at the specified [destinationOffset],\n * or when that index is out of the [destination] array indices range.\n * \n * @return the [destination] array.\n */\n@SinceKotlin("1.3")\npublic expect fun <T> Array<out T>.copyInto(destination: Array<T>, destinationOffset: Int = 0, startIndex: Int = 0, endIndex: Int = size): Array<T>\n\n/**\n * Copies this array or its subrange into the [destination] array and returns that array.\n * \n * It's allowed to pass the same array in the [destination] and even specify the subrange so that it overlaps with the destination range.\n * \n * @param destination the array to copy to.\n * @param destinationOffset the position in the [destination] array to copy to, 0 by default.\n * @param startIndex the beginning (inclusive) of the subrange to copy, 0 by default.\n * @param endIndex the end (exclusive) of the subrange to copy, size of this array by default.\n * \n * @throws IndexOutOfBoundsException or [IllegalArgumentException] when [startIndex] or [endIndex] is out of range of this array indices or when `startIndex > endIndex`.\n * @throws IndexOutOfBoundsException when the subrange doesn't fit into the [destination] array starting at the specified [destinationOffset],\n * or when that index is out of the [destination] array indices range.\n * \n * @return the [destination] array.\n */\n@SinceKotlin("1.3")\npublic expect fun ByteArray.copyInto(destination: ByteArray, destinationOffset: Int = 0, startIndex: Int = 0, endIndex: Int = size): ByteArray\n\n/**\n * Copies this array or its subrange into the [destination] array and returns that array.\n * \n * It's allowed to pass the same array in the [destination] and even specify the subrange so that it overlaps with the destination range.\n * \n * @param destination the array to copy to.\n * @param destinationOffset the position in the [destination] array to copy to, 0 by default.\n * @param startIndex the beginning (inclusive) of the subrange to copy, 0 by default.\n * @param endIndex the end (exclusive) of the subrange to copy, size of this array by default.\n * \n * @throws IndexOutOfBoundsException or [IllegalArgumentException] when [startIndex] or [endIndex] is out of range of this array indices or when `startIndex > endIndex`.\n * @throws IndexOutOfBoundsException when the subrange doesn't fit into the [destination] array starting at the specified [destinationOffset],\n * or when that index is out of the [destination] array indices range.\n * \n * @return the [destination] array.\n */\n@SinceKotlin("1.3")\npublic expect fun ShortArray.copyInto(destination: ShortArray, destinationOffset: Int = 0, startIndex: Int = 0, endIndex: Int = size): ShortArray\n\n/**\n * Copies this array or its subrange into the [destination] array and returns that array.\n * \n * It's allowed to pass the same array in the [destination] and even specify the subrange so that it overlaps with the destination range.\n * \n * @param destination the array to copy to.\n * @param destinationOffset the position in the [destination] array to copy to, 0 by default.\n * @param startIndex the beginning (inclusive) of the subrange to copy, 0 by default.\n * @param endIndex the end (exclusive) of the subrange to copy, size of this array by default.\n * \n * @throws IndexOutOfBoundsException or [IllegalArgumentException] when [startIndex] or [endIndex] is out of range of this array indices or when `startIndex > endIndex`.\n * @throws IndexOutOfBoundsException when the subrange doesn't fit into the [destination] array starting at the specified [destinationOffset],\n * or when that index is out of the [destination] array indices range.\n * \n * @return the [destination] array.\n */\n@SinceKotlin("1.3")\npublic expect fun IntArray.copyInto(destination: IntArray, destinationOffset: Int = 0, startIndex: Int = 0, endIndex: Int = size): IntArray\n\n/**\n * Copies this array or its subrange into the [destination] array and returns that array.\n * \n * It's allowed to pass the same array in the [destination] and even specify the subrange so that it overlaps with the destination range.\n * \n * @param destination the array to copy to.\n * @param destinationOffset the position in the [destination] array to copy to, 0 by default.\n * @param startIndex the

beginning (inclusive) of the subrange to copy, 0 by default.
 @param endIndex the end (exclusive) of the subrange to copy, size of this array by default.
 @throws IndexOutOfBoundsException or [IllegalArgumentException] when [startIndex] or [endIndex] is out of range of this array indices or when `startIndex > endIndex`.
 @throws IndexOutOfBoundsException when the subrange doesn't fit into the [destination] array starting at the specified [destinationOffset],
 or when that index is out of the [destination] array indices range.
 @return the [destination] array.
 @SinceKotlin("1.3")
 public expect fun

LongArray.copyInto(destination: LongArray, destinationOffset: Int = 0, startIndex: Int = 0, endIndex: Int = size): LongArray
 Copies this array or its subrange into the [destination] array and returns that array.
 It's allowed to pass the same array in the [destination] and even specify the subrange so that it overlaps with the destination range.
 @param destination the array to copy to.
 @param destinationOffset the position in the [destination] array to copy to, 0 by default.
 @param startIndex the beginning (inclusive) of the subrange to copy, 0 by default.
 @param endIndex the end (exclusive) of the subrange to copy, size of this array by default.
 @throws IndexOutOfBoundsException or [IllegalArgumentException] when [startIndex] or [endIndex] is out of range of this array indices or when `startIndex > endIndex`.
 @throws IndexOutOfBoundsException when the subrange doesn't fit into the [destination] array starting at the specified [destinationOffset],
 or when that index is out of the [destination] array indices range.
 @return the [destination] array.
 @SinceKotlin("1.3")
 public expect fun

FloatArray.copyInto(destination: FloatArray, destinationOffset: Int = 0, startIndex: Int = 0, endIndex: Int = size): FloatArray
 Copies this array or its subrange into the [destination] array and returns that array.
 It's allowed to pass the same array in the [destination] and even specify the subrange so that it overlaps with the destination range.
 @param destination the array to copy to.
 @param destinationOffset the position in the [destination] array to copy to, 0 by default.
 @param startIndex the beginning (inclusive) of the subrange to copy, 0 by default.
 @param endIndex the end (exclusive) of the subrange to copy, size of this array by default.
 @throws IndexOutOfBoundsException or [IllegalArgumentException] when [startIndex] or [endIndex] is out of range of this array indices or when `startIndex > endIndex`.
 @throws IndexOutOfBoundsException when the subrange doesn't fit into the [destination] array starting at the specified [destinationOffset],
 or when that index is out of the [destination] array indices range.
 @return the [destination] array.
 @SinceKotlin("1.3")
 public expect fun

DoubleArray.copyInto(destination: DoubleArray, destinationOffset: Int = 0, startIndex: Int = 0, endIndex: Int = size): DoubleArray
 Copies this array or its subrange into the [destination] array and returns that array.
 It's allowed to pass the same array in the [destination] and even specify the subrange so that it overlaps with the destination range.
 @param destination the array to copy to.
 @param destinationOffset the position in the [destination] array to copy to, 0 by default.
 @param startIndex the beginning (inclusive) of the subrange to copy, 0 by default.
 @param endIndex the end (exclusive) of the subrange to copy, size of this array by default.
 @throws IndexOutOfBoundsException or [IllegalArgumentException] when [startIndex] or [endIndex] is out of range of this array indices or when `startIndex > endIndex`.
 @throws IndexOutOfBoundsException when the subrange doesn't fit into the [destination] array starting at the specified [destinationOffset],
 or when that index is out of the [destination] array indices range.
 @return the [destination] array.
 @SinceKotlin("1.3")
 public expect fun

BooleanArray.copyInto(destination: BooleanArray, destinationOffset: Int = 0, startIndex: Int = 0, endIndex: Int = size): BooleanArray
 Copies this array or its subrange into the [destination] array and returns that array.
 It's allowed to pass the same array in the [destination] and even specify the subrange so that it overlaps with the destination range.
 @param destination the array to copy to.
 @param destinationOffset the position in the [destination] array to copy to, 0 by default.
 @param startIndex the beginning (inclusive) of the subrange to copy, 0 by default.
 @param endIndex the end (exclusive) of the subrange to copy, size of this array by default.
 @throws IndexOutOfBoundsException or [IllegalArgumentException] when [startIndex] or [endIndex] is out of range of this array indices or when `startIndex > endIndex`.
 @throws IndexOutOfBoundsException when the subrange doesn't fit into the [destination] array starting at the specified [destinationOffset],
 or when that index is out of the [destination] array indices range.
 @return the [destination] array.
 @SinceKotlin("1.3")
 public expect fun

CharArray.copyInto(destination: CharArray, destinationOffset: Int = 0, startIndex: Int = 0, endIndex: Int = size): CharArray\n\n/**\n * Returns new array which is a copy of the original array.\n * \n * @sample samples.collections.Arrays.CopyOfOperations.copyOf\n *\n@Suppress("NO_ACTUAL_FOR_EXPECT")\npublic expect fun <T> Array<T>.copyOf(): Array<T>\n\n/**\n * Returns new array which is a copy of the original array.\n * \n * @sample samples.collections.Arrays.CopyOfOperations.copyOf\n *\npublic expect fun ByteArray.copyOf(): ByteArray\n\n/**\n * Returns new array which is a copy of the original array.\n * \n * @sample samples.collections.Arrays.CopyOfOperations.copyOf\n *\npublic expect fun ShortArray.copyOf(): ShortArray\n\n/**\n * Returns new array which is a copy of the original array.\n * \n * @sample samples.collections.Arrays.CopyOfOperations.copyOf\n *\npublic expect fun IntArray.copyOf(): IntArray\n\n/**\n * Returns new array which is a copy of the original array.\n * \n * @sample samples.collections.Arrays.CopyOfOperations.copyOf\n *\npublic expect fun LongArray.copyOf(): LongArray\n\n/**\n * Returns new array which is a copy of the original array.\n * \n * @sample samples.collections.Arrays.CopyOfOperations.copyOf\n *\npublic expect fun FloatArray.copyOf(): FloatArray\n\n/**\n * Returns new array which is a copy of the original array.\n * \n * @sample samples.collections.Arrays.CopyOfOperations.copyOf\n *\npublic expect fun DoubleArray.copyOf(): DoubleArray\n\n/**\n * Returns new array which is a copy of the original array.\n * \n * @sample samples.collections.Arrays.CopyOfOperations.copyOf\n *\npublic expect fun BooleanArray.copyOf(): BooleanArray\n\n/**\n * Returns new array which is a copy of the original array, resized to the given [newSize].\n * The copy is either truncated or padded at the end with zero values if necessary.\n * \n * - If [newSize] is less than the size of the original array, the copy array is truncated to the [newSize].\n * - If [newSize] is greater than the size of the original array, the extra elements in the copy array are filled with zero values.\n * \n * @sample samples.collections.Arrays.CopyOfOperations.resizedPrimitiveCopyOf\n *\npublic expect fun ByteArray.copyOf(newSize: Int): ByteArray\n\n/**\n * Returns new array which is a copy of the original array, resized to the given [newSize].\n * The copy is either truncated or padded at the end with zero values if necessary.\n * \n * - If [newSize] is less than the size of the original array, the copy array is truncated to the [newSize].\n * - If [newSize] is greater than the size of the original array, the extra elements in the copy array are filled with zero values.\n * \n * @sample samples.collections.Arrays.CopyOfOperations.resizedPrimitiveCopyOf\n *\npublic expect fun ShortArray.copyOf(newSize: Int): ShortArray\n\n/**\n * Returns new array which is a copy of the original array, resized to the given [newSize].\n * The copy is either truncated or padded at the end with zero values if necessary.\n * \n * - If [newSize] is less than the size of the original array, the copy array is truncated to the [newSize].\n * - If [newSize] is greater than the size of the original array, the extra elements in the copy array are filled with zero values.\n * \n * @sample samples.collections.Arrays.CopyOfOperations.resizedPrimitiveCopyOf\n *\npublic expect fun IntArray.copyOf(newSize: Int): IntArray\n\n/**\n * Returns new array which is a copy of the original array, resized to the given [newSize].\n * The copy is either truncated or padded at the end with zero values if necessary.\n * \n * - If [newSize] is less than the size of the original array, the copy array is truncated to the [newSize].\n * - If [newSize] is greater than the size of the original array, the extra elements in the copy array are filled with zero values.\n * \n * @sample samples.collections.Arrays.CopyOfOperations.resizedPrimitiveCopyOf\n *\npublic expect fun LongArray.copyOf(newSize: Int): LongArray\n\n/**\n * Returns new array which is a copy of the original array, resized to the given [newSize].\n * The copy is either truncated or padded at the end with zero values if necessary.\n * \n * - If [newSize] is less than the size of the original array, the copy array is truncated to the [newSize].\n * - If [newSize] is greater than the size of the original array, the extra elements in the copy array are filled with zero values.\n * \n * @sample samples.collections.Arrays.CopyOfOperations.resizedPrimitiveCopyOf\n *\npublic expect fun FloatArray.copyOf(newSize: Int): FloatArray\n\n/**\n * Returns new array which is a copy of the original array, resized to the given [newSize].\n * The copy is either truncated or padded at the end with zero values if necessary.\n * \n * - If [newSize] is less than the size of the original array, the copy array is truncated to the

@param fromIndex the start of the range (inclusive) to fill, 0 by default.\n * @param toIndex the end of the range (exclusive) to fill, size of this array by default.\n * \n * @throws IndexOutOfBoundsException if [fromIndex] is less than zero or [toIndex] is greater than the size of this array.\n * @throws IllegalArgumentException if [fromIndex] is greater than [toIndex].\n * \n\n@SinceKotlin("1.3")\npublic expect fun DoubleArray.fill(element: Double, fromIndex: Int = 0, toIndex: Int = size): Unit\n\n/**\n * Fills this array or its subrange with the specified [element] value.\n * \n * @param fromIndex the start of the range (inclusive) to fill, 0 by default.\n * @param toIndex the end of the range (exclusive) to fill, size of this array by default.\n * \n * @throws IndexOutOfBoundsException if [fromIndex] is less than zero or [toIndex] is greater than the size of this array.\n * @throws IllegalArgumentException if [fromIndex] is greater than [toIndex].\n * \n\n@SinceKotlin("1.3")\npublic expect fun BooleanArray.fill(element: Boolean, fromIndex: Int = 0, toIndex: Int = size): Unit\n\n/**\n * Fills this array or its subrange with the specified [element] value.\n * \n * @param fromIndex the start of the range (inclusive) to fill, 0 by default.\n * @param toIndex the end of the range (exclusive) to fill, size of this array by default.\n * \n * @throws IndexOutOfBoundsException if [fromIndex] is less than zero or [toIndex] is greater than the size of this array.\n * @throws IllegalArgumentException if [fromIndex] is greater than [toIndex].\n * \n\n@SinceKotlin("1.3")\npublic expect fun CharArray.fill(element: Char, fromIndex: Int = 0, toIndex: Int = size): Unit\n\n/**\n * Returns the range of valid indices for the array.\n * \n\npublic val <T> Array<out T>.indices: IntRange\n get() = IntRange(0, lastIndex)\n\n/**\n * Returns the range of valid indices for the array.\n * \n\npublic val ByteArray.indices: IntRange\n get() = IntRange(0, lastIndex)\n\n/**\n * Returns the range of valid indices for the array.\n * \n\npublic val ShortArray.indices: IntRange\n get() = IntRange(0, lastIndex)\n\n/**\n * Returns the range of valid indices for the array.\n * \n\npublic val IntArray.indices: IntRange\n get() = IntRange(0, lastIndex)\n\n/**\n * Returns the range of valid indices for the array.\n * \n\npublic val LongArray.indices: IntRange\n get() = IntRange(0, lastIndex)\n\n/**\n * Returns the range of valid indices for the array.\n * \n\npublic val FloatArray.indices: IntRange\n get() = IntRange(0, lastIndex)\n\n/**\n * Returns the range of valid indices for the array.\n * \n\npublic val DoubleArray.indices: IntRange\n get() = IntRange(0, lastIndex)\n\n/**\n * Returns the range of valid indices for the array.\n * \n\npublic val BooleanArray.indices: IntRange\n get() = IntRange(0, lastIndex)\n\n/**\n * Returns the range of valid indices for the array.\n * \n\npublic val CharArray.indices: IntRange\n get() = IntRange(0, lastIndex)\n\n/**\n * Returns `true` if the array is empty.\n * \n\n@kotlin.internal.InlineOnly\npublic inline fun <T> Array<out T>.isEmpty(): Boolean {\n return size == 0\n}\n\n/**\n * Returns `true` if the array is empty.\n * \n\n@kotlin.internal.InlineOnly\npublic inline fun ByteArray.isEmpty(): Boolean {\n return size == 0\n}\n\n/**\n * Returns `true` if the array is empty.\n * \n\n@kotlin.internal.InlineOnly\npublic inline fun ShortArray.isEmpty(): Boolean {\n return size == 0\n}\n\n/**\n * Returns `true` if the array is empty.\n * \n\n@kotlin.internal.InlineOnly\npublic inline fun IntArray.isEmpty(): Boolean {\n return size == 0\n}\n\n/**\n * Returns `true` if the array is empty.\n * \n\n@kotlin.internal.InlineOnly\npublic inline fun LongArray.isEmpty(): Boolean {\n return size == 0\n}\n\n/**\n * Returns `true` if the array is empty.\n * \n\n@kotlin.internal.InlineOnly\npublic inline fun FloatArray.isEmpty(): Boolean {\n return size == 0\n}\n\n/**\n * Returns `true` if the array is empty.\n * \n\n@kotlin.internal.InlineOnly\npublic inline fun DoubleArray.isEmpty(): Boolean {\n return size == 0\n}\n\n/**\n * Returns `true` if the array is empty.\n * \n\n@kotlin.internal.InlineOnly\npublic inline fun BooleanArray.isEmpty(): Boolean {\n return size == 0\n}\n\n/**\n * Returns `true` if the array is empty.\n * \n\n@kotlin.internal.InlineOnly\npublic inline fun CharArray.isEmpty(): Boolean {\n return size == 0\n}\n\n/**\n * Returns `true` if the array is not empty.\n * \n\n@kotlin.internal.InlineOnly\npublic inline fun <T> Array<out T>.isNotEmpty(): Boolean {\n return !isEmpty()\n}\n\n/**\n * Returns `true` if the array is not empty.\n * \n\n@kotlin.internal.InlineOnly\npublic inline fun ByteArray.isNotEmpty(): Boolean {\n return !isEmpty()\n}\n\n/**\n * Returns `true` if the array is not empty.\n * \n\n@kotlin.internal.InlineOnly\npublic inline fun ShortArray.isNotEmpty(): Boolean {\n return !isEmpty()\n}\n\n/**\n * Returns `true` if the array is not empty.\n * \n\n@kotlin.internal.InlineOnly\npublic inline fun IntArray.isNotEmpty(): Boolean {\n return !isEmpty()\n}\n\n/**\n * Returns `true` if the array is not empty.\n * \n\n@kotlin.internal.InlineOnly\npublic inline fun LongArray.isNotEmpty(): Boolean {\n return !isEmpty()\n}\n\n/**\n * Returns `true` if the array is not

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empty.\n */\n@kotlin.internal.InlineOnly\npublic inline fun FloatArray.isNotEmpty(): Boolean {\n    return
    !isEmpty()\n}\n\n/**\n * Returns `true` if the array is not empty.\n */\n@kotlin.internal.InlineOnly\npublic inline
fun DoubleArray.isNotEmpty(): Boolean {\n    return !isEmpty()\n}\n\n/**\n * Returns `true` if the array is not
    empty.\n */\n@kotlin.internal.InlineOnly\npublic inline fun BooleanArray.isNotEmpty(): Boolean {\n    return
    !isEmpty()\n}\n\n/**\n * Returns `true` if the array is not empty.\n */\n@kotlin.internal.InlineOnly\npublic inline
fun CharArray.isNotEmpty(): Boolean {\n    return !isEmpty()\n}\n\n/**\n * Returns the last valid index for the
    array.\n */\npublic val <T> Array<out T>.lastIndex: Int\n    get() = size - 1\n\n/**\n * Returns the last valid index
    for the array.\n */\npublic val ByteArray.lastIndex: Int\n    get() = size - 1\n\n/**\n * Returns the last valid index for
    the array.\n */\npublic val ShortArray.lastIndex: Int\n    get() = size - 1\n\n/**\n * Returns the last valid index for the
    array.\n */\npublic val IntArray.lastIndex: Int\n    get() = size - 1\n\n/**\n * Returns the last valid index for the
    array.\n */\npublic val LongArray.lastIndex: Int\n    get() = size - 1\n\n/**\n * Returns the last valid index for the
    array.\n */\npublic val FloatArray.lastIndex: Int\n    get() = size - 1\n\n/**\n * Returns the last valid index for the
    array.\n */\npublic val DoubleArray.lastIndex: Int\n    get() = size - 1\n\n/**\n * Returns the last valid index for the
    array.\n */\npublic val BooleanArray.lastIndex: Int\n    get() = size - 1\n\n/**\n * Returns the last valid index for the
    array.\n */\npublic val CharArray.lastIndex: Int\n    get() = size - 1\n\n/**\n * Returns an array containing all
    elements of the original array and then the given [element].\n */\n\n@Suppress("NO_ACTUAL_FOR_EXPECT")\npublic expect operator fun <T> Array<T>.plus(element: T):
    Array<T>\n\n/**\n * Returns an array containing all elements of the original array and then the given [element].\n */\n\npublic expect operator fun ByteArray.plus(element: Byte): ByteArray\n\n/**\n * Returns an array containing all
    elements of the original array and then the given [element].\n */\n\npublic expect operator fun
    ShortArray.plus(element: Short): ShortArray\n\n/**\n * Returns an array containing all elements of the original
    array and then the given [element].\n */\n\npublic expect operator fun IntArray.plus(element: Int): IntArray\n\n/**\n * Returns an array containing all elements of the original array and then the given [element].\n */\n\npublic expect
    operator fun LongArray.plus(element: Long): LongArray\n\n/**\n * Returns an array containing all elements of the
    original array and then the given [element].\n */\n\npublic expect operator fun FloatArray.plus(element: Float):
    FloatArray\n\n/**\n * Returns an array containing all elements of the original array and then the given [element].\n */\n\npublic expect operator fun DoubleArray.plus(element: Double): DoubleArray\n\n/**\n * Returns an array
    containing all elements of the original array and then the given [element].\n */\n\npublic expect operator fun
    BooleanArray.plus(element: Boolean): BooleanArray\n\n/**\n * Returns an array containing all elements of the
    original array and then the given [element].\n */\n\npublic expect operator fun CharArray.plus(element: Char):
    CharArray\n\n/**\n * Returns an array containing all elements of the original array and then all elements of the
    given [elements] collection.\n */\n\n@Suppress("NO_ACTUAL_FOR_EXPECT")\npublic expect operator fun <T>
    Array<T>.plus(elements: Collection<T>): Array<T>\n\n/**\n * Returns an array containing all elements of the
    original array and then all elements of the given [elements] collection.\n */\n\npublic expect operator fun
    ByteArray.plus(elements: Collection<Byte>): ByteArray\n\n/**\n * Returns an array containing all elements of the
    original array and then all elements of the given [elements] collection.\n */\n\npublic expect operator fun
    ShortArray.plus(elements: Collection<Short>): ShortArray\n\n/**\n * Returns an array containing all elements of
    the original array and then all elements of the given [elements] collection.\n */\n\npublic expect operator fun
    IntArray.plus(elements: Collection<Int>): IntArray\n\n/**\n * Returns an array containing all elements of the
    original array and then all elements of the given [elements] collection.\n */\n\npublic expect operator fun
    LongArray.plus(elements: Collection<Long>): LongArray\n\n/**\n * Returns an array containing all elements of the
    original array and then all elements of the given [elements] collection.\n */\n\npublic expect operator fun
    FloatArray.plus(elements: Collection<Float>): FloatArray\n\n/**\n * Returns an array containing all elements of the
    original array and then all elements of the given [elements] collection.\n */\n\npublic expect operator fun
    DoubleArray.plus(elements: Collection<Double>): DoubleArray\n\n/**\n * Returns an array containing all elements
    of the original array and then all elements of the given [elements] collection.\n */\n\npublic expect operator fun
    BooleanArray.plus(elements: Collection<Boolean>): BooleanArray\n\n/**\n * Returns an array containing all
    elements of the original array and then all elements of the given [elements] collection.\n */\n\npublic expect operator

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fun CharArray.plus(elements: Collection<Char>): CharArray\n\n/**\n * Returns an array containing all elements of
the original array and then all elements of the given [elements] array.\n
*/\n\n@Suppress("NO_ACTUAL_FOR_EXPECT")\n\npublic expect operator fun <T> Array<T>.plus(elements:
Array<out T>): Array<T>\n\n/**\n * Returns an array containing all elements of the original array and then all
elements of the given [elements] array.\n */\n\npublic expect operator fun ByteArray.plus(elements: ByteArray):
ByteArray\n\n/**\n * Returns an array containing all elements of the original array and then all elements of the
given [elements] array.\n */\n\npublic expect operator fun ShortArray.plus(elements: ShortArray):
ShortArray\n\n/**\n * Returns an array containing all elements of the original array and then all elements of the
given [elements] array.\n */\n\npublic expect operator fun IntArray.plus(elements: IntArray): IntArray\n\n/**\n *
Returns an array containing all elements of the original array and then all elements of the given [elements] array.\n
*/\n\npublic expect operator fun LongArray.plus(elements: LongArray): LongArray\n\n/**\n * Returns an array
containing all elements of the original array and then all elements of the given [elements] array.\n */\n\npublic expect
operator fun FloatArray.plus(elements: FloatArray): FloatArray\n\n/**\n * Returns an array containing all elements
of the original array and then all elements of the given [elements] array.\n */\n\npublic expect operator fun
DoubleArray.plus(elements: DoubleArray): DoubleArray\n\n/**\n * Returns an array containing all elements of the
original array and then all elements of the given [elements] array.\n */\n\npublic expect operator fun
BooleanArray.plus(elements: BooleanArray): BooleanArray\n\n/**\n * Returns an array containing all elements of
the original array and then all elements of the given [elements] array.\n */\n\npublic expect operator fun
CharArray.plus(elements: CharArray): CharArray\n\n/**\n * Returns an array containing all elements of the original
array and then the given [element].\n */\n\n@Suppress("NO_ACTUAL_FOR_EXPECT")\n\npublic expect fun <T>
Array<T>.plusElement(element: T): Array<T>\n\n/**\n * Sorts the array in-place.\n */\n\n * @sample
samples.collections.Arrays.Sorting.sortArray\n */\n\npublic expect fun IntArray.sort(): Unit\n\n/**\n * Sorts the array
in-place.\n */\n\n * @sample samples.collections.Arrays.Sorting.sortArray\n */\n\npublic expect fun LongArray.sort():
Unit\n\n/**\n * Sorts the array in-place.\n */\n\n * @sample samples.collections.Arrays.Sorting.sortArray\n */\n\npublic
expect fun ByteArray.sort(): Unit\n\n/**\n * Sorts the array in-place.\n */\n\n * @sample
samples.collections.Arrays.Sorting.sortArray\n */\n\npublic expect fun ShortArray.sort(): Unit\n\n/**\n * Sorts the
array in-place.\n */\n\n * @sample samples.collections.Arrays.Sorting.sortArray\n */\n\npublic expect fun
DoubleArray.sort(): Unit\n\n/**\n * Sorts the array in-place.\n */\n\n * @sample
samples.collections.Arrays.Sorting.sortArray\n */\n\npublic expect fun FloatArray.sort(): Unit\n\n/**\n * Sorts the
array in-place.\n */\n\n * @sample samples.collections.Arrays.Sorting.sortArray\n */\n\npublic expect fun
CharArray.sort(): Unit\n\n/**\n * Sorts the array in-place according to the natural order of its elements.\n */\n\n * The
sort is stable. It means that equal elements preserve their order relative to each other after sorting.\n */\n\n *
@sample samples.collections.Arrays.Sorting.sortArrayOfComparable\n */\n\npublic expect fun <T :
Comparable<T>> Array<out T>.sort(): Unit\n\n/**\n * Sorts a range in the array in-place.\n */\n\n * The sort is
stable. It means that equal elements preserve their order relative to each other after sorting.\n */\n\n * @param
fromIndex the start of the range (inclusive) to sort, 0 by default.\n */\n\n * @param toIndex the end of the range
(exclusive) to sort, size of this array by default.\n */\n\n * @throws IndexOutOfBoundsException if [fromIndex] is
less than zero or [toIndex] is greater than the size of this array.\n */\n\n * @throws IllegalArgumentException if
[fromIndex] is greater than [toIndex].\n */\n\n * @sample
samples.collections.Arrays.Sorting.sortRangeOfArrayOfComparable\n */\n\n@SinceKotlin("1.4")\n\npublic expect
fun <T : Comparable<T>> Array<out T>.sort(fromIndex: Int = 0, toIndex: Int = size): Unit\n\n/**\n * Sorts a range
in the array in-place.\n */\n\n * @param fromIndex the start of the range (inclusive) to sort, 0 by default.\n */\n\n * @param
toIndex the end of the range (exclusive) to sort, size of this array by default.\n */\n\n * @throws
IndexOutOfBoundsException if [fromIndex] is less than zero or [toIndex] is greater than the size of this array.\n */\n\n
* @throws IllegalArgumentException if [fromIndex] is greater than [toIndex].\n */\n\n * @sample
samples.collections.Arrays.Sorting.sortRangeOfArray\n */\n\n@SinceKotlin("1.4")\n\npublic expect fun
ByteArray.sort(fromIndex: Int = 0, toIndex: Int = size): Unit\n\n/**\n * Sorts a range in the array in-place.\n */\n\n
* @param fromIndex the start of the range (inclusive) to sort, 0 by default.\n */\n\n * @param toIndex the end of the range

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(exclusive) to sort, size of this array by default.
`@throws IndexOutOfBoundsException` if [fromIndex] is less than zero or [toIndex] is greater than the size of this array.
`@throws IllegalArgumentException` if [fromIndex] is greater than [toIndex].
`@sample samples.collections.Arrays.Sorting.sortRangeOfArray`
`@SinceKotlin("1.4")`
`public expect fun ShortArray.sort(fromIndex: Int = 0, toIndex: Int = size): Unit`
 * Sorts a range in the array in-place.
 * `@param fromIndex` the start of the range (inclusive) to sort, 0 by default.
 * `@param toIndex` the end of the range (exclusive) to sort, size of this array by default.
`@throws IndexOutOfBoundsException` if [fromIndex] is less than zero or [toIndex] is greater than the size of this array.
`@throws IllegalArgumentException` if [fromIndex] is greater than [toIndex].
`@sample samples.collections.Arrays.Sorting.sortRangeOfArray`
`@SinceKotlin("1.4")`
`public expect fun IntArray.sort(fromIndex: Int = 0, toIndex: Int = size): Unit`
 * Sorts a range in the array in-place.
 * `@param fromIndex` the start of the range (inclusive) to sort, 0 by default.
 * `@param toIndex` the end of the range (exclusive) to sort, size of this array by default.
`@throws IndexOutOfBoundsException` if [fromIndex] is less than zero or [toIndex] is greater than the size of this array.
`@throws IllegalArgumentException` if [fromIndex] is greater than [toIndex].
`@sample samples.collections.Arrays.Sorting.sortRangeOfArray`
`@SinceKotlin("1.4")`
`public expect fun FloatArray.sort(fromIndex: Int = 0, toIndex: Int = size): Unit`
 * Sorts a range in the array in-place.
 * `@param fromIndex` the start of the range (inclusive) to sort, 0 by default.
 * `@param toIndex` the end of the range (exclusive) to sort, size of this array by default.
`@throws IndexOutOfBoundsException` if [fromIndex] is less than zero or [toIndex] is greater than the size of this array.
`@throws IllegalArgumentException` if [fromIndex] is greater than [toIndex].
`@sample samples.collections.Arrays.Sorting.sortRangeOfArray`
`@SinceKotlin("1.4")`
`public expect fun DoubleArray.sort(fromIndex: Int = 0, toIndex: Int = size): Unit`
 * Sorts a range in the array in-place.
 * `@param fromIndex` the start of the range (inclusive) to sort, 0 by default.
 * `@param toIndex` the end of the range (exclusive) to sort, size of this array by default.
`@throws IndexOutOfBoundsException` if [fromIndex] is less than zero or [toIndex] is greater than the size of this array.
`@throws IllegalArgumentException` if [fromIndex] is greater than [toIndex].
`@sample samples.collections.Arrays.Sorting.sortRangeOfArray`
`@SinceKotlin("1.4")`
`public expect fun CharArray.sort(fromIndex: Int = 0, toIndex: Int = size): Unit`
 * Sorts elements of the array in the specified range in-place.
 * The elements are sorted descending according to their natural sort order.
 * The sort is `_stable_`. It means that equal elements preserve their order relative to each other after sorting.
 * `@param fromIndex` the start of the range (inclusive) to sort.
 * `@param toIndex` the end of the range (exclusive) to sort.
`@throws IndexOutOfBoundsException` if [fromIndex] is less than zero or [toIndex] is greater than the size of this array.
`@throws IllegalArgumentException` if [fromIndex] is greater than [toIndex].
`@sample samples.collections.Arrays.Sorting.sortRangeOfArray`
`@SinceKotlin("1.4")`
`public fun <T : Comparable<T>> Array<out T>.sortDescending(fromIndex: Int, toIndex: Int): Unit`
 {
`sortWith(reverseOrder(), fromIndex, toIndex)`
 }
 * Sorts elements of the array in the specified range in-place.
 * The elements are sorted descending according to their natural sort order.
 * `@param fromIndex` the start of the range (inclusive) to sort.
 * `@param toIndex` the end of the range (exclusive) to sort.
`@throws IndexOutOfBoundsException` if [fromIndex] is less than zero or [toIndex] is greater than the size of this array.
`@throws IllegalArgumentException` if [fromIndex] is greater than [toIndex].
`@sample samples.collections.Arrays.Sorting.sortRangeOfArray`
`@SinceKotlin("1.4")`
`public fun ByteArray.sortDescending(fromIndex: Int, toIndex: Int): Unit`
 {
`sort(fromIndex, toIndex)`
`reverse(fromIndex, toIndex)`
 }
 * Sorts elements of the array in the specified range in-place.
 * The elements are sorted descending according to their natural sort order.
 * `@param fromIndex` the start of the range (inclusive) to sort.
 * `@param toIndex` the end of the range (exclusive) to sort.
`@throws IndexOutOfBoundsException` if [fromIndex] is less than zero or [toIndex] is greater than the size of

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this array.\n * @throws IllegalArgumentException if [fromIndex] is greater than [toIndex].\n
*\n@SinceKotlin("1.4")\npublic fun ShortArray.sortDescending(fromIndex: Int, toIndex: Int): Unit {\n
sort(fromIndex, toIndex)\n reverse(fromIndex, toIndex)\n}\n\n/**\n * Sorts elements of the array in the specified\n range in-place.\n * The elements are sorted descending according to their natural sort order.\n * \n * @param\n fromIndex the start of the range (inclusive) to sort.\n * @param toIndex the end of the range (exclusive) to sort.\n * \n * @throws IndexOutOfBoundsException if [fromIndex] is less than zero or [toIndex] is greater than the size of\n this array.\n * @throws IllegalArgumentException if [fromIndex] is greater than [toIndex].\n
*\n@SinceKotlin("1.4")\npublic fun IntArray.sortDescending(fromIndex: Int, toIndex: Int): Unit {\n
sort(fromIndex, toIndex)\n reverse(fromIndex, toIndex)\n}\n\n/**\n * Sorts elements of the array in the specified\n range in-place.\n * The elements are sorted descending according to their natural sort order.\n * \n * @param\n fromIndex the start of the range (inclusive) to sort.\n * @param toIndex the end of the range (exclusive) to sort.\n * \n * @throws IndexOutOfBoundsException if [fromIndex] is less than zero or [toIndex] is greater than the size of\n this array.\n * @throws IllegalArgumentException if [fromIndex] is greater than [toIndex].\n
*\n@SinceKotlin("1.4")\npublic fun LongArray.sortDescending(fromIndex: Int, toIndex: Int): Unit {\n
sort(fromIndex, toIndex)\n reverse(fromIndex, toIndex)\n}\n\n/**\n * Sorts elements of the array in the specified\n range in-place.\n * The elements are sorted descending according to their natural sort order.\n * \n * @param\n fromIndex the start of the range (inclusive) to sort.\n * @param toIndex the end of the range (exclusive) to sort.\n * \n * @throws IndexOutOfBoundsException if [fromIndex] is less than zero or [toIndex] is greater than the size of\n this array.\n * @throws IllegalArgumentException if [fromIndex] is greater than [toIndex].\n
*\n@SinceKotlin("1.4")\npublic fun FloatArray.sortDescending(fromIndex: Int, toIndex: Int): Unit {\n
sort(fromIndex, toIndex)\n reverse(fromIndex, toIndex)\n}\n\n/**\n * Sorts elements of the array in the specified\n range in-place.\n * The elements are sorted descending according to their natural sort order.\n * \n * @param\n fromIndex the start of the range (inclusive) to sort.\n * @param toIndex the end of the range (exclusive) to sort.\n * \n * @throws IndexOutOfBoundsException if [fromIndex] is less than zero or [toIndex] is greater than the size of\n this array.\n * @throws IllegalArgumentException if [fromIndex] is greater than [toIndex].\n
*\n@SinceKotlin("1.4")\npublic fun DoubleArray.sortDescending(fromIndex: Int, toIndex: Int): Unit {\n
sort(fromIndex, toIndex)\n reverse(fromIndex, toIndex)\n}\n\n/**\n * Sorts elements of the array in the specified\n range in-place.\n * The elements are sorted descending according to their natural sort order.\n * \n * @param\n fromIndex the start of the range (inclusive) to sort.\n * @param toIndex the end of the range (exclusive) to sort.\n * \n * @throws IndexOutOfBoundsException if [fromIndex] is less than zero or [toIndex] is greater than the size of\n this array.\n * @throws IllegalArgumentException if [fromIndex] is greater than [toIndex].\n
*\n@SinceKotlin("1.4")\npublic fun CharArray.sortDescending(fromIndex: Int, toIndex: Int): Unit {\n
sort(fromIndex, toIndex)\n reverse(fromIndex, toIndex)\n}\n\n/**\n * Sorts the array in-place according to the\n order specified by the given [comparator].\n * \n * The sort is _stable_. It means that equal elements preserve their\n order relative to each other after sorting.\n */\npublic expect fun <T> Array<out T>.sortWith(comparator:\n Comparator<in T>): Unit\n\n/**\n * Sorts a range in the array in-place with the given [comparator].\n * \n * The\n sort is _stable_. It means that equal elements preserve their order relative to each other after sorting.\n * \n * \n * @param fromIndex the start of the range (inclusive) to sort, 0 by default.\n * @param toIndex the end of the range\n (exclusive) to sort, size of this array by default.\n * \n * @throws IndexOutOfBoundsException if [fromIndex] is\n less than zero or [toIndex] is greater than the size of this array.\n * @throws IllegalArgumentException if\n [fromIndex] is greater than [toIndex].\n */\npublic expect fun <T> Array<out T>.sortWith(comparator:\n Comparator<in T>, fromIndex: Int = 0, toIndex: Int = size): Unit\n\n/**\n * Returns an array of Boolean containing\n all of the elements of this generic array.\n */\npublic fun Array<out Boolean>.toBooleanArray(): BooleanArray {\n return BooleanArray(size) { index -> this[index] }\n}\n\n/**\n * Returns an array of Byte containing all of the\n elements of this generic array.\n */\npublic fun Array<out Byte>.toByteArray(): ByteArray {\n return\n ByteArray(size) { index -> this[index] }\n}\n\n/**\n * Returns an array of Char containing all of the elements of this\n generic array.\n */\npublic fun Array<out Char>.toCharArray(): CharArray {\n return CharArray(size) { index ->\n this[index] }\n}\n\n/**\n * Returns an array of Double containing all of the elements of this generic array.\n

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LongArray.associate(transform: (Long) -> Pair<K, V>): Map<K, V> {\n  val capacity =
mapCapacity(size).coerceAtLeast(16)\n  return associateTo(LinkedHashMap<K, V>(capacity),
transform)\n}\n\n/**\n * Returns a [Map] containing key-value pairs provided by [transform] function\n * applied to
elements of the given array.\n * \n * If any of two pairs would have the same key the last one gets added to the
map.\n * \n * The returned map preserves the entry iteration order of the original array.\n * \n * @sample
samples.collections.Arrays.Transformations.associateArrayOfPrimitives\n */\npublic inline fun <K, V>
FloatArray.associate(transform: (Float) -> Pair<K, V>): Map<K, V> {\n  val capacity =
mapCapacity(size).coerceAtLeast(16)\n  return associateTo(LinkedHashMap<K, V>(capacity),
transform)\n}\n\n/**\n * Returns a [Map] containing key-value pairs provided by [transform] function\n * applied to
elements of the given array.\n * \n * If any of two pairs would have the same key the last one gets added to the
map.\n * \n * The returned map preserves the entry iteration order of the original array.\n * \n * @sample
samples.collections.Arrays.Transformations.associateArrayOfPrimitives\n */\npublic inline fun <K, V>
DoubleArray.associate(transform: (Double) -> Pair<K, V>): Map<K, V> {\n  val capacity =
mapCapacity(size).coerceAtLeast(16)\n  return associateTo(LinkedHashMap<K, V>(capacity),
transform)\n}\n\n/**\n * Returns a [Map] containing key-value pairs provided by [transform] function\n * applied to
elements of the given array.\n * \n * If any of two pairs would have the same key the last one gets added to the
map.\n * \n * The returned map preserves the entry iteration order of the original array.\n * \n * @sample
samples.collections.Arrays.Transformations.associateArrayOfPrimitives\n */\npublic inline fun <K, V>
BooleanArray.associate(transform: (Boolean) -> Pair<K, V>): Map<K, V> {\n  val capacity =
mapCapacity(size).coerceAtLeast(16)\n  return associateTo(LinkedHashMap<K, V>(capacity),
transform)\n}\n\n/**\n * Returns a [Map] containing key-value pairs provided by [transform] function\n * applied to
elements of the given array.\n * \n * If any of two pairs would have the same key the last one gets added to the
map.\n * \n * The returned map preserves the entry iteration order of the original array.\n * \n * @sample
samples.collections.Arrays.Transformations.associateArrayOfPrimitives\n */\npublic inline fun <K, V>
CharArray.associate(transform: (Char) -> Pair<K, V>): Map<K, V> {\n  val capacity =
mapCapacity(size).coerceAtLeast(16)\n  return associateTo(LinkedHashMap<K, V>(capacity),
transform)\n}\n\n/**\n * Returns a [Map] containing the elements from the given array indexed by the key\n *
returned from [keySelector] function applied to each element.\n * \n * If any two elements would have the same key
returned by [keySelector] the last one gets added to the map.\n * \n * The returned map preserves the entry iteration
order of the original array.\n * \n * @sample
samples.collections.Arrays.Transformations.associateArrayOfPrimitivesBy\n */\npublic inline fun <T, K>
Array<out T>.associateBy(keySelector: (T) -> K): Map<K, T> {\n  val capacity =
mapCapacity(size).coerceAtLeast(16)\n  return associateByTo(LinkedHashMap<K, T>(capacity),
keySelector)\n}\n\n/**\n * Returns a [Map] containing the elements from the given array indexed by the key\n *
returned from [keySelector] function applied to each element.\n * \n * If any two elements would have the same key
returned by [keySelector] the last one gets added to the map.\n * \n * The returned map preserves the entry iteration
order of the original array.\n * \n * @sample
samples.collections.Arrays.Transformations.associateArrayOfPrimitivesBy\n */\npublic inline fun <K>
ByteArray.associateBy(keySelector: (Byte) -> K): Map<K, Byte> {\n  val capacity =
mapCapacity(size).coerceAtLeast(16)\n  return associateByTo(LinkedHashMap<K, Byte>(capacity),
keySelector)\n}\n\n/**\n * Returns a [Map] containing the elements from the given array indexed by the key\n *
returned from [keySelector] function applied to each element.\n * \n * If any two elements would have the same key
returned by [keySelector] the last one gets added to the map.\n * \n * The returned map preserves the entry iteration
order of the original array.\n * \n * @sample
samples.collections.Arrays.Transformations.associateArrayOfPrimitivesBy\n */\npublic inline fun <K>
ShortArray.associateBy(keySelector: (Short) -> K): Map<K, Short> {\n  val capacity =
mapCapacity(size).coerceAtLeast(16)\n  return associateByTo(LinkedHashMap<K, Short>(capacity),
keySelector)\n}\n\n/**\n * Returns a [Map] containing the elements from the given array indexed by the key\n *

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returned from [keySelector] function applied to each element.\n * \n * If any two elements would have the same key returned by [keySelector] the last one gets added to the map.\n * \n * The returned map preserves the entry iteration order of the original array.\n * \n * @sample

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samples.collections.Arrays.Transformations.associateArrayOfPrimitivesBy\n */\npublic inline fun <K>
IntArray.associateBy(keySelector: (Int) -> K): Map<K, Int> {\n    val capacity =
mapCapacity(size).coerceAtLeast(16)\n    return associateByTo(LinkedHashMap<K, Int>(capacity),
keySelector)\n}\n\n/**\n * Returns a [Map] containing the elements from the given array indexed by the key\n *
returned from [keySelector] function applied to each element.\n * \n * If any two elements would have the same key
returned by [keySelector] the last one gets added to the map.\n * \n * The returned map preserves the entry iteration
order of the original array.\n * \n * @sample
samples.collections.Arrays.Transformations.associateArrayOfPrimitivesBy\n */\npublic inline fun <K>
LongArray.associateBy(keySelector: (Long) -> K): Map<K, Long> {\n    val capacity =
mapCapacity(size).coerceAtLeast(16)\n    return associateByTo(LinkedHashMap<K, Long>(capacity),
keySelector)\n}\n\n/**\n * Returns a [Map] containing the elements from the given array indexed by the key\n *
returned from [keySelector] function applied to each element.\n * \n * If any two elements would have the same key
returned by [keySelector] the last one gets added to the map.\n * \n * The returned map preserves the entry iteration
order of the original array.\n * \n * @sample
samples.collections.Arrays.Transformations.associateArrayOfPrimitivesBy\n */\npublic inline fun <K>
FloatArray.associateBy(keySelector: (Float) -> K): Map<K, Float> {\n    val capacity =
mapCapacity(size).coerceAtLeast(16)\n    return associateByTo(LinkedHashMap<K, Float>(capacity),
keySelector)\n}\n\n/**\n * Returns a [Map] containing the elements from the given array indexed by the key\n *
returned from [keySelector] function applied to each element.\n * \n * If any two elements would have the same key
returned by [keySelector] the last one gets added to the map.\n * \n * The returned map preserves the entry iteration
order of the original array.\n * \n * @sample
samples.collections.Arrays.Transformations.associateArrayOfPrimitivesBy\n */\npublic inline fun <K>
DoubleArray.associateBy(keySelector: (Double) -> K): Map<K, Double> {\n    val capacity =
mapCapacity(size).coerceAtLeast(16)\n    return associateByTo(LinkedHashMap<K, Double>(capacity),
keySelector)\n}\n\n/**\n * Returns a [Map] containing the elements from the given array indexed by the key\n *
returned from [keySelector] function applied to each element.\n * \n * If any two elements would have the same key
returned by [keySelector] the last one gets added to the map.\n * \n * The returned map preserves the entry iteration
order of the original array.\n * \n * @sample
samples.collections.Arrays.Transformations.associateArrayOfPrimitivesBy\n */\npublic inline fun <K>
BooleanArray.associateBy(keySelector: (Boolean) -> K): Map<K, Boolean> {\n    val capacity =
mapCapacity(size).coerceAtLeast(16)\n    return associateByTo(LinkedHashMap<K, Boolean>(capacity),
keySelector)\n}\n\n/**\n * Returns a [Map] containing the elements from the given array indexed by the key\n *
returned from [keySelector] function applied to each element.\n * \n * If any two elements would have the same key
returned by [keySelector] the last one gets added to the map.\n * \n * The returned map preserves the entry iteration
order of the original array.\n * \n * @sample
samples.collections.Arrays.Transformations.associateArrayOfPrimitivesBy\n */\npublic inline fun <K>
CharArray.associateBy(keySelector: (Char) -> K): Map<K, Char> {\n    val capacity =
mapCapacity(size).coerceAtLeast(16)\n    return associateByTo(LinkedHashMap<K, Char>(capacity),
keySelector)\n}\n\n/**\n * Returns a [Map] containing the values provided by [valueTransform] and indexed by
[keySelector] functions applied to elements of the given array.\n * \n * If any two elements would have the same key
returned by [keySelector] the last one gets added to the map.\n * \n * The returned map preserves the entry iteration
order of the original array.\n * \n * @sample
samples.collections.Arrays.Transformations.associateArrayOfPrimitivesByWithValueTransform\n */\npublic inline
fun <T, K, V> Array<out T>.associateBy(keySelector: (T) -> K, valueTransform: (T) -> V): Map<K, V> {\n    val
capacity = mapCapacity(size).coerceAtLeast(16)\n    return associateByTo(LinkedHashMap<K, V>(capacity),

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keySelector, valueTransform)\n}\n\n/**\n * Returns a [Map] containing the values provided by [valueTransform]
and indexed by [keySelector] functions applied to elements of the given array.\n * \n * If any two elements would
have the same key returned by [keySelector] the last one gets added to the map.\n * \n * The returned map preserves
the entry iteration order of the original array.\n * \n * @sample
samples.collections.Arrays.Transformations.associateArrayOfPrimitivesByWithValueTransform\n *\npublic inline
fun <K, V> ByteArray.associateBy(keySelector: (Byte) -> K, valueTransform: (Byte) -> V): Map<K, V> {\n  val
capacity = mapCapacity(size).coerceAtLeast(16)\n  return associateByTo(LinkedHashMap<K, V>(capacity),
keySelector, valueTransform)\n}\n\n/**\n * Returns a [Map] containing the values provided by [valueTransform]
and indexed by [keySelector] functions applied to elements of the given array.\n * \n * If any two elements would
have the same key returned by [keySelector] the last one gets added to the map.\n * \n * The returned map preserves
the entry iteration order of the original array.\n * \n * @sample
samples.collections.Arrays.Transformations.associateArrayOfPrimitivesByWithValueTransform\n *\npublic inline
fun <K, V> ShortArray.associateBy(keySelector: (Short) -> K, valueTransform: (Short) -> V): Map<K, V> {\n  val
capacity = mapCapacity(size).coerceAtLeast(16)\n  return associateByTo(LinkedHashMap<K, V>(capacity),
keySelector, valueTransform)\n}\n\n/**\n * Returns a [Map] containing the values provided by [valueTransform]
and indexed by [keySelector] functions applied to elements of the given array.\n * \n * If any two elements would
have the same key returned by [keySelector] the last one gets added to the map.\n * \n * The returned map preserves
the entry iteration order of the original array.\n * \n * @sample
samples.collections.Arrays.Transformations.associateArrayOfPrimitivesByWithValueTransform\n *\npublic inline
fun <K, V> IntArray.associateBy(keySelector: (Int) -> K, valueTransform: (Int) -> V): Map<K, V> {\n  val
capacity = mapCapacity(size).coerceAtLeast(16)\n  return associateByTo(LinkedHashMap<K, V>(capacity),
keySelector, valueTransform)\n}\n\n/**\n * Returns a [Map] containing the values provided by [valueTransform]
and indexed by [keySelector] functions applied to elements of the given array.\n * \n * If any two elements would
have the same key returned by [keySelector] the last one gets added to the map.\n * \n * The returned map preserves
the entry iteration order of the original array.\n * \n * @sample
samples.collections.Arrays.Transformations.associateArrayOfPrimitivesByWithValueTransform\n *\npublic inline
fun <K, V> LongArray.associateBy(keySelector: (Long) -> K, valueTransform: (Long) -> V): Map<K, V> {\n  val
capacity = mapCapacity(size).coerceAtLeast(16)\n  return associateByTo(LinkedHashMap<K, V>(capacity),
keySelector, valueTransform)\n}\n\n/**\n * Returns a [Map] containing the values provided by [valueTransform]
and indexed by [keySelector] functions applied to elements of the given array.\n * \n * If any two elements would
have the same key returned by [keySelector] the last one gets added to the map.\n * \n * The returned map preserves
the entry iteration order of the original array.\n * \n * @sample
samples.collections.Arrays.Transformations.associateArrayOfPrimitivesByWithValueTransform\n *\npublic inline
fun <K, V> FloatArray.associateBy(keySelector: (Float) -> K, valueTransform: (Float) -> V): Map<K, V> {\n  val
capacity = mapCapacity(size).coerceAtLeast(16)\n  return associateByTo(LinkedHashMap<K, V>(capacity),
keySelector, valueTransform)\n}\n\n/**\n * Returns a [Map] containing the values provided by [valueTransform]
and indexed by [keySelector] functions applied to elements of the given array.\n * \n * If any two elements would
have the same key returned by [keySelector] the last one gets added to the map.\n * \n * The returned map preserves
the entry iteration order of the original array.\n * \n * @sample
samples.collections.Arrays.Transformations.associateArrayOfPrimitivesByWithValueTransform\n *\npublic inline
fun <K, V> DoubleArray.associateBy(keySelector: (Double) -> K, valueTransform: (Double) -> V): Map<K, V>
{\n  val capacity = mapCapacity(size).coerceAtLeast(16)\n  return associateByTo(LinkedHashMap<K,
V>(capacity), keySelector, valueTransform)\n}\n\n/**\n * Returns a [Map] containing the values provided by
[valueTransform] and indexed by [keySelector] functions applied to elements of the given array.\n * \n * If any two
elements would have the same key returned by [keySelector] the last one gets added to the map.\n * \n * The
returned map preserves the entry iteration order of the original array.\n * \n * @sample
samples.collections.Arrays.Transformations.associateArrayOfPrimitivesByWithValueTransform\n *\npublic inline
fun <K, V> BooleanArray.associateBy(keySelector: (Boolean) -> K, valueTransform: (Boolean) -> V): Map<K, V>

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{\n  val capacity = mapCapacity(size).coerceAtLeast(16)\n  return associateByTo(LinkedHashMap<K,
V>(capacity), keySelector, valueTransform)\n}\n\n/**\n * Returns a [Map] containing the values provided by
[valueTransform] and indexed by [keySelector] functions applied to elements of the given array.\n * \n * If any two
elements would have the same key returned by [keySelector] the last one gets added to the map.\n * \n * The
returned map preserves the entry iteration order of the original array.\n * \n * @sample
samples.collections.Arrays.Transformations.associateArrayOfPrimitivesByWithValueTransform\n */\npublic inline
fun <K, V> CharArray.associateBy(keySelector: (Char) -> K, valueTransform: (Char) -> V): Map<K, V> {\n  val
capacity = mapCapacity(size).coerceAtLeast(16)\n  return associateByTo(LinkedHashMap<K, V>(capacity),
keySelector, valueTransform)\n}\n\n/**\n * Populates and returns the [destination] mutable map with key-value
pairs,\n * where key is provided by the [keySelector] function applied to each element of the given array\n * and
value is the element itself.\n * \n * If any two elements would have the same key returned by [keySelector] the last
one gets added to the map.\n * \n * @sample
samples.collections.Arrays.Transformations.associateArrayOfPrimitivesByTo\n */\npublic inline fun <T, K, M :
MutableMap<in K, in T>> Array<out T>.associateByTo(destination: M, keySelector: (T) -> K): M {\n  for
(element in this) {\n    destination.put(keySelector(element), element)\n  }\n  return destination\n}\n\n/**\n *
Populates and returns the [destination] mutable map with key-value pairs,\n * where key is provided by the
[keySelector] function applied to each element of the given array\n * and value is the element itself.\n * \n * If any
two elements would have the same key returned by [keySelector] the last one gets added to the map.\n * \n *
@sample samples.collections.Arrays.Transformations.associateArrayOfPrimitivesByTo\n */\npublic inline fun <K,
M : MutableMap<in K, in Byte>> ByteArray.associateByTo(destination: M, keySelector: (Byte) -> K): M {\n  for
(element in this) {\n    destination.put(keySelector(element), element)\n  }\n  return destination\n}\n\n/**\n *
Populates and returns the [destination] mutable map with key-value pairs,\n * where key is provided by the
[keySelector] function applied to each element of the given array\n * and value is the element itself.\n * \n * If any
two elements would have the same key returned by [keySelector] the last one gets added to the map.\n * \n *
@sample samples.collections.Arrays.Transformations.associateArrayOfPrimitivesByTo\n */\npublic inline fun <K,
M : MutableMap<in K, in Short>> ShortArray.associateByTo(destination: M, keySelector: (Short) -> K): M {\n  for
(element in this) {\n    destination.put(keySelector(element), element)\n  }\n  return destination\n}\n\n/**\n *
Populates and returns the [destination] mutable map with key-value pairs,\n * where key is provided by the
[keySelector] function applied to each element of the given array\n * and value is the element itself.\n * \n * If any
two elements would have the same key returned by [keySelector] the last one gets added to the map.\n * \n *
@sample samples.collections.Arrays.Transformations.associateArrayOfPrimitivesByTo\n */\npublic inline fun <K,
M : MutableMap<in K, in Int>> IntArray.associateByTo(destination: M, keySelector: (Int) -> K): M {\n  for
(element in this) {\n    destination.put(keySelector(element), element)\n  }\n  return destination\n}\n\n/**\n *
Populates and returns the [destination] mutable map with key-value pairs,\n * where key is provided by the
[keySelector] function applied to each element of the given array\n * and value is the element itself.\n * \n * If any
two elements would have the same key returned by [keySelector] the last one gets added to the map.\n * \n *
@sample samples.collections.Arrays.Transformations.associateArrayOfPrimitivesByTo\n */\npublic inline fun <K,
M : MutableMap<in K, in Long>> LongArray.associateByTo(destination: M, keySelector: (Long) -> K): M {\n  for
(element in this) {\n    destination.put(keySelector(element), element)\n  }\n  return destination\n}\n\n/**\n *
Populates and returns the [destination] mutable map with key-value pairs,\n * where key is provided by the
[keySelector] function applied to each element of the given array\n * and value is the element itself.\n * \n * If any
two elements would have the same key returned by [keySelector] the last one gets added to the map.\n * \n *
@sample samples.collections.Arrays.Transformations.associateArrayOfPrimitivesByTo\n */\npublic inline fun <K,
M : MutableMap<in K, in Float>> FloatArray.associateByTo(destination: M, keySelector: (Float) -> K): M {\n  for
(element in this) {\n    destination.put(keySelector(element), element)\n  }\n  return destination\n}\n\n/**\n *
Populates and returns the [destination] mutable map with key-value pairs,\n * where key is provided by the
[keySelector] function applied to each element of the given array\n * and value is the element itself.\n * \n * If any
two elements would have the same key returned by [keySelector] the last one gets added to the map.\n * \n *

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@sample samples.collections.Arrays.Transformations.associateArrayOfPrimitivesByTo\n *\npublic inline fun <K,
M : MutableMap<in K, in Double>> DoubleArray.associateByTo(destination: M, keySelector: (Double) -> K): M
{\n  for (element in this) {\n    destination.put(keySelector(element), element)\n  }\n  return
destination\n}\n\n/**\n * Populates and returns the [destination] mutable map with key-value pairs,\n * where key is
provided by the [keySelector] function applied to each element of the given array\n * and value is the element
itself.\n * \n * If any two elements would have the same key returned by [keySelector] the last one gets added to the
map.\n * \n * @sample samples.collections.Arrays.Transformations.associateArrayOfPrimitivesByTo\n *\npublic
inline fun <K, M : MutableMap<in K, in Boolean>> BooleanArray.associateByTo(destination: M, keySelector:
(Boolean) -> K): M {\n  for (element in this) {\n    destination.put(keySelector(element), element)\n  }\n
return destination\n}\n\n/**\n * Populates and returns the [destination] mutable map with key-value pairs,\n * where
key is provided by the [keySelector] function applied to each element of the given array\n * and value is the element
itself.\n * \n * If any two elements would have the same key returned by [keySelector] the last one gets added to the
map.\n * \n * @sample samples.collections.Arrays.Transformations.associateArrayOfPrimitivesByTo\n *\npublic
inline fun <K, M : MutableMap<in K, in Char>> CharArray.associateByTo(destination: M, keySelector: (Char) ->
K): M {\n  for (element in this) {\n    destination.put(keySelector(element), element)\n  }\n  return
destination\n}\n\n/**\n * Populates and returns the [destination] mutable map with key-value pairs,\n * where key is
provided by the [keySelector] function and\n * and value is provided by the [valueTransform] function applied to
elements of the given array.\n * \n * If any two elements would have the same key returned by [keySelector] the last
one gets added to the map.\n * \n * @sample
samples.collections.Arrays.Transformations.associateArrayOfPrimitivesByToWithValueTransform\n *\npublic
inline fun <T, K, V, M : MutableMap<in K, in V>> Array<out T>.associateByTo(destination: M, keySelector: (T) -
> K, valueTransform: (T) -> V): M {\n  for (element in this) {\n    destination.put(keySelector(element),
valueTransform(element))\n  }\n  return destination\n}\n\n/**\n * Populates and returns the [destination] mutable
map with key-value pairs,\n * where key is provided by the [keySelector] function and\n * and value is provided by
the [valueTransform] function applied to elements of the given array.\n * \n * If any two elements would have the
same key returned by [keySelector] the last one gets added to the map.\n * \n * @sample
samples.collections.Arrays.Transformations.associateArrayOfPrimitivesByToWithValueTransform\n *\npublic
inline fun <K, V, M : MutableMap<in K, in V>> ByteArray.associateByTo(destination: M, keySelector: (Byte) ->
K, valueTransform: (Byte) -> V): M {\n  for (element in this) {\n    destination.put(keySelector(element),
valueTransform(element))\n  }\n  return destination\n}\n\n/**\n * Populates and returns the [destination] mutable
map with key-value pairs,\n * where key is provided by the [keySelector] function and\n * and value is provided by
the [valueTransform] function applied to elements of the given array.\n * \n * If any two elements would have the
same key returned by [keySelector] the last one gets added to the map.\n * \n * @sample
samples.collections.Arrays.Transformations.associateArrayOfPrimitivesByToWithValueTransform\n *\npublic
inline fun <K, V, M : MutableMap<in K, in V>> ShortArray.associateByTo(destination: M, keySelector: (Short) ->
K, valueTransform: (Short) -> V): M {\n  for (element in this) {\n    destination.put(keySelector(element),
valueTransform(element))\n  }\n  return destination\n}\n\n/**\n * Populates and returns the [destination] mutable
map with key-value pairs,\n * where key is provided by the [keySelector] function and\n * and value is provided by
the [valueTransform] function applied to elements of the given array.\n * \n * If any two elements would have the
same key returned by [keySelector] the last one gets added to the map.\n * \n * @sample
samples.collections.Arrays.Transformations.associateArrayOfPrimitivesByToWithValueTransform\n *\npublic
inline fun <K, V, M : MutableMap<in K, in V>> IntArray.associateByTo(destination: M, keySelector: (Int) -> K,
valueTransform: (Int) -> V): M {\n  for (element in this) {\n    destination.put(keySelector(element),
valueTransform(element))\n  }\n  return destination\n}\n\n/**\n * Populates and returns the [destination] mutable
map with key-value pairs,\n * where key is provided by the [keySelector] function and\n * and value is provided by
the [valueTransform] function applied to elements of the given array.\n * \n * If any two elements would have the
same key returned by [keySelector] the last one gets added to the map.\n * \n * @sample
samples.collections.Arrays.Transformations.associateArrayOfPrimitivesByToWithValueTransform\n *\npublic

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inline fun <K, V, M : MutableMap<in K, in V>> LongArray.associateByTo(destination: M, keySelector: (Long) ->
K, valueTransform: (Long) -> V): M {\n for (element in this) {\n destination.put(keySelector(element),
valueTransform(element))\n }\n return destination}\n\n/**\n * Populates and returns the [destination] mutable
map with key-value pairs,\n * where key is provided by the [keySelector] function and\n * and value is provided by
the [valueTransform] function applied to elements of the given array.\n * \n * If any two elements would have the
same key returned by [keySelector] the last one gets added to the map.\n * \n * @sample
samples.collections.Arrays.Transformations.associateArrayOfPrimitivesByToWithValueTransform\n */\npublic
inline fun <K, V, M : MutableMap<in K, in V>> FloatArray.associateByTo(destination: M, keySelector: (Float) ->
K, valueTransform: (Float) -> V): M {\n for (element in this) {\n destination.put(keySelector(element),
valueTransform(element))\n }\n return destination}\n\n/**\n * Populates and returns the [destination] mutable
map with key-value pairs,\n * where key is provided by the [keySelector] function and\n * and value is provided by
the [valueTransform] function applied to elements of the given array.\n * \n * If any two elements would have the
same key returned by [keySelector] the last one gets added to the map.\n * \n * @sample
samples.collections.Arrays.Transformations.associateArrayOfPrimitivesByToWithValueTransform\n */\npublic
inline fun <K, V, M : MutableMap<in K, in V>> DoubleArray.associateByTo(destination: M, keySelector:
(Double) -> K, valueTransform: (Double) -> V): M {\n for (element in this) {\n
destination.put(keySelector(element), valueTransform(element))\n }\n return destination}\n\n/**\n * Populates
and returns the [destination] mutable map with key-value pairs,\n * where key is provided by the [keySelector]
function and\n * and value is provided by the [valueTransform] function applied to elements of the given array.\n *
\n * If any two elements would have the same key returned by [keySelector] the last one gets added to the map.\n *
\n * @sample samples.collections.Arrays.Transformations.associateArrayOfPrimitivesByToWithValueTransform\n
*/\npublic inline fun <K, V, M : MutableMap<in K, in V>> BooleanArray.associateByTo(destination: M,
keySelector: (Boolean) -> K, valueTransform: (Boolean) -> V): M {\n for (element in this) {\n
destination.put(keySelector(element), valueTransform(element))\n }\n return destination}\n\n/**\n * Populates
and returns the [destination] mutable map with key-value pairs,\n * where key is provided by the [keySelector]
function and\n * and value is provided by the [valueTransform] function applied to elements of the given array.\n *
\n * If any two elements would have the same key returned by [keySelector] the last one gets added to the map.\n *
\n * @sample samples.collections.Arrays.Transformations.associateArrayOfPrimitivesByToWithValueTransform\n
*/\npublic inline fun <K, V, M : MutableMap<in K, in V>> CharArray.associateByTo(destination: M, keySelector:
(Char) -> K, valueTransform: (Char) -> V): M {\n for (element in this) {\n
destination.put(keySelector(element), valueTransform(element))\n }\n return destination}\n\n/**\n * Populates
and returns the [destination] mutable map with key-value pairs\n * provided by [transform] function applied to each
element of the given array.\n * \n * If any of two pairs would have the same key the last one gets added to the
map.\n * \n * @sample samples.collections.Arrays.Transformations.associateArrayOfPrimitivesTo\n */\npublic
inline fun <T, K, V, M : MutableMap<in K, in V>> Array<out T>.associateTo(destination: M, transform: (T) ->
Pair<K, V>): M {\n for (element in this) {\n destination += transform(element)\n }\n return
destination}\n\n/**\n * Populates and returns the [destination] mutable map with key-value pairs\n * provided by
[transform] function applied to each element of the given array.\n * \n * If any of two pairs would have the same key
the last one gets added to the map.\n * \n * @sample
samples.collections.Arrays.Transformations.associateArrayOfPrimitivesTo\n */\npublic inline fun <K, V, M :
MutableMap<in K, in V>> ByteArray.associateTo(destination: M, transform: (Byte) -> Pair<K, V>): M {\n for
(element in this) {\n destination += transform(element)\n }\n return destination}\n\n/**\n * Populates and
returns the [destination] mutable map with key-value pairs\n * provided by [transform] function applied to each
element of the given array.\n * \n * If any of two pairs would have the same key the last one gets added to the
map.\n * \n * @sample samples.collections.Arrays.Transformations.associateArrayOfPrimitivesTo\n */\npublic
inline fun <K, V, M : MutableMap<in K, in V>> ShortArray.associateTo(destination: M, transform: (Short) ->
Pair<K, V>): M {\n for (element in this) {\n destination += transform(element)\n }\n return
destination}\n\n/**\n * Populates and returns the [destination] mutable map with key-value pairs\n * provided by

```

[transform] function applied to each element of the given array.

If any of two pairs would have the same key the last one gets added to the map.

@sample

```

samples.collections.Arrays.Transformations.associateArrayOfPrimitivesTo
public inline fun <K, V, M : MutableMap<in K, in V>> IntArray.associateTo(destination: M, transform: (Int) -> Pair<K, V>): M {
    for (element in this) {
        destination += transform(element)
    }
    return destination
}

```

Populates and returns the [destination] mutable map with key-value pairs provided by [transform] function applied to each element of the given array.

If any of two pairs would have the same key the last one gets added to the map.

@sample

```

samples.collections.Arrays.Transformations.associateArrayOfPrimitivesTo
public inline fun <K, V, M : MutableMap<in K, in V>> LongArray.associateTo(destination: M, transform: (Long) -> Pair<K, V>): M {
    for (element in this) {
        destination += transform(element)
    }
    return destination
}

```

Populates and returns the [destination] mutable map with key-value pairs provided by [transform] function applied to each element of the given array.

If any of two pairs would have the same key the last one gets added to the map.

@sample

```

samples.collections.Arrays.Transformations.associateArrayOfPrimitivesTo
public inline fun <K, V, M : MutableMap<in K, in V>> FloatArray.associateTo(destination: M, transform: (Float) -> Pair<K, V>): M {
    for (element in this) {
        destination += transform(element)
    }
    return destination
}

```

Populates and returns the [destination] mutable map with key-value pairs provided by [transform] function applied to each element of the given array.

If any of two pairs would have the same key the last one gets added to the map.

@sample

```

samples.collections.Arrays.Transformations.associateArrayOfPrimitivesTo
public inline fun <K, V, M : MutableMap<in K, in V>> DoubleArray.associateTo(destination: M, transform: (Double) -> Pair<K, V>): M {
    for (element in this) {
        destination += transform(element)
    }
    return destination
}

```

Populates and returns the [destination] mutable map with key-value pairs provided by [transform] function applied to each element of the given array.

If any of two pairs would have the same key the last one gets added to the map.

@sample

```

samples.collections.Arrays.Transformations.associateArrayOfPrimitivesTo
public inline fun <K, V, M : MutableMap<in K, in V>> BooleanArray.associateTo(destination: M, transform: (Boolean) -> Pair<K, V>): M {
    for (element in this) {
        destination += transform(element)
    }
    return destination
}

```

Populates and returns the [destination] mutable map with key-value pairs provided by [transform] function applied to each element of the given array.

If any of two pairs would have the same key the last one gets added to the map.

@sample

```

samples.collections.Arrays.Transformations.associateArrayOfPrimitivesTo
public inline fun <K, V, M : MutableMap<in K, in V>> CharArray.associateTo(destination: M, transform: (Char) -> Pair<K, V>): M {
    for (element in this) {
        destination += transform(element)
    }
    return destination
}

```

Returns a [Map] where keys are elements from the given array and values are produced by the [valueSelector] function applied to each element.

If any two elements are equal, the last one gets added to the map.

The returned map preserves the entry iteration order of the original array.

@sample

```

samples.collections.Collections.Transformations.associateWith
@SinceKotlin("1.4")
public inline fun <K, V> Array<out K>.associateWith(valueSelector: (K) -> V): Map<K, V> {
    val result = LinkedHashMap<K, V>(mapCapacity(size).coerceAtLeast(16))
    return associateWithTo(result, valueSelector)
}

```

Returns a [Map] where keys are elements from the given array and values are produced by the [valueSelector] function applied to each element.

If any two elements are equal, the last one gets added to the map.

The returned map preserves the entry iteration order of the original array.

@sample

```

samples.collections.Collections.Transformations.associateWith
@SinceKotlin("1.4")
@kotlin.internal.InlineOnly
public inline fun <V>
ByteArray.associateWith(valueSelector: (Byte) -> V): Map<Byte, V> {
    val result = LinkedHashMap<Byte, V>(mapCapacity(size).coerceAtLeast(16))
    return associateWithTo(result, valueSelector)
}

```

Returns a [Map] where keys are elements from the given array and values are produced by the [valueSelector] function applied to each element.

If any two elements are equal, the last one gets added to the map.

The returned map preserves the entry iteration order of the original array.

@sample


```

samples.collections.Collections.Transformations.associateWith\n
*\n@SinceKotlin("1.4")\n@kotlin.internal.InlineOnly\npublic inline fun <V>
ShortArray.associateWith(valueSelector: (Short) -> V): Map<Short, V> {\n    val result = LinkedHashMap<Short,
V>(mapCapacity(size).coerceAtLeast(16))\n    return associateWithTo(result, valueSelector)\n}\n\n/**\n * Returns a
[Map] where keys are elements from the given array and values are\n * produced by the [valueSelector] function
applied to each element.\n * \n * If any two elements are equal, the last one gets added to the map.\n * \n * The
returned map preserves the entry iteration order of the original array.\n * \n * @sample
samples.collections.Collections.Transformations.associateWith\n
*\n@SinceKotlin("1.4")\n@kotlin.internal.InlineOnly\npublic inline fun <V>
IntArray.associateWith(valueSelector: (Int) -> V): Map<Int, V> {\n    val result = LinkedHashMap<Int,
V>(mapCapacity(size).coerceAtLeast(16))\n    return associateWithTo(result, valueSelector)\n}\n\n/**\n * Returns a
[Map] where keys are elements from the given array and values are\n * produced by the [valueSelector] function
applied to each element.\n * \n * If any two elements are equal, the last one gets added to the map.\n * \n * The
returned map preserves the entry iteration order of the original array.\n * \n * @sample
samples.collections.Collections.Transformations.associateWith\n
*\n@SinceKotlin("1.4")\n@kotlin.internal.InlineOnly\npublic inline fun <V>
LongArray.associateWith(valueSelector: (Long) -> V): Map<Long, V> {\n    val result = LinkedHashMap<Long,
V>(mapCapacity(size).coerceAtLeast(16))\n    return associateWithTo(result, valueSelector)\n}\n\n/**\n * Returns a
[Map] where keys are elements from the given array and values are\n * produced by the [valueSelector] function
applied to each element.\n * \n * If any two elements are equal, the last one gets added to the map.\n * \n * The
returned map preserves the entry iteration order of the original array.\n * \n * @sample
samples.collections.Collections.Transformations.associateWith\n
*\n@SinceKotlin("1.4")\n@kotlin.internal.InlineOnly\npublic inline fun <V>
FloatArray.associateWith(valueSelector: (Float) -> V): Map<Float, V> {\n    val result = LinkedHashMap<Float,
V>(mapCapacity(size).coerceAtLeast(16))\n    return associateWithTo(result, valueSelector)\n}\n\n/**\n * Returns a
[Map] where keys are elements from the given array and values are\n * produced by the [valueSelector] function
applied to each element.\n * \n * If any two elements are equal, the last one gets added to the map.\n * \n * The
returned map preserves the entry iteration order of the original array.\n * \n * @sample
samples.collections.Collections.Transformations.associateWith\n
*\n@SinceKotlin("1.4")\n@kotlin.internal.InlineOnly\npublic inline fun <V>
DoubleArray.associateWith(valueSelector: (Double) -> V): Map<Double, V> {\n    val result =
LinkedHashMap<Double, V>(mapCapacity(size).coerceAtLeast(16))\n    return associateWithTo(result,
valueSelector)\n}\n\n/**\n * Returns a [Map] where keys are elements from the given array and values are\n *
produced by the [valueSelector] function applied to each element.\n * \n * If any two elements are equal, the last one
gets added to the map.\n * \n * The returned map preserves the entry iteration order of the original array.\n * \n *
@sample samples.collections.Collections.Transformations.associateWith\n
*\n@SinceKotlin("1.4")\n@kotlin.internal.InlineOnly\npublic inline fun <V>
BooleanArray.associateWith(valueSelector: (Boolean) -> V): Map<Boolean, V> {\n    val result =
LinkedHashMap<Boolean, V>(mapCapacity(size).coerceAtLeast(16))\n    return associateWithTo(result,
valueSelector)\n}\n\n/**\n * Returns a [Map] where keys are elements from the given array and values are\n *
produced by the [valueSelector] function applied to each element.\n * \n * If any two elements are equal, the last one
gets added to the map.\n * \n * The returned map preserves the entry iteration order of the original array.\n * \n *
@sample samples.collections.Collections.Transformations.associateWith\n
*\n@SinceKotlin("1.4")\n@kotlin.internal.InlineOnly\npublic inline fun <V>
CharArray.associateWith(valueSelector: (Char) -> V): Map<Char, V> {\n    val result = LinkedHashMap<Char,
V>(mapCapacity(size).coerceAtMost(128)).coerceAtLeast(16))\n    return associateWithTo(result,
valueSelector)\n}\n\n/**\n * Populates and returns the [destination] mutable map with key-value pairs for each
element of the given array,\n * where key is the element itself and value is provided by the [valueSelector] function

```

applied to that key.\n * \n * If any two elements are equal, the last one overwrites the former value in the map.\n * \n * @sample samples.collections.Collections.Transformations.associateWithTo\n * \n @SinceKotlin("1.4")\n public inline fun <K, V, M : MutableMap<in K, in V>> Array<out K>.associateWithTo(destination: M, valueSelector: (K) -> V): M {\n for (element in this) {\n destination.put(element, valueSelector(element))\n }\n return destination}\n\n\n * Populates and returns the [destination] mutable map with key-value pairs for each element of the given array,\n * where key is the element itself and value is provided by the [valueSelector] function applied to that key.\n * \n * If any two elements are equal, the last one overwrites the former value in the map.\n * \n * @sample samples.collections.Collections.Transformations.associateWithTo\n * \n @SinceKotlin("1.4")\n @kotlin.internal.InlineOnly\n public inline fun <V, M : MutableMap<in Byte, in V>> ByteArray.associateWithTo(destination: M, valueSelector: (Byte) -> V): M {\n for (element in this) {\n destination.put(element, valueSelector(element))\n }\n return destination}\n\n\n * Populates and returns the [destination] mutable map with key-value pairs for each element of the given array,\n * where key is the element itself and value is provided by the [valueSelector] function applied to that key.\n * \n * If any two elements are equal, the last one overwrites the former value in the map.\n * \n * @sample samples.collections.Collections.Transformations.associateWithTo\n * \n @SinceKotlin("1.4")\n @kotlin.internal.InlineOnly\n public inline fun <V, M : MutableMap<in Short, in V>> ShortArray.associateWithTo(destination: M, valueSelector: (Short) -> V): M {\n for (element in this) {\n destination.put(element, valueSelector(element))\n }\n return destination}\n\n\n * Populates and returns the [destination] mutable map with key-value pairs for each element of the given array,\n * where key is the element itself and value is provided by the [valueSelector] function applied to that key.\n * \n * If any two elements are equal, the last one overwrites the former value in the map.\n * \n * @sample samples.collections.Collections.Transformations.associateWithTo\n * \n @SinceKotlin("1.4")\n @kotlin.internal.InlineOnly\n public inline fun <V, M : MutableMap<in Int, in V>> IntArray.associateWithTo(destination: M, valueSelector: (Int) -> V): M {\n for (element in this) {\n destination.put(element, valueSelector(element))\n }\n return destination}\n\n\n * Populates and returns the [destination] mutable map with key-value pairs for each element of the given array,\n * where key is the element itself and value is provided by the [valueSelector] function applied to that key.\n * \n * If any two elements are equal, the last one overwrites the former value in the map.\n * \n * @sample samples.collections.Collections.Transformations.associateWithTo\n * \n @SinceKotlin("1.4")\n @kotlin.internal.InlineOnly\n public inline fun <V, M : MutableMap<in Long, in V>> LongArray.associateWithTo(destination: M, valueSelector: (Long) -> V): M {\n for (element in this) {\n destination.put(element, valueSelector(element))\n }\n return destination}\n\n\n * Populates and returns the [destination] mutable map with key-value pairs for each element of the given array,\n * where key is the element itself and value is provided by the [valueSelector] function applied to that key.\n * \n * If any two elements are equal, the last one overwrites the former value in the map.\n * \n * @sample samples.collections.Collections.Transformations.associateWithTo\n * \n @SinceKotlin("1.4")\n @kotlin.internal.InlineOnly\n public inline fun <V, M : MutableMap<in Float, in V>> FloatArray.associateWithTo(destination: M, valueSelector: (Float) -> V): M {\n for (element in this) {\n destination.put(element, valueSelector(element))\n }\n return destination}\n\n\n * Populates and returns the [destination] mutable map with key-value pairs for each element of the given array,\n * where key is the element itself and value is provided by the [valueSelector] function applied to that key.\n * \n * If any two elements are equal, the last one overwrites the former value in the map.\n * \n * @sample samples.collections.Collections.Transformations.associateWithTo\n * \n @SinceKotlin("1.4")\n @kotlin.internal.InlineOnly\n public inline fun <V, M : MutableMap<in Double, in V>> DoubleArray.associateWithTo(destination: M, valueSelector: (Double) -> V): M {\n for (element in this) {\n destination.put(element, valueSelector(element))\n }\n return destination}\n\n\n * Populates and returns the [destination] mutable map with key-value pairs for each element of the given array,\n * where key is the element itself and value is provided by the [valueSelector] function applied to that key.\n * \n * If any two elements are

equal, the last one overwrites the former value in the map.

```

\n * \n * @sample
samples.collections.Collections.Transformations.associateWithTo
*/
\n@SinceKotlin("1.4")\n@kotlin.internal.InlineOnly\npublic inline fun <V, M : MutableMap<in Boolean, in
V>> BooleanArray.associateWithTo(destination: M, valueSelector: (Boolean) -> V): M {\n for (element in this)
{\n destination.put(element, valueSelector(element))\n }\n return destination\n}\n\n/**\n * Populates and
returns the [destination] mutable map with key-value pairs for each element of the given array,\n * where key is the
element itself and value is provided by the [valueSelector] function applied to that key.\n * \n * If any two elements
are equal, the last one overwrites the former value in the map.\n * \n * @sample
samples.collections.Collections.Transformations.associateWithTo
*/
\n@SinceKotlin("1.4")\n@kotlin.internal.InlineOnly\npublic inline fun <V, M : MutableMap<in Char, in V>>
CharArray.associateWithTo(destination: M, valueSelector: (Char) -> V): M {\n for (element in this) {\n
destination.put(element, valueSelector(element))\n }\n return destination\n}\n\n/**\n * Appends all elements to
the given [destination] collection.\n */\npublic fun <T, C : MutableCollection<in T>> Array<out
T>.toCollection(destination: C): C {\n for (item in this) {\n destination.add(item)\n }\n return
destination\n}\n\n/**\n * Appends all elements to the given [destination] collection.\n */\npublic fun <C :
MutableCollection<in Byte>> ByteArray.toCollection(destination: C): C {\n for (item in this) {\n
destination.add(item)\n }\n return destination\n}\n\n/**\n * Appends all elements to the given [destination]
collection.\n */\npublic fun <C : MutableCollection<in Short>> ShortArray.toCollection(destination: C): C {\n for
(item in this) {\n destination.add(item)\n }\n return destination\n}\n\n/**\n * Appends all elements to the
given [destination] collection.\n */\npublic fun <C : MutableCollection<in Int>> IntArray.toCollection(destination:
C): C {\n for (item in this) {\n destination.add(item)\n }\n return destination\n}\n\n/**\n * Appends all
elements to the given [destination] collection.\n */\npublic fun <C : MutableCollection<in Long>>
LongArray.toCollection(destination: C): C {\n for (item in this) {\n destination.add(item)\n }\n return
destination\n}\n\n/**\n * Appends all elements to the given [destination] collection.\n */\npublic fun <C :
MutableCollection<in Float>> FloatArray.toCollection(destination: C): C {\n for (item in this) {\n
destination.add(item)\n }\n return destination\n}\n\n/**\n * Appends all elements to the given [destination]
collection.\n */\npublic fun <C : MutableCollection<in Double>> DoubleArray.toCollection(destination: C): C {\n
for (item in this) {\n destination.add(item)\n }\n return destination\n}\n\n/**\n * Appends all elements to the
given [destination] collection.\n */\npublic fun <C : MutableCollection<in Boolean>>
BooleanArray.toCollection(destination: C): C {\n for (item in this) {\n destination.add(item)\n }\n return
destination\n}\n\n/**\n * Appends all elements to the given [destination] collection.\n */\npublic fun <C :
MutableCollection<in Char>> CharArray.toCollection(destination: C): C {\n for (item in this) {\n
destination.add(item)\n }\n return destination\n}\n\n/**\n * Returns a new [HashSet] of all elements.\n */\n
public fun <T> Array<out T>.toHashSet(): HashSet<T> {\n return
toCollection(HashSet<T>(mapCapacity(size)))\n}\n\n/**\n * Returns a new [HashSet] of all elements.\n */\npublic
fun ByteArray.toHashSet(): HashSet<Byte> {\n return
toCollection(HashSet<Byte>(mapCapacity(size)))\n}\n\n/**\n * Returns a new [HashSet] of all elements.\n */\n
public fun ShortArray.toHashSet(): HashSet<Short> {\n return
toCollection(HashSet<Short>(mapCapacity(size)))\n}\n\n/**\n * Returns a new [HashSet] of all elements.\n */\n
public fun IntArray.toHashSet(): HashSet<Int> {\n return
toCollection(HashSet<Int>(mapCapacity(size)))\n}\n\n/**\n * Returns a new [HashSet] of all elements.\n */\n
public fun LongArray.toHashSet(): HashSet<Long> {\n return
toCollection(HashSet<Long>(mapCapacity(size)))\n}\n\n/**\n * Returns a new [HashSet] of all elements.\n */\n
public fun FloatArray.toHashSet(): HashSet<Float> {\n return
toCollection(HashSet<Float>(mapCapacity(size)))\n}\n\n/**\n * Returns a new [HashSet] of all elements.\n */\n
public fun DoubleArray.toHashSet(): HashSet<Double> {\n return
toCollection(HashSet<Double>(mapCapacity(size)))\n}\n\n/**\n * Returns a new [HashSet] of all elements.\n */\n
public fun BooleanArray.toHashSet(): HashSet<Boolean> {\n return

```

```

toCollection(HashSet<Boolean>(mapCapacity(size)))\n\n/**\n * Returns a new [HashSet] of all elements.\n */\npublic fun CharArray.toHashSet(): HashSet<Char> {\n    return\n    toCollection(HashSet<Char>(mapCapacity(size.coerceAtMost(128))))\n\n}\n\n/**\n * Returns a [List] containing all\n elements.\n */\npublic fun <T> Array<out T>.toList(): List<T> {\n    return when (size) {\n        0 -> emptyList()\n        1 -> listOf(this[0])\n        else -> this.toMutableList()\n    }\n\n}\n\n/**\n * Returns a [List] containing all\n elements.\n */\npublic fun ByteArray.toList(): List<Byte> {\n    return when (size) {\n        0 -> emptyList()\n        1 -> listOf(this[0])\n        else -> this.toMutableList()\n    }\n\n}\n\n/**\n * Returns a [List] containing all elements.\n */\npublic fun ShortArray.toList(): List<Short> {\n    return when (size) {\n        0 -> emptyList()\n        1 -> listOf(this[0])\n        else -> this.toMutableList()\n    }\n\n}\n\n/**\n * Returns a [List] containing all elements.\n */\npublic fun IntArray.toList(): List<Int> {\n    return when (size) {\n        0 -> emptyList()\n        1 -> listOf(this[0])\n        else -> this.toMutableList()\n    }\n\n}\n\n/**\n * Returns a [List] containing all elements.\n */\npublic fun LongArray.toList(): List<Long> {\n    return when (size) {\n        0 -> emptyList()\n        1 -> listOf(this[0])\n        else -> this.toMutableList()\n    }\n\n}\n\n/**\n * Returns a [List] containing all elements.\n */\npublic fun FloatArray.toList(): List<Float> {\n    return when (size) {\n        0 -> emptyList()\n        1 -> listOf(this[0])\n        else -> this.toMutableList()\n    }\n\n}\n\n/**\n * Returns a [List] containing all elements.\n */\npublic fun DoubleArray.toList(): List<Double> {\n    return when (size) {\n        0 -> emptyList()\n        1 -> listOf(this[0])\n        else -> this.toMutableList()\n    }\n\n}\n\n/**\n * Returns a [List] containing all elements.\n */\npublic fun BooleanArray.toList(): List<Boolean> {\n    return when (size) {\n        0 -> emptyList()\n        1 -> listOf(this[0])\n        else -> this.toMutableList()\n    }\n\n}\n\n/**\n * Returns a [List] containing all elements.\n */\npublic fun CharArray.toList(): List<Char> {\n    return when (size) {\n        0 -> emptyList()\n        1 -> listOf(this[0])\n        else -> this.toMutableList()\n    }\n\n}\n\n/**\n * Returns a new [MutableList] filled with all\n elements of this array.\n */\npublic fun <T> Array<out T>.toMutableList(): MutableList<T> {\n    return\n    ArrayList(this.asCollection())\n\n}\n\n/**\n * Returns a new [MutableList] filled with all elements of this array.\n */\npublic fun ByteArray.toMutableList(): MutableList<Byte> {\n    val list = ArrayList<Byte>(size)\n    for (item\n in this) list.add(item)\n    return list\n\n}\n\n/**\n * Returns a new [MutableList] filled with all elements of this\n array.\n */\npublic fun ShortArray.toMutableList(): MutableList<Short> {\n    val list = ArrayList<Short>(size)\n    for (item\n in this) list.add(item)\n    return list\n\n}\n\n/**\n * Returns a new [MutableList] filled with all elements of this\n array.\n */\npublic fun IntArray.toMutableList(): MutableList<Int> {\n    val list = ArrayList<Int>(size)\n    for (item\n in this) list.add(item)\n    return list\n\n}\n\n/**\n * Returns a new [MutableList] filled with all elements of this\n array.\n */\npublic fun LongArray.toMutableList(): MutableList<Long> {\n    val list = ArrayList<Long>(size)\n    for (item\n in this) list.add(item)\n    return list\n\n}\n\n/**\n * Returns a new [MutableList] filled with all elements of this\n array.\n */\npublic fun FloatArray.toMutableList(): MutableList<Float> {\n    val list =\n    ArrayList<Float>(size)\n    for (item\n in this) list.add(item)\n    return list\n\n}\n\n/**\n * Returns a new [MutableList]\n filled with all elements of this array.\n */\npublic fun DoubleArray.toMutableList(): MutableList<Double> {\n    val\n list = ArrayList<Double>(size)\n    for (item\n in this) list.add(item)\n    return list\n\n}\n\n/**\n * Returns a new\n [MutableList] filled with all elements of this array.\n */\npublic fun BooleanArray.toMutableList():\n    MutableList<Boolean> {\n    val list = ArrayList<Boolean>(size)\n    for (item\n in this) list.add(item)\n    return\n list\n\n}\n\n/**\n * Returns a new [MutableList] filled with all elements of this array.\n */\npublic fun\n CharArray.toMutableList(): MutableList<Char> {\n    val list = ArrayList<Char>(size)\n    for (item\n in this)\n list.add(item)\n    return list\n\n}\n\n/**\n * Returns a [Set] of all elements.\n */\n * \n * The returned set preserves the\n element iteration order of the original array.\n */\npublic fun <T> Array<out T>.toSet(): Set<T> {\n    return when\n (size) {\n        0 -> emptySet()\n        1 -> setOf(this[0])\n        else ->\n        toCollection(LinkedHashSet<T>(mapCapacity(size)))\n    }\n\n}\n\n/**\n * Returns a [Set] of all elements.\n */\n * \n * The returned set preserves the\n element iteration order of the original array.\n */\npublic fun\n ByteArray.toSet():\n Set<Byte> {\n    return when (size) {\n        0 -> emptySet()\n        1 -> setOf(this[0])\n        else ->\n        toCollection(LinkedHashSet<Byte>(mapCapacity(size)))\n    }\n\n}\n\n/**\n * Returns a [Set] of all elements.\n */\n * \n * The returned set preserves the\n element iteration order of the original array.\n */\npublic fun\n ShortArray.toSet():\n Set<Short> {\n    return when (size) {\n        0 -> emptySet()\n        1 -> setOf(this[0])\n        else ->

```

```

toCollection(LinkedHashSet<Short>(mapCapacity(size)))\n } \n\n\n\n * Returns a [Set] of all elements.\n * \n
* The returned set preserves the element iteration order of the original array.\n */\npublic fun IntArray.toSet():
Set<Int> {\n    return when (size) {\n        0 -> emptySet()\n        1 -> setOf(this[0])\n        else ->
toCollection(LinkedHashSet<Int>(mapCapacity(size)))\n } \n\n\n\n * Returns a [Set] of all elements.\n * \n
The returned set preserves the element iteration order of the original array.\n */\npublic fun LongArray.toSet():
Set<Long> {\n    return when (size) {\n        0 -> emptySet()\n        1 -> setOf(this[0])\n        else ->
toCollection(LinkedHashSet<Long>(mapCapacity(size)))\n } \n\n\n\n * Returns a [Set] of all elements.\n * \n
* The returned set preserves the element iteration order of the original array.\n */\npublic fun FloatArray.toSet():
Set<Float> {\n    return when (size) {\n        0 -> emptySet()\n        1 -> setOf(this[0])\n        else ->
toCollection(LinkedHashSet<Float>(mapCapacity(size)))\n } \n\n\n\n * Returns a [Set] of all elements.\n * \n
* The returned set preserves the element iteration order of the original array.\n */\npublic fun DoubleArray.toSet():
Set<Double> {\n    return when (size) {\n        0 -> emptySet()\n        1 -> setOf(this[0])\n        else ->
toCollection(LinkedHashSet<Double>(mapCapacity(size)))\n } \n\n\n\n * Returns a [Set] of all elements.\n * \n
\n * The returned set preserves the element iteration order of the original array.\n */\npublic fun
BooleanArray.toSet(): Set<Boolean> {\n    return when (size) {\n        0 -> emptySet()\n        1 -> setOf(this[0])\n
    else -> toCollection(LinkedHashSet<Boolean>(mapCapacity(size)))\n } \n\n\n\n * Returns a [Set] of all
elements.\n * \n * The returned set preserves the element iteration order of the original array.\n */\npublic fun
CharArray.toSet(): Set<Char> {\n    return when (size) {\n        0 -> emptySet()\n        1 -> setOf(this[0])\n        else -
> toCollection(LinkedHashSet<Char>(mapCapacity(size.coerceAtMost(128))))\n } \n\n\n\n * Returns a single
list of all elements yielded from results of [transform] function being invoked on each element of original array.\n *
\n * @sample samples.collections.Collections.Transformations.flatMap\n */\npublic inline fun <T, R> Array<out
T>.flatMap(transform: (T) -> Iterable<R>): List<R> {\n    return flatMapTo(ArrayList<R>(), transform)\n } \n\n\n\n *
Returns a single list of all elements yielded from results of [transform] function being invoked on each element of
original array.\n * \n * @sample samples.collections.Collections.Transformations.flatMap\n */\npublic inline fun
<R> ByteArray.flatMap(transform: (Byte) -> Iterable<R>): List<R> {\n    return flatMapTo(ArrayList<R>(),
transform)\n } \n\n\n\n * Returns a single list of all elements yielded from results of [transform] function being
invoked on each element of original array.\n * \n * @sample
samples.collections.Collections.Transformations.flatMap\n */\npublic inline fun <R> ShortArray.flatMap(transform:
(Short) -> Iterable<R>): List<R> {\n    return flatMapTo(ArrayList<R>(), transform)\n } \n\n\n\n * Returns a single
list of all elements yielded from results of [transform] function being invoked on each element of original array.\n *
\n * @sample samples.collections.Collections.Transformations.flatMap\n */\npublic inline fun <R>
IntArray.flatMap(transform: (Int) -> Iterable<R>): List<R> {\n    return flatMapTo(ArrayList<R>(),
transform)\n } \n\n\n\n * Returns a single list of all elements yielded from results of [transform] function being
invoked on each element of original array.\n * \n * @sample
samples.collections.Collections.Transformations.flatMap\n */\npublic inline fun <R> LongArray.flatMap(transform:
(Long) -> Iterable<R>): List<R> {\n    return flatMapTo(ArrayList<R>(), transform)\n } \n\n\n\n * Returns a single
list of all elements yielded from results of [transform] function being invoked on each element of original array.\n *
\n * @sample samples.collections.Collections.Transformations.flatMap\n */\npublic inline fun <R>
FloatArray.flatMap(transform: (Float) -> Iterable<R>): List<R> {\n    return flatMapTo(ArrayList<R>(),
transform)\n } \n\n\n\n * Returns a single list of all elements yielded from results of [transform] function being
invoked on each element of original array.\n * \n * @sample
samples.collections.Collections.Transformations.flatMap\n */\npublic inline fun <R>
DoubleArray.flatMap(transform: (Double) -> Iterable<R>): List<R> {\n    return flatMapTo(ArrayList<R>(),
transform)\n } \n\n\n\n * Returns a single list of all elements yielded from results of [transform] function being
invoked on each element of original array.\n * \n * @sample
samples.collections.Collections.Transformations.flatMap\n */\npublic inline fun <R>
BooleanArray.flatMap(transform: (Boolean) -> Iterable<R>): List<R> {\n    return flatMapTo(ArrayList<R>(),
transform)\n } \n\n\n\n * Returns a single list of all elements yielded from results of [transform] function being

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invoked on each element of original array.\n * \n * @sample

samples.collections.Collections.Transformations.flatMap\n * \n\npublic inline fun <R> CharArray.flatMap(transform: (Char) -> Iterable<R>): List<R> {\n return flatMapTo(ArrayList<R>(), transform)\n}\n\n/**\n * Returns a single list of all elements yielded from results of [transform] function being invoked on each element of original array.\n * \n * @sample samples.collections.Collections.Transformations.flatMap\n * \n\n*\n\n@SinceKotlin("1.4")\n\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n\n@OverloadResolutionByLambdaReturnType\n\n@kotlin.jvm.JvmName("flatMapSequence")\n\npublic inline fun <T, R> Array<out T>.flatMap(transform: (T) -> Sequence<R>): List<R> {\n return flatMapTo(ArrayList<R>(), transform)\n}\n\n/**\n * Returns a single list of all elements yielded from results of [transform] function being invoked on each element\n * and its index in the original array.\n * \n * @sample samples.collections.Collections.Transformations.flatMapIndexed\n * \n\n*\n\n@SinceKotlin("1.4")\n\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n\n@OverloadResolutionByLambdaReturnType\n\n@kotlin.jvm.JvmName("flatMapIndexedIterable")\n\n@kotlin.internal.InlineOnly\n\npublic inline fun <T, R> Array<out T>.flatMapIndexed(transform: (index: Int, T) -> Iterable<R>): List<R> {\n return flatMapIndexedTo(ArrayList<R>(), transform)\n}\n\n/**\n * Returns a single list of all elements yielded from results of [transform] function being invoked on each element\n * and its index in the original array.\n * \n * @sample samples.collections.Collections.Transformations.flatMapIndexed\n * \n\n*\n\n@SinceKotlin("1.4")\n\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n\n@OverloadResolutionByLambdaReturnType\n\n@kotlin.jvm.JvmName("flatMapIndexedIterable")\n\n@kotlin.internal.InlineOnly\n\npublic inline fun <R> ByteArray.flatMapIndexed(transform: (index: Int, Byte) -> Iterable<R>): List<R> {\n return flatMapIndexedTo(ArrayList<R>(), transform)\n}\n\n/**\n * Returns a single list of all elements yielded from results of [transform] function being invoked on each element\n * and its index in the original array.\n * \n * @sample samples.collections.Collections.Transformations.flatMapIndexed\n * \n\n*\n\n@SinceKotlin("1.4")\n\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n\n@OverloadResolutionByLambdaReturnType\n\n@kotlin.jvm.JvmName("flatMapIndexedIterable")\n\n@kotlin.internal.InlineOnly\n\npublic inline fun <R> ShortArray.flatMapIndexed(transform: (index: Int, Short) -> Iterable<R>): List<R> {\n return flatMapIndexedTo(ArrayList<R>(), transform)\n}\n\n/**\n * Returns a single list of all elements yielded from results of [transform] function being invoked on each element\n * and its index in the original array.\n * \n * @sample samples.collections.Collections.Transformations.flatMapIndexed\n * \n\n*\n\n@SinceKotlin("1.4")\n\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n\n@OverloadResolutionByLambdaReturnType\n\n@kotlin.jvm.JvmName("flatMapIndexedIterable")\n\n@kotlin.internal.InlineOnly\n\npublic inline fun <R> IntArray.flatMapIndexed(transform: (index: Int, Int) -> Iterable<R>): List<R> {\n return flatMapIndexedTo(ArrayList<R>(), transform)\n}\n\n/**\n * Returns a single list of all elements yielded from results of [transform] function being invoked on each element\n * and its index in the original array.\n * \n * @sample samples.collections.Collections.Transformations.flatMapIndexed\n * \n\n*\n\n@SinceKotlin("1.4")\n\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n\n@OverloadResolutionByLambdaReturnType\n\n@kotlin.jvm.JvmName("flatMapIndexedIterable")\n\n@kotlin.internal.InlineOnly\n\npublic inline fun <R> LongArray.flatMapIndexed(transform: (index: Int, Long) -> Iterable<R>): List<R> {\n return flatMapIndexedTo(ArrayList<R>(), transform)\n}\n\n/**\n * Returns a single list of all elements yielded from results of [transform] function being invoked on each element\n * and its index in the original array.\n * \n * @sample samples.collections.Collections.Transformations.flatMapIndexed\n * \n\n*\n\n@SinceKotlin("1.4")\n\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n\n@OverloadResolutionByLambdaReturnType\n\n@kotlin.jvm.JvmName("flatMapIndexedIterable")\n\n@kotlin.internal.InlineOnly\n\npublic inline fun <R> FloatArray.flatMapIndexed(transform: (index: Int, Float) -> Iterable<R>): List<R> {\n return flatMapIndexedTo(ArrayList<R>(), transform)\n}\n\n/**\n * Returns a single list of all elements yielded from results of [transform] function being invoked on each element\n * and its index in the original array.\n * \n * @sample samples.collections.Collections.Transformations.flatMapIndexed\n * \n\n*\n\n@SinceKotlin("1.4")\n\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n\n@OverloadResolution

```

ByLambdaReturnType\n@kotlin.jvm.JvmName("\flatMapIndexedIterable")\n@kotlin.internal.InlineOnly\npublic
inline fun <R> DoubleArray.flatMapIndexed(transform: (index: Int, Double) -> Iterable<R>): List<R> {\n  return
flatMapIndexedTo(ArrayList<R>(), transform)\n}\n\n/**\n * Returns a single list of all elements yielded from
results of [transform] function being invoked on each element\n * and its index in the original array.\n * \n *
@sample samples.collections.Collections.Transformations.flatMapIndexed\n
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.jvm.JvmName("\flatMapIndexedIterable")\n@kotlin.internal.InlineOnly\npublic
inline fun <R> BooleanArray.flatMapIndexed(transform: (index: Int, Boolean) -> Iterable<R>): List<R> {\n
return flatMapIndexedTo(ArrayList<R>(), transform)\n}\n\n/**\n * Returns a single list of all elements yielded
from results of [transform] function being invoked on each element\n * and its index in the original array.\n * \n *
@sample samples.collections.Collections.Transformations.flatMapIndexed\n
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.jvm.JvmName("\flatMapIndexedIterable")\n@kotlin.internal.InlineOnly\npublic
inline fun <R> CharArray.flatMapIndexed(transform: (index: Int, Char) -> Iterable<R>): List<R> {\n  return
flatMapIndexedTo(ArrayList<R>(), transform)\n}\n\n/**\n * Returns a single list of all elements yielded from
results of [transform] function being invoked on each element\n * and its index in the original array.\n * \n *
@sample samples.collections.Collections.Transformations.flatMapIndexed\n
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.jvm.JvmName("\flatMapIndexedSequence")\n@kotlin.internal.InlineOnly\npubli
c inline fun <T, R> Array<out T>.flatMapIndexed(transform: (index: Int, T) -> Sequence<R>): List<R> {\n  return
flatMapIndexedTo(ArrayList<R>(), transform)\n}\n\n/**\n * Appends all elements yielded from results of
[transform] function being invoked on each element\n * and its index in the original array, to the given
[destination].\n
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.jvm.JvmName("\flatMapIndexedIterableTo")\n@kotlin.internal.InlineOnly\npubli
c inline fun <T, R, C : MutableCollection<in R>> Array<out T>.flatMapIndexedTo(destination: C, transform:
(index: Int, T) -> Iterable<R>): C {\n  var index = 0\n  for (element in this) {\n    val list = transform(index++,
element)\n    destination.addAll(list)\n  }\n  return destination\n}\n\n/**\n * Appends all elements yielded from
results of [transform] function being invoked on each element\n * and its index in the original array, to the given
[destination].\n
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.jvm.JvmName("\flatMapIndexedIterableTo")\n@kotlin.internal.InlineOnly\npubli
c inline fun <R, C : MutableCollection<in R>> ByteArray.flatMapIndexedTo(destination: C, transform: (index: Int,
Byte) -> Iterable<R>): C {\n  var index = 0\n  for (element in this) {\n    val list = transform(index++,
element)\n    destination.addAll(list)\n  }\n  return destination\n}\n\n/**\n * Appends all elements yielded from
results of [transform] function being invoked on each element\n * and its index in the original array, to the given
[destination].\n
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.jvm.JvmName("\flatMapIndexedIterableTo")\n@kotlin.internal.InlineOnly\npubli
c inline fun <R, C : MutableCollection<in R>> ShortArray.flatMapIndexedTo(destination: C, transform: (index: Int,
Short) -> Iterable<R>): C {\n  var index = 0\n  for (element in this) {\n    val list = transform(index++,
element)\n    destination.addAll(list)\n  }\n  return destination\n}\n\n/**\n * Appends all elements yielded from
results of [transform] function being invoked on each element\n * and its index in the original array, to the given
[destination].\n
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.jvm.JvmName("\flatMapIndexedIterableTo")\n@kotlin.internal.InlineOnly\npubli
c inline fun <R, C : MutableCollection<in R>> IntArray.flatMapIndexedTo(destination: C, transform: (index: Int,
Int) -> Iterable<R>): C {\n  var index = 0\n  for (element in this) {\n    val list = transform(index++, element)\n

```

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    destination.addAll(list)\n    }\n    return destination\n}\n\n/**\n * Appends all elements yielded from results of
[transform] function being invoked on each element\n * and its index in the original array, to the given
[destination].\n
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.jvm.JvmName("flatMapIndexedIterableTo")\n@kotlin.internal.InlineOnly\npubli
c inline fun <R, C : MutableCollection<in R>> LongArray.flatMapIndexedTo(destination: C, transform: (index: Int,
Long) -> Iterable<R>): C {\n    var index = 0\n    for (element in this) {\n        val list = transform(index++,
element)\n        destination.addAll(list)\n    }\n    return destination\n}\n\n/**\n * Appends all elements yielded from
results of [transform] function being invoked on each element\n * and its index in the original array, to the given
[destination].\n
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.jvm.JvmName("flatMapIndexedIterableTo")\n@kotlin.internal.InlineOnly\npubli
c inline fun <R, C : MutableCollection<in R>> FloatArray.flatMapIndexedTo(destination: C, transform: (index: Int,
Float) -> Iterable<R>): C {\n    var index = 0\n    for (element in this) {\n        val list = transform(index++,
element)\n        destination.addAll(list)\n    }\n    return destination\n}\n\n/**\n * Appends all elements yielded from
results of [transform] function being invoked on each element\n * and its index in the original array, to the given
[destination].\n
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.jvm.JvmName("flatMapIndexedIterableTo")\n@kotlin.internal.InlineOnly\npubli
c inline fun <R, C : MutableCollection<in R>> DoubleArray.flatMapIndexedTo(destination: C, transform: (index:
Int, Double) -> Iterable<R>): C {\n    var index = 0\n    for (element in this) {\n        val list = transform(index++,
element)\n        destination.addAll(list)\n    }\n    return destination\n}\n\n/**\n * Appends all elements yielded from
results of [transform] function being invoked on each element\n * and its index in the original array, to the given
[destination].\n
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.jvm.JvmName("flatMapIndexedIterableTo")\n@kotlin.internal.InlineOnly\npubli
c inline fun <R, C : MutableCollection<in R>> BooleanArray.flatMapIndexedTo(destination: C, transform: (index:
Int, Boolean) -> Iterable<R>): C {\n    var index = 0\n    for (element in this) {\n        val list = transform(index++,
element)\n        destination.addAll(list)\n    }\n    return destination\n}\n\n/**\n * Appends all elements yielded from
results of [transform] function being invoked on each element\n * and its index in the original array, to the given
[destination].\n
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.jvm.JvmName("flatMapIndexedIterableTo")\n@kotlin.internal.InlineOnly\npubli
c inline fun <R, C : MutableCollection<in R>> CharArray.flatMapIndexedTo(destination: C, transform: (index: Int,
Char) -> Iterable<R>): C {\n    var index = 0\n    for (element in this) {\n        val list = transform(index++,
element)\n        destination.addAll(list)\n    }\n    return destination\n}\n\n/**\n * Appends all elements yielded from
results of [transform] function being invoked on each element\n * and its index in the original array, to the given
[destination].\n
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.jvm.JvmName("flatMapIndexedSequenceTo")\n@kotlin.internal.InlineOnly\npub
lic inline fun <T, R, C : MutableCollection<in R>> Array<out T>.flatMapIndexedTo(destination: C, transform:
(index: Int, T) -> Sequence<R>): C {\n    var index = 0\n    for (element in this) {\n        val list =
transform(index++, element)\n        destination.addAll(list)\n    }\n    return destination\n}\n\n/**\n * Appends all
elements yielded from results of [transform] function being invoked on each element of original array, to the given
[destination].\n
*\npublic inline fun <T, R, C : MutableCollection<in R>> Array<out T>.flatMapTo(destination: C,
transform: (T) -> Iterable<R>): C {\n    for (element in this) {\n        val list = transform(element)\n
destination.addAll(list)\n    }\n    return destination\n}\n\n/**\n * Appends all elements yielded from results of
[transform] function being invoked on each element of original array, to the given [destination].\n
*\npublic inline

```



```

fun <R, C : MutableCollection<in R>> ByteArray.flatMapTo(destination: C, transform: (Byte) -> Iterable<R>): C
{
    for (element in this) {
        val list = transform(element)
        destination.addAll(list)
    }
    return destination
}
/**
 * Appends all elements yielded from results of [transform] function being invoked on each
 * element of original array, to the given [destination].
 */
public inline fun <R, C : MutableCollection<in R>>
ShortArray.flatMapTo(destination: C, transform: (Short) -> Iterable<R>): C {
    for (element in this) {
        val
        list = transform(element)
        destination.addAll(list)
    }
    return destination
}
/**
 * Appends all
 * elements yielded from results of [transform] function being invoked on each element of original array, to the given
 * [destination].
 */
public inline fun <R, C : MutableCollection<in R>> IntArray.flatMapTo(destination: C,
transform: (Int) -> Iterable<R>): C {
    for (element in this) {
        val list = transform(element)
        destination.addAll(list)
    }
    return destination
}
/**
 * Appends all elements yielded from results of
 * [transform] function being invoked on each element of original array, to the given [destination].
 */
public inline fun <R, C : MutableCollection<in R>> LongArray.flatMapTo(destination: C, transform: (Long) -> Iterable<R>): C
{
    for (element in this) {
        val list = transform(element)
        destination.addAll(list)
    }
    return
    destination
}
/**
 * Appends all elements yielded from results of [transform] function being invoked on each
 * element of original array, to the given [destination].
 */
public inline fun <R, C : MutableCollection<in R>>
FloatArray.flatMapTo(destination: C, transform: (Float) -> Iterable<R>): C {
    for (element in this) {
        val
        list = transform(element)
        destination.addAll(list)
    }
    return destination
}
/**
 * Appends all
 * elements yielded from results of [transform] function being invoked on each element of original array, to the given
 * [destination].
 */
public inline fun <R, C : MutableCollection<in R>> DoubleArray.flatMapTo(destination: C,
transform: (Double) -> Iterable<R>): C {
    for (element in this) {
        val list = transform(element)
        destination.addAll(list)
    }
    return destination
}
/**
 * Appends all elements yielded from results of
 * [transform] function being invoked on each element of original array, to the given [destination].
 */
public inline fun <R, C : MutableCollection<in R>> BooleanArray.flatMapTo(destination: C, transform: (Boolean) ->
Iterable<R>): C {
    for (element in this) {
        val list = transform(element)
        destination.addAll(list)
    }
    return destination
}
/**
 * Appends all elements yielded from results of [transform] function being
 * invoked on each element of original array, to the given [destination].
 */
public inline fun <R, C :
MutableCollection<in R>> CharArray.flatMapTo(destination: C, transform: (Char) -> Iterable<R>): C {
    for
    (element in this) {
        val list = transform(element)
        destination.addAll(list)
    }
    return
    destination
}
/**
 * Appends all elements yielded from results of [transform] function being invoked on each
 * element of original array, to the given [destination].
 */
@SinceKotlin("1.4")
@OptIn(kotlin.experimental.ExperimentalTypeInference::class)
@OverloadResolution
ByLambdaReturnType
@kotlin.jvm.JvmName("flatMapSequenceTo")
public inline fun <T, R, C :
MutableCollection<in R>> Array<out T>.flatMapTo(destination: C, transform: (T) -> Sequence<R>): C {
    for
    (element in this) {
        val list = transform(element)
        destination.addAll(list)
    }
    return
    destination
}
/**
 * Groups elements of the original array by the key returned by the given [keySelector]
 * function
 * applied to each element and returns a map where each group key is associated with a list of
 * corresponding elements.
 */
 * The returned map preserves the entry iteration order of the keys produced from the
 * original array.
 */
@sample samples.collections.Collections.Transformations.groupBy
public inline fun
<T, K> Array<out T>.groupBy(keySelector: (T) -> K): Map<K, List<T>> {
    return
    groupByTo(LinkedHashMap<K, MutableList<T>>(), keySelector)
}
/**
 * Groups elements of the original
 * array by the key returned by the given [keySelector] function
 * applied to each element and returns a map where
 * each group key is associated with a list of corresponding elements.
 */
 * The returned map preserves the entry
 * iteration order of the keys produced from the original array.
 */
@sample
samples.collections.Collections.Transformations.groupBy
public inline fun <K>
ByteArray.groupBy(keySelector: (Byte) -> K): Map<K, List<Byte>> {
    return groupByTo(LinkedHashMap<K,
MutableList<Byte>>(), keySelector)
}
/**
 * Groups elements of the original array by the key returned by the
 * given [keySelector] function
 * applied to each element and returns a map where each group key is associated with
 * a list of corresponding elements.
 */
 * The returned map preserves the entry iteration order of the keys produced

```

from the original array.

```

@sample samples.collections.Collections.Transformations.groupBy
public inline fun <K> ShortArray.groupBy(keySelector: (Short) -> K): Map<K, List<Short>> {
    return groupByTo(LinkedHashMap<K, MutableList<Short>>(), keySelector)
}

```

Groups elements of the original array by the key returned by the given [keySelector] function applied to each element and returns a map where each group key is associated with a list of corresponding elements. The returned map preserves the entry iteration order of the keys produced from the original array.

```

@sample samples.collections.Collections.Transformations.groupBy
public inline fun <K> IntArray.groupBy(keySelector: (Int) -> K): Map<K, List<Int>> {
    return groupByTo(LinkedHashMap<K, MutableList<Int>>(), keySelector)
}

```

Groups elements of the original array by the key returned by the given [keySelector] function applied to each element and returns a map where each group key is associated with a list of corresponding elements. The returned map preserves the entry iteration order of the keys produced from the original array.

```

@sample samples.collections.Collections.Transformations.groupBy
public inline fun <K> LongArray.groupBy(keySelector: (Long) -> K): Map<K, List<Long>> {
    return groupByTo(LinkedHashMap<K, MutableList<Long>>(), keySelector)
}

```

Groups elements of the original array by the key returned by the given [keySelector] function applied to each element and returns a map where each group key is associated with a list of corresponding elements. The returned map preserves the entry iteration order of the keys produced from the original array.

```

@sample samples.collections.Collections.Transformations.groupBy
public inline fun <K> FloatArray.groupBy(keySelector: (Float) -> K): Map<K, List<Float>> {
    return groupByTo(LinkedHashMap<K, MutableList<Float>>(), keySelector)
}

```

Groups elements of the original array by the key returned by the given [keySelector] function applied to each element and returns a map where each group key is associated with a list of corresponding elements. The returned map preserves the entry iteration order of the keys produced from the original array.

```

@sample samples.collections.Collections.Transformations.groupBy
public inline fun <K> DoubleArray.groupBy(keySelector: (Double) -> K): Map<K, List<Double>> {
    return groupByTo(LinkedHashMap<K, MutableList<Double>>(), keySelector)
}

```

Groups elements of the original array by the key returned by the given [keySelector] function applied to each element and returns a map where each group key is associated with a list of corresponding elements. The returned map preserves the entry iteration order of the keys produced from the original array.

```

@sample samples.collections.Collections.Transformations.groupBy
public inline fun <K> BooleanArray.groupBy(keySelector: (Boolean) -> K): Map<K, List<Boolean>> {
    return groupByTo(LinkedHashMap<K, MutableList<Boolean>>(), keySelector)
}

```

Groups elements of the original array by the key returned by the given [keySelector] function applied to each element and returns a map where each group key is associated with a list of corresponding elements. The returned map preserves the entry iteration order of the keys produced from the original array.

```

@sample samples.collections.Collections.Transformations.groupBy
public inline fun <K> CharArray.groupBy(keySelector: (Char) -> K): Map<K, List<Char>> {
    return groupByTo(LinkedHashMap<K, MutableList<Char>>(), keySelector)
}

```

Groups values returned by the [valueTransform] function applied to each element of the original array by the key returned by the given [keySelector] function applied to the element and returns a map where each group key is associated with a list of corresponding values. The returned map preserves the entry iteration order of the keys produced from the original array.

```

@sample samples.collections.Collections.Transformations.groupByKeysAndValues
public inline fun <T, K, V> Array<out T>.groupBy(keySelector: (T) -> K, valueTransform: (T) -> V): Map<K, List<V>> {
    return groupByTo(LinkedHashMap<K, MutableList<V>>(), keySelector, valueTransform)
}

```

Groups values returned by the [valueTransform] function applied to each element of the original array by the key returned by the given [keySelector] function applied to the element and returns a map where each group key is associated with a list of corresponding values. The returned map preserves the entry iteration order of the keys produced from the original array.

```

@sample samples.collections.Collections.Transformations.groupByKeysAndValues
public inline fun <K, V>

```

```

ByteArray.groupBy(keySelector: (Byte) -> K, valueTransform: (Byte) -> V): Map<K, List<V>> {
    return groupByTo(LinkedHashMap<K, MutableList<V>>(), keySelector, valueTransform)
}

Groups values returned by the [valueTransform] function applied to each element of the original array
by the key returned by the given [keySelector] function applied to the element
and returns a map where each group key is associated with a list of corresponding values.
The returned map preserves the entry iteration order of the keys produced from the original array.
@sample
samples.collections.Collections.Transformations.groupByKeyAndValues

ShortArray.groupBy(keySelector: (Short) -> K, valueTransform: (Short) -> V): Map<K, List<V>> {
    return groupByTo(LinkedHashMap<K, MutableList<V>>(), keySelector, valueTransform)
}

Groups values returned by the [valueTransform] function applied to each element of the original array
by the key returned by the given [keySelector] function applied to the element
and returns a map where each group key is associated with a list of corresponding values.
The returned map preserves the entry iteration order of the keys produced from the original array.
@sample
samples.collections.Collections.Transformations.groupByKeyAndValues

IntArray.groupBy(keySelector: (Int) -> K, valueTransform: (Int) -> V): Map<K, List<V>> {
    return groupByTo(LinkedHashMap<K, MutableList<V>>(), keySelector, valueTransform)
}

Groups values returned by the [valueTransform] function applied to each element of the original array
by the key returned by the given [keySelector] function applied to the element
and returns a map where each group key is associated with a list of corresponding values.
The returned map preserves the entry iteration order of the keys produced from the original array.
@sample
samples.collections.Collections.Transformations.groupByKeyAndValues

LongArray.groupBy(keySelector: (Long) -> K, valueTransform: (Long) -> V): Map<K, List<V>> {
    return groupByTo(LinkedHashMap<K, MutableList<V>>(), keySelector, valueTransform)
}

Groups values returned by the [valueTransform] function applied to each element of the original array
by the key returned by the given [keySelector] function applied to the element
and returns a map where each group key is associated with a list of corresponding values.
The returned map preserves the entry iteration order of the keys produced from the original array.
@sample
samples.collections.Collections.Transformations.groupByKeyAndValues

FloatArray.groupBy(keySelector: (Float) -> K, valueTransform: (Float) -> V): Map<K, List<V>> {
    return groupByTo(LinkedHashMap<K, MutableList<V>>(), keySelector, valueTransform)
}

Groups values returned by the [valueTransform] function applied to each element of the original array
by the key returned by the given [keySelector] function applied to the element
and returns a map where each group key is associated with a list of corresponding values.
The returned map preserves the entry iteration order of the keys produced from the original array.
@sample
samples.collections.Collections.Transformations.groupByKeyAndValues

DoubleArray.groupBy(keySelector: (Double) -> K, valueTransform: (Double) -> V): Map<K, List<V>> {
    return groupByTo(LinkedHashMap<K, MutableList<V>>(), keySelector, valueTransform)
}

Groups values returned by the [valueTransform] function applied to each element of the original array
by the key returned by the given [keySelector] function applied to the element
and returns a map where each group key is associated with a list of corresponding values.
The returned map preserves the entry iteration order of the keys produced from the original array.
@sample
samples.collections.Collections.Transformations.groupByKeyAndValues

BooleanArray.groupBy(keySelector: (Boolean) -> K, valueTransform: (Boolean) -> V): Map<K, List<V>> {
    return groupByTo(LinkedHashMap<K, MutableList<V>>(), keySelector, valueTransform)
}

Groups values returned by the [valueTransform] function applied to each element of the original array
by the key returned by the given [keySelector] function applied to the element
and returns a map where each group key is associated with a list of corresponding values.
The returned map preserves the entry iteration order of the keys produced from the original array.
@sample

```

```

samples.collections.Collections.Transformations.groupByKeyAndValues\n *\npublic inline fun <K, V>
CharArray.groupBy(keySelector: (Char) -> K, valueTransform: (Char) -> V): Map<K, List<V>> {\n  return
groupByTo(LinkedHashMap<K, MutableList<V>>(), keySelector, valueTransform)\n}\n\n/**\n * Groups elements
of the original array by the key returned by the given [keySelector] function\n * applied to each element and puts to
the [destination] map each group key associated with a list of corresponding elements.\n * \n * @return The
[destination] map.\n * \n * @sample samples.collections.Collections.Transformations.groupBy\n *\npublic inline
fun <T, K, M : MutableMap<in K, MutableList<T>>> Array<out T>.groupByTo(destination: M, keySelector: (T) -
> K): M {\n  for (element in this) {\n    val key = keySelector(element)\n    val list = destination.getOrPut(key)
{ ArrayList<T>() }\n    list.add(element)\n  }\n  return destination\n}\n\n/**\n * Groups elements of the
original array by the key returned by the given [keySelector] function\n * applied to each element and puts to the
[destination] map each group key associated with a list of corresponding elements.\n * \n * @return The
[destination] map.\n * \n * @sample samples.collections.Collections.Transformations.groupBy\n *\npublic inline
fun <K, M : MutableMap<in K, MutableList<Byte>>> ByteArray.groupByTo(destination: M, keySelector: (Byte) -
> K): M {\n  for (element in this) {\n    val key = keySelector(element)\n    val list = destination.getOrPut(key)
{ ArrayList<Byte>() }\n    list.add(element)\n  }\n  return destination\n}\n\n/**\n * Groups elements of the
original array by the key returned by the given [keySelector] function\n * applied to each element and puts to the
[destination] map each group key associated with a list of corresponding elements.\n * \n * @return The
[destination] map.\n * \n * @sample samples.collections.Collections.Transformations.groupBy\n *\npublic inline
fun <K, M : MutableMap<in K, MutableList<Short>>> ShortArray.groupByTo(destination: M, keySelector: (Short)
-> K): M {\n  for (element in this) {\n    val key = keySelector(element)\n    val list =
destination.getOrPut(key) { ArrayList<Short>() }\n    list.add(element)\n  }\n  return destination\n}\n\n/**\n *
Groups elements of the original array by the key returned by the given [keySelector] function\n * applied to each
element and puts to the [destination] map each group key associated with a list of corresponding elements.\n * \n *
@return The [destination] map.\n * \n * @sample samples.collections.Collections.Transformations.groupBy\n
*\npublic inline fun <K, M : MutableMap<in K, MutableList<Int>>> IntArray.groupByTo(destination: M,
keySelector: (Int) -> K): M {\n  for (element in this) {\n    val key = keySelector(element)\n    val list =
destination.getOrPut(key) { ArrayList<Int>() }\n    list.add(element)\n  }\n  return destination\n}\n\n/**\n *
Groups elements of the original array by the key returned by the given [keySelector] function\n * applied to each
element and puts to the [destination] map each group key associated with a list of corresponding elements.\n * \n *
@return The [destination] map.\n * \n * @sample samples.collections.Collections.Transformations.groupBy\n
*\npublic inline fun <K, M : MutableMap<in K, MutableList<Long>>> LongArray.groupByTo(destination: M,
keySelector: (Long) -> K): M {\n  for (element in this) {\n    val key = keySelector(element)\n    val list =
destination.getOrPut(key) { ArrayList<Long>() }\n    list.add(element)\n  }\n  return destination\n}\n\n/**\n *
Groups elements of the original array by the key returned by the given [keySelector] function\n * applied to each
element and puts to the [destination] map each group key associated with a list of corresponding elements.\n * \n *
@return The [destination] map.\n * \n * @sample samples.collections.Collections.Transformations.groupBy\n
*\npublic inline fun <K, M : MutableMap<in K, MutableList<Float>>> FloatArray.groupByTo(destination: M,
keySelector: (Float) -> K): M {\n  for (element in this) {\n    val key = keySelector(element)\n    val list =
destination.getOrPut(key) { ArrayList<Float>() }\n    list.add(element)\n  }\n  return destination\n}\n\n/**\n *
Groups elements of the original array by the key returned by the given [keySelector] function\n * applied to each
element and puts to the [destination] map each group key associated with a list of corresponding elements.\n * \n *
@return The [destination] map.\n * \n * @sample samples.collections.Collections.Transformations.groupBy\n
*\npublic inline fun <K, M : MutableMap<in K, MutableList<Double>>> DoubleArray.groupByTo(destination: M,
keySelector: (Double) -> K): M {\n  for (element in this) {\n    val key = keySelector(element)\n    val list =
destination.getOrPut(key) { ArrayList<Double>() }\n    list.add(element)\n  }\n  return destination\n}\n\n/**\n *
Groups elements of the original array by the key returned by the given [keySelector] function\n * applied to each
element and puts to the [destination] map each group key associated with a list of corresponding elements.\n * \n *
@return The [destination] map.\n * \n * @sample samples.collections.Collections.Transformations.groupBy\n

```

```

*public inline fun <K, M : MutableMap<in K, MutableList<Boolean>>> BooleanArray.groupByTo(destination:
M, keySelector: (Boolean) -> K): M {
    for (element in this) {
        val key = keySelector(element)
        val list = destination.getOrPut(key) { ArrayList<Boolean>() }
        list.add(element)
    }
    return destination
}

* Groups elements of the original array by the key returned by the given [keySelector]
function * applied to each element and puts to the [destination] map each group key associated with a list of
corresponding elements.
* @return The [destination] map.
* @sample
samples.collections.Collections.Transformations.groupBy

*public inline fun <K, M : MutableMap<in K,
MutableList<Char>>> CharArray.groupByTo(destination: M, keySelector: (Char) -> K): M {
    for (element in
this) {
        val key = keySelector(element)
        val list = destination.getOrPut(key) { ArrayList<Char>() }
        list.add(element)
    }
    return destination
}

* Groups values returned by the [valueTransform] function
applied to each element of the original array * by the key returned by the given [keySelector] function applied to
the element * and puts to the [destination] map each group key associated with a list of corresponding values.
* @return The [destination] map.
* @sample
samples.collections.Collections.Transformations.groupByKeysAndValues

*public inline fun <T, K, V, M :
MutableMap<in K, MutableList<V>>> Array<out T>.groupByTo(destination: M, keySelector: (T) -> K,
valueTransform: (T) -> V): M {
    for (element in this) {
        val key = keySelector(element)
        val list = destination.getOrPut(key) { ArrayList<V>() }
        list.add(valueTransform(element))
    }
    return destination
}

* Groups values returned by the [valueTransform] function applied to each element of the
original array * by the key returned by the given [keySelector] function applied to the element * and puts to the
[destination] map each group key associated with a list of corresponding values.
* @return The [destination]
map.
* @sample
samples.collections.Collections.Transformations.groupByKeysAndValues

*public
inline fun <K, V, M : MutableMap<in K, MutableList<V>>> ByteArray.groupByTo(destination: M, keySelector:
(Byte) -> K, valueTransform: (Byte) -> V): M {
    for (element in this) {
        val key = keySelector(element)
        val list = destination.getOrPut(key) { ArrayList<V>() }
        list.add(valueTransform(element))
    }
    return destination
}

* Groups values returned by the [valueTransform] function applied to each element of the
original array * by the key returned by the given [keySelector] function applied to the element * and puts to the
[destination] map each group key associated with a list of corresponding values.
* @return The [destination]
map.
* @sample
samples.collections.Collections.Transformations.groupByKeysAndValues

*public
inline fun <K, V, M : MutableMap<in K, MutableList<V>>> ShortArray.groupByTo(destination: M, keySelector:
(Short) -> K, valueTransform: (Short) -> V): M {
    for (element in this) {
        val key = keySelector(element)
        val list = destination.getOrPut(key) { ArrayList<V>() }
        list.add(valueTransform(element))
    }
    return destination
}

* Groups values returned by the [valueTransform] function applied to each element of the
original array * by the key returned by the given [keySelector] function applied to the element * and puts to the
[destination] map each group key associated with a list of corresponding values.
* @return The [destination]
map.
* @sample
samples.collections.Collections.Transformations.groupByKeysAndValues

*public
inline fun <K, V, M : MutableMap<in K, MutableList<V>>> IntArray.groupByTo(destination: M, keySelector:
(Int) -> K, valueTransform: (Int) -> V): M {
    for (element in this) {
        val key = keySelector(element)
        val list = destination.getOrPut(key) { ArrayList<V>() }
        list.add(valueTransform(element))
    }
    return destination
}

* Groups values returned by the [valueTransform] function applied to each element of the
original array * by the key returned by the given [keySelector] function applied to the element * and puts to the
[destination] map each group key associated with a list of corresponding values.
* @return The [destination]
map.
* @sample
samples.collections.Collections.Transformations.groupByKeysAndValues

*public
inline fun <K, V, M : MutableMap<in K, MutableList<V>>> LongArray.groupByTo(destination: M, keySelector:
(Long) -> K, valueTransform: (Long) -> V): M {
    for (element in this) {
        val key = keySelector(element)
        val list = destination.getOrPut(key) { ArrayList<V>() }
        list.add(valueTransform(element))
    }
    return destination
}

* Groups values returned by the [valueTransform] function applied to each element of the
original array * by the key returned by the given [keySelector] function applied to the element * and puts to the
[destination] map each group key associated with a list of corresponding values.
* @return The [destination]

```

```

map.\n * \n * @sample samples.collections.Collections.Transformations.groupByKeyAndValues\n *^\npublic
inline fun <K, V, M : MutableMap<in K, MutableList<V>>> FloatArray.groupByTo(destination: M, keySelector:
(Float) -> K, valueTransform: (Float) -> V): M {\n for (element in this) {\n val key = keySelector(element)\n
val list = destination.getOrPut(key) { ArrayList<V>() }\n list.add(valueTransform(element))\n }\n return
destination\n}\n\n/**\n * Groups values returned by the [valueTransform] function applied to each element of the
original array\n * by the key returned by the given [keySelector] function applied to the element\n * and puts to the
[destination] map each group key associated with a list of corresponding values.\n * \n * @return The [destination]
map.\n * \n * @sample samples.collections.Collections.Transformations.groupByKeyAndValues\n *^\npublic
inline fun <K, V, M : MutableMap<in K, MutableList<V>>> DoubleArray.groupByTo(destination: M, keySelector:
(Double) -> K, valueTransform: (Double) -> V): M {\n for (element in this) {\n val key =
keySelector(element)\n val list = destination.getOrPut(key) { ArrayList<V>() }\n
list.add(valueTransform(element))\n }\n return destination\n}\n\n/**\n * Groups values returned by the
[valueTransform] function applied to each element of the original array\n * by the key returned by the given
[keySelector] function applied to the element\n * and puts to the [destination] map each group key associated with a
list of corresponding values.\n * \n * @return The [destination] map.\n * \n * @sample
samples.collections.Collections.Transformations.groupByKeyAndValues\n *^\npublic inline fun <K, V, M :
MutableMap<in K, MutableList<V>>> BooleanArray.groupByTo(destination: M, keySelector: (Boolean) -> K,
valueTransform: (Boolean) -> V): M {\n for (element in this) {\n val key = keySelector(element)\n val list
= destination.getOrPut(key) { ArrayList<V>() }\n list.add(valueTransform(element))\n }\n return
destination\n}\n\n/**\n * Groups values returned by the [valueTransform] function applied to each element of the
original array\n * by the key returned by the given [keySelector] function applied to the element\n * and puts to the
[destination] map each group key associated with a list of corresponding values.\n * \n * @return The [destination]
map.\n * \n * @sample samples.collections.Collections.Transformations.groupByKeyAndValues\n *^\npublic
inline fun <K, V, M : MutableMap<in K, MutableList<V>>> CharArray.groupByTo(destination: M, keySelector:
(Char) -> K, valueTransform: (Char) -> V): M {\n for (element in this) {\n val key = keySelector(element)\n
val list = destination.getOrPut(key) { ArrayList<V>() }\n list.add(valueTransform(element))\n }\n return
destination\n}\n\n/**\n * Creates a [Grouping] source from an array to be used later with one of group-and-fold
operations\n * using the specified [keySelector] function to extract a key from each element.\n * \n * @sample
samples.collections.Grouping.groupingByEachCount\n *^\n@SinceKotlin("1.1")\npublic inline fun <T, K>
Array<out T>.groupingBy(crossinline keySelector: (T) -> K): Grouping<T, K> {\n return object : Grouping<T,
K> {\n override fun sourceIterator(): Iterator<T> = this@groupingBy.iterator()\n override fun
keyOf(element: T): K = keySelector(element)\n }\n}\n\n/**\n * Returns a list containing the results of applying
the given [transform] function\n * to each element in the original array.\n * \n * @sample
samples.collections.Collections.Transformations.map\n *^\npublic inline fun <T, R> Array<out T>.map(transform:
(T) -> R): List<R> {\n return mapTo(ArrayList<R>(size), transform)\n}\n\n/**\n * Returns a list containing the
results of applying the given [transform] function\n * to each element in the original array.\n * \n * @sample
samples.collections.Collections.Transformations.map\n *^\npublic inline fun <R> ByteArray.map(transform: (Byte)
-> R): List<R> {\n return mapTo(ArrayList<R>(size), transform)\n}\n\n/**\n * Returns a list containing the
results of applying the given [transform] function\n * to each element in the original array.\n * \n * @sample
samples.collections.Collections.Transformations.map\n *^\npublic inline fun <R> ShortArray.map(transform:
(Short) -> R): List<R> {\n return mapTo(ArrayList<R>(size), transform)\n}\n\n/**\n * Returns a list containing
the results of applying the given [transform] function\n * to each element in the original array.\n * \n * @sample
samples.collections.Collections.Transformations.map\n *^\npublic inline fun <R> IntArray.map(transform: (Int) ->
R): List<R> {\n return mapTo(ArrayList<R>(size), transform)\n}\n\n/**\n * Returns a list containing the results
of applying the given [transform] function\n * to each element in the original array.\n * \n * @sample
samples.collections.Collections.Transformations.map\n *^\npublic inline fun <R> LongArray.map(transform:
(Long) -> R): List<R> {\n return mapTo(ArrayList<R>(size), transform)\n}\n\n/**\n * Returns a list containing
the results of applying the given [transform] function\n * to each element in the original array.\n * \n * @sample

```

`samples.collections.Collections.Transformations.map`
`\n * \n public inline fun <R> FloatArray.map(transform: (Float) -> R): List<R> { \n return mapTo(ArrayList<R>(size), transform)\n } \n \n /** \n * Returns a list containing the results of applying the given [transform] function \n * to each element in the original array. \n * \n * @sample`

`samples.collections.Collections.Transformations.map`
`\n * \n public inline fun <R> DoubleArray.map(transform: (Double) -> R): List<R> { \n return mapTo(ArrayList<R>(size), transform)\n } \n \n /** \n * Returns a list containing the results of applying the given [transform] function \n * to each element in the original array. \n * \n * @sample`

`samples.collections.Collections.Transformations.map`
`\n * \n public inline fun <R> BooleanArray.map(transform: (Boolean) -> R): List<R> { \n return mapTo(ArrayList<R>(size), transform)\n } \n \n /** \n * Returns a list containing the results of applying the given [transform] function \n * to each element in the original array. \n * \n * @sample`

`samples.collections.Collections.Transformations.map`
`\n * \n public inline fun <R> CharArray.map(transform: (Char) -> R): List<R> { \n return mapTo(ArrayList<R>(size), transform)\n } \n \n /** \n * Returns a list containing the results of applying the given [transform] function \n * to each element and its index in the original array. \n * @param [transform] function that takes the index of an element and the element itself \n * and returns the result of the transform applied to the element. \n * \n public inline fun <T, R> Array<out T>.mapIndexed(transform: (index: Int, T) -> R): List<R> { \n return mapIndexedTo(ArrayList<R>(size), transform)\n } \n \n /** \n * Returns a list containing the results of applying the given [transform] function \n * to each element and its index in the original array. \n * @param [transform] function that takes the index of an element and the element itself \n * and returns the result of the transform applied to the element. \n * \n public inline fun <R> ShortArray.mapIndexed(transform: (index: Int, Short) -> R): List<R> { \n return mapIndexedTo(ArrayList<R>(size), transform)\n } \n \n /** \n * Returns a list containing the results of applying the given [transform] function \n * to each element and its index in the original array. \n * @param [transform] function that takes the index of an element and the element itself \n * and returns the result of the transform applied to the element. \n * \n public inline fun <R> IntArray.mapIndexed(transform: (index: Int, Int) -> R): List<R> { \n return mapIndexedTo(ArrayList<R>(size), transform)\n } \n \n /** \n * Returns a list containing the results of applying the given [transform] function \n * to each element and its index in the original array. \n * @param [transform] function that takes the index of an element and the element itself \n * and returns the result of the transform applied to the element. \n * \n public inline fun <R> LongArray.mapIndexed(transform: (index: Int, Long) -> R): List<R> { \n return mapIndexedTo(ArrayList<R>(size), transform)\n } \n \n /** \n * Returns a list containing the results of applying the given [transform] function \n * to each element and its index in the original array. \n * @param [transform] function that takes the index of an element and the element itself \n * and returns the result of the transform applied to the element. \n * \n public inline fun <R> FloatArray.mapIndexed(transform: (index: Int, Float) -> R): List<R> { \n return mapIndexedTo(ArrayList<R>(size), transform)\n } \n \n /** \n * Returns a list containing the results of applying the given [transform] function \n * to each element and its index in the original array. \n * @param [transform] function that takes the index of an element and the element itself \n * and returns the result of the transform applied to the element. \n * \n public inline fun <R> DoubleArray.mapIndexed(transform: (index: Int, Double) -> R): List<R> { \n return mapIndexedTo(ArrayList<R>(size), transform)\n } \n \n /** \n * Returns a list containing the results of applying the given [transform] function \n * to each element and its index in the original array. \n * @param [transform] function that takes the index of an element and the element itself \n * and returns the result of the transform applied to the element. \n * \n public inline fun <R> BooleanArray.mapIndexed(transform: (index: Int, Boolean) -> R): List<R> { \n return mapIndexedTo(ArrayList<R>(size), transform)\n } \n \n /** \n * Returns a list containing the results of applying the given [transform] function \n * to each element and its index in the original array. \n * @param [transform] function that takes the index of an element and the element itself \n * and returns the result of the transform applied to the element. \n * \n public inline fun <R> CharArray.mapIndexed(transform: (index: Int, Char) -> R): List<R> { \n return`

`mapIndexedTo(ArrayList<R>(size), transform)`

Returns a list containing only the non-null results of applying the given [transform] function to each element and its index in the original array.

@param [transform] function that takes the index of an element and the element itself and returns the result of the transform applied to the element.

```

public inline fun <T, R : Any> Array<out T>.mapIndexedNotNull(transform: (index: Int, T) -> R?): List<R> {
    return mapIndexedNotNullTo(ArrayList<R>(), transform)
}

```

`mapIndexedNotNullTo(ArrayList<R>(), transform)`

Applies the given [transform] function to each element and its index in the original array and appends only the non-null results to the given [destination].

@param [transform] function that takes the index of an element and the element itself and returns the result of the transform applied to the element.

```

public inline fun <T, R : Any, C : MutableCollection<in R>> Array<out T>.mapIndexedNotNullTo(destination: C, transform: (index: Int, T) -> R?): C {
    forEachIndexed { index, element -> transform(index, element)?.let { destination.add(it) } }
    return destination
}

```

`mapIndexedNotNullTo(destination: C, transform: (index: Int, T) -> R?)`

Applies the given [transform] function to each element and its index in the original array and appends the results to the given [destination].

@param [transform] function that takes the index of an element and the element itself and returns the result of the transform applied to the element.

```

public inline fun <T, R, C : MutableCollection<in R>> Array<out T>.mapIndexedTo(destination: C, transform: (index: Int, T) -> R): C {
    var index = 0
    for (item in this)
        destination.add(transform(index++, item))
    return destination
}

```

`mapIndexedTo(destination: C, transform: (index: Int, T) -> R)`

Applies the given [transform] function to each element and its index in the original array and appends the results to the given [destination].

@param [transform] function that takes the index of an element and the element itself and returns the result of the transform applied to the element.

```

public inline fun <R, C : MutableCollection<in R>> ByteArray.mapIndexedTo(destination: C, transform: (index: Int, Byte) -> R): C {
    var index = 0
    for (item in this)
        destination.add(transform(index++, item))
    return destination
}

```

`mapIndexedTo(destination: C, transform: (index: Int, Byte) -> R)`

Applies the given [transform] function to each element and its index in the original array and appends the results to the given [destination].

@param [transform] function that takes the index of an element and the element itself and returns the result of the transform applied to the element.

```

public inline fun <R, C : MutableCollection<in R>> ShortArray.mapIndexedTo(destination: C, transform: (index: Int, Short) -> R): C {
    var index = 0
    for (item in this)
        destination.add(transform(index++, item))
    return destination
}

```

`mapIndexedTo(destination: C, transform: (index: Int, Short) -> R)`

Applies the given [transform] function to each element and its index in the original array and appends the results to the given [destination].

@param [transform] function that takes the index of an element and the element itself and returns the result of the transform applied to the element.

```

public inline fun <R, C : MutableCollection<in R>> IntArray.mapIndexedTo(destination: C, transform: (index: Int, Int) -> R): C {
    var index = 0
    for (item in this)
        destination.add(transform(index++, item))
    return destination
}

```

`mapIndexedTo(destination: C, transform: (index: Int, Int) -> R)`

Applies the given [transform] function to each element and its index in the original array and appends the results to the given [destination].

@param [transform] function that takes the index of an element and the element itself and returns the result of the transform applied to the element.

```

public inline fun <R, C : MutableCollection<in R>> LongArray.mapIndexedTo(destination: C, transform: (index: Int, Long) -> R): C {
    var index = 0
    for (item in this)
        destination.add(transform(index++, item))
    return destination
}

```

`mapIndexedTo(destination: C, transform: (index: Int, Long) -> R)`

Applies the given [transform] function to each element and its index in the original array and appends the results to the given [destination].

@param [transform] function that takes the index of an element and the element itself and returns the result of the transform applied to the element.

```

public inline fun <R, C : MutableCollection<in R>> FloatArray.mapIndexedTo(destination: C, transform: (index: Int, Float) -> R): C {
    var index = 0
    for (item in this)
        destination.add(transform(index++, item))
    return destination
}

```

`mapIndexedTo(destination: C, transform: (index: Int, Float) -> R)`

Applies the given [transform] function to each element and its index in the original array and appends the results to the given [destination].

@param [transform] function that takes the index of an element and the element itself and returns the result of the transform applied to the element.

```

public inline fun <R, C : MutableCollection<in R>> DoubleArray.mapIndexedTo(destination: C, transform: (index: Int, Double) -> R): C {
    var index = 0
    for (item in this)
        destination.add(transform(index++, item))
    return destination
}

```

`mapIndexedTo(destination: C, transform: (index: Int, Double) -> R)`

Applies the given [transform] function to each element and its index in the original array and appends the results to the given [destination].

@param [transform] function that takes the index of an element and the element itself and

returns the result of the transform applied to the element.

```

public inline fun <R, C : MutableCollection<in R>>
BooleanArray.mapIndexedTo(destination: C, transform: (index: Int, Boolean) -> R): C {
    var index = 0
    for (item in this)
        destination.add(transform(index++, item))
    return destination
}

```

* Applies the given [transform] function to each element and its index in the original array and appends the results to the given [destination].

@param [transform] function that takes the index of an element and the element itself and returns the result of the transform applied to the element.

```

public inline fun <R, C : MutableCollection<in R>>
CharArray.mapIndexedTo(destination: C, transform: (index: Int, Char) -> R): C {
    var index = 0
    for (item in this)
        destination.add(transform(index++, item))
    return destination
}

```

* Returns a list containing only the non-null results of applying the given [transform] function to each element in the original array.

@sample samples.collections.Collections.Transformations.mapNotNull

```

public inline fun <T, R : Any>
Array<out T>.mapNotNull(transform: (T) -> R?): List<R> {
    return mapNotNullTo(ArrayList<R>(),
transform)
}

```

* Applies the given [transform] function to each element in the original array and appends only the non-null results to the given [destination].

```

public inline fun <T, R : Any, C :
MutableCollection<in R>>
Array<out T>.mapNotNullTo(destination: C, transform: (T) -> R?): C {
    forEach {
        element -> transform(element)?.let { destination.add(it) }
    }
    return destination
}

```

* Applies the given [transform] function to each element of the original array and appends the results to the given [destination].

```

public inline fun <T, R, C : MutableCollection<in R>>
Array<out T>.mapTo(destination: C, transform: (T) ->
R): C {
    for (item in this)
        destination.add(transform(item))
    return destination
}

```

* Applies the given [transform] function to each element of the original array and appends the results to the given [destination].

```

public inline fun <R, C : MutableCollection<in R>>
ByteArray.mapTo(destination: C,
transform: (Byte) -> R): C {
    for (item in this)
        destination.add(transform(item))
    return
destination
}

```

* Applies the given [transform] function to each element of the original array and appends the results to the given [destination].

```

public inline fun <R, C : MutableCollection<in R>>
ShortArray.mapTo(destination: C, transform: (Short) -> R): C {
    for (item in this)
destination.add(transform(item))
    return destination
}

```

* Applies the given [transform] function to each element of the original array and appends the results to the given [destination].

```

public inline fun <R, C :
MutableCollection<in R>>
IntArray.mapTo(destination: C, transform: (Int) -> R): C {
    for (item in this)
destination.add(transform(item))
    return destination
}

```

* Applies the given [transform] function to each element of the original array and appends the results to the given [destination].

```

public inline fun <R, C :
MutableCollection<in R>>
LongArray.mapTo(destination: C, transform: (Long) -> R): C {
    for (item in this)
        destination.add(transform(item))
    return destination
}

```

* Applies the given [transform] function to each element of the original array and appends the results to the given [destination].

```

public inline fun <R,
C : MutableCollection<in R>>
FloatArray.mapTo(destination: C, transform: (Float) -> R): C {
    for (item in
this)
        destination.add(transform(item))
    return destination
}

```

* Applies the given [transform] function to each element of the original array and appends the results to the given [destination].

```

public inline fun <R, C : MutableCollection<in R>>
DoubleArray.mapTo(destination: C, transform: (Double) -> R): C {
    for (item in this)
        destination.add(transform(item))
    return destination
}

```

* Applies the given [transform] function to each element of the original array and appends the results to the given [destination].

```

public inline fun <R, C : MutableCollection<in R>>
BooleanArray.mapTo(destination: C, transform: (Boolean)
-> R): C {
    for (item in this)
        destination.add(transform(item))
    return destination
}

```

* Applies the given [transform] function to each element of the original array and appends the results to the given [destination].

```

public inline fun <R, C : MutableCollection<in R>>
CharArray.mapTo(destination: C,
transform: (Char) -> R): C {
    for (item in this)
        destination.add(transform(item))
    return
destination
}

```

* Returns a lazy [Iterable] that wraps each element of the original array into an [IndexedValue] containing the index of that element and the element itself.

```

public fun <T> Array<out T>.withIndex(): Iterable<IndexedValue<T>> {
    return IndexingIterable { iterator() }
}

```

* Returns a lazy [Iterable] that wraps each element of the original array into an [IndexedValue] containing the index of that element and the element itself.

```

public fun ByteArray.withIndex(): Iterable<IndexedValue<Byte>> {
    return
}

```



```

elements from the given array.\n * \n * The elements in the resulting list are in the same order as they were in the
source array.\n * \n * @sample samples.collections.Collections.Transformations.distinctAndDistinctBy\n *^\npublic
fun CharArray.distinct(): List<Char> {\n    return this.toMutableSet().toList()\n}\n\n/**\n * Returns a list containing
only elements from the given array\n * having distinct keys returned by the given [selector] function.\n * \n *
Among elements of the given array with equal keys, only the first one will be present in the resulting list.\n * The
elements in the resulting list are in the same order as they were in the source array.\n * \n * @sample
samples.collections.Collections.Transformations.distinctAndDistinctBy\n *^\npublic inline fun <T, K> Array<out
T>.distinctBy(selector: (T) -> K): List<T> {\n    val set = HashSet<K>()\n    val list = ArrayList<T>()\n    for (e in
this) {\n        val key = selector(e)\n        if (set.add(key))\n            list.add(e)\n    }\n    return list\n}\n\n/**\n *
Returns a list containing only elements from the given array\n * having distinct keys returned by the given [selector]
function.\n * \n * The elements in the resulting list are in the same order as they were in the source array.\n * \n *
@sample samples.collections.Collections.Transformations.distinctAndDistinctBy\n *^\npublic inline fun <K>
ByteArray.distinctBy(selector: (Byte) -> K): List<Byte> {\n    val set = HashSet<K>()\n    val list =
ArrayList<Byte>()\n    for (e in this) {\n        val key = selector(e)\n        if (set.add(key))\n            list.add(e)\n    }\n
return list\n}\n\n/**\n * Returns a list containing only elements from the given array\n * having distinct keys
returned by the given [selector] function.\n * \n * The elements in the resulting list are in the same order as they
were in the source array.\n * \n * @sample
samples.collections.Collections.Transformations.distinctAndDistinctBy\n *^\npublic inline fun <K>
ShortArray.distinctBy(selector: (Short) -> K): List<Short> {\n    val set = HashSet<K>()\n    val list =
ArrayList<Short>()\n    for (e in this) {\n        val key = selector(e)\n        if (set.add(key))\n            list.add(e)\n    }\n
return list\n}\n\n/**\n * Returns a list containing only elements from the given array\n * having distinct keys
returned by the given [selector] function.\n * \n * The elements in the resulting list are in the same order as they
were in the source array.\n * \n * @sample
samples.collections.Collections.Transformations.distinctAndDistinctBy\n *^\npublic inline fun <K>
IntArray.distinctBy(selector: (Int) -> K): List<Int> {\n    val set = HashSet<K>()\n    val list = ArrayList<Int>()\n
for (e in this) {\n        val key = selector(e)\n        if (set.add(key))\n            list.add(e)\n    }\n    return list\n}\n\n/**\n *
Returns a list containing only elements from the given array\n * having distinct keys returned by the given
[selector] function.\n * \n * The elements in the resulting list are in the same order as they were in the source
array.\n * \n * @sample samples.collections.Collections.Transformations.distinctAndDistinctBy\n *^\npublic inline
fun <K> LongArray.distinctBy(selector: (Long) -> K): List<Long> {\n    val set = HashSet<K>()\n    val list =
ArrayList<Long>()\n    for (e in this) {\n        val key = selector(e)\n        if (set.add(key))\n            list.add(e)\n    }\n
return list\n}\n\n/**\n * Returns a list containing only elements from the given array\n * having distinct keys
returned by the given [selector] function.\n * \n * The elements in the resulting list are in the same order as they
were in the source array.\n * \n * @sample
samples.collections.Collections.Transformations.distinctAndDistinctBy\n *^\npublic inline fun <K>
FloatArray.distinctBy(selector: (Float) -> K): List<Float> {\n    val set = HashSet<K>()\n    val list =
ArrayList<Float>()\n    for (e in this) {\n        val key = selector(e)\n        if (set.add(key))\n            list.add(e)\n    }\n
return list\n}\n\n/**\n * Returns a list containing only elements from the given array\n * having distinct keys
returned by the given [selector] function.\n * \n * The elements in the resulting list are in the same order as they
were in the source array.\n * \n * @sample
samples.collections.Collections.Transformations.distinctAndDistinctBy\n *^\npublic inline fun <K>
DoubleArray.distinctBy(selector: (Double) -> K): List<Double> {\n    val set = HashSet<K>()\n    val list =
ArrayList<Double>()\n    for (e in this) {\n        val key = selector(e)\n        if (set.add(key))\n            list.add(e)\n    }\n
return list\n}\n\n/**\n * Returns a list containing only elements from the given array\n * having distinct keys
returned by the given [selector] function.\n * \n * The elements in the resulting list are in the same order as they
were in the source array.\n * \n * @sample
samples.collections.Collections.Transformations.distinctAndDistinctBy\n *^\npublic inline fun <K>
BooleanArray.distinctBy(selector: (Boolean) -> K): List<Boolean> {\n    val set = HashSet<K>()\n    val list =

```

```

ArrayList<Boolean>() for (e in this) {\n    val key = selector(e)\n    if (set.add(key))\n        list.add(e)\n }\n return list\n}\n\n/**\n * Returns a list containing only elements from the given array\n * having distinct keys returned by the given [selector] function.\n * \n * The elements in the resulting list are in the same order as they were in the source array.\n * \n * @sample\n samples.collections.Collections.Transformations.distinctAndDistinctBy\n */\npublic inline fun <K>\n CharArray.distinctBy(selector: (Char) -> K): List<Char> {\n    val set = HashSet<K>()\n    val list = ArrayList<Char>()\n    for (e in this) {\n        val key = selector(e)\n        if (set.add(key))\n            list.add(e)\n    }\n    return list\n}\n\n/**\n * Returns a set containing all elements that are contained by both this array and the specified collection.\n * \n * The returned set preserves the element iteration order of the original array.\n * \n * To get a set containing all elements that are contained at least in one of these collections use [union].\n */\npublic infix fun <T>\n Array<out T>.intersect(other: Iterable<T>): Set<T> {\n    val set = this.toMutableSet()\n    set.retainAll(other)\n    return set\n}\n\n/**\n * Returns a set containing all elements that are contained by both this array and the specified collection.\n * \n * The returned set preserves the element iteration order of the original array.\n * \n * To get a set containing all elements that are contained at least in one of these collections use [union].\n */\npublic infix fun\n ByteArray.intersect(other: Iterable<Byte>): Set<Byte> {\n    val set = this.toMutableSet()\n    set.retainAll(other)\n    return set\n}\n\n/**\n * Returns a set containing all elements that are contained by both this array and the specified collection.\n * \n * The returned set preserves the element iteration order of the original array.\n * \n * To get a set containing all elements that are contained at least in one of these collections use [union].\n */\npublic infix fun\n ShortArray.intersect(other: Iterable<Short>): Set<Short> {\n    val set = this.toMutableSet()\n    set.retainAll(other)\n    return set\n}\n\n/**\n * Returns a set containing all elements that are contained by both this array and the specified collection.\n * \n * The returned set preserves the element iteration order of the original array.\n * \n * To get a set containing all elements that are contained at least in one of these collections use [union].\n */\npublic infix fun\n IntArray.intersect(other: Iterable<Int>): Set<Int> {\n    val set = this.toMutableSet()\n    set.retainAll(other)\n    return set\n}\n\n/**\n * Returns a set containing all elements that are contained by both this array and the specified collection.\n * \n * The returned set preserves the element iteration order of the original array.\n * \n * To get a set containing all elements that are contained at least in one of these collections use [union].\n */\npublic infix fun\n LongArray.intersect(other: Iterable<Long>): Set<Long> {\n    val set = this.toMutableSet()\n    set.retainAll(other)\n    return set\n}\n\n/**\n * Returns a set containing all elements that are contained by both this array and the specified collection.\n * \n * The returned set preserves the element iteration order of the original array.\n * \n * To get a set containing all elements that are contained at least in one of these collections use [union].\n */\npublic infix fun\n FloatArray.intersect(other: Iterable<Float>): Set<Float> {\n    val set = this.toMutableSet()\n    set.retainAll(other)\n    return set\n}\n\n/**\n * Returns a set containing all elements that are contained by both this array and the specified collection.\n * \n * The returned set preserves the element iteration order of the original array.\n * \n * To get a set containing all elements that are contained at least in one of these collections use [union].\n */\npublic infix fun\n DoubleArray.intersect(other: Iterable<Double>): Set<Double> {\n    val set = this.toMutableSet()\n    set.retainAll(other)\n    return set\n}\n\n/**\n * Returns a set containing all elements that are contained by both this array and the specified collection.\n * \n * The returned set preserves the element iteration order of the original array.\n * \n * To get a set containing all elements that are contained at least in one of these collections use [union].\n */\npublic infix fun\n BooleanArray.intersect(other: Iterable<Boolean>): Set<Boolean> {\n    val set = this.toMutableSet()\n    set.retainAll(other)\n    return set\n}\n\n/**\n * Returns a set containing all elements that are contained by both this array and the specified collection.\n * \n * The returned set preserves the element iteration order of the original array.\n * \n * To get a set containing all elements that are contained at least in one of these collections use [union].\n */\npublic infix fun\n CharArray.intersect(other: Iterable<Char>): Set<Char> {\n    val set = this.toMutableSet()\n    set.retainAll(other)\n    return set\n}\n\n/**\n * Returns a set containing all elements that are contained by this array and not contained by the specified collection.\n * \n * The returned set preserves the element iteration order of the original array.\n */\npublic infix fun <T>\n Array<out T>.subtract(other: Iterable<T>): Set<T> {\n    val set = this.toMutableSet()\n    set.removeAll(other)\n    return set\n}\n\n/**\n * Returns a set containing all elements that are contained by this array and not contained by

```

the specified collection.

```

    * The returned set preserves the element iteration order of the original array.
    *
    * public infix fun ByteArray.subtract(other: Iterable<Byte>): Set<Byte> {
    *     val set = this.toMutableSet()
    *     set.removeAll(other)
    *     return set
    * }
    * Returns a set containing all elements that are contained by this array and not contained by the specified collection.
    *
    * The returned set preserves the element iteration order of the original array.
    *
    * public infix fun ShortArray.subtract(other: Iterable<Short>): Set<Short> {
    *     val set = this.toMutableSet()
    *     set.removeAll(other)
    *     return set
    * }
    * Returns a set containing all elements that are contained by this array and not contained by the specified collection.
    *
    * The returned set preserves the element iteration order of the original array.
    *
    * public infix fun IntArray.subtract(other: Iterable<Int>): Set<Int> {
    *     val set = this.toMutableSet()
    *     set.removeAll(other)
    *     return set
    * }
    * Returns a set containing all elements that are contained by this array and not contained by the specified collection.
    *
    * The returned set preserves the element iteration order of the original array.
    *
    * public infix fun LongArray.subtract(other: Iterable<Long>): Set<Long> {
    *     val set = this.toMutableSet()
    *     set.removeAll(other)
    *     return set
    * }
    * Returns a set containing all elements that are contained by this array and not contained by the specified collection.
    *
    * The returned set preserves the element iteration order of the original array.
    *
    * public infix fun FloatArray.subtract(other: Iterable<Float>): Set<Float> {
    *     val set = this.toMutableSet()
    *     set.removeAll(other)
    *     return set
    * }
    * Returns a set containing all elements that are contained by this array and not contained by the specified collection.
    *
    * The returned set preserves the element iteration order of the original array.
    *
    * public infix fun DoubleArray.subtract(other: Iterable<Double>): Set<Double> {
    *     val set = this.toMutableSet()
    *     set.removeAll(other)
    *     return set
    * }
    * Returns a set containing all elements that are contained by this array and not contained by the specified collection.
    *
    * The returned set preserves the element iteration order of the original array.
    *
    * public infix fun BooleanArray.subtract(other: Iterable<Boolean>): Set<Boolean> {
    *     val set = this.toMutableSet()
    *     set.removeAll(other)
    *     return set
    * }
    * Returns a set containing all elements that are contained by this array and not contained by the specified collection.
    *
    * The returned set preserves the element iteration order of the original array.
    *
    * public infix fun CharArray.subtract(other: Iterable<Char>): Set<Char> {
    *     val set = this.toMutableSet()
    *     set.removeAll(other)
    *     return set
    * }
    * Returns a new [MutableSet] containing all distinct elements from the given array.
    *
    * The returned set preserves the element iteration order of the original array.
    *
    * public fun <T> Array<out T>.toMutableSet(): MutableSet<T> {
    *     return toCollection(LinkedHashSet<T>(mapCapacity(size)))
    * }
    * Returns a new [MutableSet] containing all distinct elements from the given array.
    *
    * The returned set preserves the element iteration order of the original array.
    *
    * public fun ByteArray.toMutableSet(): MutableSet<Byte> {
    *     return toCollection(LinkedHashSet<Byte>(mapCapacity(size)))
    * }
    * Returns a new [MutableSet] containing all distinct elements from the given array.
    *
    * The returned set preserves the element iteration order of the original array.
    *
    * public fun ShortArray.toMutableSet(): MutableSet<Short> {
    *     return toCollection(LinkedHashSet<Short>(mapCapacity(size)))
    * }
    * Returns a new [MutableSet] containing all distinct elements from the given array.
    *
    * The returned set preserves the element iteration order of the original array.
    *
    * public fun IntArray.toMutableSet(): MutableSet<Int> {
    *     return toCollection(LinkedHashSet<Int>(mapCapacity(size)))
    * }
    * Returns a new [MutableSet] containing all distinct elements from the given array.
    *
    * The returned set preserves the element iteration order of the original array.
    *
    * public fun LongArray.toMutableSet(): MutableSet<Long> {
    *     return toCollection(LinkedHashSet<Long>(mapCapacity(size)))
    * }
    * Returns a new [MutableSet] containing all distinct elements from the given array.
    *
    * The returned set preserves the element iteration order of the original array.
    *
    * public fun FloatArray.toMutableSet(): MutableSet<Float> {
    *     return toCollection(LinkedHashSet<Float>(mapCapacity(size)))
    * }
    * Returns a new [MutableSet] containing all distinct elements from the given array.
    *
    * The returned set preserves the element iteration order of the original array.
    *
    * public fun DoubleArray.toMutableSet(): MutableSet<Double> {
    *     return toCollection(LinkedHashSet<Double>(mapCapacity(size)))
    * }
    * Returns a new [MutableSet] containing all distinct elements from the given array.
    *
    * The returned set preserves the element iteration order of the original array.
    *
    * public fun BooleanArray.toMutableSet(): MutableSet<Boolean> {
    *     return
  
```

```

toCollection(LinkedHashSet<Boolean>(mapCapacity(size)))\n\n/**\n * Returns a new [MutableSet] containing
all distinct elements from the given array.\n * \n * The returned set preserves the element iteration order of the
original array.\n */\npublic fun CharArray.toMutableSet(): MutableSet<Char> {\n    return
toCollection(LinkedHashSet<Char>(mapCapacity(size.coerceAtMost(128))))\n\n/**\n * Returns a set containing
all distinct elements from both collections.\n * \n * The returned set preserves the element iteration order of the
original array.\n * Those elements of the [other] collection that are unique are iterated in the end\n * in the order of
the [other] collection.\n * \n * To get a set containing all elements that are contained in both collections use
[intersect].\n */\npublic infix fun <T> Array<out T>.union(other: Iterable<T>): Set<T> {\n    val set =
this.toMutableSet()\n    set.addAll(other)\n    return set\n}\n\n/**\n * Returns a set containing all distinct elements
from both collections.\n * \n * The returned set preserves the element iteration order of the original array.\n * Those
elements of the [other] collection that are unique are iterated in the end\n * in the order of the [other] collection.\n *
\n * \n * To get a set containing all elements that are contained in both collections use [intersect].\n */\npublic infix fun
ByteArray.union(other: Iterable<Byte>): Set<Byte> {\n    val set = this.toMutableSet()\n    set.addAll(other)\n
return set\n}\n\n/**\n * Returns a set containing all distinct elements from both collections.\n * \n * The returned set
preserves the element iteration order of the original array.\n * Those elements of the [other] collection that are
unique are iterated in the end\n * in the order of the [other] collection.\n * \n * \n * To get a set containing all elements
that are contained in both collections use [intersect].\n */\npublic infix fun ShortArray.union(other:
Iterable<Short>): Set<Short> {\n    val set = this.toMutableSet()\n    set.addAll(other)\n    return set\n}\n\n/**\n *
Returns a set containing all distinct elements from both collections.\n * \n * The returned set preserves the element
iteration order of the original array.\n * Those elements of the [other] collection that are unique are iterated in the
end\n * in the order of the [other] collection.\n * \n * \n * To get a set containing all elements that are contained in
both collections use [intersect].\n */\npublic infix fun IntArray.union(other: Iterable<Int>): Set<Int> {\n    val set =
this.toMutableSet()\n    set.addAll(other)\n    return set\n}\n\n/**\n * Returns a set containing all distinct elements
from both collections.\n * \n * The returned set preserves the element iteration order of the original array.\n * Those
elements of the [other] collection that are unique are iterated in the end\n * in the order of the [other] collection.\n *
\n * \n * To get a set containing all elements that are contained in both collections use [intersect].\n */\npublic infix fun
LongArray.union(other: Iterable<Long>): Set<Long> {\n    val set = this.toMutableSet()\n    set.addAll(other)\n
return set\n}\n\n/**\n * Returns a set containing all distinct elements from both collections.\n * \n * The returned set
preserves the element iteration order of the original array.\n * Those elements of the [other] collection that are
unique are iterated in the end\n * in the order of the [other] collection.\n * \n * \n * To get a set containing all elements
that are contained in both collections use [intersect].\n */\npublic infix fun FloatArray.union(other: Iterable<Float>):
Set<Float> {\n    val set = this.toMutableSet()\n    set.addAll(other)\n    return set\n}\n\n/**\n * Returns a set
containing all distinct elements from both collections.\n * \n * The returned set preserves the element iteration order
of the original array.\n * Those elements of the [other] collection that are unique are iterated in the end\n * in the
order of the [other] collection.\n * \n * \n * To get a set containing all elements that are contained in both collections
use [intersect].\n */\npublic infix fun DoubleArray.union(other: Iterable<Double>): Set<Double> {\n    val set =
this.toMutableSet()\n    set.addAll(other)\n    return set\n}\n\n/**\n * Returns a set containing all distinct elements
from both collections.\n * \n * The returned set preserves the element iteration order of the original array.\n * Those
elements of the [other] collection that are unique are iterated in the end\n * in the order of the [other] collection.\n *
\n * \n * \n * To get a set containing all elements that are contained in both collections use [intersect].\n */\npublic infix fun
BooleanArray.union(other: Iterable<Boolean>): Set<Boolean> {\n    val set = this.toMutableSet()\n    set.addAll(other)\n
return set\n}\n\n/**\n * Returns a set containing all distinct elements from both collections.\n * \n * The returned set
preserves the element iteration order of the original array.\n * Those elements of the [other] collection that are
unique are iterated in the end\n * in the order of the [other] collection.\n * \n * \n * To get a set containing all elements
that are contained in both collections use [intersect].\n */\npublic infix fun CharArray.union(other: Iterable<Char>): Set<Char> {\n
    val set = this.toMutableSet()\n    set.addAll(other)\n    return set\n}\n\n/**\n * Returns `true` if all elements match the given [predicate].\n * \n * @sample
samples.collections.Collections.Aggregates.all\n */\npublic inline fun <T> Array<out T>.all(predicate: (T) ->

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Boolean): Boolean { \n for (element in this) if (!predicate(element)) return false\n return true\n}\n\n/**\n *
Returns `true` if all elements match the given [predicate].\n * \n * @sample
samples.collections.Collections.Aggregates.all\n */\npublic inline fun ByteArray.all(predicate: (Byte) -> Boolean):
Boolean { \n for (element in this) if (!predicate(element)) return false\n return true\n}\n\n/**\n * Returns `true` if
all elements match the given [predicate].\n * \n * @sample samples.collections.Collections.Aggregates.all\n
*/\npublic inline fun ShortArray.all(predicate: (Short) -> Boolean): Boolean { \n for (element in this) if
(!predicate(element)) return false\n return true\n}\n\n/**\n * Returns `true` if all elements match the given
[predicate].\n * \n * @sample samples.collections.Collections.Aggregates.all\n */\npublic inline fun
IntArray.all(predicate: (Int) -> Boolean): Boolean { \n for (element in this) if (!predicate(element)) return false\n
return true\n}\n\n/**\n * Returns `true` if all elements match the given [predicate].\n * \n * @sample
samples.collections.Collections.Aggregates.all\n */\npublic inline fun LongArray.all(predicate: (Long) -> Boolean):
Boolean { \n for (element in this) if (!predicate(element)) return false\n return true\n}\n\n/**\n * Returns `true` if
all elements match the given [predicate].\n * \n * @sample samples.collections.Collections.Aggregates.all\n
*/\npublic inline fun FloatArray.all(predicate: (Float) -> Boolean): Boolean { \n for (element in this) if
(!predicate(element)) return false\n return true\n}\n\n/**\n * Returns `true` if all elements match the given
[predicate].\n * \n * @sample samples.collections.Collections.Aggregates.all\n */\npublic inline fun
DoubleArray.all(predicate: (Double) -> Boolean): Boolean { \n for (element in this) if (!predicate(element)) return
false\n return true\n}\n\n/**\n * Returns `true` if all elements match the given [predicate].\n * \n * @sample
samples.collections.Collections.Aggregates.all\n */\npublic inline fun BooleanArray.all(predicate: (Boolean) ->
Boolean): Boolean { \n for (element in this) if (!predicate(element)) return false\n return true\n}\n\n/**\n *
Returns `true` if all elements match the given [predicate].\n * \n * @sample
samples.collections.Collections.Aggregates.all\n */\npublic inline fun CharArray.all(predicate: (Char) -> Boolean):
Boolean { \n for (element in this) if (!predicate(element)) return false\n return true\n}\n\n/**\n * Returns `true` if
array has at least one element.\n * \n * @sample samples.collections.Collections.Aggregates.any\n */\npublic fun
<T> Array<out T>.any(): Boolean { \n return !isEmpty()\n}\n\n/**\n * Returns `true` if array has at least one
element.\n * \n * @sample samples.collections.Collections.Aggregates.any\n */\npublic fun ByteArray.any():
Boolean { \n return !isEmpty()\n}\n\n/**\n * Returns `true` if array has at least one element.\n * \n * @sample
samples.collections.Collections.Aggregates.any\n */\npublic fun ShortArray.any(): Boolean { \n return
!isEmpty()\n}\n\n/**\n * Returns `true` if array has at least one element.\n * \n * @sample
samples.collections.Collections.Aggregates.any\n */\npublic fun IntArray.any(): Boolean { \n return
!isEmpty()\n}\n\n/**\n * Returns `true` if array has at least one element.\n * \n * @sample
samples.collections.Collections.Aggregates.any\n */\npublic fun LongArray.any(): Boolean { \n return
!isEmpty()\n}\n\n/**\n * Returns `true` if array has at least one element.\n * \n * @sample
samples.collections.Collections.Aggregates.any\n */\npublic fun FloatArray.any(): Boolean { \n return
!isEmpty()\n}\n\n/**\n * Returns `true` if array has at least one element.\n * \n * @sample
samples.collections.Collections.Aggregates.any\n */\npublic fun DoubleArray.any(): Boolean { \n return
!isEmpty()\n}\n\n/**\n * Returns `true` if array has at least one element.\n * \n * @sample
samples.collections.Collections.Aggregates.any\n */\npublic fun BooleanArray.any(): Boolean { \n return
!isEmpty()\n}\n\n/**\n * Returns `true` if array has at least one element.\n * \n * @sample
samples.collections.Collections.Aggregates.any\n */\npublic fun CharArray.any(): Boolean { \n return
!isEmpty()\n}\n\n/**\n * Returns `true` if at least one element matches the given [predicate].\n * \n * @sample
samples.collections.Collections.Aggregates.anyWithPredicate\n */\npublic inline fun <T> Array<out
T>.any(predicate: (T) -> Boolean): Boolean { \n for (element in this) if (predicate(element)) return true\n return
false\n}\n\n/**\n * Returns `true` if at least one element matches the given [predicate].\n * \n * @sample
samples.collections.Collections.Aggregates.anyWithPredicate\n */\npublic inline fun ByteArray.any(predicate:
(Byte) -> Boolean): Boolean { \n for (element in this) if (predicate(element)) return true\n return
false\n}\n\n/**\n * Returns `true` if at least one element matches the given [predicate].\n * \n * @sample
samples.collections.Collections.Aggregates.anyWithPredicate\n */\npublic inline fun ShortArray.any(predicate:

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(Short) -> Boolean): Boolean {\n for (element in this) if (predicate(element)) return true\n return false\n}\n\n/**\n * Returns `true` if at least one element matches the given [predicate].\n * \n * @sample samples.collections.Collections.Aggregates.anyWithPredicate\n */\npublic inline fun IntArray.any(predicate: (Int) -> Boolean): Boolean {\n for (element in this) if (predicate(element)) return true\n return false\n}\n\n/**\n * Returns `true` if at least one element matches the given [predicate].\n * \n * @sample samples.collections.Collections.Aggregates.anyWithPredicate\n */\npublic inline fun LongArray.any(predicate: (Long) -> Boolean): Boolean {\n for (element in this) if (predicate(element)) return true\n return false\n}\n\n/**\n * Returns `true` if at least one element matches the given [predicate].\n * \n * @sample samples.collections.Collections.Aggregates.anyWithPredicate\n */\npublic inline fun FloatArray.any(predicate: (Float) -> Boolean): Boolean {\n for (element in this) if (predicate(element)) return true\n return false\n}\n\n/**\n * Returns `true` if at least one element matches the given [predicate].\n * \n * @sample samples.collections.Collections.Aggregates.anyWithPredicate\n */\npublic inline fun DoubleArray.any(predicate: (Double) -> Boolean): Boolean {\n for (element in this) if (predicate(element)) return true\n return false\n}\n\n/**\n * Returns `true` if at least one element matches the given [predicate].\n * \n * @sample samples.collections.Collections.Aggregates.anyWithPredicate\n */\npublic inline fun BooleanArray.any(predicate: (Boolean) -> Boolean): Boolean {\n for (element in this) if (predicate(element)) return true\n return false\n}\n\n/**\n * Returns `true` if at least one element matches the given [predicate].\n * \n * @sample samples.collections.Collections.Aggregates.anyWithPredicate\n */\npublic inline fun CharArray.any(predicate: (Char) -> Boolean): Boolean {\n for (element in this) if (predicate(element)) return true\n return false\n}\n\n/**\n * Returns the number of elements in this array.\n */\n@kotlin.internal.InlineOnly\npublic inline fun <T> Array<out T>.count(): Int {\n return size\n}\n\n/**\n * Returns the number of elements in this array.\n */\n@kotlin.internal.InlineOnly\npublic inline fun ByteArray.count(): Int {\n return size\n}\n\n/**\n * Returns the number of elements in this array.\n */\n@kotlin.internal.InlineOnly\npublic inline fun ShortArray.count(): Int {\n return size\n}\n\n/**\n * Returns the number of elements in this array.\n */\n@kotlin.internal.InlineOnly\npublic inline fun IntArray.count(): Int {\n return size\n}\n\n/**\n * Returns the number of elements in this array.\n */\n@kotlin.internal.InlineOnly\npublic inline fun LongArray.count(): Int {\n return size\n}\n\n/**\n * Returns the number of elements in this array.\n */\n@kotlin.internal.InlineOnly\npublic inline fun FloatArray.count(): Int {\n return size\n}\n\n/**\n * Returns the number of elements in this array.\n */\n@kotlin.internal.InlineOnly\npublic inline fun DoubleArray.count(): Int {\n return size\n}\n\n/**\n * Returns the number of elements in this array.\n */\n@kotlin.internal.InlineOnly\npublic inline fun BooleanArray.count(): Int {\n return size\n}\n\n/**\n * Returns the number of elements in this array.\n */\n@kotlin.internal.InlineOnly\npublic inline fun CharArray.count(): Int {\n return size\n}\n\n/**\n * Returns the number of elements matching the given [predicate].\n */\npublic inline fun <T> Array<out T>.count(predicate: (T) -> Boolean): Int {\n var count = 0\n for (element in this) if (predicate(element)) ++count\n return count\n}\n\n/**\n * Returns the number of elements matching the given [predicate].\n */\npublic inline fun ByteArray.count(predicate: (Byte) -> Boolean): Int {\n var count = 0\n for (element in this) if (predicate(element)) ++count\n return count\n}\n\n/**\n * Returns the number of elements matching the given [predicate].\n */\npublic inline fun ShortArray.count(predicate: (Short) -> Boolean): Int {\n var count = 0\n for (element in this) if (predicate(element)) ++count\n return count\n}\n\n/**\n * Returns the number of elements matching the given [predicate].\n */\npublic inline fun IntArray.count(predicate: (Int) -> Boolean): Int {\n var count = 0\n for (element in this) if (predicate(element)) ++count\n return count\n}\n\n/**\n * Returns the number of elements matching the given [predicate].\n */\npublic inline fun LongArray.count(predicate: (Long) -> Boolean): Int {\n var count = 0\n for (element in this) if (predicate(element)) ++count\n return count\n}\n\n/**\n * Returns the number of elements matching the given [predicate].\n */\npublic inline fun FloatArray.count(predicate: (Float) -> Boolean): Int {\n var count = 0\n for (element in this) if (predicate(element)) ++count\n return count\n}\n\n/**\n * Returns the number of elements matching the given [predicate].\n */\npublic inline fun DoubleArray.count(predicate: (Double) -> Boolean): Int {\n var count = 0\n for (element in this) if (predicate(element)) ++count\n return count\n}\n\n/**\n * Returns the number of elements matching the given [predicate].\n */\npublic inline fun BooleanArray.count(predicate: (Boolean)


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-> Boolean): Int {\n  var count = 0\n  for (element in this) if (predicate(element)) ++count\n  return
count\n}\n\n/**\n * Returns the number of elements matching the given [predicate].\n */\npublic inline fun
CharArray.count(predicate: (Char) -> Boolean): Int {\n  var count = 0\n  for (element in this) if
(predicate(element)) ++count\n  return count\n}\n\n/**\n * Accumulates value starting with [initial] value and
applying [operation] from left to right\n * to current accumulator value and each element.\n * \n * Returns the
specified [initial] value if the array is empty.\n * \n * @param [operation] function that takes current accumulator
value and an element, and calculates the next accumulator value.\n */\npublic inline fun <T, R> Array<out
T>.fold(initial: R, operation: (acc: R, T) -> R): R {\n  var accumulator = initial\n  for (element in this)
accumulator = operation(accumulator, element)\n  return accumulator\n}\n\n/**\n * Accumulates value starting
with [initial] value and applying [operation] from left to right\n * to current accumulator value and each element.\n
*\n * Returns the specified [initial] value if the array is empty.\n * \n * @param [operation] function that takes
current accumulator value and an element, and calculates the next accumulator value.\n */\npublic inline fun <R>
ByteArray.fold(initial: R, operation: (acc: R, Byte) -> R): R {\n  var accumulator = initial\n  for (element in this)
accumulator = operation(accumulator, element)\n  return accumulator\n}\n\n/**\n * Accumulates value starting
with [initial] value and applying [operation] from left to right\n * to current accumulator value and each element.\n
*\n * Returns the specified [initial] value if the array is empty.\n * \n * @param [operation] function that takes
current accumulator value and an element, and calculates the next accumulator value.\n */\npublic inline fun <R>
ShortArray.fold(initial: R, operation: (acc: R, Short) -> R): R {\n  var accumulator = initial\n  for (element in this)
accumulator = operation(accumulator, element)\n  return accumulator\n}\n\n/**\n * Accumulates value starting
with [initial] value and applying [operation] from left to right\n * to current accumulator value and each element.\n
*\n * Returns the specified [initial] value if the array is empty.\n * \n * @param [operation] function that takes
current accumulator value and an element, and calculates the next accumulator value.\n */\npublic inline fun <R>
IntArray.fold(initial: R, operation: (acc: R, Int) -> R): R {\n  var accumulator = initial\n  for (element in this)
accumulator = operation(accumulator, element)\n  return accumulator\n}\n\n/**\n * Accumulates value starting
with [initial] value and applying [operation] from left to right\n * to current accumulator value and each element.\n
*\n * Returns the specified [initial] value if the array is empty.\n * \n * @param [operation] function that takes
current accumulator value and an element, and calculates the next accumulator value.\n */\npublic inline fun <R>
LongArray.fold(initial: R, operation: (acc: R, Long) -> R): R {\n  var accumulator = initial\n  for (element in this)
accumulator = operation(accumulator, element)\n  return accumulator\n}\n\n/**\n * Accumulates value starting
with [initial] value and applying [operation] from left to right\n * to current accumulator value and each element.\n
*\n * Returns the specified [initial] value if the array is empty.\n * \n * @param [operation] function that takes
current accumulator value and an element, and calculates the next accumulator value.\n */\npublic inline fun <R>
FloatArray.fold(initial: R, operation: (acc: R, Float) -> R): R {\n  var accumulator = initial\n  for (element in this)
accumulator = operation(accumulator, element)\n  return accumulator\n}\n\n/**\n * Accumulates value starting
with [initial] value and applying [operation] from left to right\n * to current accumulator value and each element.\n
*\n * Returns the specified [initial] value if the array is empty.\n * \n * @param [operation] function that takes
current accumulator value and an element, and calculates the next accumulator value.\n */\npublic inline fun <R>
DoubleArray.fold(initial: R, operation: (acc: R, Double) -> R): R {\n  var accumulator = initial\n  for (element in
this) accumulator = operation(accumulator, element)\n  return accumulator\n}\n\n/**\n * Accumulates value
starting with [initial] value and applying [operation] from left to right\n * to current accumulator value and each
element.\n * \n * Returns the specified [initial] value if the array is empty.\n * \n * @param [operation] function that
takes current accumulator value and an element, and calculates the next accumulator value.\n */\npublic inline fun
<R> BooleanArray.fold(initial: R, operation: (acc: R, Boolean) -> R): R {\n  var accumulator = initial\n  for
(element in this) accumulator = operation(accumulator, element)\n  return accumulator\n}\n\n/**\n * Accumulates
value starting with [initial] value and applying [operation] from left to right\n * to current accumulator value and
each element.\n * \n * Returns the specified [initial] value if the array is empty.\n * \n * @param [operation]
function that takes current accumulator value and an element, and calculates the next accumulator value.\n
*/\npublic inline fun <R> CharArray.fold(initial: R, operation: (acc: R, Char) -> R): R {\n  var accumulator =

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initial\n  for (element in this) accumulator = operation(accumulator, element)\n  return accumulator\n}\n\n/**\n * Accumulates value starting with [initial] value and applying [operation] from left to right\n * to current accumulator value and each element with its index in the original array.\n * \n * Returns the specified [initial] value if the array is empty.\n * \n * @param [operation] function that takes the index of an element, current accumulator value\n * and the element itself, and calculates the next accumulator value.\n */\npublic inline fun <T, R> Array<out T>.foldIndexed(initial: R, operation: (index: Int, acc: R, T) -> R): R {\n  var index = 0\n  var accumulator = initial\n  for (element in this) accumulator = operation(index++, accumulator, element)\n  return accumulator\n}\n\n/**\n * Accumulates value starting with [initial] value and applying [operation] from left to right\n * to current accumulator value and each element with its index in the original array.\n * \n * Returns the specified [initial] value if the array is empty.\n * \n * @param [operation] function that takes the index of an element, current accumulator value\n * and the element itself, and calculates the next accumulator value.\n */\npublic inline fun <R> ByteArray.foldIndexed(initial: R, operation: (index: Int, acc: R, Byte) -> R): R {\n  var index = 0\n  var accumulator = initial\n  for (element in this) accumulator = operation(index++, accumulator, element)\n  return accumulator\n}\n\n/**\n * Accumulates value starting with [initial] value and applying [operation] from left to right\n * to current accumulator value and each element with its index in the original array.\n * \n * Returns the specified [initial] value if the array is empty.\n * \n * @param [operation] function that takes the index of an element, current accumulator value\n * and the element itself, and calculates the next accumulator value.\n */\npublic inline fun <R> ShortArray.foldIndexed(initial: R, operation: (index: Int, acc: R, Short) -> R): R {\n  var index = 0\n  var accumulator = initial\n  for (element in this) accumulator = operation(index++, accumulator, element)\n  return accumulator\n}\n\n/**\n * Accumulates value starting with [initial] value and applying [operation] from left to right\n * to current accumulator value and each element with its index in the original array.\n * \n * Returns the specified [initial] value if the array is empty.\n * \n * @param [operation] function that takes the index of an element, current accumulator value\n * and the element itself, and calculates the next accumulator value.\n */\npublic inline fun <R> IntArray.foldIndexed(initial: R, operation: (index: Int, acc: R, Int) -> R): R {\n  var index = 0\n  var accumulator = initial\n  for (element in this) accumulator = operation(index++, accumulator, element)\n  return accumulator\n}\n\n/**\n * Accumulates value starting with [initial] value and applying [operation] from left to right\n * to current accumulator value and each element with its index in the original array.\n * \n * Returns the specified [initial] value if the array is empty.\n * \n * @param [operation] function that takes the index of an element, current accumulator value\n * and the element itself, and calculates the next accumulator value.\n */\npublic inline fun <R> LongArray.foldIndexed(initial: R, operation: (index: Int, acc: R, Long) -> R): R {\n  var index = 0\n  var accumulator = initial\n  for (element in this) accumulator = operation(index++, accumulator, element)\n  return accumulator\n}\n\n/**\n * Accumulates value starting with [initial] value and applying [operation] from left to right\n * to current accumulator value and each element with its index in the original array.\n * \n * Returns the specified [initial] value if the array is empty.\n * \n * @param [operation] function that takes the index of an element, current accumulator value\n * and the element itself, and calculates the next accumulator value.\n */\npublic inline fun <R> FloatArray.foldIndexed(initial: R, operation: (index: Int, acc: R, Float) -> R): R {\n  var index = 0\n  var accumulator = initial\n  for (element in this) accumulator = operation(index++, accumulator, element)\n  return accumulator\n}\n\n/**\n * Accumulates value starting with [initial] value and applying [operation] from left to right\n * to current accumulator value and each element with its index in the original array.\n * \n * Returns the specified [initial] value if the array is empty.\n * \n * @param [operation] function that takes the index of an element, current accumulator value\n * and the element itself, and calculates the next accumulator value.\n */\npublic inline fun <R> DoubleArray.foldIndexed(initial: R, operation: (index: Int, acc: R, Double) -> R): R {\n  var index = 0\n  var accumulator = initial\n  for (element in this) accumulator = operation(index++, accumulator, element)\n  return accumulator\n}\n\n/**\n * Accumulates value starting with [initial] value and applying [operation] from left to right\n * to current accumulator value and each element with its index in the original array.\n * \n * Returns the specified [initial] value if the array is empty.\n * \n * @param [operation] function that takes the index of an element, current accumulator value\n * and the element itself, and calculates the next accumulator value.\n */

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*public inline fun <R> BooleanArray.foldIndexed(initial: R, operation: (index: Int, acc: R, Boolean) -> R): R {
    var index = 0
    var accumulator = initial
    for (element in this) accumulator = operation(index++, accumulator, element)
    return accumulator
}
* Accumulates value starting with [initial] value and applying [operation] from left to right
* to current accumulator value and each element with its index in the original array.
* Returns the specified [initial] value if the array is empty.
* @param [operation] function that takes the index of an element, current accumulator value
* and the element itself, and calculates the next accumulator value.
*public inline fun <R> CharArray.foldIndexed(initial: R, operation: (index: Int, acc: R, Char) -> R): R {
    var index = 0
    var accumulator = initial
    for (element in this) accumulator = operation(index++, accumulator, element)
    return accumulator
}
* Accumulates value starting with [initial] value and applying [operation] from right to left
* to each element and current accumulator value.
* Returns the specified [initial] value if the array is empty.
* @param [operation] function that takes an element and current accumulator value, and calculates the next accumulator value.
*public inline fun <T, R> Array<out T>.foldRight(initial: R, operation: (T, acc: R) -> R): R {
    var index = lastIndex
    var accumulator = initial
    while (index >= 0) {
        accumulator = operation(get(index--), accumulator)
    }
    return accumulator
}
* Accumulates value starting with [initial] value and applying [operation] from right to left
* to each element and current accumulator value.
* Returns the specified [initial] value if the array is empty.
* @param [operation] function that takes an element and current accumulator value, and calculates the next accumulator value.
*public inline fun <R> ByteArray.foldRight(initial: R, operation: (Byte, acc: R) -> R): R {
    var index = lastIndex
    var accumulator = initial
    while (index >= 0) {
        accumulator = operation(get(index--), accumulator)
    }
    return accumulator
}
* Accumulates value starting with [initial] value and applying [operation] from right to left
* to each element and current accumulator value.
* Returns the specified [initial] value if the array is empty.
* @param [operation] function that takes an element and current accumulator value, and calculates the next accumulator value.
*public inline fun <R> ShortArray.foldRight(initial: R, operation: (Short, acc: R) -> R): R {
    var index = lastIndex
    var accumulator = initial
    while (index >= 0) {
        accumulator = operation(get(index--), accumulator)
    }
    return accumulator
}
* Accumulates value starting with [initial] value and applying [operation] from right to left
* to each element and current accumulator value.
* Returns the specified [initial] value if the array is empty.
* @param [operation] function that takes an element and current accumulator value, and calculates the next accumulator value.
*public inline fun <R> IntArray.foldRight(initial: R, operation: (Int, acc: R) -> R): R {
    var index = lastIndex
    var accumulator = initial
    while (index >= 0) {
        accumulator = operation(get(index--), accumulator)
    }
    return accumulator
}
* Accumulates value starting with [initial] value and applying [operation] from right to left
* to each element and current accumulator value.
* Returns the specified [initial] value if the array is empty.
* @param [operation] function that takes an element and current accumulator value, and calculates the next accumulator value.
*public inline fun <R> LongArray.foldRight(initial: R, operation: (Long, acc: R) -> R): R {
    var index = lastIndex
    var accumulator = initial
    while (index >= 0) {
        accumulator = operation(get(index--), accumulator)
    }
    return accumulator
}
* Accumulates value starting with [initial] value and applying [operation] from right to left
* to each element and current accumulator value.
* Returns the specified [initial] value if the array is empty.
* @param [operation] function that takes an element and current accumulator value, and calculates the next accumulator value.
*public inline fun <R> FloatArray.foldRight(initial: R, operation: (Float, acc: R) -> R): R {
    var index = lastIndex
    var accumulator = initial
    while (index >= 0) {
        accumulator = operation(get(index--), accumulator)
    }
    return accumulator
}
* Accumulates value starting with [initial] value and applying [operation] from right to left
* to each element and current accumulator value.
* Returns the specified [initial] value if the array is empty.
* @param [operation] function that takes an element and current accumulator value, and calculates the next accumulator value.
*public inline fun <R> DoubleArray.foldRight(initial: R, operation: (Double, acc: R) -> R): R {
    var index = lastIndex
    var accumulator = initial
    while (index >= 0) {
        accumulator = operation(get(index--), accumulator)
    }
    return accumulator
}
* Accumulates value starting with [initial] value and applying [operation] from right

```

to left\n * to each element and current accumulator value.\n * \n * Returns the specified [initial] value if the array is empty.\n * \n * @param [operation] function that takes an element and current accumulator value, and calculates the next accumulator value.\n */\npublic inline fun <R> BooleanArray.foldRight(initial: R, operation: (Boolean, acc: R) -> R): R {\n var index = lastIndex\n var accumulator = initial\n while (index >= 0) {\n accumulator = operation(get(index--), accumulator)\n }\n return accumulator\n}\n\n/**\n * Accumulates value starting with [initial] value and applying [operation] from right to left\n * to each element and current accumulator value.\n * \n * Returns the specified [initial] value if the array is empty.\n * \n * @param [operation] function that takes an element and current accumulator value, and calculates the next accumulator value.\n */\npublic inline fun <R> CharArray.foldRight(initial: R, operation: (Char, acc: R) -> R): R {\n var index = lastIndex\n var accumulator = initial\n while (index >= 0) {\n accumulator = operation(get(index--), accumulator)\n }\n return accumulator\n}\n\n/**\n * Accumulates value starting with [initial] value and applying [operation] from right to left\n * to each element with its index in the original array and current accumulator value.\n * \n * Returns the specified [initial] value if the array is empty.\n * \n * @param [operation] function that takes the index of an element, the element itself\n * and current accumulator value, and calculates the next accumulator value.\n */\npublic inline fun <T, R> Array<out T>.foldRightIndexed(initial: R, operation: (index: Int, T, acc: R) -> R): R {\n var index = lastIndex\n var accumulator = initial\n while (index >= 0) {\n accumulator = operation(index, get(index), accumulator)\n --index\n }\n return accumulator\n}\n\n/**\n * Accumulates value starting with [initial] value and applying [operation] from right to left\n * to each element with its index in the original array and current accumulator value.\n * \n * Returns the specified [initial] value if the array is empty.\n * \n * @param [operation] function that takes the index of an element, the element itself\n * and current accumulator value, and calculates the next accumulator value.\n */\npublic inline fun <R> ByteArray.foldRightIndexed(initial: R, operation: (index: Int, Byte, acc: R) -> R): R {\n var index = lastIndex\n var accumulator = initial\n while (index >= 0) {\n accumulator = operation(index, get(index), accumulator)\n --index\n }\n return accumulator\n}\n\n/**\n * Accumulates value starting with [initial] value and applying [operation] from right to left\n * to each element with its index in the original array and current accumulator value.\n * \n * Returns the specified [initial] value if the array is empty.\n * \n * @param [operation] function that takes the index of an element, the element itself\n * and current accumulator value, and calculates the next accumulator value.\n */\npublic inline fun <R> ShortArray.foldRightIndexed(initial: R, operation: (index: Int, Short, acc: R) -> R): R {\n var index = lastIndex\n var accumulator = initial\n while (index >= 0) {\n accumulator = operation(index, get(index), accumulator)\n --index\n }\n return accumulator\n}\n\n/**\n * Accumulates value starting with [initial] value and applying [operation] from right to left\n * to each element with its index in the original array and current accumulator value.\n * \n * Returns the specified [initial] value if the array is empty.\n * \n * @param [operation] function that takes the index of an element, the element itself\n * and current accumulator value, and calculates the next accumulator value.\n */\npublic inline fun <R> IntArray.foldRightIndexed(initial: R, operation: (index: Int, Int, acc: R) -> R): R {\n var index = lastIndex\n var accumulator = initial\n while (index >= 0) {\n accumulator = operation(index, get(index), accumulator)\n --index\n }\n return accumulator\n}\n\n/**\n * Accumulates value starting with [initial] value and applying [operation] from right to left\n * to each element with its index in the original array and current accumulator value.\n * \n * Returns the specified [initial] value if the array is empty.\n * \n * @param [operation] function that takes the index of an element, the element itself\n * and current accumulator value, and calculates the next accumulator value.\n */\npublic inline fun <R> LongArray.foldRightIndexed(initial: R, operation: (index: Int, Long, acc: R) -> R): R {\n var index = lastIndex\n var accumulator = initial\n while (index >= 0) {\n accumulator = operation(index, get(index), accumulator)\n --index\n }\n return accumulator\n}\n\n/**\n * Accumulates value starting with [initial] value and applying [operation] from right to left\n * to each element with its index in the original array and current accumulator value.\n * \n * Returns the specified [initial] value if the array is empty.\n * \n * @param [operation] function that takes the index of an element, the element itself\n * and current accumulator value, and calculates the next accumulator value.\n */\npublic inline fun <R> FloatArray.foldRightIndexed(initial: R, operation: (index: Int, Float, acc: R) -> R): R {\n var index = lastIndex\n var accumulator = initial\n while (index >= 0) {\n accumulator =

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operation(index, get(index), accumulator)\n    --index\n } \n return accumulator\n}\n\n/**\n * Accumulates
value starting with [initial] value and applying [operation] from right to left\n * to each element with its index in the
original array and current accumulator value.\n * \n * Returns the specified [initial] value if the array is empty.\n *
\n * @param [operation] function that takes the index of an element, the element itself\n * and current accumulator
value, and calculates the next accumulator value.\n */\npublic inline fun <R> DoubleArray.foldRightIndexed(initial:
R, operation: (index: Int, Double, acc: R) -> R): R {\n    var index = lastIndex\n    var accumulator = initial\n    while
(index >= 0) {\n        accumulator = operation(index, get(index), accumulator)\n        --index\n    }\n    return
accumulator\n}\n\n/**\n * Accumulates value starting with [initial] value and applying [operation] from right to
left\n * to each element with its index in the original array and current accumulator value.\n * \n * Returns the
specified [initial] value if the array is empty.\n * \n * @param [operation] function that takes the index of an
element, the element itself\n * and current accumulator value, and calculates the next accumulator value.\n */\npublic inline fun <R> BooleanArray.foldRightIndexed(initial: R, operation: (index: Int, Boolean, acc: R) -> R):
R {\n    var index = lastIndex\n    var accumulator = initial\n    while (index >= 0) {\n        accumulator =
operation(index, get(index), accumulator)\n        --index\n    }\n    return accumulator\n}\n\n/**\n * Performs the given [action] on each element.\n */\npublic inline fun <T> Array<out
T>.forEach(action: (T) -> Unit): Unit {\n    for (element in this) action(element)\n}\n\n/**\n * Performs the given
[action] on each element.\n */\npublic inline fun ByteArray.forEach(action: (Byte) -> Unit): Unit {\n    for (element
in this) action(element)\n}\n\n/**\n * Performs the given [action] on each element.\n */\npublic inline fun
ShortArray.forEach(action: (Short) -> Unit): Unit {\n    for (element in this) action(element)\n}\n\n/**\n * Performs
the given [action] on each element.\n */\npublic inline fun IntArray.forEach(action: (Int) -> Unit): Unit {\n    for
(element in this) action(element)\n}\n\n/**\n * Performs the given [action] on each element.\n */\npublic inline fun
LongArray.forEach(action: (Long) -> Unit): Unit {\n    for (element in this) action(element)\n}\n\n/**\n * Performs
the given [action] on each element.\n */\npublic inline fun FloatArray.forEach(action: (Float) -> Unit): Unit {\n
for (element in this) action(element)\n}\n\n/**\n * Performs the given [action] on each element.\n */\npublic inline
fun DoubleArray.forEach(action: (Double) -> Unit): Unit {\n    for (element in this) action(element)\n}\n\n/**\n *
Performs the given [action] on each element.\n */\npublic inline fun BooleanArray.forEach(action: (Boolean) ->
Unit): Unit {\n    for (element in this) action(element)\n}\n\n/**\n * Performs the given [action] on each element.\n */\npublic inline fun CharArray.forEach(action: (Char) -> Unit): Unit {\n    for (element in this)
action(element)\n}\n\n/**\n * Performs the given [action] on each element, providing sequential index with the
element.\n * @param [action] function that takes the index of an element and the element itself\n * and performs the
action on the element.\n */\npublic inline fun <T> Array<out T>.forEachIndexed(action: (index: Int, T) -> Unit):
Unit {\n    var index = 0\n    for (item in this) action(index++, item)\n}\n\n/**\n * Performs the given [action] on
each element, providing sequential index with the element.\n * @param [action] function that takes the index of an
element and the element itself\n * and performs the action on the element.\n */\npublic inline fun
ByteArray.forEachIndexed(action: (index: Int, Byte) -> Unit): Unit {\n    var index = 0\n    for (item in this)
action(index++, item)\n}\n\n/**\n * Performs the given [action] on each element, providing sequential index with
the element.\n * @param [action] function that takes the index of an element and the element itself\n * and performs
the action on the element.\n */\npublic inline fun ShortArray.forEachIndexed(action: (index: Int, Short) -> Unit):
Unit {\n    var index = 0\n    for (item in this) action(index++, item)\n}\n\n/**\n * Performs the given [action] on
each element, providing sequential index with the element.\n * @param [action] function that takes the index of an
element and the element itself\n * and performs the action on the element.\n */\npublic inline fun
IntArray.forEachIndexed(action: (index: Int, Int) -> Unit): Unit {\n    var index = 0\n    for (item in this)

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action(index++, item)\n}\n\n/**\n * Performs the given [action] on each element, providing sequential index with
the element.\n * @param [action] function that takes the index of an element and the element itself\n * and performs
the action on the element.\n */\npublic inline fun LongArray.forEachIndexed(action: (index: Int, Long) -> Unit):
Unit {\n    var index = 0\n    for (item in this) action(index++, item)\n}\n\n/**\n * Performs the given [action] on
each element, providing sequential index with the element.\n * @param [action] function that takes the index of an
element and the element itself\n * and performs the action on the element.\n */\npublic inline fun
FloatArray.forEachIndexed(action: (index: Int, Float) -> Unit): Unit {\n    var index = 0\n    for (item in this)
action(index++, item)\n}\n\n/**\n * Performs the given [action] on each element, providing sequential index with
the element.\n * @param [action] function that takes the index of an element and the element itself\n * and performs
the action on the element.\n */\npublic inline fun DoubleArray.forEachIndexed(action: (index: Int, Double) -> Unit):
Unit {\n    var index = 0\n    for (item in this) action(index++, item)\n}\n\n/**\n * Performs the given [action] on
each element, providing sequential index with the element.\n * @param [action] function that takes the index of an
element and the element itself\n * and performs the action on the element.\n */\npublic inline fun
BooleanArray.forEachIndexed(action: (index: Int, Boolean) -> Unit): Unit {\n    var index = 0\n    for (item in this)
action(index++, item)\n}\n\n/**\n * Performs the given [action] on each element, providing sequential index with
the element.\n * @param [action] function that takes the index of an element and the element itself\n * and performs
the action on the element.\n */\npublic inline fun CharArray.forEachIndexed(action: (index: Int, Char) -> Unit): Unit
{\n    var index = 0\n    for (item in this) action(index++, item)\n}\n\n@Deprecated("Use maxOrNull instead.",
ReplaceWith("this.maxOrNull()"))\n@DeprecatedSinceKotlin(warningSince = "1.4", errorSince = "1.5",
hiddenSince = "1.6")\n@SinceKotlin("1.1")\npublic fun Array<out Double>.max(): Double? {\n    return
maxOrNull()\n}\n\n@Deprecated("Use maxOrNull instead.",
ReplaceWith("this.maxOrNull()"))\n@DeprecatedSinceKotlin(warningSince = "1.4", errorSince = "1.5",
hiddenSince = "1.6")\n@SinceKotlin("1.1")\npublic fun Array<out Float>.max(): Float? {\n    return
maxOrNull()\n}\n\n@Deprecated("Use maxOrNull instead.",
ReplaceWith("this.maxOrNull()"))\n@DeprecatedSinceKotlin(warningSince = "1.4", errorSince = "1.5",
hiddenSince = "1.6")\npublic fun <T : Comparable<T>> Array<out T>.max(): T? {\n    return
maxOrNull()\n}\n\n@Deprecated("Use maxOrNull instead.",
ReplaceWith("this.maxOrNull()"))\n@DeprecatedSinceKotlin(warningSince = "1.4", errorSince = "1.5",
hiddenSince = "1.6")\npublic fun ByteArray.max(): Byte? {\n    return maxOrNull()\n}\n\n@Deprecated("Use
maxOrNull instead.", ReplaceWith("this.maxOrNull()"))\n@DeprecatedSinceKotlin(warningSince = "1.4",
errorSince = "1.5", hiddenSince = "1.6")\npublic fun ShortArray.max(): Short? {\n    return
maxOrNull()\n}\n\n@Deprecated("Use maxOrNull instead.",
ReplaceWith("this.maxOrNull()"))\n@DeprecatedSinceKotlin(warningSince = "1.4", errorSince = "1.5",
hiddenSince = "1.6")\npublic fun IntArray.max(): Int? {\n    return maxOrNull()\n}\n\n@Deprecated("Use
maxOrNull instead.", ReplaceWith("this.maxOrNull()"))\n@DeprecatedSinceKotlin(warningSince = "1.4",
errorSince = "1.5", hiddenSince = "1.6")\npublic fun LongArray.max(): Long? {\n    return
maxOrNull()\n}\n\n@Deprecated("Use maxOrNull instead.",
ReplaceWith("this.maxOrNull()"))\n@DeprecatedSinceKotlin(warningSince = "1.4", errorSince = "1.5",
hiddenSince = "1.6")\npublic fun FloatArray.max(): Float? {\n    return maxOrNull()\n}\n\n@Deprecated("Use
maxOrNull instead.", ReplaceWith("this.maxOrNull()"))\n@DeprecatedSinceKotlin(warningSince = "1.4",
errorSince = "1.5", hiddenSince = "1.6")\npublic fun DoubleArray.max(): Double? {\n    return
maxOrNull()\n}\n\n@Deprecated("Use maxOrNull instead.",
ReplaceWith("this.maxOrNull()"))\n@DeprecatedSinceKotlin(warningSince = "1.4", errorSince = "1.5",
hiddenSince = "1.6")\npublic fun CharArray.max(): Char? {\n    return maxOrNull()\n}\n\n@Deprecated("Use
maxByOrNull instead.", ReplaceWith("this.maxByOrNull(selector)"))\n@DeprecatedSinceKotlin(warningSince =
"1.4", errorSince = "1.5", hiddenSince = "1.6")\npublic inline fun <T, R : Comparable<R>> Array<out
T>.maxBy(selector: (T) -> R): T? {\n    return maxByOrNull(selector)\n}\n\n@Deprecated("Use maxByOrNull
instead.", ReplaceWith("this.maxByOrNull(selector)"))\n@DeprecatedSinceKotlin(warningSince = "1.4",

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samples.collections.Collections.Aggregates.maxByOrNull\n *\n@SinceKotlin("1.4")\npublic inline fun <R : Comparable<R>> LongArray.maxByOrNull(selector: (Long) -> R): Long? {\n if (isEmpty()) return null\n var maxElem = this[0]\n val lastIndex = this.lastIndex\n if (lastIndex == 0) return maxElem\n var maxValue = selector(maxElem)\n for (i in 1..lastIndex) {\n val e = this[i]\n val v = selector(e)\n if (maxValue < v) {\n maxElem = e\n maxValue = v\n }\n }\n return maxElem\n}\n\n*\n * Returns the first element yielding the largest value of the given function or `null` if there are no elements.\n * \n * @sample
samples.collections.Collections.Aggregates.maxByOrNull\n *\n@SinceKotlin("1.4")\npublic inline fun <R : Comparable<R>> FloatArray.maxByOrNull(selector: (Float) -> R): Float? {\n if (isEmpty()) return null\n var maxElem = this[0]\n val lastIndex = this.lastIndex\n if (lastIndex == 0) return maxElem\n var maxValue = selector(maxElem)\n for (i in 1..lastIndex) {\n val e = this[i]\n val v = selector(e)\n if (maxValue < v) {\n maxElem = e\n maxValue = v\n }\n }\n return maxElem\n}\n\n*\n * Returns the first element yielding the largest value of the given function or `null` if there are no elements.\n * \n * @sample
samples.collections.Collections.Aggregates.maxByOrNull\n *\n@SinceKotlin("1.4")\npublic inline fun <R : Comparable<R>> DoubleArray.maxByOrNull(selector: (Double) -> R): Double? {\n if (isEmpty()) return null\n var maxElem = this[0]\n val lastIndex = this.lastIndex\n if (lastIndex == 0) return maxElem\n var maxValue = selector(maxElem)\n for (i in 1..lastIndex) {\n val e = this[i]\n val v = selector(e)\n if (maxValue < v) {\n maxElem = e\n maxValue = v\n }\n }\n return maxElem\n}\n\n*\n * Returns the first element yielding the largest value of the given function or `null` if there are no elements.\n * \n * @sample
samples.collections.Collections.Aggregates.maxByOrNull\n *\n@SinceKotlin("1.4")\npublic inline fun <R : Comparable<R>> BooleanArray.maxByOrNull(selector: (Boolean) -> R): Boolean? {\n if (isEmpty()) return null\n var maxElem = this[0]\n val lastIndex = this.lastIndex\n if (lastIndex == 0) return maxElem\n var maxValue = selector(maxElem)\n for (i in 1..lastIndex) {\n val e = this[i]\n val v = selector(e)\n if (maxValue < v) {\n maxElem = e\n maxValue = v\n }\n }\n return maxElem\n}\n\n*\n * Returns the first element yielding the largest value of the given function or `null` if there are no elements.\n * \n * @sample
samples.collections.Collections.Aggregates.maxByOrNull\n *\n@SinceKotlin("1.4")\npublic inline fun <R : Comparable<R>> CharArray.maxByOrNull(selector: (Char) -> R): Char? {\n if (isEmpty()) return null\n var maxElem = this[0]\n val lastIndex = this.lastIndex\n if (lastIndex == 0) return maxElem\n var maxValue = selector(maxElem)\n for (i in 1..lastIndex) {\n val e = this[i]\n val v = selector(e)\n if (maxValue < v) {\n maxElem = e\n maxValue = v\n }\n }\n return maxElem\n}\n\n*\n * Returns the largest value among all values produced by [selector] function\n * applied to each element in the array.\n * \n * If any of values produced by [selector] function is `NaN`, the returned result is `NaN`.\n * \n * @throws NoSuchElementException if the array is empty.\n
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolutionByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <T> Array<out T>.maxOf(selector: (T) -> Double): Double {\n if (isEmpty()) throw NoSuchElementException()\n var maxValue = selector(this[0])\n for (i in 1..lastIndex) {\n val v = selector(this[i])\n maxValue = maxOf(maxValue, v)\n }\n return maxValue\n}\n\n*\n * Returns the largest value among all values produced by [selector] function\n * applied to each element in the array.\n * \n * If any of values produced by [selector] function is `NaN`, the returned result is `NaN`.\n * \n * @throws NoSuchElementException if the array is empty.\n
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolutionByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun ByteArray.maxOf(selector: (Byte) -> Double): Double {\n if (isEmpty()) throw NoSuchElementException()\n var maxValue = selector(this[0])\n for (i in 1..lastIndex) {\n val v = selector(this[i])\n maxValue = maxOf(maxValue, v)\n }\n return maxValue\n}\n\n*\n * Returns the largest value among all values produced by [selector] function\n * applied to each element in the array.\n * \n * If any of values produced by [selector] function is `NaN`, the returned result is `NaN`.\n * \n * @throws NoSuchElementException if the array is empty.\n
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolutionByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun ShortArray.maxOf(selector: (Short) ->

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Double): Double {
    if (isEmpty()) throw NoSuchElementException()
    var maxValue = selector(this[0])
    for (i in 1..lastIndex) {
        val v = selector(this[i])
        maxValue = maxOf(maxValue, v)
    }
    return
    maxValue
}
/**
 * Returns the largest value among all values produced by [selector] function
 * applied to each element in the array.
 * If any of values produced by [selector] function is `NaN`, the returned result is
 * `NaN`.
 * @throws NoSuchElementException if the array is empty.
 */
@SinceKotlin("1.4")
@OptIn(kotlin.experimental.ExperimentalTypeInference::class)
@OverloadResolution
ByLambdaReturnType
@kotlin.internal.InlineOnly
public inline fun IntArray.maxOf(selector: (Int) -> Double):
Double {
    if (isEmpty()) throw NoSuchElementException()
    var maxValue = selector(this[0])
    for (i in
1..lastIndex) {
        val v = selector(this[i])
        maxValue = maxOf(maxValue, v)
    }
    return
    maxValue
}
/**
 * Returns the largest value among all values produced by [selector] function
 * applied to each element in the array.
 * If any of values produced by [selector] function is `NaN`, the returned result is
 * `NaN`.
 * @throws NoSuchElementException if the array is empty.
 */
@SinceKotlin("1.4")
@OptIn(kotlin.experimental.ExperimentalTypeInference::class)
@OverloadResolution
ByLambdaReturnType
@kotlin.internal.InlineOnly
public inline fun LongArray.maxOf(selector: (Long) ->
Double): Double {
    if (isEmpty()) throw NoSuchElementException()
    var maxValue = selector(this[0])
    for (i in 1..lastIndex) {
        val v = selector(this[i])
        maxValue = maxOf(maxValue, v)
    }
    return
    maxValue
}
/**
 * Returns the largest value among all values produced by [selector] function
 * applied to each element in the array.
 * If any of values produced by [selector] function is `NaN`, the returned result is
 * `NaN`.
 * @throws NoSuchElementException if the array is empty.
 */
@SinceKotlin("1.4")
@OptIn(kotlin.experimental.ExperimentalTypeInference::class)
@OverloadResolution
ByLambdaReturnType
@kotlin.internal.InlineOnly
public inline fun FloatArray.maxOf(selector: (Float) ->
Double): Double {
    if (isEmpty()) throw NoSuchElementException()
    var maxValue = selector(this[0])
    for (i in 1..lastIndex) {
        val v = selector(this[i])
        maxValue = maxOf(maxValue, v)
    }
    return
    maxValue
}
/**
 * Returns the largest value among all values produced by [selector] function
 * applied to each element in the array.
 * If any of values produced by [selector] function is `NaN`, the returned result is
 * `NaN`.
 * @throws NoSuchElementException if the array is empty.
 */
@SinceKotlin("1.4")
@OptIn(kotlin.experimental.ExperimentalTypeInference::class)
@OverloadResolution
ByLambdaReturnType
@kotlin.internal.InlineOnly
public inline fun DoubleArray.maxOf(selector: (Double) ->
Double): Double {
    if (isEmpty()) throw NoSuchElementException()
    var maxValue = selector(this[0])
    for (i in 1..lastIndex) {
        val v = selector(this[i])
        maxValue = maxOf(maxValue, v)
    }
    return
    maxValue
}
/**
 * Returns the largest value among all values produced by [selector] function
 * applied to each element in the array.
 * If any of values produced by [selector] function is `NaN`, the returned result is
 * `NaN`.
 * @throws NoSuchElementException if the array is empty.
 */
@SinceKotlin("1.4")
@OptIn(kotlin.experimental.ExperimentalTypeInference::class)
@OverloadResolution
ByLambdaReturnType
@kotlin.internal.InlineOnly
public inline fun BooleanArray.maxOf(selector: (Boolean) ->
Double): Double {
    if (isEmpty()) throw NoSuchElementException()
    var maxValue = selector(this[0])
    for (i in 1..lastIndex) {
        val v = selector(this[i])
        maxValue = maxOf(maxValue, v)
    }
    return
    maxValue
}
/**
 * Returns the largest value among all values produced by [selector] function
 * applied to each element in the array.
 * If any of values produced by [selector] function is `NaN`, the returned result is
 * `NaN`.
 * @throws NoSuchElementException if the array is empty.
 */
@SinceKotlin("1.4")
@OptIn(kotlin.experimental.ExperimentalTypeInference::class)
@OverloadResolution
ByLambdaReturnType
@kotlin.internal.InlineOnly
public inline fun CharArray.maxOf(selector: (Char) ->
Double): Double {
    if (isEmpty()) throw NoSuchElementException()
    var maxValue = selector(this[0])
    for (i in 1..lastIndex) {
        val v = selector(this[i])
        maxValue = maxOf(maxValue, v)
    }
    return
    maxValue
}
/**
 * Returns the largest value among all values produced by [selector] function
 * applied to each element in the array.
 * If any of values produced by [selector] function is `NaN`, the returned result is
 * `NaN`.
 * @throws NoSuchElementException if the array is empty.
 */
@SinceKotlin("1.4")
@OptIn(kotlin.experimental.ExperimentalTypeInference::class)
@OverloadResolution

```

```

ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <T> Array<out T>.maxOf(selector: (T) ->
Float): Float {\n  if (isEmpty()) throw NoSuchElementException()\n  var maxValue = selector(this[0])\n  for (i
in 1..lastIndex) {\n    val v = selector(this[i])\n    maxValue = maxOf(maxValue, v)\n  }\n  return
maxValue\n}\n\n/**\n * Returns the largest value among all values produced by [selector] function\n * applied to
each element in the array.\n * \n * If any of values produced by [selector] function is `NaN`, the returned result is
`NaN`.\n * \n * @throws NoSuchElementException if the array is empty.\n
*/\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun ByteArray.maxOf(selector: (Byte) -> Float):
Float {\n  if (isEmpty()) throw NoSuchElementException()\n  var maxValue = selector(this[0])\n  for (i
in 1..lastIndex) {\n    val v = selector(this[i])\n    maxValue = maxOf(maxValue, v)\n  }\n  return
maxValue\n}\n\n/**\n * Returns the largest value among all values produced by [selector] function\n * applied to
each element in the array.\n * \n * If any of values produced by [selector] function is `NaN`, the returned result is
`NaN`.\n * \n * @throws NoSuchElementException if the array is empty.\n
*/\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun ShortArray.maxOf(selector: (Short) ->
Float): Float {\n  if (isEmpty()) throw NoSuchElementException()\n  var maxValue = selector(this[0])\n  for (i
in 1..lastIndex) {\n    val v = selector(this[i])\n    maxValue = maxOf(maxValue, v)\n  }\n  return
maxValue\n}\n\n/**\n * Returns the largest value among all values produced by [selector] function\n * applied to
each element in the array.\n * \n * If any of values produced by [selector] function is `NaN`, the returned result is
`NaN`.\n * \n * @throws NoSuchElementException if the array is empty.\n
*/\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun IntArray.maxOf(selector: (Int) -> Float):
Float {\n  if (isEmpty()) throw NoSuchElementException()\n  var maxValue = selector(this[0])\n  for (i
in 1..lastIndex) {\n    val v = selector(this[i])\n    maxValue = maxOf(maxValue, v)\n  }\n  return
maxValue\n}\n\n/**\n * Returns the largest value among all values produced by [selector] function\n * applied to
each element in the array.\n * \n * If any of values produced by [selector] function is `NaN`, the returned result is
`NaN`.\n * \n * @throws NoSuchElementException if the array is empty.\n
*/\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun LongArray.maxOf(selector: (Long) ->
Float): Float {\n  if (isEmpty()) throw NoSuchElementException()\n  var maxValue = selector(this[0])\n  for (i
in 1..lastIndex) {\n    val v = selector(this[i])\n    maxValue = maxOf(maxValue, v)\n  }\n  return
maxValue\n}\n\n/**\n * Returns the largest value among all values produced by [selector] function\n * applied to
each element in the array.\n * \n * If any of values produced by [selector] function is `NaN`, the returned result is
`NaN`.\n * \n * @throws NoSuchElementException if the array is empty.\n
*/\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun FloatArray.maxOf(selector: (Float) ->
Float): Float {\n  if (isEmpty()) throw NoSuchElementException()\n  var maxValue = selector(this[0])\n  for (i
in 1..lastIndex) {\n    val v = selector(this[i])\n    maxValue = maxOf(maxValue, v)\n  }\n  return
maxValue\n}\n\n/**\n * Returns the largest value among all values produced by [selector] function\n * applied to
each element in the array.\n * \n * If any of values produced by [selector] function is `NaN`, the returned result is
`NaN`.\n * \n * @throws NoSuchElementException if the array is empty.\n
*/\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun DoubleArray.maxOf(selector: (Double) ->
Float): Float {\n  if (isEmpty()) throw NoSuchElementException()\n  var maxValue = selector(this[0])\n  for (i
in 1..lastIndex) {\n    val v = selector(this[i])\n    maxValue = maxOf(maxValue, v)\n  }\n  return
maxValue\n}\n\n/**\n * Returns the largest value among all values produced by [selector] function\n * applied to
each element in the array.\n * \n * If any of values produced by [selector] function is `NaN`, the returned result is
`NaN`.\n * \n * @throws NoSuchElementException if the array is empty.\n

```

```
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution  
ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun BooleanArray.maxOf(selector: (Boolean) ->  
Float): Float {\n    if (isEmpty()) throw NoSuchElementException()\n    var maxValue = selector(this[0])\n    for (i in 1..lastIndex) {\n        val v = selector(this[i])\n        maxValue = maxOf(maxValue, v)\n    }\n    return  
maxValue\n}\n\n/**\n * Returns the largest value among all values produced by [selector] function  
 * applied to each element in the array.\n * \n * If any of values produced by [selector] function is `NaN`, the returned result is  
 * `NaN`.\n * \n * @throws NoSuchElementException if the array is empty.\n
```

```
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution  
ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun CharArray.maxOf(selector: (Char) -> Float):  
Float {\n    if (isEmpty()) throw NoSuchElementException()\n    var maxValue = selector(this[0])\n    for (i in 1..lastIndex) {\n        val v = selector(this[i])\n        maxValue = maxOf(maxValue, v)\n    }\n    return  
maxValue\n}\n\n/**\n * Returns the largest value among all values produced by [selector] function  
 * applied to each element in the array.\n * \n * @throws NoSuchElementException if the array is empty.\n
```

```
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution  
ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <T, R : Comparable<R>> Array<out  
T>.maxOf(selector: (T) -> R): R {\n    if (isEmpty()) throw NoSuchElementException()\n    var maxValue =  
selector(this[0])\n    for (i in 1..lastIndex) {\n        val v = selector(this[i])\n        if (maxValue < v) {\n            maxValue = v\n        }\n    }\n    return maxValue\n}\n\n/**\n * Returns the largest value among all values produced  
 * by [selector] function  
 * applied to each element in the array.\n * \n * @throws NoSuchElementException if the  
 * array is empty.\n
```

```
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution  
ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <R : Comparable<R>>  
ByteArray.maxOf(selector: (Byte) -> R): R {\n    if (isEmpty()) throw NoSuchElementException()\n    var  
maxValue = selector(this[0])\n    for (i in 1..lastIndex) {\n        val v = selector(this[i])\n        if (maxValue < v) {\n            maxValue = v\n        }\n    }\n    return maxValue\n}\n\n/**\n * Returns the largest value among all values  
 * produced by [selector] function  
 * applied to each element in the array.\n * \n * @throws  
 * NoSuchElementException if the array is empty.\n
```

```
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution  
ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <R : Comparable<R>>  
ShortArray.maxOf(selector: (Short) -> R): R {\n    if (isEmpty()) throw NoSuchElementException()\n    var  
maxValue = selector(this[0])\n    for (i in 1..lastIndex) {\n        val v = selector(this[i])\n        if (maxValue < v) {\n            maxValue = v\n        }\n    }\n    return maxValue\n}\n\n/**\n * Returns the largest value among all values  
 * produced by [selector] function  
 * applied to each element in the array.\n * \n * @throws  
 * NoSuchElementException if the array is empty.\n
```

```
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution  
ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <R : Comparable<R>>  
IntArray.maxOf(selector: (Int) -> R): R {\n    if (isEmpty()) throw NoSuchElementException()\n    var maxValue =  
selector(this[0])\n    for (i in 1..lastIndex) {\n        val v = selector(this[i])\n        if (maxValue < v) {\n            maxValue = v\n        }\n    }\n    return maxValue\n}\n\n/**\n * Returns the largest value among all values produced  
 * by [selector] function  
 * applied to each element in the array.\n * \n * @throws NoSuchElementException if the  
 * array is empty.\n
```

```
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution  
ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <R : Comparable<R>>  
LongArray.maxOf(selector: (Long) -> R): R {\n    if (isEmpty()) throw NoSuchElementException()\n    var  
maxValue = selector(this[0])\n    for (i in 1..lastIndex) {\n        val v = selector(this[i])\n        if (maxValue < v) {\n            maxValue = v\n        }\n    }\n    return maxValue\n}\n\n/**\n * Returns the largest value among all values  
 * produced by [selector] function  
 * applied to each element in the array.\n * \n * @throws  
 * NoSuchElementException if the array is empty.\n
```

```

*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <R : Comparable<R>>
FloatArray.maxOf(selector: (Float) -> R): R {\n if (isEmpty()) throw NoSuchElementException()\n var
maxValue = selector(this[0])\n for (i in 1..lastIndex) {\n val v = selector(this[i])\n if (maxValue < v) {\n
maxValue = v\n }\n }\n return maxValue\n}\n\n**\n * Returns the largest value among all values
produced by [selector] function\n * applied to each element in the array.\n * \n * @throws
NoSuchElementException if the array is empty.\n
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <R : Comparable<R>>
DoubleArray.maxOf(selector: (Double) -> R): R {\n if (isEmpty()) throw NoSuchElementException()\n var
maxValue = selector(this[0])\n for (i in 1..lastIndex) {\n val v = selector(this[i])\n if (maxValue < v) {\n
maxValue = v\n }\n }\n return maxValue\n}\n\n**\n * Returns the largest value among all values
produced by [selector] function\n * applied to each element in the array.\n * \n * @throws
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*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <R : Comparable<R>>
BooleanArray.maxOf(selector: (Boolean) -> R): R {\n if (isEmpty()) throw NoSuchElementException()\n var
maxValue = selector(this[0])\n for (i in 1..lastIndex) {\n val v = selector(this[i])\n if (maxValue < v) {\n
maxValue = v\n }\n }\n return maxValue\n}\n\n**\n * Returns the largest value among all values
produced by [selector] function\n * applied to each element in the array.\n * \n * @throws
NoSuchElementException if the array is empty.\n
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <R : Comparable<R>>
CharArray.maxOf(selector: (Char) -> R): R {\n if (isEmpty()) throw NoSuchElementException()\n var
maxValue = selector(this[0])\n for (i in 1..lastIndex) {\n val v = selector(this[i])\n if (maxValue < v) {\n
maxValue = v\n }\n }\n return maxValue\n}\n\n**\n * Returns the largest value among all values
produced by [selector] function\n * applied to each element in the array or `null` if there are no elements.\n * \n * If
any of values produced by [selector] function is `NaN`, the returned result is `NaN`.\n
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <T> Array<out T>.maxOfOrNull(selector:
(T) -> Double): Double? {\n if (isEmpty()) return null\n var maxValue = selector(this[0])\n for (i in
1..lastIndex) {\n val v = selector(this[i])\n maxValue = maxOf(maxValue, v)\n }\n return
maxValue\n}\n\n**\n * Returns the largest value among all values produced by [selector] function\n * applied to
each element in the array or `null` if there are no elements.\n * \n * If any of values produced by [selector] function
is `NaN`, the returned result is `NaN`.\n
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun ByteArray.maxOfOrNull(selector: (Byte) ->
Double): Double? {\n if (isEmpty()) return null\n var maxValue = selector(this[0])\n for (i in 1..lastIndex) {\n
val v = selector(this[i])\n maxValue = maxOf(maxValue, v)\n }\n return maxValue\n}\n\n**\n * Returns
the largest value among all values produced by [selector] function\n * applied to each element in the array or `null`
if there are no elements.\n * \n * If any of values produced by [selector] function is `NaN`, the returned result is
`NaN`.\n
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun ShortArray.maxOfOrNull(selector: (Short) -
> Double): Double? {\n if (isEmpty()) return null\n var maxValue = selector(this[0])\n for (i in 1..lastIndex)
{\n val v = selector(this[i])\n maxValue = maxOf(maxValue, v)\n }\n return maxValue\n}\n\n**\n *
Returns the largest value among all values produced by [selector] function\n * applied to each element in the array
or `null` if there are no elements.\n * \n * If any of values produced by [selector] function is `NaN`, the returned

```

result is `NaN`.\n

```
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution\nByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun IntArray.maxOrNull(selector: (Int) ->\nDouble): Double? {\n    if (isEmpty()) return null\n    var maxValue = selector(this[0])\n    for (i in 1..lastIndex) {\n        val v = selector(this[i])\n        maxValue = maxOf(maxValue, v)\n    }\n    return maxValue\n}\n\n/**\n * Returns the largest value among all values produced by [selector] function\n * applied to each element in the array or `null` if there are no elements.\n * If any of values produced by [selector] function is `NaN`, the returned result is\n * `NaN`.\n */
```

```
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution\nByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun LongArray.maxOrNull(selector: (Long) ->\nDouble): Double? {\n    if (isEmpty()) return null\n    var maxValue = selector(this[0])\n    for (i in 1..lastIndex) {\n        val v = selector(this[i])\n        maxValue = maxOf(maxValue, v)\n    }\n    return maxValue\n}\n\n/**\n * Returns the largest value among all values produced by [selector] function\n * applied to each element in the array or `null` if there are no elements.\n * If any of values produced by [selector] function is `NaN`, the returned\n * result is `NaN`.\n */
```

```
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution\nByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun FloatArray.maxOrNull(selector: (Float) ->\nDouble): Double? {\n    if (isEmpty()) return null\n    var maxValue = selector(this[0])\n    for (i in 1..lastIndex) {\n        val v = selector(this[i])\n        maxValue = maxOf(maxValue, v)\n    }\n    return maxValue\n}\n\n/**\n * Returns the largest value among all values produced by [selector] function\n * applied to each element in the array or `null` if there are no elements.\n * If any of values produced by [selector] function is `NaN`, the returned\n * result is `NaN`.\n */
```

```
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution\nByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun DoubleArray.maxOrNull(selector:\n(Double) -> Double): Double? {\n    if (isEmpty()) return null\n    var maxValue = selector(this[0])\n    for (i in 1..lastIndex) {\n        val v = selector(this[i])\n        maxValue = maxOf(maxValue, v)\n    }\n    return\n    maxValue\n}\n\n/**\n * Returns the largest value among all values produced by [selector] function\n * applied to each element in the array or `null` if there are no elements.\n * If any of values produced by [selector] function is `NaN`, the returned result is\n * `NaN`.\n */
```

```
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution\nByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun BooleanArray.maxOrNull(selector:\n(Boolean) -> Double): Double? {\n    if (isEmpty()) return null\n    var maxValue = selector(this[0])\n    for (i in 1..lastIndex) {\n        val v = selector(this[i])\n        maxValue = maxOf(maxValue, v)\n    }\n    return\n    maxValue\n}\n\n/**\n * Returns the largest value among all values produced by [selector] function\n * applied to each element in the array or `null` if there are no elements.\n * If any of values produced by [selector] function is `NaN`, the returned result is\n * `NaN`.\n */
```

```
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution\nByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun CharArray.maxOrNull(selector: (Char) ->\nDouble): Double? {\n    if (isEmpty()) return null\n    var maxValue = selector(this[0])\n    for (i in 1..lastIndex) {\n        val v = selector(this[i])\n        maxValue = maxOf(maxValue, v)\n    }\n    return maxValue\n}\n\n/**\n * Returns the largest value among all values produced by [selector] function\n * applied to each element in the array or `null` if there are no elements.\n * If any of values produced by [selector] function is `NaN`, the returned result is\n * `NaN`.\n */
```

```
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution\nByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <T> Array<out T>.maxOrNull(selector:\n(T) -> Float): Float? {\n    if (isEmpty()) return null\n    var maxValue = selector(this[0])\n    for (i in 1..lastIndex) {\n        val v = selector(this[i])\n        maxValue = maxOf(maxValue, v)\n    }\n    return maxValue\n}\n\n/**\n * Returns the largest value among all values produced by [selector] function\n * applied to each element in the array
```

or `null` if there are no elements.\n * \n * If any of values produced by [selector] function is `NaN`, the returned result is `NaN`.\n

```
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution\nByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun ByteArray.maxOrNull(selector: (Byte) ->\nFloat): Float? {\n    if (isEmpty()) return null\n    var maxValue = selector(this[0])\n    for (i in 1..lastIndex) {\n        val v = selector(this[i])\n        maxValue = maxOf(maxValue, v)\n    }\n    return maxValue\n}\n/**\n * Returns the largest value among all values produced by [selector] function\n * applied to each element in the array or `null`\n * if there are no elements.\n * \n * If any of values produced by [selector] function is `NaN`, the returned result is\n * `NaN`.\n
```

```
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution\nByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun ShortArray.maxOrNull(selector: (Short) ->\nFloat): Float? {\n    if (isEmpty()) return null\n    var maxValue = selector(this[0])\n    for (i in 1..lastIndex) {\n        val v = selector(this[i])\n        maxValue = maxOf(maxValue, v)\n    }\n    return maxValue\n}\n/**\n * Returns the largest value among all values produced by [selector] function\n * applied to each element in the array or `null`\n * if there are no elements.\n * \n * If any of values produced by [selector] function is `NaN`, the returned result is\n * `NaN`.\n
```

```
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution\nByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun IntArray.maxOrNull(selector: (Int) ->\nFloat): Float? {\n    if (isEmpty()) return null\n    var maxValue = selector(this[0])\n    for (i in 1..lastIndex) {\n        val v = selector(this[i])\n        maxValue = maxOf(maxValue, v)\n    }\n    return maxValue\n}\n/**\n * Returns the largest value among all values produced by [selector] function\n * applied to each element in the array or `null`\n * if there are no elements.\n * \n * If any of values produced by [selector] function is `NaN`, the returned result is\n * `NaN`.\n
```

```
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution\nByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun LongArray.maxOrNull(selector: (Long) ->\nFloat): Float? {\n    if (isEmpty()) return null\n    var maxValue = selector(this[0])\n    for (i in 1..lastIndex) {\n        val v = selector(this[i])\n        maxValue = maxOf(maxValue, v)\n    }\n    return maxValue\n}\n/**\n * Returns the largest value among all values produced by [selector] function\n * applied to each element in the array or `null`\n * if there are no elements.\n * \n * If any of values produced by [selector] function is `NaN`, the returned result is\n * `NaN`.\n
```

```
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution\nByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun FloatArray.maxOrNull(selector: (Float) ->\nFloat): Float? {\n    if (isEmpty()) return null\n    var maxValue = selector(this[0])\n    for (i in 1..lastIndex) {\n        val v = selector(this[i])\n        maxValue = maxOf(maxValue, v)\n    }\n    return maxValue\n}\n/**\n * Returns the largest value among all values produced by [selector] function\n * applied to each element in the array or `null`\n * if there are no elements.\n * \n * If any of values produced by [selector] function is `NaN`, the returned result is\n * `NaN`.\n
```

```
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution\nByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun DoubleArray.maxOrNull(selector:\n(Double) -> Float): Float? {\n    if (isEmpty()) return null\n    var maxValue = selector(this[0])\n    for (i in\n1..lastIndex) {\n        val v = selector(this[i])\n        maxValue = maxOf(maxValue, v)\n    }\n    return\nmaxValue\n}\n/**\n * Returns the largest value among all values produced by [selector] function\n * applied to\n * each element in the array or `null` if there are no elements.\n * \n * If any of values produced by [selector] function\n * is `NaN`, the returned result is `NaN`.\n
```

```
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution\nByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun BooleanArray.maxOrNull(selector:\n(Boolean) -> Float): Float? {\n    if (isEmpty()) return null\n    var maxValue = selector(this[0])\n    for (i in\n1..lastIndex) {\n        val v = selector(this[i])\n        maxValue = maxOf(maxValue, v)\n    }\n    return\n
```

maxValue\n}\n\n/**\n * Returns the largest value among all values produced by [selector] function\n * applied to each element in the array or `null` if there are no elements.\n * \n * If any of values produced by [selector] function is `NaN`, the returned result is `NaN`.\n

```
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolutionByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun CharArray.maxOrNull(selector: (Char) -> Float): Float? {\n    if (isEmpty()) return null\n    var maxValue = selector(this[0])\n    for (i in 1..lastIndex) {\n        val v = selector(this[i])\n        maxValue = maxOf(maxValue, v)\n    }\n    return maxValue\n}\n\n/**\n * Returns the largest value among all values produced by [selector] function\n * applied to each element in the array or `null` if there are no elements.\n
```

```
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolutionByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <T, R : Comparable<R>> Array<out T>.maxOrNull(selector: (T) -> R): R? {\n    if (isEmpty()) return null\n    var maxValue = selector(this[0])\n    for (i in 1..lastIndex) {\n        val v = selector(this[i])\n        if (maxValue < v) {\n            maxValue = v\n        }\n    }\n    return maxValue\n}\n\n/**\n * Returns the largest value among all values produced by [selector] function\n * applied to each element in the array or `null` if there are no elements.\n
```

```
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolutionByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <R : Comparable<R>> ByteArray.maxOrNull(selector: (Byte) -> R): R? {\n    if (isEmpty()) return null\n    var maxValue = selector(this[0])\n    for (i in 1..lastIndex) {\n        val v = selector(this[i])\n        if (maxValue < v) {\n            maxValue = v\n        }\n    }\n    return maxValue\n}\n\n/**\n * Returns the largest value among all values produced by [selector] function\n * applied to each element in the array or `null` if there are no elements.\n
```

```
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolutionByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <R : Comparable<R>> ShortArray.maxOrNull(selector: (Short) -> R): R? {\n    if (isEmpty()) return null\n    var maxValue = selector(this[0])\n    for (i in 1..lastIndex) {\n        val v = selector(this[i])\n        if (maxValue < v) {\n            maxValue = v\n        }\n    }\n    return maxValue\n}\n\n/**\n * Returns the largest value among all values produced by [selector] function\n * applied to each element in the array or `null` if there are no elements.\n
```

```
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolutionByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <R : Comparable<R>> IntArray.maxOrNull(selector: (Int) -> R): R? {\n    if (isEmpty()) return null\n    var maxValue = selector(this[0])\n    for (i in 1..lastIndex) {\n        val v = selector(this[i])\n        if (maxValue < v) {\n            maxValue = v\n        }\n    }\n    return maxValue\n}\n\n/**\n * Returns the largest value among all values produced by [selector] function\n * applied to each element in the array or `null` if there are no elements.\n
```

```
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolutionByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <R : Comparable<R>> LongArray.maxOrNull(selector: (Long) -> R): R? {\n    if (isEmpty()) return null\n    var maxValue = selector(this[0])\n    for (i in 1..lastIndex) {\n        val v = selector(this[i])\n        if (maxValue < v) {\n            maxValue = v\n        }\n    }\n    return maxValue\n}\n\n/**\n * Returns the largest value among all values produced by [selector] function\n * applied to each element in the array or `null` if there are no elements.\n
```

```
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolutionByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <R : Comparable<R>> FloatArray.maxOrNull(selector: (Float) -> R): R? {\n    if (isEmpty()) return null\n    var maxValue = selector(this[0])\n    for (i in 1..lastIndex) {\n        val v = selector(this[i])\n        if (maxValue < v) {\n            maxValue = v\n        }\n    }\n    return maxValue\n}\n\n/**\n * Returns the largest value among all values produced by [selector] function\n * applied to each element in the array or `null` if there are no elements.\n
```

```
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolutionByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <R : Comparable<R>> DoubleArray.maxOrNull(selector: (Double) -> R): R? {\n    if (isEmpty()) return null\n    var maxValue =
```

```

selector(this[0])\n for (i in 1..lastIndex) {\n     val v = selector(this[i])\n     if (maxValue < v) {\n
maxValue = v\n     }\n }\n return maxValue\n}\n\n/**\n * Returns the largest value among all values produced
by [selector] function\n * applied to each element in the array or `null` if there are no elements.\n
*\n\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <R : Comparable<R>>
BooleanArray.maxOfOrNull(selector: (Boolean) -> R): R? {\n if (isEmpty()) return null\n var maxValue =
selector(this[0])\n for (i in 1..lastIndex) {\n     val v = selector(this[i])\n     if (maxValue < v) {\n
maxValue = v\n     }\n }\n return maxValue\n}\n\n/**\n * Returns the largest value among all values produced
by [selector] function\n * applied to each element in the array or `null` if there are no elements.\n
*\n\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <R : Comparable<R>>
CharArray.maxOfOrNull(selector: (Char) -> R): R? {\n if (isEmpty()) return null\n var maxValue =
selector(this[0])\n for (i in 1..lastIndex) {\n     val v = selector(this[i])\n     if (maxValue < v) {\n
maxValue = v\n     }\n }\n return maxValue\n}\n\n/**\n * Returns the largest value according to the provided
[comparator]\n * among all values produced by [selector] function applied to each element in the array.\n * \n *
@throws NoSuchElementException if the array is empty.\n
*\n\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <T, R> Array<out
T>.maxOfWith(comparator: Comparator<in R>, selector: (T) -> R): R {\n if (isEmpty()) throw
NoSuchElementException()\n var maxValue = selector(this[0])\n for (i in 1..lastIndex) {\n     val v =
selector(this[i])\n     if (comparator.compare(maxValue, v) < 0) {\n         maxValue = v\n     }\n }\n return
maxValue\n}\n\n/**\n * Returns the largest value according to the provided [comparator]\n * among all values
produced by [selector] function applied to each element in the array.\n * \n * @throws NoSuchElementException if
the array is empty.\n
*\n\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <R> ByteArray.maxOfWith(comparator:
Comparator<in R>, selector: (Byte) -> R): R {\n if (isEmpty()) throw NoSuchElementException()\n var
maxValue = selector(this[0])\n for (i in 1..lastIndex) {\n     val v = selector(this[i])\n     if
(comparator.compare(maxValue, v) < 0) {\n         maxValue = v\n     }\n }\n return maxValue\n}\n\n/**\n *
Returns the largest value according to the provided [comparator]\n * among all values produced by [selector]
function applied to each element in the array.\n * \n * @throws NoSuchElementException if the array is empty.\n
*\n\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <R> ShortArray.maxOfWith(comparator:
Comparator<in R>, selector: (Short) -> R): R {\n if (isEmpty()) throw NoSuchElementException()\n var
maxValue = selector(this[0])\n for (i in 1..lastIndex) {\n     val v = selector(this[i])\n     if
(comparator.compare(maxValue, v) < 0) {\n         maxValue = v\n     }\n }\n return maxValue\n}\n\n/**\n *
Returns the largest value according to the provided [comparator]\n * among all values produced by [selector]
function applied to each element in the array.\n * \n * @throws NoSuchElementException if the array is empty.\n
*\n\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <R> IntArray.maxOfWith(comparator:
Comparator<in R>, selector: (Int) -> R): R {\n if (isEmpty()) throw NoSuchElementException()\n var maxValue
= selector(this[0])\n for (i in 1..lastIndex) {\n     val v = selector(this[i])\n     if
(comparator.compare(maxValue, v) < 0) {\n         maxValue = v\n     }\n }\n return maxValue\n}\n\n/**\n *
Returns the largest value according to the provided [comparator]\n * among all values produced by [selector]
function applied to each element in the array.\n * \n * @throws NoSuchElementException if the array is empty.\n
*\n\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <R> LongArray.maxOfWith(comparator:
Comparator<in R>, selector: (Long) -> R): R {\n if (isEmpty()) throw NoSuchElementException()\n var

```



```

maxValue = selector(this[0])\n  for (i in 1..lastIndex) {\n    val v = selector(this[i])\n    if
(comparator.compare(maxValue, v) < 0) {\n      maxValue = v\n    }\n  }\n  return maxValue\n}\n\n/**\n * Returns the largest value according to the provided [comparator]\n * among all values produced by [selector]
function applied to each element in the array.\n * \n * @throws NoSuchElementException if the array is empty.\n
*\n * \n * @SinceKotlin("1.4")\n * @OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n * @OverloadResolution
ByLambdaReturnType\n * @kotlin.internal.InlineOnly\n * public inline fun <R> FloatArray.maxOfWith(comparator:
Comparator<in R>, selector: (Float) -> R): R {\n  if (isEmpty()) throw NoSuchElementException()\n  var
maxValue = selector(this[0])\n  for (i in 1..lastIndex) {\n    val v = selector(this[i])\n    if
(comparator.compare(maxValue, v) < 0) {\n      maxValue = v\n    }\n  }\n  return maxValue\n}\n\n/**\n * Returns the largest value according to the provided [comparator]\n * among all values produced by [selector]
function applied to each element in the array.\n * \n * @throws NoSuchElementException if the array is empty.\n
*\n * \n * @SinceKotlin("1.4")\n * @OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n * @OverloadResolution
ByLambdaReturnType\n * @kotlin.internal.InlineOnly\n * public inline fun <R> DoubleArray.maxOfWith(comparator:
Comparator<in R>, selector: (Double) -> R): R {\n  if (isEmpty()) throw NoSuchElementException()\n  var
maxValue = selector(this[0])\n  for (i in 1..lastIndex) {\n    val v = selector(this[i])\n    if
(comparator.compare(maxValue, v) < 0) {\n      maxValue = v\n    }\n  }\n  return maxValue\n}\n\n/**\n * Returns the largest value according to the provided [comparator]\n * among all values produced by [selector]
function applied to each element in the array.\n * \n * @throws NoSuchElementException if the array is empty.\n
*\n * \n * @SinceKotlin("1.4")\n * @OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n * @OverloadResolution
ByLambdaReturnType\n * @kotlin.internal.InlineOnly\n * public inline fun <R> BooleanArray.maxOfWith(comparator:
Comparator<in R>, selector: (Boolean) -> R): R {\n  if (isEmpty()) throw NoSuchElementException()\n  var
maxValue = selector(this[0])\n  for (i in 1..lastIndex) {\n    val v = selector(this[i])\n    if
(comparator.compare(maxValue, v) < 0) {\n      maxValue = v\n    }\n  }\n  return maxValue\n}\n\n/**\n * Returns the largest value according to the provided [comparator]\n * among all values produced by [selector]
function applied to each element in the array.\n * \n * @throws NoSuchElementException if the array is empty.\n
*\n * \n * @SinceKotlin("1.4")\n * @OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n * @OverloadResolution
ByLambdaReturnType\n * @kotlin.internal.InlineOnly\n * public inline fun <R> CharArray.maxOfWith(comparator:
Comparator<in R>, selector: (Char) -> R): R {\n  if (isEmpty()) throw NoSuchElementException()\n  var
maxValue = selector(this[0])\n  for (i in 1..lastIndex) {\n    val v = selector(this[i])\n    if
(comparator.compare(maxValue, v) < 0) {\n      maxValue = v\n    }\n  }\n  return maxValue\n}\n\n/**\n * Returns the largest value according to the provided [comparator]\n * among all values produced by [selector]
function applied to each element in the array or `null` if there are no elements.\n
*\n * \n * @SinceKotlin("1.4")\n * @OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n * @OverloadResolution
ByLambdaReturnType\n * @kotlin.internal.InlineOnly\n * public inline fun <T, R> Array<out
T>.maxOfWithOrNull(comparator: Comparator<in R>, selector: (T) -> R): R? {\n  if (isEmpty()) return null\n
var maxValue = selector(this[0])\n  for (i in 1..lastIndex) {\n    val v = selector(this[i])\n    if
(comparator.compare(maxValue, v) < 0) {\n      maxValue = v\n    }\n  }\n  return maxValue\n}\n\n/**\n * Returns the largest value according to the provided [comparator]\n * among all values produced by [selector]
function applied to each element in the array or `null` if there are no elements.\n
*\n * \n * @SinceKotlin("1.4")\n * @OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n * @OverloadResolution
ByLambdaReturnType\n * @kotlin.internal.InlineOnly\n * public inline fun <R>
ByteArray.maxOfWithOrNull(comparator: Comparator<in R>, selector: (Byte) -> R): R? {\n  if (isEmpty()) return
null\n  var maxValue = selector(this[0])\n  for (i in 1..lastIndex) {\n    val v = selector(this[i])\n    if
(comparator.compare(maxValue, v) < 0) {\n      maxValue = v\n    }\n  }\n  return maxValue\n}\n\n/**\n * Returns the largest value according to the provided [comparator]\n * among all values produced by [selector]
function applied to each element in the array or `null` if there are no elements.\n
*\n * \n * @SinceKotlin("1.4")\n * @OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n * @OverloadResolution
ByLambdaReturnType\n * @kotlin.internal.InlineOnly\n * public inline fun <R>

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```

ShortArray.maxOfWithOrNull(comparator: Comparator<in R>, selector: (Short) -> R): R? {\n  if (isEmpty())\n  return null\n  var maxValue = selector(this[0])\n  for (i in 1..lastIndex) {\n    val v = selector(this[i])\n    if\n    (comparator.compare(maxValue, v) < 0) {\n      maxValue = v\n    }\n  }\n  return maxValue\n}\n\nReturns the largest value according to the provided [comparator]\n * among all values produced by [selector]\n function applied to each element in the array or `null` if there are no elements.\n\n*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution\nByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <R>

IntArray.maxOfWithOrNull(comparator: Comparator<in R>, selector: (Int) -> R): R? {\n  if (isEmpty()) return\n  null\n  var maxValue = selector(this[0])\n  for (i in 1..lastIndex) {\n    val v = selector(this[i])\n    if\n    (comparator.compare(maxValue, v) < 0) {\n      maxValue = v\n    }\n  }\n  return maxValue\n}\n\nReturns the largest value according to the provided [comparator]\n * among all values produced by [selector]\n function applied to each element in the array or `null` if there are no elements.\n\n*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution\nByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <R>

LongArray.maxOfWithOrNull(comparator: Comparator<in R>, selector: (Long) -> R): R? {\n  if (isEmpty())\n  return null\n  var maxValue = selector(this[0])\n  for (i in 1..lastIndex) {\n    val v = selector(this[i])\n    if\n    (comparator.compare(maxValue, v) < 0) {\n      maxValue = v\n    }\n  }\n  return maxValue\n}\n\nReturns the largest value according to the provided [comparator]\n * among all values produced by [selector]\n function applied to each element in the array or `null` if there are no elements.\n\n*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution\nByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <R>

FloatArray.maxOfWithOrNull(comparator: Comparator<in R>, selector: (Float) -> R): R? {\n  if (isEmpty())\n  return null\n  var maxValue = selector(this[0])\n  for (i in 1..lastIndex) {\n    val v = selector(this[i])\n    if\n    (comparator.compare(maxValue, v) < 0) {\n      maxValue = v\n    }\n  }\n  return maxValue\n}\n\nReturns the largest value according to the provided [comparator]\n * among all values produced by [selector]\n function applied to each element in the array or `null` if there are no elements.\n\n*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution\nByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <R>

DoubleArray.maxOfWithOrNull(comparator: Comparator<in R>, selector: (Double) -> R): R? {\n  if (isEmpty())\n  return null\n  var maxValue = selector(this[0])\n  for (i in 1..lastIndex) {\n    val v = selector(this[i])\n    if\n    (comparator.compare(maxValue, v) < 0) {\n      maxValue = v\n    }\n  }\n  return maxValue\n}\n\nReturns the largest value according to the provided [comparator]\n * among all values produced by [selector]\n function applied to each element in the array or `null` if there are no elements.\n\n*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution\nByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <R>

BooleanArray.maxOfWithOrNull(comparator: Comparator<in R>, selector: (Boolean) -> R): R? {\n  if (isEmpty())\n  return null\n  var maxValue = selector(this[0])\n  for (i in 1..lastIndex) {\n    val v = selector(this[i])\n    if\n    (comparator.compare(maxValue, v) < 0) {\n      maxValue = v\n    }\n  }\n  return maxValue\n}\n\nReturns the largest value according to the provided [comparator]\n * among all values produced by [selector]\n function applied to each element in the array or `null` if there are no elements.\n\n*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution\nByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <R>

CharArray.maxOfWithOrNull(comparator: Comparator<in R>, selector: (Char) -> R): R? {\n  if (isEmpty()) return\n  null\n  var maxValue = selector(this[0])\n  for (i in 1..lastIndex) {\n    val v = selector(this[i])\n    if\n    (comparator.compare(maxValue, v) < 0) {\n      maxValue = v\n    }\n  }\n  return maxValue\n}\n\nReturns the largest element or `null` if there are no elements.\n * \n * If any of elements is `NaN` returns `NaN`.\n\n*\n@SinceKotlin("1.4")\npublic fun Array<out Double>.maxOrNull(): Double? {\n  if (isEmpty()) return null\n  var max = this[0]\n  for (i in 1..lastIndex) {\n    val e = this[i]\n    max = maxOf(max, e)\n  }\n  return

```

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max\n}\n\n/**\n * Returns the largest element or `null` if there are no elements.\n * \n * If any of elements is `NaN`
returns `NaN`.\n *\n@SinceKotlin("1.4")\npublic fun Array<out Float>.maxOrNull(): Float? {\n if (isEmpty())
return null\n var max = this[0]\n for (i in 1..lastIndex) {\n val e = this[i]\n max = maxOf(max, e)\n }\n
return max\n}\n\n/**\n * Returns the largest element or `null` if there are no elements.\n
*\n@SinceKotlin("1.4")\npublic fun <T : Comparable<T>> Array<out T>.maxOrNull(): T? {\n if (isEmpty())
return null\n var max = this[0]\n for (i in 1..lastIndex) {\n val e = this[i]\n if (max < e) max = e\n }\n
return max\n}\n\n/**\n * Returns the largest element or `null` if there are no elements.\n
*\n@SinceKotlin("1.4")\npublic fun ByteArray.maxOrNull(): Byte? {\n if (isEmpty()) return null\n var max =
this[0]\n for (i in 1..lastIndex) {\n val e = this[i]\n if (max < e) max = e\n }\n return max\n}\n\n/**\n *
Returns the largest element or `null` if there are no elements.\n *\n@SinceKotlin("1.4")\npublic fun
ShortArray.maxOrNull(): Short? {\n if (isEmpty()) return null\n var max = this[0]\n for (i in 1..lastIndex) {\n
val e = this[i]\n if (max < e) max = e\n }\n return max\n}\n\n/**\n * Returns the largest element or `null` if
there are no elements.\n *\n@SinceKotlin("1.4")\npublic fun IntArray.maxOrNull(): Int? {\n if (isEmpty())
return null\n var max = this[0]\n for (i in 1..lastIndex) {\n val e = this[i]\n if (max < e) max = e\n }\n
return max\n}\n\n/**\n * Returns the largest element or `null` if there are no elements.\n
*\n@SinceKotlin("1.4")\npublic fun LongArray.maxOrNull(): Long? {\n if (isEmpty()) return null\n var max
= this[0]\n for (i in 1..lastIndex) {\n val e = this[i]\n if (max < e) max = e\n }\n return max\n}\n\n/**\n *
Returns the largest element or `null` if there are no elements.\n * \n * If any of elements is `NaN` returns `NaN`.\n
*\n@SinceKotlin("1.4")\npublic fun FloatArray.maxOrNull(): Float? {\n if (isEmpty()) return null\n var max
= this[0]\n for (i in 1..lastIndex) {\n val e = this[i]\n max = maxOf(max, e)\n }\n return
max\n}\n\n/**\n * Returns the largest element or `null` if there are no elements.\n * \n * If any of elements is `NaN`
returns `NaN`.\n *\n@SinceKotlin("1.4")\npublic fun DoubleArray.maxOrNull(): Double? {\n if (isEmpty())
return null\n var max = this[0]\n for (i in 1..lastIndex) {\n val e = this[i]\n max = maxOf(max, e)\n }\n
return max\n}\n\n/**\n * Returns the largest element or `null` if there are no elements.\n
*\n@SinceKotlin("1.4")\npublic fun CharArray.maxOrNull(): Char? {\n if (isEmpty()) return null\n var max =
this[0]\n for (i in 1..lastIndex) {\n val e = this[i]\n if (max < e) max = e\n }\n return
max\n}\n\n@Deprecated("Use maxWithOrNull instead.",
ReplaceWith("this.maxWithOrNull(comparator)"))\n@DeprecatedSinceKotlin(warningSince = "1.4", errorSince
= "1.5", hiddenSince = "1.6")\npublic fun <T> Array<out T>.maxWith(comparator: Comparator<in T>): T? {\n
return maxWithOrNull(comparator)\n}\n\n@Deprecated("Use maxWithOrNull instead.",
ReplaceWith("this.maxWithOrNull(comparator)"))\n@DeprecatedSinceKotlin(warningSince = "1.4", errorSince
= "1.5", hiddenSince = "1.6")\npublic fun ByteArray.maxWith(comparator: Comparator<in Byte>): Byte? {\n
return maxWithOrNull(comparator)\n}\n\n@Deprecated("Use maxWithOrNull instead.",
ReplaceWith("this.maxWithOrNull(comparator)"))\n@DeprecatedSinceKotlin(warningSince = "1.4", errorSince
= "1.5", hiddenSince = "1.6")\npublic fun ShortArray.maxWith(comparator: Comparator<in Short>): Short? {\n
return maxWithOrNull(comparator)\n}\n\n@Deprecated("Use maxWithOrNull instead.",
ReplaceWith("this.maxWithOrNull(comparator)"))\n@DeprecatedSinceKotlin(warningSince = "1.4", errorSince
= "1.5", hiddenSince = "1.6")\npublic fun IntArray.maxWith(comparator: Comparator<in Int>): Int? {\n return
maxWithOrNull(comparator)\n}\n\n@Deprecated("Use maxWithOrNull instead.",
ReplaceWith("this.maxWithOrNull(comparator)"))\n@DeprecatedSinceKotlin(warningSince = "1.4", errorSince
= "1.5", hiddenSince = "1.6")\npublic fun LongArray.maxWith(comparator: Comparator<in Long>): Long? {\n
return maxWithOrNull(comparator)\n}\n\n@Deprecated("Use maxWithOrNull instead.",
ReplaceWith("this.maxWithOrNull(comparator)"))\n@DeprecatedSinceKotlin(warningSince = "1.4", errorSince
= "1.5", hiddenSince = "1.6")\npublic fun FloatArray.maxWith(comparator: Comparator<in Float>): Float? {\n
return maxWithOrNull(comparator)\n}\n\n@Deprecated("Use maxWithOrNull instead.",
ReplaceWith("this.maxWithOrNull(comparator)"))\n@DeprecatedSinceKotlin(warningSince = "1.4", errorSince
= "1.5", hiddenSince = "1.6")\npublic fun DoubleArray.maxWith(comparator: Comparator<in Double>): Double?
{\n return maxWithOrNull(comparator)\n}\n\n@Deprecated("Use maxWithOrNull instead.",

```



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hiddenSince = `1.6`)npublic fun <T : Comparable<T>> Array<out T>.min(): T? {n  return
minOrNull()\n}\n\n@Deprecated(`Use minOrNull instead.`),
ReplaceWith(`this.minOrNull()\n`)n@DeprecatedSinceKotlin(warningSince = `1.4`, errorSince = `1.5`,
hiddenSince = `1.6`)npublic fun ByteArray.min(): Byte? {n  return minOrNull()\n}\n\n@Deprecated(`Use
minOrNull instead.`), ReplaceWith(`this.minOrNull()\n`)n@DeprecatedSinceKotlin(warningSince = `1.4`,
errorSince = `1.5`, hiddenSince = `1.6`)npublic fun ShortArray.min(): Short? {n  return
minOrNull()\n}\n\n@Deprecated(`Use minOrNull instead.`),
ReplaceWith(`this.minOrNull()\n`)n@DeprecatedSinceKotlin(warningSince = `1.4`, errorSince = `1.5`,
hiddenSince = `1.6`)npublic fun IntArray.min(): Int? {n  return minOrNull()\n}\n\n@Deprecated(`Use
minOrNull instead.`), ReplaceWith(`this.minOrNull()\n`)n@DeprecatedSinceKotlin(warningSince = `1.4`,
errorSince = `1.5`, hiddenSince = `1.6`)npublic fun LongArray.min(): Long? {n  return
minOrNull()\n}\n\n@Deprecated(`Use minOrNull instead.`),
ReplaceWith(`this.minOrNull()\n`)n@DeprecatedSinceKotlin(warningSince = `1.4`, errorSince = `1.5`,
hiddenSince = `1.6`)npublic fun FloatArray.min(): Float? {n  return minOrNull()\n}\n\n@Deprecated(`Use
minOrNull instead.`), ReplaceWith(`this.minOrNull()\n`)n@DeprecatedSinceKotlin(warningSince = `1.4`,
errorSince = `1.5`, hiddenSince = `1.6`)npublic fun DoubleArray.min(): Double? {n  return
minOrNull()\n}\n\n@Deprecated(`Use minOrNull instead.`),
ReplaceWith(`this.minOrNull()\n`)n@DeprecatedSinceKotlin(warningSince = `1.4`, errorSince = `1.5`,
hiddenSince = `1.6`)npublic fun CharArray.min(): Char? {n  return minOrNull()\n}\n\n@Deprecated(`Use
minByOrNull instead.`), ReplaceWith(`this.minByOrNull(selector)\n`)n@DeprecatedSinceKotlin(warningSince =
`1.4`, errorSince = `1.5`, hiddenSince = `1.6`)npublic inline fun <T, R : Comparable<R>> Array<out
T>.minBy(selector: (T) -> R): T? {n  return minByOrNull(selector)\n}\n\n@Deprecated(`Use minByOrNull
instead.`), ReplaceWith(`this.minByOrNull(selector)\n`)n@DeprecatedSinceKotlin(warningSince = `1.4`,
errorSince = `1.5`, hiddenSince = `1.6`)npublic inline fun <R : Comparable<R>> ByteArray.minBy(selector:
(Byte) -> R): Byte? {n  return minByOrNull(selector)\n}\n\n@Deprecated(`Use minByOrNull instead.`),
ReplaceWith(`this.minByOrNull(selector)\n`)n@DeprecatedSinceKotlin(warningSince = `1.4`, errorSince =
`1.5`, hiddenSince = `1.6`)npublic inline fun <R : Comparable<R>> ShortArray.minBy(selector: (Short) -> R):
Short? {n  return minByOrNull(selector)\n}\n\n@Deprecated(`Use minByOrNull instead.`),
ReplaceWith(`this.minByOrNull(selector)\n`)n@DeprecatedSinceKotlin(warningSince = `1.4`, errorSince =
`1.5`, hiddenSince = `1.6`)npublic inline fun <R : Comparable<R>> IntArray.minBy(selector: (Int) -> R): Int?
{n  return minByOrNull(selector)\n}\n\n@Deprecated(`Use minByOrNull instead.`),
ReplaceWith(`this.minByOrNull(selector)\n`)n@DeprecatedSinceKotlin(warningSince = `1.4`, errorSince =
`1.5`, hiddenSince = `1.6`)npublic inline fun <R : Comparable<R>> LongArray.minBy(selector: (Long) -> R):
Long? {n  return minByOrNull(selector)\n}\n\n@Deprecated(`Use minByOrNull instead.`),
ReplaceWith(`this.minByOrNull(selector)\n`)n@DeprecatedSinceKotlin(warningSince = `1.4`, errorSince =
`1.5`, hiddenSince = `1.6`)npublic inline fun <R : Comparable<R>> FloatArray.minBy(selector: (Float) -> R):
Float? {n  return minByOrNull(selector)\n}\n\n@Deprecated(`Use minByOrNull instead.`),
ReplaceWith(`this.minByOrNull(selector)\n`)n@DeprecatedSinceKotlin(warningSince = `1.4`, errorSince =
`1.5`, hiddenSince = `1.6`)npublic inline fun <R : Comparable<R>> DoubleArray.minBy(selector: (Double) ->
R): Double? {n  return minByOrNull(selector)\n}\n\n@Deprecated(`Use minByOrNull instead.`),
ReplaceWith(`this.minByOrNull(selector)\n`)n@DeprecatedSinceKotlin(warningSince = `1.4`, errorSince =
`1.5`, hiddenSince = `1.6`)npublic inline fun <R : Comparable<R>> BooleanArray.minBy(selector: (Boolean) -
> R): Boolean? {n  return minByOrNull(selector)\n}\n\n@Deprecated(`Use minByOrNull instead.`),
ReplaceWith(`this.minByOrNull(selector)\n`)n@DeprecatedSinceKotlin(warningSince = `1.4`, errorSince =
`1.5`, hiddenSince = `1.6`)npublic inline fun <R : Comparable<R>> CharArray.minBy(selector: (Char) -> R):
Char? {n  return minByOrNull(selector)\n}\n\n/**n * Returns the first element yielding the smallest value of the
given function or `null` if there are no elements.n * \n * @sample
samples.collections.Collections.Aggregates.minByOrNull\n * \n * @SinceKotlin(`1.4`)npublic inline fun <T, R :

```

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Comparable<R>> Array<out T>.minByOrNull(selector: (T) -> R): T? {\n  if (isEmpty()) return null\n  var
minElem = this[0]\n  val lastIndex = this.lastIndex\n  if (lastIndex == 0) return minElem\n  var minValue =
selector(minElem)\n  for (i in 1..lastIndex) {\n    val e = this[i]\n    val v = selector(e)\n    if (minValue > v)
{\n      minElem = e\n      minValue = v\n    }\n  }\n  return minElem\n}\n\n/**\n * Returns the first
element yielding the smallest value of the given function or `null` if there are no elements.\n * \n * @sample
samples.collections.Collections.Aggregates.minByOrNull\n */\n@SinceKotlin("1.4")\npublic inline fun <R :
Comparable<R>> ByteArray.minByOrNull(selector: (Byte) -> R): Byte? {\n  if (isEmpty()) return null\n  var
minElem = this[0]\n  val lastIndex = this.lastIndex\n  if (lastIndex == 0) return minElem\n  var minValue =
selector(minElem)\n  for (i in 1..lastIndex) {\n    val e = this[i]\n    val v = selector(e)\n    if (minValue > v)
{\n      minElem = e\n      minValue = v\n    }\n  }\n  return minElem\n}\n\n/**\n * Returns the first
element yielding the smallest value of the given function or `null` if there are no elements.\n * \n * @sample
samples.collections.Collections.Aggregates.minByOrNull\n */\n@SinceKotlin("1.4")\npublic inline fun <R :
Comparable<R>> ShortArray.minByOrNull(selector: (Short) -> R): Short? {\n  if (isEmpty()) return null\n  var
minElem = this[0]\n  val lastIndex = this.lastIndex\n  if (lastIndex == 0) return minElem\n  var minValue =
selector(minElem)\n  for (i in 1..lastIndex) {\n    val e = this[i]\n    val v = selector(e)\n    if (minValue > v)
{\n      minElem = e\n      minValue = v\n    }\n  }\n  return minElem\n}\n\n/**\n * Returns the first
element yielding the smallest value of the given function or `null` if there are no elements.\n * \n * @sample
samples.collections.Collections.Aggregates.minByOrNull\n */\n@SinceKotlin("1.4")\npublic inline fun <R :
Comparable<R>> IntArray.minByOrNull(selector: (Int) -> R): Int? {\n  if (isEmpty()) return null\n  var minElem
= this[0]\n  val lastIndex = this.lastIndex\n  if (lastIndex == 0) return minElem\n  var minValue =
selector(minElem)\n  for (i in 1..lastIndex) {\n    val e = this[i]\n    val v = selector(e)\n    if (minValue > v)
{\n      minElem = e\n      minValue = v\n    }\n  }\n  return minElem\n}\n\n/**\n * Returns the first
element yielding the smallest value of the given function or `null` if there are no elements.\n * \n * @sample
samples.collections.Collections.Aggregates.minByOrNull\n */\n@SinceKotlin("1.4")\npublic inline fun <R :
Comparable<R>> LongArray.minByOrNull(selector: (Long) -> R): Long? {\n  if (isEmpty()) return null\n  var
minElem = this[0]\n  val lastIndex = this.lastIndex\n  if (lastIndex == 0) return minElem\n  var minValue =
selector(minElem)\n  for (i in 1..lastIndex) {\n    val e = this[i]\n    val v = selector(e)\n    if (minValue > v)
{\n      minElem = e\n      minValue = v\n    }\n  }\n  return minElem\n}\n\n/**\n * Returns the first
element yielding the smallest value of the given function or `null` if there are no elements.\n * \n * @sample
samples.collections.Collections.Aggregates.minByOrNull\n */\n@SinceKotlin("1.4")\npublic inline fun <R :
Comparable<R>> FloatArray.minByOrNull(selector: (Float) -> R): Float? {\n  if (isEmpty()) return null\n  var
minElem = this[0]\n  val lastIndex = this.lastIndex\n  if (lastIndex == 0) return minElem\n  var minValue =
selector(minElem)\n  for (i in 1..lastIndex) {\n    val e = this[i]\n    val v = selector(e)\n    if (minValue > v)
{\n      minElem = e\n      minValue = v\n    }\n  }\n  return minElem\n}\n\n/**\n * Returns the first
element yielding the smallest value of the given function or `null` if there are no elements.\n * \n * @sample
samples.collections.Collections.Aggregates.minByOrNull\n */\n@SinceKotlin("1.4")\npublic inline fun <R :
Comparable<R>> DoubleArray.minByOrNull(selector: (Double) -> R): Double? {\n  if (isEmpty()) return null\n
var minElem = this[0]\n  val lastIndex = this.lastIndex\n  if (lastIndex == 0) return minElem\n  var minValue =
selector(minElem)\n  for (i in 1..lastIndex) {\n    val e = this[i]\n    val v = selector(e)\n    if (minValue > v)
{\n      minElem = e\n      minValue = v\n    }\n  }\n  return minElem\n}\n\n/**\n * Returns the first
element yielding the smallest value of the given function or `null` if there are no elements.\n * \n * @sample
samples.collections.Collections.Aggregates.minByOrNull\n */\n@SinceKotlin("1.4")\npublic inline fun <R :
Comparable<R>> BooleanArray.minByOrNull(selector: (Boolean) -> R): Boolean? {\n  if (isEmpty()) return
null\n  var minElem = this[0]\n  val lastIndex = this.lastIndex\n  if (lastIndex == 0) return minElem\n  var
minValue = selector(minElem)\n  for (i in 1..lastIndex) {\n    val e = this[i]\n    val v = selector(e)\n    if
(minValue > v) {\n      minElem = e\n      minValue = v\n    }\n  }\n  return minElem\n}\n\n/**\n *
Returns the first element yielding the smallest value of the given function or `null` if there are no elements.\n * \n *
@sample samples.collections.Collections.Aggregates.minByOrNull\n */\n@SinceKotlin("1.4")\npublic inline fun

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<R : Comparable<R>> CharArray.minByOrNull(selector: (Char) -> R): Char? {\n  if (isEmpty()) return null\n  var minElem = this[0]\n  val lastIndex = this.lastIndex\n  if (lastIndex == 0) return minElem\n  var minValue = selector(minElem)\n  for (i in 1..lastIndex) {\n    val e = this[i]\n    val v = selector(e)\n    if (minValue > v)\n    {\n      minElem = e\n      minValue = v\n    }\n  }\n  return minElem}\n\n/**\n * Returns the smallest value among all values produced by [selector] function\n * applied to each element in the array.\n * \n * If any of values produced by [selector] function is `NaN`, the returned result is `NaN`.\n * \n * @throws NoSuchElementException if the array is empty.\n */\n\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolutionByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <T> Array<out T>.minOf(selector: (T) -> Double): Double {\n  if (isEmpty()) throw NoSuchElementException()\n  var minValue = selector(this[0])\n  for (i in 1..lastIndex) {\n    val v = selector(this[i])\n    minValue = minOf(minValue, v)\n  }\n  return minValue}\n\n/**\n * Returns the smallest value among all values produced by [selector] function\n * applied to each element in the array.\n * \n * If any of values produced by [selector] function is `NaN`, the returned result is `NaN`.\n * \n * @throws NoSuchElementException if the array is empty.\n */\n\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolutionByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun ByteArray.minOf(selector: (Byte) -> Double): Double {\n  if (isEmpty()) throw NoSuchElementException()\n  var minValue = selector(this[0])\n  for (i in 1..lastIndex) {\n    val v = selector(this[i])\n    minValue = minOf(minValue, v)\n  }\n  return minValue}\n\n/**\n * Returns the smallest value among all values produced by [selector] function\n * applied to each element in the array.\n * \n * If any of values produced by [selector] function is `NaN`, the returned result is `NaN`.\n * \n * @throws NoSuchElementException if the array is empty.\n */\n\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolutionByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun ShortArray.minOf(selector: (Short) -> Double): Double {\n  if (isEmpty()) throw NoSuchElementException()\n  var minValue = selector(this[0])\n  for (i in 1..lastIndex) {\n    val v = selector(this[i])\n    minValue = minOf(minValue, v)\n  }\n  return minValue}\n\n/**\n * Returns the smallest value among all values produced by [selector] function\n * applied to each element in the array.\n * \n * If any of values produced by [selector] function is `NaN`, the returned result is `NaN`.\n * \n * @throws NoSuchElementException if the array is empty.\n */\n\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolutionByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun IntArray.minOf(selector: (Int) -> Double): Double {\n  if (isEmpty()) throw NoSuchElementException()\n  var minValue = selector(this[0])\n  for (i in 1..lastIndex) {\n    val v = selector(this[i])\n    minValue = minOf(minValue, v)\n  }\n  return minValue}\n\n/**\n * Returns the smallest value among all values produced by [selector] function\n * applied to each element in the array.\n * \n * If any of values produced by [selector] function is `NaN`, the returned result is `NaN`.\n * \n * @throws NoSuchElementException if the array is empty.\n */\n\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolutionByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun LongArray.minOf(selector: (Long) -> Double): Double {\n  if (isEmpty()) throw NoSuchElementException()\n  var minValue = selector(this[0])\n  for (i in 1..lastIndex) {\n    val v = selector(this[i])\n    minValue = minOf(minValue, v)\n  }\n  return minValue}\n\n/**\n * Returns the smallest value among all values produced by [selector] function\n * applied to each element in the array.\n * \n * If any of values produced by [selector] function is `NaN`, the returned result is `NaN`.\n * \n * @throws NoSuchElementException if the array is empty.\n */\n\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolutionByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun FloatArray.minOf(selector: (Float) -> Double): Double {\n  if (isEmpty()) throw NoSuchElementException()\n  var minValue = selector(this[0])\n  for (i in 1..lastIndex) {\n    val v = selector(this[i])\n    minValue = minOf(minValue, v)\n  }\n  return minValue}\n\n/**\n * Returns the smallest value among all values produced by [selector] function\n * applied to each element in the array.\n * \n * If any of values produced by [selector] function is `NaN`, the returned result is

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`NaN`.n * .n * @throws NoSuchElementException if the array is empty.n
*/n@SinceKotlin("1.4")n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)n@OverloadResolution
ByLambdaReturnTypen@kotlin.internal.InlineOnlynpublic inline fun DoubleArray.minOf(selector: (Double) ->
Double): Double {n if (isEmpty()) throw NoSuchElementException()n var minValue = selector(this[0])n for
(i in 1..lastIndex) {n val v = selector(this[i])n minValue = minOf(minValue, v)n }n return
minValue.n}n/n/**n * Returns the smallest value among all values produced by [selector] functionn * applied to
each element in the array.n * .n * If any of values produced by [selector] function is `NaN`, the returned result is
`NaN`.n * .n * @throws NoSuchElementException if the array is empty.n
*/n@SinceKotlin("1.4")n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)n@OverloadResolution
ByLambdaReturnTypen@kotlin.internal.InlineOnlynpublic inline fun BooleanArray.minOf(selector: (Boolean) ->
Double): Double {n if (isEmpty()) throw NoSuchElementException()n var minValue = selector(this[0])n for
(i in 1..lastIndex) {n val v = selector(this[i])n minValue = minOf(minValue, v)n }n return
minValue.n}n/n/**n * Returns the smallest value among all values produced by [selector] functionn * applied to
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`NaN`.n * .n * @throws NoSuchElementException if the array is empty.n
*/n@SinceKotlin("1.4")n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)n@OverloadResolution
ByLambdaReturnTypen@kotlin.internal.InlineOnlynpublic inline fun CharArray.minOf(selector: (Char) ->
Double): Double {n if (isEmpty()) throw NoSuchElementException()n var minValue = selector(this[0])n for
(i in 1..lastIndex) {n val v = selector(this[i])n minValue = minOf(minValue, v)n }n return
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*/n@SinceKotlin("1.4")n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)n@OverloadResolution
ByLambdaReturnTypen@kotlin.internal.InlineOnlynpublic inline fun <T> Array<out T>.minOf(selector: (T) ->
Float): Float {n if (isEmpty()) throw NoSuchElementException()n var minValue = selector(this[0])n for (i in
1..lastIndex) {n val v = selector(this[i])n minValue = minOf(minValue, v)n }n return
minValue.n}n/n/**n * Returns the smallest value among all values produced by [selector] functionn * applied to
each element in the array.n * .n * If any of values produced by [selector] function is `NaN`, the returned result is
`NaN`.n * .n * @throws NoSuchElementException if the array is empty.n
*/n@SinceKotlin("1.4")n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)n@OverloadResolution
ByLambdaReturnTypen@kotlin.internal.InlineOnlynpublic inline fun ByteArray.minOf(selector: (Byte) -> Float):
Float {n if (isEmpty()) throw NoSuchElementException()n var minValue = selector(this[0])n for (i in
1..lastIndex) {n val v = selector(this[i])n minValue = minOf(minValue, v)n }n return
minValue.n}n/n/**n * Returns the smallest value among all values produced by [selector] functionn * applied to
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*/n@SinceKotlin("1.4")n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)n@OverloadResolution
ByLambdaReturnTypen@kotlin.internal.InlineOnlynpublic inline fun ShortArray.minOf(selector: (Short) ->
Float): Float {n if (isEmpty()) throw NoSuchElementException()n var minValue = selector(this[0])n for (i in
1..lastIndex) {n val v = selector(this[i])n minValue = minOf(minValue, v)n }n return
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*/n@SinceKotlin("1.4")n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)n@OverloadResolution
ByLambdaReturnTypen@kotlin.internal.InlineOnlynpublic inline fun IntArray.minOf(selector: (Int) -> Float):
Float {n if (isEmpty()) throw NoSuchElementException()n var minValue = selector(this[0])n for (i in
1..lastIndex) {n val v = selector(this[i])n minValue = minOf(minValue, v)n }n return
minValue.n}n/n/**n * Returns the smallest value among all values produced by [selector] functionn * applied to

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each element in the array.\n * \n * If any of values produced by [selector] function is `NaN`, the returned result is `NaN`.\n * \n * @throws NoSuchElementException if the array is empty.\n

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*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun LongArray.minOf(selector: (Long) ->
Float): Float {\n if (isEmpty()) throw NoSuchElementException()\n var minValue = selector(this[0])\n for (i in
1..lastIndex) {\n val v = selector(this[i])\n minValue = minOf(minValue, v)\n }\n return
minValue}\n\n/**\n * Returns the smallest value among all values produced by [selector] function\n * applied to
each element in the array.\n * \n * If any of values produced by [selector] function is `NaN`, the returned result is
`NaN`.\n * \n * @throws NoSuchElementException if the array is empty.\n
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun FloatArray.minOf(selector: (Float) -> Float):
Float {\n if (isEmpty()) throw NoSuchElementException()\n var minValue = selector(this[0])\n for (i in
1..lastIndex) {\n val v = selector(this[i])\n minValue = minOf(minValue, v)\n }\n return
minValue}\n\n/**\n * Returns the smallest value among all values produced by [selector] function\n * applied to
each element in the array.\n * \n * If any of values produced by [selector] function is `NaN`, the returned result is
`NaN`.\n * \n * @throws NoSuchElementException if the array is empty.\n
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun DoubleArray.minOf(selector: (Double) ->
Float): Float {\n if (isEmpty()) throw NoSuchElementException()\n var minValue = selector(this[0])\n for (i in
1..lastIndex) {\n val v = selector(this[i])\n minValue = minOf(minValue, v)\n }\n return
minValue}\n\n/**\n * Returns the smallest value among all values produced by [selector] function\n * applied to
each element in the array.\n * \n * If any of values produced by [selector] function is `NaN`, the returned result is
`NaN`.\n * \n * @throws NoSuchElementException if the array is empty.\n
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun BooleanArray.minOf(selector: (Boolean) ->
Float): Float {\n if (isEmpty()) throw NoSuchElementException()\n var minValue = selector(this[0])\n for (i in
1..lastIndex) {\n val v = selector(this[i])\n minValue = minOf(minValue, v)\n }\n return
minValue}\n\n/**\n * Returns the smallest value among all values produced by [selector] function\n * applied to
each element in the array.\n * \n * If any of values produced by [selector] function is `NaN`, the returned result is
`NaN`.\n * \n * @throws NoSuchElementException if the array is empty.\n
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun CharArray.minOf(selector: (Char) -> Float):
Float {\n if (isEmpty()) throw NoSuchElementException()\n var minValue = selector(this[0])\n for (i in
1..lastIndex) {\n val v = selector(this[i])\n minValue = minOf(minValue, v)\n }\n return
minValue}\n\n/**\n * Returns the smallest value among all values produced by [selector] function\n * applied to
each element in the array.\n * \n * @throws NoSuchElementException if the array is empty.\n
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <T, R : Comparable<R>> Array<out
T>.minOf(selector: (T) -> R): R {\n if (isEmpty()) throw NoSuchElementException()\n var minValue =
selector(this[0])\n for (i in 1..lastIndex) {\n val v = selector(this[i])\n if (minValue > v) {\n
minValue = v\n }\n }\n return minValue}\n\n/**\n * Returns the smallest value among all values produced
by [selector] function\n * applied to each element in the array.\n * \n * @throws NoSuchElementException if the
array is empty.\n
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ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <R : Comparable<R>>
ByteArray.minOf(selector: (Byte) -> R): R {\n if (isEmpty()) throw NoSuchElementException()\n var minValue
= selector(this[0])\n for (i in 1..lastIndex) {\n val v = selector(this[i])\n if (minValue > v) {\n
minValue = v\n }\n }\n return minValue}\n\n/**\n * Returns the smallest value among all values produced

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ShortArray.minOf(selector: (Short) -> R): R {\n    if (isEmpty()) throw NoSuchElementException()\n    var
minValue = selector(this[0])\n    for (i in 1..lastIndex) {\n        val v = selector(this[i])\n        if (minValue > v) {\n
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IntArray.minOf(selector: (Int) -> R): R {\n    if (isEmpty()) throw NoSuchElementException()\n    var minValue =
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LongArray.minOf(selector: (Long) -> R): R {\n    if (isEmpty()) throw NoSuchElementException()\n    var
minValue = selector(this[0])\n    for (i in 1..lastIndex) {\n        val v = selector(this[i])\n        if (minValue > v) {\n
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FloatArray.minOf(selector: (Float) -> R): R {\n    if (isEmpty()) throw NoSuchElementException()\n    var
minValue = selector(this[0])\n    for (i in 1..lastIndex) {\n        val v = selector(this[i])\n        if (minValue > v) {\n
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ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <R : Comparable<R>>
DoubleArray.minOf(selector: (Double) -> R): R {\n    if (isEmpty()) throw NoSuchElementException()\n    var
minValue = selector(this[0])\n    for (i in 1..lastIndex) {\n        val v = selector(this[i])\n        if (minValue > v) {\n
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ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <R : Comparable<R>>
BooleanArray.minOf(selector: (Boolean) -> R): R {\n    if (isEmpty()) throw NoSuchElementException()\n    var
minValue = selector(this[0])\n    for (i in 1..lastIndex) {\n        val v = selector(this[i])\n        if (minValue > v) {\n
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ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <R : Comparable<R>>
CharArray.minOf(selector: (Char) -> R): R {\n    if (isEmpty()) throw NoSuchElementException()\n    var minValue
= selector(this[0])\n    for (i in 1..lastIndex) {\n        val v = selector(this[i])\n        if (minValue > v) {\n

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minValue = v\n    }\n    }\n    return minValue\n}\n\n/**\n * Returns the smallest value among all values produced
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ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <T> Array<out T>.minOrNull(selector:
(T) -> Double): Double? {\n    if (isEmpty()) return null\n    var minValue = selector(this[0])\n    for (i in
1..lastIndex) {\n        val v = selector(this[i])\n        minValue = minOf(minValue, v)\n    }\n    return
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ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun ByteArray.minOrNull(selector: (Byte) ->
Double): Double? {\n    if (isEmpty()) return null\n    var minValue = selector(this[0])\n    for (i in 1..lastIndex) {\n
        val v = selector(this[i])\n        minValue = minOf(minValue, v)\n    }\n    return minValue\n}\n\n/**\n * Returns
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ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun ShortArray.minOrNull(selector: (Short) -
> Double): Double? {\n    if (isEmpty()) return null\n    var minValue = selector(this[0])\n    for (i in 1..lastIndex) {\n
        val v = selector(this[i])\n        minValue = minOf(minValue, v)\n    }\n    return minValue\n}\n\n/**\n * Returns
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ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun IntArray.minOrNull(selector: (Int) ->
Double): Double? {\n    if (isEmpty()) return null\n    var minValue = selector(this[0])\n    for (i in 1..lastIndex) {\n
        val v = selector(this[i])\n        minValue = minOf(minValue, v)\n    }\n    return minValue\n}\n\n/**\n * Returns
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ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun LongArray.minOrNull(selector: (Long) -
> Double): Double? {\n    if (isEmpty()) return null\n    var minValue = selector(this[0])\n    for (i in 1..lastIndex) {\n
        val v = selector(this[i])\n        minValue = minOf(minValue, v)\n    }\n    return minValue\n}\n\n/**\n * Returns
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*/\n\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun FloatArray.minOrNull(selector: (Float) ->
Double): Double? {\n    if (isEmpty()) return null\n    var minValue = selector(this[0])\n    for (i in 1..lastIndex) {\n
        val v = selector(this[i])\n        minValue = minOf(minValue, v)\n    }\n    return minValue\n}\n\n/**\n * Returns
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*/\n\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun DoubleArray.minOrNull(selector:
(Double) -> Double): Double? {\n    if (isEmpty()) return null\n    var minValue = selector(this[0])\n    for (i in

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1..lastIndex) {\n    val v = selector(this[i])\n    minValue = minOf(minValue, v)\n } \n return
minValue\n}\n\n/**\n * Returns the smallest value among all values produced by [selector] function\n * applied to
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ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun BooleanArray.minOfOrNull(selector:
(Boolean) -> Double): Double? {\n    if (isEmpty()) return null\n    var minValue = selector(this[0])\n    for (i in
1..lastIndex) {\n        val v = selector(this[i])\n        minValue = minOf(minValue, v)\n    } \n return
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*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun CharArray.minOfOrNull(selector: (Char) ->
Double): Double? {\n    if (isEmpty()) return null\n    var minValue = selector(this[0])\n    for (i in 1..lastIndex) {\n
        val v = selector(this[i])\n        minValue = minOf(minValue, v)\n    } \n return minValue\n}\n\n/**\n * Returns
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*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <T> Array<out T>.minOfOrNull(selector:
(T) -> Float): Float? {\n    if (isEmpty()) return null\n    var minValue = selector(this[0])\n    for (i in 1..lastIndex)
{\n        val v = selector(this[i])\n        minValue = minOf(minValue, v)\n    } \n return minValue\n}\n\n/**\n *
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ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun ByteArray.minOfOrNull(selector: (Byte) ->
Float): Float? {\n    if (isEmpty()) return null\n    var minValue = selector(this[0])\n    for (i in 1..lastIndex) {\n
        val v = selector(this[i])\n        minValue = minOf(minValue, v)\n    } \n return minValue\n}\n\n/**\n * Returns the
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ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun ShortArray.minOfOrNull(selector: (Short) -
> Float): Float? {\n    if (isEmpty()) return null\n    var minValue = selector(this[0])\n    for (i in 1..lastIndex) {\n
        val v = selector(this[i])\n        minValue = minOf(minValue, v)\n    } \n return minValue\n}\n\n/**\n * Returns the
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ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun IntArray.minOfOrNull(selector: (Int) ->
Float): Float? {\n    if (isEmpty()) return null\n    var minValue = selector(this[0])\n    for (i in 1..lastIndex) {\n
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`NaN`.\n
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun LongArray.minOfOrNull(selector: (Long) -

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> Float): Float? {\n  if (isEmpty()) return null\n  var minValue = selector(this[0])\n  for (i in 1..lastIndex) {\n    val v = selector(this[i])\n    minValue = minOf(minValue, v)\n  }\n  return minValue\n}\n\n/**\n * Returns the smallest value among all values produced by [selector] function\n * applied to each element in the array or `null` if there are no elements.\n * \n * If any of values produced by [selector] function is `NaN`, the returned result is `NaN`.\n */\n\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolutionByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun FloatArray.minOfOrNull(selector: (Float) -> Float): Float? {\n  if (isEmpty()) return null\n  var minValue = selector(this[0])\n  for (i in 1..lastIndex) {\n    val v = selector(this[i])\n    minValue = minOf(minValue, v)\n  }\n  return minValue\n}\n\n/**\n * Returns the smallest value among all values produced by [selector] function\n * applied to each element in the array or `null` if there are no elements.\n * \n * If any of values produced by [selector] function is `NaN`, the returned result is `NaN`.\n */\n\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolutionByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun DoubleArray.minOfOrNull(selector: (Double) -> Float): Float? {\n  if (isEmpty()) return null\n  var minValue = selector(this[0])\n  for (i in 1..lastIndex) {\n    val v = selector(this[i])\n    minValue = minOf(minValue, v)\n  }\n  return minValue\n}\n\n/**\n * Returns the smallest value among all values produced by [selector] function\n * applied to each element in the array or `null` if there are no elements.\n * \n * If any of values produced by [selector] function is `NaN`, the returned result is `NaN`.\n */\n\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolutionByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun BooleanArray.minOfOrNull(selector: (Boolean) -> Float): Float? {\n  if (isEmpty()) return null\n  var minValue = selector(this[0])\n  for (i in 1..lastIndex) {\n    val v = selector(this[i])\n    minValue = minOf(minValue, v)\n  }\n  return minValue\n}\n\n/**\n * Returns the smallest value among all values produced by [selector] function\n * applied to each element in the array or `null` if there are no elements.\n * \n * If any of values produced by [selector] function is `NaN`, the returned result is `NaN`.\n */\n\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolutionByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun CharArray.minOfOrNull(selector: (Char) -> Float): Float? {\n  if (isEmpty()) return null\n  var minValue = selector(this[0])\n  for (i in 1..lastIndex) {\n    val v = selector(this[i])\n    minValue = minOf(minValue, v)\n  }\n  return minValue\n}\n\n/**\n * Returns the smallest value among all values produced by [selector] function\n * applied to each element in the array or `null` if there are no elements.\n */\n\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolutionByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <T, R : Comparable<R>> Array<out T>.minOfOrNull(selector: (T) -> R): R? {\n  if (isEmpty()) return null\n  var minValue = selector(this[0])\n  for (i in 1..lastIndex) {\n    val v = selector(this[i])\n    if (minValue > v) {\n      minValue = v\n    }\n  }\n  return minValue\n}\n\n/**\n * Returns the smallest value among all values produced by [selector] function\n * applied to each element in the array or `null` if there are no elements.\n */\n\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolutionByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <R : Comparable<R>> ByteArray.minOfOrNull(selector: (Byte) -> R): R? {\n  if (isEmpty()) return null\n  var minValue = selector(this[0])\n  for (i in 1..lastIndex) {\n    val v = selector(this[i])\n    if (minValue > v) {\n      minValue = v\n    }\n  }\n  return minValue\n}\n\n/**\n * Returns the smallest value among all values produced by [selector] function\n * applied to each element in the array or `null` if there are no elements.\n */\n\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolutionByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <R : Comparable<R>> ShortArray.minOfOrNull(selector: (Short) -> R): R? {\n  if (isEmpty()) return null\n  var minValue = selector(this[0])\n  for (i in 1..lastIndex) {\n    val v = selector(this[i])\n    if (minValue > v) {\n      minValue = v\n    }\n  }\n  return minValue\n}\n\n/**\n * Returns the smallest value among all values produced by [selector] function\n * applied to each element in the array or `null` if there are no elements.\n */\n
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minValue = v\n    }\n    }\n    return minValue\n}\n\n/**\n * Returns the smallest value among all values produced
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LongArray.minOfOrNull(selector: (Long) -> R): R? {\n    if (isEmpty()) return null\n    var minValue =
selector(this[0])\n    for (i in 1..lastIndex) {\n        val v = selector(this[i])\n        if (minValue > v) {\n
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FloatArray.minOfOrNull(selector: (Float) -> R): R? {\n    if (isEmpty()) return null\n    var minValue =
selector(this[0])\n    for (i in 1..lastIndex) {\n        val v = selector(this[i])\n        if (minValue > v) {\n
minValue = v\n    }\n    }\n    return minValue\n}\n\n/**\n * Returns the smallest value among all values produced
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DoubleArray.minOfOrNull(selector: (Double) -> R): R? {\n    if (isEmpty()) return null\n    var minValue =
selector(this[0])\n    for (i in 1..lastIndex) {\n        val v = selector(this[i])\n        if (minValue > v) {\n
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minValue = v\n    }\n    }\n    return minValue\n}\n\n/**\n * Returns the smallest value according to the provided
[comparator]\n * among all values produced by [selector] function applied to each element in the array.\n * \n *
@throws NoSuchElementException if the array is empty.\n
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <T, R> Array<out
T>.minOfWith(comparator: Comparator<in R>, selector: (T) -> R): R {\n    if (isEmpty()) throw
NoSuchElementException()\n    var minValue = selector(this[0])\n    for (i in 1..lastIndex) {\n        val v =
selector(this[i])\n        if (comparator.compare(minValue, v) > 0) {\n            minValue = v\n        }\n    }\n    return
minValue\n}\n\n/**\n * Returns the smallest value according to the provided [comparator]\n * among all values
produced by [selector] function applied to each element in the array.\n * \n * @throws NoSuchElementException if
the array is empty.\n
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution

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ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <R> ByteArray.minOfWith(comparator:
Comparator<in R>, selector: (Byte) -> R): R {\n  if (isEmpty()) throw NoSuchElementException()\n  var
minValue = selector(this[0])\n  for (i in 1..lastIndex) {\n    val v = selector(this[i])\n    if
(comparator.compare(minValue, v) > 0) {\n      minValue = v\n    }\n  }\n  return minValue\n}\n\n/**\n *
Returns the smallest value according to the provided [comparator]\n * among all values produced by [selector]
function applied to each element in the array.\n * \n * @throws NoSuchElementException if the array is empty.\n
*\n *\n @SinceKotlin("1.4")\n @OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n @OverloadResolution
ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <R> ShortArray.minOfWith(comparator:
Comparator<in R>, selector: (Short) -> R): R {\n  if (isEmpty()) throw NoSuchElementException()\n  var
minValue = selector(this[0])\n  for (i in 1..lastIndex) {\n    val v = selector(this[i])\n    if
(comparator.compare(minValue, v) > 0) {\n      minValue = v\n    }\n  }\n  return minValue\n}\n\n/**\n *
Returns the smallest value according to the provided [comparator]\n * among all values produced by [selector]
function applied to each element in the array.\n * \n * @throws NoSuchElementException if the array is empty.\n
*\n *\n @SinceKotlin("1.4")\n @OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n @OverloadResolution
ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <R> IntArray.minOfWith(comparator:
Comparator<in R>, selector: (Int) -> R): R {\n  if (isEmpty()) throw NoSuchElementException()\n  var minValue
= selector(this[0])\n  for (i in 1..lastIndex) {\n    val v = selector(this[i])\n    if (comparator.compare(minValue,
v) > 0) {\n      minValue = v\n    }\n  }\n  return minValue\n}\n\n/**\n * Returns the smallest value
according to the provided [comparator]\n * among all values produced by [selector] function applied to each
element in the array.\n * \n * @throws NoSuchElementException if the array is empty.\n *\n *\n @SinceKotlin("1.4")\n @OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n @OverloadResolution
ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <R> LongArray.minOfWith(comparator:
Comparator<in R>, selector: (Long) -> R): R {\n  if (isEmpty()) throw NoSuchElementException()\n  var
minValue = selector(this[0])\n  for (i in 1..lastIndex) {\n    val v = selector(this[i])\n    if
(comparator.compare(minValue, v) > 0) {\n      minValue = v\n    }\n  }\n  return minValue\n}\n\n/**\n *
Returns the smallest value according to the provided [comparator]\n * among all values produced by [selector]
function applied to each element in the array.\n * \n * @throws NoSuchElementException if the array is empty.\n
*\n *\n @SinceKotlin("1.4")\n @OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n @OverloadResolution
ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <R> FloatArray.minOfWith(comparator:
Comparator<in R>, selector: (Float) -> R): R {\n  if (isEmpty()) throw NoSuchElementException()\n  var
minValue = selector(this[0])\n  for (i in 1..lastIndex) {\n    val v = selector(this[i])\n    if
(comparator.compare(minValue, v) > 0) {\n      minValue = v\n    }\n  }\n  return minValue\n}\n\n/**\n *
Returns the smallest value according to the provided [comparator]\n * among all values produced by [selector]
function applied to each element in the array.\n * \n * @throws NoSuchElementException if the array is empty.\n
*\n *\n @SinceKotlin("1.4")\n @OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n @OverloadResolution
ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <R> DoubleArray.minOfWith(comparator:
Comparator<in R>, selector: (Double) -> R): R {\n  if (isEmpty()) throw NoSuchElementException()\n  var
minValue = selector(this[0])\n  for (i in 1..lastIndex) {\n    val v = selector(this[i])\n    if
(comparator.compare(minValue, v) > 0) {\n      minValue = v\n    }\n  }\n  return minValue\n}\n\n/**\n *
Returns the smallest value according to the provided [comparator]\n * among all values produced by [selector]
function applied to each element in the array.\n * \n * @throws NoSuchElementException if the array is empty.\n
*\n *\n @SinceKotlin("1.4")\n @OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n @OverloadResolution
ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <R> BooleanArray.minOfWith(comparator:
Comparator<in R>, selector: (Boolean) -> R): R {\n  if (isEmpty()) throw NoSuchElementException()\n  var
minValue = selector(this[0])\n  for (i in 1..lastIndex) {\n    val v = selector(this[i])\n    if
(comparator.compare(minValue, v) > 0) {\n      minValue = v\n    }\n  }\n  return minValue\n}\n\n/**\n *
Returns the smallest value according to the provided [comparator]\n * among all values produced by [selector]
function applied to each element in the array.\n * \n * @throws NoSuchElementException if the array is empty.\n

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```
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution\nByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <R> CharArray.minOfWith(comparator:\nComparator<in R>, selector: (Char) -> R): R {\n    if (isEmpty()) throw NoSuchElementException()\n    var\n    minValue = selector(this[0])\n    for (i in 1..lastIndex) {\n        val v = selector(this[i])\n        if\n        (comparator.compare(minValue, v) > 0) {\n            minValue = v\n        }\n    }\n    return minValue\n}\n\n/**\n * Returns the smallest value according to the provided [comparator]\n * among all values produced by [selector]\n * function applied to each element in the array or `null` if there are no elements.\n */
```

```
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution\nByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <T, R> Array<out\nT>.minOfWithOrNull(comparator: Comparator<in R>, selector: (T) -> R): R? {\n    if (isEmpty()) return null\n    var\n    minValue = selector(this[0])\n    for (i in 1..lastIndex) {\n        val v = selector(this[i])\n        if\n        (comparator.compare(minValue, v) > 0) {\n            minValue = v\n        }\n    }\n    return minValue\n}\n\n/**\n * Returns the smallest value according to the provided [comparator]\n * among all values produced by [selector]\n * function applied to each element in the array or `null` if there are no elements.\n */
```

```
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution\nByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <R>\nByteArray.minOfWithOrNull(comparator: Comparator<in R>, selector: (Byte) -> R): R? {\n    if (isEmpty()) return\n    null\n    var\n    minValue = selector(this[0])\n    for (i in 1..lastIndex) {\n        val v = selector(this[i])\n        if\n        (comparator.compare(minValue, v) > 0) {\n            minValue = v\n        }\n    }\n    return minValue\n}\n\n/**\n * Returns the smallest value according to the provided [comparator]\n * among all values produced by [selector]\n * function applied to each element in the array or `null` if there are no elements.\n */
```

```
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution\nByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <R>\nShortArray.minOfWithOrNull(comparator: Comparator<in R>, selector: (Short) -> R): R? {\n    if (isEmpty())\n    return null\n    var\n    minValue = selector(this[0])\n    for (i in 1..lastIndex) {\n        val v = selector(this[i])\n        if\n        (comparator.compare(minValue, v) > 0) {\n            minValue = v\n        }\n    }\n    return minValue\n}\n\n/**\n * Returns the smallest value according to the provided [comparator]\n * among all values produced by [selector]\n * function applied to each element in the array or `null` if there are no elements.\n */
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*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution\nByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <R>\nIntArray.minOfWithOrNull(comparator: Comparator<in R>, selector: (Int) -> R): R? {\n    if (isEmpty()) return\n    null\n    var\n    minValue = selector(this[0])\n    for (i in 1..lastIndex) {\n        val v = selector(this[i])\n        if\n        (comparator.compare(minValue, v) > 0) {\n            minValue = v\n        }\n    }\n    return minValue\n}\n\n/**\n * Returns the smallest value according to the provided [comparator]\n * among all values produced by [selector]\n * function applied to each element in the array or `null` if there are no elements.\n */
```

```
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution\nByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <R>\nLongArray.minOfWithOrNull(comparator: Comparator<in R>, selector: (Long) -> R): R? {\n    if (isEmpty()) return\n    null\n    var\n    minValue = selector(this[0])\n    for (i in 1..lastIndex) {\n        val v = selector(this[i])\n        if\n        (comparator.compare(minValue, v) > 0) {\n            minValue = v\n        }\n    }\n    return minValue\n}\n\n/**\n * Returns the smallest value according to the provided [comparator]\n * among all values produced by [selector]\n * function applied to each element in the array or `null` if there are no elements.\n */
```

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*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution\nByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <R>\nFloatArray.minOfWithOrNull(comparator: Comparator<in R>, selector: (Float) -> R): R? {\n    if (isEmpty()) return\n    null\n    var\n    minValue = selector(this[0])\n    for (i in 1..lastIndex) {\n        val v = selector(this[i])\n        if\n        (comparator.compare(minValue, v) > 0) {\n            minValue = v\n        }\n    }\n    return minValue\n}\n\n/**\n * Returns the smallest value according to the provided [comparator]\n * among all values produced by [selector]\n */
```



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function applied to each element in the array or `null` if there are no elements.\n
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <R>
DoubleArray.minOfWithOrNull(comparator: Comparator<in R>, selector: (Double) -> R): R? {\n if (isEmpty())
return null\n var minValue = selector(this[0])\n for (i in 1..lastIndex) {\n val v = selector(this[i])\n if
(comparator.compare(minValue, v) > 0) {\n minValue = v\n }\n }\n return minValue\n}\n\n/**\n *
Returns the smallest value according to the provided [comparator]\n * among all values produced by [selector]
function applied to each element in the array or `null` if there are no elements.\n
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <R>
BooleanArray.minOfWithOrNull(comparator: Comparator<in R>, selector: (Boolean) -> R): R? {\n if (isEmpty())
return null\n var minValue = selector(this[0])\n for (i in 1..lastIndex) {\n val v = selector(this[i])\n if
(comparator.compare(minValue, v) > 0) {\n minValue = v\n }\n }\n return minValue\n}\n\n/**\n *
Returns the smallest value according to the provided [comparator]\n * among all values produced by [selector]
function applied to each element in the array or `null` if there are no elements.\n
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <R>
CharArray.minOfWithOrNull(comparator: Comparator<in R>, selector: (Char) -> R): R? {\n if (isEmpty()) return
null\n var minValue = selector(this[0])\n for (i in 1..lastIndex) {\n val v = selector(this[i])\n if
(comparator.compare(minValue, v) > 0) {\n minValue = v\n }\n }\n return minValue\n}\n\n/**\n *
Returns the smallest element or `null` if there are no elements.\n * \n * If any of elements is `NaN` returns `NaN`.\n
*\n@SinceKotlin("1.4")\npublic fun Array<out Double>.minOrNull(): Double? {\n if (isEmpty()) return null\n
var min = this[0]\n for (i in 1..lastIndex) {\n val e = this[i]\n min = minOf(min, e)\n }\n return
min\n}\n\n/**\n * Returns the smallest element or `null` if there are no elements.\n * \n * If any of elements is
`NaN` returns `NaN`.\n
*\n@SinceKotlin("1.4")\npublic fun Array<out Float>.minOrNull(): Float? {\n if
(isEmpty()) return null\n var min = this[0]\n for (i in 1..lastIndex) {\n val e = this[i]\n min = minOf(min,
e)\n }\n return min\n}\n\n/**\n * Returns the smallest element or `null` if there are no elements.\n
*\n@SinceKotlin("1.4")\npublic fun <T : Comparable<T>> Array<out T>.minOrNull(): T? {\n if (isEmpty())
return null\n var min = this[0]\n for (i in 1..lastIndex) {\n val e = this[i]\n if (min > e) min = e\n }\n
return min\n}\n\n/**\n * Returns the smallest element or `null` if there are no elements.\n
*\n@SinceKotlin("1.4")\npublic fun ByteArray.minOrNull(): Byte? {\n if (isEmpty()) return null\n var min =
this[0]\n for (i in 1..lastIndex) {\n val e = this[i]\n if (min > e) min = e\n }\n return min\n}\n\n/**\n *
Returns the smallest element or `null` if there are no elements.\n
*\n@SinceKotlin("1.4")\npublic fun
ShortArray.minOrNull(): Short? {\n if (isEmpty()) return null\n var min = this[0]\n for (i in 1..lastIndex) {\n
val e = this[i]\n if (min > e) min = e\n }\n return min\n}\n\n/**\n * Returns the smallest element or `null` if
there are no elements.\n
*\n@SinceKotlin("1.4")\npublic fun IntArray.minOrNull(): Int? {\n if (isEmpty())
return null\n var min = this[0]\n for (i in 1..lastIndex) {\n val e = this[i]\n if (min > e) min = e\n }\n
return min\n}\n\n/**\n * Returns the smallest element or `null` if there are no elements.\n
*\n@SinceKotlin("1.4")\npublic fun LongArray.minOrNull(): Long? {\n if (isEmpty()) return null\n var min =
this[0]\n for (i in 1..lastIndex) {\n val e = this[i]\n if (min > e) min = e\n }\n return min\n}\n\n/**\n *
Returns the smallest element or `null` if there are no elements.\n * \n * If any of elements is `NaN` returns `NaN`.\n
*\n@SinceKotlin("1.4")\npublic fun FloatArray.minOrNull(): Float? {\n if (isEmpty()) return null\n var min =
this[0]\n for (i in 1..lastIndex) {\n val e = this[i]\n min = minOf(min, e)\n }\n return min\n}\n\n/**\n *
Returns the smallest element or `null` if there are no elements.\n * \n * If any of elements is `NaN` returns `NaN`.\n
*\n@SinceKotlin("1.4")\npublic fun DoubleArray.minOrNull(): Double? {\n if (isEmpty()) return null\n var
min = this[0]\n for (i in 1..lastIndex) {\n val e = this[i]\n min = minOf(min, e)\n }\n return
min\n}\n\n/**\n * Returns the smallest element or `null` if there are no elements.\n
*\n@SinceKotlin("1.4")\npublic fun CharArray.minOrNull(): Char? {\n if (isEmpty()) return null\n var min =

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this[0]\n for (i in 1..lastIndex) {\n     val e = this[i]\n     if (min > e) min = e\n } \n return
min\n}\n\n@Deprecated("Use minOrNull instead.")
ReplaceWith("this.minOrNull(comparator)")\n\n@DeprecatedSinceKotlin(warningSince = "1.4", errorSince
= "1.5", hiddenSince = "1.6")\n\npublic fun <T> Array<out T>.minWith(comparator: Comparator<in T>): T? {\n
return minOrNull(comparator)\n}\n\n@Deprecated("Use minOrNull instead.")
ReplaceWith("this.minOrNull(comparator)")\n\n@DeprecatedSinceKotlin(warningSince = "1.4", errorSince
= "1.5", hiddenSince = "1.6")\n\npublic fun ByteArray.minWith(comparator: Comparator<in Byte>): Byte? {\n
return minOrNull(comparator)\n}\n\n@Deprecated("Use minOrNull instead.")
ReplaceWith("this.minOrNull(comparator)")\n\n@DeprecatedSinceKotlin(warningSince = "1.4", errorSince
= "1.5", hiddenSince = "1.6")\n\npublic fun ShortArray.minWith(comparator: Comparator<in Short>): Short? {\n
return minOrNull(comparator)\n}\n\n@Deprecated("Use minOrNull instead.")
ReplaceWith("this.minOrNull(comparator)")\n\n@DeprecatedSinceKotlin(warningSince = "1.4", errorSince
= "1.5", hiddenSince = "1.6")\n\npublic fun IntArray.minWith(comparator: Comparator<in Int>): Int? {\n
return minOrNull(comparator)\n}\n\n@Deprecated("Use minOrNull instead.")
ReplaceWith("this.minOrNull(comparator)")\n\n@DeprecatedSinceKotlin(warningSince = "1.4", errorSince
= "1.5", hiddenSince = "1.6")\n\npublic fun LongArray.minWith(comparator: Comparator<in Long>): Long? {\n
return minOrNull(comparator)\n}\n\n@Deprecated("Use minOrNull instead.")
ReplaceWith("this.minOrNull(comparator)")\n\n@DeprecatedSinceKotlin(warningSince = "1.4", errorSince
= "1.5", hiddenSince = "1.6")\n\npublic fun FloatArray.minWith(comparator: Comparator<in Float>): Float? {\n
return minOrNull(comparator)\n}\n\n@Deprecated("Use minOrNull instead.")
ReplaceWith("this.minOrNull(comparator)")\n\n@DeprecatedSinceKotlin(warningSince = "1.4", errorSince
= "1.5", hiddenSince = "1.6")\n\npublic fun DoubleArray.minWith(comparator: Comparator<in Double>): Double?
{\n return minOrNull(comparator)\n}\n\n@Deprecated("Use minOrNull instead.")
ReplaceWith("this.minOrNull(comparator)")\n\n@DeprecatedSinceKotlin(warningSince = "1.4", errorSince
= "1.5", hiddenSince = "1.6")\n\npublic fun BooleanArray.minWith(comparator: Comparator<in Boolean>):
Boolean? {\n return minOrNull(comparator)\n}\n\n@Deprecated("Use minOrNull instead.")
ReplaceWith("this.minOrNull(comparator)")\n\n@DeprecatedSinceKotlin(warningSince = "1.4", errorSince
= "1.5", hiddenSince = "1.6")\n\npublic fun CharArray.minWith(comparator: Comparator<in Char>): Char? {\n
return minOrNull(comparator)\n}\n\n/**\n * Returns the first element having the smallest value according to
the provided [comparator] or `null` if there are no elements.\n */\n\n@SinceKotlin("1.4")\n\npublic fun <T> Array<out
T>.minWithOrNull(comparator: Comparator<in T>): T? {\n if (isEmpty()) return null\n var min = this[0]\n for
(i in 1..lastIndex) {\n     val e = this[i]\n     if (comparator.compare(min, e) > 0) min = e\n } \n return
min\n}\n\n/**\n * Returns the first element having the smallest value according to the provided [comparator] or
`null` if there are no elements.\n */\n\n@SinceKotlin("1.4")\n\npublic fun ByteArray.minWithOrNull(comparator:
Comparator<in Byte>): Byte? {\n if (isEmpty()) return null\n var min = this[0]\n for (i in 1..lastIndex) {\n
val e = this[i]\n     if (comparator.compare(min, e) > 0) min = e\n } \n return min\n}\n\n/**\n * Returns the first
element having the smallest value according to the provided [comparator] or `null` if there are no elements.\n
*/\n\n@SinceKotlin("1.4")\n\npublic fun ShortArray.minWithOrNull(comparator: Comparator<in Short>): Short? {\n
if (isEmpty()) return null\n var min = this[0]\n for (i in 1..lastIndex) {\n     val e = this[i]\n     if
(comparator.compare(min, e) > 0) min = e\n } \n return min\n}\n\n/**\n * Returns the first element having the
smallest value according to the provided [comparator] or `null` if there are no elements.\n
*/\n\n@SinceKotlin("1.4")\n\npublic fun IntArray.minWithOrNull(comparator: Comparator<in Int>): Int? {\n if
(isEmpty()) return null\n var min = this[0]\n for (i in 1..lastIndex) {\n     val e = this[i]\n     if
(comparator.compare(min, e) > 0) min = e\n } \n return min\n}\n\n/**\n * Returns the first element having the
smallest value according to the provided [comparator] or `null` if there are no elements.\n
*/\n\n@SinceKotlin("1.4")\n\npublic fun LongArray.minWithOrNull(comparator: Comparator<in Long>): Long? {\n
if (isEmpty()) return null\n var min = this[0]\n for (i in 1..lastIndex) {\n     val e = this[i]\n     if
(comparator.compare(min, e) > 0) min = e\n } \n return min\n}\n\n/**\n * Returns the first element having the

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smallest value according to the provided [comparator] or `null` if there are no elements.\n
*\n@SinceKotlin("1.4")\npublic fun FloatArray.minWithOrNull(comparator: Comparator<in Float>): Float? {\n
if (isEmpty()) return null\n    var min = this[0]\n    for (i in 1..lastIndex) {\n        val e = this[i]\n        if
(comparator.compare(min, e) > 0) min = e\n    }\n    return min\n}\n\n/**\n * Returns the first element having the
smallest value according to the provided [comparator] or `null` if there are no elements.\n
*\n@SinceKotlin("1.4")\npublic fun DoubleArray.minWithOrNull(comparator: Comparator<in Double>):
Double? {\n    if (isEmpty()) return null\n    var min = this[0]\n    for (i in 1..lastIndex) {\n        val e = this[i]\n        if
(comparator.compare(min, e) > 0) min = e\n    }\n    return min\n}\n\n/**\n * Returns the first element having the
smallest value according to the provided [comparator] or `null` if there are no elements.\n
*\n@SinceKotlin("1.4")\npublic fun BooleanArray.minWithOrNull(comparator: Comparator<in Boolean>):
Boolean? {\n    if (isEmpty()) return null\n    var min = this[0]\n    for (i in 1..lastIndex) {\n        val e = this[i]\n
if (comparator.compare(min, e) > 0) min = e\n    }\n    return min\n}\n\n/**\n * Returns the first element having the
smallest value according to the provided [comparator] or `null` if there are no elements.\n
*\n@SinceKotlin("1.4")\npublic fun CharArray.minWithOrNull(comparator: Comparator<in Char>): Char? {\n
if (isEmpty()) return null\n    var min = this[0]\n    for (i in 1..lastIndex) {\n        val e = this[i]\n        if
(comparator.compare(min, e) > 0) min = e\n    }\n    return min\n}\n\n/**\n * Returns `true` if the array has no
elements.\n * \n * @sample samples.collections.Collections.Aggregates.none\n *\npublic fun <T> Array<out
T>.none(): Boolean {\n    return isEmpty()\n}\n\n/**\n * Returns `true` if the array has no elements.\n * \n *
@sample samples.collections.Collections.Aggregates.none\n *\npublic fun ByteArray.none(): Boolean {\n    return
isEmpty()\n}\n\n/**\n * Returns `true` if the array has no elements.\n * \n * @sample
samples.collections.Collections.Aggregates.none\n *\npublic fun ShortArray.none(): Boolean {\n    return
isEmpty()\n}\n\n/**\n * Returns `true` if the array has no elements.\n * \n * @sample
samples.collections.Collections.Aggregates.none\n *\npublic fun IntArray.none(): Boolean {\n    return
isEmpty()\n}\n\n/**\n * Returns `true` if the array has no elements.\n * \n * @sample
samples.collections.Collections.Aggregates.none\n *\npublic fun LongArray.none(): Boolean {\n    return
isEmpty()\n}\n\n/**\n * Returns `true` if the array has no elements.\n * \n * @sample
samples.collections.Collections.Aggregates.none\n *\npublic fun FloatArray.none(): Boolean {\n    return
isEmpty()\n}\n\n/**\n * Returns `true` if the array has no elements.\n * \n * @sample
samples.collections.Collections.Aggregates.none\n *\npublic fun DoubleArray.none(): Boolean {\n    return
isEmpty()\n}\n\n/**\n * Returns `true` if the array has no elements.\n * \n * @sample
samples.collections.Collections.Aggregates.none\n *\npublic fun BooleanArray.none(): Boolean {\n    return
isEmpty()\n}\n\n/**\n * Returns `true` if the array has no elements.\n * \n * @sample
samples.collections.Collections.Aggregates.none\n *\npublic fun CharArray.none(): Boolean {\n    return
isEmpty()\n}\n\n/**\n * Returns `true` if no elements match the given [predicate].\n * \n * @sample
samples.collections.Collections.Aggregates.noneWithPredicate\n *\npublic inline fun <T> Array<out
T>.none(predicate: (T) -> Boolean): Boolean {\n    for (element in this) if (predicate(element)) return false\n    return
true\n}\n\n/**\n * Returns `true` if no elements match the given [predicate].\n * \n * @sample
samples.collections.Collections.Aggregates.noneWithPredicate\n *\npublic inline fun ByteArray.none(predicate:
(Byte) -> Boolean): Boolean {\n    for (element in this) if (predicate(element)) return false\n    return
true\n}\n\n/**\n * Returns `true` if no elements match the given [predicate].\n * \n * @sample
samples.collections.Collections.Aggregates.noneWithPredicate\n *\npublic inline fun ShortArray.none(predicate:
(Short) -> Boolean): Boolean {\n    for (element in this) if (predicate(element)) return false\n    return
true\n}\n\n/**\n * Returns `true` if no elements match the given [predicate].\n * \n * @sample
samples.collections.Collections.Aggregates.noneWithPredicate\n *\npublic inline fun IntArray.none(predicate: (Int)
-> Boolean): Boolean {\n    for (element in this) if (predicate(element)) return false\n    return true\n}\n\n/**\n *
Returns `true` if no elements match the given [predicate].\n * \n * @sample
samples.collections.Collections.Aggregates.noneWithPredicate\n *\npublic inline fun LongArray.none(predicate:
(Long) -> Boolean): Boolean {\n    for (element in this) if (predicate(element)) return false\n    return

```

```

true\n}\n\n/**\n * Returns `true` if no elements match the given [predicate].\n * \n * @sample
samples.collections.Collections.Aggregates.noneWithPredicate\n * \npublic inline fun FloatArray.none(predicate:
(Float) -> Boolean): Boolean {\n  for (element in this) if (predicate(element)) return false\n  return
true\n}\n\n/**\n * Returns `true` if no elements match the given [predicate].\n * \n * @sample
samples.collections.Collections.Aggregates.noneWithPredicate\n * \npublic inline fun DoubleArray.none(predicate:
(Double) -> Boolean): Boolean {\n  for (element in this) if (predicate(element)) return false\n  return
true\n}\n\n/**\n * Returns `true` if no elements match the given [predicate].\n * \n * @sample
samples.collections.Collections.Aggregates.noneWithPredicate\n * \npublic inline fun
BooleanArray.none(predicate: (Boolean) -> Boolean): Boolean {\n  for (element in this) if (predicate(element))
return false\n  return true\n}\n\n/**\n * Returns `true` if no elements match the given [predicate].\n * \n * @sample
samples.collections.Collections.Aggregates.noneWithPredicate\n * \npublic inline fun CharArray.none(predicate:
(Char) -> Boolean): Boolean {\n  for (element in this) if (predicate(element)) return false\n  return
true\n}\n\n/**\n * Performs the given [action] on each element and returns the array itself afterwards.\n
*\n * \n * @SinceKotlin("1.4")\n * \n * @kotlin.internal.InlineOnly\n * \npublic inline fun <T> Array<out T>.onEach(action: (T) ->
Unit): Array<out T> {\n  return apply { for (element in this) action(element) }\n}\n\n/**\n * Performs the given
[action] on each element and returns the array itself afterwards.\n
*\n * \n * @SinceKotlin("1.4")\n * \n * @kotlin.internal.InlineOnly\n * \npublic inline fun ByteArray.onEach(action: (Byte) ->
Unit): ByteArray {\n  return apply { for (element in this) action(element) }\n}\n\n/**\n * Performs the given
[action] on each element and returns the array itself afterwards.\n
*\n * \n * @SinceKotlin("1.4")\n * \n * @kotlin.internal.InlineOnly\n * \npublic inline fun ShortArray.onEach(action: (Short) ->
Unit): ShortArray {\n  return apply { for (element in this) action(element) }\n}\n\n/**\n * Performs the given
[action] on each element and returns the array itself afterwards.\n
*\n * \n * @SinceKotlin("1.4")\n * \n * @kotlin.internal.InlineOnly\n * \npublic inline fun IntArray.onEach(action: (Int) -> Unit):
IntArray {\n  return apply { for (element in this) action(element) }\n}\n\n/**\n * Performs the given [action] on
each element and returns the array itself afterwards.\n
*\n * \n * @SinceKotlin("1.4")\n * \n * @kotlin.internal.InlineOnly\n * \npublic inline fun LongArray.onEach(action: (Long) ->
Unit): LongArray {\n  return apply { for (element in this) action(element) }\n}\n\n/**\n * Performs the given
[action] on each element and returns the array itself afterwards.\n
*\n * \n * @SinceKotlin("1.4")\n * \n * @kotlin.internal.InlineOnly\n * \npublic inline fun FloatArray.onEach(action: (Float) ->
Unit): FloatArray {\n  return apply { for (element in this) action(element) }\n}\n\n/**\n * Performs the given
[action] on each element and returns the array itself afterwards.\n
*\n * \n * @SinceKotlin("1.4")\n * \n * @kotlin.internal.InlineOnly\n * \npublic inline fun DoubleArray.onEach(action: (Double) ->
Unit): DoubleArray {\n  return apply { for (element in this) action(element) }\n}\n\n/**\n * Performs the given
[action] on each element and returns the array itself afterwards.\n
*\n * \n * @SinceKotlin("1.4")\n * \n * @kotlin.internal.InlineOnly\n * \npublic inline fun BooleanArray.onEach(action: (Boolean)
-> Unit): BooleanArray {\n  return apply { for (element in this) action(element) }\n}\n\n/**\n * Performs the given
[action] on each element and returns the array itself afterwards.\n
*\n * \n * @SinceKotlin("1.4")\n * \n * @kotlin.internal.InlineOnly\n * \npublic inline fun CharArray.onEach(action: (Char) ->
Unit): CharArray {\n  return apply { for (element in this) action(element) }\n}\n\n/**\n * Performs the given
[action] on each element, providing sequential index with the element,\n * and returns the array itself afterwards.\n *
*\n * \n * @param [action] function that takes the index of an element and the element itself\n * and performs the action on
the element.\n * \n * @SinceKotlin("1.4")\n * \n * @kotlin.internal.InlineOnly\n * \npublic inline fun <T> Array<out
T>.onEachIndexed(action: (index: Int, T) -> Unit): Array<out
T> {\n  return apply { forEachIndexed(action) }\n}\n\n/**\n * Performs the given [action] on each element, providing sequential index
with the element,\n * and returns the array itself afterwards.\n * \n * @param [action] function that takes the index of an element and the element
itself\n * and performs the action on the element.\n * \n * @SinceKotlin("1.4")\n * \n * @kotlin.internal.InlineOnly\n * \npublic
inline fun ByteArray.onEachIndexed(action: (index: Int, Byte) -> Unit): ByteArray {\n  return apply {
forEachIndexed(action) }\n}\n\n/**\n * Performs the given [action] on each element, providing sequential index

```

with the element, `\n *` and returns the array itself afterwards. `\n *` `@param [action]` function that takes the index of an element and the element itself `\n *` and performs the action on the element. `\n`

```

*\n@SinceKotlin("1.4")\n@kotlin.internal.InlineOnly\npublic inline fun ShortArray.onEachIndexed(action:
(index: Int, Short) -> Unit): ShortArray {\n    return apply { forEachIndexed(action) }\n}\n\n/**\n * Performs the
given [action] on each element, providing sequential index with the element,\n * and returns the array itself
afterwards.\n * @param [action] function that takes the index of an element and the element itself\n * and performs
the action on the element.\n */\n@SinceKotlin("1.4")\n@kotlin.internal.InlineOnly\npublic inline fun
IntArray.onEachIndexed(action: (index: Int, Int) -> Unit): IntArray {\n    return apply { forEachIndexed(action)
}\n}\n\n/**\n * Performs the given [action] on each element, providing sequential index with the element,\n * and
returns the array itself afterwards.\n * @param [action] function that takes the index of an element and the element
itself\n * and performs the action on the element.\n */\n@SinceKotlin("1.4")\n@kotlin.internal.InlineOnly\npublic
inline fun LongArray.onEachIndexed(action: (index: Int, Long) -> Unit): LongArray {\n    return apply {
forEachIndexed(action) }\n}\n\n/**\n * Performs the given [action] on each element, providing sequential index
with the element,\n * and returns the array itself afterwards.\n * @param [action] function that takes the index of an
element and the element itself\n * and performs the action on the element.\n */\n@SinceKotlin("1.4")\n@kotlin.internal.InlineOnly\npublic inline fun FloatArray.onEachIndexed(action:
(index: Int, Float) -> Unit): FloatArray {\n    return apply { forEachIndexed(action) }\n}\n\n/**\n * Performs the
given [action] on each element, providing sequential index with the element,\n * and returns the array itself
afterwards.\n * @param [action] function that takes the index of an element and the element itself\n * and performs
the action on the element.\n */\n@SinceKotlin("1.4")\n@kotlin.internal.InlineOnly\npublic inline fun
DoubleArray.onEachIndexed(action: (index: Int, Double) -> Unit): DoubleArray {\n    return apply {
forEachIndexed(action) }\n}\n\n/**\n * Performs the given [action] on each element, providing sequential index
with the element,\n * and returns the array itself afterwards.\n * @param [action] function that takes the index of an
element and the element itself\n * and performs the action on the element.\n */\n@SinceKotlin("1.4")\n@kotlin.internal.InlineOnly\npublic inline fun BooleanArray.onEachIndexed(action:
(index: Int, Boolean) -> Unit): BooleanArray {\n    return apply { forEachIndexed(action) }\n}\n\n/**\n * Performs
the given [action] on each element, providing sequential index with the element,\n * and returns the array itself
afterwards.\n * @param [action] function that takes the index of an element and the element itself\n * and performs
the action on the element.\n */\n@SinceKotlin("1.4")\n@kotlin.internal.InlineOnly\npublic inline fun
CharArray.onEachIndexed(action: (index: Int, Char) -> Unit): CharArray {\n    return apply {
forEachIndexed(action) }\n}\n\n/**\n * Accumulates value starting with the first element and applying [operation]
from left to right\n * to current accumulator value and each element.\n * \n * Throws an exception if this array is
empty. If the array can be empty in an expected way,\n * please use [reduceOrNull] instead. It returns `null` when its
receiver is empty.\n * \n * @param [operation] function that takes current accumulator value and an element,\n *
and calculates the next accumulator value.\n * \n * @sample samples.collections.Collections.Aggregates.reduce\n */\npublic inline fun <S, T : S> Array<out T>.reduce(operation: (acc: S, T) -> S): S {\n    if (isEmpty())\n        throw
UnsupportedOperationException("Empty array can't be reduced.")\n    var accumulator: S = this[0]\n    for (index
in 1..lastIndex) {\n        accumulator = operation(accumulator, this[index])\n    }\n    return accumulator\n}\n\n/**\n * Accumulates value starting with the first element and applying [operation] from left to right\n * to current
accumulator value and each element.\n * \n * Throws an exception if this array is empty. If the array can be empty
in an expected way,\n * please use [reduceOrNull] instead. It returns `null` when its receiver is empty.\n * \n *
@param [operation] function that takes current accumulator value and an element,\n * and calculates the next
accumulator value.\n * \n * @sample samples.collections.Collections.Aggregates.reduce\n */\npublic inline fun
ByteArray.reduce(operation: (acc: Byte, Byte) -> Byte): Byte {\n    if (isEmpty())\n        throw
UnsupportedOperationException("Empty array can't be reduced.")\n    var accumulator = this[0]\n    for (index in
1..lastIndex) {\n        accumulator = operation(accumulator, this[index])\n    }\n    return accumulator\n}\n\n/**\n * Accumulates value starting with the first element and applying [operation] from left to right\n * to current
accumulator value and each element.\n * \n * Throws an exception if this array is empty. If the array can be empty

```

in an expected way, please use `reduceOrNull` instead. It returns `null` when its receiver is empty.

`@param [operation]` function that takes current accumulator value and an element, and calculates the next accumulator value.

`@sample samples.collections.Collections.Aggregates.reduce`

```

public inline fun ShortArray.reduce(operation: (acc: Short, Short) -> Short): Short {
    if (isEmpty()) throw UnsupportedOperationException("Empty array can't be reduced.")
    var accumulator = this[0]
    for (index in 1..lastIndex) {
        accumulator = operation(accumulator, this[index])
    }
    return accumulator
}

```

Accumulates value starting with the first element and applying `[operation]` from left to right to current accumulator value and each element. Throws an exception if this array is empty. If the array can be empty in an expected way, please use `reduceOrNull` instead. It returns `null` when its receiver is empty.

`@param [operation]` function that takes current accumulator value and an element, and calculates the next accumulator value.

`@sample samples.collections.Collections.Aggregates.reduce`

```

public inline fun IntArray.reduce(operation: (acc: Int, Int) -> Int): Int {
    if (isEmpty()) throw UnsupportedOperationException("Empty array can't be reduced.")
    var accumulator = this[0]
    for (index in 1..lastIndex) {
        accumulator = operation(accumulator, this[index])
    }
    return accumulator
}

```

Accumulates value starting with the first element and applying `[operation]` from left to right to current accumulator value and each element. Throws an exception if this array is empty. If the array can be empty in an expected way, please use `reduceOrNull` instead. It returns `null` when its receiver is empty.

`@param [operation]` function that takes current accumulator value and an element, and calculates the next accumulator value.

`@sample samples.collections.Collections.Aggregates.reduce`

```

public inline fun LongArray.reduce(operation: (acc: Long, Long) -> Long): Long {
    if (isEmpty()) throw UnsupportedOperationException("Empty array can't be reduced.")
    var accumulator = this[0]
    for (index in 1..lastIndex) {
        accumulator = operation(accumulator, this[index])
    }
    return accumulator
}

```

Accumulates value starting with the first element and applying `[operation]` from left to right to current accumulator value and each element. Throws an exception if this array is empty. If the array can be empty in an expected way, please use `reduceOrNull` instead. It returns `null` when its receiver is empty.

`@param [operation]` function that takes current accumulator value and an element, and calculates the next accumulator value.

`@sample samples.collections.Collections.Aggregates.reduce`

```

public inline fun FloatArray.reduce(operation: (acc: Float, Float) -> Float): Float {
    if (isEmpty()) throw UnsupportedOperationException("Empty array can't be reduced.")
    var accumulator = this[0]
    for (index in 1..lastIndex) {
        accumulator = operation(accumulator, this[index])
    }
    return accumulator
}

```

Accumulates value starting with the first element and applying `[operation]` from left to right to current accumulator value and each element. Throws an exception if this array is empty. If the array can be empty in an expected way, please use `reduceOrNull` instead. It returns `null` when its receiver is empty.

`@param [operation]` function that takes current accumulator value and an element, and calculates the next accumulator value.

`@sample samples.collections.Collections.Aggregates.reduce`

```

public inline fun DoubleArray.reduce(operation: (acc: Double, Double) -> Double): Double {
    if (isEmpty()) throw UnsupportedOperationException("Empty array can't be reduced.")
    var accumulator = this[0]
    for (index in 1..lastIndex) {
        accumulator = operation(accumulator, this[index])
    }
    return accumulator
}

```

Accumulates value starting with the first element and applying `[operation]` from left to right to current accumulator value and each element. Throws an exception if this array is empty. If the array can be empty in an expected way, please use `reduceOrNull` instead. It returns `null` when its receiver is empty.

`@param [operation]` function that takes current accumulator value and an element, and calculates the next accumulator value.

`@sample samples.collections.Collections.Aggregates.reduce`

```

public inline fun BooleanArray.reduce(operation: (acc: Boolean, Boolean) -> Boolean): Boolean {
    if (isEmpty()) throw UnsupportedOperationException("Empty array can't be reduced.")
    var accumulator = this[0]
    for (index in 1..lastIndex) {
        accumulator = operation(accumulator, this[index])
    }
    return accumulator
}

```

Accumulates value starting with the first element and applying `[operation]` from left to right to current accumulator value and each element. Throws an exception if this array is empty. If the array can be empty

in an expected way, please use `reduceOrNull` instead. It returns `null` when its receiver is empty.

`@param [operation]` function that takes current accumulator value and an element and calculates the next accumulator value.

`@sample samples.collections.Collections.Aggregates.reduce`

```

public inline fun CharArray.reduce(operation: (acc: Char, Char) -> Char): Char {
    if (isEmpty()) throw UnsupportedOperationException("Empty array can't be reduced.")
    var accumulator = this[0]
    for (index in 1..lastIndex) {
        accumulator = operation(accumulator, this[index])
    }
    return accumulator
}

```

Accumulates value starting with the first element and applying `[operation]` from left to right to current accumulator value and each element with its index in the original array. Throws an exception if this array is empty. If the array can be empty in an expected way, please use `reduceIndexedOrNull` instead. It returns `null` when its receiver is empty.

`@param [operation]` function that takes the index of an element, current accumulator value and the element itself, and calculates the next accumulator value.

`@sample samples.collections.Collections.Aggregates.reduce`

```

public inline fun <S, T : S> Array<out T>.reduceIndexed(operation: (index: Int, acc: S, T) -> S): S {
    if (isEmpty()) throw UnsupportedOperationException("Empty array can't be reduced.")
    var accumulator: S = this[0]
    for (index in 1..lastIndex) {
        accumulator = operation(index, accumulator, this[index])
    }
    return accumulator
}

```

Accumulates value starting with the first element and applying `[operation]` from left to right to current accumulator value and each element with its index in the original array. Throws an exception if this array is empty. If the array can be empty in an expected way, please use `reduceIndexedOrNull` instead. It returns `null` when its receiver is empty.

`@param [operation]` function that takes the index of an element, current accumulator value and the element itself, and calculates the next accumulator value.

`@sample samples.collections.Collections.Aggregates.reduce`

```

public inline fun ByteArray.reduceIndexed(operation: (index: Int, acc: Byte, Byte) -> Byte): Byte {
    if (isEmpty()) throw UnsupportedOperationException("Empty array can't be reduced.")
    var accumulator = this[0]
    for (index in 1..lastIndex) {
        accumulator = operation(index, accumulator, this[index])
    }
    return accumulator
}

```

Accumulates value starting with the first element and applying `[operation]` from left to right to current accumulator value and each element with its index in the original array. Throws an exception if this array is empty. If the array can be empty in an expected way, please use `reduceIndexedOrNull` instead. It returns `null` when its receiver is empty.

`@param [operation]` function that takes the index of an element, current accumulator value and the element itself, and calculates the next accumulator value.

`@sample samples.collections.Collections.Aggregates.reduce`

```

public inline fun ShortArray.reduceIndexed(operation: (index: Int, acc: Short, Short) -> Short): Short {
    if (isEmpty()) throw UnsupportedOperationException("Empty array can't be reduced.")
    var accumulator = this[0]
    for (index in 1..lastIndex) {
        accumulator = operation(index, accumulator, this[index])
    }
    return accumulator
}

```

Accumulates value starting with the first element and applying `[operation]` from left to right to current accumulator value and each element with its index in the original array. Throws an exception if this array is empty. If the array can be empty in an expected way, please use `reduceIndexedOrNull` instead. It returns `null` when its receiver is empty.

`@param [operation]` function that takes the index of an element, current accumulator value and the element itself, and calculates the next accumulator value.

`@sample samples.collections.Collections.Aggregates.reduce`

```

public inline fun IntArray.reduceIndexed(operation: (index: Int, acc: Int, Int) -> Int): Int {
    if (isEmpty()) throw UnsupportedOperationException("Empty array can't be reduced.")
    var accumulator = this[0]
    for (index in 1..lastIndex) {
        accumulator = operation(index, accumulator, this[index])
    }
    return accumulator
}

```

Accumulates value starting with the first element and applying `[operation]` from left to right to current accumulator value and each element with its index in the original array. Throws an exception if this array is empty. If the array can be empty in an expected way, please use `reduceIndexedOrNull` instead. It returns `null` when its receiver is empty.

`@param [operation]` function that takes the index of an element, current accumulator value and the element itself, and calculates the next accumulator value.

`@sample samples.collections.Collections.Aggregates.reduce`

```

LongArray.reduceIndexed(operation: (index: Int, acc: Long, Long) -> Long): Long {
    if (isEmpty())
        throw UnsupportedOperationException("Empty array can't be reduced.")
    var accumulator = this[0]
    for (index in 1..lastIndex) {
        accumulator = operation(index, accumulator, this[index])
    }
    return accumulator
}
/**
 * Accumulates value starting with the first element and applying [operation] from left to
 * right
 * to current accumulator value and each element with its index in the original array.
 * Throws an
 * exception if this array is empty. If the array can be empty in an expected way,
 * please use [reduceIndexedOrNull]
 * instead. It returns `null` when its receiver is empty.
 * @param [operation] function that takes the index of an
 * element, current accumulator value and the element itself,
 * and calculates the next accumulator value.
 * @sample samples.collections.Collections.Aggregates.reduce
 */
public inline fun

FloatArray.reduceIndexed(operation: (index: Int, acc: Float, Float) -> Float): Float {
    if (isEmpty())
        throw UnsupportedOperationException("Empty array can't be reduced.")
    var accumulator = this[0]
    for (index in 1..lastIndex) {
        accumulator = operation(index, accumulator, this[index])
    }
    return accumulator
}
/**
 * Accumulates value starting with the first element and applying [operation] from left to
 * right
 * to current accumulator value and each element with its index in the original array.
 * Throws an
 * exception if this array is empty. If the array can be empty in an expected way,
 * please use [reduceIndexedOrNull]
 * instead. It returns `null` when its receiver is empty.
 * @param [operation] function that takes the index of an
 * element, current accumulator value and the element itself,
 * and calculates the next accumulator value.
 * @sample samples.collections.Collections.Aggregates.reduce
 */
public inline fun

DoubleArray.reduceIndexed(operation: (index: Int, acc: Double, Double) -> Double): Double {
    if (isEmpty())
        throw UnsupportedOperationException("Empty array can't be reduced.")
    var accumulator = this[0]
    for (index in 1..lastIndex) {
        accumulator = operation(index, accumulator, this[index])
    }
    return accumulator
}
/**
 * Accumulates value starting with the first element and applying [operation] from left to
 * right
 * to current accumulator value and each element with its index in the original array.
 * Throws an
 * exception if this array is empty. If the array can be empty in an expected way,
 * please use [reduceIndexedOrNull]
 * instead. It returns `null` when its receiver is empty.
 * @param [operation] function that takes the index of an
 * element, current accumulator value and the element itself,
 * and calculates the next accumulator value.
 * @sample samples.collections.Collections.Aggregates.reduce
 */
public inline fun

BooleanArray.reduceIndexed(operation: (index: Int, acc: Boolean, Boolean) -> Boolean): Boolean {
    if (isEmpty())
        throw UnsupportedOperationException("Empty array can't be reduced.")
    var accumulator =
this[0]
    for (index in 1..lastIndex) {
        accumulator = operation(index, accumulator, this[index])
    }
    return accumulator
}
/**
 * Accumulates value starting with the first element and applying [operation] from
 * left to right
 * to current accumulator value and each element with its index in the original array.
 * Throws
 * an exception if this array is empty. If the array can be empty in an expected way,
 * please use
 * [reduceIndexedOrNull] instead. It returns `null` when its receiver is empty.
 * @param [operation] function
 * that takes the index of an element, current accumulator value and the element itself,
 * and calculates the next
 * accumulator value.
 * @sample samples.collections.Collections.Aggregates.reduce
 */
public inline fun

CharArray.reduceIndexed(operation: (index: Int, acc: Char, Char) -> Char): Char {
    if (isEmpty())
        throw
UnsupportedOperationException("Empty array can't be reduced.")
    var accumulator = this[0]
    for (index in 1..lastIndex) {
        accumulator = operation(index, accumulator, this[index])
    }
    return
accumulator
}
/**
 * Accumulates value starting with the first element and applying [operation] from left to
 * right
 * to current accumulator value and each element with its index in the original array.
 * Returns `null`
 * if the array is empty.
 * @param [operation] function that takes the index of an element, current accumulator
 * value and the element itself,
 * and calculates the next accumulator value.
 * @sample
samples.collections.Collections.Aggregates.reduceOrNull
 */
@SinceKotlin("1.4")
public inline fun <S, T : S>
Array<out T>.reduceIndexedOrNull(operation: (index: Int, acc: S, T) -> S): S? {
    if (isEmpty())
        return
null
    var accumulator: S = this[0]
    for (index in 1..lastIndex) {
        accumulator = operation(index,
accumulator, this[index])
    }
    return accumulator
}
/**
 * Accumulates value starting with the first
 * element and applying [operation] from left to right
 * to current accumulator value and each element with its index

```


in the original array.\n * \n * Returns `null` if the array is empty.\n * \n * @param [operation] function that takes the index of an element, current accumulator value and the element itself,\n * and calculates the next accumulator value.\n * \n * @sample samples.collections.Collections.Aggregates.reduceOrNull\n

```

*\n@SinceKotlin("1.4")\npublic inline fun ByteArray.reduceIndexedOrNull(operation: (index: Int, acc: Byte, Byte) -> Byte): Byte? {\n    if (isEmpty())\n        return null\n    var accumulator = this[0]\n    for (index in 1..lastIndex) {\n        accumulator = operation(index, accumulator, this[index])\n    }\n    return accumulator\n}\n\n/**\n * Accumulates value starting with the first element and applying [operation] from left to right\n * to current accumulator value and each element with its index in the original array.\n * \n * Returns `null` if the array is empty.\n * \n * @param [operation] function that takes the index of an element, current accumulator value and the element itself,\n * and calculates the next accumulator value.\n * \n * @sample samples.collections.Collections.Aggregates.reduceOrNull\n *\n@SinceKotlin("1.4")\npublic inline fun ShortArray.reduceIndexedOrNull(operation: (index: Int, acc: Short, Short) -> Short): Short? {\n    if (isEmpty())\n        return null\n    var accumulator = this[0]\n    for (index in 1..lastIndex) {\n        accumulator = operation(index, accumulator, this[index])\n    }\n    return accumulator\n}\n\n/**\n * Accumulates value starting with the first element and applying [operation] from left to right\n * to current accumulator value and each element with its index in the original array.\n * \n * Returns `null` if the array is empty.\n * \n * @param [operation] function that takes the index of an element, current accumulator value and the element itself,\n * and calculates the next accumulator value.\n * \n * @sample samples.collections.Collections.Aggregates.reduceOrNull\n *\n@SinceKotlin("1.4")\npublic inline fun IntArray.reduceIndexedOrNull(operation: (index: Int, acc: Int, Int) -> Int): Int? {\n    if (isEmpty())\n        return null\n    var accumulator = this[0]\n    for (index in 1..lastIndex) {\n        accumulator = operation(index, accumulator, this[index])\n    }\n    return accumulator\n}\n\n/**\n * Accumulates value starting with the first element and applying [operation] from left to right\n * to current accumulator value and each element with its index in the original array.\n * \n * Returns `null` if the array is empty.\n * \n * @param [operation] function that takes the index of an element, current accumulator value and the element itself,\n * and calculates the next accumulator value.\n * \n * @sample samples.collections.Collections.Aggregates.reduceOrNull\n *\n@SinceKotlin("1.4")\npublic inline fun LongArray.reduceIndexedOrNull(operation: (index: Int, acc: Long, Long) -> Long): Long? {\n    if (isEmpty())\n        return null\n    var accumulator = this[0]\n    for (index in 1..lastIndex) {\n        accumulator = operation(index, accumulator, this[index])\n    }\n    return accumulator\n}\n\n/**\n * Accumulates value starting with the first element and applying [operation] from left to right\n * to current accumulator value and each element with its index in the original array.\n * \n * Returns `null` if the array is empty.\n * \n * @param [operation] function that takes the index of an element, current accumulator value and the element itself,\n * and calculates the next accumulator value.\n * \n * @sample samples.collections.Collections.Aggregates.reduceOrNull\n *\n@SinceKotlin("1.4")\npublic inline fun FloatArray.reduceIndexedOrNull(operation: (index: Int, acc: Float, Float) -> Float): Float? {\n    if (isEmpty())\n        return null\n    var accumulator = this[0]\n    for (index in 1..lastIndex) {\n        accumulator = operation(index, accumulator, this[index])\n    }\n    return accumulator\n}\n\n/**\n * Accumulates value starting with the first element and applying [operation] from left to right\n * to current accumulator value and each element with its index in the original array.\n * \n * Returns `null` if the array is empty.\n * \n * @param [operation] function that takes the index of an element, current accumulator value and the element itself,\n * and calculates the next accumulator value.\n * \n * @sample samples.collections.Collections.Aggregates.reduceOrNull\n *\n@SinceKotlin("1.4")\npublic inline fun DoubleArray.reduceIndexedOrNull(operation: (index: Int, acc: Double, Double) -> Double): Double? {\n    if (isEmpty())\n        return null\n    var accumulator = this[0]\n    for (index in 1..lastIndex) {\n        accumulator = operation(index, accumulator, this[index])\n    }\n    return accumulator\n}\n\n/**\n * Accumulates value starting with the first element and applying [operation] from left to right\n * to current accumulator value and each element with its index in the original array.\n * \n * Returns `null` if the array is empty.\n * \n * @param [operation] function that takes the index of an element, current accumulator value and the element itself,\n * and calculates the next accumulator value.\n * \n * @sample samples.collections.Collections.Aggregates.reduceOrNull\n *\n@SinceKotlin("1.4")\npublic inline fun

```

```

BooleanArray.reduceIndexedOrNull(operation: (index: Int, acc: Boolean, Boolean) -> Boolean): Boolean? {\n  if
(isEmpty())\n    return null\n  var accumulator = this[0]\n  for (index in 1..lastIndex) {\n    accumulator =
operation(index, accumulator, this[index])\n  }\n  return accumulator\n}\n\n/**\n * Accumulates value starting
with the first element and applying [operation] from left to right\n * to current accumulator value and each element
with its index in the original array.\n * \n * Returns `null` if the array is empty.\n * \n * @param [operation]
function that takes the index of an element, current accumulator value and the element itself,\n * and calculates the
next accumulator value.\n * \n * @sample samples.collections.Collections.Aggregates.reduceOrNull\n
*\n@SinceKotlin("1.4")\npublic inline fun CharArray.reduceIndexedOrNull(operation: (index: Int, acc: Char,
Char) -> Char): Char? {\n  if (isEmpty())\n    return null\n  var accumulator = this[0]\n  for (index in
1..lastIndex) {\n    accumulator = operation(index, accumulator, this[index])\n  }\n  return
accumulator\n}\n\n/**\n * Accumulates value starting with the first element and applying [operation] from left to
right\n * to current accumulator value and each element.\n * \n * Returns `null` if the array is empty.\n * \n *
@param [operation] function that takes current accumulator value and an element,\n * and calculates the next
accumulator value.\n * \n * @sample samples.collections.Collections.Aggregates.reduceOrNull\n
*\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\npublic inline fun <S, T : S>
Array<out T>.reduceOrNull(operation: (acc: S, T) -> S): S? {\n  if (isEmpty())\n    return null\n  var
accumulator: S = this[0]\n  for (index in 1..lastIndex) {\n    accumulator = operation(accumulator, this[index])\n
}\n  return accumulator\n}\n\n/**\n * Accumulates value starting with the first element and applying [operation]
from left to right\n * to current accumulator value and each element.\n * \n * Returns `null` if the array is empty.\n
* \n * @param [operation] function that takes current accumulator value and an element,\n * and calculates the next
accumulator value.\n * \n * @sample samples.collections.Collections.Aggregates.reduceOrNull\n
*\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\npublic inline fun
ByteArray.reduceOrNull(operation: (acc: Byte, Byte) -> Byte): Byte? {\n  if (isEmpty())\n    return null\n  var
accumulator = this[0]\n  for (index in 1..lastIndex) {\n    accumulator = operation(accumulator, this[index])\n
}\n  return accumulator\n}\n\n/**\n * Accumulates value starting with the first element and applying [operation]
from left to right\n * to current accumulator value and each element.\n * \n * Returns `null` if the array is empty.\n
* \n * @param [operation] function that takes current accumulator value and an element,\n * and calculates the next
accumulator value.\n * \n * @sample samples.collections.Collections.Aggregates.reduceOrNull\n
*\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\npublic inline fun
ShortArray.reduceOrNull(operation: (acc: Short, Short) -> Short): Short? {\n  if (isEmpty())\n    return null\n
var accumulator = this[0]\n  for (index in 1..lastIndex) {\n    accumulator = operation(accumulator, this[index])\n
}\n  return accumulator\n}\n\n/**\n * Accumulates value starting with the first element and applying [operation]
from left to right\n * to current accumulator value and each element.\n * \n * Returns `null` if the array is empty.\n
* \n * @param [operation] function that takes current accumulator value and an element,\n * and calculates the next
accumulator value.\n * \n * @sample samples.collections.Collections.Aggregates.reduceOrNull\n
*\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\npublic inline fun
IntArray.reduceOrNull(operation: (acc: Int, Int) -> Int): Int? {\n  if (isEmpty())\n    return null\n  var
accumulator = this[0]\n  for (index in 1..lastIndex) {\n    accumulator = operation(accumulator, this[index])\n
}\n  return accumulator\n}\n\n/**\n * Accumulates value starting with the first element and applying [operation]
from left to right\n * to current accumulator value and each element.\n * \n * Returns `null` if the array is empty.\n
* \n * @param [operation] function that takes current accumulator value and an element,\n * and calculates the next
accumulator value.\n * \n * @sample samples.collections.Collections.Aggregates.reduceOrNull\n
*\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\npublic inline fun
LongArray.reduceOrNull(operation: (acc: Long, Long) -> Long): Long? {\n  if (isEmpty())\n    return null\n
var accumulator = this[0]\n  for (index in 1..lastIndex) {\n    accumulator = operation(accumulator, this[index])\n
}\n  return accumulator\n}\n\n/**\n * Accumulates value starting with the first element and applying [operation]
from left to right\n * to current accumulator value and each element.\n * \n * Returns `null` if the array is empty.\n
* \n * @param [operation] function that takes current accumulator value and an element,\n * and calculates the next
accumulator value.\n * \n * @sample samples.collections.Collections.Aggregates.reduceOrNull\n

```

```

accumulator value.\n * \n * @sample samples.collections.Collections.Aggregates.reduceOrNull\n
*\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\npublic inline fun
FloatArray.reduceOrNull(operation: (acc: Float, Float) -> Float): Float? {\n if (isEmpty())\n return null\n var
accumulator = this[0]\n for (index in 1..lastIndex) {\n accumulator = operation(accumulator, this[index])\n
}\n return accumulator}\n\n/**\n * Accumulates value starting with the first element and applying [operation]
from left to right\n * to current accumulator value and each element.\n * \n * Returns `null` if the array is empty.\n *
\n * @param [operation] function that takes current accumulator value and an element,\n * and calculates the next
accumulator value.\n * \n * @sample samples.collections.Collections.Aggregates.reduceOrNull\n
*\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\npublic inline fun
DoubleArray.reduceOrNull(operation: (acc: Double, Double) -> Double): Double? {\n if (isEmpty())\n return
null\n var accumulator = this[0]\n for (index in 1..lastIndex) {\n accumulator = operation(accumulator,
this[index])\n }\n return accumulator}\n\n/**\n * Accumulates value starting with the first element and
applying [operation] from left to right\n * to current accumulator value and each element.\n * \n * Returns `null` if
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and calculates the next accumulator value.\n * \n * @sample
samples.collections.Collections.Aggregates.reduceOrNull\n
*\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\npublic inline fun
BooleanArray.reduceOrNull(operation: (acc: Boolean, Boolean) -> Boolean): Boolean? {\n if (isEmpty())\n
return null\n var accumulator = this[0]\n for (index in 1..lastIndex) {\n accumulator =
operation(accumulator, this[index])\n }\n return accumulator}\n\n/**\n * Accumulates value starting with the
first element and applying [operation] from left to right\n * to current accumulator value and each element.\n * \n *
Returns `null` if the array is empty.\n * \n * @param [operation] function that takes current accumulator value and
an element,\n * and calculates the next accumulator value.\n * \n * @sample
samples.collections.Collections.Aggregates.reduceOrNull\n
*\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\npublic inline fun
CharArray.reduceOrNull(operation: (acc: Char, Char) -> Char): Char? {\n if (isEmpty())\n return null\n var
accumulator = this[0]\n for (index in 1..lastIndex) {\n accumulator = operation(accumulator, this[index])\n
}\n return accumulator}\n\n/**\n * Accumulates value starting with the last element and applying [operation]
from right to left\n * to each element and current accumulator value.\n * \n * Throws an exception if this array is
empty. If the array can be empty in an expected way,\n * please use [reduceRightOrNull] instead. It returns `null`
when its receiver is empty.\n * \n * @param [operation] function that takes an element and current accumulator
value,\n * and calculates the next accumulator value.\n * \n * @sample
samples.collections.Collections.Aggregates.reduceRight\n
*\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\npublic inline fun <S, T : S> Array<out
T>.reduceRight(operation: (T, acc: S) -> S): S {\n var index = lastIndex\n if (index < 0) throw
UnsupportedOperationException("Empty array can't be reduced.")\n var accumulator: S = get(index--)\n while
(index >= 0) {\n accumulator = operation(get(index--), accumulator)\n }\n return accumulator}\n\n/**\n *
Accumulates value starting with the last element and applying [operation] from right to left\n * to each element and
current accumulator value.\n * \n * Throws an exception if this array is empty. If the array can be empty in an
expected way,\n * please use [reduceRightOrNull] instead. It returns `null` when its receiver is empty.\n * \n *
@param [operation] function that takes an element and current accumulator value,\n * and calculates the next
accumulator value.\n * \n * @sample samples.collections.Collections.Aggregates.reduceRight\n
*\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\npublic inline
fun ByteArray.reduceRight(operation: (Byte, acc: Byte) -> Byte): Byte {\n var index = lastIndex\n if (index < 0)
throw UnsupportedOperationException("Empty array can't be reduced.")\n var accumulator = get(index--)\n
while (index >= 0) {\n accumulator = operation(get(index--), accumulator)\n }\n return
accumulator}\n\n/**\n * Accumulates value starting with the last element and applying [operation] from right to
left\n * to each element and current accumulator value.\n * \n * Throws an exception if this array is empty. If the
array can be empty in an expected way,\n * please use [reduceRightOrNull] instead. It returns `null` when its
receiver is empty.\n * \n * @param [operation] function that takes an element and current accumulator value,\n *

```

and calculates the next accumulator value.

```

samples.collections.Collections.Aggregates.reduceRight
public inline fun ShortArray.reduceRight(operation:
(Short, acc: Short) -> Short): Short {
    var index = lastIndex
    if (index < 0) throw
UnsupportedOperationException("Empty array can't be reduced.")
    var accumulator = get(index--)
    while
(index >= 0) {
        accumulator = operation(get(index--), accumulator)
    }
    return accumulator
}

```

Accumulates value starting with the last element and applying [operation] from right to left to each element and current accumulator value. Throws an exception if this array is empty. If the array can be empty in an expected way, please use [reduceRightOrNull] instead. It returns `null` when its receiver is empty. @param [operation] function that takes an element and current accumulator value, and calculates the next accumulator value.

```

samples.collections.Collections.Aggregates.reduceRight
public inline
fun IntArray.reduceRight(operation: (Int, acc: Int) -> Int): Int {
    var index = lastIndex
    if (index < 0) throw
UnsupportedOperationException("Empty array can't be reduced.")
    var accumulator = get(index--)
    while
(index >= 0) {
        accumulator = operation(get(index--), accumulator)
    }
    return accumulator
}

```

Accumulates value starting with the last element and applying [operation] from right to left to each element and current accumulator value. Throws an exception if this array is empty. If the array can be empty in an expected way, please use [reduceRightOrNull] instead. It returns `null` when its receiver is empty. @param [operation] function that takes an element and current accumulator value, and calculates the next accumulator value.

```

samples.collections.Collections.Aggregates.reduceRight
public inline
fun LongArray.reduceRight(operation: (Long, acc: Long) -> Long): Long {
    var index = lastIndex
    if (index < 0) throw
UnsupportedOperationException("Empty array can't be reduced.")
    var accumulator = get(index--)
    while
(index >= 0) {
        accumulator = operation(get(index--), accumulator)
    }
    return
accumulator
}

```

Accumulates value starting with the last element and applying [operation] from right to left to each element and current accumulator value. Throws an exception if this array is empty. If the array can be empty in an expected way, please use [reduceRightOrNull] instead. It returns `null` when its receiver is empty. @param [operation] function that takes an element and current accumulator value, and calculates the next accumulator value.

```

samples.collections.Collections.Aggregates.reduceRight
public inline fun FloatArray.reduceRight(operation:
(Float, acc: Float) -> Float): Float {
    var index = lastIndex
    if (index < 0) throw
UnsupportedOperationException("Empty array can't be reduced.")
    var accumulator = get(index--)
    while
(index >= 0) {
        accumulator = operation(get(index--), accumulator)
    }
    return accumulator
}

```

Accumulates value starting with the last element and applying [operation] from right to left to each element and current accumulator value. Throws an exception if this array is empty. If the array can be empty in an expected way, please use [reduceRightOrNull] instead. It returns `null` when its receiver is empty. @param [operation] function that takes an element and current accumulator value, and calculates the next accumulator value.

```

samples.collections.Collections.Aggregates.reduceRight
public inline
fun DoubleArray.reduceRight(operation: (Double, acc: Double) -> Double): Double {
    var index = lastIndex
    if (index < 0) throw
UnsupportedOperationException("Empty array can't be reduced.")
    var accumulator =
get(index--)
    while (index >= 0) {
        accumulator = operation(get(index--), accumulator)
    }
    return
accumulator
}

```

Accumulates value starting with the last element and applying [operation] from right to left to each element and current accumulator value. Throws an exception if this array is empty. If the array can be empty in an expected way, please use [reduceRightOrNull] instead. It returns `null` when its receiver is empty. @param [operation] function that takes an element and current accumulator value, and calculates the next accumulator value.

```

samples.collections.Collections.Aggregates.reduceRight
public inline fun
BooleanArray.reduceRight(operation: (Boolean, acc: Boolean) -> Boolean): Boolean {
    var index = lastIndex
    if (index < 0) throw
UnsupportedOperationException("Empty array can't be reduced.")
    var accumulator =
get(index--)
    while (index >= 0) {
        accumulator = operation(get(index--), accumulator)
    }
    return
accumulator
}

```

Accumulates value starting with the last element and applying [operation] from right to

left\n * to each element and current accumulator value.\n * \n * Throws an exception if this array is empty. If the array can be empty in an expected way,\n * please use [reduceRightOrNull] instead. It returns `null` when its receiver is empty.\n * \n * @param [operation] function that takes an element and current accumulator value,\n * and calculates the next accumulator value.\n * \n * @sample

```

samples.collections.Collections.Aggregates.reduceRight\n */\npublic inline fun CharArray.reduceRight(operation:
(Char, acc: Char) -> Char): Char {\n    var index = lastIndex\n    if (index < 0) throw
UnsupportedOperationException("Empty array can't be reduced.")\n    var accumulator = get(index--)\n    while
(index >= 0) {\n        accumulator = operation(get(index--), accumulator)\n    }\n    return accumulator\n}\n\n/**\n * Accumulates value starting with the last element and applying [operation] from right to left\n * to each element with
its index in the original array and current accumulator value.\n * \n * Throws an exception if this array is empty. If
the array can be empty in an expected way,\n * please use [reduceRightIndexedOrNull] instead. It returns `null`
when its receiver is empty.\n * \n * @param [operation] function that takes the index of an element, the element
itself and current accumulator value,\n * and calculates the next accumulator value.\n * \n * @sample
samples.collections.Collections.Aggregates.reduceRight\n */\npublic inline fun <S, T : S> Array<out
T>.reduceRightIndexed(operation: (index: Int, T, acc: S) -> S): S {\n    var index = lastIndex\n    if (index < 0) throw
UnsupportedOperationException("Empty array can't be reduced.")\n    var accumulator: S = get(index--)\n    while
(index >= 0) {\n        accumulator = operation(index, get(index), accumulator)\n        --index\n    }\n    return
accumulator\n}\n\n/**\n * Accumulates value starting with the last element and applying [operation] from right to
left\n * to each element with its index in the original array and current accumulator value.\n * \n * Throws an
exception if this array is empty. If the array can be empty in an expected way,\n * please use
[reduceRightIndexedOrNull] instead. It returns `null` when its receiver is empty.\n * \n * @param [operation]
function that takes the index of an element, the element itself and current accumulator value,\n * and calculates the
next accumulator value.\n * \n * @sample samples.collections.Collections.Aggregates.reduceRight\n */\npublic
inline fun ByteArray.reduceRightIndexed(operation: (index: Int, Byte, acc: Byte) -> Byte): Byte {\n    var index =
lastIndex\n    if (index < 0) throw UnsupportedOperationException("Empty array can't be reduced.")\n    var
accumulator = get(index--)\n    while (index >= 0) {\n        accumulator = operation(index, get(index),
accumulator)\n        --index\n    }\n    return accumulator\n}\n\n/**\n * Accumulates value starting with the last
element and applying [operation] from right to left\n * to each element with its index in the original array and
current accumulator value.\n * \n * Throws an exception if this array is empty. If the array can be empty in an
expected way,\n * please use [reduceRightIndexedOrNull] instead. It returns `null` when its receiver is empty.\n * \n
* @param [operation] function that takes the index of an element, the element itself and current accumulator
value,\n * and calculates the next accumulator value.\n * \n * @sample
samples.collections.Collections.Aggregates.reduceRight\n */\npublic inline fun
ShortArray.reduceRightIndexed(operation: (index: Int, Short, acc: Short) -> Short): Short {\n    var index =
lastIndex\n    if (index < 0) throw UnsupportedOperationException("Empty array can't be reduced.")\n    var
accumulator = get(index--)\n    while (index >= 0) {\n        accumulator = operation(index, get(index),
accumulator)\n        --index\n    }\n    return accumulator\n}\n\n/**\n * Accumulates value starting with the last
element and applying [operation] from right to left\n * to each element with its index in the original array and
current accumulator value.\n * \n * Throws an exception if this array is empty. If the array can be empty in an
expected way,\n * please use [reduceRightIndexedOrNull] instead. It returns `null` when its receiver is empty.\n * \n
* @param [operation] function that takes the index of an element, the element itself and current accumulator
value,\n * and calculates the next accumulator value.\n * \n * @sample
samples.collections.Collections.Aggregates.reduceRight\n */\npublic inline fun
IntArray.reduceRightIndexed(operation: (index: Int, Int, acc: Int) -> Int): Int {\n    var index = lastIndex\n    if (index
< 0) throw UnsupportedOperationException("Empty array can't be reduced.")\n    var accumulator = get(index--)\n
while (index >= 0) {\n        accumulator = operation(index, get(index), accumulator)\n        --index\n    }\n    return
accumulator\n}\n\n/**\n * Accumulates value starting with the last element and applying [operation] from right to
left\n * to each element with its index in the original array and current accumulator value.\n * \n * Throws an

```

exception if this array is empty. If the array can be empty in an expected way, please use [reduceRightIndexedOrNull] instead. It returns `null` when its receiver is empty.

`@param [operation]` function that takes the index of an element, the element itself and current accumulator value, and calculates the next accumulator value.

`@sample` samples.collections.Collections.Aggregates.reduceRight

```

public inline fun LongArray.reduceRightIndexed(operation: (index: Int, Long, acc: Long) -> Long): Long {
    var index = lastIndex
    if (index < 0) throw UnsupportedOperationException("Empty array can't be reduced.")
    var accumulator = get(index--)
    while (index >= 0) {
        accumulator = operation(index, get(index), accumulator)
        --index
    }
    return accumulator
}

```

Accumulates value starting with the last element and applying [operation] from right to left to each element with its index in the original array and current accumulator value.

Throws an exception if this array is empty. If the array can be empty in an expected way, please use [reduceRightIndexedOrNull] instead. It returns `null` when its receiver is empty.

`@param [operation]` function that takes the index of an element, the element itself and current accumulator value, and calculates the next accumulator value.

`@sample` samples.collections.Collections.Aggregates.reduceRight

```

public inline fun FloatArray.reduceRightIndexed(operation: (index: Int, Float, acc: Float) -> Float): Float {
    var index = lastIndex
    if (index < 0) throw UnsupportedOperationException("Empty array can't be reduced.")
    var accumulator = get(index--)
    while (index >= 0) {
        accumulator = operation(index, get(index), accumulator)
        --index
    }
    return accumulator
}

```

Accumulates value starting with the last element and applying [operation] from right to left to each element with its index in the original array and current accumulator value.

Throws an exception if this array is empty. If the array can be empty in an expected way, please use [reduceRightIndexedOrNull] instead. It returns `null` when its receiver is empty.

`@param [operation]` function that takes the index of an element, the element itself and current accumulator value, and calculates the next accumulator value.

`@sample` samples.collections.Collections.Aggregates.reduceRight

```

public inline fun DoubleArray.reduceRightIndexed(operation: (index: Int, Double, acc: Double) -> Double): Double {
    var index = lastIndex
    if (index < 0) throw UnsupportedOperationException("Empty array can't be reduced.")
    var accumulator = get(index--)
    while (index >= 0) {
        accumulator = operation(index, get(index), accumulator)
        --index
    }
    return accumulator
}

```

Accumulates value starting with the last element and applying [operation] from right to left to each element with its index in the original array and current accumulator value.

Throws an exception if this array is empty. If the array can be empty in an expected way, please use [reduceRightIndexedOrNull] instead. It returns `null` when its receiver is empty.

`@param [operation]` function that takes the index of an element, the element itself and current accumulator value, and calculates the next accumulator value.

`@sample` samples.collections.Collections.Aggregates.reduceRight

```

public inline fun BooleanArray.reduceRightIndexed(operation: (index: Int, Boolean, acc: Boolean) -> Boolean): Boolean {
    var index = lastIndex
    if (index < 0) throw UnsupportedOperationException("Empty array can't be reduced.")
    var accumulator = get(index--)
    while (index >= 0) {
        accumulator = operation(index, get(index), accumulator)
        --index
    }
    return accumulator
}

```

Accumulates value starting with the last element and applying [operation] from right to left to each element with its index in the original array and current accumulator value.

Throws an exception if this array is empty. If the array can be empty in an expected way, please use [reduceRightIndexedOrNull] instead. It returns `null` when its receiver is empty.

`@param [operation]` function that takes the index of an element, the element itself and current accumulator value, and calculates the next accumulator value.

`@sample` samples.collections.Collections.Aggregates.reduceRight

```

public inline fun CharArray.reduceRightIndexed(operation: (index: Int, Char, acc: Char) -> Char): Char {
    var index = lastIndex
    if (index < 0) throw UnsupportedOperationException("Empty array can't be reduced.")
    var accumulator = get(index--)
    while (index >= 0) {
        accumulator = operation(index, get(index), accumulator)
        --index
    }
    return accumulator
}

```

Accumulates value starting with the last element and applying [operation]

from right to left\n * to each element with its index in the original array and current accumulator value.\n * \n * Returns `null` if the array is empty.\n * \n * @param [operation] function that takes the index of an element, the element itself and current accumulator value,\n * and calculates the next accumulator value.\n * \n * @sample

```

samples.collections.Collections.Aggregates.reduceRightOrNull\n */\n@SinceKotlin("1.4")\npublic inline fun <S, T : S> Array<out T>.reduceRightIndexedOrNull(operation: (index: Int, T, acc: S) -> S): S? {\n    var index = lastIndex\n    if (index < 0) return null\n    var accumulator: S = get(index--)\n    while (index >= 0) {\n        accumulator = operation(index, get(index), accumulator)\n        --index\n    }\n    return accumulator\n}\n\n
```

Accumulates value starting with the last element and applying [operation] from right to left\n * to each element with its index in the original array and current accumulator value.\n * \n * Returns `null` if the array is empty.\n * \n * @param [operation] function that takes the index of an element, the element itself and current accumulator value,\n * and calculates the next accumulator value.\n * \n * @sample

```

samples.collections.Collections.Aggregates.reduceRightOrNull\n */\n@SinceKotlin("1.4")\npublic inline fun ByteArray.reduceRightIndexedOrNull(operation: (index: Int, Byte, acc: Byte) -> Byte): Byte? {\n    var index = lastIndex\n    if (index < 0) return null\n    var accumulator = get(index--)\n    while (index >= 0) {\n        accumulator = operation(index, get(index), accumulator)\n        --index\n    }\n    return accumulator\n}\n\n
```

Accumulates value starting with the last element and applying [operation] from right to left\n * to each element with its index in the original array and current accumulator value.\n * \n * Returns `null` if the array is empty.\n * \n * @param [operation] function that takes the index of an element, the element itself and current accumulator value,\n * and calculates the next accumulator value.\n * \n * @sample

```

samples.collections.Collections.Aggregates.reduceRightOrNull\n */\n@SinceKotlin("1.4")\npublic inline fun ShortArray.reduceRightIndexedOrNull(operation: (index: Int, Short, acc: Short) -> Short): Short? {\n    var index = lastIndex\n    if (index < 0) return null\n    var accumulator = get(index--)\n    while (index >= 0) {\n        accumulator = operation(index, get(index), accumulator)\n        --index\n    }\n    return accumulator\n}\n\n
```

Accumulates value starting with the last element and applying [operation] from right to left\n * to each element with its index in the original array and current accumulator value.\n * \n * Returns `null` if the array is empty.\n * \n * @param [operation] function that takes the index of an element, the element itself and current accumulator value,\n * and calculates the next accumulator value.\n * \n * @sample

```

samples.collections.Collections.Aggregates.reduceRightOrNull\n */\n@SinceKotlin("1.4")\npublic inline fun IntArray.reduceRightIndexedOrNull(operation: (index: Int, Int, acc: Int) -> Int): Int? {\n    var index = lastIndex\n    if (index < 0) return null\n    var accumulator = get(index--)\n    while (index >= 0) {\n        accumulator = operation(index, get(index), accumulator)\n        --index\n    }\n    return accumulator\n}\n\n
```

Accumulates value starting with the last element and applying [operation] from right to left\n * to each element with its index in the original array and current accumulator value.\n * \n * Returns `null` if the array is empty.\n * \n * @param [operation] function that takes the index of an element, the element itself and current accumulator value,\n * and calculates the next accumulator value.\n * \n * @sample

```

samples.collections.Collections.Aggregates.reduceRightOrNull\n */\n@SinceKotlin("1.4")\npublic inline fun LongArray.reduceRightIndexedOrNull(operation: (index: Int, Long, acc: Long) -> Long): Long? {\n    var index = lastIndex\n    if (index < 0) return null\n    var accumulator = get(index--)\n    while (index >= 0) {\n        accumulator = operation(index, get(index), accumulator)\n        --index\n    }\n    return accumulator\n}\n\n
```

Accumulates value starting with the last element and applying [operation] from right to left\n * to each element with its index in the original array and current accumulator value.\n * \n * Returns `null` if the array is empty.\n * \n * @param [operation] function that takes the index of an element, the element itself and current accumulator value,\n * and calculates the next accumulator value.\n * \n * @sample

```

samples.collections.Collections.Aggregates.reduceRightOrNull\n */\n@SinceKotlin("1.4")\npublic inline fun FloatArray.reduceRightIndexedOrNull(operation: (index: Int, Float, acc: Float) -> Float): Float? {\n    var index = lastIndex\n    if (index < 0) return null\n    var accumulator = get(index--)\n    while (index >= 0) {\n        accumulator = operation(index, get(index), accumulator)\n        --index\n    }\n    return accumulator\n}\n\n
```

Accumulates value starting with the last element and applying [operation] from right to left\n * to each element with

its index in the original array and current accumulator value.\n * \n * Returns `null` if the array is empty.\n * \n *
 @param [operation] function that takes the index of an element, the element itself and current accumulator value,\n
 * and calculates the next accumulator value.\n * \n * @sample

```

samples.collections.Collections.Aggregates.reduceRightOrNull\n *^@SinceKotlin("1.4")\npublic inline fun
DoubleArray.reduceRightIndexedOrNull(operation: (index: Int, Double, acc: Double) -> Double): Double? {\n  var
index = lastIndex\n  if (index < 0) return null\n  var accumulator = get(index--)\n  while (index >= 0) {\n
accumulator = operation(index, get(index), accumulator)\n    --index\n  }\n  return accumulator\n}\n\n/**\n *
Accumulates value starting with the last element and applying [operation] from right to left\n * to each element with
its index in the original array and current accumulator value.\n * \n * Returns `null` if the array is empty.\n * \n *
@param [operation] function that takes the index of an element, the element itself and current accumulator value,\n
* and calculates the next accumulator value.\n * \n * @sample
samples.collections.Collections.Aggregates.reduceRightOrNull\n *^@SinceKotlin("1.4")\npublic inline fun
BooleanArray.reduceRightIndexedOrNull(operation: (index: Int, Boolean, acc: Boolean) -> Boolean): Boolean? {\n
var index = lastIndex\n  if (index < 0) return null\n  var accumulator = get(index--)\n  while (index >= 0) {\n
accumulator = operation(index, get(index), accumulator)\n    --index\n  }\n  return accumulator\n}\n\n/**\n *
Accumulates value starting with the last element and applying [operation] from right to left\n * to each element with
its index in the original array and current accumulator value.\n * \n * Returns `null` if the array is empty.\n * \n *
@param [operation] function that takes the index of an element, the element itself and current accumulator value,\n
* and calculates the next accumulator value.\n * \n * @sample
samples.collections.Collections.Aggregates.reduceRightOrNull\n *^@SinceKotlin("1.4")\npublic inline fun
CharArray.reduceRightIndexedOrNull(operation: (index: Int, Char, acc: Char) -> Char): Char? {\n  var index =
lastIndex\n  if (index < 0) return null\n  var accumulator = get(index--)\n  while (index >= 0) {\n
accumulator = operation(index, get(index), accumulator)\n    --index\n  }\n  return accumulator\n}\n\n/**\n *
Accumulates value starting with the last element and applying [operation] from right to left\n * to each element and
current accumulator value.\n * \n * Returns `null` if the array is empty.\n * \n * @param [operation] function that
takes an element and current accumulator value,\n * and calculates the next accumulator value.\n * \n * @sample
samples.collections.Collections.Aggregates.reduceRightOrNull\n
*^@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\npublic inline fun <S, T : S>
Array<out T>.reduceRightOrNull(operation: (T, acc: S) -> S): S? {\n  var index = lastIndex\n  if (index < 0)
return null\n  var accumulator: S = get(index--)\n  while (index >= 0) {\n    accumulator = operation(get(index--),
accumulator)\n  }\n  return accumulator\n}\n\n/**\n * Accumulates value starting with the last element and
applying [operation] from right to left\n * to each element and current accumulator value.\n * \n * Returns `null` if
the array is empty.\n * \n * @param [operation] function that takes an element and current accumulator value,\n *
and calculates the next accumulator value.\n * \n * @sample
samples.collections.Collections.Aggregates.reduceRightOrNull\n
*^@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\npublic inline fun
ByteArray.reduceRightOrNull(operation: (Byte, acc: Byte) -> Byte): Byte? {\n  var index = lastIndex\n  if (index
< 0) return null\n  var accumulator = get(index--)\n  while (index >= 0) {\n    accumulator =
operation(get(index--), accumulator)\n  }\n  return accumulator\n}\n\n/**\n * Accumulates value starting with the
last element and applying [operation] from right to left\n * to each element and current accumulator value.\n * \n *
Returns `null` if the array is empty.\n * \n * @param [operation] function that takes an element and current
accumulator value,\n * and calculates the next accumulator value.\n * \n * @sample
samples.collections.Collections.Aggregates.reduceRightOrNull\n
*^@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\npublic inline fun
ShortArray.reduceRightOrNull(operation: (Short, acc: Short) -> Short): Short? {\n  var index = lastIndex\n  if
(index < 0) return null\n  var accumulator = get(index--)\n  while (index >= 0) {\n    accumulator =
operation(get(index--), accumulator)\n  }\n  return accumulator\n}\n\n/**\n * Accumulates value starting with the
last element and applying [operation] from right to left\n * to each element and current accumulator value.\n * \n *

```


Returns `null` if the array is empty.

`@param [operation]` function that takes an element and current accumulator value, and calculates the next accumulator value.

`@sample`

```

samples.collections.Collections.Aggregates.reduceRightOrNull
*/
@SinceKotlin("1.4")
@WasExperimental(ExperimentalStdlibApi::class)
public inline fun
IntArray.reduceRightOrNull(operation: (Int, acc: Int) -> Int): Int? {
    var index = lastIndex
    if (index < 0)
        return null
    var accumulator = get(index--)
    while (index >= 0) {
        accumulator = operation(get(index--), accumulator)
    }
    return accumulator
}

```

Accumulates value starting with the last element and applying [operation] from right to left to each element and current accumulator value.

Returns `null` if the array is empty.

`@param [operation]` function that takes an element and current accumulator value, and calculates the next accumulator value.

`@sample`

```

samples.collections.Collections.Aggregates.reduceRightOrNull
*/
@SinceKotlin("1.4")
@WasExperimental(ExperimentalStdlibApi::class)
public inline fun
LongArray.reduceRightOrNull(operation: (Long, acc: Long) -> Long): Long? {
    var index = lastIndex
    if (index < 0)
        return null
    var accumulator = get(index--)
    while (index >= 0) {
        accumulator = operation(get(index--), accumulator)
    }
    return accumulator
}

```

Accumulates value starting with the last element and applying [operation] from right to left to each element and current accumulator value.

Returns `null` if the array is empty.

`@param [operation]` function that takes an element and current accumulator value, and calculates the next accumulator value.

`@sample`

```

samples.collections.Collections.Aggregates.reduceRightOrNull
*/
@SinceKotlin("1.4")
@WasExperimental(ExperimentalStdlibApi::class)
public inline fun
FloatArray.reduceRightOrNull(operation: (Float, acc: Float) -> Float): Float? {
    var index = lastIndex
    if (index < 0)
        return null
    var accumulator = get(index--)
    while (index >= 0) {
        accumulator = operation(get(index--), accumulator)
    }
    return accumulator
}

```

Accumulates value starting with the last element and applying [operation] from right to left to each element and current accumulator value.

Returns `null` if the array is empty.

`@param [operation]` function that takes an element and current accumulator value, and calculates the next accumulator value.

`@sample`

```

samples.collections.Collections.Aggregates.reduceRightOrNull
*/
@SinceKotlin("1.4")
@WasExperimental(ExperimentalStdlibApi::class)
public inline fun
DoubleArray.reduceRightOrNull(operation: (Double, acc: Double) -> Double): Double? {
    var index = lastIndex
    if (index < 0)
        return null
    var accumulator = get(index--)
    while (index >= 0) {
        accumulator = operation(get(index--), accumulator)
    }
    return accumulator
}

```

Accumulates value starting with the last element and applying [operation] from right to left to each element and current accumulator value.

Returns `null` if the array is empty.

`@param [operation]` function that takes an element and current accumulator value, and calculates the next accumulator value.

`@sample`

```

samples.collections.Collections.Aggregates.reduceRightOrNull
*/
@SinceKotlin("1.4")
@WasExperimental(ExperimentalStdlibApi::class)
public inline fun
BooleanArray.reduceRightOrNull(operation: (Boolean, acc: Boolean) -> Boolean): Boolean? {
    var index = lastIndex
    if (index < 0)
        return null
    var accumulator = get(index--)
    while (index >= 0) {
        accumulator = operation(get(index--), accumulator)
    }
    return accumulator
}

```

Accumulates value starting with the last element and applying [operation] from right to left to each element and current accumulator value.

Returns `null` if the array is empty.

`@param [operation]` function that takes an element and current accumulator value, and calculates the next accumulator value.

`@sample`

```

samples.collections.Collections.Aggregates.reduceRightOrNull
*/
@SinceKotlin("1.4")
@WasExperimental(ExperimentalStdlibApi::class)
public inline fun
CharArray.reduceRightOrNull(operation: (Char, acc: Char) -> Char): Char? {
    var index = lastIndex
    if (index < 0)
        return null
    var accumulator = get(index--)
    while (index >= 0) {
        accumulator = operation(get(index--), accumulator)
    }
    return accumulator
}

```

Returns a list containing successive accumulation values generated by applying [operation] from left to right to each element and current

accumulator value that starts with [initial] value.
 Note that `acc` value passed to [operation] function should not be mutated; otherwise it would affect the previous value in resulting list.
 @param [operation] function that takes current accumulator value and an element, and calculates the next accumulator value.
 @sample samples.collections.Collections.Aggregates.runningFold

```

@SinceKotlin("1.4")
public inline fun <T, R> Array<out T>.runningFold(initial: R, operation: (acc: R, T) -> R): List<R> {
    if (isEmpty()) return listOf(initial)
    val result = ArrayList<R>(size + 1).apply { add(initial) }
    var accumulator = initial
    for (element in this) {
        accumulator = operation(accumulator, element)
        result.add(accumulator)
    }
    return result
}

```

Returns a list containing successive accumulation values generated by applying [operation] from left to right to each element and current accumulator value that starts with [initial] value.
 Note that `acc` value passed to [operation] function should not be mutated; otherwise it would affect the previous value in resulting list.
 @param [operation] function that takes current accumulator value and an element, and calculates the next accumulator value.
 @sample samples.collections.Collections.Aggregates.runningFold

```

@SinceKotlin("1.4")
@kotlin.internal.InlineOnly
public inline fun <R> ByteArray.runningFold(initial: R, operation: (acc: R, Byte) -> R): List<R> {
    if (isEmpty()) return listOf(initial)
    val result = ArrayList<R>(size + 1).apply { add(initial) }
    var accumulator = initial
    for (element in this) {
        accumulator = operation(accumulator, element)
        result.add(accumulator)
    }
    return result
}

```

Returns a list containing successive accumulation values generated by applying [operation] from left to right to each element and current accumulator value that starts with [initial] value.
 Note that `acc` value passed to [operation] function should not be mutated; otherwise it would affect the previous value in resulting list.
 @param [operation] function that takes current accumulator value and an element, and calculates the next accumulator value.
 @sample samples.collections.Collections.Aggregates.runningFold

```

@SinceKotlin("1.4")
@kotlin.internal.InlineOnly
public inline fun <R> ShortArray.runningFold(initial: R, operation: (acc: R, Short) -> R): List<R> {
    if (isEmpty()) return listOf(initial)
    val result = ArrayList<R>(size + 1).apply { add(initial) }
    var accumulator = initial
    for (element in this) {
        accumulator = operation(accumulator, element)
        result.add(accumulator)
    }
    return result
}

```

Returns a list containing successive accumulation values generated by applying [operation] from left to right to each element and current accumulator value that starts with [initial] value.
 Note that `acc` value passed to [operation] function should not be mutated; otherwise it would affect the previous value in resulting list.
 @param [operation] function that takes current accumulator value and an element, and calculates the next accumulator value.
 @sample samples.collections.Collections.Aggregates.runningFold

```

@SinceKotlin("1.4")
@kotlin.internal.InlineOnly
public inline fun <R> IntArray.runningFold(initial: R, operation: (acc: R, Int) -> R): List<R> {
    if (isEmpty()) return listOf(initial)
    val result = ArrayList<R>(size + 1).apply { add(initial) }
    var accumulator = initial
    for (element in this) {
        accumulator = operation(accumulator, element)
        result.add(accumulator)
    }
    return result
}

```

Returns a list containing successive accumulation values generated by applying [operation] from left to right to each element and current accumulator value that starts with [initial] value.
 Note that `acc` value passed to [operation] function should not be mutated; otherwise it would affect the previous value in resulting list.
 @param [operation] function that takes current accumulator value and an element, and calculates the next accumulator value.
 @sample samples.collections.Collections.Aggregates.runningFold

```

@SinceKotlin("1.4")
@kotlin.internal.InlineOnly
public inline fun <R> LongArray.runningFold(initial: R, operation: (acc: R, Long) -> R): List<R> {
    if (isEmpty()) return listOf(initial)
    val result = ArrayList<R>(size + 1).apply { add(initial) }
    var accumulator = initial
    for (element in this) {
        accumulator = operation(accumulator, element)
        result.add(accumulator)
    }
    return result
}

```

Returns a list containing successive accumulation values generated by applying [operation] from left to right to each element and current accumulator value that starts with [initial] value.
 Note that `acc` value passed to [operation] function should not be mutated; otherwise it would affect the previous value in resulting list.
 @param [operation] function that takes current accumulator value and an element, and calculates the next accumulator value.

```

value.\n * \n * @sample samples.collections.Collections.Aggregates.runningFold\n
*\n@SinceKotlin("1.4")\n@kotlin.internal.InlineOnly\npublic inline fun <R> FloatArray.runningFold(initial: R,
operation: (acc: R, Float) -> R): List<R> {\n if (isEmpty()) return listOf(initial)\n val result = ArrayList<R>(size
+ 1).apply { add(initial) }\n var accumulator = initial\n for (element in this) {\n accumulator =
operation(accumulator, element)\n result.add(accumulator)\n }\n return result\n}\n\n/**\n * Returns a list
containing successive accumulation values generated by applying [operation] from left to right\n * to each element
and current accumulator value that starts with [initial] value.\n * \n * Note that `acc` value passed to [operation]
function should not be mutated;\n * otherwise it would affect the previous value in resulting list.\n * \n * @param
[operation] function that takes current accumulator value and an element, and calculates the next accumulator
value.\n * \n * @sample samples.collections.Collections.Aggregates.runningFold\n
*\n@SinceKotlin("1.4")\n@kotlin.internal.InlineOnly\npublic inline fun <R> DoubleArray.runningFold(initial: R,
operation: (acc: R, Double) -> R): List<R> {\n if (isEmpty()) return listOf(initial)\n val result =
ArrayList<R>(size + 1).apply { add(initial) }\n var accumulator = initial\n for (element in this) {\n
accumulator = operation(accumulator, element)\n result.add(accumulator)\n }\n return result\n}\n\n/**\n *
Returns a list containing successive accumulation values generated by applying [operation] from left to right\n * to
each element and current accumulator value that starts with [initial] value.\n * \n * Note that `acc` value passed to
[operation] function should not be mutated;\n * otherwise it would affect the previous value in resulting list.\n * \n *
@param [operation] function that takes current accumulator value and an element, and calculates the next
accumulator value.\n * \n * @sample samples.collections.Collections.Aggregates.runningFold\n
*\n@SinceKotlin("1.4")\n@kotlin.internal.InlineOnly\npublic inline fun <R> BooleanArray.runningFold(initial:
R, operation: (acc: R, Boolean) -> R): List<R> {\n if (isEmpty()) return listOf(initial)\n val result =
ArrayList<R>(size + 1).apply { add(initial) }\n var accumulator = initial\n for (element in this) {\n
accumulator = operation(accumulator, element)\n result.add(accumulator)\n }\n return result\n}\n\n/**\n *
Returns a list containing successive accumulation values generated by applying [operation] from left to right\n * to
each element and current accumulator value that starts with [initial] value.\n * \n * Note that `acc` value passed to
[operation] function should not be mutated;\n * otherwise it would affect the previous value in resulting list.\n * \n *
@param [operation] function that takes current accumulator value and an element, and calculates the next
accumulator value.\n * \n * @sample samples.collections.Collections.Aggregates.runningFold\n
*\n@SinceKotlin("1.4")\n@kotlin.internal.InlineOnly\npublic inline fun <R> CharArray.runningFold(initial: R,
operation: (acc: R, Char) -> R): List<R> {\n if (isEmpty()) return listOf(initial)\n val result = ArrayList<R>(size
+ 1).apply { add(initial) }\n var accumulator = initial\n for (element in this) {\n accumulator =
operation(accumulator, element)\n result.add(accumulator)\n }\n return result\n}\n\n/**\n * Returns a list
containing successive accumulation values generated by applying [operation] from left to right\n * to each element,
its index in the original array and current accumulator value that starts with [initial] value.\n * \n * Note that `acc`
value passed to [operation] function should not be mutated;\n * otherwise it would affect the previous value in
resulting list.\n * \n * @param [operation] function that takes the index of an element, current accumulator value\n *
and the element itself, and calculates the next accumulator value.\n * \n * @sample
samples.collections.Collections.Aggregates.runningFold\n
*\n@SinceKotlin("1.4")\npublic inline fun <T, R>
Array<out T>.runningFoldIndexed(initial: R, operation: (index: Int, acc: R, T) -> R): List<R> {\n if (isEmpty())
return listOf(initial)\n val result = ArrayList<R>(size + 1).apply { add(initial) }\n var accumulator = initial\n
for (index in indices) {\n accumulator = operation(index, accumulator, this[index])\n
result.add(accumulator)\n }\n return result\n}\n\n/**\n * Returns a list containing successive accumulation
values generated by applying [operation] from left to right\n * to each element, its index in the original array and
current accumulator value that starts with [initial] value.\n * \n * Note that `acc` value passed to [operation]
function should not be mutated;\n * otherwise it would affect the previous value in resulting list.\n * \n * @param
[operation] function that takes the index of an element, current accumulator value\n * and the element itself, and
calculates the next accumulator value.\n * \n * @sample samples.collections.Collections.Aggregates.runningFold\n
*\n@SinceKotlin("1.4")\n@kotlin.internal.InlineOnly\npublic inline fun <R>

```

```

ByteArray.runningFoldIndexed(initial: R, operation: (index: Int, acc: R, Byte) -> R): List<R> {
    if (isEmpty())
        return listOf(initial)
    val result = ArrayList<R>(size + 1).apply { add(initial) }
    var accumulator = initial
    for (index in indices) {
        accumulator = operation(index, accumulator, this[index])
        result.add(accumulator)
    }
    return result
}

/**
 * Returns a list containing successive accumulation
 * values generated by applying [operation] from left to right
 * to each element, its index in the original array and
 * current accumulator value that starts with [initial] value.
 * Note that `acc` value passed to [operation] function
 * should not be mutated; otherwise it would affect the previous value in resulting list.
 * @param [operation]
 * function that takes the index of an element, current accumulator value
 * and the element itself, and calculates the
 * next accumulator value.
 * @sample samples.collections.Collections.Aggregates.runningFold
 */
@SinceKotlin("1.4")
@kotlin.internal.InlineOnly
public inline fun <R>

ShortArray.runningFoldIndexed(initial: R, operation: (index: Int, acc: R, Short) -> R): List<R> {
    if (isEmpty())
        return listOf(initial)
    val result = ArrayList<R>(size + 1).apply { add(initial) }
    var accumulator = initial
    for (index in indices) {
        accumulator = operation(index, accumulator, this[index])
        result.add(accumulator)
    }
    return result
}

/**
 * Returns a list containing successive accumulation
 * values generated by applying [operation] from left to right
 * to each element, its index in the original array and
 * current accumulator value that starts with [initial] value.
 * Note that `acc` value passed to [operation] function
 * should not be mutated; otherwise it would affect the previous value in resulting list.
 * @param [operation]
 * function that takes the index of an element, current accumulator value
 * and the element itself, and calculates the
 * next accumulator value.
 * @sample samples.collections.Collections.Aggregates.runningFold
 */
@SinceKotlin("1.4")
@kotlin.internal.InlineOnly
public inline fun <R>

IntArray.runningFoldIndexed(initial: R, operation: (index: Int, acc: R, Int) -> R): List<R> {
    if (isEmpty())
        return listOf(initial)
    val result = ArrayList<R>(size + 1).apply { add(initial) }
    var accumulator = initial
    for (index in indices) {
        accumulator = operation(index, accumulator, this[index])
        result.add(accumulator)
    }
    return result
}

/**
 * Returns a list containing successive accumulation
 * values generated by applying
 * [operation] from left to right
 * to each element, its index in the original array and current accumulator value that
 * starts with [initial] value.
 * Note that `acc` value passed to [operation] function should not be mutated;
 * otherwise it would affect the previous value in resulting list.
 * @param [operation]
 * function that takes the
 * index of an element, current accumulator value
 * and the element itself, and calculates the next accumulator
 * value.
 * @sample samples.collections.Collections.Aggregates.runningFold
 */
@SinceKotlin("1.4")
@kotlin.internal.InlineOnly
public inline fun <R>

LongArray.runningFoldIndexed(initial: R, operation: (index: Int, acc: R, Long) -> R): List<R> {
    if (isEmpty())
        return listOf(initial)
    val result = ArrayList<R>(size + 1).apply { add(initial) }
    var accumulator = initial
    for (index in indices) {
        accumulator = operation(index, accumulator, this[index])
        result.add(accumulator)
    }
    return result
}

/**
 * Returns a list containing successive accumulation
 * values generated by applying [operation] from left to right
 * to each element, its index in the original array and
 * current accumulator value that starts with [initial] value.
 * Note that `acc` value passed to [operation] function
 * should not be mutated; otherwise it would affect the previous value in resulting list.
 * @param [operation]
 * function that takes the index of an element, current accumulator value
 * and the element itself, and calculates the
 * next accumulator value.
 * @sample samples.collections.Collections.Aggregates.runningFold
 */
@SinceKotlin("1.4")
@kotlin.internal.InlineOnly
public inline fun <R>

FloatArray.runningFoldIndexed(initial: R, operation: (index: Int, acc: R, Float) -> R): List<R> {
    if (isEmpty())
        return listOf(initial)
    val result = ArrayList<R>(size + 1).apply { add(initial) }
    var accumulator = initial
    for (index in indices) {
        accumulator = operation(index, accumulator, this[index])
        result.add(accumulator)
    }
    return result
}

/**
 * Returns a list containing successive accumulation
 * values generated by applying [operation] from left to right
 * to each element, its index in the original array and
 * current accumulator value that starts with [initial] value.
 * Note that `acc` value passed to [operation] function
 * should not be mutated; otherwise it would affect the previous value in resulting list.
 * @param [operation]
 * function that takes the index of an element, current accumulator value
 * and the element itself, and calculates the

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next accumulator value.\n * \n * @sample samples.collections.Collections.Aggregates.runningFold\n
*\n@SinceKotlin("1.4")\n@kotlin.internal.InlineOnly\npublic inline fun <R>
DoubleArray.runningFoldIndexed(initial: R, operation: (index: Int, acc: R, Double) -> R): List<R> {\n  if
(isEmpty()) return listOf(initial)\n  val result = ArrayList<R>(size + 1).apply { add(initial) }\n  var accumulator =
initial\n  for (index in indices) {\n    accumulator = operation(index, accumulator, this[index])\n
result.add(accumulator)\n  }\n  return result\n}\n\n/**\n * Returns a list containing successive accumulation
values generated by applying [operation] from left to right\n * to each element, its index in the original array and
current accumulator value that starts with [initial] value.\n * \n * Note that `acc` value passed to [operation] function
should not be mutated;\n * otherwise it would affect the previous value in resulting list.\n * \n * @param [operation]
function that takes the index of an element, current accumulator value\n * and the element itself, and calculates the
next accumulator value.\n * \n * @sample samples.collections.Collections.Aggregates.runningFold\n
*\n@SinceKotlin("1.4")\n@kotlin.internal.InlineOnly\npublic inline fun <R>
BooleanArray.runningFoldIndexed(initial: R, operation: (index: Int, acc: R, Boolean) -> R): List<R> {\n  if
(isEmpty()) return listOf(initial)\n  val result = ArrayList<R>(size + 1).apply { add(initial) }\n  var accumulator =
initial\n  for (index in indices) {\n    accumulator = operation(index, accumulator, this[index])\n
result.add(accumulator)\n  }\n  return result\n}\n\n/**\n * Returns a list containing successive accumulation
values generated by applying [operation] from left to right\n * to each element, its index in the original array and
current accumulator value that starts with [initial] value.\n * \n * Note that `acc` value passed to [operation] function
should not be mutated;\n * otherwise it would affect the previous value in resulting list.\n * \n * @param [operation]
function that takes the index of an element, current accumulator value\n * and the element itself, and calculates the
next accumulator value.\n * \n * @sample samples.collections.Collections.Aggregates.runningFold\n
*\n@SinceKotlin("1.4")\n@kotlin.internal.InlineOnly\npublic inline fun <R>
CharArray.runningFoldIndexed(initial: R, operation: (index: Int, acc: R, Char) -> R): List<R> {\n  if (isEmpty())
return listOf(initial)\n  val result = ArrayList<R>(size + 1).apply { add(initial) }\n  var accumulator = initial\n
for (index in indices) {\n    accumulator = operation(index, accumulator, this[index])\n
result.add(accumulator)\n  }\n  return result\n}\n\n/**\n * Returns a list containing successive accumulation
values generated by applying [operation] from left to right\n * to each element and current accumulator value that
starts with the first element of this array.\n * \n * Note that `acc` value passed to [operation] function should not be
mutated;\n * otherwise it would affect the previous value in resulting list.\n * \n * @param [operation] function that
takes current accumulator value and the element, and calculates the next accumulator value.\n * \n * @sample
samples.collections.Collections.Aggregates.runningReduce\n
*\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\npublic inline fun <S, T : S>
Array<out T>.runningReduce(operation: (acc: S, T) -> S): List<S> {\n  if (isEmpty()) return emptyList()\n  var
accumulator: S = this[0]\n  val result = ArrayList<S>(size).apply { add(accumulator) }\n  for (index in 1 until
size) {\n    accumulator = operation(accumulator, this[index])\n    result.add(accumulator)\n  }\n  return
result\n}\n\n/**\n * Returns a list containing successive accumulation values generated by applying [operation] from
left to right\n * to each element and current accumulator value that starts with the first element of this array.\n * \n *
@param [operation] function that takes current accumulator value and an element, and calculates the next
accumulator value.\n * \n * @sample samples.collections.Collections.Aggregates.runningReduce\n
*\n@SinceKotlin("1.4")\n@kotlin.internal.InlineOnly\npublic inline fun ByteArray.runningReduce(operation:
(acc: Byte, Byte) -> Byte): List<Byte> {\n  if (isEmpty()) return emptyList()\n  var accumulator = this[0]\n  val
result = ArrayList<Byte>(size).apply { add(accumulator) }\n  for (index in 1 until size) {\n    accumulator =
operation(accumulator, this[index])\n    result.add(accumulator)\n  }\n  return result\n}\n\n/**\n * Returns a list
containing successive accumulation values generated by applying [operation] from left to right\n * to each element
and current accumulator value that starts with the first element of this array.\n * \n * @param [operation] function
that takes current accumulator value and an element, and calculates the next accumulator value.\n * \n * @sample
samples.collections.Collections.Aggregates.runningReduce\n
*\n@SinceKotlin("1.4")\n@kotlin.internal.InlineOnly\npublic inline fun ShortArray.runningReduce(operation:

```

```

(acc: Short, Short) -> Short): List<Short> {\n  if (isEmpty()) return emptyList()\n  var accumulator = this[0]\n  val result = ArrayList<Short>(size).apply { add(accumulator) }\n  for (index in 1 until size) {\n    accumulator =\n    operation(accumulator, this[index])\n    result.add(accumulator)\n  }\n  return result\n}\n\n/**\n * Returns a list\n * containing successive accumulation values generated by applying [operation] from left to right\n * to each element\n * and current accumulator value that starts with the first element of this array.\n * \n * @param [operation] function\n * that takes current accumulator value and an element, and calculates the next accumulator value.\n * \n * @sample\n * samples.collections.Collections.Aggregates.runningReduce\n */\n\n@SinceKotlin("1.4")\n@kotlin.internal.InlineOnly\npublic inline fun IntArray.runningReduce(operation: (acc:\nInt, Int) -> Int): List<Int> {\n  if (isEmpty()) return emptyList()\n  var accumulator = this[0]\n  val result =\n  ArrayList<Int>(size).apply { add(accumulator) }\n  for (index in 1 until size) {\n    accumulator =\n    operation(accumulator, this[index])\n    result.add(accumulator)\n  }\n  return result\n}\n\n/**\n * Returns a list\n * containing successive accumulation values generated by applying [operation] from left to right\n * to each element\n * and current accumulator value that starts with the first element of this array.\n * \n * @param [operation] function\n * that takes current accumulator value and an element, and calculates the next accumulator value.\n * \n * @sample\n * samples.collections.Collections.Aggregates.runningReduce\n */\n\n@SinceKotlin("1.4")\n@kotlin.internal.InlineOnly\npublic inline fun LongArray.runningReduce(operation:\n(acc: Long, Long) -> Long): List<Long> {\n  if (isEmpty()) return emptyList()\n  var accumulator = this[0]\n  val result = ArrayList<Long>(size).apply { add(accumulator) }\n  for (index in 1 until size) {\n    accumulator =\n    operation(accumulator, this[index])\n    result.add(accumulator)\n  }\n  return result\n}\n\n/**\n * Returns a list\n * containing successive accumulation values generated by applying [operation] from left to right\n * to each element\n * and current accumulator value that starts with the first element of this array.\n * \n * @param [operation] function\n * that takes current accumulator value and an element, and calculates the next accumulator value.\n * \n * @sample\n * samples.collections.Collections.Aggregates.runningReduce\n */\n\n@SinceKotlin("1.4")\n@kotlin.internal.InlineOnly\npublic inline fun FloatArray.runningReduce(operation:\n(acc: Float, Float) -> Float): List<Float> {\n  if (isEmpty()) return emptyList()\n  var accumulator = this[0]\n  val\n  result = ArrayList<Float>(size).apply { add(accumulator) }\n  for (index in 1 until size) {\n    accumulator =\n    operation(accumulator, this[index])\n    result.add(accumulator)\n  }\n  return result\n}\n\n/**\n * Returns a list\n * containing successive accumulation values generated by applying [operation] from left to right\n * to each element\n * and current accumulator value that starts with the first element of this array.\n * \n * @param [operation] function\n * that takes current accumulator value and an element, and calculates the next accumulator value.\n * \n * @sample\n * samples.collections.Collections.Aggregates.runningReduce\n */\n\n@SinceKotlin("1.4")\n@kotlin.internal.InlineOnly\npublic inline fun DoubleArray.runningReduce(operation:\n(acc: Double, Double) -> Double): List<Double> {\n  if (isEmpty()) return emptyList()\n  var accumulator =\n  this[0]\n  val result = ArrayList<Double>(size).apply { add(accumulator) }\n  for (index in 1 until size) {\n    accumulator =\n    operation(accumulator, this[index])\n    result.add(accumulator)\n  }\n  return result\n}\n\n/**\n * Returns a list containing successive accumulation values generated by applying [operation] from left to right\n * to\n * each element and current accumulator value that starts with the first element of this array.\n * \n * @param\n * [operation] function that takes current accumulator value and an element, and calculates the next accumulator\n * value.\n * \n * @sample\n * samples.collections.Collections.Aggregates.runningReduce\n */\n\n@SinceKotlin("1.4")\n@kotlin.internal.InlineOnly\npublic inline fun BooleanArray.runningReduce(operation:\n(acc: Boolean, Boolean) -> Boolean): List<Boolean> {\n  if (isEmpty()) return emptyList()\n  var accumulator =\n  this[0]\n  val result = ArrayList<Boolean>(size).apply { add(accumulator) }\n  for (index in 1 until size) {\n    accumulator =\n    operation(accumulator, this[index])\n    result.add(accumulator)\n  }\n  return result\n}\n\n/**\n * Returns a list containing successive accumulation values generated by applying [operation] from left to right\n * to\n * each element and current accumulator value that starts with the first element of this array.\n * \n * @param\n * [operation] function that takes current accumulator value and an element, and calculates the next accumulator\n * value.\n * \n * @sample\n * samples.collections.Collections.Aggregates.runningReduce\n */\n\n@SinceKotlin("1.4")\n@kotlin.internal.InlineOnly\npublic inline fun CharArray.runningReduce(operation:

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(acc: Char, Char) -> Char): List<Char> {\n  if (isEmpty()) return emptyList()\n  var accumulator = this[0]\n  val result = ArrayList<Char>(size).apply { add(accumulator) }\n  for (index in 1 until size) {\n    accumulator = operation(accumulator, this[index])\n    result.add(accumulator)\n  }\n  return result\n}\n\n/**\n * Returns a list containing successive accumulation values generated by applying [operation] from left to right\n * to each element, its index in the original array and current accumulator value that starts with the first element of this array.\n * \n * Note that `acc` value passed to [operation] function should not be mutated;\n * otherwise it would affect the previous value in resulting list.\n * \n * @param [operation] function that takes the index of an element, current accumulator value\n * and the element itself, and calculates the next accumulator value.\n * \n * @sample samples.collections.Collections.Aggregates.runningReduce\n */\n@SinceKotlin("1.4")\npublic inline fun <S, T : S> Array<out T>.runningReduceIndexed(operation: (index: Int, acc: S, T) -> S): List<S> {\n  if (isEmpty()) return emptyList()\n  var accumulator: S = this[0]\n  val result = ArrayList<S>(size).apply { add(accumulator) }\n  for (index in 1 until size) {\n    accumulator = operation(index, accumulator, this[index])\n    result.add(accumulator)\n  }\n  return result\n}\n\n/**\n * Returns a list containing successive accumulation values generated by applying [operation] from left to right\n * to each element, its index in the original array and current accumulator value that starts with the first element of this array.\n * \n * @param [operation] function that takes the index of an element, current accumulator value\n * and the element itself, and calculates the next accumulator value.\n * \n * @sample samples.collections.Collections.Aggregates.runningReduce\n */\n@SinceKotlin("1.4")\n@kotlin.internal.InlineOnly\npublic inline fun ByteArray.runningReduceIndexed(operation: (index: Int, acc: Byte, Byte) -> Byte): List<Byte> {\n  if (isEmpty()) return emptyList()\n  var accumulator = this[0]\n  val result = ArrayList<Byte>(size).apply { add(accumulator) }\n  for (index in 1 until size) {\n    accumulator = operation(index, accumulator, this[index])\n    result.add(accumulator)\n  }\n  return result\n}\n\n/**\n * Returns a list containing successive accumulation values generated by applying [operation] from left to right\n * to each element, its index in the original array and current accumulator value that starts with the first element of this array.\n * \n * @param [operation] function that takes the index of an element, current accumulator value\n * and the element itself, and calculates the next accumulator value.\n * \n * @sample samples.collections.Collections.Aggregates.runningReduce\n */\n@SinceKotlin("1.4")\n@kotlin.internal.InlineOnly\npublic inline fun ShortArray.runningReduceIndexed(operation: (index: Int, acc: Short, Short) -> Short): List<Short> {\n  if (isEmpty()) return emptyList()\n  var accumulator = this[0]\n  val result = ArrayList<Short>(size).apply { add(accumulator) }\n  for (index in 1 until size) {\n    accumulator = operation(index, accumulator, this[index])\n    result.add(accumulator)\n  }\n  return result\n}\n\n/**\n * Returns a list containing successive accumulation values generated by applying [operation] from left to right\n * to each element, its index in the original array and current accumulator value that starts with the first element of this array.\n * \n * @param [operation] function that takes the index of an element, current accumulator value\n * and the element itself, and calculates the next accumulator value.\n * \n * @sample samples.collections.Collections.Aggregates.runningReduce\n */\n@SinceKotlin("1.4")\n@kotlin.internal.InlineOnly\npublic inline fun IntArray.runningReduceIndexed(operation: (index: Int, acc: Int, Int) -> Int): List<Int> {\n  if (isEmpty()) return emptyList()\n  var accumulator = this[0]\n  val result = ArrayList<Int>(size).apply { add(accumulator) }\n  for (index in 1 until size) {\n    accumulator = operation(index, accumulator, this[index])\n    result.add(accumulator)\n  }\n  return result\n}\n\n/**\n * Returns a list containing successive accumulation values generated by applying [operation] from left to right\n * to each element, its index in the original array and current accumulator value that starts with the first element of this array.\n * \n * @param [operation] function that takes the index of an element, current accumulator value\n * and the element itself, and calculates the next accumulator value.\n * \n * @sample samples.collections.Collections.Aggregates.runningReduce\n */\n@SinceKotlin("1.4")\n@kotlin.internal.InlineOnly\npublic inline fun LongArray.runningReduceIndexed(operation: (index: Int, acc: Long, Long) -> Long): List<Long> {\n  if (isEmpty()) return emptyList()\n  var accumulator = this[0]\n  val result = ArrayList<Long>(size).apply { add(accumulator) }\n  for (index in 1 until size) {\n    accumulator = operation(index, accumulator, this[index])\n    result.add(accumulator)\n  }\n  return result\n}\n\n/**\n * Returns a list containing successive accumulation values generated by applying [operation] from left to right\n * to each element, its index in the original array and current accumulator value that starts with the first element of this array.\n * \n * @param [operation] function that takes the index of an element, current accumulator value\n * and the element itself, and calculates the next accumulator value.\n * \n * @sample samples.collections.Collections.Aggregates.runningReduce\n */\n@SinceKotlin("1.4")\n@kotlin.internal.InlineOnly\npublic inline fun

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    result.add(accumulator)\n } \n return result\n}\n\n/**\n * Returns a list containing successive accumulation
values generated by applying [operation] from left to right\n * to each element, its index in the original array and
current accumulator value that starts with the first element of this array.\n * \n * @param [operation] function that
takes the index of an element, current accumulator value\n * and the element itself, and calculates the next
accumulator value.\n * \n * @sample samples.collections.Collections.Aggregates.runningReduce\n
*\n@SinceKotlin("1.4")\n@kotlin.internal.InlineOnly\npublic inline fun
FloatArray.runningReduceIndexed(operation: (index: Int, acc: Float, Float) -> Float): List<Float> {\n if
(isEmpty()) return emptyList()\n var accumulator = this[0]\n val result = ArrayList<Float>(size).apply {
add(accumulator) }\n for (index in 1 until size) {\n accumulator = operation(index, accumulator, this[index])\n
result.add(accumulator)\n } \n return result\n}\n\n/**\n * Returns a list containing successive accumulation
values generated by applying [operation] from left to right\n * to each element, its index in the original array and
current accumulator value that starts with the first element of this array.\n * \n * @param [operation] function that
takes the index of an element, current accumulator value\n * and the element itself, and calculates the next
accumulator value.\n * \n * @sample samples.collections.Collections.Aggregates.runningReduce\n
*\n@SinceKotlin("1.4")\n@kotlin.internal.InlineOnly\npublic inline fun
DoubleArray.runningReduceIndexed(operation: (index: Int, acc: Double, Double) -> Double): List<Double> {\n if
(isEmpty()) return emptyList()\n var accumulator = this[0]\n val result = ArrayList<Double>(size).apply {
add(accumulator) }\n for (index in 1 until size) {\n accumulator = operation(index, accumulator, this[index])\n
result.add(accumulator)\n } \n return result\n}\n\n/**\n * Returns a list containing successive accumulation
values generated by applying [operation] from left to right\n * to each element, its index in the original array and
current accumulator value that starts with the first element of this array.\n * \n * @param [operation] function that
takes the index of an element, current accumulator value\n * and the element itself, and calculates the next
accumulator value.\n * \n * @sample samples.collections.Collections.Aggregates.runningReduce\n
*\n@SinceKotlin("1.4")\n@kotlin.internal.InlineOnly\npublic inline fun
BooleanArray.runningReduceIndexed(operation: (index: Int, acc: Boolean, Boolean) -> Boolean): List<Boolean>
{\n if (isEmpty()) return emptyList()\n var accumulator = this[0]\n val result =
ArrayList<Boolean>(size).apply { add(accumulator) }\n for (index in 1 until size) {\n accumulator =
operation(index, accumulator, this[index])\n result.add(accumulator)\n } \n return result\n}\n\n/**\n *
Returns a list containing successive accumulation values generated by applying [operation] from left to right\n * to
each element, its index in the original array and current accumulator value that starts with the first element of this
array.\n * \n * @param [operation] function that takes the index of an element, current accumulator value\n * and
the element itself, and calculates the next accumulator value.\n * \n * @sample
samples.collections.Collections.Aggregates.runningReduce\n
*\n@SinceKotlin("1.4")\n@kotlin.internal.InlineOnly\npublic inline fun
CharArray.runningReduceIndexed(operation: (index: Int, acc: Char, Char) -> Char): List<Char> {\n if (isEmpty())
return emptyList()\n var accumulator = this[0]\n val result = ArrayList<Char>(size).apply { add(accumulator)
}\n for (index in 1 until size) {\n accumulator = operation(index, accumulator, this[index])\n
result.add(accumulator)\n } \n return result\n}\n\n/**\n * Returns a list containing successive accumulation
values generated by applying [operation] from left to right\n * to each element and current accumulator value that
starts with [initial] value.\n * \n * Note that `acc` value passed to [operation] function should not be mutated;\n *
otherwise it would affect the previous value in resulting list.\n * \n * @param [operation] function that takes current
accumulator value and an element, and calculates the next accumulator value.\n * \n * @sample
samples.collections.Collections.Aggregates.scan\n
*\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\npublic inline fun <T, R>
Array<out T>.scan(initial: R, operation: (acc: R, T) -> R): List<R> {\n return runningFold(initial,
operation)\n}\n\n/**\n * Returns a list containing successive accumulation values generated by applying [operation]
from left to right\n * to each element and current accumulator value that starts with [initial] value.\n * \n * Note that
`acc` value passed to [operation] function should not be mutated;\n * otherwise it would affect the previous value in

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resulting list.

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 * \n * @param [operation] function that takes current accumulator value and an element, and
 calculates the next accumulator value.
 * \n * @sample samples.collections.Collections.Aggregates.scan
 * \n @SinceKotlin("1.4") \n @WasExperimental(ExperimentalStdlibApi::class) \n @kotlin.internal.InlineOnly
 public inline fun <R> ByteArray.scan(initial: R, operation: (acc: R, Byte) -> R): List<R> { \n return runningFold(initial,
 operation) \n } \n \n /**
 * Returns a list containing successive accumulation values generated by applying [operation]
 from left to right
 * to each element and current accumulator value that starts with [initial] value.
 * \n * Note that `acc` value passed to [operation] function should not be mutated;
 * otherwise it would affect the previous value in
 resulting list.
 * \n * @param [operation] function that takes current accumulator value and an element, and
 calculates the next accumulator value.
 * \n * @sample samples.collections.Collections.Aggregates.scan
 * \n @SinceKotlin("1.4") \n @WasExperimental(ExperimentalStdlibApi::class) \n @kotlin.internal.InlineOnly
 public inline fun <R> ShortArray.scan(initial: R, operation: (acc: R, Short) -> R): List<R> { \n return
 runningFold(initial, operation) \n } \n \n /**
 * Returns a list containing successive accumulation values generated by
 applying [operation] from left to right
 * to each element and current accumulator value that starts with [initial]
 value.
 * \n * Note that `acc` value passed to [operation] function should not be mutated;
 * otherwise it would
 affect the previous value in resulting list.
 * \n * @param [operation] function that takes current accumulator value
 and an element, and calculates the next accumulator value.
 * \n * @sample
 samples.collections.Collections.Aggregates.scan
 * \n @SinceKotlin("1.4") \n @WasExperimental(ExperimentalStdlibApi::class) \n @kotlin.internal.InlineOnly
 public inline fun <R> IntArray.scan(initial: R, operation: (acc: R, Int) -> R): List<R> { \n return runningFold(initial,
 operation) \n } \n \n /**
 * Returns a list containing successive accumulation values generated by applying [operation]
 from left to right
 * to each element and current accumulator value that starts with [initial] value.
 * \n * Note that `acc` value passed to [operation] function should not be mutated;
 * otherwise it would affect the previous value in
 resulting list.
 * \n * @param [operation] function that takes current accumulator value and an element, and
 calculates the next accumulator value.
 * \n * @sample samples.collections.Collections.Aggregates.scan
 * \n @SinceKotlin("1.4") \n @WasExperimental(ExperimentalStdlibApi::class) \n @kotlin.internal.InlineOnly
 public inline fun <R> LongArray.scan(initial: R, operation: (acc: R, Long) -> R): List<R> { \n return
 runningFold(initial, operation) \n } \n \n /**
 * Returns a list containing successive accumulation values generated by
 applying [operation] from left to right
 * to each element and current accumulator value that starts with [initial]
 value.
 * \n * Note that `acc` value passed to [operation] function should not be mutated;
 * otherwise it would affect the previous value in
 resulting list.
 * \n * @param [operation] function that takes current accumulator value
 and an element, and calculates the next accumulator value.
 * \n * @sample
 samples.collections.Collections.Aggregates.scan
 * \n @SinceKotlin("1.4") \n @WasExperimental(ExperimentalStdlibApi::class) \n @kotlin.internal.InlineOnly
 public inline fun <R> FloatArray.scan(initial: R, operation: (acc: R, Float) -> R): List<R> { \n return
 runningFold(initial, operation) \n } \n \n /**
 * Returns a list containing successive accumulation values generated by
 applying [operation] from left to right
 * to each element and current accumulator value that starts with [initial]
 value.
 * \n * Note that `acc` value passed to [operation] function should not be mutated;
 * otherwise it would affect the previous value in
 resulting list.
 * \n * @param [operation] function that takes current accumulator value
 and an element, and calculates the next accumulator value.
 * \n * @sample
 samples.collections.Collections.Aggregates.scan
 * \n @SinceKotlin("1.4") \n @WasExperimental(ExperimentalStdlibApi::class) \n @kotlin.internal.InlineOnly
 public inline fun <R> DoubleArray.scan(initial: R, operation: (acc: R, Double) -> R): List<R> { \n return
 runningFold(initial, operation) \n } \n \n /**
 * Returns a list containing successive accumulation values generated by
 applying [operation] from left to right
 * to each element and current accumulator value that starts with [initial]
 value.
 * \n * Note that `acc` value passed to [operation] function should not be mutated;
 * otherwise it would affect the previous value in
 resulting list.
 * \n * @param [operation] function that takes current accumulator value
 and an element, and calculates the next accumulator value.
 * \n * @sample
 samples.collections.Collections.Aggregates.scan
 
```

```
*\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\n@kotlin.internal.InlineOnly\npublic inline fun <R> BooleanArray.scan(initial: R, operation: (acc: R, Boolean) -> R): List<R> {\n    return\n    runningFold(initial, operation)\n}\n\n/**\n * Returns a list containing successive accumulation values generated by\n * applying [operation] from left to right\n * to each element and current accumulator value that starts with [initial]\n * value.\n * \n * Note that `acc` value passed to [operation] function should not be mutated;\n * otherwise it would affect the previous value in resulting list.\n * \n * @param [operation] function that takes current accumulator value\n * and an element, and calculates the next accumulator value.\n * \n * @sample\n * samples.collections.Collections.Aggregates.scan\n
```

```
*\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\n@kotlin.internal.InlineOnly\npublic inline fun <R> CharArray.scan(initial: R, operation: (acc: R, Char) -> R): List<R> {\n    return runningFold(initial,\n    operation)\n}\n\n/**\n * Returns a list containing successive accumulation values generated by applying [operation]\n * from left to right\n * to each element, its index in the original array and current accumulator value that starts with\n * [initial] value.\n * \n * Note that `acc` value passed to [operation] function should not be mutated;\n * otherwise it would affect the previous value in resulting list.\n * \n * @param [operation] function that takes the index of an\n * element, current accumulator value\n * and the element itself, and calculates the next accumulator value.\n * \n * @sample\n * samples.collections.Collections.Aggregates.scan\n
```

```
*\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\npublic inline fun <T, R>\nArray<out T>.scanIndexed(initial: R, operation: (index: Int, acc: R, T) -> R): List<R> {\n    return\n    runningFoldIndexed(initial, operation)\n}\n\n/**\n * Returns a list containing successive accumulation values\n * generated by applying [operation] from left to right\n * to each element, its index in the original array and current\n * accumulator value that starts with [initial] value.\n * \n * Note that `acc` value passed to [operation] function should\n * not be mutated;\n * otherwise it would affect the previous value in resulting list.\n * \n * @param [operation]\n * function that takes the index of an element, current accumulator value\n * and the element itself, and calculates the\n * next accumulator value.\n * \n * @sample\n * samples.collections.Collections.Aggregates.scan\n
```

```
*\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\n@kotlin.internal.InlineOnly\npublic inline fun <R> ByteArray.scanIndexed(initial: R, operation: (index: Int, acc: R, Byte) -> R): List<R> {\n    return\n    runningFoldIndexed(initial, operation)\n}\n\n/**\n * Returns a list containing successive accumulation values\n * generated by applying [operation] from left to right\n * to each element, its index in the original array and current\n * accumulator value that starts with [initial] value.\n * \n * Note that `acc` value passed to [operation] function should\n * not be mutated;\n * otherwise it would affect the previous value in resulting list.\n * \n * @param [operation]\n * function that takes the index of an element, current accumulator value\n * and the element itself, and calculates the\n * next accumulator value.\n * \n * @sample\n * samples.collections.Collections.Aggregates.scan\n
```

```
*\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\n@kotlin.internal.InlineOnly\npublic inline fun <R> ShortArray.scanIndexed(initial: R, operation: (index: Int, acc: R, Short) -> R): List<R> {\n    return\n    runningFoldIndexed(initial, operation)\n}\n\n/**\n * Returns a list containing successive accumulation values\n * generated by applying [operation] from left to right\n * to each element, its index in the original array and current\n * accumulator value that starts with [initial] value.\n * \n * Note that `acc` value passed to [operation] function should\n * not be mutated;\n * otherwise it would affect the previous value in resulting list.\n * \n * @param [operation]\n * function that takes the index of an element, current accumulator value\n * and the element itself, and calculates the\n * next accumulator value.\n * \n * @sample\n * samples.collections.Collections.Aggregates.scan\n
```

```
*\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\n@kotlin.internal.InlineOnly\npublic inline fun <R> IntArray.scanIndexed(initial: R, operation: (index: Int, acc: R, Int) -> R): List<R> {\n    return\n    runningFoldIndexed(initial, operation)\n}\n\n/**\n * Returns a list containing successive accumulation values\n * generated by applying [operation] from left to right\n * to each element, its index in the original array and current\n * accumulator value that starts with [initial] value.\n * \n * Note that `acc` value passed to [operation] function should\n * not be mutated;\n * otherwise it would affect the previous value in resulting list.\n * \n * @param [operation]\n * function that takes the index of an element, current accumulator value\n * and the element itself, and calculates the\n * next accumulator value.\n * \n * @sample\n * samples.collections.Collections.Aggregates.scan\n
```

```
*\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\n@kotlin.internal.InlineOnly\npublic inline fun <R> LongArray.scanIndexed(initial: R, operation: (index: Int, acc: R, Long) -> R): List<R> {\n    return\n        runningFoldIndexed(initial, operation)\n}\n\n/**\n * Returns a list containing successive accumulation values\n * generated by applying [operation] from left to right\n * to each element, its index in the original array and current\n * accumulator value that starts with [initial] value.\n * \n * Note that `acc` value passed to [operation] function should\n * not be mutated;\n * otherwise it would affect the previous value in resulting list.\n * \n * @param [operation]\n * function that takes the index of an element, current accumulator value\n * and the element itself, and calculates the\n * next accumulator value.\n * \n * @sample samples.collections.Collections.Aggregates.scan\n
```

```
*\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\n@kotlin.internal.InlineOnly\npublic inline fun <R> FloatArray.scanIndexed(initial: R, operation: (index: Int, acc: R, Float) -> R): List<R> {\n    return\n        runningFoldIndexed(initial, operation)\n}\n\n/**\n * Returns a list containing successive accumulation values\n * generated by applying [operation] from left to right\n * to each element, its index in the original array and current\n * accumulator value that starts with [initial] value.\n * \n * Note that `acc` value passed to [operation] function should\n * not be mutated;\n * otherwise it would affect the previous value in resulting list.\n * \n * @param [operation]\n * function that takes the index of an element, current accumulator value\n * and the element itself, and calculates the\n * next accumulator value.\n * \n * @sample samples.collections.Collections.Aggregates.scan\n
```

```
*\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\n@kotlin.internal.InlineOnly\npublic inline fun <R> DoubleArray.scanIndexed(initial: R, operation: (index: Int, acc: R, Double) -> R): List<R> {\n    return\n        runningFoldIndexed(initial, operation)\n}\n\n/**\n * Returns a list containing successive accumulation values\n * generated by applying [operation] from left to right\n * to each element, its index in the original array and current\n * accumulator value that starts with [initial] value.\n * \n * Note that `acc` value passed to [operation] function should\n * not be mutated;\n * otherwise it would affect the previous value in resulting list.\n * \n * @param [operation]\n * function that takes the index of an element, current accumulator value\n * and the element itself, and calculates the\n * next accumulator value.\n * \n * @sample samples.collections.Collections.Aggregates.scan\n
```

```
*\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\n@kotlin.internal.InlineOnly\npublic inline fun <R> BooleanArray.scanIndexed(initial: R, operation: (index: Int, acc: R, Boolean) -> R): List<R> {\n    return\n        runningFoldIndexed(initial, operation)\n}\n\n/**\n * Returns a list containing successive accumulation values\n * generated by applying [operation] from left to right\n * to each element, its index in the original array and current\n * accumulator value that starts with [initial] value.\n * \n * Note that `acc` value passed to [operation] function should\n * not be mutated;\n * otherwise it would affect the previous value in resulting list.\n * \n * @param [operation]\n * function that takes the index of an element, current accumulator value\n * and the element itself, and calculates the\n * next accumulator value.\n * \n * @sample samples.collections.Collections.Aggregates.scan\n
```

```
*\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\n@kotlin.internal.InlineOnly\npublic inline fun <R> CharArray.scanIndexed(initial: R, operation: (index: Int, acc: R, Char) -> R): List<R> {\n    return\n        runningFoldIndexed(initial, operation)\n}\n\n/**\n * Returns the sum of all values produced by [selector] function\n * applied to each element in the array.\n * \n * @Deprecated("Use sumOf instead.")\n
```

```
ReplaceWith("this.sumOf(selector)")\n@DeprecatedSinceKotlin(warningSince = "1.5")\npublic inline fun <T>\nArray<out T>.sumBy(selector: (T) -> Int): Int {\n    var sum: Int = 0\n    for (element in this) {\n        sum +=\n            selector(element)\n    }\n    return sum\n}\n\n/**\n * Returns the sum of all values produced by [selector] function\n * applied to each element in the array.\n * \n * @Deprecated("Use sumOf instead.")\n
```

```
ReplaceWith("this.sumOf(selector)")\n@DeprecatedSinceKotlin(warningSince = "1.5")\npublic inline fun\nByteArray.sumBy(selector: (Byte) -> Int): Int {\n    var sum: Int = 0\n    for (element in this) {\n        sum +=\n            selector(element)\n    }\n    return sum\n}\n\n/**\n * Returns the sum of all values produced by [selector] function\n * applied to each element in the array.\n * \n * @Deprecated("Use sumOf instead.")\n
```

```
ReplaceWith("this.sumOf(selector)")\n@DeprecatedSinceKotlin(warningSince = "1.5")\npublic inline fun\nShortArray.sumBy(selector: (Short) -> Int): Int {\n    var sum: Int = 0\n    for (element in this) {\n        sum +=\n            selector(element)\n    }\n    return sum\n}\n\n/**\n * Returns the sum of all values produced by [selector] function\n * applied to each element in the array.\n * \n * @Deprecated("Use sumOf instead.")\n
```

```

ReplaceWith("\this.sumOf(selector)\n\n")\n@DeprecatedSinceKotlin(warningSince = \"1.5\")\npublic inline fun
IntArray.sumBy(selector: (Int) -> Int): Int {\n    var sum: Int = 0\n    for (element in this) {\n        sum +=
selector(element)\n    }\n    return sum\n}\n\n/**\n * Returns the sum of all values produced by [selector] function
applied to each element in the array.\n */\n@Deprecated(\"Use sumOf instead.\",
ReplaceWith("\this.sumOf(selector)\n\n")\n@DeprecatedSinceKotlin(warningSince = \"1.5\")\npublic inline fun
LongArray.sumBy(selector: (Long) -> Int): Int {\n    var sum: Int = 0\n    for (element in this) {\n        sum +=
selector(element)\n    }\n    return sum\n}\n\n/**\n * Returns the sum of all values produced by [selector] function
applied to each element in the array.\n */\n@Deprecated(\"Use sumOf instead.\",
ReplaceWith("\this.sumOf(selector)\n\n")\n@DeprecatedSinceKotlin(warningSince = \"1.5\")\npublic inline fun
FloatArray.sumBy(selector: (Float) -> Int): Int {\n    var sum: Int = 0\n    for (element in this) {\n        sum +=
selector(element)\n    }\n    return sum\n}\n\n/**\n * Returns the sum of all values produced by [selector] function
applied to each element in the array.\n */\n@Deprecated(\"Use sumOf instead.\",
ReplaceWith("\this.sumOf(selector)\n\n")\n@DeprecatedSinceKotlin(warningSince = \"1.5\")\npublic inline fun
DoubleArray.sumBy(selector: (Double) -> Int): Int {\n    var sum: Int = 0\n    for (element in this) {\n        sum +=
selector(element)\n    }\n    return sum\n}\n\n/**\n * Returns the sum of all values produced by [selector] function
applied to each element in the array.\n */\n@Deprecated(\"Use sumOf instead.\",
ReplaceWith("\this.sumOf(selector)\n\n")\n@DeprecatedSinceKotlin(warningSince = \"1.5\")\npublic inline fun
BooleanArray.sumBy(selector: (Boolean) -> Int): Int {\n    var sum: Int = 0\n    for (element in this) {\n        sum +=
selector(element)\n    }\n    return sum\n}\n\n/**\n * Returns the sum of all values produced by [selector] function
applied to each element in the array.\n */\n@Deprecated(\"Use sumOf instead.\",
ReplaceWith("\this.sumOf(selector)\n\n")\n@DeprecatedSinceKotlin(warningSince = \"1.5\")\npublic inline fun
CharArray.sumBy(selector: (Char) -> Int): Int {\n    var sum: Int = 0\n    for (element in this) {\n        sum +=
selector(element)\n    }\n    return sum\n}\n\n/**\n * Returns the sum of all values produced by [selector] function
applied to each element in the array.\n */\n@Deprecated(\"Use sumOf instead.\",
ReplaceWith("\this.sumOf(selector)\n\n")\n@DeprecatedSinceKotlin(warningSince = \"1.5\")\npublic inline fun <T>
Array<out T>.sumByDouble(selector: (T) -> Double): Double {\n    var sum: Double = 0.0\n    for (element in this)
{\n        sum += selector(element)\n    }\n    return sum\n}\n\n/**\n * Returns the sum of all values produced by
[selector] function applied to each element in the array.\n */\n@Deprecated(\"Use sumOf instead.\",
ReplaceWith("\this.sumOf(selector)\n\n")\n@DeprecatedSinceKotlin(warningSince = \"1.5\")\npublic inline fun
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{\n        sum += selector(element)\n    }\n    return sum\n}\n\n/**\n * Returns the sum of all values produced by
[selector] function applied to each element in the array.\n */\n@Deprecated(\"Use sumOf instead.\",
ReplaceWith("\this.sumOf(selector)\n\n")\n@DeprecatedSinceKotlin(warningSince = \"1.5\")\npublic inline fun
ShortArray.sumByDouble(selector: (Short) -> Double): Double {\n    var sum: Double = 0.0\n    for (element in this)
{\n        sum += selector(element)\n    }\n    return sum\n}\n\n/**\n * Returns the sum of all values produced by
[selector] function applied to each element in the array.\n */\n@Deprecated(\"Use sumOf instead.\",
ReplaceWith("\this.sumOf(selector)\n\n")\n@DeprecatedSinceKotlin(warningSince = \"1.5\")\npublic inline fun
IntArray.sumByDouble(selector: (Int) -> Double): Double {\n    var sum: Double = 0.0\n    for (element in this) {\n
        sum += selector(element)\n    }\n    return sum\n}\n\n/**\n * Returns the sum of all values produced by [selector]
function applied to each element in the array.\n */\n@Deprecated(\"Use sumOf instead.\",
ReplaceWith("\this.sumOf(selector)\n\n")\n@DeprecatedSinceKotlin(warningSince = \"1.5\")\npublic inline fun
LongArray.sumByDouble(selector: (Long) -> Double): Double {\n    var sum: Double = 0.0\n    for (element in this)
{\n        sum += selector(element)\n    }\n    return sum\n}\n\n/**\n * Returns the sum of all values produced by
[selector] function applied to each element in the array.\n */\n@Deprecated(\"Use sumOf instead.\",
ReplaceWith("\this.sumOf(selector)\n\n")\n@DeprecatedSinceKotlin(warningSince = \"1.5\")\npublic inline fun
FloatArray.sumByDouble(selector: (Float) -> Double): Double {\n    var sum: Double = 0.0\n    for (element in this)
{\n        sum += selector(element)\n    }\n    return sum\n}\n\n/**\n * Returns the sum of all values produced by
[selector] function applied to each element in the array.\n */\n@Deprecated(\"Use sumOf instead.\",

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this) {\n    sum += selector(element)\n  }\n  return sum\n}\n\n/**\n * Returns the sum of all values produced by
[selector] function applied to each element in the array.\n */\n@Deprecated("Use sumOf instead."),
ReplaceWith("this.sumOf(selector)")\n@DeprecatedSinceKotlin(warningSince = "1.5")\npublic inline fun
BooleanArray.sumByDouble(selector: (Boolean) -> Double): Double {\n  var sum: Double = 0.0\n  for (element
in this) {\n    sum += selector(element)\n  }\n  return sum\n}\n\n/**\n * Returns the sum of all values produced
by [selector] function applied to each element in the array.\n */\n@Deprecated("Use sumOf instead."),
ReplaceWith("this.sumOf(selector)")\n@DeprecatedSinceKotlin(warningSince = "1.5")\npublic inline fun
CharArray.sumByDouble(selector: (Char) -> Double): Double {\n  var sum: Double = 0.0\n  for (element in this)
{\n    sum += selector(element)\n  }\n  return sum\n}\n\n/**\n * Returns the sum of all values produced by
[selector] function applied to each element in the array.\n */
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.jvm.JvmName("sumOfDouble")\n@kotlin.internal.InlineOnly\npublic inline fun
<T> Array<out T>.sumOf(selector: (T) -> Double): Double {\n  var sum: Double = 0.toDouble()\n  for (element
in this) {\n    sum += selector(element)\n  }\n  return sum\n}\n\n/**\n * Returns the sum of all values produced
by [selector] function applied to each element in the array.\n */
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ByLambdaReturnType\n@kotlin.jvm.JvmName("sumOfDouble")\n@kotlin.internal.InlineOnly\npublic inline fun
ByteArray.sumOf(selector: (Byte) -> Double): Double {\n  var sum: Double = 0.toDouble()\n  for (element in
this) {\n    sum += selector(element)\n  }\n  return sum\n}\n\n/**\n * Returns the sum of all values produced by
[selector] function applied to each element in the array.\n */
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ByLambdaReturnType\n@kotlin.jvm.JvmName("sumOfDouble")\n@kotlin.internal.InlineOnly\npublic inline fun
ShortArray.sumOf(selector: (Short) -> Double): Double {\n  var sum: Double = 0.toDouble()\n  for (element in
this) {\n    sum += selector(element)\n  }\n  return sum\n}\n\n/**\n * Returns the sum of all values produced by
[selector] function applied to each element in the array.\n */
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IntArray.sumOf(selector: (Int) -> Double): Double {\n  var sum: Double = 0.toDouble()\n  for (element in this)
{\n    sum += selector(element)\n  }\n  return sum\n}\n\n/**\n * Returns the sum of all values produced by
[selector] function applied to each element in the array.\n */
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ByLambdaReturnType\n@kotlin.jvm.JvmName("sumOfDouble")\n@kotlin.internal.InlineOnly\npublic inline fun
LongArray.sumOf(selector: (Long) -> Double): Double {\n  var sum: Double = 0.toDouble()\n  for (element in
this) {\n    sum += selector(element)\n  }\n  return sum\n}\n\n/**\n * Returns the sum of all values produced by
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ByLambdaReturnType\n@kotlin.jvm.JvmName("sumOfDouble")\n@kotlin.internal.InlineOnly\npublic inline fun
FloatArray.sumOf(selector: (Float) -> Double): Double {\n  var sum: Double = 0.toDouble()\n  for (element in
this) {\n    sum += selector(element)\n  }\n  return sum\n}\n\n/**\n * Returns the sum of all values produced by
[selector] function applied to each element in the array.\n */
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ByLambdaReturnType\n@kotlin.jvm.JvmName("sumOfDouble")\n@kotlin.internal.InlineOnly\npublic inline fun
DoubleArray.sumOf(selector: (Double) -> Double): Double {\n  var sum: Double = 0.toDouble()\n  for (element
in this) {\n    sum += selector(element)\n  }\n  return sum\n}\n\n/**\n * Returns the sum of all values produced
by [selector] function applied to each element in the array.\n */
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution

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```

ByLambdaReturnType\n@kotlin.jvm.JvmName("\\sumOfDouble\\")\n@kotlin.internal.InlineOnly\npublic inline fun
BooleanArray.sumOf(selector: (Boolean) -> Double): Double {\n    var sum: Double = 0.toDouble()\n    for
(element in this) {\n        sum += selector(element)\n    }\n    return sum\n}\n\n/**\n * Returns the sum of all values
produced by [selector] function applied to each element in the array.\n
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.jvm.JvmName("\\sumOfDouble\\")\n@kotlin.internal.InlineOnly\npublic inline fun
CharArray.sumOf(selector: (Char) -> Double): Double {\n    var sum: Double = 0.toDouble()\n    for (element in
this) {\n        sum += selector(element)\n    }\n    return sum\n}\n\n/**\n * Returns the sum of all values produced by
[selector] function applied to each element in the array.\n
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.jvm.JvmName("\\sumOfInt\\")\n@kotlin.internal.InlineOnly\npublic inline fun <T>
Array<out T>.sumOf(selector: (T) -> Int): Int {\n    var sum: Int = 0.toInt()\n    for (element in this) {\n        sum +=
selector(element)\n    }\n    return sum\n}\n\n/**\n * Returns the sum of all values produced by [selector] function
applied to each element in the array.\n
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.jvm.JvmName("\\sumOfInt\\")\n@kotlin.internal.InlineOnly\npublic inline fun
ByteArray.sumOf(selector: (Byte) -> Int): Int {\n    var sum: Int = 0.toInt()\n    for (element in this) {\n        sum +=
selector(element)\n    }\n    return sum\n}\n\n/**\n * Returns the sum of all values produced by [selector] function
applied to each element in the array.\n
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.jvm.JvmName("\\sumOfInt\\")\n@kotlin.internal.InlineOnly\npublic inline fun
ShortArray.sumOf(selector: (Short) -> Int): Int {\n    var sum: Int = 0.toInt()\n    for (element in this) {\n        sum +=
selector(element)\n    }\n    return sum\n}\n\n/**\n * Returns the sum of all values produced by [selector] function
applied to each element in the array.\n
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.jvm.JvmName("\\sumOfInt\\")\n@kotlin.internal.InlineOnly\npublic inline fun
IntArray.sumOf(selector: (Int) -> Int): Int {\n    var sum: Int = 0.toInt()\n    for (element in this) {\n        sum +=
selector(element)\n    }\n    return sum\n}\n\n/**\n * Returns the sum of all values produced by [selector] function
applied to each element in the array.\n
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.jvm.JvmName("\\sumOfInt\\")\n@kotlin.internal.InlineOnly\npublic inline fun
LongArray.sumOf(selector: (Long) -> Int): Int {\n    var sum: Int = 0.toInt()\n    for (element in this) {\n        sum +=
selector(element)\n    }\n    return sum\n}\n\n/**\n * Returns the sum of all values produced by [selector] function
applied to each element in the array.\n
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.jvm.JvmName("\\sumOfInt\\")\n@kotlin.internal.InlineOnly\npublic inline fun
FloatArray.sumOf(selector: (Float) -> Int): Int {\n    var sum: Int = 0.toInt()\n    for (element in this) {\n        sum +=
selector(element)\n    }\n    return sum\n}\n\n/**\n * Returns the sum of all values produced by [selector] function
applied to each element in the array.\n
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.jvm.JvmName("\\sumOfInt\\")\n@kotlin.internal.InlineOnly\npublic inline fun
DoubleArray.sumOf(selector: (Double) -> Int): Int {\n    var sum: Int = 0.toInt()\n    for (element in this) {\n        sum +=
selector(element)\n    }\n    return sum\n}\n\n/**\n * Returns the sum of all values produced by [selector]
function applied to each element in the array.\n
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.jvm.JvmName("\\sumOfInt\\")\n@kotlin.internal.InlineOnly\npublic inline fun
BooleanArray.sumOf(selector: (Boolean) -> Int): Int {\n    var sum: Int = 0.toInt()\n    for (element in this) {\n        sum +=
selector(element)\n    }\n    return sum\n}\n\n/**\n * Returns the sum of all values produced by [selector]

```

function applied to each element in the array.\n

```
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution\nByLambdaReturnType\n@kotlin.jvm.JvmName("sumOfInt")\n@kotlin.internal.InlineOnly\npublic inline fun\nCharArray.sumOf(selector: (Char) -> Int): Int {\n    var sum: Int = 0.toInt()\n    for (element in this) {\n        sum +=\n        selector(element)\n    }\n    return sum\n}\n\n/**\n * Returns the sum of all values produced by [selector] function\n    applied to each element in the array.\n
```

```
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution\nByLambdaReturnType\n@kotlin.jvm.JvmName("sumOfLong")\n@kotlin.internal.InlineOnly\npublic inline fun\n<T> Array<out T>.sumOf(selector: (T) -> Long): Long {\n    var sum: Long = 0.toLong()\n    for (element in this)\n    {\n        sum += selector(element)\n    }\n    return sum\n}\n\n/**\n * Returns the sum of all values produced by\n    [selector] function applied to each element in the array.\n
```

```
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution\nByLambdaReturnType\n@kotlin.jvm.JvmName("sumOfLong")\n@kotlin.internal.InlineOnly\npublic inline fun\nByteArray.sumOf(selector: (Byte) -> Long): Long {\n    var sum: Long = 0.toLong()\n    for (element in this) {\n        sum += selector(element)\n    }\n    return sum\n}\n\n/**\n * Returns the sum of all values produced by [selector]\n    function applied to each element in the array.\n
```

```
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution\nByLambdaReturnType\n@kotlin.jvm.JvmName("sumOfLong")\n@kotlin.internal.InlineOnly\npublic inline fun\nShortArray.sumOf(selector: (Short) -> Long): Long {\n    var sum: Long = 0.toLong()\n    for (element in this) {\n        sum += selector(element)\n    }\n    return sum\n}\n\n/**\n * Returns the sum of all values produced by [selector]\n    function applied to each element in the array.\n
```

```
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution\nByLambdaReturnType\n@kotlin.jvm.JvmName("sumOfLong")\n@kotlin.internal.InlineOnly\npublic inline fun\nIntArray.sumOf(selector: (Int) -> Long): Long {\n    var sum: Long = 0.toLong()\n    for (element in this) {\n        sum += selector(element)\n    }\n    return sum\n}\n\n/**\n * Returns the sum of all values produced by [selector]\n    function applied to each element in the array.\n
```

```
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution\nByLambdaReturnType\n@kotlin.jvm.JvmName("sumOfLong")\n@kotlin.internal.InlineOnly\npublic inline fun\nLongArray.sumOf(selector: (Long) -> Long): Long {\n    var sum: Long = 0.toLong()\n    for (element in this) {\n        sum += selector(element)\n    }\n    return sum\n}\n\n/**\n * Returns the sum of all values produced by [selector]\n    function applied to each element in the array.\n
```

```
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution\nByLambdaReturnType\n@kotlin.jvm.JvmName("sumOfLong")\n@kotlin.internal.InlineOnly\npublic inline fun\nFloatArray.sumOf(selector: (Float) -> Long): Long {\n    var sum: Long = 0.toLong()\n    for (element in this) {\n        sum += selector(element)\n    }\n    return sum\n}\n\n/**\n * Returns the sum of all values produced by [selector]\n    function applied to each element in the array.\n
```

```
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution\nByLambdaReturnType\n@kotlin.jvm.JvmName("sumOfLong")\n@kotlin.internal.InlineOnly\npublic inline fun\nDoubleArray.sumOf(selector: (Double) -> Long): Long {\n    var sum: Long = 0.toLong()\n    for (element in this)\n    {\n        sum += selector(element)\n    }\n    return sum\n}\n\n/**\n * Returns the sum of all values produced by\n    [selector] function applied to each element in the array.\n
```

```
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution\nByLambdaReturnType\n@kotlin.jvm.JvmName("sumOfLong")\n@kotlin.internal.InlineOnly\npublic inline fun\nBooleanArray.sumOf(selector: (Boolean) -> Long): Long {\n    var sum: Long = 0.toLong()\n    for (element in this)\n    {\n        sum += selector(element)\n    }\n    return sum\n}\n\n/**\n * Returns the sum of all values produced by\n    [selector] function applied to each element in the array.\n
```

```
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution\nByLambdaReturnType\n@kotlin.jvm.JvmName("sumOfLong")\n@kotlin.internal.InlineOnly\npublic inline fun
```

```

CharArray.sumOf(selector: (Char) -> Long): Long {
    var sum: Long = 0.toLong()
    for (element in this) {
        sum += selector(element)
    }
    return sum
}
// Returns the sum of all values produced by [selector]
function applied to each element in the array.

*\/n@SinceKotlin("1.5")n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)n@OverloadResolution
ByLambdaReturnTypen@kotlin.jvm.JvmName("sumOfUInt")n@WasExperimental(ExperimentalUnsignedType
s::class)n@kotlin.internal.InlineOnlynpublic inline fun <T> Array<out T>.sumOf(selector: (T) -> UInt): UInt {
    var sum: UInt = 0.toUInt()
    for (element in this) {
        sum += selector(element)
    }
    return
sum
}
// Returns the sum of all values produced by [selector] function applied to each element in the
array.

*\/n@SinceKotlin("1.5")n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)n@OverloadResolution
ByLambdaReturnTypen@kotlin.jvm.JvmName("sumOfUInt")n@WasExperimental(ExperimentalUnsignedType
s::class)n@kotlin.internal.InlineOnlynpublic inline fun ByteArray.sumOf(selector: (Byte) -> UInt): UInt {
    var
sum: UInt = 0.toUInt()
    for (element in this) {
        sum += selector(element)
    }
    return sum
}
// Returns the sum of all values produced by [selector] function applied to each element in the array.

*\/n@SinceKotlin("1.5")n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)n@OverloadResolution
ByLambdaReturnTypen@kotlin.jvm.JvmName("sumOfUInt")n@WasExperimental(ExperimentalUnsignedType
s::class)n@kotlin.internal.InlineOnlynpublic inline fun ShortArray.sumOf(selector: (Short) -> UInt): UInt {
    var
sum: UInt = 0.toUInt()
    for (element in this) {
        sum += selector(element)
    }
    return sum
}
// Returns the sum of all values produced by [selector] function applied to each element in the array.

*\/n@SinceKotlin("1.5")n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)n@OverloadResolution
ByLambdaReturnTypen@kotlin.jvm.JvmName("sumOfUInt")n@WasExperimental(ExperimentalUnsignedType
s::class)n@kotlin.internal.InlineOnlynpublic inline fun IntArray.sumOf(selector: (Int) -> UInt): UInt {
    var
sum: UInt = 0.toUInt()
    for (element in this) {
        sum += selector(element)
    }
    return sum
}
// Returns the sum of all values produced by [selector] function applied to each element in the array.

*\/n@SinceKotlin("1.5")n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)n@OverloadResolution
ByLambdaReturnTypen@kotlin.jvm.JvmName("sumOfUInt")n@WasExperimental(ExperimentalUnsignedType
s::class)n@kotlin.internal.InlineOnlynpublic inline fun LongArray.sumOf(selector: (Long) -> UInt): UInt {
    var
sum: UInt = 0.toUInt()
    for (element in this) {
        sum += selector(element)
    }
    return sum
}
// Returns the sum of all values produced by [selector] function applied to each element in the array.

*\/n@SinceKotlin("1.5")n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)n@OverloadResolution
ByLambdaReturnTypen@kotlin.jvm.JvmName("sumOfUInt")n@WasExperimental(ExperimentalUnsignedType
s::class)n@kotlin.internal.InlineOnlynpublic inline fun FloatArray.sumOf(selector: (Float) -> UInt): UInt {
    var
sum: UInt = 0.toUInt()
    for (element in this) {
        sum += selector(element)
    }
    return sum
}
// Returns the sum of all values produced by [selector] function applied to each element in the array.

*\/n@SinceKotlin("1.5")n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)n@OverloadResolution
ByLambdaReturnTypen@kotlin.jvm.JvmName("sumOfUInt")n@WasExperimental(ExperimentalUnsignedType
s::class)n@kotlin.internal.InlineOnlynpublic inline fun DoubleArray.sumOf(selector: (Double) -> UInt): UInt {
    var
sum: UInt = 0.toUInt()
    for (element in this) {
        sum += selector(element)
    }
    return
sum
}
// Returns the sum of all values produced by [selector] function applied to each element in the
array.

*\/n@SinceKotlin("1.5")n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)n@OverloadResolution
ByLambdaReturnTypen@kotlin.jvm.JvmName("sumOfUInt")n@WasExperimental(ExperimentalUnsignedType
s::class)n@kotlin.internal.InlineOnlynpublic inline fun BooleanArray.sumOf(selector: (Boolean) -> UInt): UInt
{
    var sum: UInt = 0.toUInt()
    for (element in this) {
        sum += selector(element)
    }
    return
sum
}
// Returns the sum of all values produced by [selector] function applied to each element in the
array.

*\/n@SinceKotlin("1.5")n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)n@OverloadResolution
ByLambdaReturnTypen@kotlin.jvm.JvmName("sumOfUInt")n@WasExperimental(ExperimentalUnsignedType

```



```

::class)@kotlin.internal.InlineOnly\npublic inline fun CharArray.sumOf(selector: (Char) -> UInt): UInt {\n  var
sum: UInt = 0.toUInt()\n  for (element in this) {\n    sum += selector(element)\n  }\n  return sum\n}\n\n/**\n *
Returns the sum of all values produced by [selector] function applied to each element in the array.\n
*\n@SinceKotlin("1.5")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.jvm.JvmName("sumOfULong")\n@WasExperimental(ExperimentalUnsignedTy
pes::class)\n@kotlin.internal.InlineOnly\npublic inline fun <T> Array<out T>.sumOf(selector: (T) -> ULong):
ULong {\n  var sum: ULong = 0.toULong()\n  for (element in this) {\n    sum += selector(element)\n  }\n  return
sum\n}\n\n/**\n * Returns the sum of all values produced by [selector] function applied to each element in
the array.\n
*\n@SinceKotlin("1.5")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.jvm.JvmName("sumOfULong")\n@WasExperimental(ExperimentalUnsignedTy
pes::class)\n@kotlin.internal.InlineOnly\npublic inline fun ByteArray.sumOf(selector: (Byte) -> ULong): ULong
{\n  var sum: ULong = 0.toULong()\n  for (element in this) {\n    sum += selector(element)\n  }\n  return
sum\n}\n\n/**\n * Returns the sum of all values produced by [selector] function applied to each element in the
array.\n
*\n@SinceKotlin("1.5")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.jvm.JvmName("sumOfULong")\n@WasExperimental(ExperimentalUnsignedTy
pes::class)\n@kotlin.internal.InlineOnly\npublic inline fun ShortArray.sumOf(selector: (Short) -> ULong): ULong
{\n  var sum: ULong = 0.toULong()\n  for (element in this) {\n    sum += selector(element)\n  }\n  return
sum\n}\n\n/**\n * Returns the sum of all values produced by [selector] function applied to each element in the
array.\n
*\n@SinceKotlin("1.5")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.jvm.JvmName("sumOfULong")\n@WasExperimental(ExperimentalUnsignedTy
pes::class)\n@kotlin.internal.InlineOnly\npublic inline fun IntArray.sumOf(selector: (Int) -> ULong): ULong {\n
var sum: ULong = 0.toULong()\n  for (element in this) {\n    sum += selector(element)\n  }\n  return
sum\n}\n\n/**\n * Returns the sum of all values produced by [selector] function applied to each element in the
array.\n
*\n@SinceKotlin("1.5")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.jvm.JvmName("sumOfULong")\n@WasExperimental(ExperimentalUnsignedTy
pes::class)\n@kotlin.internal.InlineOnly\npublic inline fun LongArray.sumOf(selector: (Long) -> ULong): ULong
{\n  var sum: ULong = 0.toULong()\n  for (element in this) {\n    sum += selector(element)\n  }\n  return
sum\n}\n\n/**\n * Returns the sum of all values produced by [selector] function applied to each element in the
array.\n
*\n@SinceKotlin("1.5")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.jvm.JvmName("sumOfULong")\n@WasExperimental(ExperimentalUnsignedTy
pes::class)\n@kotlin.internal.InlineOnly\npublic inline fun FloatArray.sumOf(selector: (Float) -> ULong): ULong
{\n  var sum: ULong = 0.toULong()\n  for (element in this) {\n    sum += selector(element)\n  }\n  return
sum\n}\n\n/**\n * Returns the sum of all values produced by [selector] function applied to each element in the
array.\n
*\n@SinceKotlin("1.5")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.jvm.JvmName("sumOfULong")\n@WasExperimental(ExperimentalUnsignedTy
pes::class)\n@kotlin.internal.InlineOnly\npublic inline fun DoubleArray.sumOf(selector: (Double) -> ULong):
ULong {\n  var sum: ULong = 0.toULong()\n  for (element in this) {\n    sum += selector(element)\n  }\n  return
sum\n}\n\n/**\n * Returns the sum of all values produced by [selector] function applied to each element in
the array.\n
*\n@SinceKotlin("1.5")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.jvm.JvmName("sumOfULong")\n@WasExperimental(ExperimentalUnsignedTy
pes::class)\n@kotlin.internal.InlineOnly\npublic inline fun BooleanArray.sumOf(selector: (Boolean) -> ULong):

```

```

ULong {
    var sum: ULong = 0.toULong()
    for (element in this) {
        sum += selector(element)
    }
    return sum
}

Returns the sum of all values produced by [selector] function applied to each element in the array.

SinceKotlin("1.5")
OptIn(kotlin.experimental.ExperimentalTypeInference::class)
OverloadResolutionByLambdaReturnType
kotlin.jvm.JvmName("sumOfULong")
WasExperimental(ExperimentalUnsignedTypes::class)
kotlin.internal.InlineOnly
public inline fun CharArray.sumOf(selector: (Char) -> ULong): ULong {
    var sum: ULong = 0.toULong()
    for (element in this) {
        sum += selector(element)
    }
    return sum
}

Returns an original collection containing all the non-`null` elements, throwing an [IllegalArgumentException] if there are any `null` elements.

public fun <T : Any> Array<T?.>.requireNotNulls(): Array<T> {
    for (element in this) {
        if (element == null) {
            throw IllegalArgumentException("null element found in $this.")
        }
    }
}

@Suppress("UNCHECKED_CAST")
return this as Array<T>

Splits the original array into pair of lists, where `first` list contains elements for which [predicate] yielded `true`, while `second` list contains elements for which [predicate] yielded `false`.

@sample
samples.collections.Arrays.Transformations.partitionArrayOfPrimitives

public inline fun <T> Array<out T>.partition(predicate: (T) -> Boolean): Pair<List<T>, List<T>> {
    val first = ArrayList<T>()
    val second = ArrayList<T>()
    for (element in this) {
        if (predicate(element)) {
            first.add(element)
        } else {
            second.add(element)
        }
    }
    return Pair(first, second)
}

Splits the original array into pair of lists, where `first` list contains elements for which [predicate] yielded `true`, while `second` list contains elements for which [predicate] yielded `false`.

@sample
samples.collections.Arrays.Transformations.partitionArrayOfPrimitives

public inline fun ByteArray.partition(predicate: (Byte) -> Boolean): Pair<List<Byte>, List<Byte>> {
    val first = ArrayList<Byte>()
    val second = ArrayList<Byte>()
    for (element in this) {
        if (predicate(element)) {
            first.add(element)
        } else {
            second.add(element)
        }
    }
    return Pair(first, second)
}

Splits the original array into pair of lists, where `first` list contains elements for which [predicate] yielded `true`, while `second` list contains elements for which [predicate] yielded `false`.

@sample
samples.collections.Arrays.Transformations.partitionArrayOfPrimitives

public inline fun ShortArray.partition(predicate: (Short) -> Boolean): Pair<List<Short>, List<Short>> {
    val first = ArrayList<Short>()
    val second = ArrayList<Short>()
    for (element in this) {
        if (predicate(element)) {
            first.add(element)
        } else {
            second.add(element)
        }
    }
    return Pair(first, second)
}

Splits the original array into pair of lists, where `first` list contains elements for which [predicate] yielded `true`, while `second` list contains elements for which [predicate] yielded `false`.

@sample
samples.collections.Arrays.Transformations.partitionArrayOfPrimitives

public inline fun IntArray.partition(predicate: (Int) -> Boolean): Pair<List<Int>, List<Int>> {
    val first = ArrayList<Int>()
    val second = ArrayList<Int>()
    for (element in this) {
        if (predicate(element)) {
            first.add(element)
        } else {
            second.add(element)
        }
    }
    return Pair(first, second)
}

Splits the original array into pair of lists, where `first` list contains elements for which [predicate] yielded `true`, while `second` list contains elements for which [predicate] yielded `false`.

@sample
samples.collections.Arrays.Transformations.partitionArrayOfPrimitives

public inline fun LongArray.partition(predicate: (Long) -> Boolean): Pair<List<Long>, List<Long>> {
    val first = ArrayList<Long>()
    val second = ArrayList<Long>()
    for (element in this) {
        if (predicate(element)) {
            first.add(element)
        } else {
            second.add(element)
        }
    }
    return Pair(first, second)
}

Splits the original array into pair of lists, where `first` list contains elements for which [predicate] yielded `true`, while `second` list contains elements for which [predicate] yielded `false`.

@sample
samples.collections.Arrays.Transformations.partitionArrayOfPrimitives

public inline fun FloatArray.partition(predicate: (Float) -> Boolean): Pair<List<Float>, List<Float>> {
    val first = ArrayList<Float>()
    val second = ArrayList<Float>()
    for (element in this) {
        if (predicate(element)) {
            first.add(element)
        } else {
            second.add(element)
        }
    }
    return Pair(first,

```

```

second)\n\n/**\n * Splits the original array into pair of lists,\n * where *first* list contains elements for which
[predicate] yielded `true`,\n * while *second* list contains elements for which [predicate] yielded `false`.\n * \n *
@sample samples.collections.Arrays.Transformations.partitionArrayOfPrimitives\n */\npublic inline fun
DoubleArray.partition(predicate: (Double) -> Boolean): Pair<List<Double>, List<Double>> {\n val first =
ArrayList<Double>()\n val second = ArrayList<Double>()\n for (element in this) {\n if (predicate(element))
{\n first.add(element)\n } else {\n second.add(element)\n }\n }\n return Pair(first,
second)\n}\n\n/**\n * Splits the original array into pair of lists,\n * where *first* list contains elements for which
[predicate] yielded `true`,\n * while *second* list contains elements for which [predicate] yielded `false`.\n * \n *
@sample samples.collections.Arrays.Transformations.partitionArrayOfPrimitives\n */\npublic inline fun
BooleanArray.partition(predicate: (Boolean) -> Boolean): Pair<List<Boolean>, List<Boolean>> {\n val first =
ArrayList<Boolean>()\n val second = ArrayList<Boolean>()\n for (element in this) {\n if
(predicate(element)) {\n first.add(element)\n } else {\n second.add(element)\n }\n }\n
return Pair(first, second)\n}\n\n/**\n * Splits the original array into pair of lists,\n * where *first* list contains
elements for which [predicate] yielded `true`,\n * while *second* list contains elements for which [predicate]
yielded `false`.\n * \n * @sample samples.collections.Arrays.Transformations.partitionArrayOfPrimitives\n
*/\npublic inline fun CharArray.partition(predicate: (Char) -> Boolean): Pair<List<Char>, List<Char>> {\n val
first = ArrayList<Char>()\n val second = ArrayList<Char>()\n for (element in this) {\n if
(predicate(element)) {\n first.add(element)\n } else {\n second.add(element)\n }\n }\n
return Pair(first, second)\n}\n\n/**\n * Returns a list of pairs built from the elements of `this` array and the [other]
array with the same index.\n * The returned list has length of the shortest collection.\n * \n * @sample
samples.collections.Iterables.Operations.zipIterable\n */\npublic infix fun <T, R> Array<out T>.zip(other:
Array<out R>): List<Pair<T, R>> {\n return zip(other) { t1, t2 -> t1 to t2 }\n}\n\n/**\n * Returns a list of pairs
built from the elements of `this` array and the [other] array with the same index.\n * The returned list has length of
the shortest collection.\n * \n * @sample samples.collections.Iterables.Operations.zipIterable\n */\npublic infix fun
<R> ByteArray.zip(other: Array<out R>): List<Pair<Byte, R>> {\n return zip(other) { t1, t2 -> t1 to t2
}\n}\n\n/**\n * Returns a list of pairs built from the elements of `this` array and the [other] array with the same
index.\n * The returned list has length of the shortest collection.\n * \n * @sample
samples.collections.Iterables.Operations.zipIterable\n */\npublic infix fun <R> ShortArray.zip(other: Array<out
R>): List<Pair<Short, R>> {\n return zip(other) { t1, t2 -> t1 to t2 }\n}\n\n/**\n * Returns a list of pairs built from
the elements of `this` array and the [other] array with the same index.\n * The returned list has length of the shortest
collection.\n * \n * @sample samples.collections.Iterables.Operations.zipIterable\n */\npublic infix fun <R>
IntArray.zip(other: Array<out R>): List<Pair<Int, R>> {\n return zip(other) { t1, t2 -> t1 to t2 }\n}\n\n/**\n *
Returns a list of pairs built from the elements of `this` array and the [other] array with the same index.\n * The
returned list has length of the shortest collection.\n * \n * @sample
samples.collections.Iterables.Operations.zipIterable\n */\npublic infix fun <R> LongArray.zip(other: Array<out
R>): List<Pair<Long, R>> {\n return zip(other) { t1, t2 -> t1 to t2 }\n}\n\n/**\n * Returns a list of pairs built from
the elements of `this` array and the [other] array with the same index.\n * The returned list has length of the shortest
collection.\n * \n * @sample samples.collections.Iterables.Operations.zipIterable\n */\npublic infix fun <R>
FloatArray.zip(other: Array<out R>): List<Pair<Float, R>> {\n return zip(other) { t1, t2 -> t1 to t2 }\n}\n\n/**\n *
Returns a list of pairs built from the elements of `this` array and the [other] array with the same index.\n * The
returned list has length of the shortest collection.\n * \n * @sample
samples.collections.Iterables.Operations.zipIterable\n */\npublic infix fun <R> DoubleArray.zip(other: Array<out
R>): List<Pair<Double, R>> {\n return zip(other) { t1, t2 -> t1 to t2 }\n}\n\n/**\n * Returns a list of pairs built
from the elements of `this` array and the [other] array with the same index.\n * The returned list has length of the
shortest collection.\n * \n * @sample samples.collections.Iterables.Operations.zipIterable\n */\npublic infix fun <R>
BooleanArray.zip(other: Array<out R>): List<Pair<Boolean, R>> {\n return zip(other) { t1, t2 -> t1 to t2
}\n}\n\n/**\n * Returns a list of pairs built from the elements of `this` array and the [other] array with the same
index.\n * The returned list has length of the shortest collection.\n * \n * @sample

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samples.collections.Iterables.Operations.zipIterable\n *\npublic infix fun <R> CharArray.zip(other: Array<out R>):
List<Pair<Char, R>> {\n    return zip(other) { t1, t2 -> t1 to t2 }\n}\n\n/**\n * Returns a list of values built from the
elements of `this` array and the [other] array with the same index\n * using the provided [transform] function
applied to each pair of elements.\n * The returned list has length of the shortest collection.\n * \n * @sample
samples.collections.Iterables.Operations.zipIterableWithTransform\n *\npublic inline fun <T, R, V> Array<out
T>.zip(other: Array<out R>, transform: (a: T, b: R) -> V): List<V> {\n    val size = minOf(size, other.size)\n    val
list = ArrayList<V>(size)\n    for (i in 0 until size) {\n        list.add(transform(this[i], other[i]))\n    }\n    return
list\n}\n\n/**\n * Returns a list of values built from the elements of `this` array and the [other] array with the same
index\n * using the provided [transform] function applied to each pair of elements.\n * The returned list has length
of the shortest collection.\n * \n * @sample
samples.collections.Iterables.Operations.zipIterableWithTransform\n *\npublic inline fun <R, V> ByteArray.zip(other: Array<out R>, transform: (a: Byte, b: R) -> V): List<V> {\n    val
size = minOf(size, other.size)\n    val list = ArrayList<V>(size)\n    for (i in 0 until size) {\n
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samples.collections.Iterables.Operations.zipIterableWithTransform\n *\npublic inline fun <R, V>
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samples.collections.Iterables.Operations.zipIterableWithTransform\n *\npublic inline fun <R, V> LongArray.zip(other: Array<out R>, transform: (a: Long, b: R) -> V): List<V> {\n
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FloatArray.zip(other: Array<out R>, transform: (a: Float, b: R) -> V): List<V> {\n    val size = minOf(size,
other.size)\n    val list = ArrayList<V>(size)\n    for (i in 0 until size) {\n        list.add(transform(this[i], other[i]))\n
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DoubleArray.zip(other: Array<out R>, transform: (a: Double, b: R) -> V): List<V> {\n    val size = minOf(size,
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BooleanArray.zip(other: Array<out R>, transform: (a: Boolean, b: R) -> V): List<V> {\n    val size = minOf(size,
other.size)\n    val list = ArrayList<V>(size)\n    for (i in 0 until size) {\n        list.add(transform(this[i], other[i]))\n
}\n    return list\n}\n\n/**\n * Returns a list of values built from the elements of `this` array and the [other] array

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with the same index\n * using the provided [transform] function applied to each pair of elements.\n * The returned list has length of the shortest collection.\n * \n * @sample

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samples.collections.Iterables.Operations.zipIterableWithTransform\n *\npublic inline fun <R, V>
CharArray.zip(other: Array<out R>, transform: (a: Char, b: R) -> V): List<V> {\n    val size = minOf(size,
other.size)\n    val list = ArrayList<V>(size)\n    for (i in 0 until size) {\n        list.add(transform(this[i], other[i]))\n    }\n    return list\n}\n\n/**\n * Returns a list of pairs built from the elements of `this` collection and [other] array with
the same index.\n * The returned list has length of the shortest collection.\n * \n * @sample
samples.collections.Iterables.Operations.zipIterable\n *\npublic infix fun <T, R> Array<out T>.zip(other:
Iterable<R>): List<Pair<T, R>> {\n    return zip(other) { t1, t2 -> t1 to t2 }\n}\n\n/**\n * Returns a list of pairs built
from the elements of `this` collection and [other] array with the same index.\n * The returned list has length of the
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List<Pair<Long, R>> {\n    return zip(other) { t1, t2 -> t1 to t2 }\n}\n\n/**\n * Returns a list of pairs built from the
elements of `this` collection and [other] array with the same index.\n * The returned list has length of the shortest
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FloatArray.zip(other: Iterable<R>): List<Pair<Float, R>> {\n    return zip(other) { t1, t2 -> t1 to t2 }\n}\n\n/**\n *
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samples.collections.Iterables.Operations.zipIterableWithTransform\n *\npublic inline fun <T, R, V> Array<out
T>.zip(other: Iterable<R>, transform: (a: T, b: R) -> V): List<V> {\n    val arraySize = size\n    val list =
ArrayList<V>(minOf(other.collectionSizeOrDefault(10), arraySize))\n    var i = 0\n    for (element in other) {\n
if (i >= arraySize) break\n        list.add(transform(this[i++], element))\n    }\n    return list\n}\n\n/**\n * Returns a
list of values built from the elements of `this` array and the [other] collection with the same index\n * using the
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samples.collections.Iterables.Operations.zipIterableWithTransform\n *\npublic inline
fun <R, V> ByteArray.zip(other: Iterable<R>, transform: (a: Byte, b: R) -> V): List<V> {\n    val arraySize = size\n
val list = ArrayList<V>(minOf(other.collectionSizeOrDefault(10), arraySize))\n    var i = 0\n    for (element in

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other) {\n    if (i >= arraySize) break\n    list.add(transform(this[i++], element))\n } \n return list\n}\n\n/**\n * Returns a list of values built from the elements of `this` array and the [other] collection with the same index\n * using the provided [transform] function applied to each pair of elements.\n * The returned list has length of the\n shortest collection.\n * \n * @sample samples.collections.Iterables.Operations.zipIterableWithTransform\n */\n\npublic inline fun <R, V> ShortArray.zip(other: Iterable<R>, transform: (a: Short, b: R) -> V): List<V> {\n    val\n    arraySize = size\n    val list = ArrayList<V>(minOf(other.collectionSizeOrDefault(10), arraySize))\n    var i = 0\n    for (element in other) {\n        if (i >= arraySize) break\n        list.add(transform(this[i++], element))\n    }\n    return\n    list\n}\n\n/**\n * Returns a list of values built from the elements of `this` array and the [other] collection with the\n same index\n * using the provided [transform] 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(a: Long, b: R) -> V): List<V> {\n    val arraySize =\n    size\n    val list = ArrayList<V>(minOf(other.collectionSizeOrDefault(10), arraySize))\n    var i = 0\n    for (element\n in other) {\n        if (i >= arraySize) break\n        list.add(transform(this[i++], element))\n    }\n    return\n    list\n}\n\n/**\n * Returns a list of values built from the elements of `this` array and the [other] collection with the\n same index\n * using the provided [transform] function applied to each pair of elements.\n * The returned list has\n length of the shortest collection.\n * \n * @sample\n samples.collections.Iterables.Operations.zipIterableWithTransform\n */\n\npublic inline fun <R, V>\n FloatArray.zip(other: Iterable<R>, transform: (a: Float, b: R) -> V): List<V> {\n    val arraySize = size\n    val list =\n    ArrayList<V>(minOf(other.collectionSizeOrDefault(10), arraySize))\n    var i = 0\n    for (element in other) {\n        if (i >= arraySize) break\n        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List<V> {\n    val\n    arraySize = size\n    val list = ArrayList<V>(minOf(other.collectionSizeOrDefault(10), arraySize))\n    var i = 0\n    for (element in other) {\n        if (i >= arraySize) break\n        list.add(transform(this[i++], element))\n    }\n    return\n    list\n}\n\n/**\n * Returns a list of pairs built from the elements of `this` array and the [other] array with the same\n index.\n * The returned list has length of the shortest collection.\n * \n * @sample

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samples.collections.Iterables.Operations.zipIterable\n * \npublic infix fun ByteArray.zip(other: ByteArray):
List<Pair<Byte, Byte>> {\n    return zip(other) { t1, t2 -> t1 to t2 }\n}\n\n/**\n * Returns a list of pairs built from
the elements of `this` array and the [other] array with the same index.\n * The returned list has length of the shortest
collection.\n * \n * @sample samples.collections.Iterables.Operations.zipIterable\n * \npublic infix fun
ShortArray.zip(other: ShortArray): List<Pair<Short, Short>> {\n    return zip(other) { t1, t2 -> t1 to t2 }\n}\n\n/**\n
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returned list has length of the shortest collection.\n * \n * @sample
samples.collections.Iterables.Operations.zipIterable\n * \npublic infix fun IntArray.zip(other: IntArray):
List<Pair<Int, Int>> {\n    return zip(other) { t1, t2 -> t1 to t2 }\n}\n\n/**\n * Returns a list of pairs built from the
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LongArray.zip(other: LongArray): List<Pair<Long, Long>> {\n    return zip(other) { t1, t2 -> t1 to t2 }\n}\n\n/**\n
 * Returns a list of pairs built from the elements of `this` array and the [other] array with the same index.\n * The
returned list has length of the shortest collection.\n * \n * @sample
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List<Pair<Float, Float>> {\n    return zip(other) { t1, t2 -> t1 to t2 }\n}\n\n/**\n * Returns a list of pairs built from
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DoubleArray.zip(other: DoubleArray): List<Pair<Double, Double>> {\n    return zip(other) { t1, t2 -> t1 to t2
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samples.collections.Iterables.Operations.zipIterable\n * \npublic infix fun BooleanArray.zip(other: BooleanArray):
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CharArray.zip(other: CharArray): List<Pair<Char, Char>> {\n    return zip(other) { t1, t2 -> t1 to t2 }\n}\n\n/**\n
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<V> ByteArray.zip(other: ByteArray, transform: (a: Byte, b: Byte) -> V): List<V> {\n    val size = minOf(size,
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size = minOf(size, other.size)\n    val list = ArrayList<V>(size)\n    for (i in 0 until size) {\n

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list.add(transform(this[i], other[i]))\n } \n return list\n\n\n\n * Returns a list of values built from the elements
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CharArray.zip(other: CharArray, transform: (a: Char, b: Char) -> V): List<V> {\n    val size = minOf(size,
other.size)\n    val list = ArrayList<V>(size)\n    for (i in 0 until size) {\n        list.add(transform(this[i], other[i]))\n    }\n    return list\n}\n\n\n\n * Appends the string from all the elements separated using [separator] and using the
given [prefix] and [postfix] if supplied.\n * \n * If the collection could be huge, you can specify a non-negative value
of [limit], in which case only the first [limit]\n * elements will be appended, followed by the [truncated] string
(which defaults to "...").\n * \n * @sample samples.collections.Collections.Transformations.joinTo\n *\n\npublic fun
<T, A : Appendable> Array<out T>.joinTo(buffer: A, separator: CharSequence = "\", \"", prefix: CharSequence = "\",
postfix: CharSequence = "\", limit: Int = -1, truncated: CharSequence = "...", transform: ((T) -> CharSequence)? =
null): A {\n    buffer.append(prefix)\n    var count = 0\n    for (element in this) {\n        if (++count > 1)
buffer.append(separator)\n        if (limit < 0 || count <= limit) {\n            buffer.appendElement(element, transform)\n        }
else break\n    }\n    if (limit >= 0 && count > limit) buffer.append(truncated)\n    buffer.append(postfix)\n    return buffer\n}\n\n\n\n * Appends the string from all the elements separated using [separator] and using the given
[prefix] and [postfix] if supplied.\n * \n * If the collection could be huge, you can specify a non-negative value of
[limit], in which case only the first [limit]\n * elements will be appended, followed by the [truncated] string (which
defaults to "...").\n * \n * @sample samples.collections.Collections.Transformations.joinTo\n *\n\npublic fun <A :
Appendable> ByteArray.joinTo(buffer: A, separator: CharSequence = "\", \"", prefix: CharSequence = "\", postfix:
CharSequence = "\", limit: Int = -1, truncated: CharSequence = "...", transform: ((Byte) -> CharSequence)? =
null): A {\n    buffer.append(prefix)\n    var count = 0\n    for (element in this) {\n        if (++count > 1)
buffer.append(separator)\n        if (limit < 0 || count <= limit) {\n            if (transform != null)\n                buffer.append(transform(element))\n            else\n                buffer.append(element.toString())\n        } else break\n    }\n    if (limit >= 0 && count > limit) buffer.append(truncated)\n    buffer.append(postfix)\n    return
buffer\n}\n\n\n\n * Appends the string from all the elements separated using [separator] and using the given
[prefix] and [postfix] if supplied.\n * \n * If the collection could be huge, you can specify a non-negative value of
[limit], in which case only the first [limit]\n * elements will be appended, followed by the [truncated] string (which
defaults to "...").\n * \n * @sample samples.collections.Collections.Transformations.joinTo\n *\n\npublic fun <A :
Appendable> ShortArray.joinTo(buffer: A, separator: CharSequence = "\", \"", prefix: CharSequence = "\", postfix:

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CharSequence = "\\\"", limit: Int = -1, truncated: CharSequence = "...\"", transform: ((Short) -> CharSequence)? =
null): A {
    buffer.append(prefix)\n    var count = 0\n    for (element in this) {
        if (++count > 1)
        buffer.append(separator)\n        if (limit < 0 || count <= limit) {
            if (transform != null)\n
            buffer.append(transform(element))\n        else\n            buffer.append(element.toString())\n        } else break\n
    }\n    if (limit >= 0 && count > limit) buffer.append(truncated)\n    buffer.append(postfix)\n    return
buffer\n}\n\n/**
 * Appends the string from all the elements separated using [separator] and using the given
 [prefix] and [postfix] if supplied.
 * If the collection could be huge, you can specify a non-negative value of
 [limit], in which case only the first [limit]
 * elements will be appended, followed by the [truncated] string (which
 defaults to "...").
 * @sample samples.collections.Collections.Transformations.joinTo\n
 * \npublic fun <A :
 Appendable> IntArray.joinTo(buffer: A, separator: CharSequence = "\", \"", prefix: CharSequence = "\\\"", postfix:
 CharSequence = "\\\"", limit: Int = -1, truncated: CharSequence = "...\"", transform: ((Int) -> CharSequence)? =
null): A {
    buffer.append(prefix)\n    var count = 0\n    for (element in this) {
        if (++count > 1)
        buffer.append(separator)\n        if (limit < 0 || count <= limit) {
            if (transform != null)\n
            buffer.append(transform(element))\n        else\n            buffer.append(element.toString())\n        } else break\n
    }\n    if (limit >= 0 && count > limit) buffer.append(truncated)\n    buffer.append(postfix)\n    return
buffer\n}\n\n/**
 * Appends the string from all the elements separated using [separator] and using the given
 [prefix] and [postfix] if supplied.
 * If the collection could be huge, you can specify a non-negative value of
 [limit], in which case only the first [limit]
 * elements will be appended, followed by the [truncated] string (which
 defaults to "...").
 * @sample samples.collections.Collections.Transformations.joinTo\n
 * \npublic fun <A :
 Appendable> LongArray.joinTo(buffer: A, separator: CharSequence = "\", \"", prefix: CharSequence = "\\\"", postfix:
 CharSequence = "\\\"", limit: Int = -1, truncated: CharSequence = "...\"", transform: ((Long) -> CharSequence)? =
null): A {
    buffer.append(prefix)\n    var count = 0\n    for (element in this) {
        if (++count > 1)
        buffer.append(separator)\n        if (limit < 0 || count <= limit) {
            if (transform != null)\n
            buffer.append(transform(element))\n        else\n            buffer.append(element.toString())\n        } else break\n
    }\n    if (limit >= 0 && count > limit) buffer.append(truncated)\n    buffer.append(postfix)\n    return
buffer\n}\n\n/**
 * Appends the string from all the elements separated using [separator] and using the given
 [prefix] and [postfix] if supplied.
 * If the collection could be huge, you can specify a non-negative value of
 [limit], in which case only the first [limit]
 * elements will be appended, followed by the [truncated] string (which
 defaults to "...").
 * @sample samples.collections.Collections.Transformations.joinTo\n
 * \npublic fun <A :
 Appendable> FloatArray.joinTo(buffer: A, separator: CharSequence = "\", \"", prefix: CharSequence = "\\\"", postfix:
 CharSequence = "\\\"", limit: Int = -1, truncated: CharSequence = "...\"", transform: ((Float) -> CharSequence)? =
null): A {
    buffer.append(prefix)\n    var count = 0\n    for (element in this) {
        if (++count > 1)
        buffer.append(separator)\n        if (limit < 0 || count <= limit) {
            if (transform != null)\n
            buffer.append(transform(element))\n        else\n            buffer.append(element.toString())\n        } else break\n
    }\n    if (limit >= 0 && count > limit) buffer.append(truncated)\n    buffer.append(postfix)\n    return
buffer\n}\n\n/**
 * Appends the string from all the elements separated using [separator] and using the given
 [prefix] and [postfix] if supplied.
 * If the collection could be huge, you can specify a non-negative value of
 [limit], in which case only the first [limit]
 * elements will be appended, followed by the [truncated] string (which
 defaults to "...").
 * @sample samples.collections.Collections.Transformations.joinTo\n
 * \npublic fun <A :
 Appendable> DoubleArray.joinTo(buffer: A, separator: CharSequence = "\", \"", prefix: CharSequence = "\\\"", postfix:
 CharSequence = "\\\"", limit: Int = -1, truncated: CharSequence = "...\"", transform: ((Double) -> CharSequence)? =
null): A {
    buffer.append(prefix)\n    var count = 0\n    for (element in this) {
        if (++count > 1)
        buffer.append(separator)\n        if (limit < 0 || count <= limit) {
            if (transform != null)\n
            buffer.append(transform(element))\n        else\n            buffer.append(element.toString())\n        } else break\n
    }\n    if (limit >= 0 && count > limit) buffer.append(truncated)\n    buffer.append(postfix)\n    return
buffer\n}\n\n/**
 * Appends the string from all the elements separated using [separator] and using the given
 [prefix] and [postfix] if supplied.
 * If the collection could be huge, you can specify a non-negative value of
 [limit], in which case only the first [limit]
 * elements will be appended, followed by the [truncated] string (which

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defaults to "...").\n * \n * @sample samples.collections.Collections.Transformations.joinTo\n *\npublic fun <A :
Appendable> BooleanArray.joinTo(buffer: A, separator: CharSequence = "\", "\", prefix: CharSequence = "\",
postfix: CharSequence = "\", limit: Int = -1, truncated: CharSequence = "...", transform: ((Boolean) ->
CharSequence)? = null): A {\n  buffer.append(prefix)\n  var count = 0\n  for (element in this) {\n    if (++count
> 1) buffer.append(separator)\n    if (limit < 0 || count <= limit) {\n      if (transform != null)\n        buffer.append(transform(element))\n      else\n        buffer.append(element.toString())\n    } else break\n  }\n  if (limit >= 0 && count > limit) buffer.append(truncated)\n  buffer.append(postfix)\n  return
buffer}\n}\n\n**\n * Appends the string from all the elements separated using [separator] and using the given
[prefix] and [postfix] if supplied.\n * \n * If the collection could be huge, you can specify a non-negative value of
[limit], in which case only the first [limit]\n * elements will be appended, followed by the [truncated] string (which
defaults to "...").\n * \n * @sample samples.collections.Collections.Transformations.joinTo\n *\npublic fun <A :
Appendable> CharArray.joinTo(buffer: A, separator: CharSequence = "\", "\", prefix: CharSequence = "\", postfix:
CharSequence = "\", limit: Int = -1, truncated: CharSequence = "...", transform: ((Char) -> CharSequence)? =
null): A {\n  buffer.append(prefix)\n  var count = 0\n  for (element in this) {\n    if (++count > 1)
buffer.append(separator)\n    if (limit < 0 || count <= limit) {\n      if (transform != null)\n        buffer.append(transform(element))\n      else\n        buffer.append(element)\n    } else break\n  }\n  if
(limit >= 0 && count > limit) buffer.append(truncated)\n  buffer.append(postfix)\n  return buffer}\n}\n\n**\n *
Creates a string from all the elements separated using [separator] and using the given [prefix] and [postfix] if
supplied.\n * \n * If the collection could be huge, you can specify a non-negative value of [limit], in which case only
the first [limit]\n * elements will be appended, followed by the [truncated] string (which defaults to "...").\n * \n *
@sample samples.collections.Collections.Transformations.joinToString\n *\npublic fun <T> Array<out
T>.joinToString(separator: CharSequence = "\", "\", prefix: CharSequence = "\", postfix: CharSequence = "\", limit:
Int = -1, truncated: CharSequence = "...", transform: ((T) -> CharSequence)? = null): String {\n  return
joinTo(StringBuilder(), separator, prefix, postfix, limit, truncated, transform).toString()\n}\n}\n\n**\n * Creates a
string from all the elements separated using [separator] and using the given [prefix] and [postfix] if supplied.\n * \n
* If the collection could be huge, you can specify a non-negative value of [limit], in which case only the first
[limit]\n * elements will be appended, followed by the [truncated] string (which defaults to "...").\n * \n * @sample
samples.collections.Collections.Transformations.joinToString\n *\npublic fun ByteArray.joinToString(separator:
CharSequence = "\", "\", prefix: CharSequence = "\", postfix: CharSequence = "\", limit: Int = -1, truncated:
CharSequence = "...", transform: ((Byte) -> CharSequence)? = null): String {\n  return joinTo(StringBuilder(),
separator, prefix, postfix, limit, truncated, transform).toString()\n}\n}\n\n**\n * Creates a string from all the elements
separated using [separator] and using the given [prefix] and [postfix] if supplied.\n * \n * If the collection could be
huge, you can specify a non-negative value of [limit], in which case only the first [limit]\n * elements will be
appended, followed by the [truncated] string (which defaults to "...").\n * \n * @sample
samples.collections.Collections.Transformations.joinToString\n *\npublic fun ShortArray.joinToString(separator:
CharSequence = "\", "\", prefix: CharSequence = "\", postfix: CharSequence = "\", limit: Int = -1, truncated:
CharSequence = "...", transform: ((Short) -> CharSequence)? = null): String {\n  return joinTo(StringBuilder(),
separator, prefix, postfix, limit, truncated, transform).toString()\n}\n}\n\n**\n * Creates a string from all the elements
separated using [separator] and using the given [prefix] and [postfix] if supplied.\n * \n * If the collection could be
huge, you can specify a non-negative value of [limit], in which case only the first [limit]\n * elements will be
appended, followed by the [truncated] string (which defaults to "...").\n * \n * @sample
samples.collections.Collections.Transformations.joinToString\n *\npublic fun IntArray.joinToString(separator:
CharSequence = "\", "\", prefix: CharSequence = "\", postfix: CharSequence = "\", limit: Int = -1, truncated:
CharSequence = "...", transform: ((Int) -> CharSequence)? = null): String {\n  return joinTo(StringBuilder(),
separator, prefix, postfix, limit, truncated, transform).toString()\n}\n}\n\n**\n * Creates a string from all the elements
separated using [separator] and using the given [prefix] and [postfix] if supplied.\n * \n * If the collection could be
huge, you can specify a non-negative value of [limit], in which case only the first [limit]\n * elements will be
appended, followed by the [truncated] string (which defaults to "...").\n * \n * @sample

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samples.collections.Collections.Transformations.joinToString\n *^npublic fun LongArray.joinToString(separator:
CharSequence = "\", \"", prefix: CharSequence = \"\", postfix: CharSequence = \"\", limit: Int = -1, truncated:
CharSequence = \"...\", transform: ((Long) -> CharSequence)? = null): String {\n    return joinTo(StringBuilder(),
separator, prefix, postfix, limit, truncated, transform).toString()\n}\n\n/**\n * Creates a string from all the elements
separated using [separator] and using the given [prefix] and [postfix] if supplied.\n * \n * If the collection could be
huge, you can specify a non-negative value of [limit], in which case only the first [limit]\n * elements will be
appended, followed by the [truncated] string (which defaults to \"...\").\n * \n * @sample
samples.collections.Collections.Transformations.joinToString\n *^npublic fun FloatArray.joinToString(separator:
CharSequence = "\", \"", prefix: CharSequence = \"\", postfix: CharSequence = \"\", limit: Int = -1, truncated:
CharSequence = \"...\", transform: ((Float) -> CharSequence)? = null): String {\n    return joinTo(StringBuilder(),
separator, prefix, postfix, limit, truncated, transform).toString()\n}\n\n/**\n * Creates a string from all the elements
separated using [separator] and using the given [prefix] and [postfix] if supplied.\n * \n * If the collection could be
huge, you can specify a non-negative value of [limit], in which case only the first [limit]\n * elements will be
appended, followed by the [truncated] string (which defaults to \"...\").\n * \n * @sample
samples.collections.Collections.Transformations.joinToString\n *^npublic fun DoubleArray.joinToString(separator:
CharSequence = "\", \"", prefix: CharSequence = \"\", postfix: CharSequence = \"\", limit: Int = -1, truncated:
CharSequence = \"...\", transform: ((Double) -> CharSequence)? = null): String {\n    return joinTo(StringBuilder(),
separator, prefix, postfix, limit, truncated, transform).toString()\n}\n\n/**\n * Creates a string from all the elements
separated using [separator] and using the given [prefix] and [postfix] if supplied.\n * \n * If the collection could be
huge, you can specify a non-negative value of [limit], in which case only the first [limit]\n * elements will be
appended, followed by the [truncated] string (which defaults to \"...\").\n * \n * @sample
samples.collections.Collections.Transformations.joinToString\n *^npublic fun
BooleanArray.joinToString(separator: CharSequence = "\", \"", prefix: CharSequence = \"\", postfix: CharSequence =
\"\", limit: Int = -1, truncated: CharSequence = \"...\", transform: ((Boolean) -> CharSequence)? = null): String {\n
return joinTo(StringBuilder(), separator, prefix, postfix, limit, truncated, transform).toString()\n}\n\n/**\n * Creates
a string from all the elements separated using [separator] and using the given [prefix] and [postfix] if supplied.\n * \n
* If the collection could be huge, you can specify a non-negative value of [limit], in which case only the first
[limit]\n * elements will be appended, followed by the [truncated] string (which defaults to \"...\").\n * \n * @sample
samples.collections.Collections.Transformations.joinToString\n *^npublic fun CharArray.joinToString(separator:
CharSequence = "\", \"", prefix: CharSequence = \"\", postfix: CharSequence = \"\", limit: Int = -1, truncated:
CharSequence = \"...\", transform: ((Char) -> CharSequence)? = null): String {\n    return joinTo(StringBuilder(),
separator, prefix, postfix, limit, truncated, transform).toString()\n}\n\n/**\n * Creates an [Iterable] instance that
wraps the original array returning its elements when being iterated.\n *^npublic fun <T> Array<out T>.asIterable():
Iterable<T> {\n    if (isEmpty()) return emptyList()\n    return Iterable { this.iterator() }\n}\n\n/**\n * Creates an
[Iterable] instance that wraps the original array returning its elements when being iterated.\n *^npublic fun
ByteArray.asIterable(): Iterable<Byte> {\n    if (isEmpty()) return emptyList()\n    return Iterable { this.iterator()
}\n}\n\n/**\n * Creates an [Iterable] instance that wraps the original array returning its elements when being
iterated.\n *^npublic fun ShortArray.asIterable(): Iterable<Short> {\n    if (isEmpty()) return emptyList()\n    return
Iterable { this.iterator() }\n}\n\n/**\n * Creates an [Iterable] instance that wraps the original array returning its
elements when being iterated.\n *^npublic fun IntArray.asIterable(): Iterable<Int> {\n    if (isEmpty()) return
emptyList()\n    return Iterable { this.iterator() }\n}\n\n/**\n * Creates an [Iterable] instance that wraps the original
array returning its elements when being iterated.\n *^npublic fun LongArray.asIterable(): Iterable<Long> {\n    if
(isEmpty()) return emptyList()\n    return Iterable { this.iterator() }\n}\n\n/**\n * Creates an [Iterable] instance that
wraps the original array returning its elements when being iterated.\n *^npublic fun FloatArray.asIterable():
Iterable<Float> {\n    if (isEmpty()) return emptyList()\n    return Iterable { this.iterator() }\n}\n\n/**\n * Creates an
[Iterable] instance that wraps the original array returning its elements when being iterated.\n *^npublic fun
DoubleArray.asIterable(): Iterable<Double> {\n    if (isEmpty()) return emptyList()\n    return Iterable {
this.iterator() }\n}\n\n/**\n * Creates an [Iterable] instance that wraps the original array returning its elements when

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being iterated.\n */\npublic fun BooleanArray.asIterable(): Iterable<Boolean> {\n    if (isEmpty()) return
emptyList()\n    return Iterable { this.iterator() }\n}\n\n/**\n * Creates an [Iterable] instance that wraps the original
array returning its elements when being iterated.\n */\npublic fun CharArray.asIterable(): Iterable<Char> {\n    if
(isEmpty()) return emptyList()\n    return Iterable { this.iterator() }\n}\n\n/**\n * Creates a [Sequence] instance that
wraps the original array returning its elements when being iterated.\n * \n * @sample
samples.collections.Sequences.Building.sequenceFromArray\n */\npublic fun <T> Array<out T>.asSequence():
Sequence<T> {\n    if (isEmpty()) return emptySequence()\n    return Sequence { this.iterator() }\n}\n\n/**\n *
Creates a [Sequence] instance that wraps the original array returning its elements when being iterated.\n * \n *
@sample samples.collections.Sequences.Building.sequenceFromArray\n */\npublic fun ByteArray.asSequence():
Sequence<Byte> {\n    if (isEmpty()) return emptySequence()\n    return Sequence { this.iterator() }\n}\n\n/**\n *
Creates a [Sequence] instance that wraps the original array returning its elements when being iterated.\n * \n *
@sample samples.collections.Sequences.Building.sequenceFromArray\n */\npublic fun ShortArray.asSequence():
Sequence<Short> {\n    if (isEmpty()) return emptySequence()\n    return Sequence { this.iterator() }\n}\n\n/**\n *
Creates a [Sequence] instance that wraps the original array returning its elements when being iterated.\n * \n *
@sample samples.collections.Sequences.Building.sequenceFromArray\n */\npublic fun IntArray.asSequence():
Sequence<Int> {\n    if (isEmpty()) return emptySequence()\n    return Sequence { this.iterator() }\n}\n\n/**\n *
Creates a [Sequence] instance that wraps the original array returning its elements when being iterated.\n * \n *
@sample samples.collections.Sequences.Building.sequenceFromArray\n */\npublic fun LongArray.asSequence():
Sequence<Long> {\n    if (isEmpty()) return emptySequence()\n    return Sequence { this.iterator() }\n}\n\n/**\n *
Creates a [Sequence] instance that wraps the original array returning its elements when being iterated.\n * \n *
@sample samples.collections.Sequences.Building.sequenceFromArray\n */\npublic fun FloatArray.asSequence():
Sequence<Float> {\n    if (isEmpty()) return emptySequence()\n    return Sequence { this.iterator() }\n}\n\n/**\n *
Creates a [Sequence] instance that wraps the original array returning its elements when being iterated.\n * \n *
@sample samples.collections.Sequences.Building.sequenceFromArray\n */\npublic fun DoubleArray.asSequence():
Sequence<Double> {\n    if (isEmpty()) return emptySequence()\n    return Sequence { this.iterator() }\n}\n\n/**\n *
Creates a [Sequence] instance that wraps the original array returning its elements when being iterated.\n * \n *
@sample samples.collections.Sequences.Building.sequenceFromArray\n */\npublic fun
BooleanArray.asSequence(): Sequence<Boolean> {\n    if (isEmpty()) return emptySequence()\n    return Sequence
{ this.iterator() }\n}\n\n/**\n * Creates a [Sequence] instance that wraps the original array returning its elements
when being iterated.\n * \n * @sample samples.collections.Sequences.Building.sequenceFromArray\n */\npublic
fun CharArray.asSequence(): Sequence<Char> {\n    if (isEmpty()) return emptySequence()\n    return Sequence {
this.iterator() }\n}\n\n/**\n * Returns an average value of elements in the array.\n
*/\n\n@kotlin.jvm.JvmName("averageOfByte")\npublic fun Array<out Byte>.average(): Double {\n    var sum:
Double = 0.0\n    var count: Int = 0\n    for (element in this) {\n        sum += element\n        ++count\n    }\n    return
if (count == 0) Double.NaN else sum / count\n}\n\n/**\n * Returns an average value of elements in the array.\n
*/\n\n@kotlin.jvm.JvmName("averageOfShort")\npublic fun Array<out Short>.average(): Double {\n    var sum:
Double = 0.0\n    var count: Int = 0\n    for (element in this) {\n        sum += element\n        ++count\n    }\n    return
if (count == 0) Double.NaN else sum / count\n}\n\n/**\n * Returns an average value of elements in the array.\n
*/\n\n@kotlin.jvm.JvmName("averageOfInt")\npublic fun Array<out Int>.average(): Double {\n    var sum: Double
= 0.0\n    var count: Int = 0\n    for (element in this) {\n        sum += element\n        ++count\n    }\n    return if (count
== 0) Double.NaN else sum / count\n}\n\n/**\n * Returns an average value of elements in the array.\n
*/\n\n@kotlin.jvm.JvmName("averageOfLong")\npublic fun Array<out Long>.average(): Double {\n    var sum:
Double = 0.0\n    var count: Int = 0\n    for (element in this) {\n        sum += element\n        ++count\n    }\n    return
if (count == 0) Double.NaN else sum / count\n}\n\n/**\n * Returns an average value of elements in the array.\n
*/\n\n@kotlin.jvm.JvmName("averageOfFloat")\npublic fun Array<out Float>.average(): Double {\n    var sum:
Double = 0.0\n    var count: Int = 0\n    for (element in this) {\n        sum += element\n        ++count\n    }\n    return
if (count == 0) Double.NaN else sum / count\n}\n\n/**\n * Returns an average value of elements in the array.\n
*/\n\n@kotlin.jvm.JvmName("averageOfDouble")\npublic fun Array<out Double>.average(): Double {\n    var sum:

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Double = 0.0\n  var count: Int = 0\n  for (element in this) {\n    sum += element\n    ++count\n  }\n  return
if (count == 0) Double.NaN else sum / count\n}\n\n/**\n * Returns an average value of elements in the array.\n */\npublic fun ByteArray.average(): Double {\n  var sum: Double = 0.0\n  var count: Int = 0\n  for (element in
this) {\n    sum += element\n    ++count\n  }\n  return if (count == 0) Double.NaN else sum /
count\n}\n\n/**\n * Returns an average value of elements in the array.\n */\npublic fun ShortArray.average():
Double {\n  var sum: Double = 0.0\n  var count: Int = 0\n  for (element in this) {\n    sum += element\n
++count\n  }\n  return if (count == 0) Double.NaN else sum / count\n}\n\n/**\n * Returns an average value of
elements in the array.\n */\npublic fun IntArray.average(): Double {\n  var sum: Double = 0.0\n  var count: Int =
0\n  for (element in this) {\n    sum += element\n    ++count\n  }\n  return if (count == 0) Double.NaN else
sum / count\n}\n\n/**\n * Returns an average value of elements in the array.\n */\npublic fun LongArray.average():
Double {\n  var sum: Double = 0.0\n  var count: Int = 0\n  for (element in this) {\n    sum += element\n
++count\n  }\n  return if (count == 0) Double.NaN else sum / count\n}\n\n/**\n * Returns an average value of
elements in the array.\n */\npublic fun FloatArray.average(): Double {\n  var sum: Double = 0.0\n  var count: Int
= 0\n  for (element in this) {\n    sum += element\n    ++count\n  }\n  return if (count == 0) Double.NaN
else sum / count\n}\n\n/**\n * Returns an average value of elements in the array.\n */\npublic fun
DoubleArray.average(): Double {\n  var sum: Double = 0.0\n  var count: Int = 0\n  for (element in this) {\n
sum += element\n    ++count\n  }\n  return if (count == 0) Double.NaN else sum / count\n}\n\n/**\n * Returns
the sum of all elements in the array.\n */\n@kotlin.jvm.JvmName("sumOfByte")\npublic fun Array<out
Byte>.sum(): Int {\n  var sum: Int = 0\n  for (element in this) {\n    sum += element\n  }\n  return
sum\n}\n\n/**\n * Returns the sum of all elements in the array.\n */\n@kotlin.jvm.JvmName("sumOfShort")\npublic fun Array<out Short>.sum(): Int {\n  var sum: Int = 0\n  for
(element in this) {\n    sum += element\n  }\n  return sum\n}\n\n/**\n * Returns the sum of all elements in the
array.\n */\n@kotlin.jvm.JvmName("sumOfInt")\npublic fun Array<out Int>.sum(): Int {\n  var sum: Int = 0\n
for (element in this) {\n    sum += element\n  }\n  return sum\n}\n\n/**\n * Returns the sum of all elements in
the array.\n */\n@kotlin.jvm.JvmName("sumOfLong")\npublic fun Array<out Long>.sum(): Long {\n  var sum:
Long = 0L\n  for (element in this) {\n    sum += element\n  }\n  return sum\n}\n\n/**\n * Returns the sum of
all elements in the array.\n */\n@kotlin.jvm.JvmName("sumOfFloat")\npublic fun Array<out Float>.sum(): Float
{\n  var sum: Float = 0.0f\n  for (element in this) {\n    sum += element\n  }\n  return sum\n}\n\n/**\n *
Returns the sum of all elements in the array.\n */\n@kotlin.jvm.JvmName("sumOfDouble")\npublic fun Array<out
Double>.sum(): Double {\n  var sum: Double = 0.0\n  for (element in this) {\n    sum += element\n  }\n
return sum\n}\n\n/**\n * Returns the sum of all elements in the array.\n */\npublic fun ByteArray.sum(): Int {\n
var sum: Int = 0\n  for (element in this) {\n    sum += element\n  }\n  return sum\n}\n\n/**\n * Returns the
sum of all elements in the array.\n */\npublic fun ShortArray.sum(): Int {\n  var sum: Int = 0\n  for (element
in this) {\n    sum += element\n  }\n  return sum\n}\n\n/**\n * Returns the sum of all elements in the array.\n
*/\npublic fun IntArray.sum(): Int {\n  var sum: Int = 0\n  for (element in this) {\n    sum += element\n  }\n
return sum\n}\n\n/**\n * Returns the sum of all elements in the array.\n */\npublic fun LongArray.sum(): Long {\n
var sum: Long = 0L\n  for (element in this) {\n    sum += element\n  }\n  return sum\n}\n\n/**\n * Returns the
sum of all elements in the array.\n */\npublic fun FloatArray.sum(): Float {\n  var sum: Float = 0.0f\n  for
(element in this) {\n    sum += element\n  }\n  return sum\n}\n\n/**\n * Returns the sum of all elements in the
array.\n */\npublic fun DoubleArray.sum(): Double {\n  var sum: Double = 0.0\n  for (element in this) {\n
sum += element\n  }\n  return sum\n}\n\n"/**\n * Copyright 2010-2021 JetBrains s.r.o. and Kotlin Programming
Language contributors.\n * Use of this source code is governed by the Apache 2.0 license that can be found in the
license/LICENSE.txt file.\n */\n\n@file:kotlin.jvm.JvmMultifileClass\n@file:kotlin.jvm.JvmName("RangesKt")\n\npackage
kotlin.ranges\n\n// NOTE: THIS FILE IS AUTO-GENERATED by the GenerateStandardLib.kt\n// See:
https://github.com/JetBrains/kotlin/tree/master/libraries/stdlib\n\nimport kotlin.random.*\n\n/**\n * Returns a
random element from this range.\n * \n * @throws IllegalArgumentException if this range is empty.\n */\n@SinceKotlin("1.3")\n@kotlin.internal.InlineOnly\npublic inline fun IntRange.random(): Int {\n  return

```

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random(Random)\n}\n\n/**\n * Returns a random element from this range.\n * \n * @throws
IllegalArgumentException if this range is empty.\n */\n@SinceKotlin("1.3")\n@kotlin.internal.InlineOnly\npublic
inline fun LongRange.random(): Long {\n    return random(Random)\n}\n\n/**\n * Returns a random element from
this range.\n * \n * @throws IllegalArgumentException if this range is empty.\n
*/\n@SinceKotlin("1.3")\n@kotlin.internal.InlineOnly\npublic inline fun CharRange.random(): Char {\n    return
random(Random)\n}\n\n/**\n * Returns a random element from this range using the specified source of
randomness.\n * \n * @throws IllegalArgumentException if this range is empty.\n
*/\n@SinceKotlin("1.3")\npublic fun IntRange.random(random: Random): Int {\n    try {\n        return
random.nextInt(this)\n    } catch(e: IllegalArgumentException) {\n        throw
NoSuchElementException(e.message)\n    }\n}\n\n/**\n * Returns a random element from this range using the
specified source of randomness.\n * \n * @throws IllegalArgumentException if this range is empty.\n
*/\n@SinceKotlin("1.3")\npublic fun LongRange.random(random: Random): Long {\n    try {\n        return
random.nextLong(this)\n    } catch(e: IllegalArgumentException) {\n        throw
NoSuchElementException(e.message)\n    }\n}\n\n/**\n * Returns a random element from this range using the
specified source of randomness.\n * \n * @throws IllegalArgumentException if this range is empty.\n
*/\n@SinceKotlin("1.3")\npublic fun CharRange.random(random: Random): Char {\n    try {\n        return
random.nextInt(first.code, last.code + 1).toChar()\n    } catch(e: IllegalArgumentException) {\n        throw
NoSuchElementException(e.message)\n    }\n}\n\n/**\n * Returns a random element from this range, or `null` if this
range is empty.\n
*/\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\n@kotlin.internal.InlineOnly\npubli
c inline fun IntRange.randomOrNull(): Int? {\n    return randomOrNull(Random)\n}\n\n/**\n * Returns a random
element from this range, or `null` if this range is empty.\n
*/\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\n@kotlin.internal.InlineOnly\npubli
c inline fun LongRange.randomOrNull(): Long? {\n    return randomOrNull(Random)\n}\n\n/**\n * Returns a
random element from this range, or `null` if this range is empty.\n
*/\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\n@kotlin.internal.InlineOnly\npubli
c inline fun CharRange.randomOrNull(): Char? {\n    return randomOrNull(Random)\n}\n\n/**\n * Returns a
random element from this range using the specified source of randomness, or `null` if this range is empty.\n
*/\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\npublic fun
IntRange.randomOrNull(random: Random): Int? {\n    if (isEmpty())\n        return null\n    return
random.nextInt(this)\n}\n\n/**\n * Returns a random element from this range using the specified source of
randomness, or `null` if this range is empty.\n
*/\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\npublic fun
LongRange.randomOrNull(random: Random): Long? {\n    if (isEmpty())\n        return null\n    return
random.nextLong(this)\n}\n\n/**\n * Returns a random element from this range using the specified source of
randomness, or `null` if this range is empty.\n
*/\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\npublic fun
CharRange.randomOrNull(random: Random): Char? {\n    if (isEmpty())\n        return null\n    return
random.nextInt(first.code, last.code + 1).toChar()\n}\n\n/**\n * Returns `true` if this range contains the specified
[element].\n * \n * Always returns `false` if the [element] is `null`.\n
*/\n@SinceKotlin("1.3")\n@kotlin.internal.InlineOnly\npublic inline operator fun IntRange.contains(element:
Int?): Boolean {\n    return element != null && contains(element)\n}\n\n/**\n * Returns `true` if this range contains
the specified [element].\n * \n * Always returns `false` if the [element] is `null`.\n
*/\n@SinceKotlin("1.3")\n@kotlin.internal.InlineOnly\npublic inline operator fun LongRange.contains(element:
Long?): Boolean {\n    return element != null && contains(element)\n}\n\n/**\n * Returns `true` if this range
contains the specified [element].\n * \n * Always returns `false` if the [element] is `null`.\n
*/\n@SinceKotlin("1.3")\n@kotlin.internal.InlineOnly\npublic inline operator fun CharRange.contains(element:
Char?): Boolean {\n    return element != null && contains(element)\n}\n\n/**\n * Checks if the specified [value]

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belongs to this range.
`*\n@kotlin.jvm.JvmName("intRangeContains")\npublic operator fun
ClosedRange<Int>.contains(value: Byte): Boolean {\n return contains(value.toInt())\n}\n\n**\n * Checks if the
specified [value] belongs to this range.
*\n@kotlin.jvm.JvmName("longRangeContains")\npublic operator fun
ClosedRange<Long>.contains(value: Byte): Boolean {\n return contains(value.toLong())\n}\n\n**\n * Checks if
the specified [value] belongs to this range.
*\n@kotlin.jvm.JvmName("shortRangeContains")\npublic operator
fun ClosedRange<Short>.contains(value: Byte): Boolean {\n return contains(value.toShort())\n}\n\n**\n *
Checks if the specified [value] belongs to this range.
*\n@Deprecated("This `contains` operation mixing integer
and floating point arguments has ambiguous semantics and is going to be
removed.")\n@DeprecatedSinceKotlin(warningSince = "1.3", errorSince = "1.4", hiddenSince =
"1.5")\n@kotlin.jvm.JvmName("doubleRangeContains")\npublic operator fun
ClosedRange<Double>.contains(value: Byte): Boolean {\n return contains(value.toDouble())\n}\n\n**\n *
Checks if the specified [value] belongs to this range.
*\n@Deprecated("This `contains` operation mixing integer
and floating point arguments has ambiguous semantics and is going to be
removed.")\n@DeprecatedSinceKotlin(warningSince = "1.3", errorSince = "1.4", hiddenSince =
"1.5")\n@kotlin.jvm.JvmName("floatRangeContains")\npublic operator fun ClosedRange<Float>.contains(value:
Byte): Boolean {\n return contains(value.toFloat())\n}\n\n**\n * Checks if the specified [value] belongs to this
range.
*\n@Deprecated("This `contains` operation mixing integer and floating point arguments has ambiguous
semantics and is going to be removed.")\n@DeprecatedSinceKotlin(warningSince = "1.3", errorSince = "1.4",
hiddenSince = "1.5")\n@kotlin.jvm.JvmName("intRangeContains")\npublic operator fun
ClosedRange<Int>.contains(value: Double): Boolean {\n return value.toIntExactOrNull().let { if (it != null)
contains(it) else false }\n}\n\n**\n * Checks if the specified [value] belongs to this range.
*\n@Deprecated("This `contains` operation mixing integer and floating point arguments has ambiguous semantics
and is going to be removed.")\n@DeprecatedSinceKotlin(warningSince = "1.3", errorSince = "1.4", hiddenSince
= "1.5")\n@kotlin.jvm.JvmName("longRangeContains")\npublic operator fun
ClosedRange<Long>.contains(value: Double): Boolean {\n return value.toLongExactOrNull().let { if (it != null)
contains(it) else false }\n}\n\n**\n * Checks if the specified [value] belongs to this range.
*\n@Deprecated("This `contains` operation mixing integer and floating point arguments has ambiguous semantics
and is going to be removed.")\n@DeprecatedSinceKotlin(warningSince = "1.3", errorSince = "1.4", hiddenSince
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contains(it) else false }\n}\n\n**\n * Checks if the specified [value] belongs to this range.
*\n@Deprecated("This `contains` operation mixing integer and floating point arguments has ambiguous semantics
and is going to be removed.")\n@DeprecatedSinceKotlin(warningSince = "1.3", errorSince = "1.4", hiddenSince
= "1.5")\n@kotlin.jvm.JvmName("shortRangeContains")\npublic operator fun
ClosedRange<Short>.contains(value: Double): Boolean {\n return value.toShortExactOrNull().let { if (it != null)
contains(it) else false }\n}\n\n**\n * Checks if the specified [value] belongs to this range.
*\n@kotlin.jvm.JvmName("floatRangeContains")\npublic operator fun ClosedRange<Float>.contains(value:
Double): Boolean {\n return contains(value.toFloat())\n}\n\n**\n * Checks if the specified [value] belongs to this
range.
*\n@Deprecated("This `contains` operation mixing integer and floating point arguments has ambiguous
semantics and is going to be removed.")\n@DeprecatedSinceKotlin(warningSince = "1.3", errorSince = "1.4",
hiddenSince = "1.5")\n@kotlin.jvm.JvmName("intRangeContains")\npublic operator fun
ClosedRange<Int>.contains(value: Float): Boolean {\n return value.toIntExactOrNull().let { if (it != null)
contains(it) else false }\n}\n\n**\n * Checks if the specified [value] belongs to this range.
*\n@Deprecated("This `contains` operation mixing integer and floating point arguments has ambiguous semantics
and is going to be removed.")\n@DeprecatedSinceKotlin(warningSince = "1.3", errorSince = "1.4", hiddenSince
= "1.5")\n@kotlin.jvm.JvmName("longRangeContains")\npublic operator fun
ClosedRange<Long>.contains(value: Float): Boolean {\n return value.toLongExactOrNull().let { if (it != null)
contains(it) else false }\n}\n\n**\n * Checks if the specified [value] belongs to this range.`

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*\/n@Deprecated("This `contains` operation mixing integer and floating point arguments has ambiguous semantics
and is going to be removed.")n@DeprecatedSinceKotlin(warningSince = "1.3", errorSince = "1.4", hiddenSince
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ClosedRange<Byte>.contains(value: Float): Boolean {n  return value.toByteExactOrNull().let { if (it != null)
contains(it) else false }n}n/**n * Checks if the specified [value] belongs to this range.n
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= "1.5")n@kotlin.jvm.JvmName("shortRangeContains")npublic operator fun
ClosedRange<Short>.contains(value: Float): Boolean {n  return value.toShortExactOrNull().let { if (it != null)
contains(it) else false }n}n/**n * Checks if the specified [value] belongs to this range.n
*\/n@kotlin.jvm.JvmName("doubleRangeContains")npublic operator fun ClosedRange<Double>.contains(value:
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range.n *\/n@kotlin.jvm.JvmName("longRangeContains")npublic operator fun
ClosedRange<Long>.contains(value: Int): Boolean {n  return contains(value.toLong())n}n/**n * Checks if the
specified [value] belongs to this range.n *\/n@kotlin.jvm.JvmName("byteRangeContains")npublic operator fun
ClosedRange<Byte>.contains(value: Int): Boolean {n  return value.toByteExactOrNull().let { if (it != null)
contains(it) else false }n}n/**n * Checks if the specified [value] belongs to this range.n
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removed.")n@DeprecatedSinceKotlin(warningSince = "1.3", errorSince = "1.4", hiddenSince =
"1.5")n@kotlin.jvm.JvmName("floatRangeContains")npublic operator fun ClosedRange<Float>.contains(value:
Int): Boolean {n  return contains(value.toFloat())n}n/**n * Checks if the specified [value] belongs to this
range.n *\/n@kotlin.jvm.JvmName("intRangeContains")npublic operator fun ClosedRange<Int>.contains(value:
Long): Boolean {n  return value.toIntExactOrNull().let { if (it != null) contains(it) else false }n}n/**n *
Checks if the specified [value] belongs to this range.n *\/n@kotlin.jvm.JvmName("byteRangeContains")npublic
operator fun ClosedRange<Byte>.contains(value: Long): Boolean {n  return value.toByteExactOrNull().let { if (it
!= null) contains(it) else false }n}n/**n * Checks if the specified [value] belongs to this range.n
*\/n@kotlin.jvm.JvmName("shortRangeContains")npublic operator fun ClosedRange<Short>.contains(value:
Long): Boolean {n  return value.toShortExactOrNull().let { if (it != null) contains(it) else false }n}n/**n *
Checks if the specified [value] belongs to this range.n *\/n@Deprecated("This `contains` operation mixing integer
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ClosedRange<Double>.contains(value: Long): Boolean {n  return contains(value.toDouble())n}n/**n *
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"1.5")n@kotlin.jvm.JvmName("floatRangeContains")npublic operator fun ClosedRange<Float>.contains(value:
Long): Boolean {n  return contains(value.toFloat())n}n/**n * Checks if the specified [value] belongs to this
range.n *\/n@kotlin.jvm.JvmName("intRangeContains")npublic operator fun ClosedRange<Int>.contains(value:
Short): Boolean {n  return contains(value.toInt())n}n/**n * Checks if the specified [value] belongs to this

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range.
`@kotlin.jvm.JvmName("longRangeContains")`
 public operator fun
 ClosedRange<Long>.contains(value: Short): Boolean {
 return contains(value.toLong())
 }
 * Checks if the specified [value] belongs to this range.
`@kotlin.jvm.JvmName("byteRangeContains")`
 public operator
 fun ClosedRange<Byte>.contains(value: Short): Boolean {
 return value.toByteExactOrNull().let { if (it != null)
 contains(it) else false }
 }
 * Checks if the specified [value] belongs to this range.
`@Deprecated("This `contains` operation mixing integer and floating point arguments has ambiguous semantics and is going to be removed.")`
`@DeprecatedSinceKotlin(warningSince = "1.3", errorSince = "1.4", hiddenSince = "1.5")`
`@kotlin.jvm.JvmName("doubleRangeContains")`
 public operator fun
 ClosedRange<Double>.contains(value: Short): Boolean {
 return contains(value.toDouble())
 }
 * Checks if the specified [value] belongs to this range.
`@Deprecated("This `contains` operation mixing integer and floating point arguments has ambiguous semantics and is going to be removed.")`
`@DeprecatedSinceKotlin(warningSince = "1.3", errorSince = "1.4", hiddenSince = "1.5")`
`@kotlin.jvm.JvmName("floatRangeContains")`
 public operator fun ClosedRange<Float>.contains(value: Short): Boolean {
 return contains(value.toFloat())
 }
 * Returns a progression from this value down to the specified [to] value with the step -1.
 * The [to] value should be less than or equal to `this` value.
 * If the [to] value is greater than `this` value the returned progression is empty.
 public infix fun Int.downTo(to: Byte): IntProgression {
 return IntProgression.fromClosedRange(this, to.toInt(), -1)
 }
 * Returns a progression from this value down to the specified [to] value with the step -1.
 * The [to] value should be less than or equal to `this` value.
 * If the [to] value is greater than `this` value the returned progression is empty.
 public infix fun Long.downTo(to: Byte): LongProgression {
 return LongProgression.fromClosedRange(this, to.toLong(), -1L)
 }
 * Returns a progression from this value down to the specified [to] value with the step -1.
 * The [to] value should be less than or equal to `this` value.
 * If the [to] value is greater than `this` value the returned progression is empty.
 public infix fun Byte.downTo(to: Byte): IntProgression {
 return IntProgression.fromClosedRange(this.toInt(), to.toInt(), -1)
 }
 * Returns a progression from this value down to the specified [to] value with the step -1.
 * The [to] value should be less than or equal to `this` value.
 * If the [to] value is greater than `this` value the returned progression is empty.
 public infix fun Short.downTo(to: Byte): IntProgression {
 return IntProgression.fromClosedRange(this.toInt(), to.toInt(), -1)
 }
 * Returns a progression from this value down to the specified [to] value with the step -1.
 * The [to] value should be less than or equal to `this` value.
 * If the [to] value is greater than `this` value the returned progression is empty.
 public infix fun Char.downTo(to: Char): CharProgression {
 return CharProgression.fromClosedRange(this, to, -1)
 }
 * Returns a progression from this value down to the specified [to] value with the step -1.
 * The [to] value should be less than or equal to `this` value.
 * If the [to] value is greater than `this` value the returned progression is empty.
 public infix fun Int.downTo(to: Int): IntProgression {
 return IntProgression.fromClosedRange(this, to, -1)
 }
 * Returns a progression from this value down to the specified [to] value with the step -1.
 * The [to] value should be less than or equal to `this` value.
 * If the [to] value is greater than `this` value the returned progression is empty.
 public infix fun Long.downTo(to: Int): LongProgression {
 return LongProgression.fromClosedRange(this, to.toLong(), -1L)
 }
 * Returns a progression from this value down to the specified [to] value with the step -1.
 * The [to] value should be less than or equal to `this` value.
 * If the [to] value is greater than `this` value the returned progression is empty.
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 return IntProgression.fromClosedRange(this.toInt(), to, -1)
 }
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 * The [to] value should be less than or equal to `this` value.
 * If the [to] value is greater than `this` value the returned progression is empty.
 public infix fun Short.downTo(to: Int): IntProgression {
 return IntProgression.fromClosedRange(this.toInt(), to, -1)
 }
 * Returns a progression from this value down to the specified [to] value with the step -1.
 * The [to] value should be less than or equal to `this` value.
 * If the [to] value is greater than `this` value the returned progression is empty.
 public infix fun Int.downTo(to: Long): LongProgression {
 return LongProgression.fromClosedRange(this.toLong(), to, -1L)
 }
 * Returns a progression from this value down to the specified [to] value with the step -1.
 * The [to] value should be less than or equal to `this` value.
 * If the [to] value is greater than `this` value the returned progression is empty.

The [to] value should be less than or equal to `this` value.\n * If the [to] value is greater than `this` value the returned progression is empty.\n */\npublic infix fun Long.downTo(to: Long): LongProgression {\n return LongProgression.fromClosedRange(this, to, -1L)\n}\n\n/**\n * Returns a progression from this value down to the specified [to] value with the step -1.\n * The [to] value should be less than or equal to `this` value.\n * If the [to] value is greater than `this` value the returned progression is empty.\n */\npublic infix fun Byte.downTo(to: Long): LongProgression {\n return LongProgression.fromClosedRange(this.toLong(), to, -1L)\n}\n\n/**\n * Returns a progression from this value down to the specified [to] value with the step -1.\n * The [to] value should be less than or equal to `this` value.\n * If the [to] value is greater than `this` value the returned progression is empty.\n */\npublic infix fun Short.downTo(to: Long): LongProgression {\n return LongProgression.fromClosedRange(this.toLong(), to, -1L)\n}\n\n/**\n * Returns a progression from this value down to the specified [to] value with the step -1.\n * The [to] value should be less than or equal to `this` value.\n * If the [to] value is greater than `this` value the returned progression is empty.\n */\npublic infix fun Int.downTo(to: Short): IntProgression {\n return IntProgression.fromClosedRange(this, to.toInt(), -1)\n}\n\n/**\n * Returns a progression from this value down to the specified [to] value with the step -1.\n * The [to] value should be less than or equal to `this` value.\n * If the [to] value is greater than `this` value the returned progression is empty.\n */\npublic infix fun Long.downTo(to: Short): LongProgression {\n return LongProgression.fromClosedRange(this, to.toLong(), -1L)\n}\n\n/**\n * Returns a progression from this value down to the specified [to] value with the step -1.\n * The [to] value should be less than or equal to `this` value.\n * If the [to] value is greater than `this` value the returned progression is empty.\n */\npublic infix fun Byte.downTo(to: Short): IntProgression {\n return IntProgression.fromClosedRange(this.toInt(), to.toInt(), -1)\n}\n\n/**\n * Returns a progression from this value down to the specified [to] value with the step -1.\n * The [to] value should be less than or equal to `this` value.\n * If the [to] value is greater than `this` value the returned progression is empty.\n */\npublic infix fun Short.downTo(to: Short): IntProgression {\n return IntProgression.fromClosedRange(this.toInt(), to.toInt(), -1)\n}\n\n/**\n * Returns a progression that goes over the same range in the opposite direction with the same step.\n */\npublic fun IntProgression.reversed(): IntProgression {\n return IntProgression.fromClosedRange(last, first, -step)\n}\n\n/**\n * Returns a progression that goes over the same range in the opposite direction with the same step.\n */\npublic fun LongProgression.reversed(): LongProgression {\n return LongProgression.fromClosedRange(last, first, -step)\n}\n\n/**\n * Returns a progression that goes over the same range in the opposite direction with the same step.\n */\npublic fun CharProgression.reversed(): CharProgression {\n return CharProgression.fromClosedRange(last, first, -step)\n}\n\n/**\n * Returns a progression that goes over the same range with the given step.\n */\npublic infix fun IntProgression.step(step: Int): IntProgression {\n checkStepIsPositive(step > 0, step)\n return IntProgression.fromClosedRange(first, last, if (this.step > 0) step else -step)\n}\n\n/**\n * Returns a progression that goes over the same range with the given step.\n */\npublic infix fun LongProgression.step(step: Long): LongProgression {\n checkStepIsPositive(step > 0, step)\n return LongProgression.fromClosedRange(first, last, if (this.step > 0) step else -step)\n}\n\n/**\n * Returns a progression that goes over the same range with the given step.\n */\npublic infix fun CharProgression.step(step: Int): CharProgression {\n checkStepIsPositive(step > 0, step)\n return CharProgression.fromClosedRange(first, last, if (this.step > 0) step else -step)\n}\n\ninternal fun Int.toByteExactOrNull(): Byte? {\n return if (this in Byte.MIN_VALUE.toInt()..Byte.MAX_VALUE.toInt()) this.toByte() else null\n}\n\ninternal fun Long.toByteExactOrNull(): Byte? {\n return if (this in Byte.MIN_VALUE.toLong()..Byte.MAX_VALUE.toLong()) this.toByte() else null\n}\n\ninternal fun Short.toByteExactOrNull(): Byte? {\n return if (this in Byte.MIN_VALUE.toShort()..Byte.MAX_VALUE.toShort()) this.toByte() else null\n}\n\ninternal fun Double.toByteExactOrNull(): Byte? {\n return if (this in Byte.MIN_VALUE.toDouble()..Byte.MAX_VALUE.toDouble()) this.toInt().toByte() else null\n}\n\ninternal fun Float.toByteExactOrNull(): Byte? {\n return if (this in Byte.MIN_VALUE.toFloat()..Byte.MAX_VALUE.toFloat()) this.toInt().toByte() else null\n}\n\ninternal fun Long.toIntExactOrNull(): Int? {\n return if (this in Int.MIN_VALUE.toLong()..Int.MAX_VALUE.toLong())

```

this.toInt() else null\n}\n\ninternal fun Double.toIntExactOrNull(): Int? {\n  return if (this in
Int.MIN_VALUE.toDouble()..Int.MAX_VALUE.toDouble()) this.toInt() else null\n}\n\ninternal fun
Float.toIntExactOrNull(): Int? {\n  return if (this in Int.MIN_VALUE.toFloat()..Int.MAX_VALUE.toFloat())
this.toInt() else null\n}\n\ninternal fun Double.toLongExactOrNull(): Long? {\n  return if (this in
Long.MIN_VALUE.toDouble()..Long.MAX_VALUE.toDouble()) this.toLong() else null\n}\n\ninternal fun
Float.toLongExactOrNull(): Long? {\n  return if (this in
Long.MIN_VALUE.toFloat()..Long.MAX_VALUE.toFloat()) this.toLong() else null\n}\n\ninternal fun
Int.toShortExactOrNull(): Short? {\n  return if (this in Short.MIN_VALUE.toInt()..Short.MAX_VALUE.toInt())
this.toShort() else null\n}\n\ninternal fun Long.toShortExactOrNull(): Short? {\n  return if (this in
Short.MIN_VALUE.toLong()..Short.MAX_VALUE.toLong()) this.toShort() else null\n}\n\ninternal fun
Double.toShortExactOrNull(): Short? {\n  return if (this in
Short.MIN_VALUE.toDouble()..Short.MAX_VALUE.toDouble()) this.toInt().toShort() else null\n}\n\ninternal fun
Float.toShortExactOrNull(): Short? {\n  return if (this in
Short.MIN_VALUE.toFloat()..Short.MAX_VALUE.toFloat()) this.toInt().toShort() else null\n}\n\n/**\n * Returns
a range from this value up to but excluding the specified [to] value.\n * \n * If the [to] value is less than or equal to
`this` value, then the returned range is empty.\n */\npublic infix fun Int.until(to: Byte): IntRange {\n  return this ..
(to.toInt() - 1).toInt()\n}\n\n/**\n * Returns a range from this value up to but excluding the specified [to] value.\n *
\n * If the [to] value is less than or equal to `this` value, then the returned range is empty.\n */\npublic infix fun
Long.until(to: Byte): LongRange {\n  return this .. (to.toLong() - 1).toLong()\n}\n\n/**\n * Returns a range from
this value up to but excluding the specified [to] value.\n * \n * If the [to] value is less than or equal to `this` value,
then the returned range is empty.\n */\npublic infix fun Byte.until(to: Byte): IntRange {\n  return this.toInt() ..
(to.toInt() - 1).toInt()\n}\n\n/**\n * Returns a range from this value up to but excluding the specified [to] value.\n *
\n * If the [to] value is less than or equal to `this` value, then the returned range is empty.\n */\npublic infix fun
Short.until(to: Byte): IntRange {\n  return this.toInt() .. (to.toInt() - 1).toInt()\n}\n\n/**\n * Returns a range from
this value up to but excluding the specified [to] value.\n * \n * If the [to] value is less than or equal to `this` value,
then the returned range is empty.\n */\npublic infix fun Char.until(to: Char): CharRange {\n  if (to <= "\u0000")
return CharRange.EMPTY\n  return this .. (to - 1).toChar()\n}\n\n/**\n * Returns a range from this value up to but
excluding the specified [to] value.\n * \n * If the [to] value is less than or equal to `this` value, then the returned
range is empty.\n */\npublic infix fun Int.until(to: Int): IntRange {\n  if (to <= Int.MIN_VALUE) return
IntRange.EMPTY\n  return this .. (to - 1).toInt()\n}\n\n/**\n * Returns a range from this value up to but excluding
the specified [to] value.\n * \n * If the [to] value is less than or equal to `this` value, then the returned range is
empty.\n */\npublic infix fun Long.until(to: Int): LongRange {\n  return this .. (to.toLong() -
1).toLong()\n}\n\n/**\n * Returns a range from this value up to but excluding the specified [to] value.\n * \n * If the
[to] value is less than or equal to `this` value, then the returned range is empty.\n */\npublic infix fun Byte.until(to:
Int): IntRange {\n  if (to <= Int.MIN_VALUE) return IntRange.EMPTY\n  return this.toInt() .. (to -
1).toInt()\n}\n\n/**\n * Returns a range from this value up to but excluding the specified [to] value.\n * \n * If the
[to] value is less than or equal to `this` value, then the returned range is empty.\n */\npublic infix fun Short.until(to:
Int): IntRange {\n  if (to <= Int.MIN_VALUE) return IntRange.EMPTY\n  return this.toInt() .. (to -
1).toInt()\n}\n\n/**\n * Returns a range from this value up to but excluding the specified [to] value.\n * \n * If the
[to] value is less than or equal to `this` value, then the returned range is empty.\n */\npublic infix fun Int.until(to:
Long): LongRange {\n  if (to <= Long.MIN_VALUE) return LongRange.EMPTY\n  return this.toLong() .. (to -
1).toLong()\n}\n\n/**\n * Returns a range from this value up to but excluding the specified [to] value.\n * \n * If the
[to] value is less than or equal to `this` value, then the returned range is empty.\n */\npublic infix fun Long.until(to:
Long): LongRange {\n  if (to <= Long.MIN_VALUE) return LongRange.EMPTY\n  return this .. (to -
1).toLong()\n}\n\n/**\n * Returns a range from this value up to but excluding the specified [to] value.\n * \n * If the
[to] value is less than or equal to `this` value, then the returned range is empty.\n */\npublic infix fun Byte.until(to:
Long): LongRange {\n  if (to <= Long.MIN_VALUE) return LongRange.EMPTY\n  return this.toLong() .. (to -
1).toLong()\n}\n\n/**\n * Returns a range from this value up to but excluding the specified [to] value.\n * \n * If the

```

[to] value is less than or equal to `this` value, then the returned range is empty.

```

public infix fun Short.until(to: Long): LongRange {
    if (to <= Long.MIN_VALUE) return LongRange.EMPTY
    return this.toLong() .. (to - 1).toLong()
}

```

* Returns a range from this value up to but excluding the specified [to] value.

```

public infix fun Int.until(to: Short): IntRange {
    return this .. (to.toInt() - 1).toInt()
}

```

* Returns a range from this value up to but excluding the specified [to] value.

```

public infix fun Long.until(to: Short): LongRange {
    return this .. (to.toLong() - 1).toLong()
}

```

* Returns a range from this value up to but excluding the specified [to] value.

```

public infix fun Byte.until(to: Short): IntRange {
    return this.toInt() .. (to.toInt() - 1).toInt()
}

```

* Returns a range from this value up to but excluding the specified [to] value.

```

public infix fun Short.until(to: Short): IntRange {
    return this.toInt() .. (to.toInt() - 1).toInt()
}

```

* Ensures that this value is not less than the specified [minimumValue].

```

@return this value if it's greater than or equal to the [minimumValue] or the [minimumValue] otherwise.
@sample
samples.comparisons.ComparableOps.coerceAtLeast

```

```

public fun <T : Comparable<T>> T.coerceAtLeast(minimumValue: T): T {
    return if (this < minimumValue) minimumValue else this
}

```

* Ensures that this value is not less than the specified [minimumValue].

```

@return this value if it's greater than or equal to the [minimumValue] or the [minimumValue] otherwise.
@sample
samples.comparisons.ComparableOps.coerceAtLeast

```

```

public fun Byte.coerceAtLeast(minimumValue: Byte): Byte {
    return if (this < minimumValue) minimumValue else this
}

```

* Ensures that this value is not less than the specified [minimumValue].

```

@return this value if it's greater than or equal to the [minimumValue] or the [minimumValue] otherwise.
@sample
samples.comparisons.ComparableOps.coerceAtLeast

```

```

public fun Short.coerceAtLeast(minimumValue: Short): Short {
    return if (this < minimumValue) minimumValue else this
}

```

* Ensures that this value is not less than the specified [minimumValue].

```

@return this value if it's greater than or equal to the [minimumValue] or the [minimumValue] otherwise.
@sample
samples.comparisons.ComparableOps.coerceAtLeast

```

```

public fun Int.coerceAtLeast(minimumValue: Int): Int {
    return if (this < minimumValue) minimumValue else this
}

```

* Ensures that this value is not less than the specified [minimumValue].

```

@return this value if it's greater than or equal to the [minimumValue] or the [minimumValue] otherwise.
@sample
samples.comparisons.ComparableOps.coerceAtLeast

```

```

public fun Long.coerceAtLeast(minimumValue: Long): Long {
    return if (this < minimumValue) minimumValue else this
}

```

* Ensures that this value is not less than the specified [minimumValue].

```

@return this value if it's greater than or equal to the [minimumValue] or the [minimumValue] otherwise.
@sample
samples.comparisons.ComparableOps.coerceAtLeast

```

```

public fun Float.coerceAtLeast(minimumValue: Float): Float {
    return if (this < minimumValue) minimumValue else this
}

```

* Ensures that this value is not less than the specified [minimumValue].

```

@return this value if it's greater than or equal to the [minimumValue] or the [minimumValue] otherwise.
@sample
samples.comparisons.ComparableOps.coerceAtLeast

```

```

public fun Double.coerceAtLeast(minimumValue: Double): Double {
    return if (this < minimumValue) minimumValue else this
}

```

* Ensures that this value is not greater than the specified [maximumValue].

```

@return this value if it's less than or equal to the [maximumValue] or the [maximumValue] otherwise.
@sample
samples.comparisons.ComparableOps.coerceAtMost

```

```

public fun <T : Comparable<T>> T.coerceAtMost(maximumValue: T): T {
    return if (this > maximumValue) maximumValue else this
}

```

* Ensures that this value is not greater than the specified [maximumValue].

```

@return this value if it's less than or equal to the [maximumValue] or the [maximumValue] otherwise.
@sample
samples.comparisons.ComparableOps.coerceAtMost

```

```

public fun Byte.coerceAtMost(maximumValue: Byte): Byte {
    return if (this > maximumValue) maximumValue else this
}

```

* Ensures that this value is not greater than the specified [maximumValue].

```

@return this value if it's less than or equal to the [maximumValue] or the [maximumValue] otherwise.
@sample

```

```

samples.comparisons.ComparableOps.coerceAtMost\n *\npublic fun Short.coerceAtMost(maximumValue: Short):
Short {\n  return if (this > maximumValue) maximumValue else this\n}\n\n/**\n * Ensures that this value is not
greater than the specified [maximumValue].\n * \n * @return this value if it's less than or equal to the
[maximumValue] or the [maximumValue] otherwise.\n * \n * @sample
samples.comparisons.ComparableOps.coerceAtMost\n *\npublic fun Int.coerceAtMost(maximumValue: Int): Int
{\n  return if (this > maximumValue) maximumValue else this\n}\n\n/**\n * Ensures that this value is not greater
than the specified [maximumValue].\n * \n * @return this value if it's less than or equal to the [maximumValue] or
the [maximumValue] otherwise.\n * \n * @sample samples.comparisons.ComparableOps.coerceAtMost\n
*\npublic fun Long.coerceAtMost(maximumValue: Long): Long {\n  return if (this > maximumValue)
maximumValue else this\n}\n\n/**\n * Ensures that this value is not greater than the specified [maximumValue].\n
*\n * @return this value if it's less than or equal to the [maximumValue] or the [maximumValue] otherwise.\n
*\n * @sample samples.comparisons.ComparableOps.coerceAtMost\n *\npublic fun
Float.coerceAtMost(maximumValue: Float): Float {\n  return if (this > maximumValue) maximumValue else
this\n}\n\n/**\n * Ensures that this value is not greater than the specified [maximumValue].\n * \n * @return this
value if it's less than or equal to the [maximumValue] or the [maximumValue] otherwise.\n * \n * @sample
samples.comparisons.ComparableOps.coerceAtMost\n *\npublic fun Double.coerceAtMost(maximumValue:
Double): Double {\n  return if (this > maximumValue) maximumValue else this\n}\n\n/**\n * Ensures that this
value lies in the specified range [minimumValue]..[maximumValue].\n * \n * @return this value if it's in the range,
or [minimumValue] if this value is less than [minimumValue], or [maximumValue] if this value is greater than
[maximumValue].\n * \n * @sample samples.comparisons.ComparableOps.coerceInComparable\n *\npublic fun
<T : Comparable<T>> T.coerceIn(minimumValue: T?, maximumValue: T?): T {\n  if (minimumValue !== null
&& maximumValue !== null) {\n    if (minimumValue > maximumValue) throw
IllegalArgumentException("Cannot coerce value to an empty range: maximum $maximumValue is less than
minimum $minimumValue.")\n    if (this < minimumValue) return minimumValue\n    if (this >
maximumValue) return maximumValue\n  }\n  else {\n    if (minimumValue !== null && this <
minimumValue) return minimumValue\n    if (maximumValue !== null && this > maximumValue) return
maximumValue\n  }\n  return this\n}\n\n/**\n * Ensures that this value lies in the specified range
[minimumValue]..[maximumValue].\n * \n * @return this value if it's in the range, or [minimumValue] if this value
is less than [minimumValue], or [maximumValue] if this value is greater than [maximumValue].\n * \n * @sample
samples.comparisons.ComparableOps.coerceIn\n *\npublic fun Byte.coerceIn(minimumValue: Byte,
maximumValue: Byte): Byte {\n  if (minimumValue > maximumValue) throw
IllegalArgumentException("Cannot coerce value to an empty range: maximum $maximumValue is less than
minimum $minimumValue.")\n  if (this < minimumValue) return minimumValue\n  if (this > maximumValue)
return maximumValue\n  return this\n}\n\n/**\n * Ensures that this value lies in the specified range
[minimumValue]..[maximumValue].\n * \n * @return this value if it's in the range, or [minimumValue] if this value
is less than [minimumValue], or [maximumValue] if this value is greater than [maximumValue].\n * \n * @sample
samples.comparisons.ComparableOps.coerceIn\n *\npublic fun Short.coerceIn(minimumValue: Short,
maximumValue: Short): Short {\n  if (minimumValue > maximumValue) throw
IllegalArgumentException("Cannot coerce value to an empty range: maximum $maximumValue is less than
minimum $minimumValue.")\n  if (this < minimumValue) return minimumValue\n  if (this > maximumValue)
return maximumValue\n  return this\n}\n\n/**\n * Ensures that this value lies in the specified range
[minimumValue]..[maximumValue].\n * \n * @return this value if it's in the range, or [minimumValue] if this value
is less than [minimumValue], or [maximumValue] if this value is greater than [maximumValue].\n * \n * @sample
samples.comparisons.ComparableOps.coerceIn\n *\npublic fun Int.coerceIn(minimumValue: Int, maximumValue:
Int): Int {\n  if (minimumValue > maximumValue) throw IllegalArgumentException("Cannot coerce value to an
empty range: maximum $maximumValue is less than minimum $minimumValue.")\n  if (this < minimumValue)
return minimumValue\n  if (this > maximumValue) return maximumValue\n  return this\n}\n\n/**\n * Ensures
that this value lies in the specified range [minimumValue]..[maximumValue].\n * \n * @return this value if it's in

```



```
this\n } \n\n", /*\n * Copyright 2010-2022 JetBrains s.r.o. and Kotlin Programming Language contributors.\n * Use of this source code is governed by the Apache 2.0 license that can be found in the license/LICENSE.txt file.\n * \n\n// Auto-generated file. DO NOT EDIT!\n\npackage kotlin\n\nimport kotlin.experimental.*\nimport\nkotlin.jvm.*\n\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class)\n@JvmInline\npublic value class UByte @PublishedApi internal constructor(@PublishedApi internal val data: Byte) :\nComparable<UByte> {\n\n    companion object {\n\n        /*\n        * A constant holding the minimum value an\n        instance of UByte can have.\n        */\n        public const val MIN_VALUE: UByte = UByte(0)\n\n        /*\n        * A constant holding the maximum value an instance of UByte can have.\n        */\n        public const val\n        MAX_VALUE: UByte = UByte(-1)\n\n        /*\n        * The number of bytes used to represent an instance of\n        UByte in a binary form.\n        */\n        public const val SIZE_BYTES: Int = 1\n\n        /*\n        * The number of\n        bits used to represent an instance of UByte in a binary form.\n        */\n        public const val SIZE_BITS: Int = 8\n    }\n\n    /*\n    * Compares this value with the specified value for order.\n    * Returns zero if this value is equal to\n    the specified other value, a negative number if it's less than other,\n    * or a positive number if it's greater than\n    other.\n    */\n    @kotlin.internal.InlineOnly\n    @Suppress("OVERRIDE_BY_INLINE")\n    public override\n    inline operator fun compareTo(other: UByte): Int = this.toInt().compareTo(other.toInt())\n\n    /*\n    * Compares\n    this value with the specified value for order.\n    * Returns zero if this value is equal to the specified other value, a\n    negative number if it's less than other,\n    * or a positive number if it's greater than other.\n    */\n    @kotlin.internal.InlineOnly\n    public inline operator fun compareTo(other: UShort): Int =\n    this.toInt().compareTo(other.toInt())\n\n    /*\n    * Compares this value with the specified value for order.\n    * Returns zero if this value is equal to the specified other value, a negative number if it's less than other,\n    * or a\n    positive number if it's greater than other.\n    */\n    @kotlin.internal.InlineOnly\n    public inline operator fun\n    compareTo(other: UInt): Int = this.toUInt().compareTo(other)\n\n    /*\n    * Compares this value with the\n    specified value for order.\n    * Returns zero if this value is equal to the specified other value, a negative number if\n    it's less than other,\n    * or a positive number if it's greater than other.\n    */\n    @kotlin.internal.InlineOnly\n    public inline operator fun compareTo(other: ULong): Int = this.toULong().compareTo(other)\n\n    /*\n    * Adds the\n    other value to this value.\n    */\n    @kotlin.internal.InlineOnly\n    public inline operator fun plus(other: UByte): UInt =\n    this.toUInt().plus(other.toUInt())\n\n    /*\n    * Adds the other value to this value.\n    */\n    @kotlin.internal.InlineOnly\n    public inline operator fun plus(other: UShort): UInt =\n    this.toUInt().plus(other.toUInt())\n\n    /*\n    * Adds the other value\n    to this value.\n    */\n    @kotlin.internal.InlineOnly\n    public inline operator fun plus(other: UInt): UInt =\n    this.toUInt().plus(other)\n\n    /*\n    * Adds the other value to this value.\n    */\n    @kotlin.internal.InlineOnly\n    public\n    inline operator fun plus(other: ULong): ULong = this.toULong().plus(other)\n\n    /*\n    * Subtracts the other value from\n    this value.\n    */\n    @kotlin.internal.InlineOnly\n    public inline operator fun minus(other: UByte): UInt =\n    this.toUInt().minus(other.toUInt())\n\n    /*\n    * Subtracts the other value from this value.\n    */\n    @kotlin.internal.InlineOnly\n    public inline operator fun minus(other: UShort): UInt =\n    this.toUInt().minus(other.toUInt())\n\n    /*\n    * Subtracts the other value from this value.\n    */\n    @kotlin.internal.InlineOnly\n    public inline operator fun minus(other: UInt): UInt =\n    this.toUInt().minus(other)\n\n    /*\n    * Subtracts the other value from this value.\n    */\n    @kotlin.internal.InlineOnly\n    public inline operator fun\n    minus(other: ULong): ULong = this.toULong().minus(other)\n\n    /*\n    * Multiplies this value by the other value.\n    */\n    @kotlin.internal.InlineOnly\n    public inline operator fun times(other: UByte): UInt =\n    this.toUInt().times(other.toUInt())\n\n    /*\n    * Multiplies this value by the other value.\n    */\n    @kotlin.internal.InlineOnly\n    public inline operator fun times(other: UShort): UInt =\n    this.toUInt().times(other.toUInt())\n\n    /*\n    * Multiplies this value by the other value.\n    */\n    @kotlin.internal.InlineOnly\n    public inline operator fun times(other: UInt): UInt =\n    this.toUInt().times(other)\n\n    /*\n    * Multiplies this value by the other value.\n    */\n    @kotlin.internal.InlineOnly\n    public inline operator fun\n    times(other: ULong): ULong = this.toULong().times(other)\n\n    /*\n    * Divides this value by the other value,\n    truncating the result to an integer that is closer to zero.\n    */\n    @kotlin.internal.InlineOnly\n    public inline operator\n    fun div(other: UByte): UInt = this.toUInt().div(other.toUInt())\n\n    /*\n    * Divides this value by the other value,\n    truncating the result to an integer that is closer to zero.\n    */\n    @kotlin.internal.InlineOnly\n    public inline operator
```

```

fun div(other: UShort): UInt = this.toUInt().div(other.toUInt())\n /** Divides this value by the other value,
truncating the result to an integer that is closer to zero. */\n @kotlin.internal.InlineOnly\n public inline operator
fun div(other: UInt): UInt = this.toUInt().div(other)\n /** Divides this value by the other value, truncating the
result to an integer that is closer to zero. */\n @kotlin.internal.InlineOnly\n public inline operator fun div(other:
ULong): ULong = this.toULong().div(other)\n\n /**\n * Calculates the remainder of truncating division of this
value by the other value.\n * \n * The result is always less than the divisor.\n */\n @kotlin.internal.InlineOnly\n public inline operator fun rem(other: UByte): UInt =
this.toUInt().rem(other.toUInt())\n /**\n * Calculates the remainder of truncating division of this value by the
other value.\n * \n * The result is always less than the divisor.\n */\n @kotlin.internal.InlineOnly\n public
inline operator fun rem(other: UShort): UInt = this.toUInt().rem(other.toUInt())\n /**\n * Calculates the
remainder of truncating division of this value by the other value.\n * \n * The result is always less than the
divisor.\n */\n @kotlin.internal.InlineOnly\n public inline operator fun rem(other: UInt): UInt =
this.toUInt().rem(other)\n /**\n * Calculates the remainder of truncating division of this value by the other
value.\n * \n * The result is always less than the divisor.\n */\n @kotlin.internal.InlineOnly\n public
inline operator fun rem(other: ULong): ULong = this.toULong().rem(other)\n\n /**\n * Divides this value by
the other value, flooring the result to an integer that is closer to negative infinity.\n * \n * For unsigned types,
the results of flooring division and truncating division are the same.\n */\n @kotlin.internal.InlineOnly\n
public inline fun floorDiv(other: UByte): UInt = this.toUInt().floorDiv(other.toUInt())\n /**\n * Divides this
value by the other value, flooring the result to an integer that is closer to negative infinity.\n * \n * For unsigned
types, the results of flooring division and truncating division are the same.\n */\n @kotlin.internal.InlineOnly\n
public inline fun floorDiv(other: UShort): UInt = this.toUInt().floorDiv(other.toUInt())\n /**\n * Divides this
value by the other value, flooring the result to an integer that is closer to negative infinity.\n * \n * For unsigned
types, the results of flooring division and truncating division are the same.\n */\n @kotlin.internal.InlineOnly\n
public inline fun floorDiv(other: UInt): UInt = this.toUInt().floorDiv(other)\n /**\n * Divides this value by the
other value, flooring the result to an integer that is closer to negative infinity.\n * \n * For unsigned types, the
results of flooring division and truncating division are the same.\n */\n @kotlin.internal.InlineOnly\n public
inline fun floorDiv(other: ULong): ULong = this.toULong().floorDiv(other)\n\n /**\n * Calculates the
remainder of flooring division of this value by the other value.\n * \n * The result is always less than the
divisor.\n * \n * For unsigned types, the remainders of flooring division and truncating division are the same.\n
*/\n @kotlin.internal.InlineOnly\n public inline fun mod(other: UByte): UByte =
this.toUInt().mod(other.toUInt()).toUByte()\n /**\n * Calculates the remainder of flooring division of this value
by the other value.\n * \n * The result is always less than the divisor.\n * \n * For unsigned types, the
remainders of flooring division and truncating division are the same.\n */\n @kotlin.internal.InlineOnly\n
public inline fun mod(other: UShort): UShort = this.toUInt().mod(other.toUInt()).toUShort()\n /**\n *
Calculates the remainder of flooring division of this value by the other value.\n * \n * The result is always less
than the divisor.\n * \n * For unsigned types, the remainders of flooring division and truncating division are the
same.\n */\n @kotlin.internal.InlineOnly\n public inline fun mod(other: UInt): UInt =
this.toUInt().mod(other)\n /**\n * Calculates the remainder of flooring division of this value by the other
value.\n * \n * The result is always less than the divisor.\n * \n * For unsigned types, the remainders of
flooring division and truncating division are the same.\n */\n @kotlin.internal.InlineOnly\n public inline fun
mod(other: ULong): ULong = this.toULong().mod(other)\n\n /**\n * Returns this value incremented by one.\n
*\n * @sample samples.misc.Builtins.inc\n */\n @kotlin.internal.InlineOnly\n public inline operator fun
inc(): UByte = UByte(data.inc())\n\n /**\n * Returns this value decremented by one.\n *\n * @sample
samples.misc.Builtins.dec\n */\n @kotlin.internal.InlineOnly\n public inline operator fun dec(): UByte =
UByte(data.dec())\n\n /**\n * Creates a range from this value to the specified [other] value. */\n
@kotlin.internal.InlineOnly\n public inline operator fun rangeTo(other: UByte): UIntRange =
UIntRange(this.toUInt(), other.toUInt())\n\n /**\n * Performs a bitwise AND operation between the two values. */\n
@kotlin.internal.InlineOnly\n public inline infix fun and(other: UByte): UByte = UByte(this.data and other.data)\n

```



```

/** Performs a bitwise OR operation between the two values. */
@kotlin.internal.InlineOnly
public inline infix fun or(other: UByte): UByte = UByte(this.data or other.data)
/** Performs a bitwise XOR operation between the two values. */
@kotlin.internal.InlineOnly
public inline infix fun xor(other: UByte): UByte = UByte(this.data xor other.data)
/** Inverts the bits in this value. */
@kotlin.internal.InlineOnly
public inline fun inv(): UByte = UByte(data.inv())
/**
 * Converts this [UByte] value to [Byte].
 * If this value is less than or equals to [Byte.MAX_VALUE], the resulting `Byte` value represents the same numerical value as this `UByte`. Otherwise the result is negative.
 * The resulting `Byte` value has the same binary representation as this `UByte` value.
 */
@kotlin.internal.InlineOnly
public inline fun toByte(): Byte = data
/**
 * Converts this [UByte] value to [Short].
 * The resulting `Short` value represents the same numerical value as this `UByte`.
 * The least significant 8 bits of the resulting `Short` value are the same as the bits of this `UByte` value, whereas the most significant 8 bits are filled with zeros.
 */
@kotlin.internal.InlineOnly
public inline fun toShort(): Short = data.toShort() and 0xFF
/**
 * Converts this [UByte] value to [Int].
 * The resulting `Int` value represents the same numerical value as this `UByte`.
 * The least significant 8 bits of the resulting `Int` value are the same as the bits of this `UByte` value, whereas the most significant 24 bits are filled with zeros.
 */
@kotlin.internal.InlineOnly
public inline fun toInt(): Int = data.toInt() and 0xFF
/**
 * Converts this [UByte] value to [Long].
 * The resulting `Long` value represents the same numerical value as this `UByte`.
 * The least significant 8 bits of the resulting `Long` value are the same as the bits of this `UByte` value, whereas the most significant 56 bits are filled with zeros.
 */
@kotlin.internal.InlineOnly
public inline fun toLong(): Long = data.toLong() and 0xFF
/** Returns this value. */
@kotlin.internal.InlineOnly
public inline fun toUByte(): UByte = this
/**
 * Converts this [UByte] value to [UShort].
 * The resulting `UShort` value represents the same numerical value as this `UByte`.
 * The least significant 8 bits of the resulting `UShort` value are the same as the bits of this `UByte` value, whereas the most significant 8 bits are filled with zeros.
 */
@kotlin.internal.InlineOnly
public inline fun toUShort(): UShort = UShort(data.toShort() and 0xFF)
/**
 * Converts this [UByte] value to [UInt].
 * The resulting `UInt` value represents the same numerical value as this `UByte`.
 * The least significant 8 bits of the resulting `UInt` value are the same as the bits of this `UByte` value, whereas the most significant 24 bits are filled with zeros.
 */
@kotlin.internal.InlineOnly
public inline fun toUInt(): UInt = UInt(data.toInt() and 0xFF)
/**
 * Converts this [UByte] value to [ULong].
 * The resulting `ULong` value represents the same numerical value as this `UByte`.
 * The least significant 8 bits of the resulting `ULong` value are the same as the bits of this `UByte` value, whereas the most significant 56 bits are filled with zeros.
 */
@kotlin.internal.InlineOnly
public inline fun toULong(): ULong = ULong(data.toLong() and 0xFF)
/**
 * Converts this [UByte] value to [Float].
 */
@kotlin.internal.InlineOnly
public inline fun toFloat(): Float = this.toInt().toFloat()
/**
 * Converts this [UByte] value to [Double].
 */
@kotlin.internal.InlineOnly
public inline fun toDouble(): Double = this.toInt().toDouble()
public override fun toString(): String = toInt().toString()
/**
 * Converts this [Byte] value to [UByte].
 * If this value is positive, the resulting `UByte` value represents the same numerical value as this `Byte`.
 * The resulting `UByte` value has the same binary representation as this `Byte` value.
 */
@SinceKotlin("1.5")
@WasExperimental(ExperimentalUnsignedTypes::class)
@kotlin.internal.InlineOnly
public inline fun Byte.toUByte(): UByte = UByte(this)
/**
 * Converts this [Short] value to [UByte].
 * If this value is positive and less than or equals to [UByte.MAX_VALUE], the resulting `UByte` value represents the same numerical value as this `Short`.
 * The resulting `UByte` value is represented by the least significant 8 bits of this `Short` value.
 */
@SinceKotlin("1.5")
@WasExperimental(ExperimentalUnsignedTypes::class)
@kotlin.internal.InlineOnly
public inline fun Short.toUByte(): UByte = UByte(this.toByte())
/**
 * Converts this [Int] value to [UByte].
 */

```

```

*\n * If this value is positive and less than or equals to [UByte.MAX_VALUE], the resulting `UByte` value
represents\n * the same numerical value as this `Int`. \n *\n * The resulting `UByte` value is represented by the least
significant 8 bits of this `Int` value.\n
*\n @SinceKotlin("1.5")\n @WasExperimental(ExperimentalUnsignedTypes::class)\n @kotlin.internal.InlineOnly\n public inline fun Int.toUByte(): UByte = UByte(this.toByte())\n *\n * Converts this [Long] value to [UByte].\n
*\n * If this value is positive and less than or equals to [UByte.MAX_VALUE], the resulting `UByte` value
represents\n * the same numerical value as this `Long`. \n *\n * The resulting `UByte` value is represented by the
least significant 8 bits of this `Long` value.\n
*\n @SinceKotlin("1.5")\n @WasExperimental(ExperimentalUnsignedTypes::class)\n @kotlin.internal.InlineOnly\n
public inline fun Long.toUByte(): UByte = UByte(this.toByte())\n ,"/*\n * Copyright 2010-2022 JetBrains s.r.o.
and Kotlin Programming Language contributors.\n * Use of this source code is governed by the Apache 2.0 license
that can be found in the license/LICENSE.txt file.\n */\n\n// Auto-generated file. DO NOT EDIT!\n\npackage
kotlin\n\nimport kotlin.experimental.*\nimport
kotlin.jvm.*\n\n @SinceKotlin("1.5")\n @WasExperimental(ExperimentalUnsignedTypes::class)\n @JvmInline\npu
blic value class UInt @PublishedApi internal constructor(@PublishedApi internal val data: Int) :
Comparable<UInt> {\n\n    companion object {\n\n        /**\n         * A constant holding the minimum value an
instance of UInt can have.\n         */\n        public const val MIN_VALUE: UInt = UInt(0)\n\n        /**\n         * A
constant holding the maximum value an instance of UInt can have.\n         */\n        public const val MAX_VALUE:
UInt = UInt(-1)\n\n        /**\n         * The number of bytes used to represent an instance of UInt in a binary form.\n
         */\n        public const val SIZE_BYTES: Int = 4\n\n        /**\n         * The number of bits used to represent an
instance of UInt in a binary form.\n         */\n        public const val SIZE_BITS: Int = 32\n    }\n\n    /**\n     *
Compares this value with the specified value for order.\n     * Returns zero if this value is equal to the specified other
value, a negative number if it's less than other,\n     * or a positive number if it's greater than other.\n     */\n
    @kotlin.internal.InlineOnly\n    public inline operator fun compareTo(other: UByte): Int =
this.compareTo(other.toUInt())\n\n    /**\n     * Compares this value with the specified value for order.\n     *
Returns zero if this value is equal to the specified other value, a negative number if it's less than other,\n     * or a
positive number if it's greater than other.\n     */\n    @kotlin.internal.InlineOnly\n    public inline operator fun
compareTo(other: UShort): Int = this.compareTo(other.toUInt())\n\n    /**\n     * Compares this value with the
specified value for order.\n     * Returns zero if this value is equal to the specified other value, a negative number if
it's less than other,\n     * or a positive number if it's greater than other.\n     */\n    @kotlin.internal.InlineOnly\n
    @Suppress("OVERRIDE_BY_INLINE")\n    public override inline operator fun compareTo(other: UInt): Int =
uintCompare(this.data, other.data)\n\n    /**\n     * Compares this value with the specified value for order.\n     *
Returns zero if this value is equal to the specified other value, a negative number if it's less than other,\n     * or a
positive number if it's greater than other.\n     */\n    @kotlin.internal.InlineOnly\n    public inline operator fun
compareTo(other: ULong): Int = this.toULong().compareTo(other)\n\n    /**\n     * Adds the other value to this value. */\n
    @kotlin.internal.InlineOnly\n    public inline operator fun plus(other: UByte): UInt = this.plus(other.toUInt())\n
    /**\n     * Adds the other value to this value. */\n    @kotlin.internal.InlineOnly\n    public inline operator fun
plus(other:
UShort): UInt = this.plus(other.toUInt())\n    /**\n     * Adds the other value to this value. */\n    @kotlin.internal.InlineOnly\n
    public inline operator fun plus(other: UInt): UInt = UInt(this.data.plus(other.data))\n
    /**\n     * Adds the other value to this value. */\n    @kotlin.internal.InlineOnly\n    public inline operator fun
plus(other:
ULong): ULong = this.toULong().plus(other)\n\n    /**\n     * Subtracts the other value from this value. */\n    @kotlin.internal.InlineOnly\n
    public inline operator fun minus(other: UByte): UInt = this.minus(other.toUInt())\n
    /**\n     * Subtracts the other value from this value. */\n    @kotlin.internal.InlineOnly\n    public inline operator
fun
minus(other: UShort): UInt = this.minus(other.toUInt())\n    /**\n     * Subtracts the other value from this value. */\n
    @kotlin.internal.InlineOnly\n    public inline operator fun minus(other: UInt): UInt =
UInt(this.data.minus(other.data))\n
    /**\n     * Subtracts the other value from this value. */\n    @kotlin.internal.InlineOnly\n    public inline operator
fun
minus(other: ULong): ULong =
this.toULong().minus(other)\n\n    /**\n     * Multiplies this value by the other value. */\n    @kotlin.internal.InlineOnly\n

```

```

public inline operator fun times(other: UByte): UInt = this.times(other.toInt())\n /** Multiplies this value by the
other value. */\n @kotlin.internal.InlineOnly\n public inline operator fun times(other: UShort): UInt =
this.times(other.toInt())\n /** Multiplies this value by the other value. */\n @kotlin.internal.InlineOnly\n
public inline operator fun times(other: UInt): UInt = UInt(this.data.times(other.data))\n /** Multiplies this value
by the other value. */\n @kotlin.internal.InlineOnly\n public inline operator fun times(other: ULong): ULong =
this.toULong().times(other)\n\n /** Divides this value by the other value, truncating the result to an integer that is
closer to zero. */\n @kotlin.internal.InlineOnly\n public inline operator fun div(other: UByte): UInt =
this.div(other.toInt())\n /** Divides this value by the other value, truncating the result to an integer that is closer
to zero. */\n @kotlin.internal.InlineOnly\n public inline operator fun div(other: UShort): UInt =
this.div(other.toInt())\n /** Divides this value by the other value, truncating the result to an integer that is closer
to zero. */\n @kotlin.internal.InlineOnly\n public inline operator fun div(other: UInt): UInt = uintDivide(this,
other)\n /** Divides this value by the other value, truncating the result to an integer that is closer to zero. */\n
@kotlin.internal.InlineOnly\n public inline operator fun div(other: ULong): ULong =
this.toULong().div(other)\n\n /**\n * Calculates the remainder of truncating division of this value by the other
value.\n * \n * The result is always less than the divisor.\n */\n @kotlin.internal.InlineOnly\n public
inline operator fun rem(other: UByte): UInt = this.rem(other.toInt())\n /**\n * Calculates the remainder of
truncating division of this value by the other value.\n * \n * The result is always less than the divisor.\n */\n
@kotlin.internal.InlineOnly\n public inline operator fun rem(other: UShort): UInt = this.rem(other.toInt())\n
/**\n * Calculates the remainder of truncating division of this value by the other value.\n * \n * The result is
always less than the divisor.\n */\n @kotlin.internal.InlineOnly\n public inline operator fun rem(other: UInt):
UInt = uintRemainder(this, other)\n /**\n * Calculates the remainder of truncating division of this value by the
other value.\n * \n * The result is always less than the divisor.\n */\n @kotlin.internal.InlineOnly\n public
inline operator fun rem(other: ULong): ULong = this.toULong().rem(other)\n\n /**\n * Divides this value by
the other value, flooring the result to an integer that is closer to negative infinity.\n * \n * For unsigned types,
the results of flooring division and truncating division are the same.\n */\n @kotlin.internal.InlineOnly\n
public inline fun floorDiv(other: UByte): UInt = this.floorDiv(other.toInt())\n /**\n * Divides this value by the
other value, flooring the result to an integer that is closer to negative infinity.\n * \n * For unsigned types, the
results of flooring division and truncating division are the same.\n */\n @kotlin.internal.InlineOnly\n public
inline fun floorDiv(other: UShort): UInt = this.floorDiv(other.toInt())\n /**\n * Divides this value by the other
value, flooring the result to an integer that is closer to negative infinity.\n * \n * For unsigned types, the results
of flooring division and truncating division are the same.\n */\n @kotlin.internal.InlineOnly\n public inline
fun floorDiv(other: UInt): UInt = div(other)\n /**\n * Divides this value by the other value, flooring the result to
an integer that is closer to negative infinity.\n * \n * For unsigned types, the results of flooring division and
truncating division are the same.\n */\n @kotlin.internal.InlineOnly\n public inline fun floorDiv(other:
ULong): ULong = this.toULong().floorDiv(other)\n\n /**\n * Calculates the remainder of flooring division of
this value by the other value.\n * \n * The result is always less than the divisor.\n * \n * For unsigned
types, the remainders of flooring division and truncating division are the same.\n */\n
@kotlin.internal.InlineOnly\n public inline fun mod(other: UByte): UByte = this.mod(other.toInt()).toUByte()\n
/**\n * Calculates the remainder of flooring division of this value by the other value.\n * \n * The result is
always less than the divisor.\n * \n * For unsigned types, the remainders of flooring division and truncating
division are the same.\n */\n @kotlin.internal.InlineOnly\n public inline fun mod(other: UShort): UShort =
this.mod(other.toInt()).toUShort()\n /**\n * Calculates the remainder of flooring division of this value by the
other value.\n * \n * The result is always less than the divisor.\n * \n * For unsigned types, the remainders
of flooring division and truncating division are the same.\n */\n @kotlin.internal.InlineOnly\n public inline
fun mod(other: UInt): UInt = rem(other)\n /**\n * Calculates the remainder of flooring division of this value by
the other value.\n * \n * The result is always less than the divisor.\n * \n * For unsigned types, the
remainders of flooring division and truncating division are the same.\n */\n @kotlin.internal.InlineOnly\n
public inline fun mod(other: ULong): ULong = this.toULong().mod(other)\n\n /**\n * Returns this value

```

```

incremented by one.\n * \n * @sample samples.misc.Builtins.inc\n * \n @kotlin.internal.InlineOnly\n
public inline operator fun inc(): UInt = UInt(data.inc())\n\n /**\n * Returns this value decremented by one.\n
*\n * @sample samples.misc.Builtins.dec\n * \n @kotlin.internal.InlineOnly\n public inline operator fun
dec(): UInt = UInt(data.dec())\n\n /** Creates a range from this value to the specified [other] value. *\n
@kotlin.internal.InlineOnly\n public inline operator fun rangeTo(other: UInt): UIntRange = UIntRange(this,
other)\n\n /**\n * Shifts this value left by the [bitCount] number of bits.\n * \n * Note that only the five
lowest-order bits of the [bitCount] are used as the shift distance.\n * The shift distance actually used is therefore
always in the range `0..31`.\n * \n @kotlin.internal.InlineOnly\n public inline infix fun shl(bitCount: Int): UInt
= UInt(data shl bitCount)\n\n /**\n * Shifts this value right by the [bitCount] number of bits, filling the leftmost
bits with zeros.\n * \n * Note that only the five lowest-order bits of the [bitCount] are used as the shift
distance.\n * The shift distance actually used is therefore always in the range `0..31`.\n * \n
@kotlin.internal.InlineOnly\n public inline infix fun shr(bitCount: Int): UInt = UInt(data ushr bitCount)\n\n /**
Performs a bitwise AND operation between the two values. *\n @kotlin.internal.InlineOnly\n public inline infix
fun and(other: UInt): UInt = UInt(this.data and other.data)\n\n /** Performs a bitwise OR operation between the two
values. *\n @kotlin.internal.InlineOnly\n public inline infix fun or(other: UInt): UInt = UInt(this.data or
other.data)\n\n /** Performs a bitwise XOR operation between the two values. *\n @kotlin.internal.InlineOnly\n
public inline infix fun xor(other: UInt): UInt = UInt(this.data xor other.data)\n\n /** Inverts the bits in this value.
*\n @kotlin.internal.InlineOnly\n public inline fun inv(): UInt = UInt(data.inv())\n\n /**\n * Converts this
[UInt] value to [Byte].\n * \n * If this value is less than or equals to [Byte.MAX_VALUE], the resulting `Byte`
value represents\n * the same numerical value as this `UInt`.\n * \n * The resulting `Byte` value is
represented by the least significant 8 bits of this `UInt` value.\n * Note that the resulting `Byte` value may be
negative.\n * \n @kotlin.internal.InlineOnly\n public inline fun toByte(): Byte = data.toByte()\n\n /**\n *
Converts this [UInt] value to [Short].\n * \n * If this value is less than or equals to [Short.MAX_VALUE], the
resulting `Short` value represents\n * the same numerical value as this `UInt`.\n * \n * The resulting `Short`
value is represented by the least significant 16 bits of this `UInt` value.\n * Note that the resulting `Short` value
may be negative.\n * \n @kotlin.internal.InlineOnly\n public inline fun toShort(): Short = data.toShort()\n\n /**\n
* Converts this [UInt] value to [Int].\n * \n * If this value is less than or equals to [Int.MAX_VALUE], the
resulting `Int` value represents\n * the same numerical value as this `UInt`. Otherwise the result is negative.\n
*\n * The resulting `Int` value has the same binary representation as this `UInt` value.\n * \n
@kotlin.internal.InlineOnly\n public inline fun toInt(): Int = data\n\n /**\n * Converts this [UInt] value to
[Long].\n * \n * The resulting `Long` value represents the same numerical value as this `UInt`.\n * \n * The
least significant 32 bits of the resulting `Long` value are the same as the bits of this `UInt` value,\n * whereas the
most significant 32 bits are filled with zeros.\n * \n @kotlin.internal.InlineOnly\n public inline fun toLong():
Long = data.toLong() and 0xFFFF_FFFF\n\n /**\n * Converts this [UInt] value to [UByte].\n * \n * If this
value is less than or equals to [UByte.MAX_VALUE], the resulting `UByte` value represents\n * the same
numerical value as this `UInt`.\n * \n * The resulting `UByte` value is represented by the least significant 8 bits
of this `UInt` value.\n * \n @kotlin.internal.InlineOnly\n public inline fun toUByte(): UByte =
data.toUByte()\n\n /**\n * Converts this [UInt] value to [UShort].\n * \n * If this value is less than or equals
to [UShort.MAX_VALUE], the resulting `UShort` value represents\n * the same numerical value as this `UInt`.\n
*\n * The resulting `UShort` value is represented by the least significant 16 bits of this `UInt` value.\n * \n
@kotlin.internal.InlineOnly\n public inline fun toUShort(): UShort = data.toUShort()\n\n /** Returns this value.
*\n @kotlin.internal.InlineOnly\n public inline fun toUInt(): UInt = this\n\n /**\n * Converts this [UInt] value
to [ULong].\n * \n * The resulting `ULong` value represents the same numerical value as this `UInt`.\n * \n
*\n * The least significant 32 bits of the resulting `ULong` value are the same as the bits of this `UInt` value,\n
*\n * whereas the most significant 32 bits are filled with zeros.\n * \n @kotlin.internal.InlineOnly\n public inline
fun toULong(): ULong = ULong(data.toLong() and 0xFFFF_FFFF)\n\n /**\n * Converts this [UInt] value to
[Float].\n * \n * The resulting value is the closest `Float` to this `UInt` value.\n * In case when this `UInt`
value is exactly between two `Float`s,\n * the one with zero at least significant bit of mantissa is selected.\n * \n

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```

    @kotlin.internal.InlineOnly public inline fun toFloat(): Float = this.toDouble().toFloat()
    /**
     * Converts this [UInt] value to [Double].
     * The resulting `Double` value represents the same numerical value as this
     * `UInt`.
     */
    @kotlin.internal.InlineOnly public inline fun toDouble(): Double = uintToDouble(data)
    public override fun toString(): String = toLong().toString()
    /**
     * Converts this [Byte] value to [UInt].
     * If this value is positive, the resulting `UInt` value represents the same numerical value as this `Byte`.
     * The least significant 8 bits of the resulting `UInt` value are the same as the bits of this `Byte` value,
     * whereas the most significant 24 bits are filled with the sign bit of this value.
     */
    @SinceKotlin("1.5") @WasExperimental(ExperimentalUnsignedTypes::class) @kotlin.internal.InlineOnly
    public inline fun Byte.toUInt(): UInt = UInt(this.toInt())
    /**
     * Converts this [Short] value to [UInt].
     * If this value is positive, the resulting `UInt` value represents the same numerical value as this `Short`.
     * The least significant 16 bits of the resulting `UInt` value are the same as the bits of this `Short` value,
     * whereas the most significant 16 bits are filled with the sign bit of this value.
     */
    @SinceKotlin("1.5") @WasExperimental(ExperimentalUnsignedTypes::class) @kotlin.internal.InlineOnly
    public inline fun Short.toUInt(): UInt = UInt(this.toInt())
    /**
     * Converts this [Int] value to [UInt].
     * If this value is positive, the resulting `UInt` value represents the same numerical value as this `Int`.
     * The resulting `UInt` value has the same binary representation as this `Int` value.
     */
    @SinceKotlin("1.5") @WasExperimental(ExperimentalUnsignedTypes::class) @kotlin.internal.InlineOnly
    public inline fun Int.toUInt(): UInt = UInt(this)
    /**
     * Converts this [Long] value to [UInt].
     * If this value is positive and less than or equals to [UInt.MAX_VALUE], the resulting `UInt` value represents
     * the same numerical value as this `Long`.
     * The resulting `UInt` value is represented by the least significant 32 bits of
     * this `Long` value.
     */
    @SinceKotlin("1.5") @WasExperimental(ExperimentalUnsignedTypes::class) @kotlin.internal.InlineOnly
    public inline fun Long.toUInt(): UInt = UInt(this.toInt())
    /**
     * Converts this [Float] value to [UInt].
     * The fractional part, if any, is rounded down towards zero.
     * Returns zero if this `Float` value is negative or `NaN`,
     * [UInt.MAX_VALUE] if it's bigger than `UInt.MAX_VALUE`.
     */
    @SinceKotlin("1.5") @WasExperimental(ExperimentalUnsignedTypes::class) @kotlin.internal.InlineOnly
    public inline fun Float.toUInt(): UInt = doubleToUInt(this.toDouble())
    /**
     * Converts this [Double] value to [UInt].
     * The fractional part, if any, is rounded down towards zero.
     * Returns zero if this `Double` value is
     * negative or `NaN`, [UInt.MAX_VALUE] if it's bigger than `UInt.MAX_VALUE`.
     */
    @SinceKotlin("1.5") @WasExperimental(ExperimentalUnsignedTypes::class) @kotlin.internal.InlineOnly
    public inline fun Double.toUInt(): UInt = doubleToUInt(this)
    /**
     * Copyright 2010-2022 JetBrains s.r.o. and
     * Kotlin Programming Language contributors.
     * Use of this source code is governed by the Apache 2.0 license that
     * can be found in the license/LICENSE.txt file.
     */
    // Auto-generated file. DO NOT EDIT!
    package
    kotlin
    import kotlin.experimental.*
    import
    kotlin.jvm.*
    @SinceKotlin("1.5") @WasExperimental(ExperimentalUnsignedTypes::class) @JvmInline
    public value class UShort @PublishedApi internal constructor(@PublishedApi internal val data: Short) :
    Comparable<UShort> {
        companion object {
            /**
             * A constant holding the minimum value an
             * instance of UShort can have.
             */
            public const val MIN_VALUE: UShort = UShort(0)
            /**
             * A constant holding the maximum value an instance of UShort can have.
             */
            public const val
            MAX_VALUE: UShort = UShort(-1)
            /**
             * The number of bytes used to represent an instance of
             * UShort in a binary form.
             */
            public const val SIZE_BYTES: Int = 2
            /**
             * The number of
            bits used to represent an instance of UShort in a binary form.
             */
            public const val SIZE_BITS: Int =
            16
        }
        /**
         * Compares this value with the specified value for order.
         * Returns zero if this value is
         * equal to the specified other value, a negative number if it's less than other,
         * or a positive number if it's greater
         * than other.
         */
        @kotlin.internal.InlineOnly public inline operator fun compareTo(other: UByte): Int =
        this.toInt().compareTo(other.toInt())
        /**
         * Compares this value with the specified value for order.
         * Returns zero if this value is equal to the specified other value, a negative number if it's less than other,
         * or a
         * positive number if it's greater than other.
         */
        @kotlin.internal.InlineOnly

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@Suppress("OVERRIDE_BY_INLINE")\n public override inline operator fun compareTo(other: UShort): Int =
this.toInt().compareTo(other.toInt())\n\n /**\n * Compares this value with the specified value for order.\n *
Returns zero if this value is equal to the specified other value, a negative number if it's less than other,\n * or a
positive number if it's greater than other.\n */\n @kotlin.internal.InlineOnly\n public inline operator fun
compareTo(other: UInt): Int = this.toUInt().compareTo(other)\n\n /**\n * Compares this value with the
specified value for order.\n * Returns zero if this value is equal to the specified other value, a negative number if
it's less than other,\n * or a positive number if it's greater than other.\n */\n @kotlin.internal.InlineOnly\n
public inline operator fun compareTo(other: ULong): Int = this.toULong().compareTo(other)\n\n /** Adds the
other value to this value. *\n @kotlin.internal.InlineOnly\n public inline operator fun plus(other: UByte): UInt =
this.toUInt().plus(other.toUInt())\n\n /** Adds the other value to this value. *\n @kotlin.internal.InlineOnly\n
public inline operator fun plus(other: UShort): UInt = this.toUInt().plus(other.toUInt())\n\n /** Adds the other value
to this value. *\n @kotlin.internal.InlineOnly\n public inline operator fun plus(other: UInt): UInt =
this.toUInt().plus(other)\n\n /** Adds the other value to this value. *\n @kotlin.internal.InlineOnly\n public
inline operator fun plus(other: ULong): ULong = this.toULong().plus(other)\n\n /** Subtracts the other value from
this value. *\n @kotlin.internal.InlineOnly\n public inline operator fun minus(other: UByte): UInt =
this.toUInt().minus(other.toUInt())\n\n /** Subtracts the other value from this value. *\n
@kotlin.internal.InlineOnly\n public inline operator fun minus(other: UShort): UInt =
this.toUInt().minus(other.toUInt())\n\n /** Subtracts the other value from this value. *\n
@kotlin.internal.InlineOnly\n public inline operator fun minus(other: UInt): UInt = this.toUInt().minus(other)\n\n
/** Subtracts the other value from this value. *\n @kotlin.internal.InlineOnly\n public inline operator fun
minus(other: ULong): ULong = this.toULong().minus(other)\n\n /** Multiplies this value by the other value. *\n
@kotlin.internal.InlineOnly\n public inline operator fun times(other: UByte): UInt =
this.toUInt().times(other.toUInt())\n\n /** Multiplies this value by the other value. *\n
@kotlin.internal.InlineOnly\n public inline operator fun times(other: UShort): UInt =
this.toUInt().times(other.toUInt())\n\n /** Multiplies this value by the other value. *\n
@kotlin.internal.InlineOnly\n public inline operator fun times(other: UInt): UInt = this.toUInt().times(other)\n\n
/** Multiplies this value by the other value. *\n @kotlin.internal.InlineOnly\n public inline operator fun
times(other: ULong): ULong = this.toULong().times(other)\n\n /** Divides this value by the other value,
truncating the result to an integer that is closer to zero. *\n @kotlin.internal.InlineOnly\n public inline operator
fun div(other: UByte): UInt = this.toUInt().div(other.toUInt())\n\n /** Divides this value by the other value,
truncating the result to an integer that is closer to zero. *\n @kotlin.internal.InlineOnly\n public inline operator
fun div(other: UShort): UInt = this.toUInt().div(other.toUInt())\n\n /** Divides this value by the other value,
truncating the result to an integer that is closer to zero. *\n @kotlin.internal.InlineOnly\n public inline operator
fun div(other: UInt): UInt = this.toUInt().div(other)\n\n /** Divides this value by the other value, truncating the
result to an integer that is closer to zero. *\n @kotlin.internal.InlineOnly\n public inline operator fun div(other:
ULong): ULong = this.toULong().div(other)\n\n /**\n * Calculates the remainder of truncating division of this
value by the other value.\n * \n * The result is always less than the divisor.\n */\n
@kotlin.internal.InlineOnly\n public inline operator fun rem(other: UByte): UInt =
this.toUInt().rem(other.toUInt())\n\n /**\n * Calculates the remainder of truncating division of this value by the
other value.\n * \n * The result is always less than the divisor.\n */\n @kotlin.internal.InlineOnly\n public
inline operator fun rem(other: UShort): UInt = this.toUInt().rem(other.toUInt())\n\n /**\n * Calculates the
remainder of truncating division of this value by the other value.\n * \n * The result is always less than the
divisor.\n */\n @kotlin.internal.InlineOnly\n public inline operator fun rem(other: UInt): UInt =
this.toUInt().rem(other)\n\n /**\n * Calculates the remainder of truncating division of this value by the other
value.\n * \n * The result is always less than the divisor.\n */\n @kotlin.internal.InlineOnly\n public
inline operator fun rem(other: ULong): ULong = this.toULong().rem(other)\n\n /**\n * Divides this value by
the other value, flooring the result to an integer that is closer to negative infinity.\n * \n * For unsigned types,
the results of flooring division and truncating division are the same.\n */\n @kotlin.internal.InlineOnly\n

```

```

public inline fun floorDiv(other: UByte): UInt = this.toUInt().floorDiv(other.toUInt())\n /**\n * Divides this
value by the other value, flooring the result to an integer that is closer to negative infinity.\n *\n * For unsigned
types, the results of flooring division and truncating division are the same.\n */\n @kotlin.internal.InlineOnly\n
public inline fun floorDiv(other: UShort): UInt = this.toUInt().floorDiv(other.toUInt())\n /**\n * Divides this
value by the other value, flooring the result to an integer that is closer to negative infinity.\n *\n * For unsigned
types, the results of flooring division and truncating division are the same.\n */\n @kotlin.internal.InlineOnly\n
public inline fun floorDiv(other: UInt): UInt = this.toUInt().floorDiv(other)\n /**\n * Divides this value by the
other value, flooring the result to an integer that is closer to negative infinity.\n *\n * For unsigned types, the
results of flooring division and truncating division are the same.\n */\n @kotlin.internal.InlineOnly\n public
inline fun floorDiv(other: ULong): ULong = this.toULong().floorDiv(other)\n\n /**\n * Calculates the
remainder of flooring division of this value by the other value.\n *\n * The result is always less than the
divisor.\n *\n * For unsigned types, the remainders of flooring division and truncating division are the same.\n
*/\n @kotlin.internal.InlineOnly\n public inline fun mod(other: UByte): UByte =
this.toUInt().mod(other.toUInt()).toUByte()\n /**\n * Calculates the remainder of flooring division of this value
by the other value.\n *\n * The result is always less than the divisor.\n *\n * For unsigned types, the
remainders of flooring division and truncating division are the same.\n */\n @kotlin.internal.InlineOnly\n
public inline fun mod(other: UShort): UShort = this.toUInt().mod(other.toUInt()).toUShort()\n /**\n *
Calculates the remainder of flooring division of this value by the other value.\n *\n * The result is always less
than the divisor.\n *\n * For unsigned types, the remainders of flooring division and truncating division are the
same.\n */\n @kotlin.internal.InlineOnly\n public inline fun mod(other: UInt): UInt =
this.toUInt().mod(other)\n /**\n * Calculates the remainder of flooring division of this value by the other
value.\n *\n * The result is always less than the divisor.\n *\n * For unsigned types, the remainders of
flooring division and truncating division are the same.\n */\n @kotlin.internal.InlineOnly\n public inline fun
mod(other: ULong): ULong = this.toULong().mod(other)\n\n /**\n * Returns this value incremented by one.\n
*/\n * @sample samples.misc.Builtins.inc\n */\n @kotlin.internal.InlineOnly\n public inline operator fun
inc(): UShort = UShort(data.inc())\n\n /**\n * Returns this value decremented by one.\n */\n * @sample
samples.misc.Builtins.dec\n */\n @kotlin.internal.InlineOnly\n public inline operator fun dec(): UShort =
UShort(data.dec())\n\n /**\n * Creates a range from this value to the specified [other] value. */\n
@kotlin.internal.InlineOnly\n public inline operator fun rangeTo(other: UShort): UIntRange =
UIntRange(this.toUInt(), other.toUInt())\n\n /**\n * Performs a bitwise AND operation between the two values. */\n
@kotlin.internal.InlineOnly\n public inline infix fun and(other: UShort): UShort = UShort(this.data and
other.data)\n\n /**\n * Performs a bitwise OR operation between the two values. */\n @kotlin.internal.InlineOnly\n
public inline infix fun or(other: UShort): UShort = UShort(this.data or other.data)\n\n /**\n * Performs a bitwise XOR
operation between the two values. */\n @kotlin.internal.InlineOnly\n public inline infix fun xor(other: UShort):
UShort = UShort(this.data xor other.data)\n\n /**\n * Inverts the bits in this value. */\n @kotlin.internal.InlineOnly\n
public inline fun inv(): UShort = UShort(data.inv())\n\n /**\n * Converts this [UShort] value to [Byte].\n *\n
* If this value is less than or equals to [Byte.MAX_VALUE], the resulting `Byte` value represents\n * the same
numerical value as this `UShort`.\n *\n * The resulting `Byte` value is represented by the least significant 8 bits
of this `UShort` value.\n *\n * Note that the resulting `Byte` value may be negative.\n */\n
@kotlin.internal.InlineOnly\n public inline fun toByte(): Byte = data.toByte()\n\n /**\n * Converts this [UShort]
value to [Short].\n *\n * If this value is less than or equals to [Short.MAX_VALUE], the resulting `Short` value
represents\n * the same numerical value as this `UShort`. Otherwise the result is negative.\n *\n * The
resulting `Short` value has the same binary representation as this `UShort` value.\n */\n
@kotlin.internal.InlineOnly\n public inline fun toShort(): Short = data\n\n /**\n * Converts this [UShort] value
to [Int].\n *\n * The resulting `Int` value represents the same numerical value as this `UShort`.\n *\n * The
least significant 16 bits of the resulting `Int` value are the same as the bits of this `UShort` value,\n * whereas
the most significant 16 bits are filled with zeros.\n */\n @kotlin.internal.InlineOnly\n public inline fun toInt(): Int
= data.toInt() and 0xFFFF\n\n /**\n * Converts this [UShort] value to [Long].\n *\n * The resulting `Long`

```

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value represents the same numerical value as this `UShort`.
 * The least significant 16 bits of the resulting
`Long` value are the same as the bits of this `UShort` value,
 * whereas the most significant 48 bits are filled
with zeros.
 * @kotlin.internal.InlineOnly
 public inline fun toLong(): Long = data.toLong() and
0xFFFF
 /**
 * Converts this [UShort] value to [UByte].
 * If this value is less than or equals to
[UByte.MAX_VALUE], the resulting `UByte` value represents
 * the same numerical value as this `UShort`.
 * The resulting `UByte` value is represented by the least significant 8 bits of this `UShort` value.
 * @kotlin.internal.InlineOnly
 public inline fun toUByte(): UByte = data.toUByte()
 /** Returns this value.
 * @kotlin.internal.InlineOnly
 public inline fun toUShort(): UShort = this
 /**
 * Converts this [UShort]
value to [UInt].
 * The resulting `UInt` value represents the same numerical value as this `UShort`.
 * The least significant 16 bits of the resulting `UInt` value are the same as the bits of this `UShort` value,
 * whereas the most significant 16 bits are filled with zeros.
 * @kotlin.internal.InlineOnly
 public inline
fun toUInt(): UInt = UInt(data.toInt() and 0xFFFF)
 /**
 * Converts this [UShort] value to [ULong].
 * The resulting `ULong` value represents the same numerical value as this `UShort`.
 * The least
significant 16 bits of the resulting `ULong` value are the same as the bits of this `UShort` value,
 * whereas the
most significant 48 bits are filled with zeros.
 * @kotlin.internal.InlineOnly
 public inline fun toULong():
ULong = ULong(data.toLong() and 0xFFFF)
 /**
 * Converts this [UShort] value to [Float].
 * The resulting `Float` value represents the same numerical value as this `UShort`.
 * @kotlin.internal.InlineOnly
 public inline fun toFloat(): Float = this.toInt().toFloat()
 /**
 * Converts this
[UShort] value to [Double].
 * The resulting `Double` value represents the same numerical value as this
`UShort`.
 * @kotlin.internal.InlineOnly
 public inline fun toDouble(): Double =
this.toInt().toDouble()
 public override fun toString(): String = toInt().toString()
 /**
 * Converts this
[Byte] value to [UShort].
 * If this value is positive, the resulting `UShort` value represents the same numerical
value as this `Byte`.
 * The least significant 8 bits of the resulting `UShort` value are the same as the bits of this
`Byte` value,
 * whereas the most significant 8 bits are filled with the sign bit of this value.
 * @SinceKotlin("1.5")
 @WasExperimental(ExperimentalUnsignedTypes::class)
 @kotlin.internal.InlineOnly
 public inline fun Byte.toUShort(): UShort = UShort(this.toShort())
 /**
 * Converts this [Short] value to
[UShort].
 * If this value is positive, the resulting `UShort` value represents the same numerical value as this
`Short`.
 * The resulting `UShort` value has the same binary representation as this `Short` value.
 * @SinceKotlin("1.5")
 @WasExperimental(ExperimentalUnsignedTypes::class)
 @kotlin.internal.InlineOnly
 public inline fun Short.toUShort(): UShort = UShort(this)
 /**
 * Converts this [Int] value to [UShort].
 * If
this value is positive and less than or equals to [UShort.MAX_VALUE], the resulting `UShort` value represents
 * the same numerical value as this `Int`.
 * The resulting `UShort` value is represented by the least significant 16
bits of this `Int` value.
 * @SinceKotlin("1.5")
 @WasExperimental(ExperimentalUnsignedTypes::class)
 @kotlin.internal.InlineOnly
 public inline fun Int.toUShort(): UShort = UShort(this.toShort())
 /**
 * Converts this [Long] value to
[UShort].
 * If this value is positive and less than or equals to [UShort.MAX_VALUE], the resulting `UShort`
value represents
 * the same numerical value as this `Long`.
 * The resulting `UShort` value is represented by
the least significant 16 bits of this `Long` value.
 * @SinceKotlin("1.5")
 @WasExperimental(ExperimentalUnsignedTypes::class)
 @kotlin.internal.InlineOnly
 public inline fun Long.toUShort(): UShort = UShort(this.toShort())
",
/**
 * Copyright 2010-2022 JetBrains s.r.o.
and Kotlin Programming Language contributors.
 * Use of this source code is governed by the Apache 2.0 license
that can be found in the license/LICENSE.txt file.
 * @Auto-generated file. DO NOT EDIT!
 * package
kotlin.ranges
 /**
 * A range of values of type `Char`.
 * @public class CharRange(start: Char, endInclusive:
Char) : CharProgression(start, endInclusive, 1), ClosedRange<Char> {
 override val start: Char get() = first
override val endInclusive: Char get() = last
 override fun contains(value: Char): Boolean = first <= value &&
value <= last
 /**
 * Checks whether the range is empty.
 * The range is empty if its start value is
greater than the end value.
 * @override fun isEmpty(): Boolean = first > last
 override fun equals(other:
Any?): Boolean =
other is CharRange && (isEmpty() && other.isEmpty()) ||
first == other.first && last

```


read-only list. The returned list is serializable (JVM).\n * @sample

```

samples.collections.Collections.Lists.emptyReadOnlyList\n *^npublic fun <T> emptyList(): List<T> =
EmptyList\n\n/**\n * Returns a new read-only list of given elements. The returned list is serializable (JVM).\n *
@sample samples.collections.Collections.Lists.readOnlyList\n *^npublic fun <T> listOf(vararg elements: T):
List<T> = if (elements.size > 0) elements.asList() else emptyList()\n\n/**\n * Returns an empty read-only list. The
returned list is serializable (JVM).\n * @sample samples.collections.Collections.Lists.emptyReadOnlyList\n
*^n@kotlin.internal.InlineOnly\npublic inline fun <T> listOf(): List<T> = emptyList()\n\n/**\n * Returns an empty
new [MutableList].\n * @sample samples.collections.Collections.Lists.emptyMutableList\n
*^n@SinceKotlin("1.1")\n@kotlin.internal.InlineOnly\npublic inline fun <T> mutableListOf(): MutableList<T> =
ArrayList()\n\n/**\n * Returns an empty new [ArrayList].\n * @sample
samples.collections.Collections.Lists.emptyArrayList\n
*^n@SinceKotlin("1.1")\n@kotlin.internal.InlineOnly\npublic inline fun <T> arrayListOf(): ArrayList<T> =
ArrayList()\n\n/**\n * Returns a new [MutableList] with the given elements.\n * @sample
samples.collections.Collections.Lists.mutableList\n *^npublic fun <T> mutableListOf(vararg elements: T):
MutableList<T> =\n if (elements.size == 0) ArrayList() else ArrayList(ArrayAsCollection(elements, isVarargs =
true))\n\n/**\n * Returns a new [ArrayList] with the given elements.\n * @sample
samples.collections.Collections.Lists.arrayList\n *^npublic fun <T> arrayListOf(vararg elements: T): ArrayList<T>
=\n if (elements.size == 0) ArrayList() else ArrayList(ArrayAsCollection(elements, isVarargs = true))\n\n/**\n
Returns a new read-only list either of single given element, if it is not null, or empty list if the element is null. The
returned list is serializable (JVM).\n * @sample samples.collections.Collections.Lists.listOfNotNull\n *^npublic fun
<T : Any> listOfNotNull(element: T?): List<T> = if (element != null) listOf(element) else emptyList()\n\n/**\n
Returns a new read-only list only of those given elements, that are not null. The returned list is serializable
(JVM).\n * @sample samples.collections.Collections.Lists.listOfNotNull\n *^npublic fun <T : Any>
listOfNotNull(vararg elements: T?): List<T> = elements.filterNotNull()\n\n/**\n * Creates a new read-only list with
the specified [size], where each element is calculated by calling the specified\n * [init] function.\n * \n * The
function [init] is called for each list element sequentially starting from the first one.\n * It should return the value for
a list element given its index.\n * \n * @sample samples.collections.Collections.Lists.readOnlyListFromInitializer\n
*^n@SinceKotlin("1.1")\n@kotlin.internal.InlineOnly\npublic inline fun <T> List(size: Int, init: (index: Int) -> T):
List<T> = MutableList(size, init)\n\n/**\n * Creates a new mutable list with the specified [size], where each element
is calculated by calling the specified\n * [init] function.\n * \n * The function [init] is called for each list element
sequentially starting from the first one.\n * It should return the value for a list element given its index.\n * \n
* @sample samples.collections.Collections.Lists.mutableListFromInitializer\n
*^n@SinceKotlin("1.1")\n@kotlin.internal.InlineOnly\npublic inline fun <T> MutableList(size: Int, init: (index:
Int) -> T): MutableList<T> {\n val list = ArrayList<T>(size)\n repeat(size) { index -> list.add(init(index)) }\n
return list\n}\n\n/**\n * Builds a new read-only [List] by populating a [MutableList] using the given
[builderAction]\n * and returning a read-only list with the same elements.\n * \n * The list passed as a receiver to the
[builderAction] is valid only inside that function.\n * Using it outside of the function produces an unspecified
behavior.\n * \n * The returned list is serializable (JVM).\n * \n * @sample
samples.collections.Builders.Lists.buildListSample\n
*^n@SinceKotlin("1.6")\n@WasExperimental(ExperimentalStdlibApi::class)\n@kotlin.internal.InlineOnly\npublic
inline fun <E> buildList(@BuilderInference builderAction: MutableList<E>.() -> Unit): List<E> {\n contract {
callsInPlace(builderAction, InvocationKind.EXACTLY_ONCE) }\n return
buildListInternal(builderAction)\n}\n\n@PublishedApi\n@SinceKotlin("1.3")\n@kotlin.internal.InlineOnly\ninternal
expect inline fun <E> buildListInternal(builderAction: MutableList<E>.() -> Unit): List<E>\n\n/**\n * Builds a
new read-only [List] by populating a [MutableList] using the given [builderAction]\n * and returning a read-only list
with the same elements.\n * \n * The list passed as a receiver to the [builderAction] is valid only inside that
function.\n * Using it outside of the function produces an unspecified behavior.\n * \n * The returned list is
serializable (JVM).\n * \n * [capacity] is used to hint the expected number of elements added in the

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[builderAction].\n *\n * @throws IllegalArgumentException if the given [capacity] is negative.\n *\n * @sample
samples.collections.Builders.Lists.buildListSampleWithCapacity\n
*\n@SinceKotlin("1.6")\n@WasExperimental(ExperimentalStdlibApi::class)\n@kotlin.internal.InlineOnly\npublic
c inline fun <E> buildList(capacity: Int, @BuilderInference builderAction: MutableList<E>() -> Unit): List<E> {\n
    contract { callsInPlace(builderAction, InvocationKind.EXACTLY_ONCE) }\n    return buildListInternal(capacity,
builderAction)\n}\n\n@PublishedApi\n@SinceKotlin("1.3")\n@kotlin.internal.InlineOnly\ninternal expect inline
fun <E> buildListInternal(capacity: Int, builderAction: MutableList<E>() -> Unit): List<E>\n\n/**\n * Returns an
[IntRange] of the valid indices for this collection.\n *\n * @sample
samples.collections.Collections.Collections.indicesOfCollection\n *\npublic val Collection<*>.indices: IntRange\n
get() = 0..size - 1\n\n/**\n * Returns the index of the last item in the list or -1 if the list is empty.\n *\n * @sample
samples.collections.Collections.Lists.lastIndexOfList\n *\npublic val <T> List<T>.lastIndex: Int\n    get() =
this.size - 1\n\n/**\n * Returns `true` if the collection is not empty.\n *\n * @sample
samples.collections.Collections.Collections.collectionIsNotEmpty\n *\n@kotlin.internal.InlineOnly\npublic inline
fun <T> Collection<T>.isNotEmpty(): Boolean = !isEmpty()\n\n/**\n * Returns `true` if this nullable collection is
either null or empty.\n *\n * @sample samples.collections.Collections.Collections.collectionIsNullOrEmpty\n
*\n@SinceKotlin("1.3")\n@kotlin.internal.InlineOnly\npublic inline fun <T> Collection<T>?.isNullOrEmpty():
Boolean {\n    contract {\n        returns(false) implies (this@isNullOrEmpty != null)\n    }\n    return this == null ||
this.isEmpty()\n}\n\n/**\n * Returns this Collection if it's not `null` and the empty list otherwise.\n *\n * @sample
samples.collections.Collections.Collections.collectionOrElse\n *\n@kotlin.internal.InlineOnly\npublic inline fun
<T> Collection<T>?.orElse(): Collection<T> = this ?: emptyList()\n\n/**\n * Returns this List if it's not `null` and
the empty list otherwise.\n *\n * @sample samples.collections.Collections.Lists.listOrElse\n
*\n@kotlin.internal.InlineOnly\npublic inline fun <T> List<T>?.orElse(): List<T> = this ?: emptyList()\n\n/**\n
 * Returns this collection if it's not empty\n * or the result of calling [defaultValue] function if the collection is
empty.\n *\n * @sample samples.collections.Collections.Collections.collectionIfEmpty\n
*\n@SinceKotlin("1.3")\n@kotlin.internal.InlineOnly\npublic inline fun <C, R> C.ifEmpty(defaultValue: () ->
R): R where C : Collection<*>, C : R =\n    if (isEmpty()) defaultValue() else this\n\n\n/**\n * Checks if all
elements in the specified collection are contained in this collection.\n *\n * Allows to overcome type-safety
restriction of `containsAll` that requires to pass a collection of type `Collection<E>`.\n *\n * @sample
samples.collections.Collections.Collections.collectionContainsAll\n
*\n@Suppress("EXTENSION_SHADOWED_BY_MEMBER") // false warning, extension takes precedence in
some cases\n@kotlin.internal.InlineOnly\npublic inline fun <@kotlin.internal.OnlyInputTypes T>
Collection<T>.containsAll(elements: Collection<T>): Boolean = this.containsAll(elements)\n\n\n/**\n * Returns a
new list with the elements of this list randomly shuffled\n * using the specified [random] instance as the source of
randomness.\n *\n@SinceKotlin("1.3")\npublic fun <T> Iterable<T>.shuffled(random: Random): List<T> =
toMutableList().apply { shuffle(random) }\n\n\ninternal fun <T> List<T>.optimizeReadOnlyList() = when (size) {\n
    0 -> emptyList()\n    1 -> listOf(this[0])\n    else -> this\n}\n\n\n/**\n * Searches this list or its range for the provided
[element] using the binary search algorithm.\n * The list is expected to be sorted into ascending order according to
the Comparable natural ordering of its elements,\n * otherwise the result is undefined.\n *\n * If the list contains
multiple elements equal to the specified [element], there is no guarantee which one will be found.\n *\n * `null`
value is considered to be less than any non-null value.\n *\n * @return the index of the element, if it is contained in
the list within the specified range;\n * otherwise, the inverted insertion point `(-insertion point - 1)`.\n * The
insertion point is defined as the index at which the element should be inserted,\n * so that the list (or the specified
subrange of list) still remains sorted.\n *\n * @sample
samples.collections.Collections.Lists.binarySearchOnComparable\n *\n * @sample
samples.collections.Collections.Lists.binarySearchWithBoundaries\n *\npublic fun <T : Comparable<T>>
List<T>?.binarySearch(element: T?, fromIndex: Int = 0, toIndex: Int = size): Int {\n    rangeCheck(size, fromIndex,
toIndex)\n    var low = fromIndex\n    var high = toIndex - 1\n    while (low <= high) {\n        val mid = (low +
high).ushr(1) // safe from overflows\n        val midVal = get(mid)\n        val cmp = compareValues(midVal,

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element)\n\n    if (cmp < 0)\n        low = mid + 1\n    else if (cmp > 0)\n        high = mid - 1\n    else\n        return mid // key found\n    }\n    return -(low + 1) // key not found\n}\n\n/**\n * Searches this list or its range
for the provided [element] using the binary search algorithm.\n * The list is expected to be sorted into ascending
order according to the specified [comparator],\n * otherwise the result is undefined.\n *\n * If the list contains
multiple elements equal to the specified [element], there is no guarantee which one will be found.\n *\n * `null`
value is considered to be less than any non-null value.\n *\n * @return the index of the element, if it is contained in
the list within the specified range;\n * otherwise, the inverted insertion point `(-insertion point - 1)`.\n * The
insertion point is defined as the index at which the element should be inserted,\n * so that the list (or the specified
subrange of list) still remains sorted according to the specified [comparator].\n * @sample
samples.collections.Collections.Lists.binarySearchWithComparator\n */\npublic fun <T>
List<T>.binarySearch(element: T, comparator: Comparator<in T>, fromIndex: Int = 0, toIndex: Int = size): Int {\n
    rangeCheck(size, fromIndex, toIndex)\n\n    var low = fromIndex\n    var high = toIndex - 1\n    while (low <=
high) {\n        val mid = (low + high).ushr(1) // safe from overflows\n        val midVal = get(mid)\n        val cmp =
comparator.compare(midVal, element)\n\n        if (cmp < 0)\n            low = mid + 1\n        else if (cmp > 0)\n
            high = mid - 1\n        else\n            return mid // key found\n    }\n    return -(low + 1) // key not found\n}\n\n/**\n * Searches this list or its range for an element having the key returned by the specified [selector] function\n * equal to
the provided [key] value using the binary search algorithm.\n * The list is expected to be sorted into ascending order
according to the Comparable natural ordering of keys of its elements.\n * otherwise the result is undefined.\n *\n * If
the list contains multiple elements with the specified [key], there is no guarantee which one will be found.\n *\n *
`null` value is considered to be less than any non-null value.\n *\n * @return the index of the element with the
specified [key], if it is contained in the list within the specified range;\n * otherwise, the inverted insertion point
`(-insertion point - 1)`.\n * The insertion point is defined as the index at which the element should be inserted,\n * so
that the list (or the specified subrange of list) still remains sorted.\n * @sample
samples.collections.Collections.Lists.binarySearchByKey\n */\npublic inline fun <T, K : Comparable<K>>
List<T>.binarySearchBy(\n    key: K?,\n    fromIndex: Int = 0,\n    toIndex: Int = size,\n    crossinline selector: (T) ->
K?)\n): Int =\n    binarySearch(fromIndex, toIndex) { compareValues(selector(it), key) }\n\n// do not introduce this
overload --- too rare\n//\npublic fun <T, K> List<T>.binarySearchBy(key: K, comparator: Comparator<K>,\n
fromIndex: Int = 0, toIndex: Int = size(), selector: (T) -> K): Int =\n    binarySearch(fromIndex, toIndex) {\n
    comparator.compare(selector(it), key) }\n\n\n/**\n * Searches this list or its range for an element for which the
given [comparison] function returns zero using the binary search algorithm.\n *\n * The list is expected to be sorted
so that the signs of the [comparison] function's return values ascend on the list elements,\n * i.e. negative values
come before zero and zeroes come before positive values.\n * Otherwise, the result is undefined.\n *\n * If the list
contains multiple elements for which [comparison] returns zero, there is no guarantee which one will be found.\n *\n *
@param comparison function that returns zero when called on the list element being searched.\n * On the
elements coming before the target element, the function must return negative values;\n * on the elements coming
after the target element, the function must return positive values.\n *\n * @return the index of the found element, if
it is contained in the list within the specified range;\n * otherwise, the inverted insertion point `(-insertion point -
1)`.\n * The insertion point is defined as the index at which the element should be inserted,\n * so that the list (or
the specified subrange of list) still remains sorted.\n * @sample
samples.collections.Collections.Lists.binarySearchWithComparisonFunction\n */\npublic fun <T>
List<T>.binarySearch(fromIndex: Int = 0, toIndex: Int = size, comparison: (T) -> Int): Int {\n    rangeCheck(size,
fromIndex, toIndex)\n\n    var low = fromIndex\n    var high = toIndex - 1\n    while (low <= high) {\n        val mid
= (low + high).ushr(1) // safe from overflows\n        val midVal = get(mid)\n        val cmp = comparison(midVal)\n\n
        if (cmp < 0)\n            low = mid + 1\n        else if (cmp > 0)\n            high = mid - 1\n        else\n
            return mid // key found\n    }\n    return -(low + 1) // key not found\n}\n\n\n/**\n * Checks that `from` and `to` are in\n * the
range of [0..size] and throws an appropriate exception, if they aren't.\n *\n * @private\n */\nprivate fun rangeCheck(size: Int,
fromIndex: Int, toIndex: Int) {\n    when {\n        fromIndex > toIndex -> throw
IllegalArgumentException("fromIndex ($fromIndex) is greater than toIndex ($toIndex).")\n        fromIndex < 0 ->

```

```

throw IndexOutOfBoundsException("fromIndex ($fromIndex) is less than zero.")\n      toIndex > size -> throw
IndexOutOfBoundsException("toIndex ($toIndex) is greater than size ($size).")\n
}\n}\n\n\n@PublishedApi\n@SinceKotlin("1.3")\ninternal expect fun checkIndexOverflow(index: Int):
Int\n\n@PublishedApi\n@SinceKotlin("1.3")\ninternal expect fun checkCountOverflow(count: Int):
Int\n\n\n@PublishedApi\n@SinceKotlin("1.3")\ninternal fun throwIndexOverflow() { throw
ArithmeticException("Index overflow has happened.") }\n\n@PublishedApi\n@SinceKotlin("1.3")\ninternal fun
throwCountOverflow() { throw ArithmeticException("Count overflow has happened.") }\n\n"/*\n * Copyright
2010-2021 JetBrains s.r.o. and Kotlin Programming Language contributors.\n * Use of this source code is governed
by the Apache 2.0 license that can be found in the license/LICENSE.txt file.\n
*/\n\n@file:kotlin.jvm.JvmMultifileClass\n@file:kotlin.jvm.JvmName("MapsKt")\n@file:OptIn(kotlin.experiment
al.ExperimentalTypeInference::class)\n\npackage kotlin.collections\n\nimport kotlin.contracts.*\n\nprivate object
EmptyMap : Map<Any?, Nothing>, Serializable { \n    private const val serialVersionUID: Long =
8246714829545688274\n\n    override fun equals(other: Any?): Boolean = other is Map<*, *> &&
other.isEmpty()\n    override fun hashCode(): Int = 0\n    override fun toString(): String = "{}"\n\n    override val
size: Int get() = 0\n    override fun isEmpty(): Boolean = true\n\n    override fun containsKey(key: Any?): Boolean =
false\n    override fun containsValue(value: Nothing): Boolean = false\n    override fun get(key: Any?): Nothing? =
null\n\n    override val entries: Set<Map.Entry<Any?, Nothing>> get() = EmptySet\n    override val keys: Set<Any?>
get() = EmptySet\n    override val values: Collection<Nothing> get() = EmptyList\n\n    private fun readResolve():
Any = EmptyMap\n}\n\n/**\n * Returns an empty read-only map of specified type.\n * \n * The returned map is
serializable (JVM).\n * @sample samples.collections.Maps.Instantiation.emptyReadOnlyMap\n */\n\npublic fun <K,
V> emptyMap(): Map<K, V> = @Suppress("UNCHECKED_CAST") (EmptyMap as Map<K, V>)\n\n/**\n *
Returns a new read-only map with the specified contents, given as a list of pairs\n * where the first value is the key
and the second is the value.\n * \n * If multiple pairs have the same key, the resulting map will contain the value
from the last of those pairs.\n * \n * Entries of the map are iterated in the order they were specified.\n * \n * The
returned map is serializable (JVM).\n * @sample samples.collections.Maps.Instantiation.mapFromPairs\n */\n\npublic fun
<K, V> mapOf(vararg pairs: Pair<K, V>): Map<K, V> =\n    if (pairs.size > 0)\n        pairs.toMap(LinkedHashMap(mapCapacity(pairs.size))) else emptyMap()\n\n/**\n * Returns an empty read-only
map.\n * \n * The returned map is serializable (JVM).\n * @sample
samples.collections.Maps.Instantiation.emptyReadOnlyMap\n */\n\n@kotlin.internal.InlineOnly\npublic inline fun
<K, V> mapOf(): Map<K, V> = emptyMap()\n\n/**\n * Returns an empty new [MutableMap].\n * \n * The returned
map preserves the entry iteration order.\n * @sample samples.collections.Maps.Instantiation.emptyMutableMap\n */\n\n@SinceKotlin("1.1")\n@kotlin.internal.InlineOnly\npublic inline fun <K, V> mutableMapOf():
MutableMap<K, V> = LinkedHashMap()\n\n/**\n * Returns a new [MutableMap] with the specified contents, given
as a list of pairs\n * where the first component is the key and the second is the value.\n * \n * If multiple pairs have
the same key, the resulting map will contain the value from the last of those pairs.\n * \n * Entries of the map are
iterated in the order they were specified.\n * \n * @sample
samples.collections.Maps.Instantiation.mutableMapFromPairs\n * @sample
samples.collections.Maps.Instantiation.emptyMutableMap\n */\n\npublic fun <K, V> mutableMapOf(vararg pairs:
Pair<K, V>): MutableMap<K, V> =\n    LinkedHashMap<K, V>(mapCapacity(pairs.size)).apply { putAll(pairs)
}\n\n/**\n * Returns an empty new [HashMap].\n * \n * @sample
samples.collections.Maps.Instantiation.emptyHashMap\n */\n\n@SinceKotlin("1.1")\n@kotlin.internal.InlineOnly\npublic inline fun <K, V> hashMapOf(): HashMap<K, V>
= HashMap<K, V>()\n\n/**\n * Returns a new [HashMap] with the specified contents, given as a list of pairs\n *
where the first component is the key and the second is the value.\n * \n * @sample
samples.collections.Maps.Instantiation.hashMapFromPairs\n */\n\npublic fun <K, V> hashMapOf(vararg pairs:
Pair<K, V>): HashMap<K, V> = HashMap<K, V>(mapCapacity(pairs.size)).apply { putAll(pairs) }\n\n/**\n *
Returns an empty new [LinkedHashMap].\n */\n\n@SinceKotlin("1.1")\n@kotlin.internal.InlineOnly\npublic inline
fun <K, V> linkedMapOf(): LinkedHashMap<K, V> = LinkedHashMap<K, V>()\n\n/**\n * Returns a new

```

[LinkedHashMap] with the specified contents, given as a list of pairs where the first component is the key and the second is the value. If multiple pairs have the same key, the resulting map will contain the value from the last of those pairs. Entries of the map are iterated in the order they were specified. @sample

```

samples.collections.Maps.Instantiation.linkedMapFromPairs
public fun <K, V> linkedMapOf(vararg pairs: Pair<K, V>): LinkedHashMap<K, V> = pairs.toMap(LinkedHashMap(mapCapacity(pairs.size)))
Builds a new read-only [Map] by populating a [MutableMap] using the given [builderAction] and returning a read-only map with the same key-value pairs. The map passed as a receiver to the [builderAction] is valid only inside that function. Using it outside of the function produces an unspecified behavior. Entries of the map are iterated in the order they were added by the [builderAction]. The returned map is serializable (JVM).
@sample samples.collections.Builders.Maps.buildMapSample
@SinceKotlin("1.6")@WasExperimental(ExperimentalStdlibApi::class)@kotlin.internal.InlineOnly
public inline fun <K, V> buildMap(@BuilderInference builderAction: MutableMap<K, V>() -> Unit): Map<K, V> {
    contract { callsInPlace(builderAction, InvocationKind.EXACTLY_ONCE) }
    return buildMapInternal(builderAction)
}
@PublishedApi
@SinceKotlin("1.3")@kotlin.internal.InlineOnly
internal expect inline fun <K, V> buildMapInternal(builderAction: MutableMap<K, V>() -> Unit): Map<K, V>
Builds a new read-only [Map] by populating a [MutableMap] using the given [builderAction] and returning a read-only map with the same key-value pairs. The map passed as a receiver to the [builderAction] is valid only inside that function. Using it outside of the function produces an unspecified behavior. [capacity] is used to hint the expected number of pairs added in the [builderAction]. Entries of the map are iterated in the order they were added by the [builderAction]. The returned map is serializable (JVM). @throws IllegalArgumentException if the given [capacity] is negative.
@sample samples.collections.Builders.Maps.buildMapSample
@SinceKotlin("1.6")@WasExperimental(ExperimentalStdlibApi::class)@kotlin.internal.InlineOnly
public inline fun <K, V> buildMap(capacity: Int, @BuilderInference builderAction: MutableMap<K, V>() -> Unit): Map<K, V> {
    contract { callsInPlace(builderAction, InvocationKind.EXACTLY_ONCE) }
    return buildMapInternal(capacity, builderAction)
}
@PublishedApi
@SinceKotlin("1.3")@kotlin.internal.InlineOnly
internal expect inline fun <K, V> buildMapInternal(capacity: Int, builderAction: MutableMap<K, V>() -> Unit): Map<K, V>
Calculate the initial capacity of a map.
@PublishedApi
internal expect fun mapCapacity(expectedSize: Int): Int
Returns `true` if this map is not empty.
@sample samples.collections.Maps.Usage.mapIsNotEmpty
@kotlin.internal.InlineOnly
public inline fun <K, V> Map<out K, V>.isEmpty(): Boolean = !isNotEmpty()
Returns `true` if this nullable map is either null or empty.
@sample samples.collections.Maps.Usage.mapIsNullOrEmpty
@SinceKotlin("1.3")@kotlin.internal.InlineOnly
public inline fun <K, V> Map<out K, V>?.isNullOrEmpty(): Boolean {
    contract { returns(false) implies (this@isNullOrEmpty != null) }
    return this == null || isEmpty()
}
Returns the [Map] if its not `null`, or the empty [Map] otherwise.
@sample samples.collections.Maps.Usage.mapOrElse
@kotlin.internal.InlineOnly
public inline fun <K, V> Map<K, V>?.orElse(): Map<K, V> = this ?: emptyMap()
Returns this map if it's not empty or the result of calling [defaultValue] function if the map is empty.
@sample samples.collections.Maps.Usage.mapIfEmpty
@SinceKotlin("1.3")@kotlin.internal.InlineOnly
public inline fun <M, R> M.ifEmpty(defaultValue: () -> R): R where M : Map<*, *>, M : R = if (isEmpty()) defaultValue() else this
Checks if the map contains the given key. This method allows to use the `x in map` syntax for checking whether an object is contained in the map.
@sample samples.collections.Maps.Usage.containsKey
@kotlin.internal.InlineOnly
public inline operator fun <@kotlin.internal.OnlyInputTypes K, V> Map<out K, V>.contains(key: K): Boolean = containsKey(key)
Returns the value corresponding to the given [key], or `null` if such a key is not present in the map.
@kotlin.internal.InlineOnly
public inline operator fun <@kotlin.internal.OnlyInputTypes K, V> Map<out K, V>.get(key: K): V? = @Suppress("UNCHECKED_CAST") (this as Map<K, V>).get(key)
Allows

```

```

to use the index operator for storing values in a mutable map.\n *\n@kotlin.internal.InlineOnly\npublic inline
operator fun <K, V> MutableMap<K, V>.set(key: K, value: V): Unit {\n    put(key, value)\n}\n\n/**\n * Returns
`true` if the map contains the specified [key].\n *\n * Allows to overcome type-safety restriction of `containsKey`
that requires to pass a key of type `K`.\n *\n@kotlin.internal.InlineOnly\npublic inline fun
<@kotlin.internal.OnlyInputTypes K> Map<out K, *>.containsKey(key: K): Boolean =\n
@Suppress("\nUNCHECKED_CAST") (this as Map<K, *>).containsKey(key)\n\n/**\n * Returns `true` if the map
maps one or more keys to the specified [value].\n *\n * Allows to overcome type-safety restriction of
`containsValue` that requires to pass a value of type `V`.\n *\n * @sample
samples.collections.Maps.Usage.containsValue\n *\n@Suppress("\nEXTENSION_SHADOWED_BY_MEMBER")
// false warning, extension takes precedence in some cases\n@kotlin.internal.InlineOnly\npublic inline fun <K,
@kotlin.internal.OnlyInputTypes V> Map<K, V>.containsValue(value: V): Boolean =
this.containsValue(value)\n\n/**\n * Removes the specified key and its corresponding value from this map.\n *\n
* @return the previous value associated with the key, or `null` if the key was not present in the map.\n\n * Allows to
overcome type-safety restriction of `remove` that requires to pass a key of type `K`.\n
*\n@kotlin.internal.InlineOnly\npublic inline fun <@kotlin.internal.OnlyInputTypes K, V> MutableMap<out K,
V>.remove(key: K): V? =\n    @Suppress("\nUNCHECKED_CAST") (this as MutableMap<K,
V>).remove(key)\n\n/**\n * Returns the key component of the map entry.\n *\n * This method allows to use
destructuring declarations when working with maps, for example:\n *\n * ``\n * for ((key, value) in map) {\n *     // do
something with the key and the value\n * }\n *\n * ``\n *\n@kotlin.internal.InlineOnly\npublic inline operator fun <K,
V> Map.Entry<K, V>.component1(): K = key\n\n/**\n * Returns the value component of the map entry.\n *\n * This
method allows to use destructuring declarations when working with maps, for example:\n *\n * ``\n * for ((key,
value) in map) {\n *     // do something with the key and the value\n * }\n *\n * ``\n
*\n@kotlin.internal.InlineOnly\npublic inline operator fun <K, V> Map.Entry<K, V>.component2(): V =
value\n\n/**\n * Converts entry to [Pair] with key being first component and value being second.\n
*\n@kotlin.internal.InlineOnly\npublic inline fun <K, V> Map.Entry<K, V>.toPair(): Pair<K, V> = Pair(key,
value)\n\n/**\n * Returns the value for the given key, or the result of the [defaultValue] function if there was no
entry for the given key.\n *\n * @sample samples.collections.Maps.Usage.getOrElse\n
*\n@kotlin.internal.InlineOnly\npublic inline fun <K, V> Map<K, V>.getOrElse(key: K, defaultValue: () -> V): V
= get(key) ?: defaultValue()\n\n\ninternal inline fun <K, V> Map<K, V>.getOrElseNullable(key: K, defaultValue: ()
-> V): V {\n    val value = get(key)\n    if (value == null && !containsKey(key)) {\n        return defaultValue()\n    }
else {\n        @Suppress("\nUNCHECKED_CAST")\n        return value as V\n    }\n}\n\n/**\n * Returns the value
for the given [key] or throws an exception if there is no such key in the map.\n *\n * If the map was created by
[withDefault], resorts to its `defaultValue` provider function\n * instead of throwing an exception.\n *\n * @throws
NoSuchElementException when the map doesn't contain a value for the specified key and\n * no implicit default
value was provided for that map.\n *\n@kotlin.SinceKotlin("1.1")\npublic fun <K, V> Map<K, V>.getValue(key: K): V
= getOrImplicitDefault(key)\n\n/**\n * Returns the value for the given key. If the key is not found in the map, calls
the [defaultValue] function,\n * puts its result into the map under the given key and returns it.\n *\n * Note that the
operation is not guaranteed to be atomic if the map is being modified concurrently.\n *\n * @sample
samples.collections.Maps.Usage.getOrPut\n *\npublic inline fun <K, V> MutableMap<K, V>.getOrPut(key: K,
defaultValue: () -> V): V {\n    val value = get(key)\n    return if (value == null) {\n        val answer =
defaultValue()\n        put(key, answer)\n        answer\n    } else {\n        value\n    }\n}\n\n/**\n * Returns an
[Iterator] over the entries in the [Map].\n *\n * @sample samples.collections.Maps.Usage.forOverEntries\n
*\n@kotlin.internal.InlineOnly\npublic inline operator fun <K, V> Map<out K, V>.iterator():
Iterator<Map.Entry<K, V>> = entries.iterator()\n\n/**\n * Returns a [MutableIterator] over the mutable entries in
the [MutableMap].\n *\n *\n@kotlin.jvm.JvmName("\nmutableIterator")\n@kotlin.internal.InlineOnly\npublic
inline operator fun <K, V> MutableMap<K, V>.iterator(): MutableIterator<MutableMap.MutableEntry<K, V>> =
entries.iterator()\n\n/**\n * Populates the given [destination] map with entries having the keys of this map and the
values obtained\n * by applying the [transform] function to each entry in this [Map].\n *\n@kotlin.internal.InlineOnly\npublic inline fun <K, V,

```

```

R, M : MutableMap<in K, in R>> Map<out K, V>.mapValuesTo(destination: M, transform: (Map.Entry<K, V>) ->
R): M {\n  return entries.associateByTo(destination, { it.key }, transform)\n}\n\n/**\n * Populates the given
[destination] map with entries having the keys obtained\n * by applying the [transform] function to each entry in this
[Map] and the values of this map.\n *\n * In case if any two entries are mapped to the equal keys, the value of the
latter one will overwrite\n * the value associated with the former one.\n */\npublic inline fun <K, V, R, M :
MutableMap<in R, in V>> Map<out K, V>.mapKeysTo(destination: M, transform: (Map.Entry<K, V>) -> R): M
{\n  return entries.associateByTo(destination, transform, { it.value })\n}\n\n/**\n * Puts all the given [pairs] into
this [MutableMap] with the first component in the pair being the key and the second the value.\n */\npublic fun <K,
V> MutableMap<in K, in V>.putAll(pairs: Array<out Pair<K, V>>): Unit {\n  for ((key, value) in pairs) {\n
put(key, value)\n  }\n}\n\n/**\n * Puts all the elements of the given collection into this [MutableMap] with the first
component in the pair being the key and the second the value.\n */\npublic fun <K, V> MutableMap<in K, in
V>.putAll(pairs: Iterable<Pair<K, V>>): Unit {\n  for ((key, value) in pairs) {\n    put(key, value)\n
}\n}\n\n/**\n * Puts all the elements of the given sequence into this [MutableMap] with the first component in the
pair being the key and the second the value.\n */\npublic fun <K, V> MutableMap<in K, in V>.putAll(pairs:
Sequence<Pair<K, V>>): Unit {\n  for ((key, value) in pairs) {\n    put(key, value)\n  }\n}\n\n/**\n * Returns a
new map with entries having the keys of this map and the values obtained by applying the [transform]\n * function
to each entry in this [Map].\n *\n * The returned map preserves the entry iteration order of the original map.\n *\n
* @sample samples.collections.Maps.Transformations.mapValues\n */\npublic inline fun <K, V, R> Map<out K,
V>.mapValues(transform: (Map.Entry<K, V>) -> R): Map<K, R> {\n  return mapValuesTo(LinkedHashMap<K,
R>(mapCapacity(size)), transform) // .optimizeReadOnlyMap()\n}\n\n/**\n * Returns a new Map with entries
having the keys obtained by applying the [transform] function to each entry in this\n * [Map] and the values of this
map.\n *\n * In case if any two entries are mapped to the equal keys, the value of the latter one will overwrite\n *
the value associated with the former one.\n *\n * The returned map preserves the entry iteration order of the original
map.\n *\n * @sample samples.collections.Maps.Transformations.mapKeys\n */\npublic inline fun <K, V, R>
Map<out K, V>.mapKeys(transform: (Map.Entry<K, V>) -> R): Map<R, V> {\n  return
mapKeysTo(LinkedHashMap<R, V>(mapCapacity(size)), transform) // .optimizeReadOnlyMap()\n}\n\n/**\n * Returns a map
containing all key-value pairs with keys matching the given [predicate].\n *\n * The returned map
preserves the entry iteration order of the original map.\n *\n * @sample samples.collections.Maps.Filtering.filterKeys\n
*/\npublic inline fun <K, V> Map<out K, V>.filterKeys(predicate: (K) -> Boolean): Map<K, V> {\n  val result =
LinkedHashMap<K, V>()\n  for (entry in this) {\n    if (predicate(entry.key)) {\n      result.put(entry.key,
entry.value)\n    }\n  }\n  return result\n}\n\n/**\n * Returns a map containing all key-value pairs with values
matching the given [predicate].\n *\n * The returned map preserves the entry iteration order of the original map.\n *\n
* @sample samples.collections.Maps.Filtering.filterValues\n */\npublic inline fun <K, V> Map<out K,
V>.filterValues(predicate: (V) -> Boolean): Map<K, V> {\n  val result = LinkedHashMap<K, V>()\n  for (entry
in this) {\n    if (predicate(entry.value)) {\n      result.put(entry.key, entry.value)\n    }\n  }\n  return
result\n}\n\n/**\n * Appends all entries matching the given [predicate] into the mutable map given as [destination]
parameter.\n *\n * @return the destination map.\n *\n * @sample samples.collections.Maps.Filtering.filterTo\n
*/\npublic inline fun <K, V, M : MutableMap<in K, in V>> Map<out K, V>.filterTo(destination: M, predicate:
(Map.Entry<K, V>) -> Boolean): M {\n  for (element in this) {\n    if (predicate(element)) {\n
destination.put(element.key, element.value)\n    }\n  }\n  return destination\n}\n\n/**\n * Returns a new map
containing all key-value pairs matching the given [predicate].\n *\n * The returned map preserves the entry iteration
order of the original map.\n *\n * @sample samples.collections.Maps.Filtering.filter\n */\npublic inline fun <K, V>
Map<out K, V>.filter(predicate: (Map.Entry<K, V>) -> Boolean): Map<K, V> {\n  return
filterTo(LinkedHashMap<K, V>(), predicate)\n}\n\n/**\n * Appends all entries not matching the given [predicate]
into the given [destination].\n *\n * @return the destination map.\n *\n * @sample
samples.collections.Maps.Filtering.filterNotTo\n */\npublic inline fun <K, V, M : MutableMap<in K, in V>>
Map<out K, V>.filterNotTo(destination: M, predicate: (Map.Entry<K, V>) -> Boolean): M {\n  for (element in
this) {\n    if (!predicate(element)) {\n      destination.put(element.key, element.value)\n    }\n  }\n  return
}

```


the order of [pairs] sequence.

```

public operator fun <K, V> Map<out K, V>.plus(pairs: Sequence<Pair<K, V>>): Map<K, V> =
    LinkedHashMap(this).apply { putAll(pairs) }.optimizeReadOnlyMap()

```

* Creates a new read-only map by replacing or adding entries to this map from another [map].

```

public operator fun <K, V> Map<out K, V>.plus(map: Map<out K, V>): Map<K, V> =
    LinkedHashMap(this).apply { putAll(map) }

```

* Appends or replaces the given [pair] in this mutable map.

```

@kotlin.internal.InlineOnly
public inline operator fun <K, V> MutableMap<in K, in V>.plusAssign(pair: Pair<K, V>) {
    put(pair.first, pair.second)
}

```

* Appends or replaces all pairs from the given collection of [pairs] in this mutable map.

```

@kotlin.internal.InlineOnly
public inline operator fun <K, V> MutableMap<in K, in V>.plusAssign(pairs: Iterable<Pair<K, V>>) {
    putAll(pairs)
}

```

* Appends or replaces all pairs from the given array of [pairs] in this mutable map.

```

@kotlin.internal.InlineOnly
public inline operator fun <K, V> MutableMap<in K, in V>.plusAssign(pairs: Array<out Pair<K, V>>) {
    putAll(pairs)
}

```

* Appends or replaces all pairs from the given sequence of [pairs] in this mutable map.

```

@kotlin.internal.InlineOnly
public inline operator fun <K, V> MutableMap<in K, in V>.plusAssign(pairs: Sequence<Pair<K, V>>) {
    putAll(pairs)
}

```

* Appends or replaces all entries from the given [map] in this mutable map.

```

@kotlin.internal.InlineOnly
public inline operator fun <K, V> MutableMap<in K, in V>.plusAssign(map: Map<K, V>) {
    putAll(map)
}

```

* Returns a map containing all entries of the original map except the entry with the given [key].

```

@SinceKotlin("1.1")
public operator fun <K, V> Map<out K, V>.minus(key: K): Map<K, V> =
    this.toMutableMap().apply { minusAssign(key) }.optimizeReadOnlyMap()

```

* Returns a map containing all entries of the original map except those entries the keys of which are contained in the given [keys] collection.

```

@SinceKotlin("1.1")
public operator fun <K, V> Map<out K, V>.minus(keys: Iterable<K>): Map<K, V> =
    this.toMutableMap().apply { minusAssign(keys) }.optimizeReadOnlyMap()

```

* Returns a map containing all entries of the original map except those entries the keys of which are contained in the given [keys] array.

```

@SinceKotlin("1.1")
public operator fun <K, V> Map<out K, V>.minus(keys: Array<out K>): Map<K, V> =
    this.toMutableMap().apply { minusAssign(keys) }.optimizeReadOnlyMap()

```

* Returns a map containing all entries of the original map except those entries the keys of which are contained in the given [keys] sequence.

```

@SinceKotlin("1.1")
public operator fun <K, V> Map<out K, V>.minus(keys: Sequence<K>): Map<K, V> =
    this.toMutableMap().apply { minusAssign(keys) }.optimizeReadOnlyMap()

```

* Removes the entry with the given [key] from this mutable map.

```

@SinceKotlin("1.1")
@kotlin.internal.InlineOnly
public inline operator fun <K, V> MutableMap<K, V>.minusAssign(key: K) {
    remove(key)
}

```

* Removes all entries the keys of which are contained in the given [keys] collection from this mutable map.

```

@SinceKotlin("1.1")
@kotlin.internal.InlineOnly
public inline operator fun <K, V> MutableMap<K, V>.minusAssign(keys: Iterable<K>) {
    this.keys.removeAll(keys)
}

```

* Removes all entries the keys of which are contained in the given [keys] array from this mutable map.

```

@SinceKotlin("1.1")
@kotlin.internal.InlineOnly
public inline operator fun <K, V> MutableMap<K, V>.minusAssign(keys: Array<out K>) {
    this.keys.removeAll(keys)
}

```

* Removes all entries from the keys of which are contained in the given [keys] sequence from this mutable map.

```

@SinceKotlin("1.1")
@kotlin.internal.InlineOnly
public inline operator fun <K, V> MutableMap<K, V>.minusAssign(keys: Sequence<K>) {
    this.keys.removeAll(keys)
}

```

// do not expose for now

```

@PublishedApi
internal fun <K, V> Map<K, V>.optimizeReadOnlyMap() = when (size) {
    0 -> emptyMap()
    1 -> toSingletonMapOrSelf()
    else -> this
}

```

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```

*\/n\n@file:kotlin.jvm.JvmMultifileClass\n@file:kotlin.jvm.JvmName("\SetsKt")\n@file:OptIn(kotlin.experimenta
l.ExperimentalTypeInference::class)\n\npackage kotlin.collections\n\nimport kotlin.contracts.*\n\ninternal object
EmptySet : Set<Nothing>, Serializable {\n    private const val serialVersionUID: Long =
3406603774387020532\n\n    override fun equals(other: Any?): Boolean = other is Set<*> && other.isEmpty()\n
override fun hashCode(): Int = 0\n    override fun toString(): String = ""\n\n    override val size: Int get() = 0\n
override fun isEmpty(): Boolean = true\n    override fun contains(element: Nothing): Boolean = false\n    override
fun containsAll(elements: Collection<Nothing>): Boolean = elements.isEmpty()\n    override fun iterator():
Iterator<Nothing> = EmptyIterator\n\n    private fun readResolve(): Any = EmptySet\n}\n\n/**\n * Returns an
empty read-only set. The returned set is serializable (JVM).\n * @sample
samples.collections.Collections.Sets.emptyReadOnlySet\n *\/n\npublic fun <T> emptySet(): Set<T> =
EmptySet\n\n/**\n * Returns a new read-only set with the given elements.\n * Elements of the set are iterated in the
order they were specified.\n * The returned set is serializable (JVM).\n * @sample
samples.collections.Collections.Sets.readOnlySet\n *\/n\npublic fun <T> setOf(vararg elements: T): Set<T> = if
(elements.size > 0) elements.toSet() else emptySet()\n\n/**\n * Returns an empty read-only set. The returned set is
serializable (JVM).\n * @sample samples.collections.Collections.Sets.emptyReadOnlySet\n *\/n\n@kotlin.internal.InlineOnly\npublic inline fun <T> setOf(): Set<T> = emptySet()\n\n/**\n * Returns an empty
new [MutableSet].\n *\/n\n * The returned set preserves the element iteration order.\n * @sample
samples.collections.Collections.Sets.emptyMutableSet\n *\/n\n@SinceKotlin("1.1")\n@kotlin.internal.InlineOnly\npublic inline fun <T> mutableSetOf(): MutableSet<T> =
LinkedHashSet()\n\n/**\n * Returns a new [MutableSet] with the given elements.\n * Elements of the set are
iterated in the order they were specified.\n * @sample samples.collections.Collections.Sets.mutableSet\n *\/n\npublic
fun <T> mutableSetOf(vararg elements: T): MutableSet<T> =
elements.toCollection(LinkedHashSet(mapCapacity(elements.size)))\n\n/**\n * Returns an empty new [HashSet].\n *\/n\n@SinceKotlin("1.1")\n@kotlin.internal.InlineOnly\npublic inline fun <T> hashSetOf(): HashSet<T> =
HashSet()\n\n/**\n * Returns a new [HashSet] with the given elements. *\n *\/n\npublic fun <T> hashSetOf(vararg elements:
T): HashSet<T> = elements.toCollection(HashSet(mapCapacity(elements.size)))\n\n/**\n * Returns an empty new
[LinkedHashSet].\n * @sample samples.collections.Collections.Sets.emptyLinkedHashSet\n *\/n\n@SinceKotlin("1.1")\n@kotlin.internal.InlineOnly\npublic inline fun <T> linkedSetOf(): LinkedHashSet<T>
= LinkedHashSet()\n\n/**\n * Returns a new [LinkedHashSet] with the given elements.\n * Elements of the set are
iterated in the order they were specified.\n * @sample samples.collections.Collections.Sets.linkedHashSet\n *\/n\npublic fun <T> linkedSetOf(vararg elements: T): LinkedHashSet<T> =
elements.toCollection(LinkedHashSet(mapCapacity(elements.size)))\n\n/**\n * Returns a new read-only set either
with single given element, if it is not null, or empty set if the element is null.\n * The returned set is serializable
(JVM).\n * @sample samples.collections.Collections.Sets.setOfNotNull\n *\/n\n@SinceKotlin("1.4")\npublic fun <T
: Any> setOfNotNull(element: T?): Set<T> = if (element != null) setOf(element) else emptySet()\n\n/**\n * Returns
a new read-only set only with those given elements, that are not null.\n * Elements of the set are iterated in the order
they were specified.\n * The returned set is serializable (JVM).\n * @sample
samples.collections.Collections.Sets.setOfNotNull\n *\/n\n@SinceKotlin("1.4")\npublic fun <T : Any>
setOfNotNull(vararg elements: T?): Set<T> {\n    return elements.filterNotNullTo(LinkedHashSet())\n}\n\n/**\n *
Builds a new read-only [Set] by populating a [MutableSet] using the given [builderAction]\n * and returning a read-
only set with the same elements.\n *\/n\n * The set passed as a receiver to the [builderAction] is valid only inside that
function.\n * Using it outside of the function produces an unspecified behavior.\n *\/n\n * Elements of the set are
iterated in the order they were added by the [builderAction].\n *\/n\n * The returned set is serializable (JVM).\n *\/n\n *
@sample samples.collections.Builders.Sets.buildSetSample\n *\/n\n@SinceKotlin("1.6")\n@WasExperimental(ExperimentalStdlibApi::class)\n@kotlin.internal.InlineOnly\npublic
inline fun <E> buildSet(@BuilderInference builderAction: MutableSet<E>.() -> Unit): Set<E> {\n    contract {
callsInPlace(builderAction, InvocationKind.EXACTLY_ONCE) }\n    return
buildSetInternal(builderAction)\n}\n\n@PublishedApi\n@SinceKotlin("1.3")\n@kotlin.internal.InlineOnly\nintern

```

```

al expect inline fun <E> buildSetInternal(builderAction: MutableSet<E>().-> Unit): Set<E>\n\n/**\n * Builds a
new read-only [Set] by populating a [MutableSet] using the given [builderAction]\n * and returning a read-only set
with the same elements.\n * The set passed as a receiver to the [builderAction] is valid only inside that
function.\n * Using it outside of the function produces an unspecified behavior.\n * [capacity] is used to hint the
expected number of elements added in the [builderAction].\n * Elements of the set are iterated in the order they
were added by the [builderAction].\n * The returned set is serializable (JVM).\n * @throws
IllegalArgumentExcepTion if the given [capacity] is negative.\n * @sample
samples.collections.Builders.Sets.buildSetSample\n
*\n@SinceKotlin("1.6")\n@WasExperimental(ExperimentalStdlibApi::class)\n@kotlin.internal.InlineOnly\npublic
inline fun <E> buildSet(capacity: Int, @BuilderInference builderAction: MutableSet<E>().-> Unit): Set<E> {\n
contract { callsInPlace(builderAction, InvocationKind.EXACTLY_ONCE) }\n return buildSetInternal(capacity,
builderAction)\n}\n\n@PublishedApi\n@SinceKotlin("1.3")\n@kotlin.internal.InlineOnly\ninternal expect inline
fun <E> buildSetInternal(capacity: Int, builderAction: MutableSet<E>().-> Unit): Set<E>\n\n/** Returns this Set
if it's not `null` and the empty set otherwise. *\n@kotlin.internal.InlineOnly\npublic inline fun <T>
Set<T>?.orEmpty(): Set<T> = this ?: emptySet()\n\ninternal fun <T> Set<T>.optimizeReadOnlySet() = when (size)
{\n 0 -> emptySet()\n 1 -> setOf(iterator().next())\n else -> this}\n\n",/>\n * Copyright 2010-2018 JetBrains
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license that can be found in the license/LICENSE.txt file.\n
*\n@file:kotlin.jvm.JvmMultifileClass\n@file:kotlin.jvm.JvmName("StringsKt")\n@file:Suppress("PLATFOR
M_CLASS_MAPPED_TO_KOTLIN")\n\npackage kotlin.text\n\n/**\n * Parses the string as a signed [Byte]
number and returns the result\n * or `null` if the string is not a valid representation of a number.\n
*\n@SinceKotlin("1.1")\n\npublic fun String.toByteArrayOrNull(): Byte? = toByteOrNull(radix = 10)\n\n/**\n * Parses
the string as a signed [Byte] number and returns the result\n * or `null` if the string is not a valid representation of a
number.\n * @throws IllegalArgumentExcepTion when [radix] is not a valid radix for string to number
conversion.\n *\n@SinceKotlin("1.1")\n\npublic fun String.toByteArrayOrNull(radix: Int): Byte? {\n val int =
this.toIntOrNull(radix) ?: return null\n if (int < Byte.MIN_VALUE || int > Byte.MAX_VALUE) return null\n
return int.toByteArray()\n}\n\n/**\n * Parses the string as a [Short] number and returns the result\n * or `null` if the string
is not a valid representation of a number.\n *\n@SinceKotlin("1.1")\n\npublic fun String.toShortOrNull(): Short? =
toShortOrNull(radix = 10)\n\n/**\n * Parses the string as a [Short] number and returns the result\n * or `null` if the
string is not a valid representation of a number.\n * @throws IllegalArgumentExcepTion when [radix] is not a
valid radix for string to number conversion.\n *\n@SinceKotlin("1.1")\n\npublic fun String.toShortOrNull(radix:
Int): Short? {\n val int = this.toIntOrNull(radix) ?: return null\n if (int < Short.MIN_VALUE || int >
Short.MAX_VALUE) return null\n return int.toShort()\n}\n\n/**\n * Parses the string as an [Int] number and
returns the result\n * or `null` if the string is not a valid representation of a number.\n
*\n@SinceKotlin("1.1")\n\npublic fun String.toIntOrNull(): Int? = toIntOrNull(radix = 10)\n\n/**\n * Parses the
string as an [Int] number and returns the result\n * or `null` if the string is not a valid representation of a number.\n
*\n * @throws IllegalArgumentExcepTion when [radix] is not a valid radix for string to number conversion.\n
*\n@SinceKotlin("1.1")\n\npublic fun String.toIntOrNull(radix: Int): Int? {\n checkRadix(radix)\n\n val length
= this.length\n if (length == 0) return null\n\n val start: Int\n val isNegative: Boolean\n val limit: Int\n val
firstChar = this[0]\n if (firstChar < '0') { // Possible leading sign\n if (length == 1) return null // non-digit
(possible sign) only, no digits after\n\n start = 1\n\n if (firstChar == '-') {\n isNegative = true\n
limit = Int.MIN_VALUE\n } else if (firstChar == '+') {\n isNegative = false\n limit = -
Int.MAX_VALUE\n } else\n return null\n } else {\n start = 0\n isNegative = false\n limit
= -Int.MAX_VALUE\n }\n\n val limitForMaxRadix = (-Int.MAX_VALUE) / 36\n\n var limitBeforeMul =
limitForMaxRadix\n var result = 0\n for (i in start until length) {\n val digit = digitOf(this[i], radix)\n\n
if (digit < 0) return null\n if (result < limitBeforeMul) {\n if (limitBeforeMul == limitForMaxRadix) {\n
limitBeforeMul = limit / radix\n\n if (result < limitBeforeMul) {\n return null\n
}\n } else {\n return null\n }\n }\n\n result *= radix\n\n if (result < limit + digit)

```

```

return null\n\n    result -= digit\n    }\n\n    return if (isNegative) result else -result\n}\n\n/**\n * Parses the string
as a [Long] number and returns the result\n * or `null` if the string is not a valid representation of a number.\n
*\n@SinceKotlin("1.1")\npublic fun String.toLongOrNull(): Long? = toLongOrNull(radix = 10)\n\n/**\n * Parses
the string as a [Long] number and returns the result\n * or `null` if the string is not a valid representation of a
number.\n *\n * @throws IllegalArgumentException when [radix] is not a valid radix for string to number
conversion.\n *\n@SinceKotlin("1.1")\npublic fun String.toLongOrNull(radix: Int): Long? {\n
checkRadix(radix)\n\n    val length = this.length\n    if (length == 0) return null\n\n    val start: Int\n    val isNegative:
Boolean\n    val limit: Long\n\n    val firstChar = this[0]\n    if (firstChar < '0') { // Possible leading sign\n        if
(length == 1) return null // non-digit (possible sign) only, no digits after\n\n        start = 1\n\n        if (firstChar == '-')
{\n            isNegative = true\n            limit = Long.MIN_VALUE\n        } else if (firstChar == '+') {\n
isNegative = false\n            limit = -Long.MAX_VALUE\n        } else\n            return null\n    } else {\n        start =
0\n        isNegative = false\n        limit = -Long.MAX_VALUE\n    }\n\n    val limitForMaxRadix = (-
Long.MAX_VALUE) / 36\n\n    var limitBeforeMul = limitForMaxRadix\n    var result = 0L\n    for (i in start until
length) {\n        val digit = digitOf(this[i], radix)\n\n        if (digit < 0) return null\n        if (result < limitBeforeMul)
{\n            if (limitBeforeMul == limitForMaxRadix) {\n                limitBeforeMul = limit / radix\n\n                if
(result < limitBeforeMul) {\n                    return null\n                }\n            } else {\n                return null\n
            }\n        }\n\n        result *= radix\n\n        if (result < limit + digit) return null\n\n        result -= digit\n    }\n
return if (isNegative) result else -result\n}\n\n\ninternal fun numberFormatError(input: String): Nothing = throw
NumberFormatException("Invalid number format: '$input')\n", "/*\n * Copyright 2010-2021 JetBrains s.r.o. and
Kotlin Programming Language contributors.\n * Use of this source code is governed by the Apache 2.0 license that
can be found in the license/LICENSE.txt file.\n */\n\npackage kotlin.time\n\nimport kotlin.contracts.*\nimport
kotlin.jvm.JvmInline\nimport kotlin.math.*\n\n/**\n * Represents the amount of time one instant of time is away
from another instant.\n *\n * A negative duration is possible in a situation when the second instant is earlier than the
first one.\n *\n * The type can store duration values up to \u00b1146 years with nanosecond precision,\n * and up to
\u00b1146 million years with millisecond precision.\n * If a duration-returning operation provided in `kotlin.time`
produces a duration value that doesn't fit into the above range,\n * the returned `Duration` is infinite.\n *\n * An
infinite duration value [Duration.INFINITE] can be used to represent infinite timeouts.\n *\n * To construct a
duration use either the extension function [toDuration],\n * or the extension properties [hours], [minutes], [seconds],
and so on,\n * available on [Int], [Long], and [Double] numeric types.\n *\n * To get the value of this duration
expressed in a particular [duration units][DurationUnit]\n * use the functions [toInt], [toLong], and [toDouble]\n * or
the properties [inWholeHours], [inWholeMinutes], [inWholeSeconds], [inWholeNanoseconds], and so on.\n
*\n@SinceKotlin("1.6")\n@WasExperimental(ExperimentalTime::class)\n@JvmInline\npublic value class
Duration internal constructor(private val rawValue: Long) : Comparable<Duration> {\n\n    private val value: Long
get() = rawValue shr 1\n    private inline val unitDiscriminator: Int get() = rawValue.toInt() and 1\n    private fun
isInNanos() = unitDiscriminator == 0\n    private fun isInMillis() = unitDiscriminator == 1\n    private val
storageUnit get() = if (isInNanos()) DurationUnit.NANOSECONDS else DurationUnit.MILLISECONDS\n\n    init
{\n        if (durationAssertionsEnabled) {\n            if (isInNanos()) {\n                if (value !in -
MAX_NANOS..MAX_NANOS) throw AssertionError("$value ns is out of nanoseconds range")\n            } else
{\n                if (value !in -MAX_MILLIS..MAX_MILLIS) throw AssertionError("$value ms is out of milliseconds
range")\n                if (value in -MAX_NANOS_IN_MILLIS..MAX_NANOS_IN_MILLIS) throw
AssertionError("$value ms is denormalized")\n            }\n        }\n    }\n\n    companion object {\n        /** The
duration equal to exactly 0 seconds. *\n        public val ZERO: Duration = Duration(0L)\n        /** The duration
whose value is positive infinity. It is useful for representing timeouts that should never expire. *\n        public val
INFINITE: Duration = durationOfMillis(MAX_MILLIS)\n        internal val NEG_INFINITE: Duration =
durationOfMillis(-MAX_MILLIS)\n        /** Converts the given time duration [value] expressed in the specified
[sourceUnit] into the specified [targetUnit]. *\n        @ExperimentalTime\n        public fun convert(value: Double,
sourceUnit: DurationUnit, targetUnit: DurationUnit): Double =\n            convertDurationUnit(value, sourceUnit,
targetUnit)\n    }\n\n    // Duration construction extension properties in Duration companion scope\n    /** Returns a

```

```

[Duration] equal to this [Int] number of nanoseconds. */n    @kotlin.internal.InlineOnly\n    public inline val
Int.nanoseconds get() = toDuration(DurationUnit.NANOSECONDS)\n\n    /** Returns a [Duration] equal to this
[Long] number of nanoseconds. */n    @kotlin.internal.InlineOnly\n    public inline val Long.nanoseconds
get() = toDuration(DurationUnit.NANOSECONDS)\n\n    /**\n    * Returns a [Duration] equal to this
[Double] number of nanoseconds.\n    *\n    * Depending on its magnitude, the value is rounded to an integer
number of nanoseconds or milliseconds.\n    *\n    * @throws IllegalArgumentException if this [Double]
value is `NaN`.\n    */n    @kotlin.internal.InlineOnly\n    public inline val Double.nanoseconds get() =
toDuration(DurationUnit.NANOSECONDS)\n\n    /** Returns a [Duration] equal to this [Int] number of
microseconds. */n    @kotlin.internal.InlineOnly\n    public inline val Int.microseconds get() =
toDuration(DurationUnit.MICROSECONDS)\n\n    /** Returns a [Duration] equal to this [Long] number of
microseconds. */n    @kotlin.internal.InlineOnly\n    public inline val Long.microseconds get() =
toDuration(DurationUnit.MICROSECONDS)\n\n    /**\n    * Returns a [Duration] equal to this [Double]
number of microseconds.\n    *\n    * Depending on its magnitude, the value is rounded to an integer number
of nanoseconds or milliseconds.\n    *\n    * @throws IllegalArgumentException if this [Double] value is
`NaN`.\n    */n    @kotlin.internal.InlineOnly\n    public inline val Double.microseconds get() =
toDuration(DurationUnit.MICROSECONDS)\n\n    /** Returns a [Duration] equal to this [Int] number of
milliseconds. */n    @kotlin.internal.InlineOnly\n    public inline val Int.milliseconds get() =
toDuration(DurationUnit.MILLISECONDS)\n\n    /** Returns a [Duration] equal to this [Long] number of
milliseconds. */n    @kotlin.internal.InlineOnly\n    public inline val Long.milliseconds get() =
toDuration(DurationUnit.MILLISECONDS)\n\n    /**\n    * Returns a [Duration] equal to this [Double]
number of milliseconds.\n    *\n    * Depending on its magnitude, the value is rounded to an integer number of
nanoseconds or milliseconds.\n    *\n    * @throws IllegalArgumentException if this [Double] value is
`NaN`.\n    */n    @kotlin.internal.InlineOnly\n    public inline val Double.milliseconds get() =
toDuration(DurationUnit.MILLISECONDS)\n\n    /** Returns a [Duration] equal to this [Int] number of
seconds. */n    @kotlin.internal.InlineOnly\n    public inline val Int.seconds get() =
toDuration(DurationUnit.SECONDS)\n\n    /** Returns a [Duration] equal to this [Long] number of seconds. */n
    @kotlin.internal.InlineOnly\n    public inline val Long.seconds get() =
toDuration(DurationUnit.SECONDS)\n\n    /**\n    * Returns a [Duration] equal to this [Double] number of
seconds.\n    *\n    * Depending on its magnitude, the value is rounded to an integer number of nanoseconds or
milliseconds.\n    *\n    * @throws IllegalArgumentException if this [Double] value is `NaN`.\n    */n
    @kotlin.internal.InlineOnly\n    public inline val Double.seconds get() =
toDuration(DurationUnit.SECONDS)\n\n    /** Returns a [Duration] equal to this [Int] number of minutes. */n
    @kotlin.internal.InlineOnly\n    public inline val Int.minutes get() = toDuration(DurationUnit.MINUTES)\n\n
    /** Returns a [Duration] equal to this [Long] number of minutes. */n    @kotlin.internal.InlineOnly\n
    public inline val Long.minutes get() = toDuration(DurationUnit.MINUTES)\n\n    /**\n    * Returns a
[Duration] equal to this [Double] number of minutes.\n    *\n    * Depending on its magnitude, the value is
rounded to an integer number of nanoseconds or milliseconds.\n    *\n    * @throws IllegalArgumentException
if this [Double] value is `NaN`.\n    */n    @kotlin.internal.InlineOnly\n    public inline val Double.minutes
get() = toDuration(DurationUnit.MINUTES)\n\n    /** Returns a [Duration] equal to this [Int] number of hours.
*/n    @kotlin.internal.InlineOnly\n    public inline val Int.hours get() = toDuration(DurationUnit.HOURS)\n\n
    /** Returns a [Duration] equal to this [Long] number of hours. */n    @kotlin.internal.InlineOnly\n    public
inline val Long.hours get() = toDuration(DurationUnit.HOURS)\n\n    /**\n    * Returns a [Duration] equal to
this [Double] number of hours.\n    *\n    * Depending on its magnitude, the value is rounded to an integer
number of nanoseconds or milliseconds.\n    *\n    * @throws IllegalArgumentException if this [Double]
value is `NaN`.\n    */n    @kotlin.internal.InlineOnly\n    public inline val Double.hours get() =
toDuration(DurationUnit.HOURS)\n\n    /** Returns a [Duration] equal to this [Int] number of days. */n
    @kotlin.internal.InlineOnly\n    public inline val Int.days get() = toDuration(DurationUnit.DAYS)\n\n
    /** Returns a [Duration] equal to this [Long] number of days. */n    @kotlin.internal.InlineOnly\n    public inline

```

```

val Long.days get() = toDuration(DurationUnit.DAYS)\n\n    /**\n        * Returns a [Duration] equal to this
[Double] number of days.\n        *\n        * Depending on its magnitude, the value is rounded to an integer number
of nanoseconds or milliseconds.\n        *\n        * @throws IllegalArgumentException if this [Double] value is
`NaN`.\n        */\n    @kotlin.internal.InlineOnly\n    public inline val Double.days get() =
toDuration(DurationUnit.DAYS)\n\n    // deprecated static factory functions\n\n    /** Returns a [Duration]
representing the specified [value] number of nanoseconds. */\n    @SinceKotlin("1.5")\n    @ExperimentalTime\n    @Deprecated("Use 'Int.nanoseconds' extension property from Duration.Companion
instead.", ReplaceWith("value.nanoseconds", "kotlin.time.Duration.Companion.nanoseconds"))\n
    @DeprecatedSinceKotlin(warningSince = "1.6")\n    public fun nanoseconds(value: Int): Duration =
value.toDuration(DurationUnit.NANOSECONDS)\n\n    /** Returns a [Duration] representing the specified
[value] number of nanoseconds. */\n    @SinceKotlin("1.5")\n    @ExperimentalTime\n    @Deprecated("Use 'Long.nanoseconds' extension property from Duration.Companion
instead.",
ReplaceWith("value.nanoseconds", "kotlin.time.Duration.Companion.nanoseconds"))\n
    @DeprecatedSinceKotlin(warningSince = "1.6")\n    public fun nanoseconds(value: Long): Duration =
value.toDuration(DurationUnit.NANOSECONDS)\n\n    /**\n        * Returns a [Duration] representing the
specified [value] number of nanoseconds.\n        *\n        * @throws IllegalArgumentException if the provided
`Double` [value] is `NaN`.\n        */\n    @SinceKotlin("1.5")\n    @ExperimentalTime\n    @Deprecated("Use 'Double.nanoseconds' extension property from Duration.Companion
instead.",
ReplaceWith("value.nanoseconds", "kotlin.time.Duration.Companion.nanoseconds"))\n
    @DeprecatedSinceKotlin(warningSince = "1.6")\n    public fun nanoseconds(value: Double): Duration =
value.toDuration(DurationUnit.NANOSECONDS)\n\n    /** Returns a [Duration] representing the specified
[value] number of microseconds. */\n    @SinceKotlin("1.5")\n    @ExperimentalTime\n    @Deprecated("Use 'Int.microseconds' extension property from Duration.Companion
instead.",
ReplaceWith("value.microseconds", "kotlin.time.Duration.Companion.microseconds"))\n
    @DeprecatedSinceKotlin(warningSince = "1.6")\n    public fun microseconds(value: Int): Duration =
value.toDuration(DurationUnit.MICROSECONDS)\n\n    /** Returns a [Duration] representing the specified
[value] number of microseconds. */\n    @SinceKotlin("1.5")\n    @ExperimentalTime\n    @Deprecated("Use 'Long.microseconds' extension property from Duration.Companion
instead.",
ReplaceWith("value.microseconds", "kotlin.time.Duration.Companion.microseconds"))\n
    @DeprecatedSinceKotlin(warningSince = "1.6")\n    public fun microseconds(value: Long): Duration =
value.toDuration(DurationUnit.MICROSECONDS)\n\n    /**\n        * Returns a [Duration] representing the
specified [value] number of microseconds.\n        *\n        * @throws IllegalArgumentException if the provided
`Double` [value] is `NaN`.\n        */\n    @SinceKotlin("1.5")\n    @ExperimentalTime\n    @Deprecated("Use 'Double.microseconds' extension property from Duration.Companion
instead.",
ReplaceWith("value.microseconds", "kotlin.time.Duration.Companion.microseconds"))\n
    @DeprecatedSinceKotlin(warningSince = "1.6")\n    public fun microseconds(value: Double): Duration =
value.toDuration(DurationUnit.MICROSECONDS)\n\n    /** Returns a [Duration] representing the specified
[value] number of milliseconds. */\n    @SinceKotlin("1.5")\n    @ExperimentalTime\n    @Deprecated("Use 'Int.milliseconds' extension property from Duration.Companion
instead.",
ReplaceWith("value.milliseconds", "kotlin.time.Duration.Companion.milliseconds"))\n
    @DeprecatedSinceKotlin(warningSince = "1.6")\n    public fun milliseconds(value: Int): Duration =
value.toDuration(DurationUnit.MILLISECONDS)\n\n    /** Returns a [Duration] representing the specified
[value] number of milliseconds. */\n    @SinceKotlin("1.5")\n    @ExperimentalTime\n    @Deprecated("Use 'Long.milliseconds' extension property from Duration.Companion
instead.",
ReplaceWith("value.milliseconds", "kotlin.time.Duration.Companion.milliseconds"))\n
    @DeprecatedSinceKotlin(warningSince = "1.6")\n    public fun milliseconds(value: Long): Duration =
value.toDuration(DurationUnit.MILLISECONDS)\n\n    /**\n        * Returns a [Duration] representing the
specified [value] number of milliseconds.\n        *\n        * @throws IllegalArgumentException if the provided

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`Double` [value] is `NaN`. \n      * \n      @SinceKotlin("1.5") \n      @ExperimentalTime \n
@Deprecated("Use 'Double.milliseconds' extension property from Duration.Companion instead.",
ReplaceWith("value.milliseconds", "kotlin.time.Duration.Companion.milliseconds")) \n
@DeprecatedSinceKotlin(warningSince = "1.6") \n      public fun milliseconds(value: Double): Duration =
value.toDuration(DurationUnit.MILLISECONDS) \n \n      /** Returns a [Duration] representing the specified
[value] number of seconds. * \n      @SinceKotlin("1.5") \n      @ExperimentalTime \n      @Deprecated("Use
'Int.seconds' extension property from Duration.Companion instead.", ReplaceWith("value.seconds",
"kotlin.time.Duration.Companion.seconds")) \n      @DeprecatedSinceKotlin(warningSince = "1.6") \n      public
fun seconds(value: Int): Duration = value.toDuration(DurationUnit.SECONDS) \n \n      /** Returns a [Duration]
representing the specified [value] number of seconds. * \n      @SinceKotlin("1.5") \n      @ExperimentalTime \n
      @Deprecated("Use 'Long.seconds' extension property from Duration.Companion instead.",
ReplaceWith("value.seconds", "kotlin.time.Duration.Companion.seconds")) \n
@DeprecatedSinceKotlin(warningSince = "1.6") \n      public fun seconds(value: Long): Duration =
value.toDuration(DurationUnit.SECONDS) \n \n      /** \n      * Returns a [Duration] representing the specified
[value] number of seconds. \n      * \n      * @throws IllegalArgumentException if the provided `Double` [value] is
`NaN`. \n      * \n      * @SinceKotlin("1.5") \n      @ExperimentalTime \n      @Deprecated("Use
'Double.seconds' extension property from Duration.Companion instead.", ReplaceWith("value.seconds",
"kotlin.time.Duration.Companion.seconds")) \n      @DeprecatedSinceKotlin(warningSince = "1.6") \n      public
fun seconds(value: Double): Duration = value.toDuration(DurationUnit.SECONDS) \n \n      /** Returns a
[Duration] representing the specified [value] number of minutes. * \n      @SinceKotlin("1.5") \n
@ExperimentalTime \n      @Deprecated("Use 'Int.minutes' extension property from Duration.Companion
instead.", ReplaceWith("value.minutes", "kotlin.time.Duration.Companion.minutes")) \n
@DeprecatedSinceKotlin(warningSince = "1.6") \n      public fun minutes(value: Int): Duration =
value.toDuration(DurationUnit.MINUTES) \n \n      /** Returns a [Duration] representing the specified [value]
number of minutes. * \n      @SinceKotlin("1.5") \n      @ExperimentalTime \n      @Deprecated("Use
'Long.minutes' extension property from Duration.Companion instead.", ReplaceWith("value.minutes",
"kotlin.time.Duration.Companion.minutes")) \n      @DeprecatedSinceKotlin(warningSince = "1.6") \n      public
fun minutes(value: Long): Duration = value.toDuration(DurationUnit.MINUTES) \n \n      /** \n      * Returns a
[Duration] representing the specified [value] number of minutes. \n      * \n      * @throws
IllegalArgumentException if the provided `Double` [value] is `NaN`. \n      * \n      * @SinceKotlin("1.5") \n
@ExperimentalTime \n      @Deprecated("Use 'Double.minutes' extension property from Duration.Companion
instead.", ReplaceWith("value.minutes", "kotlin.time.Duration.Companion.minutes")) \n
@DeprecatedSinceKotlin(warningSince = "1.6") \n      public fun minutes(value: Double): Duration =
value.toDuration(DurationUnit.MINUTES) \n \n      /** Returns a [Duration] representing the specified [value]
number of hours. * \n      @SinceKotlin("1.5") \n      @ExperimentalTime \n      @Deprecated("Use 'Int.hours'
extension property from Duration.Companion instead.", ReplaceWith("value.hours",
"kotlin.time.Duration.Companion.hours")) \n      @DeprecatedSinceKotlin(warningSince = "1.6") \n      public
fun hours(value: Int): Duration = value.toDuration(DurationUnit.HOURS) \n \n      /** Returns a [Duration]
representing the specified [value] number of hours. * \n      @SinceKotlin("1.5") \n      @ExperimentalTime \n
@Deprecated("Use 'Long.hours' extension property from Duration.Companion instead.",
ReplaceWith("value.hours", "kotlin.time.Duration.Companion.hours")) \n
@DeprecatedSinceKotlin(warningSince = "1.6") \n      public fun hours(value: Long): Duration =
value.toDuration(DurationUnit.HOURS) \n \n      /** \n      * Returns a [Duration] representing the specified
[value] number of hours. \n      * \n      * @throws IllegalArgumentException if the provided `Double` [value] is
`NaN`. \n      * \n      * @SinceKotlin("1.5") \n      @ExperimentalTime \n      @Deprecated("Use 'Double.hours'
extension property from Duration.Companion instead.", ReplaceWith("value.hours",
"kotlin.time.Duration.Companion.hours")) \n      @DeprecatedSinceKotlin(warningSince = "1.6") \n      public
fun hours(value: Double): Duration = value.toDuration(DurationUnit.HOURS) \n \n      /** Returns a [Duration]

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representing the specified [value] number of days. *^@SinceKotlin("1.5")@ExperimentalTime\n
@Deprecated("Use 'Int.days' extension property from Duration.Companion instead.", ReplaceWith("value.days",
"kotlin.time.Duration.Companion.days"))\n    @DeprecatedSinceKotlin(warningSince = "1.6")\n    public
fun days(value: Int): Duration = value.toDuration(DurationUnit.DAYS)\n    /** Returns a [Duration]
representing the specified [value] number of days. *^@SinceKotlin("1.5")@ExperimentalTime\n
@Deprecated("Use 'Long.days' extension property from Duration.Companion instead.",
ReplaceWith("value.days", "kotlin.time.Duration.Companion.days"))\n
@DeprecatedSinceKotlin(warningSince = "1.6")\n    public fun days(value: Long): Duration =
value.toDuration(DurationUnit.DAYS)\n    /**\n    * Returns a [Duration] representing the specified [value]
number of days.\n    *\n    * @throws IllegalArgumentException if the provided `Double` [value] is `NaN`.\n
    *^@SinceKotlin("1.5")@ExperimentalTime\n    @Deprecated("Use 'Double.days' extension
property from Duration.Companion instead.", ReplaceWith("value.days",
"kotlin.time.Duration.Companion.days"))\n    @DeprecatedSinceKotlin(warningSince = "1.6")\n    public
fun days(value: Double): Duration = value.toDuration(DurationUnit.DAYS)\n    /**\n    * Parses a string that
represents a duration and returns the parsed [Duration] value.\n    *\n    * The following formats are
accepted:\n    *\n    * - ISO-8601 Duration format, e.g. `P1DT2H3M4.058S`, see [toIsoString] and
[parseIsoString].\n    * - The format of string returned by the default [Duration.toString] and `toString` in a
specific unit,\n    * e.g. `10s`, `1h 30m` or `-(1h 30m)`.\n    *\n    * @throws IllegalArgumentException if
the string doesn't represent a duration in any of the supported formats.\n    * @sample
samples.time.Durations.parse\n    *^@SinceKotlin("1.5")@ExperimentalTime\n    @Deprecated("Use
'Double.days' extension property from Duration.Companion instead.", ReplaceWith("value.days",
"kotlin.time.Duration.Companion.days"))\n    @DeprecatedSinceKotlin(warningSince = "1.6")\n    public
fun parse(value: String): Duration = try {\n    parseDuration(value, strictIso = false)\n    } catch (e:
IllegalArgumentException) {\n    throw
IllegalArgumentException("Invalid duration string format: '$value'.", e)\n    }\n    /**\n    * Parses a
string that represents a duration in ISO-8601 format and returns the parsed [Duration] value.\n    *\n    *
@throws IllegalArgumentException if the string doesn't represent a duration in ISO-8601 format.\n    * @sample
samples.time.Durations.parseIsoString\n    *^@SinceKotlin("1.5")@ExperimentalTime\n    @Deprecated("Use
'Double.days' extension property from Duration.Companion instead.", ReplaceWith("value.days",
"kotlin.time.Duration.Companion.days"))\n    @DeprecatedSinceKotlin(warningSince = "1.6")\n    public
fun parseIsoString(value: String): Duration = try {\n    parseDuration(value, strictIso = true)\n    } catch
(e: IllegalArgumentException) {\n    throw
IllegalArgumentException("Invalid ISO duration string format: '$value'.", e)\n    }\n    /**\n    * Parses a
string that represents a duration and returns the parsed [Duration] value,\n    * or `null` if the string doesn't
represent a duration in any of the supported formats.\n    *\n    * The following formats are accepted:\n
*\n    * - ISO-8601 Duration format, e.g. `P1DT2H3M4.058S`, see [toIsoString] and [parseIsoString].\n    * -
The format of string returned by the default [Duration.toString] and `toString` in a specific unit,\n    * e.g.
`10s`, `1h 30m` or `-(1h 30m)`.\n    * @sample samples.time.Durations.parse\n    *^@SinceKotlin("1.5")@ExperimentalTime\n    @Deprecated("Use
'Double.days' extension property from Duration.Companion instead.", ReplaceWith("value.days",
"kotlin.time.Duration.Companion.days"))\n    @DeprecatedSinceKotlin(warningSince = "1.6")\n    public
fun parseOrNull(value: String): Duration? = try {\n    parseDuration(value, strictIso = false)\n    } catch (e:
IllegalArgumentException) {\n    null\n    }\n    /**\n    * Parses a string that represents a duration in
ISO-8601 format and returns the parsed [Duration] value,\n    * or `null` if the string doesn't represent a
duration in ISO-8601 format.\n    * @sample samples.time.Durations.parseIsoString\n    *^@SinceKotlin("1.5")@ExperimentalTime\n    @Deprecated("Use
'Double.days' extension property from Duration.Companion instead.", ReplaceWith("value.days",
"kotlin.time.Duration.Companion.days"))\n    @DeprecatedSinceKotlin(warningSince = "1.6")\n    public
fun parseIsoStringOrNull(value: String): Duration? = try {\n    parseDuration(value, strictIso = true)\n    }
catch (e: IllegalArgumentException) {\n    null\n    }\n    }\n    /**\n    * Returns the
negative of this value. *^@SinceKotlin("1.5")@ExperimentalTime\n    @Deprecated("Use 'Double.days'
extension property from Duration.Companion instead.", ReplaceWith("value.days",
"kotlin.time.Duration.Companion.days"))\n    @DeprecatedSinceKotlin(warningSince = "1.6")\n    public
operator fun unaryMinus(): Duration = durationOf(-value,
unitDiscriminator)\n    /**\n    * Returns a duration whose value is the sum of this and [other] duration
values.\n    *\n    * @throws IllegalArgumentException if the operation results in an undefined value for the
given arguments,\n    * e.g. when adding infinite durations of different sign.\n    *^@SinceKotlin("1.5")@ExperimentalTime\n    @Deprecated("Use 'Double.days'
extension property from Duration.Companion instead.", ReplaceWith("value.days",
"kotlin.time.Duration.Companion.days"))\n    @DeprecatedSinceKotlin(warningSince = "1.6")\n    public
operator fun plus(other: Duration):
Duration {\n    when {\n    this.isInfinite() -> {\n    if (other.isFinite() || (this.rawValue xor
other.rawValue >= 0))\n    return this\n    else\n    throw
IllegalArgumentException("Summing infinite durations of different signs yields an undefined result.")\n    }\n
    other.isInfinite() -> return other\n    }\n    return when {\n    this.unitDiscriminator ==
other.unitDiscriminator -> {\n    val result = this.value + other.value // never overflows long, but can
overflow long63\n    when {\n    isInNanos() ->\n

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durationOfNanosNormalized(result)\n          else ->\n          durationOfMillisNormalized(result)\n    }\n    }\n    this.isInMillis() ->\n    addValuesMixedRanges(this.value, other.value)\nelse ->\n    addValuesMixedRanges(other.value, this.value)\n    }\n    }\n    private fun\n    addValuesMixedRanges(thisMillis: Long, otherNanos: Long): Duration {\n    val otherMillis =\n    nanosToMillis(otherNanos)\n    val resultMillis = thisMillis + otherMillis\n    return if (resultMillis in -\n    MAX_NANOS_IN_MILLIS..MAX_NANOS_IN_MILLIS) {\n    val otherNanoRemainder = otherNanos -\n    millisToNanos(otherMillis)\n    durationOfNanos(millisToNanos(resultMillis) + otherNanoRemainder)\n    }\n    else {\n    durationOfMillis(resultMillis.coerceIn(-MAX_MILLIS, MAX_MILLIS))\n    }\n    }\n    /**\n    * Returns a duration whose value is the difference between this and [other] duration values.\n    * @throws\n    IllegalArgumentException if the operation results in an undefined value for the given arguments,\n    * e.g. when\n    subtracting infinite durations of the same sign.\n    */\n    public operator fun minus(other: Duration): Duration =\n    this + (-other)\n    /**\n    * Returns a duration whose value is this duration value multiplied by the given [scale]\n    number.\n    * @throws IllegalArgumentException if the operation results in an undefined value for the given\n    arguments,\n    * e.g. when multiplying an infinite duration by zero.\n    */\n    public operator fun times(scale: Int):\n    Duration {\n    if (isInfinite()) {\n    return when {\n    scale == 0 -> throw\n    IllegalArgumentException("Multiplying infinite duration by zero yields an undefined result.")\n    scale > 0\n    -> this\n    else -> -this\n    }\n    }\n    if (scale == 0) return ZERO\n    val value = value\n    val result = value * scale\n    return if (isInNanos()) {\n    if (value in (MAX_NANOS /\n    Int.MIN_VALUE)..(-MAX_NANOS / Int.MIN_VALUE)) {\n    // can't overflow nanos range for any\n    scale\n    durationOfNanos(result)\n    } else {\n    if (result / scale == value) {\n    durationOfNanosNormalized(result)\n    } else {\n    val millis = nanosToMillis(value)\n    val remNanos = value - millisToNanos(millis)\n    val resultMillis = millis * scale\n    val\n    totalMillis = resultMillis + nanosToMillis(remNanos * scale)\n    if (resultMillis / scale == millis &&\n    totalMillis xor resultMillis >= 0) {\n    durationOfMillis(totalMillis.coerceIn(-\n    MAX_MILLIS..MAX_MILLIS))\n    } else {\n    if (value.sign * scale.sign > 0) INFINITE\n    else NEG_INFINITE\n    }\n    }\n    }\n    } else {\n    if (result / scale == value) {\n    durationOfMillis(result.coerceIn(-MAX_MILLIS..MAX_MILLIS))\n    } else {\n    if (value.sign\n    * scale.sign > 0) INFINITE else NEG_INFINITE\n    }\n    }\n    }\n    /**\n    * Returns a duration whose\n    value is this duration value multiplied by the given [scale] number.\n    * @throws\n    IllegalArgumentException if the operation results in an undefined value for the given arguments,\n    * e.g. when\n    multiplying an infinite duration by zero.\n    */\n    public operator fun times(scale: Double): Duration {\n    val\n    intScale = scale.roundToInt()\n    if (intScale.toDouble() == scale) {\n    return times(intScale)\n    }\n    val unit = storageUnit\n    val result = toDouble(unit) * scale\n    return result.toDuration(unit)\n    }\n    /**\n    * Returns a duration whose value is this duration value divided by the given [scale] number.\n    * @throws\n    IllegalArgumentException if the operation results in an undefined value for the given arguments,\n    * e.g. when\n    dividing zero duration by zero.\n    */\n    public operator fun div(scale: Int): Duration {\n    if (scale ==\n    0) {\n    return when {\n    isPositive() -> INFINITE\n    isNegative() -> NEG_INFINITE\n    else -> throw\n    IllegalArgumentException("Dividing zero duration by zero yields an undefined result.")\n    }\n    }\n    if (isInNanos()) {\n    return durationOfNanos(value / scale)\n    } else {\n    if\n    (isInfinite())\n    return this * scale.sign\n    val result = value / scale\n    if (result in -\n    MAX_NANOS_IN_MILLIS..MAX_NANOS_IN_MILLIS) {\n    val rem = millisToNanos(value - (result *\n    scale)) / scale\n    return durationOfNanos(millisToNanos(result) + rem)\n    }\n    return\n    durationOfMillis(result)\n    }\n    }\n    /**\n    * Returns a duration whose value is this duration value divided\n    by the given [scale] number.\n    * @throws\n    IllegalArgumentException if the operation results in an\n    undefined value for the given arguments,\n    * e.g. when dividing an infinite duration by infinity or zero duration\n    by zero.\n    */\n    public operator fun div(scale: Double): Duration {\n    val intScale = scale.roundToInt()\n    if (intScale.toDouble() == scale && intScale != 0) {\n    return div(intScale)\n    }\n    val unit =

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storageUnit\n    val result = toDouble(unit) / scale\n    return result.toDuration(unit)\n  }\n\n  /** Returns a
number that is the ratio of this and [other] duration values. */\n  public operator fun div(other: Duration): Double
{\n    val coarserUnit = maxOf(this.storageUnit, other.storageUnit)\n    return this.toDouble(coarserUnit) /
other.toDouble(coarserUnit)\n  }\n\n  /** Returns true, if the duration value is less than zero. */\n  public fun
isNegative(): Boolean = rawValue < 0\n\n  /** Returns true, if the duration value is greater than zero. */\n  public fun
isPositive(): Boolean = rawValue > 0\n\n  /** Returns true, if the duration value is infinite. */\n  public fun
isInfinite(): Boolean = rawValue == INFINITE.rawValue || rawValue == NEG_INFINITE.rawValue\n\n  /**
Returns true, if the duration value is finite. */\n  public fun isFinite(): Boolean = !isInfinite()\n\n  /** Returns the
absolute value of this value. The returned value is always non-negative. */\n  public val absoluteValue: Duration
get() = if (isNegative()) -this else this\n\n  override fun compareTo(other: Duration): Int {\n    val compareBits =
this.rawValue xor other.rawValue\n    if (compareBits < 0 || compareBits.toInt() and 1 == 0) // different signs or
same sign/same range\n      return this.rawValue.compareTo(other.rawValue) // same sign/different
ranges\n    val r = this.unitDiscriminator - other.unitDiscriminator // compare ranges\n    return if (isNegative())
-r else r\n  }\n\n  /** // splitting to components\n\n  /**\n  * Splits this duration into days, hours, minutes,
seconds, and nanoseconds and executes the given [action] with these components.\n  * The result of [action] is
returned as the result of this function.\n  *\n  * - `nanoseconds` represents the whole number of nanoseconds in
this duration, and its absolute value is less than 1_000_000_000;\n  * - `seconds` represents the whole number of
seconds in this duration, and its absolute value is less than 60;\n  * - `minutes` represents the whole number of
minutes in this duration, and its absolute value is less than 60;\n  * - `hours` represents the whole number of hours
in this duration, and its absolute value is less than 24;\n  * - `days` represents the whole number of days in this
duration.\n  *\n  * Infinite durations are represented as either [Long.MAX_VALUE] days, or
[Long.MIN_VALUE] days (depending on the sign of infinity),\n  * and zeroes in the lower components.\n  *\n  public inline fun <T> toComponents(action: (days: Long, hours: Int, minutes: Int, seconds: Int, nanoseconds: Int) -
> T): T {\n    contract { callsInPlace(action, InvocationKind.EXACTLY_ONCE) }\n    return
action(inWholeDays, hoursComponent, minutesComponent, secondsComponent, nanosecondsComponent)\n  }\n\n  /**\n  * Splits this duration into hours, minutes, seconds, and nanoseconds and executes the given [action] with
these components.\n  * The result of [action] is returned as the result of this function.\n  *\n  * - `nanoseconds`
represents the whole number of nanoseconds in this duration, and its absolute value is less than 1_000_000_000;\n
* - `seconds` represents the whole number of seconds in this duration, and its absolute value is less than 60;\n
* - `minutes` represents the whole number of minutes in this duration, and its absolute value is less than 60;\n
* - `hours` represents the whole number of hours in this duration.\n  *\n  * Infinite durations are represented as
either [Long.MAX_VALUE] hours, or [Long.MIN_VALUE] hours (depending on the sign of infinity),\n  * and
zeroes in the lower components.\n  *\n  public inline fun <T> toComponents(action: (hours: Long, minutes: Int,
seconds: Int, nanoseconds: Int) -> T): T {\n    contract { callsInPlace(action, InvocationKind.EXACTLY_ONCE)
}\n    return action(inWholeHours, minutesComponent, secondsComponent, nanosecondsComponent)\n  }\n\n  /**\n  * Splits this duration into minutes, seconds, and nanoseconds and executes the given [action] with these
components.\n  * The result of [action] is returned as the result of this function.\n  *\n  * - `nanoseconds`
represents the whole number of nanoseconds in this duration, and its absolute value is less than 1_000_000_000;\n
* - `seconds` represents the whole number of seconds in this duration, and its absolute value is less than 60;\n
* - `minutes` represents the whole number of minutes in this duration.\n  *\n  * Infinite durations are represented as
either [Long.MAX_VALUE] minutes, or [Long.MIN_VALUE] minutes (depending on the sign of infinity),\n  *
and zeroes in the lower components.\n  *\n  public inline fun <T> toComponents(action: (minutes: Long,
seconds: Int, nanoseconds: Int) -> T): T {\n    contract { callsInPlace(action, InvocationKind.EXACTLY_ONCE)
}\n    return action(inWholeMinutes, secondsComponent, nanosecondsComponent)\n  }\n\n  /**\n  * Splits
this duration into seconds, and nanoseconds and executes the given [action] with these components.\n  * The result
of [action] is returned as the result of this function.\n  *\n  * - `nanoseconds` represents the whole number of
nanoseconds in this duration, and its absolute value is less than 1_000_000_000;\n  * - `seconds` represents the
whole number of seconds in this duration.\n  *\n  * Infinite durations are represented as either

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[Long.MAX_VALUE] seconds, or [Long.MIN_VALUE] seconds (depending on the sign of infinity),\n * and
zero nanoseconds.\n *^\n public inline fun <T> toComponents(action: (seconds: Long, nanoseconds: Int) -> T):
T {\n contract { callsInPlace(action, InvocationKind.EXACTLY_ONCE) }\n return
action(inWholeSeconds, nanosecondsComponent)\n }\n\n @PublishedApi\n internal val hoursComponent:
Int\n get() = if (isInfinite()) 0 else (inWholeHours % 24).toInt()\n\n @PublishedApi\n internal val
minutesComponent: Int\n get() = if (isInfinite()) 0 else (inWholeMinutes % 60).toInt()\n\n @PublishedApi\n
internal val secondsComponent: Int\n get() = if (isInfinite()) 0 else (inWholeSeconds % 60).toInt()\n\n
@PublishedApi\n internal val nanosecondsComponent: Int\n get() = when {\n isInfinite() -> 0\n
isInMillis() -> millisToNanos(value % 1_000).toInt()\n else -> (value % 1_000_000_000).toInt()\n
}\n\n // conversion to units\n\n /**\n * Returns the value of this duration expressed as a [Double] number of
the specified [unit].\n *\n * The operation may involve rounding when the result cannot be represented exactly
with a [Double] number.\n *\n * An infinite duration value is converted either to
[Double.POSITIVE_INFINITY] or [Double.NEGATIVE_INFINITY] depending on its sign.\n *^\n public fun
toDouble(unit: DurationUnit): Double {\n return when (rawValue) {\n INFINITE.rawValue ->
Double.POSITIVE_INFINITY\n NEG_INFINITE.rawValue -> Double.NEGATIVE_INFINITY\n
else -> {\n // TODO: whether it's ok to convert to Double before scaling\n
convertDurationUnit(value.toDouble(), storageUnit, unit)\n }\n }\n }\n\n /**\n * Returns the value
of this duration expressed as a [Long] number of the specified [unit].\n *\n * If the result doesn't fit in the range
of [Long] type, it is coerced into that range:\n * - [Long.MIN_VALUE] is returned if it's less than
`Long.MIN_VALUE`,\n * - [Long.MAX_VALUE] is returned if it's greater than `Long.MAX_VALUE`.\n *\n * An infinite duration value is converted either to [Long.MAX_VALUE] or [Long.MIN_VALUE] depending on
its sign.\n *^\n public fun toLong(unit: DurationUnit): Long {\n return when (rawValue) {\n
INFINITE.rawValue -> Long.MAX_VALUE\n NEG_INFINITE.rawValue -> Long.MIN_VALUE\n
else -> convertDurationUnit(value, storageUnit, unit)\n }\n }\n\n /**\n * Returns the value of this
duration expressed as an [Int] number of the specified [unit].\n *\n * If the result doesn't fit in the range of [Int]
type, it is coerced into that range:\n * - [Int.MIN_VALUE] is returned if it's less than `Int.MIN_VALUE`,\n * -
[Int.MAX_VALUE] is returned if it's greater than `Int.MAX_VALUE`.\n *\n * An infinite duration value is
converted either to [Int.MAX_VALUE] or [Int.MIN_VALUE] depending on its sign.\n *^\n public fun
toInt(unit: DurationUnit): Int =\n toLong(unit).coerceIn(Int.MIN_VALUE.toInt(),
Int.MAX_VALUE.toInt()).toInt()\n\n /** The value of this duration expressed as a [Double] number of days.
*^\n @ExperimentalTime\n @Deprecated("Use inWholeDays property instead or convert toDouble(DAYS) if a
double value is required.", ReplaceWith("toDouble(DurationUnit.DAYS)"))\n public val inDays: Double get() =
toDouble(DurationUnit.DAYS)\n\n /** The value of this duration expressed as a [Double] number of hours. *^\n
@ExperimentalTime\n @Deprecated("Use inWholeHours property instead or convert toDouble(HOURS) if a
double value is required.", ReplaceWith("toDouble(DurationUnit.HOURS)"))\n public val inHours: Double
get() = toDouble(DurationUnit.HOURS)\n\n /** The value of this duration expressed as a [Double] number of
minutes. *^\n @ExperimentalTime\n @Deprecated("Use inWholeMinutes property instead or convert
toDouble(MINUTES) if a double value is required.", ReplaceWith("toDouble(DurationUnit.MINUTES)"))\n
public val inMinutes: Double get() = toDouble(DurationUnit.MINUTES)\n\n /** The value of this duration
expressed as a [Double] number of seconds. *^\n @ExperimentalTime\n @Deprecated("Use inWholeSeconds
property instead or convert toDouble(SECONDS) if a double value is required.",
ReplaceWith("toDouble(DurationUnit.SECONDS)"))\n public val inSeconds: Double get() =
toDouble(DurationUnit.SECONDS)\n\n /** The value of this duration expressed as a [Double] number of
milliseconds. *^\n @ExperimentalTime\n @Deprecated("Use inWholeMilliseconds property instead or convert
toDouble(MILLISECONDS) if a double value is required.",
ReplaceWith("toDouble(DurationUnit.MILLISECONDS)"))\n public val inMilliseconds: Double get() =
toDouble(DurationUnit.MILLISECONDS)\n\n /** The value of this duration expressed as a [Double] number of
microseconds. *^\n @ExperimentalTime\n @Deprecated("Use inWholeMicroseconds property instead or

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convert toDouble(MICROSECONDS) if a double value is required.",
ReplaceWith("toDouble(DurationUnit.MICROSECONDS)")\n public val inMicroseconds: Double get() =
toDouble(DurationUnit.MICROSECONDS)\n\n /** The value of this duration expressed as a [Double] number of
nanoseconds. *\n @ExperimentalTime\n @Deprecated("Use inWholeNanoseconds property instead or convert
toDouble(NANOSECONDS) if a double value is required.",
ReplaceWith("toDouble(DurationUnit.NANOSECONDS)")\n public val inNanoseconds: Double get() =
toDouble(DurationUnit.NANOSECONDS)\n\n\n /**\n * The value of this duration expressed as a [Long]
number of days.\n *\n * An infinite duration value is converted either to [Long.MAX_VALUE] or
[Long.MIN_VALUE] depending on its sign.\n */\n public val inWholeDays: Long\n get() =
toLong(DurationUnit.DAYS)\n\n\n /**\n * The value of this duration expressed as a [Long] number of hours.\n
*\n * An infinite duration value is converted either to [Long.MAX_VALUE] or [Long.MIN_VALUE] depending
on its sign.\n */\n public val inWholeHours: Long\n get() = toLong(DurationUnit.HOURS)\n\n\n /**\n *
The value of this duration expressed as a [Long] number of minutes.\n *\n * An infinite duration value is
converted either to [Long.MAX_VALUE] or [Long.MIN_VALUE] depending on its sign.\n */\n public val
inWholeMinutes: Long\n get() = toLong(DurationUnit.MINUTES)\n\n\n /**\n * The value of this duration
expressed as a [Long] number of seconds.\n *\n * An infinite duration value is converted either to
[Long.MAX_VALUE] or [Long.MIN_VALUE] depending on its sign.\n */\n public val inWholeSeconds:
Long\n get() = toLong(DurationUnit.SECONDS)\n\n\n /**\n * The value of this duration expressed as a
[Long] number of milliseconds.\n *\n * An infinite duration value is converted either to [Long.MAX_VALUE]
or [Long.MIN_VALUE] depending on its sign.\n */\n public val inWholeMilliseconds: Long\n get() {\n
return if (isInMillis() && isFinite()) value else toLong(DurationUnit.MILLISECONDS)\n } \n\n\n /**\n *
The value of this duration expressed as a [Long] number of microseconds.\n *\n * If the result doesn't fit in the
range of [Long] type, it is coerced into that range:\n * - [Long.MIN_VALUE] is returned if it's less than
`Long.MIN_VALUE`,\n * - [Long.MAX_VALUE] is returned if it's greater than `Long.MAX_VALUE`.\n *\n
* An infinite duration value is converted either to [Long.MAX_VALUE] or [Long.MIN_VALUE] depending on
its sign.\n */\n public val inWholeMicroseconds: Long\n get() =
toLong(DurationUnit.MICROSECONDS)\n\n\n /**\n * The value of this duration expressed as a [Long] number
of nanoseconds.\n *\n * If the result doesn't fit in the range of [Long] type, it is coerced into that range:\n
* - [Long.MIN_VALUE] is returned if it's less than `Long.MIN_VALUE`,\n * - [Long.MAX_VALUE] is returned if
it's greater than `Long.MAX_VALUE`.\n *\n * An infinite duration value is converted either to
[Long.MAX_VALUE] or [Long.MIN_VALUE] depending on its sign.\n */\n public val inWholeNanoseconds:
Long\n get() {\n val value = value\n return when {\n isInNanos() -> value\n
value > Long.MAX_VALUE / NANOS_IN_MILLIS -> Long.MAX_VALUE\n value <
Long.MIN_VALUE / NANOS_IN_MILLIS -> Long.MIN_VALUE\n else -> millisToNanos(value)\n
}\n }\n\n // shortcuts\n\n /**\n * Returns the value of this duration expressed as a [Long] number of
nanoseconds.\n *\n * If the value doesn't fit in the range of [Long] type, it is coerced into that range, see the
conversion [Double.toLong] for details.\n *\n * The range of durations that can be expressed as a `Long`
number of nanoseconds is approximately \u00b1292 years.\n */\n @ExperimentalTime\n @Deprecated("Use
inWholeNanoseconds property instead.", ReplaceWith("this.inWholeNanoseconds"))\n public fun
toLongNanoseconds(): Long = inWholeNanoseconds\n\n\n /**\n * Returns the value of this duration expressed as
a [Long] number of milliseconds.\n *\n * The value is coerced to the range of [Long] type, if it doesn't fit in
that range, see the conversion [Double.toLong] for details.\n *\n * The range of durations that can be expressed
as a `Long` number of milliseconds is approximately \u00b1292 million years.\n */\n @ExperimentalTime\n
@Deprecated("Use inWholeMilliseconds property instead.", ReplaceWith("this.inWholeMilliseconds"))\n
public fun toLongMilliseconds(): Long = inWholeMilliseconds\n\n\n /**\n * Returns a string representation of
this duration value\n * expressed as a combination of numeric components, each in its own unit.\n *\n * Each
component is a number followed by the unit abbreviated name: `d`, `h`, `m`, `s`:\n * `5h`, `1d 12h`, `1h 0m
30.340s`.\n *\n * The last component, usually seconds, can be a number with a fractional part.\n *\n * If the

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this [Double] number of microseconds.\n * \n * @throws IllegalArgumentException if this [Double] value is
`NaN`.\n * \n @SinceKotlin("1.3")\n @ExperimentalTime\n @Deprecated("Use 'Double.microseconds' extension
property from Duration.Companion instead.", ReplaceWith("this.microseconds",
"kotlin.time.Duration.Companion.microseconds"))\n @DeprecatedSinceKotlin(warningSince = "1.5")\n public val
Double.microseconds get() = toDuration(DurationUnit.MICROSECONDS)\n\n /** Returns a [Duration] equal to
this [Int] number of milliseconds. * \n @SinceKotlin("1.3")\n @ExperimentalTime\n @Deprecated("Use
'Int.milliseconds' extension property from Duration.Companion instead.", ReplaceWith("this.milliseconds",
"kotlin.time.Duration.Companion.milliseconds"))\n @DeprecatedSinceKotlin(warningSince = "1.5")\n public val
Int.milliseconds get() = toDuration(DurationUnit.MILLISECONDS)\n\n /** Returns a [Duration] equal to this
[Long] number of milliseconds. * \n @SinceKotlin("1.3")\n @ExperimentalTime\n @Deprecated("Use
'Long.milliseconds' extension property from Duration.Companion instead.", ReplaceWith("this.milliseconds",
"kotlin.time.Duration.Companion.milliseconds"))\n @DeprecatedSinceKotlin(warningSince = "1.5")\n public val
Long.milliseconds get() = toDuration(DurationUnit.MILLISECONDS)\n\n /** \n * Returns a [Duration] equal to this
[Double] number of milliseconds.\n * \n * @throws IllegalArgumentException if this [Double] value is `NaN`.\n
* \n @SinceKotlin("1.3")\n @ExperimentalTime\n @Deprecated("Use 'Double.milliseconds' extension property
from Duration.Companion instead.", ReplaceWith("this.milliseconds",
"kotlin.time.Duration.Companion.milliseconds"))\n @DeprecatedSinceKotlin(warningSince = "1.5")\n public val
Double.milliseconds get() = toDuration(DurationUnit.MILLISECONDS)\n\n /** Returns a [Duration] equal to this
[Int] number of seconds. * \n @SinceKotlin("1.3")\n @ExperimentalTime\n @Deprecated("Use 'Int.seconds'
extension property from Duration.Companion instead.", ReplaceWith("this.seconds",
"kotlin.time.Duration.Companion.seconds"))\n @DeprecatedSinceKotlin(warningSince = "1.5")\n public val
Int.seconds get() = toDuration(DurationUnit.SECONDS)\n\n /** Returns a [Duration] equal to this [Long] number of
seconds. * \n @SinceKotlin("1.3")\n @ExperimentalTime\n @Deprecated("Use 'Long.seconds' extension property
from Duration.Companion instead.", ReplaceWith("this.seconds",
"kotlin.time.Duration.Companion.seconds"))\n @DeprecatedSinceKotlin(warningSince = "1.5")\n public val
Long.seconds get() = toDuration(DurationUnit.SECONDS)\n\n /** \n * Returns a [Duration] equal to this [Double]
number of seconds.\n * \n * @throws IllegalArgumentException if this [Double] value is `NaN`.\n
* \n @SinceKotlin("1.3")\n @ExperimentalTime\n @Deprecated("Use 'Double.seconds' extension property from
Duration.Companion instead.", ReplaceWith("this.seconds",
"kotlin.time.Duration.Companion.seconds"))\n @DeprecatedSinceKotlin(warningSince = "1.5")\n public val
Double.seconds get() = toDuration(DurationUnit.SECONDS)\n\n /** Returns a [Duration] equal to this [Int]
number of minutes. * \n @SinceKotlin("1.3")\n @ExperimentalTime\n @Deprecated("Use 'Int.minutes' extension
property from Duration.Companion instead.", ReplaceWith("this.minutes",
"kotlin.time.Duration.Companion.minutes"))\n @DeprecatedSinceKotlin(warningSince = "1.5")\n public val
Int.minutes get() = toDuration(DurationUnit.MINUTES)\n\n /** Returns a [Duration] equal to this [Long] number of
minutes. * \n @SinceKotlin("1.3")\n @ExperimentalTime\n @Deprecated("Use 'Long.minutes' extension property
from Duration.Companion instead.", ReplaceWith("this.minutes",
"kotlin.time.Duration.Companion.minutes"))\n @DeprecatedSinceKotlin(warningSince = "1.5")\n public val
Long.minutes get() = toDuration(DurationUnit.MINUTES)\n\n /** \n * Returns a [Duration] equal to this [Double]
number of minutes.\n * \n * @throws IllegalArgumentException if this [Double] value is `NaN`.\n
* \n @SinceKotlin("1.3")\n @ExperimentalTime\n @Deprecated("Use 'Double.minutes' extension property from
Duration.Companion instead.", ReplaceWith("this.minutes",
"kotlin.time.Duration.Companion.minutes"))\n @DeprecatedSinceKotlin(warningSince = "1.5")\n public val
Double.minutes get() = toDuration(DurationUnit.MINUTES)\n\n /** Returns a [Duration] equal to this [Int]
number of hours. * \n @SinceKotlin("1.3")\n @ExperimentalTime\n @Deprecated("Use 'Int.hours' extension
property from Duration.Companion instead.", ReplaceWith("this.hours",
"kotlin.time.Duration.Companion.hours"))\n @DeprecatedSinceKotlin(warningSince = "1.5")\n public val
Int.hours get() = toDuration(DurationUnit.HOURS)\n\n /** Returns a [Duration] equal to this [Long] number of

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hours. *\n@SinceKotlin("1.3")\n@ExperimentalTime\n@Deprecated("Use 'Long.hours' extension property from
Duration.Companion instead.", ReplaceWith("this.hours"),
"\"kotlin.time.Duration.Companion.hours\")\n@DeprecatedSinceKotlin(warningSince = "1.5")\npublic val
Long.hours get() = toDuration(DurationUnit.HOURS)\n\n/** Returns a [Duration] equal to this [Double]
number of hours.\n *\n * @throws IllegalArgumentException if this [Double] value is `NaN`.\n
*\n@SinceKotlin("1.3")\n@ExperimentalTime\n@Deprecated("Use 'Double.hours' extension property from
Duration.Companion instead.", ReplaceWith("this.hours"),
"\"kotlin.time.Duration.Companion.hours\")\n@DeprecatedSinceKotlin(warningSince = "1.5")\npublic val
Double.hours get() = toDuration(DurationUnit.HOURS)\n\n\n/** Returns a [Duration] equal to this [Int] number of
days. *\n@SinceKotlin("1.3")\n@ExperimentalTime\n@Deprecated("Use 'Int.days' extension property from
Duration.Companion instead.", ReplaceWith("this.days"),
"\"kotlin.time.Duration.Companion.days")\n@DeprecatedSinceKotlin(warningSince = "1.5")\npublic val Int.days
get() = toDuration(DurationUnit.DAYS)\n\n\n/** Returns a [Duration] equal to this [Long] number of days.
*\n@SinceKotlin("1.3")\n@ExperimentalTime\n@Deprecated("Use 'Long.days' extension property from
Duration.Companion instead.", ReplaceWith("this.days"),
"\"kotlin.time.Duration.Companion.days")\n@DeprecatedSinceKotlin(warningSince = "1.5")\npublic val
Long.days get() = toDuration(DurationUnit.DAYS)\n\n\n/** Returns a [Duration] equal to this [Double] number
of days.\n *\n * @throws IllegalArgumentException if this [Double] value is `NaN`.\n
*\n@SinceKotlin("1.3")\n@ExperimentalTime\n@Deprecated("Use 'Double.days' extension property from
Duration.Companion instead.", ReplaceWith("this.days"),
"\"kotlin.time.Duration.Companion.days")\n@DeprecatedSinceKotlin(warningSince = "1.5")\npublic val
Double.days get() = toDuration(DurationUnit.DAYS)\n\n\n/** Returns a duration whose value is the specified
[duration] value multiplied by this number.
*\n@SinceKotlin("1.6")\n@WasExperimental(ExperimentalTime::class)\n@kotlin.internal.InlineOnly\npublic
inline operator fun Int.times(duration: Duration): Duration = duration * this\n\n\n/** Returns a duration whose
value is the specified [duration] value multiplied by this number.\n *\n * The operation may involve rounding when
the result cannot be represented exactly with a [Double] number.\n *\n * @throws IllegalArgumentException if the
operation results in a `NaN` value.\n
*\n@SinceKotlin("1.6")\n@WasExperimental(ExperimentalTime::class)\n@kotlin.internal.InlineOnly\npublic
inline operator fun Double.times(duration: Duration): Duration = duration * this\n\n\n\nprivate fun
parseDuration(value: String, strictIso: Boolean): Duration {
    var length = value.length
    if (length == 0) throw
    IllegalArgumentException("The string is empty")
    var index = 0
    var result = Duration.ZERO
    val
    infinityString = "Infinity"
    when (value[index]) {
        '+', '-' -> index++
    }
    val hasSign = index > 0
    val isNegative = hasSign && value.startsWith('-')
    when {
        length <= index -> throw
        IllegalArgumentException("No components")
        value[index] == 'P' -> {
            if (++index == length) throw
            IllegalArgumentException()
            val nonDigitSymbols = "+-."
            var isTimeComponent = false
            var prevUnit: DurationUnit? = null
            while (index < length) {
                if (value[index] == 'T') {
                    if (isTimeComponent || ++index == length) throw
                    IllegalArgumentException()
                    isTimeComponent =
                    true
                    continue
                }
                val component = value.substringWhile(index) { it in '0'..'9' || it in
                nonDigitSymbols }
                if (component.isEmpty()) throw
                IllegalArgumentException()
                index +=
                component.length
                val unitChar = value.getOrElse(index) { throw
                IllegalArgumentException("Missing
                unit for value $component") }
                index++
                val unit = durationUnitByIsoChar(unitChar,
                isTimeComponent)
                if (prevUnit != null && prevUnit <= unit) throw
                IllegalArgumentException("Unexpected order of duration components")
                prevUnit = unit
                val
                dotIndex = component.indexOf('.')
                if (unit == DurationUnit.SECONDS && dotIndex > 0) {
                    val whole = component.substring(0, dotIndex)
                    result +=
                    parseOverLongIsoComponent(whole).toDuration(unit)
                    result +=
                    component.substring(dotIndex).toDouble().toDuration(unit)
                } else {
                    result +=

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parseOverLongIsoComponent(component).toDuration(unit)\n        }\n        }\n        }\n        strictIso ->\n        throw IllegalArgumentException()\n        value.regionMatches(index, infinityString, 0, length = maxOf(length -\n        index, infinityString.length), ignoreCase = true) -> {\n        result = Duration.INFINITE\n        }\n        else -> {\n        // parse default string format\n        var prevUnit: DurationUnit? = null\n        var afterFirst = false\n        var allowSpaces = !hasSign\n        if (hasSign && value[index] == '(' && value.last() == ')') {\n        allowSpaces = true\n        if (++index == --length) throw IllegalArgumentException("No components")\n        }\n        while (index < length) {\n        if (afterFirst && allowSpaces) {\n        index =\n        value.skipWhile(index) { it == ' ' }\n        }\n        afterFirst = true\n        val component =\n        value.substringWhile(index) { it in '0'..'9' || it == '.' }\n        if (component.isEmpty()) throw\n        IllegalArgumentException()\n        index += component.length\n        val unitName =\n        value.substringWhile(index) { it in 'a'..'z' }\n        index += unitName.length\n        val unit =\n        durationUnitByShortName(unitName)\n        if (prevUnit != null && prevUnit <= unit) throw\n        IllegalArgumentException("Unexpected order of duration components")\n        prevUnit = unit\n        val\n        dotIndex = component.indexOf('.')\n        if (dotIndex > 0) {\n        val whole = component.substring(0,\n        dotIndex)\n        result += whole.toLong().toDuration(unit)\n        result +=\n        component.substring(dotIndex).toDouble().toDuration(unit)\n        if (index < length) throw\n        IllegalArgumentException("Fractional component must be last")\n        } else {\n        result +=\n        component.toLong().toDuration(unit)\n        }\n        }\n        }\n        }\n        return if (isNegative) -result else\n        result\n    }\n\nprivate fun parseOverLongIsoComponent(value: String): Long {\n    val length = value.length\n    var\n    startIndex = 0\n    if (length > 0 && value[0] in "+-") startIndex++\n    if ((length - startIndex) > 16 &&\n    (startIndex..value.lastIndex).all { value[it] in '0'..'9' }) {\n        // all chars are digits, but more than\n        ceiling(log10(MAX_MILLIS / 1000)) of them\n        return if (value[0] == '-') Long.MIN_VALUE else\n        Long.MAX_VALUE\n    }\n    // TODO: replace with just toLong after min JDK becomes 8\n    return if\n    (value.startsWith("+")) value.drop(1).toLong() else value.toLong()\n}\n\nprivate inline fun\nString.substringWhile(startIndex: Int, predicate: (Char) -> Boolean): String =\n    substring(startIndex,\n    skipWhile(startIndex, predicate))\n\nprivate inline fun String.skipWhile(startIndex: Int, predicate: (Char) ->\nBoolean): Int {\n    var i = startIndex\n    while (i < length && predicate(this[i])) i++\n    return i\n}\n\nThe ranges are chosen so that they are:\n- symmetric relative to zero: this greatly simplifies operations with sign,\n  e.g. unaryMinus and minus.\n- non-overlapping, but adjacent: the first value that doesn't fit in nanos range, can be\n  exactly represented in millis.\n\ninternal const val NANOS_IN_MILLIS = 1_000_000\n// maximum number\n// duration can store in nanosecond range\ninternal const val MAX_NANOS = Long.MAX_VALUE / 2 /\nNANOS_IN_MILLIS * NANOS_IN_MILLIS - 1 // ends in ...999_999\n// maximum number duration can store in\n// millisecond range, also encodes an infinite value\ninternal const val MAX_MILLIS = Long.MAX_VALUE / 2\n//\nMAX_NANOS expressed in milliseconds\nprivate const val MAX_NANOS_IN_MILLIS = MAX_NANOS /\nNANOS_IN_MILLIS\nprivate fun nanosToMillis(nanos: Long): Long = nanos / NANOS_IN_MILLIS\nprivate\nfun millisToNanos(millis: Long): Long = millis * NANOS_IN_MILLIS\nprivate fun\ndurationOfNanos(normalNanos: Long) = Duration(normalNanos shl 1)\nprivate fun durationOfMillis(normalMillis:\nLong) = Duration((normalMillis shl 1) + 1)\nprivate fun durationOf(normalValue: Long, unitDiscriminator: Int) =\nDuration((normalValue shl 1) + unitDiscriminator)\nprivate fun durationOfNanosNormalized(nanos: Long) =\nif\n(nanos in -MAX_NANOS..MAX_NANOS) {\n    durationOfNanos(nanos)\n} else {\n    durationOfMillis(nanosToMillis(nanos))\n}\nprivate fun durationOfMillisNormalized(millis: Long) =\nif\n(millis in -MAX_NANOS_IN_MILLIS..MAX_NANOS_IN_MILLIS) {\n    durationOfNanos(millisToNanos(millis))\n} else {\n    durationOfMillis(millis.coerceIn(-MAX_MILLIS,\n    MAX_MILLIS))\n}\n\ninternal expect val durationAssertionsEnabled: Boolean\n\ninternal expect fun\nformatToExactDecimals(value: Double, decimals: Int): String\n\ninternal expect fun\nformatUpToDecimals(value: Double, decimals: Int): String\n\n/*\n * Copyright 2010-2021 JetBrains s.r.o. and Kotlin Programming Language\n    contributors.\n * Use of this source code is governed by the Apache 2.0 license that can be found in the\n    license/LICENSE.txt file.\n */\n\n@file:kotlin.jvm.JvmName("UnsignedKt")\npackage

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kotlin\n\n@PublishedApi\ninternal fun uintCompare(v1: Int, v2: Int): Int = (v1 xor
Int.MIN_VALUE).compareTo(v2 xor Int.MIN_VALUE)\n@PublishedApi\ninternal fun ulongCompare(v1: Long,
v2: Long): Int = (v1 xor Long.MIN_VALUE).compareTo(v2 xor Long.MIN_VALUE)\n\n@PublishedApi\ninternal
fun uintDivide(v1: UInt, v2: UInt): UInt = (v1.toLong() / v2.toLong()).toUInt()\n@PublishedApi\ninternal fun
uintRemainder(v1: UInt, v2: UInt): UInt = (v1.toLong() % v2.toLong()).toUInt()\n\n// Division and remainder are
based on Guava's UnsignedLongs implementation\n// Copyright 2011 The Guava
Authors\n\n@PublishedApi\ninternal fun ulongDivide(v1: ULong, v2: ULong): ULong {\n    val dividend =
v1.toLong()\n    val divisor = v2.toLong()\n    if (divisor < 0) { // i.e., divisor >= 2^63:\n        return if (v1 < v2)
ULong(0) else ULong(1)\n    }\n    // Optimization - use signed division if both dividend and divisor < 2^63\n    if
(dividend >= 0) {\n        return ULong(dividend / divisor)\n    }\n    // Otherwise, approximate the quotient, check,
and correct if necessary.\n    val quotient = ((dividend ushr 1) / divisor) shl 1\n    val rem = dividend - quotient *
divisor\n    return ULong(quotient + if (ULong(rem) >= ULong(divisor)) 1 else 0)\n}\n\n@PublishedApi\ninternal
fun ulongRemainder(v1: ULong, v2: ULong): ULong {\n    val dividend = v1.toLong()\n    val divisor =
v2.toLong()\n    if (divisor < 0) { // i.e., divisor >= 2^63:\n        return if (v1 < v2) {\n            v1 // dividend <
divisor\n        } else {\n            v1 - v2 // dividend >= divisor\n        }\n    }\n    // Optimization - use signed
modulus if both dividend and divisor < 2^63\n    if (dividend >= 0) {\n        return ULong(dividend % divisor)\n
    }\n    // Otherwise, approximate the quotient, check, and correct if necessary.\n    val quotient = ((dividend ushr 1)
/ divisor) shl 1\n    val rem = dividend - quotient * divisor\n    return ULong(rem - if (ULong(rem) >=
ULong(divisor)) divisor else 0)\n}\n\n@PublishedApi\ninternal fun doubleToUInt(v: Double): UInt = when {\n
v.isNaN() -> 0u\n    v <= UInt.MIN_VALUE.toDouble() -> UInt.MIN_VALUE\n    v >=
UInt.MAX_VALUE.toDouble() -> UInt.MAX_VALUE\n    v <= Int.MAX_VALUE -> v.toInt().toUInt()\n    else -
> (v - Int.MAX_VALUE).toInt().toUInt() + Int.MAX_VALUE.toUInt() // Int.MAX_VALUE < v <
UInt.MAX_VALUE\n}\n\n@PublishedApi\ninternal fun doubleToULong(v: Double): ULong = when {\n
v.isNaN() -> 0u\n    v <= ULong.MIN_VALUE.toDouble() -> ULong.MIN_VALUE\n    v >=
ULong.MAX_VALUE.toDouble() -> ULong.MAX_VALUE\n    v < Long.MAX_VALUE ->
v.toLong().toULong()\n    // Real values from Long.MAX_VALUE to (Long.MAX_VALUE + 1) are not
representable in Double, so don't handle them.\n    else -> (v - 9223372036854775808.0).toLong().toULong() +
9223372036854775808uL // Long.MAX_VALUE + 1 < v <
ULong.MAX_VALUE\n}\n\n\n@PublishedApi\ninternal fun uintToDouble(v: Int): Double = (v and
Int.MAX_VALUE).toDouble() + (v ushr 31 shl 30).toDouble() * 2\n\n@PublishedApi\ninternal fun
ulongToDouble(v: Long): Double = (v ushr 11).toDouble() * 2048 + (v and 2047)\n\n\ninternal fun
ulongToString(v: Long): String = ulongToString(v, 10)\n\ninternal fun ulongToString(v: Long, base: Int): String {\n
    if (v >= 0) return v.toString(base)\n    var quotient = ((v ushr 1) / base) shl 1\n    var rem = v - quotient * base\n
    if (rem >= base) {\n        rem -= base\n        quotient += 1\n    }\n    return quotient.toString(base) +
rem.toString(base)\n}\n\n", /*\n * Copyright 2010-2018 JetBrains s.r.o. and Kotlin Programming Language
contributors.\n * Use of this source code is governed by the Apache 2.0 license that can be found in the
license/LICENSE.txt file.\n
*\n\n@file:kotlin.jvm.JvmMultifileClass\n@file:kotlin.jvm.JvmName("CollectionsKt")\n\npackage
kotlin.collections\n\n/**\n * Given an [iterator] function constructs an [Iterable] instance that returns values through
the [Iterator]\n * provided by that function.\n * @sample samples.collections.Iterables.Building.iterable\n
*\n\n@kotlin.internal.InlineOnly\npublic inline fun <T> Iterable(crossinline iterator: () -> Iterator<T>): Iterable<T>
= object : Iterable<T> {\n    override fun iterator(): Iterator<T> = iterator()\n}\n\n/**\n * A wrapper over another
[Iterable] (or any other object that can produce an [Iterator]) that returns\n * an indexing iterator.\n *\n\ninternal class
IndexingIterable<out T>(private val iteratorFactory: () -> Iterator<T>) : Iterable<IndexedValue<T>> {\n    override
fun iterator(): Iterator<IndexedValue<T>> = IndexingIterator(iteratorFactory())\n}\n\n/**\n * Returns the size of
this iterable if it is known, or `null` otherwise.\n *\n\n@PublishedApi\ninternal fun <T>
Iterable<T>.collectionSizeOrNull(): Int? = if (this is Collection<*>) this.size else null\n\n/**\n * Returns the size of
this iterable if it is known, or the specified [default] value otherwise.\n *\n\n@PublishedApi\ninternal fun <T>

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Iterable<T>.collectionSizeOrDefault(default: Int): Int = if (this is Collection<*>) this.size else default\n\n/**\n *
Returns a single list of all elements from all collections in the given collection.\n * @sample
samples.collections.Iterables.Operations.flattenIterable\n */\npublic fun <T> Iterable<Iterable<T>>.flatten():
List<T> {\n    val result = ArrayList<T>()\n    for (element in this) {\n        result.addAll(element)\n    }\n    return
result\n}\n\n/**\n * Returns a pair of lists, where\n * *first* list is built from the first values of each pair from this
collection,\n * *second* list is built from the second values of each pair from this collection.\n * @sample
samples.collections.Iterables.Operations.unzipIterable\n */\npublic fun <T, R> Iterable<Pair<T, R>>.unzip():
Pair<List<T>, List<R>> {\n    val expectedSize = collectionSizeOrDefault(10)\n    val listT =
ArrayList<T>(expectedSize)\n    val listR = ArrayList<R>(expectedSize)\n    for (pair in this) {\n
listT.add(pair.first)\n    listR.add(pair.second)\n    }\n    return listT to listR\n}\n\n"/*\n * Copyright 2010-2020
JetBrains s.r.o. and Kotlin Programming Language contributors.\n * Use of this source code is governed by the
Apache 2.0 license that can be found in the license/LICENSE.txt file.\n
*/\n\n@file:kotlin.jvm.JvmMultifileClass\n@file:kotlin.jvm.JvmName("SequencesKt")\n\npackage
kotlin.sequences\n\nimport kotlin.random.Random\n\n/**\n * Given an [iterator] function constructs a [Sequence]
that returns values through the [Iterator]\n * provided by that function.\n * The values are evaluated lazily, and the
sequence is potentially infinite.\n * \n * @sample samples.collections.Sequences.Building.sequenceFromIterator\n
*/\n\n@kotlin.internal.InlineOnly\n\npublic inline fun <T> Sequence(crossinline iterator: () -> Iterator<T>):
Sequence<T> = object : Sequence<T> {\n    override fun iterator(): Iterator<T> = iterator()\n}\n\n/**\n * Creates a
sequence that returns all elements from this iterator. The sequence is constrained to be iterated only once.\n * \n *
@sample samples.collections.Sequences.Building.sequenceFromIterator\n */\n\npublic fun <T>
Iterator<T>.asSequence(): Sequence<T> = Sequence { this }.constrainOnce()\n\n/**\n * Creates a sequence that
returns the specified values.\n * \n * @sample samples.collections.Sequences.Building.sequenceOfValues\n
*/\n\npublic fun <T> sequenceOf(vararg elements: T): Sequence<T> = if (elements.isEmpty()) emptySequence() else
elements.asSequence()\n\n/**\n * Returns an empty sequence.\n */\n\npublic fun <T> emptySequence():
Sequence<T> = EmptySequence\n\nprivate object EmptySequence : Sequence<Nothing>,\nDropTakeSequence<Nothing> {\n    override fun iterator(): Iterator<Nothing> = EmptyIterator\n    override fun
drop(n: Int) = EmptySequence\n    override fun take(n: Int) = EmptySequence\n}\n\n/**\n * Returns this sequence if
it's not `null` and the empty sequence otherwise.\n * @sample
samples.collections.Sequences.Usage.sequenceOrEmpty\n
*/\n\n@SinceKotlin("1.3")\n\n@kotlin.internal.InlineOnly\n\npublic inline fun <T> Sequence<T>?.orEmpty():
Sequence<T> = this ?: emptySequence()\n\n/**\n * Returns a sequence that iterates through the elements either of
this sequence\n * or, if this sequence turns out to be empty, of the sequence returned by [defaultValue] function.\n
*/\n * @sample samples.collections.Sequences.Usage.sequenceIfEmpty\n */\n\n@SinceKotlin("1.3")\n\npublic fun
<T> Sequence<T>.ifEmpty(defaultValue: () -> Sequence<T>): Sequence<T> = sequence {\n    val iterator =
this@ifEmpty.iterator()\n    if (iterator.hasNext()) {\n        yieldAll(iterator)\n    } else {\n
yieldAll(defaultValue())\n    }\n}\n\n/**\n * Returns a sequence of all elements from all sequences in this
sequence.\n * \n * The operation is _intermediate_ and _stateless_.\n * \n * @sample
samples.collections.Sequences.Transformations.flattenSequenceOfSequences\n */\n\npublic fun <T>
Sequence<Sequence<T>>.flatten(): Sequence<T> = flatten { it.iterator() }\n\n/**\n * Returns a sequence of all
elements from all iterables in this sequence.\n * \n * The operation is _intermediate_ and _stateless_.\n * \n *
@sample samples.collections.Sequences.Transformations.flattenSequenceOfLists\n
*/\n\n@kotlin.jvm.JvmName("flattenSequenceOfIterable")\n\npublic fun <T> Sequence<Iterable<T>>.flatten():
Sequence<T> = flatten { it.iterator() }\n\nprivate fun <T, R> Sequence<T>.flatten(iterator: (T) -> Iterator<R>):
Sequence<R> {\n    if (this is TransformingSequence<*, *>) {\n        return (this as TransformingSequence<*,
T>).flatten(iterator)\n    }\n    return FlatteningSequence(this, { it }, iterator)\n}\n\n/**\n * Returns a pair of lists,
where\n * *first* list is built from the first values of each pair from this sequence,\n * *second* list is built from the
second values of each pair from this sequence.\n * \n * The operation is _terminal_.\n * \n * @sample
samples.collections.Sequences.Transformations.unzip\n */\n\npublic fun <T, R> Sequence<Pair<T, R>>.unzip():

```

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Pair<List<T>, List<R>> {\n    val listT = ArrayList<T>()\n    val listR = ArrayList<R>()\n    for (pair in this) {\n        listT.add(pair.first)\n        listR.add(pair.second)\n    }\n    return listT to listR\n}\n\n * Returns a sequence that yields elements of this sequence randomly shuffled.\n * Note that every iteration of the sequence returns elements in a different order.\n * The operation is _intermediate_ and _stateful_.\n\n * Since Kotlin("1.4")\npublic fun <T> Sequence<T>.shuffled(): Sequence<T> = shuffled(Random)\n\n * Returns a sequence that yields elements of this sequence randomly shuffled\n * using the specified [random] instance as the source of randomness.\n * Note that every iteration of the sequence returns elements in a different order.\n * The operation is _intermediate_ and _stateful_.\n\n * Since Kotlin("1.4")\npublic fun <T> Sequence<T>.shuffled(random: Random): Sequence<T> = sequence<T> {\n    val buffer = toMutableList()\n    while (buffer.isNotEmpty()) {\n        val j = random.nextInt(buffer.size)\n        val last = buffer.removeLast()\n        val value = if (j < buffer.size) buffer.set(j, last) else last\n        yield(value)\n    }\n}\n\n * A sequence that returns the values from the underlying [sequence] that either match or do not match\n * the specified [predicate].\n * @param sendWhen If `true`, values for which the predicate returns `true` are returned. Otherwise,\n * values for which the predicate returns `false` are returned\n\n * internal class FilteringSequence<T> {\n    private val sequence: Sequence<T>,\n    private val sendWhen: Boolean = true,\n    private val predicate: (T) -> Boolean\n}\n\n Sequence<T> {\n    override fun iterator(): Iterator<T> = object : Iterator<T> {\n        val iterator = sequence.iterator()\n        var nextState: Int = -1 // -1 for unknown, 0 for done, 1 for continue\n        var nextItem: T? = null\n        private fun calcNext() {\n            while (iterator.hasNext()) {\n                val item = iterator.next()\n                if (predicate(item) == sendWhen) {\n                    nextItem = item\n                    nextState = 1\n                }\n            }\n            nextState = 0\n        }\n        override fun next(): T {\n            if (nextState == -1)\n                calcNext()\n            if (nextState == 0)\n                throw NoSuchElementException()\n            val result = nextItem\n            nextItem = null\n            nextState = -1\n            @Suppress("UNCHECKED_CAST")\n            return result as T\n        }\n        override fun hasNext(): Boolean {\n            if (nextState == -1)\n                calcNext()\n            return nextState == 1\n        }\n    }\n}\n\n * A sequence which returns the results of applying the given [transformer] function to the values\n * in the underlying [sequence].\n\n * internal class TransformingSequence<T, R> {\n    constructor(private val sequence: Sequence<T>, private val transformer: (T) -> R) : Sequence<R> {\n        override fun iterator(): Iterator<R> = object : Iterator<R> {\n            val iterator = sequence.iterator()\n            override fun next(): R {\n                return transformer(iterator.next())\n            }\n        }\n        override fun hasNext(): Boolean {\n            return iterator.hasNext()\n        }\n    }\n    internal fun <E> flatten(iterator: (R) -> Iterator<E>): Sequence<E> {\n        return FlatteningSequence<T, R, E>(sequence, transformer, iterator)\n    }\n}\n\n * A sequence which returns the results of applying the given [transformer] function to the values\n * in the underlying [sequence], where the transformer function takes the index of the value in the underlying\n * sequence along with the value itself.\n\n * internal class TransformingIndexedSequence<T, R> {\n    constructor(private val sequence: Sequence<T>, private val transformer: (Int, T) -> R) : Sequence<R> {\n        override fun iterator(): Iterator<R> = object : Iterator<R> {\n            val iterator = sequence.iterator()\n            var index = 0\n            override fun next(): R {\n                return transformer(checkIndexOverflow(index++), iterator.next())\n            }\n            override fun hasNext(): Boolean {\n                return iterator.hasNext()\n            }\n        }\n    }\n}\n\n * A sequence which combines values from the underlying [sequence] with their indices and returns them as\n * [IndexedValue] objects.\n\n * internal class IndexingSequence<T> {\n    constructor(private val sequence: Sequence<T>) : Sequence<IndexedValue<T>> {\n        override fun iterator(): Iterator<IndexedValue<T>> = object : Iterator<IndexedValue<T>> {\n            val iterator = sequence.iterator()\n            var index = 0\n            override fun next(): IndexedValue<T> {\n                return IndexedValue(checkIndexOverflow(index++), iterator.next())\n            }\n            override fun hasNext(): Boolean {\n                return iterator.hasNext()\n            }\n        }\n    }\n}\n\n * A sequence which takes the values from two parallel underlying sequences, passes them to the given\n * [transform] function and returns the values returned by that function. The sequence stops returning\n * values as soon as one of the underlying sequences stops returning values.\n\n * internal class MergingSequence<T1, T2, V> {\n    constructor(\n        private val sequence1: Sequence<T1>,\n        private val sequence2: Sequence<T2>,\n        private val transform: (T1, T2) -> V\n    ) : Sequence<V> {\n        override fun iterator(): Iterator<V> = object : Iterator<V> {\n            val iterator1 =

```



```

    }
    nextState = 0
  }
  override fun next(): T {
    if (nextState == -1)
      calcNext() // will change nextState
    if (nextState == 0)
      throw NoSuchElementException()
    @Suppress("UNCHECKED_CAST")
    val result = nextItem as T // Clean next to avoid keeping
    // reference on yielded instance
    nextItem = null
    nextState = -1
    return result
  }
  override fun hasNext(): Boolean {
    if (nextState == -1)
      calcNext() // will change nextState
    return nextState == 1
  }
}

/** A sequence that skips the specified number of values from the
 * underlying [sequence] and returns
 * all values after that.
 */
internal class DropSequence<T>() {
  private val sequence: Sequence<T>
  private val count: Int
  : Sequence<T>, DropTakeSequence<T> {
    init {
      require(count >= 0) { "count must be non-negative, but was $count." }
    }
    override fun drop(n: Int):
      Sequence<T> = (count + n).let { n1 -> if (n1 < 0) DropSequence(this, n) else DropSequence(sequence, n1) }
    override fun take(n: Int): Sequence<T> = (count + n).let { n1 -> if (n1 < 0) TakeSequence(this, n) else
      SubSequence(sequence, count, n1) }
    override fun iterator(): Iterator<T> = object : Iterator<T> {
      val iterator = sequence.iterator()
      var left = count // Shouldn't be called from constructor to avoid
      // premature iteration
      private fun drop() {
        while (left > 0 && iterator.hasNext()) {
          iterator.next()
          left--
        }
      }
      override fun next(): T {
        drop()
        return iterator.next()
      }
      override fun hasNext(): Boolean {
        drop()
        return iterator.hasNext()
      }
    }
  }

  /** A sequence that skips the values from the underlying [sequence] while the given
  [predicate] returns `true` and returns
  all values after that.
  */
  internal class DropWhileSequence<T>() {
    private val sequence: Sequence<T>
    private val predicate: (T) ->
    Boolean
    : Sequence<T> {
      override fun iterator(): Iterator<T> = object : Iterator<T> {
        val iterator =
        sequence.iterator()
        var dropState: Int = -1 // -1 for not dropping, 1 for nextItem, 0 for normal iteration
        var nextItem: T? = null
        private fun drop() {
          while (iterator.hasNext()) {
            val item =
            iterator.next()
            if (!predicate(item)) {
              nextItem = item
              dropState = 1
            }
            return
          }
          dropState = 0
        }
        override fun next(): T {
          if
          (dropState == -1)
            drop()
          if (dropState == 1) {
            @Suppress("UNCHECKED_CAST")
            val result = nextItem as T
            nextItem = null
            dropState = 0
            return result
          }
          return iterator.next()
        }
        override fun
        hasNext(): Boolean {
          if (dropState == -1)
            drop()
          return dropState == 1 ||
          iterator.hasNext()
        }
      }
    }

    internal class DistinctSequence<T, K>(private val source: Sequence<T>,
    private val keySelector: (T) -> K) : Sequence<T> {
      override fun iterator(): Iterator<T> =
      DistinctIterator(source.iterator(), keySelector)
    }

    private class DistinctIterator<T, K>(private val source:
    Iterator<T>, private val keySelector: (T) -> K) : AbstractIterator<T>() {
      private val observed =
      HashSet<K>()
      override fun computeNext() {
        while (source.hasNext()) {
          val next =
          source.next()
          val key = keySelector(next)
          if (observed.add(key)) {
            setNext(next)
            return
          }
          done()
        }
      }
    }

    private class GeneratorSequence<T : Any>(private val
    getInitialValue: () -> T?, private val getNextValue: (T) -> T?) : Sequence<T> {
      override fun iterator():
      Iterator<T> = object : Iterator<T> {
        var nextItem: T? = null
        var nextState: Int = -2 // -2 for initial
        // unknown, -1 for next unknown, 0 for done, 1 for continue
        private fun calcNext() {
          nextItem = if
          (nextState == -2) getInitialValue() else getNextValue(nextItem!!)
          nextState = if (nextItem == null) 0 else
          1
        }
        override fun next(): T {
          if (nextState < 0)
            calcNext()
          if (nextState
          == 0)
            throw NoSuchElementException()
          val result = nextItem as T // Do not clean
          // nextItem (to avoid keeping reference on yielded instance) -- need to keep state for getNextValue
          nextState
          = -1
          return result
        }
        override fun
        hasNext(): Boolean {
          if (nextState < 0)
            calcNext()
          return nextState == 1
        }
      }
    }

  /** Returns a wrapper sequence that provides
  values of this sequence, but ensures it can be iterated only one time.
  The operation is _intermediate_ and
  _stateless_.
  [IllegalStateException] is thrown on iterating the returned sequence for the second time and the
  following times.
  */
  public fun <T> Sequence<T>.constrainOnce(): Sequence<T> {
    // as? does not work
    // in js
    //return this as? ConstrainedOnceSequence<T> ? : ConstrainedOnceSequence(this)
    return if (this is

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ConstrainedOnceSequence<T>) this else ConstrainedOnceSequence(this)\n}\n\n/**\n * Returns a sequence which
invokes the function to calculate the next value on each iteration until the function returns `null`.\n *\n * The
returned sequence is constrained to be iterated only once.\n *\n * @see constrainOnce\n * @see
kotlin.sequences.sequence\n *\n * @sample samples.collections.Sequences.Building.generateSequence\n */\npublic
fun <T : Any> generateSequence(nextFunction: () -> T?): Sequence<T> {\n    return
GeneratorSequence(nextFunction, { nextFunction() }).constrainOnce()\n}\n\n/**\n * Returns a sequence defined by
the starting value [seed] and the function [nextFunction],\n * which is invoked to calculate the next value based on
the previous one on each iteration.\n *\n * The sequence produces values until it encounters first `null` value.\n *
If [seed] is `null`, an empty sequence is produced.\n *\n * The sequence can be iterated multiple times, each time
starting with [seed].\n *\n * @see kotlin.sequences.sequence\n *\n * @sample
samples.collections.Sequences.Building.generateSequenceWithSeed\n
*/\n\n@kotlin.internal.LowPriorityInOverloadResolution\npublic fun <T : Any> generateSequence(seed: T?,
nextFunction: (T) -> T?): Sequence<T> =\n    if (seed == null)\n        EmptySequence\n    else\n
GeneratorSequence({ seed }, nextFunction)\n}\n\n/**\n * Returns a sequence defined by the function [seedFunction],
which is invoked to produce the starting value,\n * and the [nextFunction], which is invoked to calculate the next
value based on the previous one on each iteration.\n *\n * The sequence produces values until it encounters first
`null` value.\n * If [seedFunction] returns `null`, an empty sequence is produced.\n *\n * The sequence can be
iterated multiple times.\n *\n * @see kotlin.sequences.sequence\n *\n * @sample
samples.collections.Sequences.Building.generateSequenceWithLazySeed\n */\n\npublic fun <T : Any>
generateSequence(seedFunction: () -> T?, nextFunction: (T) -> T?): Sequence<T> =\n
GeneratorSequence(seedFunction, nextFunction)\n}\n\n"/**\n * Copyright 2010-2018 JetBrains s.r.o. and Kotlin
Programming Language contributors.\n * Use of this source code is governed by the Apache 2.0 license that can be
found in the license/LICENSE.txt file.\n
*/\n\n@file:kotlin.jvm.JvmMultifileClass\n@file:kotlin.jvm.JvmName("PreconditionsKt")\n\npackage
kotlin\n\nimport kotlin.contracts.contract\n\n/**\n * Throws an [IllegalArgumentException] if the [value] is false.\n
*\n * @sample samples.misc.Preconditions.failRequireWithLazyMessage\n */\n\n@kotlin.internal.InlineOnly\npublic
inline fun require(value: Boolean): Unit {\n    contract {\n        returns() implies value\n    }\n    require(value) {
\n        "Failed requirement." }\n}\n\n/**\n * Throws an [IllegalArgumentException] with the result of calling
[lazyMessage] if the [value] is false.\n *\n * @sample samples.misc.Preconditions.failRequireWithLazyMessage\n
*/\n\n@kotlin.internal.InlineOnly\npublic inline fun require(value: Boolean, lazyMessage: () -> Any): Unit {\n
    contract {\n        returns() implies value\n    }\n    if (!value) {\n        val message = lazyMessage()\n        throw
IllegalArgumentException(message.toString())\n    }\n}\n\n/**\n * Throws an [IllegalArgumentException] if the
[value] is null. Otherwise returns the not null value.\n */\n\n@kotlin.internal.InlineOnly\npublic inline fun <T : Any>
requireNotNull(value: T?): T {\n    contract {\n        returns() implies (value != null)\n    }\n    return
requireNotNull(value) { "Required value was null." }\n}\n\n/**\n * Throws an [IllegalArgumentException] with
the result of calling [lazyMessage] if the [value] is null. Otherwise\n * returns the not null value.\n *\n * @sample
samples.misc.Preconditions.failRequireNotNullWithLazyMessage\n */\n\n@kotlin.internal.InlineOnly\npublic inline
fun <T : Any> requireNotNull(value: T?, lazyMessage: () -> Any): T {\n    contract {\n        returns() implies (value
!= null)\n    }\n    if (value == null) {\n        val message = lazyMessage()\n        throw
IllegalArgumentException(message.toString())\n    } else {\n        return value\n    }\n}\n\n/**\n * Throws an
[IllegalStateException] if the [value] is false.\n *\n * @sample
samples.misc.Preconditions.failCheckWithLazyMessage\n */\n\n@kotlin.internal.InlineOnly\npublic inline fun
check(value: Boolean): Unit {\n    contract {\n        returns() implies value\n    }\n    check(value) { "Check failed."
}\n}\n\n/**\n * Throws an [IllegalStateException] with the result of calling [lazyMessage] if the [value] is false.\n
*\n * @sample samples.misc.Preconditions.failCheckWithLazyMessage\n */\n\n@kotlin.internal.InlineOnly\npublic
inline fun check(value: Boolean, lazyMessage: () -> Any): Unit {\n    contract {\n        returns() implies value\n    }\n
    if (!value) {\n        val message = lazyMessage()\n        throw IllegalStateException(message.toString())\n    }\n}\n\n/**\n * Throws an [IllegalStateException] if the [value] is null. Otherwise\n * returns the not null value.\n

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*\n * @sample samples.misc.Preconditions.failCheckWithLazyMessage\n *\n@kotlin.internal.InlineOnly\npublic
inline fun <T : Any> checkNotNull(value: T?): T {\n  contract {\n    returns() implies (value != null)\n  }\n
return checkNotNull(value) { \"Required value was null.\" }\n}\n\n/**\n * Throws an [IllegalStateException] with
the result of calling [lazyMessage] if the [value] is null. Otherwise\n * returns the not null value.\n *\n * @sample
samples.misc.Preconditions.failCheckWithLazyMessage\n *\n@kotlin.internal.InlineOnly\npublic inline fun <T :
Any> checkNotNull(value: T?, lazyMessage: () -> Any): T {\n  contract {\n    returns() implies (value != null)\n
}\n\n  if (value == null) {\n    val message = lazyMessage()\n    throw
IllegalStateException(message.toString())\n  } else {\n    return value\n  }\n}\n\n\n/**\n * Throws an
[IllegalStateException] with the given [message].\n *\n * @sample samples.misc.Preconditions.failWithError\n
*\n@kotlin.internal.InlineOnly\npublic inline fun error(message: Any): Nothing = throw
IllegalStateException(message.toString())\n", /*\n * Copyright 2010-2021 JetBrains s.r.o. and Kotlin Programming
Language contributors.\n * Use of this source code is governed by the Apache 2.0 license that can be found in the
license/LICENSE.txt file.\n *\n\npackage kotlin.collections\n\n/\n\n// NOTE: THIS FILE IS AUTO-GENERATED
by the GenerateStandardLib.kt\n// See: https://github.com/JetBrains/kotlin/tree/master/libraries/stdlib\n/\n\nimport
kotlin.js.*\nimport primitiveArrayConcat\nimport withType\nimport kotlin.ranges.contains\nimport
kotlin.ranges.reversed\n\n/**\n * Returns an element at the given [index] or throws an
[IndexOutOfBoundsException] if the [index] is out of bounds of this array.\n *\n *\n * @sample
samples.collections.Collections.Elements.elementAt\n *\n\npublic actual fun <T> Array<out T>.elementAt(index:
Int): T {\n  return elementAtOrElse(index) { throw IndexOutOfBoundsException(\"index: $index, size: $size\") }\n
}\n\n\n/**\n * Returns an element at the given [index] or throws an [IndexOutOfBoundsException] if the [index] is
out of bounds of this array.\n *\n *\n * @sample samples.collections.Collections.Elements.elementAt\n *\n\npublic
actual fun ByteArray.elementAt(index: Int): Byte {\n  return elementAtOrElse(index) { throw
IndexOutOfBoundsException(\"index: $index, size: $size\") }\n}\n\n\n/**\n * Returns an element at the given
[index] or throws an [IndexOutOfBoundsException] if the [index] is out of bounds of this array.\n *\n *\n * @sample
samples.collections.Collections.Elements.elementAt\n *\n\npublic actual fun ShortArray.elementAt(index: Int): Short
{\n  return elementAtOrElse(index) { throw IndexOutOfBoundsException(\"index: $index, size: $size\") }\n
}\n\n\n/**\n * Returns an element at the given [index] or throws an [IndexOutOfBoundsException] if the [index] is
out of bounds of this array.\n *\n *\n * @sample samples.collections.Collections.Elements.elementAt\n *\n\npublic
actual fun IntArray.elementAt(index: Int): Int {\n  return elementAtOrElse(index) { throw
IndexOutOfBoundsException(\"index: $index, size: $size\") }\n}\n\n\n/**\n * Returns an element at the given
[index] or throws an [IndexOutOfBoundsException] if the [index] is out of bounds of this array.\n *\n *\n * @sample
samples.collections.Collections.Elements.elementAt\n *\n\npublic actual fun LongArray.elementAt(index: Int): Long
{\n  return elementAtOrElse(index) { throw IndexOutOfBoundsException(\"index: $index, size: $size\") }\n
}\n\n\n/**\n * Returns an element at the given [index] or throws an [IndexOutOfBoundsException] if the [index] is
out of bounds of this array.\n *\n *\n * @sample samples.collections.Collections.Elements.elementAt\n *\n\npublic
actual fun FloatArray.elementAt(index: Int): Float {\n  return elementAtOrElse(index) { throw
IndexOutOfBoundsException(\"index: $index, size: $size\") }\n}\n\n\n/**\n * Returns an element at the given
[index] or throws an [IndexOutOfBoundsException] if the [index] is out of bounds of this array.\n *\n *\n * @sample
samples.collections.Collections.Elements.elementAt\n *\n\npublic actual fun DoubleArray.elementAt(index: Int):
Double {\n  return elementAtOrElse(index) { throw IndexOutOfBoundsException(\"index: $index, size: $size\") }\n
}\n\n\n/**\n * Returns an element at the given [index] or throws an [IndexOutOfBoundsException] if the [index] is
out of bounds of this array.\n *\n *\n * @sample samples.collections.Collections.Elements.elementAt\n *\n\npublic
actual fun BooleanArray.elementAt(index: Int): Boolean {\n  return elementAtOrElse(index) { throw
IndexOutOfBoundsException(\"index: $index, size: $size\") }\n}\n\n\n/**\n * Returns an element at the given
[index] or throws an [IndexOutOfBoundsException] if the [index] is out of bounds of this array.\n *\n *\n * @sample
samples.collections.Collections.Elements.elementAt\n *\n\npublic actual fun CharArray.elementAt(index: Int): Char
{\n  return elementAtOrElse(index) { throw IndexOutOfBoundsException(\"index: $index, size: $size\") }\n
}\n\n\n/**\n * Returns a [List] that wraps the original array.\n *\n\npublic actual fun <T> Array<out T>.asList():

```

```

List<T> {\n    return ArrayList<T>(this.unsafeCast<Array<Any?>>())\n}\n\n/**\n * Returns a [List] that wraps the original array.\n */\n@kotlin.internal.InlineOnly\npublic actual inline fun ByteArray.asList(): List<Byte> {\n    return this.unsafeCast<Array<Byte>>().asList()\n}\n\n/**\n * Returns a [List] that wraps the original array.\n */\n@kotlin.internal.InlineOnly\npublic actual inline fun ShortArray.asList(): List<Short> {\n    return this.unsafeCast<Array<Short>>().asList()\n}\n\n/**\n * Returns a [List] that wraps the original array.\n */\n@kotlin.internal.InlineOnly\npublic actual inline fun IntArray.asList(): List<Int> {\n    return this.unsafeCast<Array<Int>>().asList()\n}\n\n/**\n * Returns a [List] that wraps the original array.\n */\n@kotlin.internal.InlineOnly\npublic actual inline fun LongArray.asList(): List<Long> {\n    return this.unsafeCast<Array<Long>>().asList()\n}\n\n/**\n * Returns a [List] that wraps the original array.\n */\n@kotlin.internal.InlineOnly\npublic actual inline fun FloatArray.asList(): List<Float> {\n    return this.unsafeCast<Array<Float>>().asList()\n}\n\n/**\n * Returns a [List] that wraps the original array.\n */\n@kotlin.internal.InlineOnly\npublic actual inline fun DoubleArray.asList(): List<Double> {\n    return this.unsafeCast<Array<Double>>().asList()\n}\n\n/**\n * Returns a [List] that wraps the original array.\n */\n@kotlin.internal.InlineOnly\npublic actual inline fun BooleanArray.asList(): List<Boolean> {\n    return this.unsafeCast<Array<Boolean>>().asList()\n}\n\n/**\n * Returns a [List] that wraps the original array.\n */\npublic actual fun CharArray.asList(): List<Char> {\n    return object : AbstractList<Char>(), RandomAccess {\n        override val size: Int get() = this@asList.size\n        override fun isEmpty(): Boolean = this@asList.isEmpty()\n        override fun contains(element: Char): Boolean = this@asList.contains(element)\n        override fun get(index: Int): Char {\n            AbstractList.checkElementIndex(index, size)\n            return this@asList[index]\n        }\n        override fun indexOf(element: Char): Int {\n            @Suppress("USELESS_CAST")\n            if ((element as Any?) !is Char) return -1\n            return this@asList.indexOf(element)\n        }\n        override fun lastIndexOf(element: Char): Int {\n            @Suppress("USELESS_CAST")\n            if ((element as Any?) !is Char) return -1\n            return this@asList.lastIndexOf(element)\n        }\n    }\n}\n\n/**\n * Returns `true` if the two specified arrays are *deeply* equal to one another,\n * i.e. contain the same number of the same elements in the same order.\n * If two corresponding elements are nested arrays, they are also compared deeply.\n * If any of arrays contains itself on any nesting level the behavior is undefined.\n * The elements of other types are compared for equality with the [equals][Any.equals] function.\n * For floating point numbers it means that `NaN` is equal to itself and `-0.0` is not equal to `0.0`.\n */\n@SinceKotlin("1.1")\n@kotlin.internal.LowPriorityInOverloadResolution\npublic actual infix fun <T> Array<out T>.contentDeepEquals(other: Array<out T>): Boolean {\n    return this.contentDeepEquals(other)\n}\n\n/**\n * Returns `true` if the two specified arrays are *deeply* equal to one another,\n * i.e. contain the same number of the same elements in the same order.\n * The specified arrays are also considered deeply equal if both are `null`.\n * If two corresponding elements are nested arrays, they are also compared deeply.\n * If any of arrays contains itself on any nesting level the behavior is undefined.\n * The elements of other types are compared for equality with the [equals][Any.equals] function.\n * For floating point numbers it means that `NaN` is equal to itself and `-0.0` is not equal to `0.0`.\n */\n@SinceKotlin("1.4")\n@library("arrayDeepEquals")\npublic actual infix fun <T> Array<out T>?.contentDeepEquals(other: Array<out T>?): Boolean {\n    definedExternally\n}\n\n/**\n * Returns a hash code based on the contents of this array as if it is [List].\n * Nested arrays are treated as lists too.\n * If any of arrays contains itself on any nesting level the behavior is undefined.\n */\n@SinceKotlin("1.1")\n@kotlin.internal.LowPriorityInOverloadResolution\npublic actual fun <T> Array<out T>.contentDeepHashCode(): Int {\n    return this.contentDeepHashCode()\n}\n\n/**\n * Returns a hash code based on the contents of this array as if it is [List].\n * Nested arrays are treated as lists too.\n * If any of arrays contains itself on any nesting level the behavior is undefined.\n */\n@SinceKotlin("1.4")\n@library("arrayDeepHashCode")\npublic actual fun <T> Array<out T>?.contentDeepHashCode(): Int {\n    definedExternally\n}\n\n/**\n * Returns a string representation of the contents of this array as if it is a [List].\n * Nested arrays are treated as lists too.\n * If any of arrays contains itself on any nesting level that reference\n * is rendered as `[...]` to prevent recursion.\n * @sample

```

samples.collections.Arrays.ContentOperations.contentDeepToString

```
*\n@SinceKotlin("1.1")\n@kotlin.internal.LowPriorityInOverloadResolution\npublic actual fun <T> Array<out T>.contentDeepToString(): String {\n    return this.contentDeepToString()\n}\n\n/**\n * Returns a string representation of the contents of this array as if it is a [List].\n * Nested arrays are treated as lists too.\n * \n * If any of arrays contains itself on any nesting level that reference\n * is rendered as `"[...]"` to prevent recursion.\n * \n * @sample samples.collections.Arrays.ContentOperations.contentDeepToString
```

```
*\n@SinceKotlin("1.4")\n@library("arrayDeepToString")\npublic actual fun <T> Array<out T>?.contentDeepToString(): String {\n    definedExternally\n}\n\n/**\n * Returns `true` if the two specified arrays are *structurally* equal to one another,\n * i.e. contain the same number of the same elements in the same order.\n * \n * The elements are compared for equality with the [equals][Any.equals] function.\n * For floating point numbers it means that `NaN` is equal to itself and `-0.0` is not equal to `0.0`.\n *\n@Deprecated("Use Kotlin compiler 1.4 to avoid deprecation warning.")\n@SinceKotlin("1.1")\n@DeprecatedSinceKotlin(hiddenSince = "1.4")\npublic actual infix fun <T> Array<out T>.contentEquals(other: Array<out T>): Boolean {\n    return this.contentEquals(other)\n}\n\n/**\n * Returns `true` if the two specified arrays are *structurally* equal to one another,\n * i.e. contain the same number of the same elements in the same order.\n * \n * The elements are compared for equality with the [equals][Any.equals] function.\n * For floating point numbers it means that `NaN` is equal to itself and `-0.0` is not equal to `0.0`.\n *\n@Deprecated("Use Kotlin compiler 1.4 to avoid deprecation warning.")\n@SinceKotlin("1.1")\n@DeprecatedSinceKotlin(hiddenSince = "1.4")\npublic actual infix fun ByteArray.contentEquals(other: ByteArray): Boolean {\n    return this.contentEquals(other)\n}\n\n/**\n * Returns `true` if the two specified arrays are *structurally* equal to one another,\n * i.e. contain the same number of the same elements in the same order.\n * \n * The elements are compared for equality with the [equals][Any.equals] function.\n * For floating point numbers it means that `NaN` is equal to itself and `-0.0` is not equal to `0.0`.\n *\n@Deprecated("Use Kotlin compiler 1.4 to avoid deprecation warning.")\n@SinceKotlin("1.1")\n@DeprecatedSinceKotlin(hiddenSince = "1.4")\npublic actual infix fun ShortArray.contentEquals(other: ShortArray): Boolean {\n    return this.contentEquals(other)\n}\n\n/**\n * Returns `true` if the two specified arrays are *structurally* equal to one another,\n * i.e. contain the same number of the same elements in the same order.\n * \n * The elements are compared for equality with the [equals][Any.equals] function.\n * For floating point numbers it means that `NaN` is equal to itself and `-0.0` is not equal to `0.0`.\n *\n@Deprecated("Use Kotlin compiler 1.4 to avoid deprecation warning.")\n@SinceKotlin("1.1")\n@DeprecatedSinceKotlin(hiddenSince = "1.4")\npublic actual infix fun IntArray.contentEquals(other: IntArray): Boolean {\n    return this.contentEquals(other)\n}\n\n/**\n * Returns `true` if the two specified arrays are *structurally* equal to one another,\n * i.e. contain the same number of the same elements in the same order.\n * \n * The elements are compared for equality with the [equals][Any.equals] function.\n * For floating point numbers it means that `NaN` is equal to itself and `-0.0` is not equal to `0.0`.\n *\n@Deprecated("Use Kotlin compiler 1.4 to avoid deprecation warning.")\n@SinceKotlin("1.1")\n@DeprecatedSinceKotlin(hiddenSince = "1.4")\npublic actual infix fun LongArray.contentEquals(other: LongArray): Boolean {\n    return this.contentEquals(other)\n}\n\n/**\n * Returns `true` if the two specified arrays are *structurally* equal to one another,\n * i.e. contain the same number of the same elements in the same order.\n * \n * The elements are compared for equality with the [equals][Any.equals] function.\n * For floating point numbers it means that `NaN` is equal to itself and `-0.0` is not equal to `0.0`.\n *\n@Deprecated("Use Kotlin compiler 1.4 to avoid deprecation warning.")\n@SinceKotlin("1.1")\n@DeprecatedSinceKotlin(hiddenSince = "1.4")\npublic actual infix fun FloatArray.contentEquals(other: FloatArray): Boolean {\n    return this.contentEquals(other)\n}\n\n/**\n * Returns `true` if the two specified arrays are *structurally* equal to one another,\n * i.e. contain the same number of the same elements in the same order.\n * \n * The elements are compared for equality with the [equals][Any.equals] function.\n * For floating point numbers it means that `NaN` is equal to itself and `-0.0` is not equal to `0.0`.\n *\n@Deprecated("Use Kotlin compiler 1.4 to avoid deprecation warning.")\n@SinceKotlin("1.1")\n@DeprecatedSinceKotlin(hiddenSince = "1.4")\npublic actual infix fun
```

```

DoubleArray.contentEquals(other: DoubleArray): Boolean {
    return this.contentEquals(other)
}

Returns `true` if the two specified arrays are structurally equal to one another, i.e. contain the same number of the same elements in the same order. The elements are compared for equality with the [equals][Any.equals] function. For floating point numbers it means that `NaN` is equal to itself and `-0.0` is not equal to `0.0`.

@Deprecated("Use Kotlin compiler 1.4 to avoid deprecation
warning.")
@SinceKotlin("1.1")
@DeprecatedSinceKotlin(hiddenSince = "1.4")
public actual infix fun
BooleanArray.contentEquals(other: BooleanArray): Boolean {
    return this.contentEquals(other)
}

Returns `true` if the two specified arrays are structurally equal to one another, i.e. contain the same number of the same elements in the same order. The elements are compared for equality with the [equals][Any.equals] function. For floating point numbers it means that `NaN` is equal to itself and `-0.0` is not equal to `0.0`.

@Deprecated("Use Kotlin compiler 1.4 to avoid deprecation
warning.")
@SinceKotlin("1.1")
@DeprecatedSinceKotlin(hiddenSince = "1.4")
public actual infix fun
CharArray.contentEquals(other: CharArray): Boolean {
    return this.contentEquals(other)
}

Returns `true` if the two specified arrays are structurally equal to one another, i.e. contain the same number of the same elements in the same order. The elements are compared for equality with the [equals][Any.equals] function. For floating point numbers it means that `NaN` is equal to itself and `-0.0` is not equal to `0.0`.

@SinceKotlin("1.4")
@library("arrayEquals")
public actual infix fun <T> Array<out
T>?.contentEquals(other: Array<out T>?): Boolean {
    definedExternally
}

Returns `true` if the two specified arrays are structurally equal to one another, i.e. contain the same number of the same elements in the same order. The elements are compared for equality with the [equals][Any.equals] function. For floating point numbers it means that `NaN` is equal to itself and `-0.0` is not equal to `0.0`.

@SinceKotlin("1.4")
@library("arrayEquals")
public actual infix fun ByteArray?.contentEquals(other:
ByteArray?): Boolean {
    definedExternally
}

Returns `true` if the two specified arrays are structurally equal to one another, i.e. contain the same number of the same elements in the same order. The elements are compared for equality with the [equals][Any.equals] function. For floating point numbers it means that `NaN` is equal to itself and `-0.0` is not equal to `0.0`.

@SinceKotlin("1.4")
@library("arrayEquals")
public actual infix fun ShortArray?.contentEquals(other:
ShortArray?): Boolean {
    definedExternally
}

Returns `true` if the two specified arrays are structurally equal to one another, i.e. contain the same number of the same elements in the same order. The elements are compared for equality with the [equals][Any.equals] function. For floating point numbers it means that `NaN` is equal to itself and `-0.0` is not equal to `0.0`.

@SinceKotlin("1.4")
@library("arrayEquals")
public actual infix fun IntArray?.contentEquals(other:
IntArray?): Boolean {
    definedExternally
}

Returns `true` if the two specified arrays are structurally equal to one another, i.e. contain the same number of the same elements in the same order. The elements are compared for equality with the [equals][Any.equals] function. For floating point numbers it means that `NaN` is equal to itself and `-0.0` is not equal to `0.0`.

@SinceKotlin("1.4")
@library("arrayEquals")
public actual infix fun LongArray?.contentEquals(other:
LongArray?): Boolean {
    definedExternally
}

Returns `true` if the two specified arrays are structurally equal to one another, i.e. contain the same number of the same elements in the same order. The elements are compared for equality with the [equals][Any.equals] function. For floating point numbers it means that `NaN` is equal to itself and `-0.0` is not equal to `0.0`.

@SinceKotlin("1.4")
@library("arrayEquals")
public actual infix fun FloatArray?.contentEquals(other:
FloatArray?): Boolean {
    definedExternally
}

Returns `true` if the two specified arrays are structurally equal to one another, i.e. contain the same number of the same elements in the same order. The elements are compared for equality with the [equals][Any.equals] function. For floating point numbers it means that `NaN` is equal to itself and `-0.0` is not equal to `0.0`.

@SinceKotlin("1.4")
@library("arrayEquals")
public actual infix fun DoubleArray?.contentEquals(other:
DoubleArray?): Boolean {
    definedExternally
}

Returns `true` if the two specified arrays are

```

structurally equal to one another,\n * i.e. contain the same number of the same elements in the same order.\n * \n

* The elements are compared for equality with the [equals][Any.equals] function.\n * For floating point numbers it means that `NaN` is equal to itself and `-0.0` is not equal to `0.0`.\n

*\n@SinceKotlin("1.4")\n@library("arrayEquals")\npublic actual infix fun BooleanArray?.contentEquals(other: BooleanArray?): Boolean {\n definedExternally\n}\n\n/**\n * Returns `true` if the two specified arrays are *structurally* equal to one another,\n * i.e. contain the same number of the same elements in the same order.\n * \n * The elements are compared for equality with the [equals][Any.equals] function.\n * For floating point numbers it means that `NaN` is equal to itself and `-0.0` is not equal to `0.0`.\n

*\n@SinceKotlin("1.4")\n@library("arrayEquals")\npublic actual infix fun CharArray?.contentEquals(other: CharArray?): Boolean {\n definedExternally\n}\n\n/**\n * Returns a hash code based on the contents of this array as if it is [List].\n *\n@Deprecated("Use Kotlin compiler 1.4 to avoid deprecation warning.")\n@SinceKotlin("1.1")\n@DeprecatedSinceKotlin(hiddenSince = "1.4")\npublic actual fun <T> Array<out T>.contentHashCode(): Int {\n return this.contentHashCode()\n}\n\n/**\n * Returns a hash code based on the contents of this array as if it is [List].\n *\n@Deprecated("Use Kotlin compiler 1.4 to avoid deprecation warning.")\n@SinceKotlin("1.1")\n@DeprecatedSinceKotlin(hiddenSince = "1.4")\npublic actual fun ByteArray.contentHashCode(): Int {\n return this.contentHashCode()\n}\n\n/**\n * Returns a hash code based on the contents of this array as if it is [List].\n *\n@Deprecated("Use Kotlin compiler 1.4 to avoid deprecation warning.")\n@SinceKotlin("1.1")\n@DeprecatedSinceKotlin(hiddenSince = "1.4")\npublic actual fun ShortArray.contentHashCode(): Int {\n return this.contentHashCode()\n}\n\n/**\n * Returns a hash code based on the contents of this array as if it is [List].\n *\n@Deprecated("Use Kotlin compiler 1.4 to avoid deprecation warning.")\n@SinceKotlin("1.1")\n@DeprecatedSinceKotlin(hiddenSince = "1.4")\npublic actual fun IntArray.contentHashCode(): Int {\n return this.contentHashCode()\n}\n\n/**\n * Returns a hash code based on the contents of this array as if it is [List].\n *\n@Deprecated("Use Kotlin compiler 1.4 to avoid deprecation warning.")\n@SinceKotlin("1.1")\n@DeprecatedSinceKotlin(hiddenSince = "1.4")\npublic actual fun LongArray.contentHashCode(): Int {\n return this.contentHashCode()\n}\n\n/**\n * Returns a hash code based on the contents of this array as if it is [List].\n *\n@Deprecated("Use Kotlin compiler 1.4 to avoid deprecation warning.")\n@SinceKotlin("1.1")\n@DeprecatedSinceKotlin(hiddenSince = "1.4")\npublic actual fun FloatArray.contentHashCode(): Int {\n return this.contentHashCode()\n}\n\n/**\n * Returns a hash code based on the contents of this array as if it is [List].\n *\n@Deprecated("Use Kotlin compiler 1.4 to avoid deprecation warning.")\n@SinceKotlin("1.1")\n@DeprecatedSinceKotlin(hiddenSince = "1.4")\npublic actual fun DoubleArray.contentHashCode(): Int {\n return this.contentHashCode()\n}\n\n/**\n * Returns a hash code based on the contents of this array as if it is [List].\n *\n@Deprecated("Use Kotlin compiler 1.4 to avoid deprecation warning.")\n@SinceKotlin("1.1")\n@DeprecatedSinceKotlin(hiddenSince = "1.4")\npublic actual fun BooleanArray.contentHashCode(): Int {\n return this.contentHashCode()\n}\n\n/**\n * Returns a hash code based on the contents of this array as if it is [List].\n *\n@Deprecated("Use Kotlin compiler 1.4 to avoid deprecation warning.")\n@SinceKotlin("1.1")\n@DeprecatedSinceKotlin(hiddenSince = "1.4")\npublic actual fun CharArray.contentHashCode(): Int {\n return this.contentHashCode()\n}\n\n/**\n * Returns a hash code based on the contents of this array as if it is [List].\n *\n@SinceKotlin("1.4")\n@library("arrayHashCode")\npublic actual fun <T> Array<out T>?.contentHashCode(): Int {\n definedExternally\n}\n\n/**\n * Returns a hash code based on the contents of this array as if it is [List].\n *\n@SinceKotlin("1.4")\n@library("arrayHashCode")\npublic actual fun ByteArray?.contentHashCode(): Int {\n definedExternally\n}\n\n/**\n * Returns a hash code based on the contents of this array as if it is [List].\n *\n@SinceKotlin("1.4")\n@library("arrayHashCode")\npublic actual fun ShortArray?.contentHashCode(): Int {\n definedExternally\n}\n\n/**\n * Returns a hash code based on the contents of this array as if it is [List].\n *\n@SinceKotlin("1.4")\n@library("arrayHashCode")\npublic actual fun IntArray?.contentHashCode(): Int {\n definedExternally\n}\n\n/**\n * Returns a hash code based on the contents of this array as if it is [List].\n *\n@SinceKotlin("1.4")\n@library("arrayHashCode")\npublic actual fun LongArray?.contentHashCode(): Int {\n definedExternally\n}\n\n/**\n * Returns a hash code based on the contents of this array as if it is [List].\n *\n@SinceKotlin("1.4")\n@library("arrayHashCode")\npublic actual fun

```

FloatArray?.contentHashCode(): Int {\n  definedExternally\n}\n\n/**\n * Returns a hash code based on the
contents of this array as if it is [List].\n *^@\n@SinceKotlin("1.4")\n@library("arrayHashCode")\npublic actual fun
DoubleArray?.contentHashCode(): Int {\n  definedExternally\n}\n\n/**\n * Returns a hash code based on the
contents of this array as if it is [List].\n *^@\n@SinceKotlin("1.4")\n@library("arrayHashCode")\npublic actual fun
BooleanArray?.contentHashCode(): Int {\n  definedExternally\n}\n\n/**\n * Returns a hash code based on the
contents of this array as if it is [List].\n *^@\n@SinceKotlin("1.4")\n@library("arrayHashCode")\npublic actual fun
CharArray?.contentHashCode(): Int {\n  definedExternally\n}\n\n/**\n * Returns a string representation of the
contents of the specified array as if it is [List].\n * \n * @sample
samples.collections.Arrays.ContentOperations.contentToString\n *^@\n@Deprecated("Use Kotlin compiler 1.4 to
avoid deprecation warning.")\n@SinceKotlin("1.1")\n@DeprecatedSinceKotlin(hiddenSince = "1.4")\npublic
actual fun <T> Array<out T>.contentToString(): String {\n  return this.contentToString()\n}\n\n/**\n * Returns a
string representation of the contents of the specified array as if it is [List].\n * \n * @sample
samples.collections.Arrays.ContentOperations.contentToString\n *^@\n@Deprecated("Use Kotlin compiler 1.4 to
avoid deprecation warning.")\n@SinceKotlin("1.1")\n@DeprecatedSinceKotlin(hiddenSince = "1.4")\npublic
actual fun ByteArray.contentToString(): String {\n  return this.contentToString()\n}\n\n/**\n * Returns a string
representation of the contents of the specified array as if it is [List].\n * \n * @sample
samples.collections.Arrays.ContentOperations.contentToString\n *^@\n@Deprecated("Use Kotlin compiler 1.4 to
avoid deprecation warning.")\n@SinceKotlin("1.1")\n@DeprecatedSinceKotlin(hiddenSince = "1.4")\npublic
actual fun ShortArray.contentToString(): String {\n  return this.contentToString()\n}\n\n/**\n * Returns a string
representation of the contents of the specified array as if it is [List].\n * \n * @sample
samples.collections.Arrays.ContentOperations.contentToString\n *^@\n@Deprecated("Use Kotlin compiler 1.4 to
avoid deprecation warning.")\n@SinceKotlin("1.1")\n@DeprecatedSinceKotlin(hiddenSince = "1.4")\npublic
actual fun IntArray.contentToString(): String {\n  return this.contentToString()\n}\n\n/**\n * Returns a string
representation of the contents of the specified array as if it is [List].\n * \n * @sample
samples.collections.Arrays.ContentOperations.contentToString\n *^@\n@Deprecated("Use Kotlin compiler 1.4 to
avoid deprecation warning.")\n@SinceKotlin("1.1")\n@DeprecatedSinceKotlin(hiddenSince = "1.4")\npublic
actual fun LongArray.contentToString(): String {\n  return this.contentToString()\n}\n\n/**\n * Returns a string
representation of the contents of the specified array as if it is [List].\n * \n * @sample
samples.collections.Arrays.ContentOperations.contentToString\n *^@\n@Deprecated("Use Kotlin compiler 1.4 to
avoid deprecation warning.")\n@SinceKotlin("1.1")\n@DeprecatedSinceKotlin(hiddenSince = "1.4")\npublic
actual fun FloatArray.contentToString(): String {\n  return this.contentToString()\n}\n\n/**\n * Returns a string
representation of the contents of the specified array as if it is [List].\n * \n * @sample
samples.collections.Arrays.ContentOperations.contentToString\n *^@\n@Deprecated("Use Kotlin compiler 1.4 to
avoid deprecation warning.")\n@SinceKotlin("1.1")\n@DeprecatedSinceKotlin(hiddenSince = "1.4")\npublic
actual fun DoubleArray.contentToString(): String {\n  return this.contentToString()\n}\n\n/**\n * Returns a string
representation of the contents of the specified array as if it is [List].\n * \n * @sample
samples.collections.Arrays.ContentOperations.contentToString\n *^@\n@Deprecated("Use Kotlin compiler 1.4 to
avoid deprecation warning.")\n@SinceKotlin("1.1")\n@DeprecatedSinceKotlin(hiddenSince = "1.4")\npublic
actual fun BooleanArray.contentToString(): String {\n  return this.contentToString()\n}\n\n/**\n * Returns a string
representation of the contents of the specified array as if it is [List].\n * \n * @sample
samples.collections.Arrays.ContentOperations.contentToString\n *^@\n@Deprecated("Use Kotlin compiler 1.4 to
avoid deprecation warning.")\n@SinceKotlin("1.1")\n@DeprecatedSinceKotlin(hiddenSince = "1.4")\npublic
actual fun CharArray.contentToString(): String {\n  return this.contentToString()\n}\n\n/**\n * Returns a string
representation of the contents of the specified array as if it is [List].\n * \n * @sample
samples.collections.Arrays.ContentOperations.contentToString\n
*^@\n@SinceKotlin("1.4")\n@library("arrayToString")\npublic actual fun <T> Array<out T>?.contentToString():
String {\n  definedExternally\n}\n\n/**\n * Returns a string representation of the contents of the specified array as
if it is [List].\n * \n * @sample samples.collections.Arrays.ContentOperations.contentToString\n

```

```

*\n@SinceKotlin("1.4")\n@library("arrayToString")\npublic actual fun ByteArray?.contentToString(): String
{\n  definedExternally\n}\n\n**\n * Returns a string representation of the contents of the specified array as if it is
[List].\n * \n * @sample samples.collections.Arrays.ContentOperations.contentToString\n
*\n@SinceKotlin("1.4")\n@library("arrayToString")\npublic actual fun ShortArray?.contentToString(): String
{\n  definedExternally\n}\n\n**\n * Returns a string representation of the contents of the specified array as if it is
[List].\n * \n * @sample samples.collections.Arrays.ContentOperations.contentToString\n
*\n@SinceKotlin("1.4")\n@library("arrayToString")\npublic actual fun IntArray?.contentToString(): String {\n
definedExternally\n}\n\n**\n * Returns a string representation of the contents of the specified array as if it is
[List].\n * \n * @sample samples.collections.Arrays.ContentOperations.contentToString\n
*\n@SinceKotlin("1.4")\n@library("arrayToString")\npublic actual fun LongArray?.contentToString(): String
{\n  definedExternally\n}\n\n**\n * Returns a string representation of the contents of the specified array as if it is
[List].\n * \n * @sample samples.collections.Arrays.ContentOperations.contentToString\n
*\n@SinceKotlin("1.4")\n@library("arrayToString")\npublic actual fun FloatArray?.contentToString(): String
{\n  definedExternally\n}\n\n**\n * Returns a string representation of the contents of the specified array as if it is
[List].\n * \n * @sample samples.collections.Arrays.ContentOperations.contentToString\n
*\n@SinceKotlin("1.4")\n@library("arrayToString")\npublic actual fun DoubleArray?.contentToString(): String
{\n  definedExternally\n}\n\n**\n * Returns a string representation of the contents of the specified array as if it is
[List].\n * \n * @sample samples.collections.Arrays.ContentOperations.contentToString\n
*\n@SinceKotlin("1.4")\n@library("arrayToString")\npublic actual fun BooleanArray?.contentToString():
String {\n  definedExternally\n}\n\n**\n * Returns a string representation of the contents of the specified array as
if it is [List].\n * \n * @sample samples.collections.Arrays.ContentOperations.contentToString\n
*\n@SinceKotlin("1.4")\n@library("arrayToString")\npublic actual fun CharArray?.contentToString(): String
{\n  definedExternally\n}\n\n**\n * Copies this array or its subrange into the [destination] array and returns that
array.\n * \n * It's allowed to pass the same array in the [destination] and even specify the subrange so that it
overlaps with the destination range.\n * \n * @param destination the array to copy to.\n * @param destinationOffset
the position in the [destination] array to copy to, 0 by default.\n * @param startIndex the beginning (inclusive) of
the subrange to copy, 0 by default.\n * @param endIndex the end (exclusive) of the subrange to copy, size of this
array by default.\n * \n * @throws IndexOutOfBoundsException or [IllegalArgumentException] when [startIndex]
or [endIndex] is out of range of this array indices or when `startIndex > endIndex`.\n * @throws
IndexOutOfBoundsException when the subrange doesn't fit into the [destination] array starting at the specified
[destinationOffset],\n * or when that index is out of the [destination] array indices range.\n * \n * @return the
[destination] array.\n
*\n@SinceKotlin("1.3")\n@kotlin.internal.InlineOnly\n@Suppress("ACTUAL_FUNCTION_WITH_DEFAULT
_ARGUMENTS")\npublic actual inline fun <T> Array<out T>.copyInto(destination: Array<T>, destinationOffset:
Int = 0, startIndex: Int = 0, endIndex: Int = size): Array<T> {\n  arrayCopy(this, destination, destinationOffset,
startIndex, endIndex)\n  return destination\n}\n\n**\n * Copies this array or its subrange into the [destination]
array and returns that array.\n * \n * It's allowed to pass the same array in the [destination] and even specify the
subrange so that it overlaps with the destination range.\n * \n * @param destination the array to copy to.\n *
@param destinationOffset the position in the [destination] array to copy to, 0 by default.\n * @param startIndex the
beginning (inclusive) of the subrange to copy, 0 by default.\n * @param endIndex the end (exclusive) of the
subrange to copy, size of this array by default.\n * \n * @throws IndexOutOfBoundsException or
[IllegalArgumentException] when [startIndex] or [endIndex] is out of range of this array indices or when `startIndex
> endIndex`.\n * @throws IndexOutOfBoundsException when the subrange doesn't fit into the [destination] array
starting at the specified [destinationOffset],\n * or when that index is out of the [destination] array indices
range.\n * \n * @return the [destination] array.\n
*\n@SinceKotlin("1.3")\n@kotlin.internal.InlineOnly\n@Suppress("ACTUAL_FUNCTION_WITH_DEFAULT
_ARGUMENTS")\npublic actual inline fun ByteArray.copyInto(destination: ByteArray, destinationOffset: Int = 0,
startIndex: Int = 0, endIndex: Int = size): ByteArray {\n  arrayCopy(this.unsafeCast<Array<Byte>>()),

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destination.unsafeCast<Array<Byte>>(), destinationOffset, startIndex, endIndex)\n  return destination\n}\n\n/**\n * Copies this array or its subrange into the [destination] array and returns that array.\n * \n * It's allowed to pass the same array in the [destination] and even specify the subrange so that it overlaps with the destination range.\n * \n * @param destination the array to copy to.\n * @param destinationOffset the position in the [destination] array to copy to, 0 by default.\n * @param startIndex the beginning (inclusive) of the subrange to copy, 0 by default.\n * @param endIndex the end (exclusive) of the subrange to copy, size of this array by default.\n * \n * @throws IndexOutOfBoundsException or [IllegalArgumentException] when [startIndex] or [endIndex] is out of range of this array indices or when `startIndex > endIndex`.\n * @throws IndexOutOfBoundsException when the subrange doesn't fit into the [destination] array starting at the specified [destinationOffset],\n * or when that index is out of the [destination] array indices range.\n * \n * @return the [destination] array.\n\n*/\n@SinceKotlin("1.3")\n@kotlin.internal.InlineOnly\n@Suppress("ACTUAL_FUNCTION_WITH_DEFAULT_ARGUMENTS")\npublic actual inline fun ShortArray.copyInto(destination: ShortArray, destinationOffset: Int = 0, startIndex: Int = 0, endIndex: Int = size): ShortArray {\n  arrayCopy(this.unsafeCast<Array<Short>>(), destination.unsafeCast<Array<Short>>(), destinationOffset, startIndex, endIndex)\n  return destination\n}\n\n/**\n * Copies this array or its subrange into the [destination] array and returns that array.\n * \n * It's allowed to pass the same array in the [destination] and even specify the subrange so that it overlaps with the destination range.\n * \n * @param destination the array to copy to.\n * @param destinationOffset the position in the [destination] array to copy to, 0 by default.\n * @param startIndex the beginning (inclusive) of the subrange to copy, 0 by default.\n * @param endIndex the end (exclusive) of the subrange to copy, size of this array by default.\n * \n * @throws IndexOutOfBoundsException or [IllegalArgumentException] when [startIndex] or [endIndex] is out of range of this array indices or when `startIndex > endIndex`.\n * @throws IndexOutOfBoundsException when the subrange doesn't fit into the [destination] array starting at the specified [destinationOffset],\n * or when that index is out of the [destination] array indices range.\n * \n * @return the [destination] array.\n\n*/\n@SinceKotlin("1.3")\n@kotlin.internal.InlineOnly\n@Suppress("ACTUAL_FUNCTION_WITH_DEFAULT_ARGUMENTS")\npublic actual inline fun IntArray.copyInto(destination: IntArray, destinationOffset: Int = 0, startIndex: Int = 0, endIndex: Int = size): IntArray {\n  arrayCopy(this.unsafeCast<Array<Int>>(), destination.unsafeCast<Array<Int>>(), destinationOffset, startIndex, endIndex)\n  return destination\n}\n\n/**\n * Copies this array or its subrange into the [destination] array and returns that array.\n * \n * It's allowed to pass the same array in the [destination] and even specify the subrange so that it overlaps with the destination range.\n * \n * @param destination the array to copy to.\n * @param destinationOffset the position in the [destination] array to copy to, 0 by default.\n * @param startIndex the beginning (inclusive) of the subrange to copy, 0 by default.\n * @param endIndex the end (exclusive) of the subrange to copy, size of this array by default.\n * \n * @throws IndexOutOfBoundsException or [IllegalArgumentException] when [startIndex] or [endIndex] is out of range of this array indices or when `startIndex > endIndex`.\n * @throws IndexOutOfBoundsException when the subrange doesn't fit into the [destination] array starting at the specified [destinationOffset],\n * or when that index is out of the [destination] array indices range.\n * \n * @return the [destination] array.\n\n*/\n@SinceKotlin("1.3")\n@kotlin.internal.InlineOnly\n@Suppress("ACTUAL_FUNCTION_WITH_DEFAULT_ARGUMENTS")\npublic actual inline fun LongArray.copyInto(destination: LongArray, destinationOffset: Int = 0, startIndex: Int = 0, endIndex: Int = size): LongArray {\n  arrayCopy(this.unsafeCast<Array<Long>>(), destination.unsafeCast<Array<Long>>(), destinationOffset, startIndex, endIndex)\n  return destination\n}\n\n/**\n * Copies this array or its subrange into the [destination] array and returns that array.\n * \n * It's allowed to pass the same array in the [destination] and even specify the subrange so that it overlaps with the destination range.\n * \n * @param destination the array to copy to.\n * @param destinationOffset the position in the [destination] array to copy to, 0 by default.\n * @param startIndex the beginning (inclusive) of the subrange to copy, 0 by default.\n * @param endIndex the end (exclusive) of the subrange to copy, size of this array by default.\n * \n * @throws IndexOutOfBoundsException or [IllegalArgumentException] when [startIndex] or [endIndex] is out of range of this array indices or when `startIndex > endIndex`.\n * @throws IndexOutOfBoundsException when the subrange doesn't fit into the [destination] array starting at the specified [destinationOffset],\n * or when that index is out of the

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[destination] array indices range.\n * \n * @return the [destination] array.\n
*\n@SinceKotlin("1.3")\n@kotlin.internal.InlineOnly\n@Suppress("ACTUAL_FUNCTION_WITH_DEFAULT
_ARGUMENTS")\npublic actual inline fun FloatArray.copyInto(destination: FloatArray, destinationOffset: Int = 0,
startIndex: Int = 0, endIndex: Int = size): FloatArray {\n    arrayCopy(this.unsafeCast<Array<Float>>(),
destination.unsafeCast<Array<Float>>(), destinationOffset, startIndex, endIndex)\n    return destination\n}\n\n/**\n
* Copies this array or its subrange into the [destination] array and returns that array.\n * \n * It's allowed to pass the
same array in the [destination] and even specify the subrange so that it overlaps with the destination range.\n * \n *
@param destination the array to copy to.\n * @param destinationOffset the position in the [destination] array to
copy to, 0 by default.\n * @param startIndex the beginning (inclusive) of the subrange to copy, 0 by default.\n *
@param endIndex the end (exclusive) of the subrange to copy, size of this array by default.\n * \n * @throws
IndexOutOfBoundsException or [IllegalArgumentException] when [startIndex] or [endIndex] is out of range of this
array indices or when `startIndex > endIndex`.\n * @throws IndexOutOfBoundsException when the subrange
doesn't fit into the [destination] array starting at the specified [destinationOffset],\n * or when that index is out of the
[destination] array indices range.\n * \n * @return the [destination] array.\n
*\n@SinceKotlin("1.3")\n@kotlin.internal.InlineOnly\n@Suppress("ACTUAL_FUNCTION_WITH_DEFAULT
_ARGUMENTS")\npublic actual inline fun DoubleArray.copyInto(destination: DoubleArray, destinationOffset: Int
= 0, startIndex: Int = 0, endIndex: Int = size): DoubleArray {\n    arrayCopy(this.unsafeCast<Array<Double>>(),
destination.unsafeCast<Array<Double>>(), destinationOffset, startIndex, endIndex)\n    return
destination\n}\n\n/**\n
* Copies this array or its subrange into the [destination] array and returns that array.\n * \n * It's allowed to pass the
same array in the [destination] and even specify the subrange so that it overlaps with the
destination range.\n * \n * @param destination the array to copy to.\n * @param destinationOffset the position in the
[destination] array to copy to, 0 by default.\n * @param startIndex the beginning (inclusive) of the subrange to copy,
0 by default.\n * @param endIndex the end (exclusive) of the subrange to copy, size of this array by default.\n * \n *
@throws IndexOutOfBoundsException or [IllegalArgumentException] when [startIndex] or [endIndex] is out of
range of this array indices or when `startIndex > endIndex`.\n * @throws IndexOutOfBoundsException when the
subrange doesn't fit into the [destination] array starting at the specified [destinationOffset],\n * or when that index is
out of the [destination] array indices range.\n * \n * @return the [destination] array.\n
*\n@SinceKotlin("1.3")\n@kotlin.internal.InlineOnly\n@Suppress("ACTUAL_FUNCTION_WITH_DEFAULT
_ARGUMENTS")\npublic actual inline fun BooleanArray.copyInto(destination: BooleanArray, destinationOffset:
Int = 0, startIndex: Int = 0, endIndex: Int = size): BooleanArray {\n
arrayCopy(this.unsafeCast<Array<Boolean>>(), destination.unsafeCast<Array<Boolean>>(), destinationOffset,
startIndex, endIndex)\n    return destination\n}\n\n/**\n
* Copies this array or its subrange into the [destination]
array and returns that array.\n * \n * It's allowed to pass the same array in the [destination] and even specify the
subrange so that it overlaps with the destination range.\n * \n * @param destination the array to copy to.\n *
@param destinationOffset the position in the [destination] array to copy to, 0 by default.\n * @param startIndex the
beginning (inclusive) of the subrange to copy, 0 by default.\n * @param endIndex the end (exclusive) of the
subrange to copy, size of this array by default.\n * \n * @throws IndexOutOfBoundsException or
[IllegalArgumentException] when [startIndex] or [endIndex] is out of range of this array indices or when `startIndex
> endIndex`.\n * @throws IndexOutOfBoundsException when the subrange doesn't fit into the [destination] array
starting at the specified [destinationOffset],\n * or when that index is out of the [destination] array indices range.\n
*\n * @return the [destination] array.\n
*\n@SinceKotlin("1.3")\n@kotlin.internal.InlineOnly\n@Suppress("ACTUAL_FUNCTION_WITH_DEFAULT
_ARGUMENTS")\npublic actual inline fun CharArray.copyInto(destination: CharArray, destinationOffset: Int = 0,
startIndex: Int = 0, endIndex: Int = size): CharArray {\n    arrayCopy(this.unsafeCast<Array<Char>>(),
destination.unsafeCast<Array<Char>>(), destinationOffset, startIndex, endIndex)\n    return destination\n}\n\n/**\n
* Returns new array which is a copy of the original array.\n * \n * @sample
samples.collections.Arrays.CopyOfOperations.copyOf\n *\n@Suppress("ACTUAL_WITHOUT_EXPECT",
"NOTHING_TO_INLINE")\npublic actual inline fun <T> Array<out T>.copyOf(): Array<T> {\n    return

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this.asDynamic().slice()\n}\n\n/**\n * Returns new array which is a copy of the original array.\n * \n * @sample
samples.collections.Arrays.CopyOfOperations.copyOf\n *^\n@Suppress("NOTHING_TO_INLINE")\npublic
actual inline fun ByteArray.copyOf(): ByteArray {\n    return this.asDynamic().slice()\n}\n\n/**\n * Returns new
array which is a copy of the original array.\n * \n * @sample
samples.collections.Arrays.CopyOfOperations.copyOf\n *^\n@Suppress("NOTHING_TO_INLINE")\npublic
actual inline fun ShortArray.copyOf(): ShortArray {\n    return this.asDynamic().slice()\n}\n\n/**\n * Returns new
array which is a copy of the original array.\n * \n * @sample
samples.collections.Arrays.CopyOfOperations.copyOf\n *^\n@Suppress("NOTHING_TO_INLINE")\npublic
actual inline fun IntArray.copyOf(): IntArray {\n    return this.asDynamic().slice()\n}\n\n/**\n * Returns new array
which is a copy of the original array.\n * \n * @sample samples.collections.Arrays.CopyOfOperations.copyOf\n
*^\npublic actual fun LongArray.copyOf(): LongArray {\n    return withType("LongArray",
this.asDynamic().slice())\n}\n\n/**\n * Returns new array which is a copy of the original array.\n * \n * @sample
samples.collections.Arrays.CopyOfOperations.copyOf\n *^\n@Suppress("NOTHING_TO_INLINE")\npublic
actual inline fun FloatArray.copyOf(): FloatArray {\n    return this.asDynamic().slice()\n}\n\n/**\n * Returns new
array which is a copy of the original array.\n * \n * @sample
samples.collections.Arrays.CopyOfOperations.copyOf\n *^\n@Suppress("NOTHING_TO_INLINE")\npublic
actual inline fun DoubleArray.copyOf(): DoubleArray {\n    return this.asDynamic().slice()\n}\n\n/**\n * Returns
new array which is a copy of the original array.\n * \n * @sample
samples.collections.Arrays.CopyOfOperations.copyOf\n *^\npublic actual fun BooleanArray.copyOf():
BooleanArray {\n    return withType("BooleanArray", this.asDynamic().slice())\n}\n\n/**\n * Returns new array
which is a copy of the original array.\n * \n * @sample samples.collections.Arrays.CopyOfOperations.copyOf\n
*^\npublic actual fun CharArray.copyOf(): CharArray {\n    return withType("CharArray",
this.asDynamic().slice())\n}\n\n/**\n * Returns new array which is a copy of the original array, resized to the given
[newSize].\n * The copy is either truncated or padded at the end with zero values if necessary.\n * \n * - If [newSize]
is less than the size of the original array, the copy array is truncated to the [newSize].\n * - If [newSize] is greater
than the size of the original array, the extra elements in the copy array are filled with zero values.\n * \n * @sample
samples.collections.Arrays.CopyOfOperations.resizedPrimitiveCopyOf\n *^\npublic actual fun
ByteArray.copyOf(newSize: Int): ByteArray {\n    require(newSize >= 0) { "Invalid new array size: $newSize." }\n
}\n    return fillFrom(this, ByteArray(newSize))\n}\n\n/**\n * Returns new array which is a copy of the original
array, resized to the given [newSize].\n * The copy is either truncated or padded at the end with zero values if
necessary.\n * \n * - If [newSize] is less than the size of the original array, the copy array is truncated to the
[newSize].\n * - If [newSize] is greater than the size of the original array, the extra elements in the copy array are
filled with zero values.\n * \n * @sample samples.collections.Arrays.CopyOfOperations.resizedPrimitiveCopyOf\n
*^\npublic actual fun ShortArray.copyOf(newSize: Int): ShortArray {\n    require(newSize >= 0) { "Invalid new
array size: $newSize." }\n    return fillFrom(this, ShortArray(newSize))\n}\n\n/**\n * Returns new array which is a
copy of the original array, resized to the given [newSize].\n * The copy is either truncated or padded at the end with
zero values if necessary.\n * \n * - If [newSize] is less than the size of the original array, the copy array is truncated
to the [newSize].\n * - If [newSize] is greater than the size of the original array, the extra elements in the copy array
are filled with zero values.\n * \n * @sample
samples.collections.Arrays.CopyOfOperations.resizedPrimitiveCopyOf\n *^\npublic actual fun
IntArray.copyOf(newSize: Int): IntArray {\n    require(newSize >= 0) { "Invalid new array size: $newSize." }\n
}\n    return fillFrom(this, IntArray(newSize))\n}\n\n/**\n * Returns new array which is a copy of the original array,
resized to the given [newSize].\n * The copy is either truncated or padded at the end with zero values if necessary.\n
*\n * - If [newSize] is less than the size of the original array, the copy array is truncated to the [newSize].\n * - If
[newSize] is greater than the size of the original array, the extra elements in the copy array are filled with zero
values.\n * \n * @sample samples.collections.Arrays.CopyOfOperations.resizedPrimitiveCopyOf\n *^\npublic actual
fun LongArray.copyOf(newSize: Int): LongArray {\n    require(newSize >= 0) { "Invalid new array size:
$newSize." }\n    return withType("LongArray", arrayCopyResize(this, newSize, 0L))\n}\n\n/**\n * Returns new

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array which is a copy of the original array, resized to the given [newSize].\n * The copy is either truncated or padded at the end with zero values if necessary.\n * - If [newSize] is less than the size of the original array, the copy array is truncated to the [newSize].\n * - If [newSize] is greater than the size of the original array, the extra elements in the copy array are filled with zero values.\n * \n * @sample

samples.collections.Arrays.CopyOfOperations.resizedPrimitiveCopyOf\n * \n * public actual fun

```
FloatArray.copyOf(newSize: Int): FloatArray {\n    require(newSize >= 0) { \"Invalid new array size: $newSize.\" }\n    return fillFrom(this, FloatArray(newSize))\n}\n\n/**\n * Returns new array which is a copy of the original array, resized to the given [newSize].\n * The copy is either truncated or padded at the end with zero values if
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necessary.\n * \n * - If [newSize] is less than the size of the original array, the copy array is truncated to the [newSize].\n * - If [newSize] is greater than the size of the original array, the extra elements in the copy array are
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```
filled with zero values.\n * \n * @sample samples.collections.Arrays.CopyOfOperations.resizedPrimitiveCopyOf\n * \n * public actual fun DoubleArray.copyOf(newSize: Int): DoubleArray {\n    require(newSize >= 0) { \"Invalid new array size: $newSize.\" }\n    return fillFrom(this, DoubleArray(newSize))\n}\n\n/**\n * Returns new array which is a copy of the original array, resized to the given [newSize].\n * The copy is either truncated or padded at the end with `false` values if necessary.\n * \n * - If [newSize] is less than the size of the original array, the copy array is truncated to the [newSize].\n * - If [newSize] is greater than the size of the original array, the extra elements in the copy array are filled with `false` values.\n * \n * @sample
```

samples.collections.Arrays.CopyOfOperations.resizedPrimitiveCopyOf\n * \n * public actual fun

```
BooleanArray.copyOf(newSize: Int): BooleanArray {\n    require(newSize >= 0) { \"Invalid new array size: $newSize.\" }\n    return withType(\"BooleanArray\", arrayCopyResize(this, newSize, false))\n}\n\n/**\n * Returns new array which is a copy of the original array, resized to the given [newSize].\n * The copy is either truncated or padded at the end with null char (`\\u0000`) values if necessary.\n * \n * - If [newSize] is less than the size of the original array, the copy array is truncated to the [newSize].\n * - If [newSize] is greater than the size of the original array, the extra elements in the copy array are filled with null char (`\\u0000`) values.\n * \n * @sample
```

samples.collections.Arrays.CopyOfOperations.resizedPrimitiveCopyOf\n * \n * public actual fun

```
CharArray.copyOf(newSize: Int): CharArray {\n    require(newSize >= 0) { \"Invalid new array size: $newSize.\" }\n    return withType(\"CharArray\", fillFrom(this, CharArray(newSize)))\n}\n\n/**\n * Returns new array which is a copy of the original array, resized to the given [newSize].\n * The copy is either truncated or padded at the end with `null` values if necessary.\n * \n * - If [newSize] is less than the size of the original array, the copy array is truncated to the [newSize].\n * - If [newSize] is greater than the size of the original array, the extra elements in the copy array are filled with `null` values.\n * \n * @sample
```

samples.collections.Arrays.CopyOfOperations.resizingCopyOf\n * \n * public actual fun

```
<T> Array<out T>.copyOf(newSize: Int): Array<T?> {\n    require(newSize >= 0) { \"Invalid new array size: $newSize.\" }\n    return arrayCopyResize(this, newSize, null)\n}\n\n/**\n * Returns a new array which is a copy of the specified range of the original array.\n * \n * @param fromIndex the start of the range (inclusive) to copy.\n * @param toIndex the end of the range (exclusive) to copy.\n * \n * @throws IndexOutOfBoundsException if [fromIndex] is less than zero or [toIndex] is greater than the size of this array.\n * @throws IllegalArgumentException if [fromIndex] is greater than [toIndex].\n * \n * @suppress(\"ACTUAL_WITHOUT_EXPECT\")\n * \n * public actual fun <T> Array<out
```

```
T>.copyOfRange(fromIndex: Int, toIndex: Int): Array<T> {\n    AbstractList.checkRangeIndexes(fromIndex,
```

```
toIndex, size)\n    return this.asDynamic().slice(fromIndex, toIndex)\n}\n\n/**\n * Returns a new array which is a copy of the specified range of the original array.\n * \n * @param fromIndex the start of the range (inclusive) to copy.\n * @param toIndex the end of the range (exclusive) to copy.\n * \n * @throws IndexOutOfBoundsException if [fromIndex] is less than zero or [toIndex] is greater than the size of this array.\n * @throws IllegalArgumentException if [fromIndex] is greater than [toIndex].\n * \n * public actual fun
```

ByteArray.copyOfRange(fromIndex: Int, toIndex: Int): ByteArray {\n * \n * public actual fun

```
AbstractList.checkRangeIndexes(fromIndex, toIndex, size)\n    return this.asDynamic().slice(fromIndex, toIndex)\n}\n\n/**\n * Returns a new array which is a copy of the specified range of the original array.\n * \n * @param fromIndex the start of the range (inclusive) to copy.\n * @param toIndex the end of the range (exclusive) to copy.\n * \n * @throws IndexOutOfBoundsException if [fromIndex] is less than zero or [toIndex] is greater than the size of this array.\n * @throws IllegalArgumentException if [fromIndex] is greater than [toIndex].\n * \n * public actual fun
```

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@param fromIndex the start of the range (inclusive) to copy.\n * @param toIndex the end of the range (exclusive) to
copy.\n * \n * @throws IndexOutOfBoundsException if [fromIndex] is less than zero or [toIndex] is greater than the
size of this array.\n * @throws IllegalArgumentException if [fromIndex] is greater than [toIndex].\n * \n\npublic
actual fun ShortArray.copyOfRange(fromIndex: Int, toIndex: Int): ShortArray {\n
AbstractList.checkRangeIndexes(fromIndex, toIndex, size)\n    return this.asDynamic().slice(fromIndex,
toIndex)\n}\n\n/**\n * Returns a new array which is a copy of the specified range of the original array.\n * \n *
@param fromIndex the start of the range (inclusive) to copy.\n * @param toIndex the end of the range (exclusive) to
copy.\n * \n * @throws IndexOutOfBoundsException if [fromIndex] is less than zero or [toIndex] is greater than the
size of this array.\n * @throws IllegalArgumentException if [fromIndex] is greater than [toIndex].\n * \n\npublic
actual fun IntArray.copyOfRange(fromIndex: Int, toIndex: Int): IntArray {\n
AbstractList.checkRangeIndexes(fromIndex, toIndex, size)\n    return this.asDynamic().slice(fromIndex,
toIndex)\n}\n\n/**\n * Returns a new array which is a copy of the specified range of the original array.\n * \n *
@param fromIndex the start of the range (inclusive) to copy.\n * @param toIndex the end of the range (exclusive) to
copy.\n * \n * @throws IndexOutOfBoundsException if [fromIndex] is less than zero or [toIndex] is greater than the
size of this array.\n * @throws IllegalArgumentException if [fromIndex] is greater than [toIndex].\n * \n\npublic
actual fun LongArray.copyOfRange(fromIndex: Int, toIndex: Int): LongArray {\n
AbstractList.checkRangeIndexes(fromIndex, toIndex, size)\n    return withType("<code>LongArray</code>",
this.asDynamic().slice(fromIndex, toIndex))\n}\n\n/**\n * Returns a new array which is a copy of the specified
range of the original array.\n * \n * @param fromIndex the start of the range (inclusive) to copy.\n * @param
toIndex the end of the range (exclusive) to copy.\n * \n * @throws IndexOutOfBoundsException if [fromIndex] is
less than zero or [toIndex] is greater than the size of this array.\n * @throws IllegalArgumentException if
[fromIndex] is greater than [toIndex].\n * \n\npublic actual fun FloatArray.copyOfRange(fromIndex: Int, toIndex: Int):
FloatArray {\n    AbstractList.checkRangeIndexes(fromIndex, toIndex, size)\n    return
this.asDynamic().slice(fromIndex, toIndex)\n}\n\n/**\n * Returns a new array which is a copy of the specified range
of the original array.\n * \n * @param fromIndex the start of the range (inclusive) to copy.\n * @param toIndex the
end of the range (exclusive) to copy.\n * \n * @throws IndexOutOfBoundsException if [fromIndex] is less than zero
or [toIndex] is greater than the size of this array.\n * @throws IllegalArgumentException if [fromIndex] is greater
than [toIndex].\n * \n\npublic actual fun DoubleArray.copyOfRange(fromIndex: Int, toIndex: Int): DoubleArray {\n
AbstractList.checkRangeIndexes(fromIndex, toIndex, size)\n    return this.asDynamic().slice(fromIndex,
toIndex)\n}\n\n/**\n * Returns a new array which is a copy of the specified range of the original array.\n * \n *
@param fromIndex the start of the range (inclusive) to copy.\n * @param toIndex the end of the range (exclusive) to
copy.\n * \n * @throws IndexOutOfBoundsException if [fromIndex] is less than zero or [toIndex] is greater than the
size of this array.\n * @throws IllegalArgumentException if [fromIndex] is greater than [toIndex].\n * \n\npublic
actual fun BooleanArray.copyOfRange(fromIndex: Int, toIndex: Int): BooleanArray {\n
AbstractList.checkRangeIndexes(fromIndex, toIndex, size)\n    return withType("<code>BooleanArray</code>",
this.asDynamic().slice(fromIndex, toIndex))\n}\n\n/**\n * Returns a new array which is a copy of the specified
range of the original array.\n * \n * @param fromIndex the start of the range (inclusive) to copy.\n * @param
toIndex the end of the range (exclusive) to copy.\n * \n * @throws IndexOutOfBoundsException if [fromIndex] is
less than zero or [toIndex] is greater than the size of this array.\n * @throws IllegalArgumentException if
[fromIndex] is greater than [toIndex].\n * \n\npublic actual fun CharArray.copyOfRange(fromIndex: Int, toIndex: Int):
CharArray {\n    AbstractList.checkRangeIndexes(fromIndex, toIndex, size)\n    return withType("<code>CharArray</code>",
this.asDynamic().slice(fromIndex, toIndex))\n}\n\n/**\n * Fills this array or its subrange with the specified
[element] value.\n * \n * @param fromIndex the start of the range (inclusive) to fill, 0 by default.\n * @param
toIndex the end of the range (exclusive) to fill, size of this array by default.\n * \n * @throws
IndexOutOfBoundsException if [fromIndex] is less than zero or [toIndex] is greater than the size of this array.\n *
@throws IllegalArgumentException if [fromIndex] is greater than [toIndex].\n * \n\n* \n\n@SinceKotlin("1.3")\n@Suppress("<code>ACTUAL_FUNCTION_WITH_DEFAULT_ARGUMENTS</code>")\n\npublic
actual fun <T> Array<T>.fill(element: T, fromIndex: Int = 0, toIndex: Int = size): Unit {\n

```

```

AbstractList.checkRangeIndexes(fromIndex, toIndex, size)\n    this.asDynamic().fill(element, fromIndex,
toIndex);\n}\n\n/**\n * Fills this array or its subrange with the specified [element] value.\n * \n * @param
fromIndex the start of the range (inclusive) to fill, 0 by default.\n * @param toIndex the end of the range (exclusive)
to fill, size of this array by default.\n * \n * @throws IndexOutOfBoundsException if [fromIndex] is less than zero
or [toIndex] is greater than the size of this array.\n * @throws IllegalArgumentException if [fromIndex] is greater
than [toIndex].\n
*\n@SinceKotlin("1.3")\n@Suppress("ACTUAL_FUNCTION_WITH_DEFAULT_ARGUMENTS")\npublic
actual fun ByteArray.fill(element: Byte, fromIndex: Int = 0, toIndex: Int = size): Unit {\n
AbstractList.checkRangeIndexes(fromIndex, toIndex, size)\n    this.asDynamic().fill(element, fromIndex,
toIndex);\n}\n\n/**\n * Fills this array or its subrange with the specified [element] value.\n * \n * @param
fromIndex the start of the range (inclusive) to fill, 0 by default.\n * @param toIndex the end of the range (exclusive)
to fill, size of this array by default.\n * \n * @throws IndexOutOfBoundsException if [fromIndex] is less than zero
or [toIndex] is greater than the size of this array.\n * @throws IllegalArgumentException if [fromIndex] is greater
than [toIndex].\n
*\n@SinceKotlin("1.3")\n@Suppress("ACTUAL_FUNCTION_WITH_DEFAULT_ARGUMENTS")\npublic
actual fun ShortArray.fill(element: Short, fromIndex: Int = 0, toIndex: Int = size): Unit {\n
AbstractList.checkRangeIndexes(fromIndex, toIndex, size)\n    this.asDynamic().fill(element, fromIndex,
toIndex);\n}\n\n/**\n * Fills this array or its subrange with the specified [element] value.\n * \n * @param
fromIndex the start of the range (inclusive) to fill, 0 by default.\n * @param toIndex the end of the range (exclusive)
to fill, size of this array by default.\n * \n * @throws IndexOutOfBoundsException if [fromIndex] is less than zero
or [toIndex] is greater than the size of this array.\n * @throws IllegalArgumentException if [fromIndex] is greater
than [toIndex].\n
*\n@SinceKotlin("1.3")\n@Suppress("ACTUAL_FUNCTION_WITH_DEFAULT_ARGUMENTS")\npublic
actual fun IntArray.fill(element: Int, fromIndex: Int = 0, toIndex: Int = size): Unit {\n
AbstractList.checkRangeIndexes(fromIndex, toIndex, size)\n    this.asDynamic().fill(element, fromIndex,
toIndex);\n}\n\n/**\n * Fills this array or its subrange with the specified [element] value.\n * \n * @param
fromIndex the start of the range (inclusive) to fill, 0 by default.\n * @param toIndex the end of the range (exclusive)
to fill, size of this array by default.\n * \n * @throws IndexOutOfBoundsException if [fromIndex] is less than zero
or [toIndex] is greater than the size of this array.\n * @throws IllegalArgumentException if [fromIndex] is greater
than [toIndex].\n
*\n@SinceKotlin("1.3")\n@Suppress("ACTUAL_FUNCTION_WITH_DEFAULT_ARGUMENTS")\npublic
actual fun LongArray.fill(element: Long, fromIndex: Int = 0, toIndex: Int = size): Unit {\n
AbstractList.checkRangeIndexes(fromIndex, toIndex, size)\n    this.asDynamic().fill(element, fromIndex,
toIndex);\n}\n\n/**\n * Fills this array or its subrange with the specified [element] value.\n * \n * @param
fromIndex the start of the range (inclusive) to fill, 0 by default.\n * @param toIndex the end of the range (exclusive)
to fill, size of this array by default.\n * \n * @throws IndexOutOfBoundsException if [fromIndex] is less than zero
or [toIndex] is greater than the size of this array.\n * @throws IllegalArgumentException if [fromIndex] is greater
than [toIndex].\n
*\n@SinceKotlin("1.3")\n@Suppress("ACTUAL_FUNCTION_WITH_DEFAULT_ARGUMENTS")\npublic
actual fun FloatArray.fill(element: Float, fromIndex: Int = 0, toIndex: Int = size): Unit {\n
AbstractList.checkRangeIndexes(fromIndex, toIndex, size)\n    this.asDynamic().fill(element, fromIndex,
toIndex);\n}\n\n/**\n * Fills this array or its subrange with the specified [element] value.\n * \n * @param
fromIndex the start of the range (inclusive) to fill, 0 by default.\n * @param toIndex the end of the range (exclusive)
to fill, size of this array by default.\n * \n * @throws IndexOutOfBoundsException if [fromIndex] is less than zero
or [toIndex] is greater than the size of this array.\n * @throws IllegalArgumentException if [fromIndex] is greater
than [toIndex].\n
*\n@SinceKotlin("1.3")\n@Suppress("ACTUAL_FUNCTION_WITH_DEFAULT_ARGUMENTS")\npublic
actual fun DoubleArray.fill(element: Double, fromIndex: Int = 0, toIndex: Int = size): Unit {\n

```

```

AbstractList.checkRangeIndexes(fromIndex, toIndex, size)\n  this.asDynamic().fill(element, fromIndex,
toIndex);\n}\n\n/**\n * Fills this array or its subrange with the specified [element] value.\n * \n * @param
fromIndex the start of the range (inclusive) to fill, 0 by default.\n * @param toIndex the end of the range (exclusive)
to fill, size of this array by default.\n * \n * @throws IndexOutOfBoundsException if [fromIndex] is less than zero
or [toIndex] is greater than the size of this array.\n * @throws IllegalArgumentException if [fromIndex] is greater
than [toIndex].\n
*\n@SinceKotlin("1.3")\n@Suppress("ACTUAL_FUNCTION_WITH_DEFAULT_ARGUMENTS")\npublic
actual fun BooleanArray.fill(element: Boolean, fromIndex: Int = 0, toIndex: Int = size): Unit {\n
AbstractList.checkRangeIndexes(fromIndex, toIndex, size)\n  this.asDynamic().fill(element, fromIndex,
toIndex);\n}\n\n/**\n * Fills this array or its subrange with the specified [element] value.\n * \n * @param
fromIndex the start of the range (inclusive) to fill, 0 by default.\n * @param toIndex the end of the range (exclusive)
to fill, size of this array by default.\n * \n * @throws IndexOutOfBoundsException if [fromIndex] is less than zero
or [toIndex] is greater than the size of this array.\n * @throws IllegalArgumentException if [fromIndex] is greater
than [toIndex].\n
*\n@SinceKotlin("1.3")\n@Suppress("ACTUAL_FUNCTION_WITH_DEFAULT_ARGUMENTS")\npublic
actual fun CharArray.fill(element: Char, fromIndex: Int = 0, toIndex: Int = size): Unit {\n
AbstractList.checkRangeIndexes(fromIndex, toIndex, size)\n  this.asDynamic().fill(element, fromIndex,
toIndex);\n}\n\n/**\n * Returns an array containing all elements of the original array and then the given [element].\n
*\n@Suppress("ACTUAL_WITHOUT_EXPECT", "NOTHING_TO_INLINE")\npublic actual inline operator
fun <T> Array<out T>.plus(element: T): Array<T> {\n  return
this.asDynamic().concat(arrayOf(element))\n}\n\n/**\n * Returns an array containing all elements of the original
array and then the given [element].\n *\n@Suppress("NOTHING_TO_INLINE")\npublic actual inline operator
fun ByteArray.plus(element: Byte): ByteArray {\n  return plus(byteArrayOf(element))\n}\n\n/**\n * Returns an
array containing all elements of the original array and then the given [element].\n
*\n@Suppress("NOTHING_TO_INLINE")\npublic actual inline operator fun ShortArray.plus(element: Short):
ShortArray {\n  return plus(shortArrayOf(element))\n}\n\n/**\n * Returns an array containing all elements of the
original array and then the given [element].\n *\n@Suppress("NOTHING_TO_INLINE")\npublic actual inline
operator fun IntArray.plus(element: Int): IntArray {\n  return plus(intArrayOf(element))\n}\n\n/**\n * Returns an
array containing all elements of the original array and then the given [element].\n
*\n@Suppress("NOTHING_TO_INLINE")\npublic actual inline operator fun LongArray.plus(element: Long):
LongArray {\n  return plus(longArrayOf(element))\n}\n\n/**\n * Returns an array containing all elements of the
original array and then the given [element].\n *\n@Suppress("NOTHING_TO_INLINE")\npublic actual inline
operator fun FloatArray.plus(element: Float): FloatArray {\n  return plus(floatArrayOf(element))\n}\n\n/**\n *
Returns an array containing all elements of the original array and then the given [element].\n
*\n@Suppress("NOTHING_TO_INLINE")\npublic actual inline operator fun DoubleArray.plus(element:
Double): DoubleArray {\n  return plus(doubleArrayOf(element))\n}\n\n/**\n * Returns an array containing all
elements of the original array and then the given [element].\n *\n@Suppress("NOTHING_TO_INLINE")\npublic
actual inline operator fun BooleanArray.plus(element: Boolean): BooleanArray {\n  return
plus(booleanArrayOf(element))\n}\n\n/**\n * Returns an array containing all elements of the original array and then
the given [element].\n *\n@Suppress("NOTHING_TO_INLINE")\npublic actual inline operator fun
CharArray.plus(element: Char): CharArray {\n  return plus(charArrayOf(element))\n}\n\n/**\n * Returns an array
containing all elements of the original array and then all elements of the given [elements] collection.\n
*\n@Suppress("ACTUAL_WITHOUT_EXPECT")\npublic actual operator fun <T> Array<out T>.plus(elements:
Collection<T>): Array<T> {\n  return arrayPlusCollection(this, elements)\n}\n\n/**\n * Returns an array
containing all elements of the original array and then all elements of the given [elements] collection.\n *\n@public
actual operator fun ByteArray.plus(elements: Collection<Byte>): ByteArray {\n  return
fillFromCollection(this.copyOf(size + elements.size), this.size, elements)\n}\n\n/**\n * Returns an array containing
all elements of the original array and then all elements of the given [elements] collection.\n *\n@public actual

```

```

operator fun ShortArray.plus(elements: Collection<Short>): ShortArray {
    return fillFromCollection(this.copyOf(size + elements.size), this.size, elements)
}
// Returns an array containing all elements of the original array and then all elements of the given [elements] collection.
// public actual operator fun IntArray.plus(elements: Collection<Int>): IntArray {
//     return fillFromCollection(this.copyOf(size + elements.size), this.size, elements)
// }
// Returns an array containing all elements of the original array and then all elements of the given [elements] collection.
// public actual operator fun LongArray.plus(elements: Collection<Long>): LongArray {
//     return arrayPlusCollection(this, elements)
// }
// Returns an array containing all elements of the original array and then all elements of the given [elements] collection.
// public actual operator fun FloatArray.plus(elements: Collection<Float>): FloatArray {
//     return fillFromCollection(this.copyOf(size + elements.size), this.size, elements)
// }
// Returns an array containing all elements of the original array and then all elements of the given [elements] collection.
// public actual operator fun DoubleArray.plus(elements: Collection<Double>): DoubleArray {
//     return fillFromCollection(this.copyOf(size + elements.size), this.size, elements)
// }
// Returns an array containing all elements of the original array and then all elements of the given [elements] collection.
// public actual operator fun BooleanArray.plus(elements: Collection<Boolean>): BooleanArray {
//     return arrayPlusCollection(this, elements)
// }
// Returns an array containing all elements of the original array and then all elements of the given [elements] collection.
// public actual operator fun CharArray.plus(elements: Collection<Char>): CharArray {
//     return fillFromCollection(this.copyOf(size + elements.size), this.size, elements)
// }
// Returns an array containing all elements of the original array and then all elements of the given [elements] array.
// @Suppress("ACTUAL_WITHOUT_EXPECT", "NOTHING_TO_INLINE")
// public actual inline operator fun <T> Array<out T>.plus(elements: Array<out T>): Array<T> {
//     return this.asDynamic().concat(elements)
// }
// Returns an array containing all elements of the original array and then all elements of the given [elements] array.
// @Suppress("NOTHING_TO_INLINE")
// public actual inline operator fun ByteArray.plus(elements: ByteArray): ByteArray {
//     return primitiveArrayConcat(this, elements)
// }
// Returns an array containing all elements of the original array and then all elements of the given [elements] array.
// @Suppress("NOTHING_TO_INLINE")
// public actual inline operator fun ShortArray.plus(elements: ShortArray): ShortArray {
//     return primitiveArrayConcat(this, elements)
// }
// Returns an array containing all elements of the original array and then all elements of the given [elements] array.
// @Suppress("NOTHING_TO_INLINE")
// public actual inline operator fun IntArray.plus(elements: IntArray): IntArray {
//     return primitiveArrayConcat(this, elements)
// }
// Returns an array containing all elements of the original array and then all elements of the given [elements] array.
// @Suppress("NOTHING_TO_INLINE")
// public actual inline operator fun LongArray.plus(elements: LongArray): LongArray {
//     return primitiveArrayConcat(this, elements)
// }
// Returns an array containing all elements of the original array and then all elements of the given [elements] array.
// @Suppress("NOTHING_TO_INLINE")
// public actual inline operator fun FloatArray.plus(elements: FloatArray): FloatArray {
//     return primitiveArrayConcat(this, elements)
// }
// Returns an array containing all elements of the original array and then all elements of the given [elements] array.
// @Suppress("NOTHING_TO_INLINE")
// public actual inline operator fun DoubleArray.plus(elements: DoubleArray): DoubleArray {
//     return primitiveArrayConcat(this, elements)
// }
// Returns an array containing all elements of the original array and then all elements of the given [elements] array.
// @Suppress("NOTHING_TO_INLINE")
// public actual inline operator fun BooleanArray.plus(elements: BooleanArray): BooleanArray {
//     return primitiveArrayConcat(this, elements)
// }
// Returns an array containing all elements of the original array and then all elements of the given [elements] array.
// @Suppress("NOTHING_TO_INLINE")
// public actual inline operator fun CharArray.plus(elements: CharArray): CharArray {
//     return primitiveArrayConcat(this, elements)
// }
// Returns an array containing all elements of the original array and then the given [element].
// @Suppress("ACTUAL_WITHOUT_EXPECT", "NOTHING_TO_INLINE")
// public actual inline fun <T>

```

```

Array<out T>.plusElement(element: T): Array<T> {
    return
    this.asDynamic().concat(arrayOf(element))
}

@sample
samples.collections.Arrays.Sorting.sortArray
@library("primitiveArraySort")
public actual fun
IntArray.sort(): Unit {
    definedExternally
}

@sample
samples.collections.Arrays.Sorting.sortArray
public actual fun
LongArray.sort(): Unit {
    @Suppress("DEPRECATION")
    if (size > 1) sort { a: Long, b: Long -> a.compareTo(b) }
}

@sample
samples.collections.Arrays.Sorting.sortArray
@library("primitiveArraySort")
public actual fun
ByteArray.sort(): Unit {
    definedExternally
}

@sample
samples.collections.Arrays.Sorting.sortArray
@library("primitiveArraySort")
public actual fun
ShortArray.sort(): Unit {
    definedExternally
}

@sample
samples.collections.Arrays.Sorting.sortArray
@library("primitiveArraySort")
public actual fun
DoubleArray.sort(): Unit {
    definedExternally
}

@sample
samples.collections.Arrays.Sorting.sortArray
@library("primitiveArraySort")
public actual fun
FloatArray.sort(): Unit {
    definedExternally
}

@sample
samples.collections.Arrays.Sorting.sortArray
@library("primitiveArraySort")
public actual fun
CharArray.sort(): Unit {
    definedExternally
}

@sample
samples.collections.Arrays.Sorting.sortArrayOfComparable
@library("primitiveArraySort")
public actual fun
<T : Comparable<T>> Array<out T>.sort(): Unit {
    if (size > 1) sortArray(this)
}

@sample
samples.collections.Arrays.Sorting.sortArrayOfComparable
@library("primitiveArraySort")
public actual fun
<T : Comparable<T>> Array<out T>.sort(comparison: (a: T, b: T) -> Int): Unit {
    if (size > 1)
        sortArrayWith(this, comparison)
}

@sample
samples.collections.Arrays.Sorting.sortRangeOfArrayOfComparable
@library("primitiveArraySort")
public actual fun
<T : Comparable<T>> Array<out T>.sort(fromIndex: Int = 0, toIndex: Int = size): Unit {
    AbstractList.checkRangeIndexes(fromIndex, toIndex, size)
    sortArrayWith(this, fromIndex, toIndex,
        naturalOrder())
}

@sample
samples.collections.Arrays.Sorting.sortRangeOfArrayOfComparable
@library("primitiveArraySort")
public actual fun
ByteArray.sort(fromIndex: Int = 0, toIndex: Int = size): Unit {
    AbstractList.checkRangeIndexes(fromIndex, toIndex, size)
    val subarray =
        this.asDynamic().subarray(fromIndex, toIndex).unsafeCast<ByteArray>()
    subarray.sort()
}

@sample
samples.collections.Arrays.Sorting.sortRangeOfArrayOfComparable
@library("primitiveArraySort")
public actual fun
ByteArray.sort(fromIndex: Int = 0, toIndex: Int = size): Unit {
    AbstractList.checkRangeIndexes(fromIndex, toIndex, size)
    val subarray =
        this.asDynamic().subarray(fromIndex, toIndex).unsafeCast<ByteArray>()
    subarray.sort()
}

@sample
samples.collections.Arrays.Sorting.sortRangeOfArrayOfComparable
@library("primitiveArraySort")
public actual fun
ShortArray.sort(fromIndex: Int = 0, toIndex: Int = size): Unit {
    AbstractList.checkRangeIndexes(fromIndex, toIndex, size)
    val subarray =
        this.asDynamic().subarray(fromIndex, toIndex).unsafeCast<ShortArray>()
    subarray.sort()
}

@sample
samples.collections.Arrays.Sorting.sortRangeOfArrayOfComparable
@library("primitiveArraySort")
public actual fun
DoubleArray.sort(fromIndex: Int = 0, toIndex: Int = size): Unit {
    AbstractList.checkRangeIndexes(fromIndex, toIndex, size)
    val subarray =
        this.asDynamic().subarray(fromIndex, toIndex).unsafeCast<DoubleArray>()
    subarray.sort()
}

@sample
samples.collections.Arrays.Sorting.sortRangeOfArrayOfComparable
@library("primitiveArraySort")
public actual fun
FloatArray.sort(fromIndex: Int = 0, toIndex: Int = size): Unit {
    AbstractList.checkRangeIndexes(fromIndex, toIndex, size)
    val subarray =
        this.asDynamic().subarray(fromIndex, toIndex).unsafeCast<FloatArray>()
    subarray.sort()
}

@sample
samples.collections.Arrays.Sorting.sortRangeOfArrayOfComparable
@library("primitiveArraySort")
public actual fun
CharArray.sort(fromIndex: Int = 0, toIndex: Int = size): Unit {
    AbstractList.checkRangeIndexes(fromIndex, toIndex, size)
    val subarray =
        this.asDynamic().subarray(fromIndex, toIndex).unsafeCast<CharArray>()
    subarray.sort()
}

```



```

actual fun ShortArray.sort(fromIndex: Int = 0, toIndex: Int = size): Unit {
    AbstractList.checkRangeIndexes(fromIndex, toIndex, size)
    val subarray =
        this.asDynamic().subarray(fromIndex, toIndex).unsafeCast<ShortArray>()
    subarray.sort()
}

/**
 * Sorts a range in the array in-place.
 * @param fromIndex the start of the range (inclusive) to sort, 0 by default.
 * @param toIndex the end of the range (exclusive) to sort, size of this array by default.
 * @throws IndexOutOfBoundsException if [fromIndex] is less than zero or [toIndex] is greater than the size of this array.
 * @throws IllegalArgumentException if [fromIndex] is greater than [toIndex].
 * @sample samples.collections.Arrays.Sorting.sortRangeOfArray
 */
@SinceKotlin("1.4")
@Suppress("ACTUAL_FUNCTION_WITH_DEFAULT_ARGUMENTS")
public actual fun IntArray.sort(fromIndex: Int = 0, toIndex: Int = size): Unit {
    AbstractList.checkRangeIndexes(fromIndex, toIndex, size)
    val subarray =
        this.asDynamic().subarray(fromIndex, toIndex).unsafeCast<IntArray>()
    subarray.sort()
}

/**
 * Sorts a range in the array in-place.
 * @param fromIndex the start of the range (inclusive) to sort, 0 by default.
 * @param toIndex the end of the range (exclusive) to sort, size of this array by default.
 * @throws IndexOutOfBoundsException if [fromIndex] is less than zero or [toIndex] is greater than the size of this array.
 * @throws IllegalArgumentException if [fromIndex] is greater than [toIndex].
 * @sample samples.collections.Arrays.Sorting.sortRangeOfArray
 */
@SinceKotlin("1.4")
@Suppress("ACTUAL_FUNCTION_WITH_DEFAULT_ARGUMENTS")
public actual fun LongArray.sort(fromIndex: Int = 0, toIndex: Int = size): Unit {
    AbstractList.checkRangeIndexes(fromIndex, toIndex, size)
    sortArrayWith(this.unsafeCast<Array<Long>>(),
        fromIndex, toIndex, naturalOrder())
}

/**
 * Sorts a range in the array in-place.
 * @param fromIndex the start of the range (inclusive) to sort, 0 by default.
 * @param toIndex the end of the range (exclusive) to sort, size of this array by default.
 * @throws IndexOutOfBoundsException if [fromIndex] is less than zero or [toIndex] is greater than the size of this array.
 * @throws IllegalArgumentException if [fromIndex] is greater than [toIndex].
 * @sample samples.collections.Arrays.Sorting.sortRangeOfArray
 */
@SinceKotlin("1.4")
@Suppress("ACTUAL_FUNCTION_WITH_DEFAULT_ARGUMENTS")
public actual fun FloatArray.sort(fromIndex: Int = 0, toIndex: Int = size): Unit {
    AbstractList.checkRangeIndexes(fromIndex, toIndex, size)
    val subarray =
        this.asDynamic().subarray(fromIndex, toIndex).unsafeCast<FloatArray>()
    subarray.sort()
}

/**
 * Sorts a range in the array in-place.
 * @param fromIndex the start of the range (inclusive) to sort, 0 by default.
 * @param toIndex the end of the range (exclusive) to sort, size of this array by default.
 * @throws IndexOutOfBoundsException if [fromIndex] is less than zero or [toIndex] is greater than the size of this array.
 * @throws IllegalArgumentException if [fromIndex] is greater than [toIndex].
 * @sample samples.collections.Arrays.Sorting.sortRangeOfArray
 */
@SinceKotlin("1.4")
@Suppress("ACTUAL_FUNCTION_WITH_DEFAULT_ARGUMENTS")
public actual fun DoubleArray.sort(fromIndex: Int = 0, toIndex: Int = size): Unit {
    AbstractList.checkRangeIndexes(fromIndex, toIndex, size)
    val subarray =
        this.asDynamic().subarray(fromIndex, toIndex).unsafeCast<DoubleArray>()
    subarray.sort()
}

/**
 * Sorts a range in the array in-place.
 * @param fromIndex the start of the range (inclusive) to sort, 0 by default.
 * @param toIndex the end of the range (exclusive) to sort, size of this array by default.
 * @throws IndexOutOfBoundsException if [fromIndex] is less than zero or [toIndex] is greater than the size of this array.
 * @throws IllegalArgumentException if [fromIndex] is greater than [toIndex].
 * @sample samples.collections.Arrays.Sorting.sortRangeOfArray
 */
@SinceKotlin("1.4")
@Suppress("ACTUAL_FUNCTION_WITH_DEFAULT_ARGUMENTS")
public actual fun CharArray.sort(fromIndex: Int = 0, toIndex: Int = size): Unit {
    AbstractList.checkRangeIndexes(fromIndex, toIndex, size)
    val subarray =
        this.asDynamic().subarray(fromIndex, toIndex).unsafeCast<CharArray>()
    subarray.sort()
}

/**
 * Sorts the array in-place according to the order specified by the given [comparison] function.
 * @param comparison the order to sort by.
 * @sample samples.collections.Arrays.Sorting.sortRangeOfArray
 */
@SinceKotlin("1.4")
@Deprecated("Use other")

```

```

sorting functions from the Standard Library")\n\n@DeprecatedSinceKotlin(warningSince =
\'1.6\')\n\n@kotlin.internal.InlineOnly\n\npublic inline fun ByteArray.sort(noinline comparison: (a: Byte, b: Byte) ->
Int): Unit {\n    asDynamic().sort(comparison)\n}\n\n/**\n * Sorts the array in-place according to the order specified
by the given [comparison] function.\n * \n\n@Deprecated("Use other sorting functions from the Standard
Library")\n\n@DeprecatedSinceKotlin(warningSince = \'1.6\')\n\n@kotlin.internal.InlineOnly\n\npublic inline fun
ShortArray.sort(noinline comparison: (a: Short, b: Short) -> Int): Unit {\n
asDynamic().sort(comparison)\n}\n\n/**\n * Sorts the array in-place according to the order specified by the given
[comparison] function.\n * \n\n@Deprecated("Use other sorting functions from the Standard
Library")\n\n@DeprecatedSinceKotlin(warningSince = \'1.6\')\n\n@kotlin.internal.InlineOnly\n\npublic inline fun
IntArray.sort(noinline comparison: (a: Int, b: Int) -> Int): Unit {\n    asDynamic().sort(comparison)\n}\n\n/**\n *
Sorts the array in-place according to the order specified by the given [comparison] function.\n * \n\n@Deprecated("Use other sorting functions from the Standard
Library")\n\n@DeprecatedSinceKotlin(warningSince = \'1.6\')\n\n@kotlin.internal.InlineOnly\n\npublic inline fun
LongArray.sort(noinline comparison: (a: Long, b: Long) -> Int): Unit {\n
asDynamic().sort(comparison)\n}\n\n/**\n * Sorts the array in-place according to the order specified by the given
[comparison] function.\n * \n\n@Deprecated("Use other sorting functions from the Standard
Library")\n\n@DeprecatedSinceKotlin(warningSince = \'1.6\')\n\n@kotlin.internal.InlineOnly\n\npublic inline fun
FloatArray.sort(noinline comparison: (a: Float, b: Float) -> Int): Unit {\n
asDynamic().sort(comparison)\n}\n\n/**\n * Sorts the array in-place according to the order specified by the given
[comparison] function.\n * \n\n@Deprecated("Use other sorting functions from the Standard
Library")\n\n@DeprecatedSinceKotlin(warningSince = \'1.6\')\n\n@kotlin.internal.InlineOnly\n\npublic inline fun
DoubleArray.sort(noinline comparison: (a: Double, b: Double) -> Int): Unit {\n
asDynamic().sort(comparison)\n}\n\n/**\n * Sorts the array in-place according to the order specified by the given
[comparison] function.\n * \n\n@Deprecated("Use other sorting functions from the Standard
Library")\n\n@DeprecatedSinceKotlin(warningSince = \'1.6\')\n\n@kotlin.internal.InlineOnly\n\npublic inline fun
CharArray.sort(noinline comparison: (a: Char, b: Char) -> Int): Unit {\n
asDynamic().sort(comparison)\n}\n\n/**\n * Sorts the array in-place according to the order specified by the given
[comparator].\n * \n\n * The sort is _stable_. It means that equal elements preserve their order relative to each other
after sorting.\n * \n\npublic actual fun <T> Array<out T>.sortWith(comparator: Comparator<in T>): Unit {\n    if
(size > 1) sortArrayWith(this, comparator)\n}\n\n/**\n * Sorts a range in the array in-place with the given
[comparator].\n * \n\n * The sort is _stable_. It means that equal elements preserve their order relative to each other
after sorting.\n * \n\n * @param fromIndex the start of the range (inclusive) to sort, 0 by default.\n * \n\n * @param toIndex
the end of the range (exclusive) to sort, size of this array by default.\n * \n\n * @throws IndexOutOfBoundsException
if [fromIndex] is less than zero or [toIndex] is greater than the size of this array.\n * \n\n * @throws
IllegalArgumentExcepion if [fromIndex] is greater than [toIndex].\n\n
*\n\n@SinceKotlin("1.4")\n\n@Suppress("ACTUAL_FUNCTION_WITH_DEFAULT_ARGUMENTS")\n\npublic
actual fun <T> Array<out T>.sortWith(comparator: Comparator<in T>, fromIndex: Int = 0, toIndex: Int = size):
Unit {\n    AbstractList.checkRangeIndexes(fromIndex, toIndex, size)\n    sortArrayWith(this, fromIndex, toIndex,
comparator)\n}\n\n/**\n * Returns a *typed* object array containing all of the elements of this primitive array.\n * \n\npublic actual fun ByteArray.toTypedArray(): Array<Byte> {\n    return js("[]").slice.call(this)\n}\n\n/**\n *
Returns a *typed* object array containing all of the elements of this primitive array.\n * \n\npublic actual fun
ShortArray.toTypedArray(): Array<Short> {\n    return js("[]").slice.call(this)\n}\n\n/**\n * Returns a *typed*
object array containing all of the elements of this primitive array.\n * \n\npublic actual fun IntArray.toTypedArray():
Array<Int> {\n    return js("[]").slice.call(this)\n}\n\n/**\n * Returns a *typed* object array containing all of the
elements of this primitive array.\n * \n\npublic actual fun LongArray.toTypedArray(): Array<Long> {\n    return
js("[]").slice.call(this)\n}\n\n/**\n * Returns a *typed* object array containing all of the elements of this primitive
array.\n * \n\npublic actual fun FloatArray.toTypedArray(): Array<Float> {\n    return
js("[]").slice.call(this)\n}\n\n/**\n * Returns a *typed* object array containing all of the elements of this primitive

```

```

array.\n *^/npublic actual fun DoubleArray.toArray(): Array<Double> {\n  return
js("[\"]).slice.call(this)\n}\n\n/**\n * Returns a *typed* object array containing all of the elements of this primitive
array.\n *^/npublic actual fun BooleanArray.toArray(): Array<Boolean> {\n  return
js("[\"]).slice.call(this)\n}\n\n/**\n * Returns a *typed* object array containing all of the elements of this primitive
array.\n *^/npublic actual fun CharArray.toArray(): Array<Char> {\n  return Array(size) { index ->
this[index] }\n}\n\n"/\n * Copyright 2010-2018 JetBrains s.r.o. and Kotlin Programming Language
contributors.\n * Use of this source code is governed by the Apache 2.0 license that can be found in the
license/LICENSE.txt file.\n
*/\n@file:kotlin.jvm.JvmName("ComparisonsKt")\n@file:kotlin.jvm.JvmMultifileClass\n\npackage
kotlin.comparisons\n\n/**\n * Compares two values using the specified functions [selectors] to calculate the result
of the comparison.\n * The functions are called sequentially, receive the given values [a] and [b] and return
[Comparable]\n * objects. As soon as the [Comparable] instances returned by a function for [a] and [b] values do
not\n * compare as equal, the result of that comparison is returned.\n * \n * @sample
samples.comparisons.Comparisons.compareValuesByWithSelectors\n *^/npublic fun <T> compareValuesBy(a: T,
b: T, vararg selectors: (T) -> Comparable<*>?): Int {\n  require(selectors.size > 0)\n  return
compareValuesByImpl(a, b, selectors)\n}\n\nprivate fun <T> compareValuesByImpl(a: T, b: T, selectors:
Array<out (T) -> Comparable<*>?>): Int {\n  for (fn in selectors) {\n    val v1 = fn(a)\n    val v2 = fn(b)\n    val diff = compareValues(v1, v2)\n    if (diff != 0) return diff\n  }\n  return 0\n}\n\n/**\n * Compares two
values using the specified [selector] function to calculate the result of the comparison.\n * The function is applied to
the given values [a] and [b] and return [Comparable] objects.\n * The result of comparison of these [Comparable]
instances is returned.\n * \n * @sample samples.comparisons.Comparisons.compareValuesByWithSingleSelector\n *^/n@kotlin.internal.InlineOnly\npublic inline fun <T> compareValuesBy(a: T, b: T, selector: (T) ->
Comparable<*>?): Int {\n  return compareValues(selector(a), selector(b))\n}\n\n/**\n * Compares two values
using the specified [selector] function to calculate the result of the comparison.\n * The function is applied to the
given values [a] and [b] and return objects of type K which are then being\n * compared with the given
[comparator].\n * \n * @sample samples.comparisons.Comparisons.compareValuesByWithComparator\n *^/n@kotlin.internal.InlineOnly\npublic inline fun <T, K> compareValuesBy(a: T, b: T, comparator: Comparator<in
K>, selector: (T) -> K): Int {\n  return comparator.compare(selector(a), selector(b))\n}\n\n//// Not so useful without
type inference for receiver of expression\n//// compareValuesWith(v1, v2, compareBy { it.prop1 }
thenByDescending { it.prop2 })\n\n/**\n * Compares two values using the specified [comparator].\n\n *^/n@/Suppress("NOTHING_TO_INLINE")\npublic inline fun <T> compareValuesWith(a: T, b: T, comparator:
Comparator<T>): Int = comparator.compare(a, b)\n\n/**\n * Compares two nullable [Comparable] values. Null
is considered less than any value.\n * \n * @sample samples.comparisons.Comparisons.compareValues\n *^/npublic
fun <T : Comparable<*>> compareValues(a: T?, b: T?): Int {\n  if (a === b) return 0\n  if (a == null) return -1\n  if (b == null) return 1\n  @Suppress("UNCHECKED_CAST")\n  return (a as
Comparable<Any>).compareTo(b)\n}\n\n/**\n * Creates a comparator using the sequence of functions to calculate a
result of comparison.\n * The functions are called sequentially, receive the given values `a` and `b` and return
[Comparable]\n * objects. As soon as the [Comparable] instances returned by a function for `a` and `b` values do
not\n * compare as equal, the result of that comparison is returned from the [Comparator].\n * \n * @sample
samples.comparisons.Comparisons.compareByWithSelectors\n *^/npublic fun <T> compareBy(vararg selectors: (T)
-> Comparable<*>?): Comparator<T> {\n  require(selectors.size > 0)\n  return Comparator { a, b ->
compareValuesByImpl(a, b, selectors) }\n}\n\n/**\n * Creates a comparator using the function to transform value
to a [Comparable] instance for comparison.\n * \n * @sample
samples.comparisons.Comparisons.compareByWithSingleSelector\n *^/n@kotlin.internal.InlineOnly\npublic inline
fun <T> compareBy(crossinline selector: (T) -> Comparable<*>?): Comparator<T> =\n  Comparator { a, b ->
compareValuesBy(a, b, selector) }\n\n/**\n * Creates a comparator using the [selector] function to transform values
being compared and then applying\n * the specified [comparator] to compare transformed values.\n * \n * @sample
samples.comparisons.Comparisons.compareByWithComparator\n *^/n@kotlin.internal.InlineOnly\npublic inline

```

```

fun <T, K> compareBy(comparator: Comparator<in K>, crossinline selector: (T) -> K): Comparator<T> =\n
Comparator { a, b -> compareValuesBy(a, b, comparator, selector) }\n\n/**\n * Creates a descending comparator\n using the function to transform value to a [Comparable] instance for comparison.\n *\n * @sample\n samples.comparisons.Comparisons.compareByDescendingWithSingleSelector\n\n *\n @kotlin.internal.InlineOnly\n public inline fun <T> compareByDescending(crossinline selector: (T) ->\n Comparable<*>?): Comparator<T> =\n Comparator { a, b -> compareValuesBy(b, a, selector) }\n\n/**\n * Creates a descending comparator using the [selector] function to transform values being compared and then\n applying\n * the specified [comparator] to compare transformed values.\n *\n * Note that an order of [comparator] is\n reversed by this wrapper.\n *\n * @sample\n samples.comparisons.Comparisons.compareByDescendingWithComparator\n\n *\n @kotlin.internal.InlineOnly\n public inline fun <T, K> compareByDescending(comparator: Comparator<in K>,\n crossinline selector: (T) -> K): Comparator<T> =\n Comparator { a, b -> compareValuesBy(b, a, comparator,\n selector) }\n\n/**\n * Creates a comparator comparing values after the primary comparator defined them equal. It\n uses\n * the function to transform value to a [Comparable] instance for comparison.\n *\n * @sample\n samples.comparisons.Comparisons.thenBy\n\n *\n @kotlin.internal.InlineOnly\n public inline fun <T>\n Comparator<T>.thenBy(crossinline selector: (T) -> Comparable<*>?): Comparator<T> =\n Comparator { a, b -\n >\n val previousCompare = this@thenBy.compare(a, b)\n if (previousCompare != 0) previousCompare else\n compareValuesBy(a, b, selector)\n }\n\n/**\n * Creates a comparator comparing values after the primary\n comparator defined them equal. It uses\n * the [selector] function to transform values and then compares them with\n the given [comparator].\n *\n * @sample\n samples.comparisons.Comparisons.thenByWithComparator\n\n *\n @kotlin.internal.InlineOnly\n public inline fun <T, K> Comparator<T>.thenBy(comparator: Comparator<in K>,\n crossinline selector: (T) -> K): Comparator<T> =\n Comparator { a, b ->\n val previousCompare =\n this@thenBy.compare(a, b)\n if (previousCompare != 0) previousCompare else compareValuesBy(a, b,\n comparator, selector)\n }\n\n/**\n * Creates a descending comparator using the primary comparator and\n * the function to transform value to a [Comparable] instance for comparison.\n *\n * @sample\n samples.comparisons.Comparisons.thenByDescending\n\n *\n @kotlin.internal.InlineOnly\n public inline fun <T>\n Comparator<T>.thenByDescending(crossinline selector: (T) -> Comparable<*>?): Comparator<T> =\n Comparator { a, b ->\n val previousCompare = this@thenByDescending.compare(a, b)\n if\n (previousCompare != 0) previousCompare else compareValuesBy(b, a, selector)\n }\n\n/**\n * Creates a\n descending comparator comparing values after the primary comparator defined them equal. It uses\n * the [selector]\n function to transform values and then compares them with the given [comparator].\n *\n * @sample\n samples.comparisons.Comparisons.thenByDescendingWithComparator\n\n *\n @kotlin.internal.InlineOnly\n public\n inline fun <T, K> Comparator<T>.thenByDescending(comparator: Comparator<in K>, crossinline selector: (T) ->\n K): Comparator<T> =\n Comparator { a, b ->\n val previousCompare = this@thenByDescending.compare(a,\n b)\n if (previousCompare != 0) previousCompare else compareValuesBy(b, a, comparator, selector)\n }\n\n/**\n * Creates a comparator using the primary comparator and function to calculate a result of comparison.\n *\n * @sample\n samples.comparisons.Comparisons.thenComparator\n\n *\n @kotlin.internal.InlineOnly\n public inline\n fun <T> Comparator<T>.thenComparator(crossinline comparison: (a: T, b: T) -> Int): Comparator<T> =\n Comparator { a, b ->\n val previousCompare = this@thenComparator.compare(a, b)\n if (previousCompare\n != 0) previousCompare else comparison(a, b)\n }\n\n/**\n * Combines this comparator and the given [comparator]\n such that the latter is applied only\n * when the former considered values equal.\n *\n * @sample\n samples.comparisons.Comparisons.then\n\n *\n public infix fun <T> Comparator<T>.then(comparator:\n Comparator<in T>): Comparator<T> =\n Comparator { a, b ->\n val previousCompare =\n this@then.compare(a, b)\n if (previousCompare != 0) previousCompare else comparator.compare(a, b)\n }\n\n/**\n * Combines this comparator and the given [comparator] such that the latter is applied only\n * when the\n former considered values equal.\n *\n * @sample\n samples.comparisons.Comparisons.thenDescending\n\n *\n public\n infix fun <T> Comparator<T>.thenDescending(comparator: Comparator<in T>): Comparator<T> =\n Comparator<T> { a, b ->\n val previousCompare = this@thenDescending.compare(a, b)\n if

```

```

(previousCompare != 0) previousCompare else comparator.compare(b, a)\n } \n\n// Not so useful without type
inference for receiver of expression\n\n/**\n * Extends the given [comparator] of non-nullable values to a comparator
of nullable values\n * considering `null` value less than any other value.\n *\n * @sample
samples.comparisons.Comparisons.nullsFirstLastWithComparator\n *\npublic fun <T : Any>
nullsFirst(comparator: Comparator<in T>): Comparator<T?> =\n    Comparator { a, b ->\n        when {\n            a
=== b -> 0\n            a == null -> -1\n            b == null -> 1\n            else -> comparator.compare(a, b)\n        }\n    }\n\n/**\n * Provides a comparator of nullable [Comparable] values\n * considering `null` value less than any other
value.\n *\n * @sample samples.comparisons.Comparisons.nullsFirstLastComparator\n
*\n@kotlin.internal.InlineOnly\npublic inline fun <T : Comparable<T>> nullsFirst(): Comparator<T?> =
nullsFirst(naturalOrder())\n\n/**\n * Extends the given [comparator] of non-nullable values to a comparator of
nullable values\n * considering `null` value greater than any other value.\n *\n * @sample
samples.comparisons.Comparisons.nullsFirstLastWithComparator\n *\npublic fun <T : Any>
nullsLast(comparator: Comparator<in T>): Comparator<T?> =\n    Comparator { a, b ->\n        when {\n            a
=== b -> 0\n            a == null -> 1\n            b == null -> -1\n            else -> comparator.compare(a, b)\n        }\n    }\n\n/**\n * Provides a comparator of nullable [Comparable] values\n * considering `null` value greater than any
other value.\n *\n * @sample samples.comparisons.Comparisons.nullsFirstLastComparator\n
*\n@kotlin.internal.InlineOnly\npublic inline fun <T : Comparable<T>> nullsLast(): Comparator<T?> =
nullsLast(naturalOrder())\n\n/**\n * Returns a comparator that compares [Comparable] objects in natural order.\n
*\n * @sample samples.comparisons.Comparisons.naturalOrderComparator\n *\npublic fun <T : Comparable<T>>
naturalOrder(): Comparator<T> = @Suppress("UNCHECKED_CAST") (NaturalOrderComparator as
Comparator<T>)\n\n/**\n * Returns a comparator that compares [Comparable] objects in reversed natural order.\n
*\n * @sample samples.comparisons.Comparisons.nullsFirstLastWithComparator\n *\npublic fun <T :
Comparable<T>> reverseOrder(): Comparator<T> = @Suppress("UNCHECKED_CAST")
(ReverseOrderComparator as Comparator<T>)\n\n/**\n * Returns a comparator that imposes the reverse ordering
of this comparator.\n *\n * @sample samples.comparisons.Comparisons.reversed\n
*\n@Suppress("EXTENSION_SHADOWED_BY_MEMBER")\npublic fun <T> Comparator<T>.reversed():
Comparator<T> = when (this) {\n    is ReversedComparator -> this.comparator\n    NaturalOrderComparator ->
@Suppress("UNCHECKED_CAST") (ReverseOrderComparator as Comparator<T>)\n    ReverseOrderComparator -> @Suppress("UNCHECKED_CAST") (NaturalOrderComparator as
Comparator<T>)\n    else -> ReversedComparator(this)\n}\n\nprivate class ReversedComparator<T>(public val
comparator: Comparator<T>) : Comparator<T> {\n    override fun compare(a: T, b: T): Int = comparator.compare(b,
a)\n    @Suppress("VIRTUAL_MEMBER_HIDDEN")\n    fun reversed(): Comparator<T> =
comparator\n}\n\nprivate object NaturalOrderComparator : Comparator<Comparable<Any>> {\n    override fun
compare(a: Comparable<Any>, b: Comparable<Any>): Int = a.compareTo(b)\n    @Suppress("VIRTUAL_MEMBER_HIDDEN")\n    fun reversed(): Comparator<Comparable<Any>> =
ReverseOrderComparator\n}\n\nprivate object ReverseOrderComparator : Comparator<Comparable<Any>> {\n
override fun compare(a: Comparable<Any>, b: Comparable<Any>): Int = b.compareTo(a)\n    @Suppress("VIRTUAL_MEMBER_HIDDEN")\n    fun reversed(): Comparator<Comparable<Any>> =
NaturalOrderComparator\n}\n\n"/\n * Copyright 2010-2018 JetBrains s.r.o. and Kotlin Programming Language
contributors.\n * Use of this source code is governed by the Apache 2.0 license that can be found in the
license/LICENSE.txt file.\n
*\n@file:kotlin.jvm.JvmMultifileClass\n@file:kotlin.jvm.JvmName("StandardKt")\npackage kotlin\n\nimport
kotlin.contracts.*\n\n/**\n * An exception is thrown to indicate that a method body remains to be implemented.\n
*\n * @public class NotImplementedError(message: String = "An operation is not implemented.") :
Error(message)\n\n/**\n * Always throws [NotImplementedError] stating that operation is not implemented.\n
*\n * @kotlin.internal.InlineOnly\npublic inline fun TODO(): Nothing = throw NotImplementedError()\n\n/**\n * Always throws [NotImplementedError] stating that operation is not implemented.\n *\n * @param reason a string
explaining why the implementation is missing.\n *\n@kotlin.internal.InlineOnly\npublic inline fun TODO(reason:

```

String): Nothing = throw NotImplementedError("An operation is not implemented: \$reason")\n\n\n/**\n * Calls the specified function [block] and returns its result.\n * For detailed usage information see the documentation for [scope functions](https://kotlinlang.org/docs/reference/scope-functions.html#run).\n

```

*\n@kotlin.internal.InlineOnly\npublic inline fun <R> run(block: () -> R): R {\n    contract {\n        callsInPlace(block, InvocationKind.EXACTLY_ONCE)\n    }\n    return block()\n}\n
```

* Calls the specified function [block] with `this` value as its receiver and returns its result.\n * For detailed usage information see the documentation for [scope functions](https://kotlinlang.org/docs/reference/scope-functions.html#run).\n

```

*\n@kotlin.internal.InlineOnly\npublic inline fun <T, R> T.run(block: T.() -> R): R {\n    contract {\n        callsInPlace(block, InvocationKind.EXACTLY_ONCE)\n    }\n    return block()\n}\n
```

* Calls the specified function [block] with the given [receiver] as its receiver and returns its result.\n * For detailed usage information see the documentation for [scope functions](https://kotlinlang.org/docs/reference/scope-functions.html#with).\n

```

*\n@kotlin.internal.InlineOnly\npublic inline fun <T, R> with(receiver: T, block: T.() -> R): R {\n    contract {\n        callsInPlace(block, InvocationKind.EXACTLY_ONCE)\n    }\n    return receiver.block()\n}\n
```

* Calls the specified function [block] with `this` value as its receiver and returns `this` value.\n * For detailed usage information see the documentation for [scope functions](https://kotlinlang.org/docs/reference/scope-functions.html#apply).\n

```

*\n@kotlin.internal.InlineOnly\npublic inline fun <T> T.apply(block: T.() -> Unit): T {\n    contract {\n        callsInPlace(block, InvocationKind.EXACTLY_ONCE)\n    }\n    block()\n    return this\n}\n
```

* Calls the specified function [block] with `this` value as its argument and returns `this` value.\n * For detailed usage information see the documentation for [scope functions](https://kotlinlang.org/docs/reference/scope-functions.html#also).\n

```

*\n@kotlin.internal.InlineOnly\n@SinceKotlin("1.1")\npublic inline fun <T> T.also(block: (T) -> Unit): T {\n    contract {\n        callsInPlace(block, InvocationKind.EXACTLY_ONCE)\n    }\n    block(this)\n    return this\n}\n
```

* Calls the specified function [block] with `this` value as its argument and returns its result.\n * For detailed usage information see the documentation for [scope functions](https://kotlinlang.org/docs/reference/scope-functions.html#let).\n

```

*\n@kotlin.internal.InlineOnly\npublic inline fun <T, R> T.let(block: (T) -> R): R {\n    contract {\n        callsInPlace(block, InvocationKind.EXACTLY_ONCE)\n    }\n    return block(this)\n}\n
```

* Returns `this` value if it satisfies the given [predicate] or `null`, if it doesn't.\n * For detailed usage information see the documentation for [scope functions](https://kotlinlang.org/docs/reference/scope-functions.html#takeif-and-takeunless).\n

```

*\n@kotlin.internal.InlineOnly\n@SinceKotlin("1.1")\npublic inline fun <T> T.takeIf(predicate: (T) -> Boolean): T? {\n    contract {\n        callsInPlace(predicate, InvocationKind.EXACTLY_ONCE)\n    }\n    return if (predicate(this)) this else null\n}\n
```

* Returns `this` value if it does not satisfy the given [predicate] or `null`, if it does.\n * For detailed usage information see the documentation for [scope functions](https://kotlinlang.org/docs/reference/scope-functions.html#takeif-and-takeunless).\n

```

*\n@kotlin.internal.InlineOnly\n@SinceKotlin("1.1")\npublic inline fun <T> T.takeUnless(predicate: (T) -> Boolean): T? {\n    contract {\n        callsInPlace(predicate, InvocationKind.EXACTLY_ONCE)\n    }\n    return if (!predicate(this)) this else null\n}\n
```

* Executes the given function [action] specified number of [times].\n * A zero-based index of current iteration is passed as a parameter to [action].\n * @sample samples.misc.ControlFlow.repeat\n

```

*\n@kotlin.internal.InlineOnly\npublic inline fun repeat(times: Int, action: (Int) -> Unit) {\n    contract { callsInPlace(action) }\n    for (index in 0 until times) {\n        action(index)\n    }\n}\n
```

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```

*\n\npackage kotlin.comparisons\n\n/\n// NOTE: THIS FILE IS AUTO-GENERATED by the GenerateStandardLib.kt\n// See: https://github.com/JetBrains/kotlin/tree/master/libraries/stdlib\n\nimport kotlin.js.*\n
```

* Returns the greater of two values.\n * If values are equal, returns the first one.\n

```

*\n@SinceKotlin("1.1")\npublic actual fun <T : Comparable<T>> maxOf(a: T, b: T): T {\n    return if (a >= b) a else b\n}\n
```

* Returns the greater of two values.\n

```

*\n@SinceKotlin("1.1")\n@kotlin.internal.InlineOnly\npublic actual inline fun maxOf(a: Byte, b: Byte): Byte {\n
```

```

return maxOf(a.toInt(), b.toInt()).unsafeCast<Byte>()\n\n/**\n * Returns the greater of two values.\n
*\n@SinceKotlin("1.1")\n@kotlin.internal.InlineOnly\npublic actual inline fun maxOf(a: Short, b: Short): Short
{\n    return maxOf(a.toInt(), b.toInt()).unsafeCast<Short>()\n}\n\n/**\n * Returns the greater of two values.\n
*\n@SinceKotlin("1.1")\n@kotlin.internal.InlineOnly\npublic actual inline fun maxOf(a: Int, b: Int): Int {\n
return JsMath.max(a, b)\n}\n\n/**\n * Returns the greater of two values.\n
*\n@SinceKotlin("1.1")\n@Suppress("NOTHING_TO_INLINE")\npublic actual inline fun maxOf(a: Long, b:
Long): Long {\n    return if (a >= b) a else b\n}\n\n/**\n * Returns the greater of two values.\n * \n * If either value
is `NaN`, returns `NaN`.\n
*\n@SinceKotlin("1.1")\n@kotlin.internal.InlineOnly\npublic actual inline fun
maxOf(a: Float, b: Float): Float {\n    return JsMath.max(a, b)\n}\n\n/**\n * Returns the greater of two values.\n * \n
* If either value is `NaN`, returns `NaN`.\n
*\n@SinceKotlin("1.1")\n@kotlin.internal.InlineOnly\npublic actual
inline fun maxOf(a: Double, b: Double): Double {\n    return JsMath.max(a, b)\n}\n\n/**\n * Returns the greater of
three values.\n * \n * If there are multiple equal maximal values, returns the first of them.\n
*\n@SinceKotlin("1.1")\npublic actual fun <T : Comparable<T>> maxOf(a: T, b: T, c: T): T {\n    return
maxOf(a, maxOf(b, c))\n}\n\n/**\n * Returns the greater of three values.\n
*\n@SinceKotlin("1.1")\n@kotlin.internal.InlineOnly\npublic actual inline fun maxOf(a: Byte, b: Byte, c: Byte):
Byte {\n    return JsMath.max(a.toInt(), b.toInt(), c.toInt()).unsafeCast<Byte>()\n}\n\n/**\n * Returns the greater of
three values.\n
*\n@SinceKotlin("1.1")\n@kotlin.internal.InlineOnly\npublic actual inline fun maxOf(a: Short, b:
Short, c: Short): Short {\n    return JsMath.max(a.toInt(), b.toInt(), c.toInt()).unsafeCast<Short>()\n}\n\n/**\n *
Returns the greater of three values.\n
*\n@SinceKotlin("1.1")\n@kotlin.internal.InlineOnly\npublic actual inline
fun maxOf(a: Int, b: Int, c: Int): Int {\n    return JsMath.max(a, b, c)\n}\n\n/**\n * Returns the greater of three
values.\n
*\n@SinceKotlin("1.1")\n@kotlin.internal.InlineOnly\npublic actual inline fun maxOf(a: Long, b: Long,
c: Long): Long {\n    return maxOf(a, maxOf(b, c))\n}\n\n/**\n * Returns the greater of three values.\n * \n * If any
value is `NaN`, returns `NaN`.\n
*\n@SinceKotlin("1.1")\n@kotlin.internal.InlineOnly\npublic actual inline fun
maxOf(a: Float, b: Float, c: Float): Float {\n    return JsMath.max(a, b, c)\n}\n\n/**\n * Returns the greater of three
values.\n * \n * If any value is `NaN`, returns `NaN`.\n
*\n@SinceKotlin("1.1")\n@kotlin.internal.InlineOnly\npublic actual inline fun maxOf(a: Double, b: Double, c:
Double): Double {\n    return JsMath.max(a, b, c)\n}\n\n/**\n * Returns the greater of the given values.\n * \n * If
there are multiple equal maximal values, returns the first of them.\n
*\n@SinceKotlin("1.4")\npublic actual fun <T
: Comparable<T>> maxOf(a: T, vararg other: T): T {\n    var max = a\n    for (e in other) max = maxOf(max, e)\n
return max\n}\n\n/**\n * Returns the greater of the given values.\n
*\n@SinceKotlin("1.4")\npublic actual fun
maxOf(a: Byte, vararg other: Byte): Byte {\n    var max = a\n    for (e in other) max = maxOf(max, e)\n    return
max\n}\n\n/**\n * Returns the greater of the given values.\n
*\n@SinceKotlin("1.4")\npublic actual fun maxOf(a:
Short, vararg other: Short): Short {\n    var max = a\n    for (e in other) max = maxOf(max, e)\n    return
max\n}\n\n/**\n * Returns the greater of the given values.\n
*\n@SinceKotlin("1.4")\npublic actual fun maxOf(a:
Int, vararg other: Int): Int {\n    var max = a\n    for (e in other) max = maxOf(max, e)\n    return max\n}\n\n/**\n
* Returns the greater of the given values.\n
*\n@SinceKotlin("1.4")\npublic actual fun maxOf(a: Long, vararg
other: Long): Long {\n    var max = a\n    for (e in other) max = maxOf(max, e)\n    return max\n}\n\n/**\n *
Returns the greater of the given values.\n * \n * If any value is `NaN`, returns `NaN`.\n
*\n@SinceKotlin("1.4")\npublic actual fun maxOf(a: Float, vararg other: Float): Float {\n    var max = a\n    for (e
in other) max = maxOf(max, e)\n    return max\n}\n\n/**\n * Returns the greater of the given values.\n * \n * If any
value is `NaN`, returns `NaN`.\n
*\n@SinceKotlin("1.4")\npublic actual fun maxOf(a: Double, vararg other:
Double): Double {\n    var max = a\n    for (e in other) max = maxOf(max, e)\n    return max\n}\n\n/**\n * Returns
the smaller of two values.\n * \n * If values are equal, returns the first one.\n
*\n@SinceKotlin("1.1")\npublic
actual fun <T : Comparable<T>> minOf(a: T, b: T): T {\n    return if (a <= b) a else b\n}\n\n/**\n * Returns the
smaller of two values.\n
*\n@SinceKotlin("1.1")\n@kotlin.internal.InlineOnly\npublic actual inline fun minOf(a:
Byte, b: Byte): Byte {\n    return minOf(a.toInt(), b.toInt()).unsafeCast<Byte>()\n}\n\n/**\n * Returns the smaller of
two values.\n
*\n@SinceKotlin("1.1")\n@kotlin.internal.InlineOnly\npublic actual inline fun minOf(a: Short, b:
Short): Short {\n    return minOf(a.toInt(), b.toInt()).unsafeCast<Short>()\n}\n\n/**\n * Returns the smaller of two

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values.\n *\n@SinceKotlin("1.1")\n@kotlin.internal.InlineOnly\npublic actual inline fun minOf(a: Int, b: Int): Int
{\n    return JsMath.min(a, b)\n}\n\n/**\n * Returns the smaller of two values.\n
*\n@SinceKotlin("1.1")\n@Suppress("NOTHING_TO_INLINE")\npublic actual inline fun minOf(a: Long, b:
Long): Long {\n    return if (a <= b) a else b\n}\n\n/**\n * Returns the smaller of two values.\n * \n * If either value
is `NaN`, returns `NaN`.\n *\n@SinceKotlin("1.1")\n@kotlin.internal.InlineOnly\npublic actual inline fun
minOf(a: Float, b: Float): Float {\n    return JsMath.min(a, b)\n}\n\n/**\n * Returns the smaller of two values.\n * \n *
If either value is `NaN`, returns `NaN`.\n *\n@SinceKotlin("1.1")\n@kotlin.internal.InlineOnly\npublic actual
inline fun minOf(a: Double, b: Double): Double {\n    return JsMath.min(a, b)\n}\n\n/**\n * Returns the smaller of
three values.\n * \n * If there are multiple equal minimal values, returns the first of them.\n
*\n@SinceKotlin("1.1")\npublic actual fun <T : Comparable<T>> minOf(a: T, b: T, c: T): T {\n    return minOf(a,
minOf(b, c))\n}\n\n/**\n * Returns the smaller of three values.\n
*\n@SinceKotlin("1.1")\n@kotlin.internal.InlineOnly\npublic actual inline fun minOf(a: Byte, b: Byte, c: Byte):
Byte {\n    return JsMath.min(a.toInt(), b.toInt(), c.toInt()).unsafeCast<Byte>()\n}\n\n/**\n * Returns the smaller of
three values.\n *\n@SinceKotlin("1.1")\n@kotlin.internal.InlineOnly\npublic actual inline fun minOf(a: Short, b:
Short, c: Short): Short {\n    return JsMath.min(a.toInt(), b.toInt(), c.toInt()).unsafeCast<Short>()\n}\n\n/**\n *
Returns the smaller of three values.\n *\n@SinceKotlin("1.1")\n@kotlin.internal.InlineOnly\npublic actual inline
fun minOf(a: Int, b: Int, c: Int): Int {\n    return JsMath.min(a, b, c)\n}\n\n/**\n * Returns the smaller of three
values.\n *\n@SinceKotlin("1.1")\n@kotlin.internal.InlineOnly\npublic actual inline fun minOf(a: Long, b: Long,
c: Long): Long {\n    return minOf(a, minOf(b, c))\n}\n\n/**\n * Returns the smaller of three values.\n * \n * If any
value is `NaN`, returns `NaN`.\n *\n@SinceKotlin("1.1")\n@kotlin.internal.InlineOnly\npublic actual inline fun
minOf(a: Float, b: Float, c: Float): Float {\n    return JsMath.min(a, b, c)\n}\n\n/**\n * Returns the smaller of three
values.\n * \n * If any value is `NaN`, returns `NaN`.\n
*\n@SinceKotlin("1.1")\n@kotlin.internal.InlineOnly\npublic actual inline fun minOf(a: Double, b: Double, c:
Double): Double {\n    return JsMath.min(a, b, c)\n}\n\n/**\n * Returns the smaller of the given values.\n * \n * If
there are multiple equal minimal values, returns the first of them.\n *\n@SinceKotlin("1.4")\npublic actual fun <T
: Comparable<T>> minOf(a: T, vararg other: T): T {\n    var min = a\n    for (e in other) min = minOf(min, e)\n    return
min\n}\n\n/**\n * Returns the smaller of the given values.\n *\n@SinceKotlin("1.4")\npublic actual fun
minOf(a: Byte, vararg other: Byte): Byte {\n    var min = a\n    for (e in other) min = minOf(min, e)\n    return
min\n}\n\n/**\n * Returns the smaller of the given values.\n *\n@SinceKotlin("1.4")\npublic actual fun minOf(a:
Short, vararg other: Short): Short {\n    var min = a\n    for (e in other) min = minOf(min, e)\n    return
min\n}\n\n/**\n * Returns the smaller of the given values.\n *\n@SinceKotlin("1.4")\npublic actual fun minOf(a:
Int, vararg other: Int): Int {\n    var min = a\n    for (e in other) min = minOf(min, e)\n    return min\n}\n\n/**\n
* Returns the smaller of the given values.\n *\n@SinceKotlin("1.4")\npublic actual fun minOf(a: Long, vararg
other: Long): Long {\n    var min = a\n    for (e in other) min = minOf(min, e)\n    return min\n}\n\n/**\n * Returns
the smaller of the given values.\n * \n * If any value is `NaN`, returns `NaN`.\n *\n@SinceKotlin("1.4")\npublic
actual fun minOf(a: Float, vararg other: Float): Float {\n    var min = a\n    for (e in other) min = minOf(min, e)\n
    return min\n}\n\n/**\n * Returns the smaller of the given values.\n * \n * If any value is `NaN`, returns `NaN`.\n
*\n@SinceKotlin("1.4")\npublic actual fun minOf(a: Double, vararg other: Double): Double {\n    var min = a\n
    for (e in other) min = minOf(min, e)\n    return min\n}\n\n"/**\n * Copyright 2010-2022 JetBrains s.r.o. and Kotlin
Programming Language contributors.\n * Use of this source code is governed by the Apache 2.0 license that can be
found in the license/LICENSE.txt file.\n *\n@n// Auto-generated file. DO NOT EDIT!\n\npackage kotlin\n\nimport
kotlin.experimental.*\nimport
kotlin.jvm.*\n\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class)\n@JvmInline\npublic
value class ULong @PublishedApi internal constructor(@PublishedApi internal val data: Long) :
Comparable<ULong> {\n    companion object {\n        /**\n         * A constant holding the minimum value an
instance of ULong can have.\n         *\n         * public const val MIN_VALUE: ULong = ULong(0)\n         */\n        * A constant holding the maximum value an instance of ULong can have.\n         *\n         * public const val
MAX_VALUE: ULong = ULong(-1)\n         */\n        * The number of bytes used to represent an instance of

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ULong in a binary form.\n    *\n    public const val SIZE_BYTES: Int = 8\n    /**\n    * The number of bits used to represent an instance of ULong in a binary form.\n    *\n    public const val SIZE_BITS: Int = 64\n    }\n    /**\n    * Compares this value with the specified value for order.\n    * Returns zero if this value is equal to the specified other value, a negative number if it's less than other,\n    * or a positive number if it's greater than other.\n    *\n    @kotlin.internal.InlineOnly\n    public inline operator fun compareTo(other: UByte): Int = this.compareTo(other.toULong())\n    /**\n    * Compares this value with the specified value for order.\n    * Returns zero if this value is equal to the specified other value, a negative number if it's less than other,\n    * or a positive number if it's greater than other.\n    *\n    @kotlin.internal.InlineOnly\n    public inline operator fun compareTo(other: UShort): Int = this.compareTo(other.toULong())\n    /**\n    * Compares this value with the specified value for order.\n    * Returns zero if this value is equal to the specified other value, a negative number if it's less than other,\n    * or a positive number if it's greater than other.\n    *\n    @kotlin.internal.InlineOnly\n    public inline operator fun compareTo(other: UInt): Int = this.compareTo(other.toULong())\n    /**\n    * Compares this value with the specified value for order.\n    * Returns zero if this value is equal to the specified other value, a negative number if it's less than other,\n    * or a positive number if it's greater than other.\n    *\n    @kotlin.internal.InlineOnly\n    @Suppress("OVERRIDE_BY_INLINE")\n    public override inline operator fun compareTo(other: ULong): Int = ulongCompare(this.data, other.data)\n    /** Adds the other value to this value.\n    *\n    @kotlin.internal.InlineOnly\n    public inline operator fun plus(other: UByte): ULong = this.plus(other.toULong())\n    /** Adds the other value to this value.\n    *\n    @kotlin.internal.InlineOnly\n    public inline operator fun plus(other: UShort): ULong = this.plus(other.toULong())\n    /** Adds the other value to this value.\n    *\n    @kotlin.internal.InlineOnly\n    public inline operator fun plus(other: UInt): ULong = this.plus(other.toULong())\n    /** Adds the other value to this value.\n    *\n    @kotlin.internal.InlineOnly\n    public inline operator fun plus(other: ULong): ULong = ULong(this.data.plus(other.data))\n    /** Subtracts the other value from this value.\n    *\n    @kotlin.internal.InlineOnly\n    public inline operator fun minus(other: UByte): ULong = this.minus(other.toULong())\n    /** Subtracts the other value from this value.\n    *\n    @kotlin.internal.InlineOnly\n    public inline operator fun minus(other: UShort): ULong = this.minus(other.toULong())\n    /** Subtracts the other value from this value.\n    *\n    @kotlin.internal.InlineOnly\n    public inline operator fun minus(other: UInt): ULong = this.minus(other.toULong())\n    /** Subtracts the other value from this value.\n    *\n    @kotlin.internal.InlineOnly\n    public inline operator fun minus(other: ULong): ULong = ULong(this.data.minus(other.data))\n    /** Multiplies this value by the other value.\n    *\n    @kotlin.internal.InlineOnly\n    public inline operator fun times(other: UByte): ULong = this.times(other.toULong())\n    /** Multiplies this value by the other value.\n    *\n    @kotlin.internal.InlineOnly\n    public inline operator fun times(other: UShort): ULong = this.times(other.toULong())\n    /** Multiplies this value by the other value.\n    *\n    @kotlin.internal.InlineOnly\n    public inline operator fun times(other: UInt): ULong = this.times(other.toULong())\n    /** Multiplies this value by the other value.\n    *\n    @kotlin.internal.InlineOnly\n    public inline operator fun times(other: ULong): ULong = ULong(this.data.times(other.data))\n    /** Divides this value by the other value, truncating the result to an integer that is closer to zero.\n    *\n    @kotlin.internal.InlineOnly\n    public inline operator fun div(other: UByte): ULong = this.div(other.toULong())\n    /** Divides this value by the other value, truncating the result to an integer that is closer to zero.\n    *\n    @kotlin.internal.InlineOnly\n    public inline operator fun div(other: UShort): ULong = this.div(other.toULong())\n    /** Divides this value by the other value, truncating the result to an integer that is closer to zero.\n    *\n    @kotlin.internal.InlineOnly\n    public inline operator fun div(other: UInt): ULong = this.div(other.toULong())\n    /** Divides this value by the other value, truncating the result to an integer that is closer to zero.\n    *\n    @kotlin.internal.InlineOnly\n    public inline operator fun div(other: ULong): ULong = ulongDivide(this, other)\n    /**\n    * Calculates the remainder of truncating division of this value by the other value.\n    * \n    * The result is always less than the divisor.\n    *\n    @kotlin.internal.InlineOnly\n    public inline operator fun rem(other: UByte): ULong = this.rem(other.toULong())\n    /**\n    * Calculates the remainder of truncating division of this value by the other value.\n    * \n    * The result is always less than the divisor.\n    *\n    @kotlin.internal.InlineOnly\n    public inline operator fun rem(other: UShort): ULong = this.rem(other.toULong())\n    /**\n    * Calculates the remainder of truncating division of this value by the other

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value.\n * \n * The result is always less than the divisor.\n *^ \n @kotlin.internal.InlineOnly\n public
inline operator fun rem(other: UInt): ULong = this.rem(other.toULong())\n /**\n * Calculates the remainder of
truncating division of this value by the other value.\n * \n * The result is always less than the divisor.\n *^ \n
@kotlin.internal.InlineOnly\n public inline operator fun rem(other: ULong): ULong = ulongRemainder(this,
other)\n\n /**\n * Divides this value by the other value, flooring the result to an integer that is closer to negative
infinity.\n * \n * For unsigned types, the results of flooring division and truncating division are the same.\n
*^ \n @kotlin.internal.InlineOnly\n public inline fun floorDiv(other: UByte): ULong =
this.floorDiv(other.toULong())\n /**\n * Divides this value by the other value, flooring the result to an integer
that is closer to negative infinity.\n * \n * For unsigned types, the results of flooring division and truncating
division are the same.\n *^ \n @kotlin.internal.InlineOnly\n public inline fun floorDiv(other: UShort): ULong
= this.floorDiv(other.toULong())\n /**\n * Divides this value by the other value, flooring the result to an integer
that is closer to negative infinity.\n * \n * For unsigned types, the results of flooring division and truncating
division are the same.\n *^ \n @kotlin.internal.InlineOnly\n public inline fun floorDiv(other: UInt): ULong =
this.floorDiv(other.toULong())\n /**\n * Divides this value by the other value, flooring the result to an integer
that is closer to negative infinity.\n * \n * For unsigned types, the results of flooring division and truncating
division are the same.\n *^ \n @kotlin.internal.InlineOnly\n public inline fun floorDiv(other: ULong): ULong =
div(other)\n\n /**\n * Calculates the remainder of flooring division of this value by the other value.\n * \n *
The result is always less than the divisor.\n * \n * For unsigned types, the remainders of flooring division and
truncating division are the same.\n *^ \n @kotlin.internal.InlineOnly\n public inline fun mod(other: UByte):
UByte = this.mod(other.toULong()).toUByte()\n /**\n * Calculates the remainder of flooring division of this
value by the other value.\n * \n * The result is always less than the divisor.\n * \n * For unsigned types, the
remainders of flooring division and truncating division are the same.\n *^ \n @kotlin.internal.InlineOnly\n
public inline fun mod(other: UShort): UShort = this.mod(other.toULong()).toUShort()\n /**\n * Calculates the
remainder of flooring division of this value by the other value.\n * \n * The result is always less than the
divisor.\n * \n * For unsigned types, the remainders of flooring division and truncating division are the same.\n
*^ \n @kotlin.internal.InlineOnly\n public inline fun mod(other: UInt): UInt =
this.mod(other.toULong()).toUInt()\n /**\n * Calculates the remainder of flooring division of this value by the
other value.\n * \n * The result is always less than the divisor.\n * \n * For unsigned types, the remainders
of flooring division and truncating division are the same.\n *^ \n @kotlin.internal.InlineOnly\n public inline
fun mod(other: ULong): ULong = rem(other)\n\n /**\n * Returns this value incremented by one.\n * \n *
@sample samples.misc.Builtins.inc\n *^ \n @kotlin.internal.InlineOnly\n public inline operator fun inc():
ULong = ULong(data.inc())\n\n /**\n * Returns this value decremented by one.\n * \n * @sample
samples.misc.Builtins.dec\n *^ \n @kotlin.internal.InlineOnly\n public inline operator fun dec(): ULong =
ULong(data.dec())\n\n /**\n * Creates a range from this value to the specified [other] value. *\n
@kotlin.internal.InlineOnly\n public inline operator fun rangeTo(other: ULong): ULongRange =
ULongRange(this, other)\n\n /**\n * Shifts this value left by the [bitCount] number of bits.\n * \n * Note
that only the six lowest-order bits of the [bitCount] are used as the shift distance.\n * The shift distance actually
used is therefore always in the range `0..63`.\n *^ \n @kotlin.internal.InlineOnly\n public inline infix fun
shl(bitCount: Int): ULong = ULong(data shl bitCount)\n\n /**\n * Shifts this value right by the [bitCount]
number of bits, filling the leftmost bits with zeros.\n * \n * Note that only the six lowest-order bits of the
[bitCount] are used as the shift distance.\n * The shift distance actually used is therefore always in the range
`0..63`.\n *^ \n @kotlin.internal.InlineOnly\n public inline infix fun shr(bitCount: Int): ULong = ULong(data
ushr bitCount)\n\n /**\n * Performs a bitwise AND operation between the two values. *\n
@kotlin.internal.InlineOnly\n public inline infix fun and(other: ULong): ULong = ULong(this.data and
other.data)\n\n /**\n * Performs a bitwise OR operation between the two values. *\n
@kotlin.internal.InlineOnly\n public inline infix fun or(other: ULong): ULong = ULong(this.data or other.data)\n
/**\n * Performs a bitwise XOR operation between the two values. *\n
@kotlin.internal.InlineOnly\n public inline infix fun xor(other: ULong):
ULong = ULong(this.data xor other.data)\n\n /**\n * Inverts the bits in this value. *\n
@kotlin.internal.InlineOnly\n

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public inline fun inv(): ULong = ULong(data.inv())\n\n /**\n * Converts this [ULong] value to [Byte].\n *\n * If this value is less than or equals to [Byte.MAX_VALUE], the resulting `Byte` value represents\n * the same numerical value as this `ULong`. \n *\n * The resulting `Byte` value is represented by the least significant 8 bits of this `ULong` value.\n * Note that the resulting `Byte` value may be negative.\n */\n\n @kotlin.internal.InlineOnly\n public inline fun toByte(): Byte = data.toByte()\n /**\n * Converts this [ULong] value to [Short].\n *\n * If this value is less than or equals to [Short.MAX_VALUE], the resulting `Short` value represents\n * the same numerical value as this `ULong`. \n *\n * The resulting `Short` value is represented by the least significant 16 bits of this `ULong` value.\n * Note that the resulting `Short` value may be negative.\n */\n\n @kotlin.internal.InlineOnly\n public inline fun toShort(): Short = data.toShort()\n /**\n * Converts this [ULong] value to [Int].\n *\n * If this value is less than or equals to [Int.MAX_VALUE], the resulting `Int` value represents\n * the same numerical value as this `ULong`. \n *\n * The resulting `Int` value is represented by the least significant 32 bits of this `ULong` value.\n * Note that the resulting `Int` value may be negative.\n */\n\n @kotlin.internal.InlineOnly\n public inline fun toInt(): Int = data.toInt()\n /**\n * Converts this [ULong] value to [Long].\n *\n * If this value is less than or equals to [Long.MAX_VALUE], the resulting `Long` value represents\n * the same numerical value as this `ULong`. Otherwise the result is negative.\n *\n * The resulting `Long` value has the same binary representation as this `ULong` value.\n */\n\n @kotlin.internal.InlineOnly\n public inline fun toLong(): Long = data\n /**\n * Converts this [ULong] value to [UByte].\n *\n * If this value is less than or equals to [UByte.MAX_VALUE], the resulting `UByte` value represents\n * the same numerical value as this `ULong`. \n *\n * The resulting `UByte` value is represented by the least significant 8 bits of this `ULong` value.\n */\n\n @kotlin.internal.InlineOnly\n public inline fun toUByte(): UByte = data.toUByte()\n /**\n * Converts this [ULong] value to [UShort].\n *\n * If this value is less than or equals to [UShort.MAX_VALUE], the resulting `UShort` value represents\n * the same numerical value as this `ULong`. \n *\n * The resulting `UShort` value is represented by the least significant 16 bits of this `ULong` value.\n */\n\n @kotlin.internal.InlineOnly\n public inline fun toUShort(): UShort = data.toUShort()\n /**\n * Converts this [ULong] value to [UInt].\n *\n * If this value is less than or equals to [UInt.MAX_VALUE], the resulting `UInt` value represents\n * the same numerical value as this `ULong`. \n *\n * The resulting `UInt` value is represented by the least significant 32 bits of this `ULong` value.\n */\n\n @kotlin.internal.InlineOnly\n public inline fun toUInt(): UInt = data.toUInt()\n /** Returns this value. */\n\n @kotlin.internal.InlineOnly\n public inline fun toULong(): ULong = this\n /**\n * Converts this [ULong] value to [Float].\n *\n * The resulting value is the closest `Float` to this `ULong` value. \n * In case when this `ULong` value is exactly between two `Float`s, \n * the one with zero at least significant bit of mantissa is selected.\n */\n\n @kotlin.internal.InlineOnly\n public inline fun toFloat(): Float = this.toDouble().toFloat()\n /**\n * Converts this [ULong] value to [Double].\n *\n * The resulting value is the closest `Double` to this `ULong` value. \n * In case when this `ULong` value is exactly between two `Double`s, \n * the one with zero at least significant bit of mantissa is selected.\n */\n\n @kotlin.internal.InlineOnly\n public inline fun toDouble(): Double = ulongToDouble(data)\n\n public override fun toString(): String = ulongToString(data)\n\n /**\n * Converts this [Byte] value to [ULong].\n *\n * If this value is positive, the resulting `ULong` value represents the same numerical value as this `Byte`. \n *\n * The least significant 8 bits of the resulting `ULong` value are the same as the bits of this `Byte` value, \n * whereas the most significant 56 bits are filled with the sign bit of this value.\n */\n\n @SinceKotlin("1.5")\n @WasExperimental(ExperimentalUnsignedTypes::class)\n @kotlin.internal.InlineOnly\n public inline fun Byte.toULong(): ULong = ULong(this.toLong())\n /**\n * Converts this [Short] value to [ULong].\n *\n * If this value is positive, the resulting `ULong` value represents the same numerical value as this `Short`. \n *\n * The least significant 16 bits of the resulting `ULong` value are the same as the bits of this `Short` value, \n * whereas the most significant 48 bits are filled with the sign bit of this value.\n */\n\n @SinceKotlin("1.5")\n @WasExperimental(ExperimentalUnsignedTypes::class)\n @kotlin.internal.InlineOnly\n public inline fun Short.toULong(): ULong = ULong(this.toLong())\n /**\n * Converts this [Int] value to [ULong].\n *\n * If this value is positive, the resulting `ULong` value represents the same numerical value as this `Int`. \n *\n * The least significant 32 bits of the resulting `ULong` value are the same as the bits of this `Int` value, \n * whereas

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    return element\n } \n return default\nValue(index)\n}\n\n/**\n * Returns an element at the given [index] or the
    result of calling the [default\nValue] function if the [index] is out of bounds of this list.\n * \n * @sample
    samples.collections.Collections.Elements.elementAtOrElse\n * \n\n@kotlin.internal.InlineOnly\n\npublic inline fun
    <T> List<T>.elementAtOrElse(index: Int, default\nValue: (Int) -> T): T {\n return if (index >= 0 && index <=
    last\nIndex) get(index) else default\nValue(index)\n}\n\n/**\n * Returns an element at the given [index] or `null` if the
    [index] is out of bounds of this collection.\n * \n * @sample
    samples.collections.Collections.Elements.elementAtOrNull\n * \n\npublic fun <T>
    Iterable<T>.elementAtOrNull(index: Int): T? {\n if (this is List)\n return this.getOrNull(index)\n if (index <
    0)\n return null\n val iterator = iterator()\n var count = 0\n while (iterator.hasNext()) {\n val element =
    iterator.next()\n if (index == count++)\n return element\n }\n return null\n}\n\n/**\n * Returns an
    element at the given [index] or `null` if the [index] is out of bounds of this list.\n * \n * @sample
    samples.collections.Collections.Elements.elementAtOrNull\n * \n\n@kotlin.internal.InlineOnly\n\npublic inline fun
    <T> List<T>.elementAtOrNull(index: Int): T? {\n return this.getOrNull(index)\n}\n\n/**\n * Returns the first
    element matching the given [predicate], or `null` if no such element was found.\n * \n * @sample
    samples.collections.Collections.Elements.find\n * \n\n@kotlin.internal.InlineOnly\n\npublic inline fun <T>
    Iterable<T>.find(predicate: (T) -> Boolean): T? {\n return firstOrNull(predicate)\n}\n\n/**\n * Returns the last
    element matching the given [predicate], or `null` if no such element was found.\n * \n * @sample
    samples.collections.Collections.Elements.find\n * \n\n@kotlin.internal.InlineOnly\n\npublic inline fun <T>
    Iterable<T>.findLast(predicate: (T) -> Boolean): T? {\n return lastOrNull(predicate)\n}\n\n/**\n * Returns the last
    element matching the given [predicate], or `null` if no such element was found.\n * \n * @sample
    samples.collections.Collections.Elements.find\n * \n\n@kotlin.internal.InlineOnly\n\npublic inline fun <T>
    List<T>.findLast(predicate: (T) -> Boolean): T? {\n return lastOrNull(predicate)\n}\n\n/**\n * Returns first
    element.\n * @throws [NoSuchElementException] if the collection is empty.\n * \n\npublic fun <T>
    Iterable<T>.first(): T {\n when (this) {\n is List -> return this.first()\n else -> {\n val iterator =
    iterator()\n if (!iterator.hasNext())\n throw NoSuchElementException("Collection is empty.")\n
    return iterator.next()\n }\n }\n}\n\n/**\n * Returns first element.\n * @throws [NoSuchElementException]
    if the list is empty.\n * \n\npublic fun <T> List<T>.first(): T {\n if (isEmpty())\n throw
    NoSuchElementException("List is empty.")\n return this[0]\n}\n\n/**\n * Returns the first element matching the
    given [predicate].\n * @throws [NoSuchElementException] if no such element is found.\n * \n\npublic inline fun <T>
    Iterable<T>.first(predicate: (T) -> Boolean): T {\n for (element in this) if (predicate(element)) return element\n
    throw NoSuchElementException("Collection contains no element matching the predicate.")\n}\n\n/**\n * Returns
    the first non-null value produced by [transform] function being applied to elements of this collection in iteration
    order,\n * or throws [NoSuchElementException] if no non-null value was produced.\n * \n * @sample
    samples.collections.Collections.Transformations.firstNotNullOf\n
    * \n\n@SinceKotlin("1.5")\n\n@kotlin.internal.InlineOnly\n\npublic inline fun <T, R : Any>
    Iterable<T>.firstNotNullOf(transform: (T) -> R?): R {\n return firstNotNullOfOrNull(transform) ?: throw
    NoSuchElementException("No element of the collection was transformed to a non-null value.")\n}\n\n/**\n *
    Returns the first non-null value produced by [transform] function being applied to elements of this collection in
    iteration order,\n * or `null` if no non-null value was produced.\n * \n * @sample
    samples.collections.Collections.Transformations.firstNotNullOf\n
    * \n\n@SinceKotlin("1.5")\n\n@kotlin.internal.InlineOnly\n\npublic inline fun <T, R : Any>
    Iterable<T>.firstNotNullOfOrNull(transform: (T) -> R?): R? {\n for (element in this) {\n val result =
    transform(element)\n if (result != null) {\n return result\n }\n }\n return null\n}\n\n/**\n *
    Returns the first element, or `null` if the collection is empty.\n * \n\npublic fun <T> Iterable<T>.firstOrNull(): T? {\n
    when (this) {\n is List -> {\n if (isEmpty())\n return null\n else\n return this[0]\n }\n else -> {\n
    val iterator = iterator()\n if (!iterator.hasNext())\n return null\n
    return iterator.next()\n }\n }\n}\n\n/**\n * Returns the first element, or `null` if the list is empty.\n * \n\npublic
    fun <T> List<T>.firstOrNull(): T? {\n return if (isEmpty()) null else this[0]\n}\n\n/**\n * Returns the first element
  
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matching the given [predicate], or `null` if element was not found.\n */\npublic inline fun <T>
Iterable<T>.firstOrNull(predicate: (T) -> Boolean): T? {\n    for (element in this) if (predicate(element)) return
element\n    return null\n}\n\n/**\n * Returns an element at the given [index] or the result of calling the
[defaultValue] function if the [index] is out of bounds of this list.\n */\n@kotlin.internal.InlineOnly\npublic inline
fun <T> List<T>.getOrNull(index: Int, defaultValue: (Int) -> T): T {\n    return if (index >= 0 && index <=
lastIndex) get(index) else defaultValue(index)\n}\n\n/**\n * Returns an element at the given [index] or `null` if the
[index] is out of bounds of this list.\n * \n * @sample samples.collections.Collections.Elements.getOrNull\n */\npublic fun <T> List<T>.getOrNull(index: Int): T? {\n    return if (index >= 0 && index <= lastIndex) get(index)
else null\n}\n\n/**\n * Returns first index of [element], or -1 if the collection does not contain element.\n */\npublic
fun <@kotlin.internal.OnlyInputTypes T> Iterable<T>.indexOf(element: T): Int {\n    if (this is List) return
this.indexOf(element)\n    var index = 0\n    for (item in this) {\n        checkIndexOverflow(index)\n        if (element
== item)\n            return index\n        index++\n    }\n    return -1\n}\n\n/**\n * Returns first index of [element], or -1
if the list does not contain element.\n */\n@Suppress("EXTENSION_SHADOWED_BY_MEMBER") // false
warning, extension takes precedence in some cases\npublic fun <@kotlin.internal.OnlyInputTypes T>
List<T>.indexOf(element: T): Int {\n    return indexOf(element)\n}\n\n/**\n * Returns index of the first element
matching the given [predicate], or -1 if the collection does not contain such element.\n */\npublic inline fun <T>
Iterable<T>.indexOfFirst(predicate: (T) -> Boolean): Int {\n    var index = 0\n    for (item in this) {\n
        checkIndexOverflow(index)\n        if (predicate(item))\n            return index\n        index++\n    }\n    return -
1\n}\n\n/**\n * Returns index of the first element matching the given [predicate], or -1 if the list does not contain
such element.\n */\npublic inline fun <T> List<T>.indexOfFirst(predicate: (T) -> Boolean): Int {\n    var index = 0\n
for (item in this) {\n        if (predicate(item))\n            return index\n        index++\n    }\n    return -1\n}\n\n/**\n *
Returns index of the last element matching the given [predicate], or -1 if the collection does not contain such
element.\n */\npublic inline fun <T> Iterable<T>.indexOfLast(predicate: (T) -> Boolean): Int {\n    var lastIndex = -
1\n    var index = 0\n    for (item in this) {\n        checkIndexOverflow(index)\n        if (predicate(item))\n
            lastIndex = index\n            index++\n    }\n    return lastIndex\n}\n\n/**\n * Returns index of the last element matching
the given [predicate], or -1 if the list does not contain such element.\n */\npublic inline fun <T> List<T>.indexOfLast(predicate: (T) -> Boolean): Int {\n    val iterator = this.listIterator(size)\n    while
(iterator.hasPrevious()) {\n        if (predicate(iterator.previous())) {\n            return iterator.nextIndex()\n        }\n    }\n    return -1\n}\n\n/**\n * Returns the last element.\n * \n * @throws NoSuchElementException if the collection
is empty.\n * \n * @sample samples.collections.Collections.Elements.last\n */\npublic fun <T> Iterable<T>.last(): T
{\n    when (this) {\n        is List -> return this.last()\n        else -> {\n            val iterator = iterator()\n            if
(!iterator.hasNext())\n                throw NoSuchElementException("Collection is empty.")\n            var last =
iterator.next()\n            while (iterator.hasNext())\n                last = iterator.next()\n            return last\n        }\n    }\n}\n\n/**\n * Returns the last element.\n * \n * @throws NoSuchElementException if the list is empty.\n * \n *
@sample samples.collections.Collections.Elements.last\n */\npublic fun <T> List<T>.last(): T {\n    if (isEmpty())\n        throw NoSuchElementException("List is empty.")\n    return this[lastIndex]\n}\n\n/**\n * Returns the last
element matching the given [predicate].\n * \n * @throws NoSuchElementException if no such element is found.\n * \n *
@sample samples.collections.Collections.Elements.last\n */\npublic inline fun <T> Iterable<T>.last(predicate: (T) -> Boolean): T {\n    var last: T? = null\n    var found = false\n    for (element in this) {\n
        if (predicate(element)) {\n            last = element\n            found = true\n        }\n    }\n    if (!found) throw
NoSuchElementException("Collection contains no element matching the predicate.")\n    @Suppress("UNCHECKED_CAST")\n    return last as T\n}\n\n/**\n * Returns the last element matching the
given [predicate].\n * \n * @throws NoSuchElementException if no such element is found.\n * \n * @sample
samples.collections.Collections.Elements.last\n */\npublic inline fun <T> List<T>.last(predicate: (T) -> Boolean): T {\n    val iterator = this.listIterator(size)\n    while (iterator.hasPrevious()) {\n        val element = iterator.previous()\n
        if (predicate(element)) return element\n    }\n    throw NoSuchElementException("List contains no element
matching the predicate.")\n}\n\n/**\n * Returns last index of [element], or -1 if the collection does not contain
element.\n */\npublic fun <@kotlin.internal.OnlyInputTypes T> Iterable<T>.lastIndexOf(element: T): Int {\n    if

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(this is List) return this.lastIndexOf(element)\n    var lastIndex = -1\n    var index = 0\n    for (item in this) {\n        checkIndexOverflow(index)\n        if (element == item)\n            lastIndex = index\n            index++\n    }\n    return\n    lastIndex\n}\n\n/**\n * Returns last index of [element], or -1 if the list does not contain element.\n */\n\n@Suppress("EXTENSION_SHADOWED_BY_MEMBER") // false warning, extension takes precedence in\nsome cases\npublic fun <@kotlin.internal.OnlyInputTypes T> List<T>.lastIndexOf(element: T): Int {\n    return\n    lastIndexOf(element)\n}\n\n/**\n * Returns the last element, or `null` if the collection is empty.\n */\n\n@sample\nsamples.collections.Collections.Elements.last\n\npublic fun <T> Iterable<T>.lastOrNull(): T? {\n    when (this)\n    {\n        is List -> return if (isEmpty()) null else this[size - 1]\n        else -> {\n            val iterator = iterator()\n            if (!iterator.hasNext())\n                return null\n            var last = iterator.next()\n            while (iterator.hasNext())\n                last = iterator.next()\n            return last\n        }\n    }\n}\n\n/**\n * Returns the last element, or `null` if the\nlist is empty.\n */\n\n@sample\nsamples.collections.Collections.Elements.last\n\npublic fun <T>\nList<T>.lastOrNull(): T? {\n    return if (isEmpty()) null else this[size - 1]\n}\n\n/**\n * Returns the last element\nmatching the given [predicate], or `null` if no such element was found.\n */\n\n@sample\nsamples.collections.Collections.Elements.last\n\npublic inline fun <T> Iterable<T>.lastOrNull(predicate: (T) ->\nBoolean): T? {\n    var last: T? = null\n    for (element in this) {\n        if (predicate(element)) {\n            last =\n            element\n        }\n    }\n    return last\n}\n\n/**\n * Returns the last element matching the given [predicate], or `null`\nif no such element was found.\n */\n\n@sample\nsamples.collections.Collections.Elements.last\n\npublic inline\nfun <T> List<T>.lastOrNull(predicate: (T) -> Boolean): T? {\n    val iterator = this.listIterator(size)\n    while\n(iterator.hasPrevious()) {\n        val element = iterator.previous()\n        if (predicate(element)) return element\n    }\n    return null\n}\n\n/**\n * Returns a random element from this collection.\n */\n\n@throws\nNoSuchElementException if this collection is empty.\n\n\n@SinceKotlin("1.3")\n@kotlin.internal.InlineOnly\npublic inline fun <T> Collection<T>.random(): T {\n    return\n    random(Random)\n}\n\n/**\n * Returns a random element from this collection using the specified source of\nrandomness.\n */\n\n@throws\nNoSuchElementException if this collection is empty.\n\n\n@SinceKotlin("1.3")\npublic fun <T> Collection<T>.random(random: Random): T {\n    if (isEmpty())\n    throw\n    NoSuchElementException("Collection is empty.")\n    return\n    elementAt(random.nextInt(size))\n}\n\n/**\n * Returns a random element from this collection, or `null` if this collection is empty.\n */\n\n\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\n@kotlin.internal.InlineOnly\npublic\ninline fun <T> Collection<T>.randomOrNull(): T? {\n    return\n    randomOrNull(Random)\n}\n\n/**\n * Returns a\nrandom element from this collection using the specified source of randomness, or `null` if this collection is empty.\n */\n\n\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\npublic fun <T>\nCollection<T>.randomOrNull(random: Random): T? {\n    if (isEmpty())\n    return\n    null\n    return\n    elementAt(random.nextInt(size))\n}\n\n/**\n * Returns the single element, or throws an exception if the collection is\nempty or has more than one element.\n */\n\n\npublic fun <T> Iterable<T>.single(): T {\n    when (this)\n    {\n        is List -\n        > return\n        this.single()\n        else -> {\n            val iterator = iterator()\n            if (!iterator.hasNext())\n                throw\n                NoSuchElementException("Collection is empty.")\n            val\n            single = iterator.next()\n            if\n            (iterator.hasNext())\n                throw\n                IllegalArgumentException("Collection has more than one element.")\n            return\n            single\n        }\n    }\n}\n\n/**\n * Returns the single element, or throws an exception if the list is empty or\nhas more than one element.\n */\n\n\npublic fun <T> List<T>.single(): T {\n    return\n    when (size)\n    {\n        0 -> throw\n        NoSuchElementException("List is empty.")\n        1 -> this[0]\n        else -> throw\n        IllegalArgumentException("List has more than one element.")\n    }\n}\n\n/**\n * Returns the single element\nmatching the given [predicate], or throws exception if there is no or more than one matching element.\n */\n\n\npublic\ninline fun <T> Iterable<T>.single(predicate: (T) -> Boolean): T {\n    var\n    single: T? = null\n    var\n    found = false\n    for (element in this) {\n        if (predicate(element)) {\n            if (found)\n                throw\n                IllegalArgumentException("Collection contains more than one matching element.")\n            single =\n            element\n            found =\n            true\n        }\n    }\n    if (!found)\n        throw\n        NoSuchElementException("Collection contains no element\nmatching the\npredicate.")\n    @Suppress("UNCHECKED_CAST")\n    return\n    single as T\n}\n\n/**\n * Returns\nsingle element, or `null` if the collection is empty or has more than one element.\n */\n\n\npublic fun <T>

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Iterable<T>.singleOrNull(): T? {\n  when (this) {\n    is List -> return if (size == 1) this[0] else null\n    else ->
{\n      val iterator = iterator()\n      if (!iterator.hasNext())\n        return null\n      val single =
iterator.next()\n      if (iterator.hasNext())\n        return null\n      return single\n    }\n  }\n}\n\n*\n * Returns single element, or `null` if the list is empty or has more than one element.\n *\n\npublic fun <T>
List<T>.singleOrNull(): T? {\n  return if (size == 1) this[0] else null\n}\n\n*\n * Returns the single element
matching the given [predicate], or `null` if element was not found or more than one element was found.\n *\n\npublic
inline fun <T> Iterable<T>.singleOrNull(predicate: (T) -> Boolean): T? {\n  var single: T? = null\n  var found =
false\n  for (element in this) {\n    if (predicate(element)) {\n      if (found) return null\n      single =
element\n      found = true\n    }\n  }\n  if (!found) return null\n  return single\n}\n\n*\n * Returns a list
containing all elements except first [n] elements.\n *\n *\n * @throws IllegalArgumentException if [n] is negative.\n *\n
*\n * @sample samples.collections.Collections.Transformations.drop\n *\n\npublic fun <T> Iterable<T>.drop(n: Int):
List<T> {\n  require(n >= 0) { \"Requested element count $n is less than zero.\" }\n  if (n == 0) return toList()\n
val list: ArrayList<T>\n  if (this is Collection<*>) {\n    val resultSize = size - n\n    if (resultSize <= 0)\n      return emptyList()\n    if (resultSize == 1)\n      return listOf(last())\n    list = ArrayList<T>(resultSize)\n
if (this is List<T>) {\n      if (this is RandomAccess) {\n        for (index in n until size)\n          list.add(this[index])\n      } else {\n        for (item in listIterator(n))\n          list.add(item)\n      }\n      return list\n    }\n  }\n  else {\n    list = ArrayList<T>()\n    }\n    var count = 0\n    for (item in this) {\n      if (count >= n) list.add(item) else ++count\n    }\n    return list.optimizeReadOnlyList()\n  }\n}\n\n*\n * Returns a list
containing all elements except last [n] elements.\n *\n *\n * @throws IllegalArgumentException if [n] is negative.\n *\n
*\n * @sample samples.collections.Collections.Transformations.drop\n *\n\npublic fun <T> List<T>.dropLast(n: Int):
List<T> {\n  require(n >= 0) { \"Requested element count $n is less than zero.\" }\n  return take((size -
n).coerceAtLeast(0))\n}\n\n*\n * Returns a list containing all elements except last elements that satisfy the given
[predicate].\n *\n *\n * @sample samples.collections.Collections.Transformations.drop\n *\n\npublic inline fun <T>
List<T>.dropLastWhile(predicate: (T) -> Boolean): List<T> {\n  if (!isEmpty()) {\n    val iterator =
listIterator(size)\n    while (iterator.hasPrevious()) {\n      if (!predicate(iterator.previous())) {\n        return
take(iterator.nextIndex() + 1)\n      }\n    }\n  }\n  return emptyList()\n}\n\n*\n * Returns a list containing
all elements except first elements that satisfy the given [predicate].\n *\n *\n * @sample
samples.collections.Collections.Transformations.drop\n *\n\npublic inline fun <T> Iterable<T>.dropWhile(predicate:
(T) -> Boolean): List<T> {\n  var yielding = false\n  val list = ArrayList<T>()\n  for (item in this)\n    if
(yielding)\n      list.add(item)\n    else if (!predicate(item)) {\n      list.add(item)\n      yielding = true\n    }\n  return list\n}\n\n*\n * Returns a list containing only elements matching the given [predicate].\n *\n *\n *
@sample samples.collections.Collections.Filtering.filter\n *\n\npublic inline fun <T> Iterable<T>.filter(predicate: (T)
-> Boolean): List<T> {\n  return filterTo(ArrayList<T>(), predicate)\n}\n\n*\n * Returns a list containing only
elements matching the given [predicate].\n *\n * @param [predicate] function that takes the index of an element and the
element itself\n * and returns the result of predicate evaluation on the element.\n *\n *\n * @sample
samples.collections.Collections.Filtering.filterIndexed\n *\n\npublic inline fun <T>
Iterable<T>.filterIndexed(predicate: (index: Int, T) -> Boolean): List<T> {\n  return
filterIndexedTo(ArrayList<T>(), predicate)\n}\n\n*\n * Appends all elements matching the given [predicate] to
the given [destination].\n *\n * @param [predicate] function that takes the index of an element and the element itself\n *
and returns the result of predicate evaluation on the element.\n *\n *\n * @sample
samples.collections.Collections.Filtering.filterIndexedTo\n *\n\npublic inline fun <T, C : MutableCollection<in T>>
Iterable<T>.filterIndexedTo(destination: C, predicate: (index: Int, T) -> Boolean): C {\n  forEachIndexed { index,
element -> }\n    if (predicate(index, element)) destination.add(element)\n  }\n  return destination\n}\n\n*\n *
Returns a list containing all elements that are instances of specified type parameter R.\n *\n *\n * @sample
samples.collections.Collections.Filtering.filterIsInstance\n *\n\npublic inline fun <reified R>
Iterable<*>.filterIsInstance(): List<@kotlin.internal.NoInfer R> {\n  return
filterIsInstanceTo(ArrayList<R>(),)\n}\n\n*\n * Appends all elements that are instances of specified type
parameter R to the given [destination].\n *\n *\n * @sample

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samples.collections.Collections.Filtering.filterIsInstanceTo\n *^\npublic inline fun <reified R, C :
MutableCollection<in R>> Iterable<*>.filterIsInstanceTo(destination: C): C {\n  for (element in this) if (element is
R) destination.add(element)\n  return destination\n}\n\n/**\n * Returns a list containing all elements not matching
the given [predicate].\n * \n * @sample samples.collections.Collections.Filtering.filter\n *^\npublic inline fun <T>
Iterable<T>.filterNot(predicate: (T) -> Boolean): List<T> {\n  return filterNotTo(ArrayList<T>(),
predicate)\n}\n\n/**\n * Returns a list containing all elements that are not `null`.\n * \n * @sample
samples.collections.Collections.Filtering.filterNotNull\n *^\npublic fun <T : Any> Iterable<T?>.filterNotNull():
List<T> {\n  return filterNotNullTo(ArrayList<T>())\n}\n\n/**\n * Appends all elements that are not `null` to the
given [destination].\n * \n * @sample samples.collections.Collections.Filtering.filterNotNullTo\n *^\npublic fun <C
: MutableCollection<in T>, T : Any> Iterable<T?>.filterNotNullTo(destination: C): C {\n  for (element in this) if
(element != null) destination.add(element)\n  return destination\n}\n\n/**\n * Appends all elements not matching
the given [predicate] to the given [destination].\n * \n * @sample samples.collections.Collections.Filtering.filterTo\n
*^\npublic inline fun <T, C : MutableCollection<in T>> Iterable<T>.filterNotTo(destination: C, predicate: (T) ->
Boolean): C {\n  for (element in this) if (!predicate(element)) destination.add(element)\n  return
destination\n}\n\n/**\n * Appends all elements matching the given [predicate] to the given [destination].\n * \n *
@sample samples.collections.Collections.Filtering.filterTo\n *^\npublic inline fun <T, C : MutableCollection<in
T>> Iterable<T>.filterTo(destination: C, predicate: (T) -> Boolean): C {\n  for (element in this) if
(predicate(element)) destination.add(element)\n  return destination\n}\n\n/**\n * Returns a list containing elements
at indices in the specified [indices] range.\n *^\npublic fun <T> List<T>.slice(indices: IntRange): List<T> {\n  if
(indices.isEmpty()) return listOf()\n  return this.subList(indices.start, indices.endInclusive + 1).toList()\n}\n\n/**\n
* Returns a list containing elements at specified [indices].\n *^\npublic fun <T> List<T>.slice(indices:
Iterable<Int>): List<T> {\n  val size = indices.collectionSizeOrDefault(10)\n  if (size == 0) return emptyList()\n
val list = ArrayList<T>(size)\n  for (index in indices) {\n    list.add(get(index))\n  }\n  return list\n}\n\n/**\n
* Returns a list containing first [n] elements.\n * \n * @throws IllegalArgumentException if [n] is negative.\n * \n *
@sample samples.collections.Collections.Transformations.take\n *^\npublic fun <T> Iterable<T>.take(n: Int):
List<T> {\n  require(n >= 0) { \"Requested element count $n is less than zero.\" }\n  if (n == 0) return
emptyList()\n  if (this is Collection<T>) {\n    if (n >= size) return toList()\n    if (n == 1) return
listOf(first())\n  }\n  var count = 0\n  val list = ArrayList<T>(n)\n  for (item in this) {\n    list.add(item)\n
if (++count == n)\n    break\n  }\n  return list.optimizeReadOnlyList()\n}\n\n/**\n * Returns a list containing
last [n] elements.\n * \n * @throws IllegalArgumentException if [n] is negative.\n * \n * @sample
samples.collections.Collections.Transformations.take\n *^\npublic fun <T> List<T>.takeLast(n: Int): List<T> {\n
require(n >= 0) { \"Requested element count $n is less than zero.\" }\n  if (n == 0) return emptyList()\n  val size =
size\n  if (n >= size) return toList()\n  if (n == 1) return listOf(last())\n  val list = ArrayList<T>(n)\n  if (this is
RandomAccess) {\n    for (index in size - n until size)\n      list.add(this[index])\n  } else {\n    for (item in
listIterator(size - n))\n      list.add(item)\n  }\n  return list\n}\n\n/**\n * Returns a list containing last elements
satisfying the given [predicate].\n * \n * @sample samples.collections.Collections.Transformations.take\n *^\npublic
inline fun <T> List<T>.takeLastWhile(predicate: (T) -> Boolean): List<T> {\n  if (isEmpty())\n    return
emptyList()\n  val iterator = listIterator(size)\n  while (iterator.hasPrevious()) {\n    if
(!predicate(iterator.previous())) {\n      iterator.next()\n      val expectedSize = size - iterator.nextIndex()\n
if (expectedSize == 0) return emptyList()\n      return ArrayList<T>(expectedSize).apply {\n        while
(iterator.hasNext())\n          add(iterator.next())\n        }\n    }\n  }\n  return toList()\n}\n\n/**\n
* Returns a list containing first elements satisfying the given [predicate].\n * \n * @sample
samples.collections.Collections.Transformations.take\n *^\npublic inline fun <T> Iterable<T>.takeWhile(predicate:
(T) -> Boolean): List<T> {\n  val list = ArrayList<T>()\n  for (item in this) {\n    if (!predicate(item))\n
break\n    list.add(item)\n  }\n  return list\n}\n\n/**\n * Reverses elements in the list in-place.\n *^\npublic
expect fun <T> MutableList<T>.reverse(): Unit\n\n/**\n * Returns a list with elements in reversed order.\n *^\npublic
fun <T> Iterable<T>.reversed(): List<T> {\n  if (this is Collection && size <= 1) return toList()\n  val
list = toMutableList()\n  list.reverse()\n  return list\n}\n\n/**\n * Randomly shuffles elements in this list in-place

```

using the specified [random] instance as the source of randomness.\n * \n * See:
https://en.wikipedia.org/wiki/Fisher%20%80%93Yates_shuffle#The_modern_algorithm\n

```

*\n@SinceKotlin("1.3")\npublic fun <T> MutableList<T>.shuffle(random: Random): Unit {\n    for (i in lastIndex\n        downTo 1) {\n        val j = random.nextInt(i + 1)\n        this[j] = this.set(i, this[j])\n    }\n}\n\n/**\n * Sorts elements\n * in the list in-place according to natural sort order of the value returned by specified [selector] function.\n * \n * The\n * sort is _stable_. It means that equal elements preserve their order relative to each other after sorting.\n */\n\npublic\n * inline fun <T, R : Comparable<R>> MutableList<T>.sortBy(crossinline selector: (T) -> R?): Unit {\n    if (size > 1)\n        sortWith(compareBy(selector))\n}\n\n/**\n * Sorts elements in the list in-place descending according to natural sort\n * order of the value returned by specified [selector] function.\n * \n * The sort is _stable_. It means that equal\n * elements preserve their order relative to each other after sorting.\n */\n\npublic\n * inline fun <T, R : Comparable<R>>\n * MutableList<T>.sortByDescending(crossinline selector: (T) -> R?): Unit {\n    if (size > 1)\n        sortWith(compareByDescending(selector))\n}\n\n/**\n * Sorts elements in the list in-place descending according to\n * their natural sort order.\n * \n * The sort is _stable_. It means that equal elements preserve their order relative to\n * each other after sorting.\n */\n\npublic\n * fun <T : Comparable<T>> MutableList<T>.sortDescending(): Unit {\n    sortWith(reverseOrder())\n}\n\n/**\n * Returns a list of all elements sorted according to their natural sort order.\n * \n * The sort is _stable_. It means that equal elements preserve their order relative to each other after sorting.\n */\n\npublic\n * fun <T : Comparable<T>> Iterable<T>.sorted(): List<T> {\n    if (this is Collection) {\n        if (size <= 1)\n            return this.toList()\n        @Suppress("UNCHECKED_CAST")\n        return (toTypedArray<Comparable<T>>())\n            as Array<T>().apply { sort() }.asList()\n    }\n    return toMutableList().apply { sort() }\n}\n\n/**\n * Returns a list of\n * all elements sorted according to natural sort order of the value returned by specified [selector] function.\n * \n * The\n * sort is _stable_. It means that equal elements preserve their order relative to each other after sorting.\n * \n * @sample samples.collections.Collections.Sorting.sortedBy\n */\n\npublic\n * inline fun <T, R : Comparable<R>>\n * Iterable<T>.sortedBy(crossinline selector: (T) -> R?): List<T> {\n    return\n        sortedWith(compareBy(selector))\n}\n\n/**\n * Returns a list of all elements sorted descending according to natural\n * sort order of the value returned by specified [selector] function.\n * \n * The sort is _stable_. It means that equal\n * elements preserve their order relative to each other after sorting.\n */\n\npublic\n * inline fun <T, R : Comparable<R>>\n * Iterable<T>.sortedByDescending(crossinline selector: (T) -> R?): List<T> {\n    return\n        sortedWith(compareByDescending(selector))\n}\n\n/**\n * Returns a list of all elements sorted descending\n * according to their natural sort order.\n * \n * The sort is _stable_. It means that equal elements preserve their order\n * relative to each other after sorting.\n */\n\npublic\n * fun <T : Comparable<T>> Iterable<T>.sortedDescending(): List<T>\n * {\n    return sortedWith(reverseOrder())\n}\n\n/**\n * Returns a list of all elements sorted according to the specified\n * [comparator].\n * \n * The sort is _stable_. It means that equal elements preserve their order relative to each other\n * after sorting.\n */\n\npublic\n * fun <T> Iterable<T>.sortedWith(comparator: Comparator<in T>): List<T> {\n    if (this is\n        Collection) {\n        if (size <= 1) return this.toList()\n        @Suppress("UNCHECKED_CAST")\n        return\n            (toTypedArray<Any?>()) as Array<T>().apply { sortWith(comparator) }.asList()\n    }\n    return\n        toMutableList().apply { sortWith(comparator) }\n}\n\n/**\n * Returns an array of Boolean containing all of the\n * elements of this collection.\n */\n\npublic\n * fun Collection<Boolean>.toBooleanArray(): BooleanArray {\n    val result\n        = BooleanArray(size)\n    var index = 0\n    for (element in this)\n        result[index++] = element\n    return\n        result\n}\n\n/**\n * Returns an array of Byte containing all of the elements of this collection.\n */\n\npublic\n * fun\n * Collection<Byte>.toByteArray(): ByteArray {\n    val result = ByteArray(size)\n    var index = 0\n    for (element in\n        this)\n        result[index++] = element\n    return result\n}\n\n/**\n * Returns an array of Char containing all of the\n * elements of this collection.\n */\n\npublic\n * fun Collection<Char>.toCharArray(): CharArray {\n    val result =\n        CharArray(size)\n    var index = 0\n    for (element in this)\n        result[index++] = element\n    return\n        result\n}\n\n/**\n * Returns an array of Double containing all of the elements of this collection.\n */\n\npublic\n * fun\n * Collection<Double>.toDoubleArray(): DoubleArray {\n    val result = DoubleArray(size)\n    var index = 0\n    for\n        (element in this)\n        result[index++] = element\n    return result\n}\n\n/**\n * Returns an array of Float containing\n * all of the elements of this collection.\n */\n\npublic\n * fun Collection<Float>.toFloatArray(): FloatArray {\n    val result\n        = FloatArray(size)\n    var index = 0\n    for (element in this)\n        result[index++] = element\n    return\n        result\n}

```

```

result\n}\n\n/**\n * Returns an array of Int containing all of the elements of this collection.\n */\npublic fun
Collection<Int>.toIntArray(): IntArray {\n    val result = IntArray(size)\n    var index = 0\n    for (element in this)\n        result[index++] = element\n    return result\n}\n\n/**\n * Returns an array of Long containing all of the elements
of this collection.\n */\npublic fun Collection<Long>.toLongArray(): LongArray {\n    val result =
LongArray(size)\n    var index = 0\n    for (element in this)\n        result[index++] = element\n    return
result\n}\n\n/**\n * Returns an array of Short containing all of the elements of this collection.\n */\npublic fun
Collection<Short>.toShortArray(): ShortArray {\n    val result = ShortArray(size)\n    var index = 0\n    for (element
in this)\n        result[index++] = element\n    return result\n}\n\n/**\n * Returns a [Map] containing key-value pairs
provided by [transform] function\n * applied to elements of the given collection.\n * \n * If any of two pairs would
have the same key the last one gets added to the map.\n * \n * The returned map preserves the entry iteration order
of the original collection.\n * \n * @sample samples.collections.Collections.Transformations.associate\n */\npublic
inline fun <T, K, V> Iterable<T>.associate(transform: (T) -> Pair<K, V>): Map<K, V> {\n    val capacity =
mapCapacity(collectionSizeOrDefault(10)).coerceAtLeast(16)\n    return associateTo(LinkedHashMap<K,
V>(capacity), transform)\n}\n\n/**\n * Returns a [Map] containing the elements from the given collection indexed
by the key\n * returned from [keySelector] function applied to each element.\n * \n * If any two elements would
have the same key returned by [keySelector] the last one gets added to the map.\n * \n * The returned map preserves
the entry iteration order of the original collection.\n * \n * @sample
samples.collections.Collections.Transformations.associateBy\n */\npublic inline fun <T, K>
Iterable<T>.associateBy(keySelector: (T) -> K): Map<K, T> {\n    val capacity =
mapCapacity(collectionSizeOrDefault(10)).coerceAtLeast(16)\n    return associateByTo(LinkedHashMap<K,
T>(capacity), keySelector)\n}\n\n/**\n * Returns a [Map] containing the values provided by [valueTransform] and
indexed by [keySelector] functions applied to elements of the given collection.\n * \n * If any two elements would
have the same key returned by [keySelector] the last one gets added to the map.\n * \n * The returned map preserves
the entry iteration order of the original collection.\n * \n * @sample
samples.collections.Collections.Transformations.associateByWithValueTransform\n */\npublic inline fun <T, K, V>
Iterable<T>.associateBy(keySelector: (T) -> K, valueTransform: (T) -> V): Map<K, V> {\n    val capacity =
mapCapacity(collectionSizeOrDefault(10)).coerceAtLeast(16)\n    return associateByTo(LinkedHashMap<K,
V>(capacity), keySelector, valueTransform)\n}\n\n/**\n * Populates and returns the [destination] mutable map with
key-value pairs,\n * where key is provided by the [keySelector] function applied to each element of the given
collection\n * and value is the element itself.\n * \n * If any two elements would have the same key returned by
[keySelector] the last one gets added to the map.\n * \n * @sample
samples.collections.Collections.Transformations.associateByTo\n */\npublic inline fun <T, K, M : MutableMap<in
K, in T>> Iterable<T>.associateByTo(destination: M, keySelector: (T) -> K): M {\n    for (element in this) {\n
destination.put(keySelector(element), element)\n    }\n    return destination\n}\n\n/**\n * Populates and returns the
[destination] mutable map with key-value pairs,\n * where key is provided by the [keySelector] function and\n *
and value is provided by the [valueTransform] function applied to elements of the given collection.\n * \n * If any two
elements would have the same key returned by [keySelector] the last one gets added to the map.\n * \n * @sample
samples.collections.Collections.Transformations.associateByToWithValueTransform\n */\npublic inline fun <T, K,
V, M : MutableMap<in K, in V>> Iterable<T>.associateByTo(destination: M, keySelector: (T) -> K,
valueTransform: (T) -> V): M {\n    for (element in this) {\n        destination.put(keySelector(element),
valueTransform(element))\n    }\n    return destination\n}\n\n/**\n * Populates and returns the [destination] mutable
map with key-value pairs\n * provided by [transform] function applied to each element of the given collection.\n *
\n * If any of two pairs would have the same key the last one gets added to the map.\n * \n * @sample
samples.collections.Collections.Transformations.associateTo\n */\npublic inline fun <T, K, V, M : MutableMap<in
K, in V>> Iterable<T>.associateTo(destination: M, transform: (T) -> Pair<K, V>): M {\n    for (element in this) {\n
destination += transform(element)\n    }\n    return destination\n}\n\n/**\n * Returns a [Map] where keys are
elements from the given collection and values are\n * produced by the [valueSelector] function applied to each
element.\n * \n * If any two elements are equal, the last one gets added to the map.\n * \n * The returned map

```



```

flatMapIndexedTo(ArrayList<R>(), transform)\n\n\n**\n * Appends all elements yielded from results of
[transform] function being invoked on each element\n * and its index in the original collection, to the given
[destination].\n
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.jvm.JvmName("flatMapIndexedIterableTo")\n@kotlin.internal.InlineOnly\npubli
c inline fun <T, R, C : MutableCollection<in R>> Iterable<T>.flatMapIndexedTo(destination: C, transform: (index:
Int, T) -> Iterable<R>): C {\n    var index = 0\n    for (element in this) {\n        val list =
transform(checkIndexOverflow(index++), element)\n        destination.addAll(list)\n    }\n    return
destination\n}\n\n**\n * Appends all elements yielded from results of [transform] function being invoked on each
element\n * and its index in the original collection, to the given [destination].\n
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.jvm.JvmName("flatMapIndexedSequenceTo")\n@kotlin.internal.InlineOnly\npub
lic inline fun <T, R, C : MutableCollection<in R>> Iterable<T>.flatMapIndexedTo(destination: C, transform:
(index: Int, T) -> Sequence<R>): C {\n    var index = 0\n    for (element in this) {\n        val list =
transform(checkIndexOverflow(index++), element)\n        destination.addAll(list)\n    }\n    return
destination\n}\n\n**\n * Appends all elements yielded from results of [transform] function being invoked on each
element of original collection, to the given [destination].\n * \npublic inline fun <T, R, C : MutableCollection<in
R>> Iterable<T>.flatMapTo(destination: C, transform: (T) -> Iterable<R>): C {\n    for (element in this) {\n        val
list = transform(element)\n        destination.addAll(list)\n    }\n    return destination\n}\n\n**\n * Appends all
elements yielded from results of [transform] function being invoked on each element of original collection, to the
given [destination].\n
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.jvm.JvmName("flatMapSequenceTo")\npublic inline fun <T, R, C :
MutableCollection<in R>> Iterable<T>.flatMapTo(destination: C, transform: (T) -> Sequence<R>): C {\n    for
(element in this) {\n        val list = transform(element)\n        destination.addAll(list)\n    }\n    return
destination\n}\n\n**\n * Groups elements of the original collection by the key returned by the given [keySelector]
function\n * applied to each element and returns a map where each group key is associated with a list of
corresponding elements.\n * \n * The returned map preserves the entry iteration order of the keys produced from the
original collection.\n * \n * @sample samples.collections.Collections.Transformations.groupBy\n * \npublic inline
fun <T, K> Iterable<T>.groupBy(keySelector: (T) -> K): Map<K, List<T>> {\n    return
groupByTo(LinkedHashMap<K, MutableList<T>>(), keySelector)\n}\n\n**\n * Groups values returned by the
[valueTransform] function applied to each element of the original collection\n * by the key returned by the given
[keySelector] function applied to the element\n * and returns a map where each group key is associated with a list of
corresponding values.\n * \n * The returned map preserves the entry iteration order of the keys produced from the
original collection.\n * \n * @sample samples.collections.Collections.Transformations.groupByKeysAndValues\n * \npublic inline fun <T, K, V> Iterable<T>.groupBy(keySelector: (T) -> K, valueTransform: (T) -> V): Map<K,
List<V>> {\n    return groupByTo(LinkedHashMap<K, MutableList<V>>(), keySelector,
valueTransform)\n}\n\n**\n * Groups elements of the original collection by the key returned by the given
[keySelector] function\n * applied to each element and puts to the [destination] map each group key associated with
a list of corresponding elements.\n * \n * @return The [destination] map.\n * \n * @sample
samples.collections.Collections.Transformations.groupBy\n * \npublic inline fun <T, K, M : MutableMap<in K,
MutableList<T>>> Iterable<T>.groupByTo(destination: M, keySelector: (T) -> K): M {\n    for (element in this) {\n
        val key = keySelector(element)\n        val list = destination.getOrPut(key) { ArrayList<T>() }\n
list.add(element)\n    }\n    return destination\n}\n\n**\n * Groups values returned by the [valueTransform] function
applied to each element of the original collection\n * by the key returned by the given [keySelector] function applied
to the element\n * and puts to the [destination] map each group key associated with a list of corresponding values.\n
* \n * @return The [destination] map.\n * \n * @sample
samples.collections.Collections.Transformations.groupByKeysAndValues\n * \npublic inline fun <T, K, V, M :

```

```

MutableMap<in K, MutableList<V>>> Iterable<T>.groupByTo(destination: M, keySelector: (T) -> K,
valueTransform: (T) -> V): M {
    for (element in this) {
        val key = keySelector(element)
        val list = destination.getOrPut(key) { ArrayList<V>() }
        list.add(valueTransform(element))
    }
    return destination
}

Creates a [Grouping] source from a collection to be used later with one of group-and-fold
operations using the specified [keySelector] function to extract a key from each element.
@sample
samples.collections.Grouping.groupingByEachCount

@SinceKotlin("1.1")
public inline fun <T, K>
Iterable<T>.groupingBy(crossinline keySelector: (T) -> K): Grouping<T, K> {
    return object : Grouping<T, K> {
        override fun sourceIterator(): Iterator<T> = this@groupingBy.iterator()
        override fun keyOf(element: T): K = keySelector(element)
    }
}

Returns a list containing the results of applying the given
[transform] function to each element in the original collection.
@sample
samples.collections.Collections.Transformations.map

public inline fun <T, R> Iterable<T>.map(transform:
(T) -> R): List<R> {
    return mapTo(ArrayList<R>(collectionSizeOrDefault(10)), transform)
}

Returns a list containing the results of applying the given [transform] function to each element and its index in
the original collection.
@param [transform] function that takes the index of an element and the element itself
and returns the result of the transform applied to the element.
public inline fun <T, R>
Iterable<T>.mapIndexed(transform: (index: Int, T) -> R): List<R> {
    return
mapIndexedTo(ArrayList<R>(collectionSizeOrDefault(10)), transform)
}

Returns a list containing only
the non-null results of applying the given [transform] function to each element and its index in the original
collection.
@param [transform] function that takes the index of an element and the element itself
and returns the result of the transform applied to the element.
public inline fun <T, R : Any>
Iterable<T>.mapIndexedNotNull(transform: (index: Int, T) -> R?): List<R> {
    return
mapIndexedNotNullTo(ArrayList<R>(), transform)
}

Applies the given [transform] function to each
element and its index in the original collection and appends only the non-null results to the given [destination].
@param [transform] function that takes the index of an element and the element itself
and returns the result of
the transform applied to the element.
public inline fun <T, R : Any, C : MutableCollection<in R>>
Iterable<T>.mapIndexedNotNullTo(destination: C, transform: (index: Int, T) -> R?): C {
    forEachIndexed {
index, element -> transform(index, element)?.let { destination.add(it) }
}
    return destination
}

Applies the given [transform] function to each element and its index in the original collection
and appends the
results to the given [destination].
@param [transform] function that takes the index of an element and the
element itself
and returns the result of the transform applied to the element.
public inline fun <T, R, C :
MutableCollection<in R>> Iterable<T>.mapIndexedTo(destination: C, transform: (index: Int, T) -> R): C {
    var
index = 0
    for (item in this)
        destination.add(transform(checkIndexOverflow(index++), item))
    return
destination
}

Returns a list containing only the non-null results of applying the given [transform]
function to each element in the original collection.
@sample
samples.collections.Collections.Transformations.mapNotNull

public inline fun <T, R : Any>
Iterable<T>.mapNotNull(transform: (T) -> R?): List<R> {
    return mapNotNullTo(ArrayList<R>(),
transform)
}

Applies the given [transform] function to each element in the original collection
and appends only the non-null results to the given [destination].
public inline fun <T, R : Any, C :
MutableCollection<in R>> Iterable<T>.mapNotNullTo(destination: C, transform: (T) -> R?): C {
    forEach {
element -> transform(element)?.let { destination.add(it) }
}
    return destination
}

Applies the given
[transform] function to each element of the original collection and appends the results to the given
[destination].
public inline fun <T, R, C : MutableCollection<in R>> Iterable<T>.mapTo(destination: C,
transform: (T) -> R): C {
    for (item in this)
        destination.add(transform(item))
    return
destination
}

Returns a lazy [Iterable] that wraps each element of the original collection into an
[IndexValue] containing the index of that element and the element itself.
public fun <T>
Iterable<T>.withIndex(): Iterable<IndexedValue<T>> {
    return IndexingIterable { iterator() }
}

Returns a list containing only distinct elements from the given collection.
Among equal elements of the
given collection, only the first one will be present in the resulting list.
The elements in the resulting list are in the

```

same order as they were in the source collection.

```

samples.collections.Collections.Transformations.distinctAndDistinctBy
public fun <T> Iterable<T>.distinct():
List<T> {
    return this.toMutableSet().toList()
}

```

Returns a list containing only elements from the given collection having distinct keys returned by the given [selector] function. Among elements of the given collection with equal keys, only the first one will be present in the resulting list. The elements in the resulting list are in the same order as they were in the source collection.

```

samples.collections.Collections.Transformations.distinctAndDistinctBy
public inline fun <T, K>
Iterable<T>.distinctBy(selector: (T) -> K): List<T> {
    val set = HashSet<K>()
    val list = ArrayList<T>()
    for (e in this) {
        val key = selector(e)
        if (set.add(key)) list.add(e)
    }
    return list
}

```

Returns a set containing all elements that are contained by both this collection and the specified collection. The returned set preserves the element iteration order of the original collection. To get a set containing all elements that are contained at least in one of these collections use [union].

```

public infix fun <T>
Iterable<T>.intersect(other: Iterable<T>): Set<T> {
    val set = this.toMutableSet()
    set.retainAll(other)
    return set
}

```

Returns a set containing all elements that are contained by this collection and not contained by the specified collection. The returned set preserves the element iteration order of the original collection.

```

public infix fun <T> Iterable<T>.subtract(other: Iterable<T>): Set<T> {
    val set =
this.toMutableSet()
    set.removeAll(other)
    return set
}

```

Returns a new [MutableSet] containing all distinct elements from the given collection. The returned set preserves the element iteration order of the original collection.

```

public fun <T> Iterable<T>.toMutableSet(): MutableSet<T> {
    return when (this) {
        is Collection<T> -> LinkedHashSet(this)
        else -> toCollection(LinkedHashSet<T>())
    }
}

```

Returns a set containing all distinct elements from both collections. The returned set preserves the element iteration order of the original collection. Those elements of the [other] collection that are unique are iterated in the end in the order of the [other] collection. To get a set containing all elements that are contained in both collections use [intersect].

```

public infix fun <T> Iterable<T>.union(other: Iterable<T>): Set<T> {
    val set = this.toMutableSet()
    set.addAll(other)
    return set
}

```

Returns `true` if all elements match the given [predicate].

```

samples.collections.Collections.Aggregates.all
public inline fun <T>
Iterable<T>.all(predicate: (T) -> Boolean): Boolean {
    if (this is Collection && isEmpty()) return true
    for (element in this) if (!predicate(element)) return false
    return true
}

```

Returns `true` if collection has at least one element.

```

samples.collections.Collections.Aggregates.any
public fun <T>
Iterable<T>.any(): Boolean {
    if (this is Collection) return !isEmpty()
    return iterator().hasNext()
}

```

Returns `true` if at least one element matches the given [predicate].

```

samples.collections.Collections.Aggregates.anyWithPredicate
public inline fun <T>
Iterable<T>.any(predicate: (T) -> Boolean): Boolean {
    if (this is Collection && isEmpty()) return false
    for (element in this) if (predicate(element)) return true
    return false
}

```

Returns the number of elements in this collection.

```

public fun <T> Iterable<T>.count(): Int {
    if (this is Collection) return size
    var count = 0
    for (element in this) checkCountOverflow(++count)
    return count
}

```

Returns the number of elements in this collection.

```

@kotlin.internal.InlineOnly
public inline fun <T> Collection<T>.count(): Int {
    return size
}

```

Returns the number of elements matching the given [predicate].

```

public inline fun <T>
Iterable<T>.count(predicate: (T) -> Boolean): Int {
    if (this is Collection && isEmpty()) return 0
    var count = 0
    for (element in this) if (predicate(element)) checkCountOverflow(++count)
    return count
}

```

Accumulates value starting with [initial] value and applying [operation] from left to right to current accumulator value and each element. Returns the specified [initial] value if the collection is empty.

```

public inline fun <T, R> Iterable<T>.fold(initial: R, operation: (acc: R, T) -> R): R {
    var accumulator = initial
    for (element in this) accumulator = operation(accumulator, element)
    return accumulator
}

```

Accumulates value starting with [initial] value and applying [operation] from left to right to current accumulator value and each element with its index in the original collection. Returns the specified [initial] value if the collection is empty.

```

public inline fun <T, R> Iterable<T>.fold(initial: R, operation: (acc: R, Int, T) -> R): R {
    var accumulator = initial
    for (index in 0 until size) accumulator = operation(accumulator, index, this[index])
    return accumulator
}

```

element, current accumulator value and the element itself, and calculates the next accumulator value.

```

*public inline fun <T, R> Iterable<T>.foldIndexed(initial: R, operation: (index: Int, acc: R, T) -> R): R {
    var index = 0
    var accumulator = initial
    for (element in this) accumulator =
        operation(checkIndexOverflow(index++), accumulator, element)
    return accumulator
}

```

Accumulates value starting with [initial] value and applying [operation] from right to left to each element and current accumulator value. Returns the specified [initial] value if the list is empty. @param [operation] function that takes an element and current accumulator value, and calculates the next accumulator value.

```

*public inline fun <T, R> List<T>.foldRight(initial: R, operation: (T, acc: R) -> R): R {
    var accumulator = initial
    if (!isEmpty()) {
        val iterator = listIterator(size)
        while (iterator.hasPrevious()) {
            accumulator = operation(iterator.previous(), accumulator)
        }
    }
    return accumulator
}

```

Accumulates value starting with [initial] value and applying [operation] from right to left to each element with its index in the original list and current accumulator value. Returns the specified [initial] value if the list is empty. @param [operation] function that takes the index of an element, the element itself and current accumulator value, and calculates the next accumulator value.

```

*public inline fun <T, R> List<T>.foldRightIndexed(initial: R, operation: (index: Int, T, acc: R) -> R): R {
    var accumulator = initial
    if (!isEmpty()) {
        val iterator = listIterator(size)
        while (iterator.hasPrevious()) {
            val index = iterator.previousIndex()
            accumulator = operation(index, iterator.previous(), accumulator)
        }
    }
    return accumulator
}

```

Performs the given [action] on each element.

```

*internal.HidesMembers
*public inline fun <T> Iterable<T>.forEach(action: (T) -> Unit): Unit {
    for (element in this) action(element)
}

```

Performs the given [action] on each element, providing sequential index with the element. @param [action] function that takes the index of an element and the element itself and performs the action on the element.

```

*public inline fun <T> Iterable<T>.forEachIndexed(action: (index: Int, T) -> Unit): Unit {
    var index = 0
    for (item in this) action(checkIndexOverflow(index++), item)
}

```

@Deprecated("Use maxOrNull instead.")

```

ReplaceWith("this.maxOrNull()")
@DeprecatedSinceKotlin(warningSince = "1.4", errorSince = "1.5", hiddenSince = "1.6")
@SinceKotlin("1.1")
public fun Iterable<Double>.max(): Double? {
    return maxOrNull()
}

```

@Deprecated("Use maxOrNull instead.")

```

ReplaceWith("this.maxOrNull()")
@DeprecatedSinceKotlin(warningSince = "1.4", errorSince = "1.5", hiddenSince = "1.6")
@SinceKotlin("1.1")
public fun Iterable<Float>.max(): Float? {
    return maxOrNull()
}

```

@Deprecated("Use maxOrNull instead.")

```

ReplaceWith("this.maxOrNull()")
@DeprecatedSinceKotlin(warningSince = "1.4", errorSince = "1.5", hiddenSince = "1.6")
public fun <T : Comparable<T>> Iterable<T>.max(): T? {
    return maxOrNull()
}

```

@Deprecated("Use maxByOrNull instead.")

```

ReplaceWith("this.maxByOrNull(selector)")
@DeprecatedSinceKotlin(warningSince = "1.4", errorSince = "1.5", hiddenSince = "1.6")
public inline fun <T, R : Comparable<R>> Iterable<T>.maxBy(selector: (T) -> R): T? {
    return maxByOrNull(selector)
}

```

Returns the first element yielding the largest value of the given function or `null` if there are no elements. @sample

```

samples.collections.Collections.Aggregates.maxByOrNull

```

@SinceKotlin("1.4")

```

*public inline fun <T, R : Comparable<R>> Iterable<T>.maxByOrNull(selector: (T) -> R): T? {
    val iterator = iterator()
    if (!iterator.hasNext()) return null
    var maxElem = iterator.next()
    if (!iterator.hasNext()) return maxElem
    var maxVal = selector(maxElem)
    do {
        val e = iterator.next()
        val v = selector(e)
        if (maxVal < v) {
            maxElem = e
            maxVal = v
        }
    } while (iterator.hasNext())
    return maxElem
}

```

Returns the largest value among all values produced by [selector] function applied to each element in the collection. If any of values produced by [selector] function is `NaN`, the returned result is `NaN`. @throws NoSuchElementException if the collection is empty.

```

*SinceKotlin("1.4")
*OptIn(kotlin.experimental.ExperimentalTypeInference::class)
*OverloadResolutionByLambdaReturnType
*internal.InlineOnly
*public inline fun <T> Iterable<T>.maxOf(selector: (T) -> Double): Double {
    val iterator = iterator()
    if (!iterator.hasNext()) throw NoSuchElementException()
    var

```



```

maxValue = selector(iterator.next())\n  while (iterator.hasNext()) {\n    val v = selector(iterator.next())\n    maxValue = maxOf(maxValue, v)\n  }\n  return maxValue\n}\n\n/**\n * Returns the largest value among all values produced by [selector] function\n * applied to each element in the collection.\n * \n * If any of values produced by [selector] function is `NaN`, the returned result is `NaN`.\n * \n * @throws NoSuchElementException if the collection is empty.\n */\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolutionByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <T> Iterable<T>.maxOf(selector: (T) -> Float): Float {\n  val iterator = iterator()\n  if (!iterator.hasNext()) throw NoSuchElementException()\n  var\n  maxValue = selector(iterator.next())\n  while (iterator.hasNext()) {\n    val v = selector(iterator.next())\n    maxValue = maxOf(maxValue, v)\n  }\n  return maxValue\n}\n\n/**\n * Returns the largest value among all values produced by [selector] function\n * applied to each element in the collection.\n * \n * @throws NoSuchElementException if the collection is empty.\n */\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolutionByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <T, R : Comparable<R>> Iterable<T>.maxOf(selector: (T) -> R): R {\n  val iterator = iterator()\n  if (!iterator.hasNext()) throw\n  NoSuchElementException()\n  var maxValue = selector(iterator.next())\n  while (iterator.hasNext()) {\n    val v = selector(iterator.next())\n    if (maxValue < v) {\n      maxValue = v\n    }\n  }\n  return\n  maxValue\n}\n\n/**\n * Returns the largest value among all values produced by [selector] function\n * applied to each element in the collection or `null` if there are no elements.\n * \n * If any of values produced by [selector] function is `NaN`, the returned result is `NaN`.\n */\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolutionByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <T> Iterable<T>.maxOfOrNull(selector: (T) -> Double): Double? {\n  val iterator = iterator()\n  if (!iterator.hasNext()) return null\n  var maxValue =\n  selector(iterator.next())\n  while (iterator.hasNext()) {\n    val v = selector(iterator.next())\n    maxValue =\n    maxOf(maxValue, v)\n  }\n  return maxValue\n}\n\n/**\n * Returns the largest value among all values produced by [selector] function\n * applied to each element in the collection or `null` if there are no elements.\n * \n * If any of values produced by [selector] function is `NaN`, the returned result is `NaN`.\n */\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolutionByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <T> Iterable<T>.maxOfOrNull(selector: (T) -> Float): Float? {\n  val iterator = iterator()\n  if (!iterator.hasNext()) return null\n  var maxValue =\n  selector(iterator.next())\n  while (iterator.hasNext()) {\n    val v = selector(iterator.next())\n    maxValue =\n    maxOf(maxValue, v)\n  }\n  return maxValue\n}\n\n/**\n * Returns the largest value among all values produced by [selector] function\n * applied to each element in the collection or `null` if there are no elements.\n * \n * If any of values produced by [selector] function is `NaN`, the returned result is `NaN`.\n */\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolutionByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <T, R : Comparable<R>> Iterable<T>.maxOfOrNull(selector: (T) -> R): R? {\n  val iterator = iterator()\n  if (!iterator.hasNext()) return\n  null\n  var maxValue = selector(iterator.next())\n  while (iterator.hasNext()) {\n    val v =\n    selector(iterator.next())\n    if (maxValue < v) {\n      maxValue = v\n    }\n  }\n  return\n  maxValue\n}\n\n/**\n * Returns the largest value according to the provided [comparator]\n * among all values produced by [selector] function applied to each element in the collection.\n * \n * @throws\n  NoSuchElementException if the collection is empty.\n */\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolutionByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <T, R> Iterable<T>.maxOfWith(comparator: Comparator<in R>, selector: (T) -> R): R {\n  val iterator = iterator()\n  if\n  (!iterator.hasNext()) throw NoSuchElementException()\n  var maxValue = selector(iterator.next())\n  while\n  (iterator.hasNext()) {\n    val v = selector(iterator.next())\n    if (comparator.compare(maxValue, v) < 0) {\n     \n      maxValue = v\n    }\n  }\n  return maxValue\n}\n\n/**\n * Returns the largest value according to the provided [comparator]\n * among all values produced by [selector] function applied to each element in the collection or `null`

```

```

if there are no elements.\n
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <T, R>
Iterable<T>.maxOfWithOrNull(comparator: Comparator<in R>, selector: (T) -> R): R? {\n    val iterator =
iterator()\n    if (!iterator.hasNext()) return null\n    var max = selector(iterator.next())\n    while
(iterator.hasNext()) {\n        val v = selector(iterator.next())\n        if (comparator.compare(max, v) < 0) {\n
            max = v\n        }\n    }\n    return max\n}\n\n/**\n * Returns the largest element or `null` if there are no
elements.\n * \n * If any of elements is `NaN` returns `NaN`.\n */\n*\n@SinceKotlin("1.4")\npublic fun
Iterable<Double>.maxOrNull(): Double? {\n    val iterator = iterator()\n    if (!iterator.hasNext()) return null\n
    var max = iterator.next()\n    while (iterator.hasNext()) {\n        val e = iterator.next()\n        max =
maxOf(max, e)\n    }\n    return max\n}\n\n/**\n * Returns the largest element or `null` if there are no elements.\n
* \n * If any of elements is `NaN` returns `NaN`.\n */\n*\n@SinceKotlin("1.4")\npublic fun Iterable<Float>.maxOrNull():
Float? {\n    val iterator = iterator()\n    if (!iterator.hasNext()) return null\n    var max = iterator.next()\n
    while (iterator.hasNext()) {\n        val e = iterator.next()\n        max = maxOf(max, e)\n    }\n    return
max\n}\n\n/**\n * Returns the largest element or `null` if there are no elements.\n */\n*\n@SinceKotlin("1.4")\npublic fun <T :
Comparable<T>> Iterable<T>.maxOrNull(): T? {\n    val iterator = iterator()\n    if (!iterator.hasNext()) return null\n
    var max = iterator.next()\n    while (iterator.hasNext()) {\n        val e = iterator.next()\n        if (max <
e) max = e\n    }\n    return max\n}\n\n@Deprecated("Use maxWithOrNull instead.")\nReplaceWith("this.maxWithOrNull(comparator)")\n@DeprecatedSinceKotlin(warningSince = "1.4", errorSince = "1.5", hiddenSince = "1.6")\npublic fun <T> Iterable<T>.maxWith(comparator: Comparator<in T>): T? {\n    return
maxWithOrNull(comparator)\n}\n\n/**\n * Returns the first element having the largest value according to the
provided [comparator] or `null` if there are no elements.\n */\n*\n@SinceKotlin("1.4")\npublic fun <T>
Iterable<T>.maxWithOrNull(comparator: Comparator<in T>): T? {\n    val iterator = iterator()\n    if
(!iterator.hasNext()) return null\n    var max = iterator.next()\n    while (iterator.hasNext()) {\n        val e =
iterator.next()\n        if (comparator.compare(max, e) < 0) max = e\n    }\n    return max\n}\n\n@Deprecated("Use
minOrNull instead.")\nReplaceWith("this.minOrNull()")\n@DeprecatedSinceKotlin(warningSince = "1.4", errorSince = "1.5", hiddenSince = "1.6")\n@SinceKotlin("1.1")\npublic fun Iterable<Double>.min(): Double? {\n    return
minOrNull()\n}\n\n@Deprecated("Use minOrNull instead.")\nReplaceWith("this.minOrNull()")\n@DeprecatedSinceKotlin(warningSince = "1.4", errorSince = "1.5", hiddenSince = "1.6")\n@SinceKotlin("1.1")\npublic fun Iterable<Float>.min(): Float? {\n    return
minOrNull()\n}\n\n@Deprecated("Use minOrNull instead.")\nReplaceWith("this.minOrNull()")\n@DeprecatedSinceKotlin(warningSince = "1.4", errorSince = "1.5", hiddenSince = "1.6")\npublic fun <T : Comparable<T>> Iterable<T>.min(): T? {\n    return
minOrNull()\n}\n\n@Deprecated("Use minByOrNull instead.")\nReplaceWith("this.minByOrNull(selector)")\n@DeprecatedSinceKotlin(warningSince = "1.4", errorSince = "1.5", hiddenSince = "1.6")\npublic inline fun <T, R : Comparable<R>> Iterable<T>.minBy(selector: (T) -> R): T? {\n    return
minByOrNull(selector)\n}\n\n/**\n * Returns the first element yielding the smallest value of the
given function or `null` if there are no elements.\n * \n * @sample
samples.collections.Collections.Aggregates.minByOrNull\n */\n*\n@SinceKotlin("1.4")\npublic inline fun <T, R :
Comparable<R>> Iterable<T>.minByOrNull(selector: (T) -> R): T? {\n    val iterator = iterator()\n    if
(!iterator.hasNext()) return null\n    var minElem = iterator.next()\n    if (!iterator.hasNext()) return minElem\n
    var min = selector(minElem)\n    do {\n        val e = iterator.next()\n        val v = selector(e)\n        if (min >
v) {\n            minElem = e\n            min = v\n        }\n    } while (iterator.hasNext())\n    return
minElem\n}\n\n/**\n * Returns the smallest value among all values produced by [selector] function\n * applied to
each element in the collection.\n * \n * If any of values produced by [selector] function is `NaN`, the returned result
is `NaN`.\n * \n * @throws NoSuchElementException if the collection is empty.\n */\n*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <T> Iterable<T>.minOf(selector: (T) ->

```

Double): Double {
 val iterator = iterator()
 if (!iterator.hasNext()) throw NoSuchElementException()
 var minValue = selector(iterator.next())
 while (iterator.hasNext()) {
 val v = selector(iterator.next())
 minValue = minOf(minValue, v)
 }
 return minValue
}
 * Returns the smallest value among all values produced by [selector] function * applied to each element in the collection.
 * If any of values produced by [selector] function is `NaN`, the returned result is `NaN`.
 * @throws NoSuchElementException if the collection is empty.

*
@SinceKotlin("1.4")
@OptIn(kotlin.experimental.ExperimentalTypeInference::class)
@OverloadResolutionByLambdaReturnType
@kotlin.internal.InlineOnly
public inline fun <T> Iterable<T>.minOf(selector: (T) ->

Float): Float {
 val iterator = iterator()
 if (!iterator.hasNext()) throw NoSuchElementException()
 var minValue = selector(iterator.next())
 while (iterator.hasNext()) {
 val v = selector(iterator.next())
 minValue = minOf(minValue, v)
 }
 return minValue
}
 * Returns the smallest value among all values produced by [selector] function * applied to each element in the collection.
 * @throws NoSuchElementException if the collection is empty.

*
@SinceKotlin("1.4")
@OptIn(kotlin.experimental.ExperimentalTypeInference::class)
@OverloadResolutionByLambdaReturnType
@kotlin.internal.InlineOnly
public inline fun <T, R : Comparable<R>>

Iterable<T>.minOf(selector: (T) -> R): R {
 val iterator = iterator()
 if (!iterator.hasNext()) throw NoSuchElementException()
 var minValue = selector(iterator.next())
 while (iterator.hasNext()) {
 val v = selector(iterator.next())
 if (minValue > v) {
 minValue = v
 }
 }
 return minValue
}
 * Returns the smallest value among all values produced by [selector] function * applied to each element in the collection or `null` if there are no elements.
 * If any of values produced by [selector] function is `NaN`, the returned result is `NaN`.

*
@SinceKotlin("1.4")
@OptIn(kotlin.experimental.ExperimentalTypeInference::class)
@OverloadResolutionByLambdaReturnType
@kotlin.internal.InlineOnly
public inline fun <T> Iterable<T>.minOfOrNull(selector: (T)

-> Double): Double? {
 val iterator = iterator()
 if (!iterator.hasNext()) return null
 var minValue = selector(iterator.next())
 while (iterator.hasNext()) {
 val v = selector(iterator.next())
 minValue = minOf(minValue, v)
 }
 return minValue
}
 * Returns the smallest value among all values produced by [selector] function * applied to each element in the collection or `null` if there are no elements.
 * If any of values produced by [selector] function is `NaN`, the returned result is `NaN`.

*
@SinceKotlin("1.4")
@OptIn(kotlin.experimental.ExperimentalTypeInference::class)
@OverloadResolutionByLambdaReturnType
@kotlin.internal.InlineOnly
public inline fun <T> Iterable<T>.minOfOrNull(selector: (T)

-> Float): Float? {
 val iterator = iterator()
 if (!iterator.hasNext()) return null
 var minValue = selector(iterator.next())
 while (iterator.hasNext()) {
 val v = selector(iterator.next())
 minValue = minOf(minValue, v)
 }
 return minValue
}
 * Returns the smallest value among all values produced by [selector] function * applied to each element in the collection or `null` if there are no elements.

*
@SinceKotlin("1.4")
@OptIn(kotlin.experimental.ExperimentalTypeInference::class)
@OverloadResolutionByLambdaReturnType
@kotlin.internal.InlineOnly
public inline fun <T, R : Comparable<R>>

Iterable<T>.minOfOrNull(selector: (T) -> R): R? {
 val iterator = iterator()
 if (!iterator.hasNext()) return null
 var minValue = selector(iterator.next())
 while (iterator.hasNext()) {
 val v = selector(iterator.next())
 if (minValue > v) {
 minValue = v
 }
 }
 return minValue
}
 * Returns the smallest value according to the provided [comparator] * among all values produced by [selector] function applied to each element in the collection.
 * @throws

NoSuchElementException if the collection is empty.

*
@SinceKotlin("1.4")
@OptIn(kotlin.experimental.ExperimentalTypeInference::class)
@OverloadResolutionByLambdaReturnType
@kotlin.internal.InlineOnly
public inline fun <T, R> Iterable<T>.minOfWith(comparator:

Comparator<in R>, selector: (T) -> R): R {
 val iterator = iterator()
 if (!iterator.hasNext()) throw NoSuchElementException()
 var minValue = selector(iterator.next())
 while (iterator.hasNext()) {
 val v = selector(iterator.next())
 if (comparator.compare(minValue, v) > 0) {
 minValue = v
 }
 }
 return minValue
}
 * Returns the smallest value according to the provided [comparator] * among all

```

values produced by [selector] function applied to each element in the collection or `null` if there are no elements.
*^@SinceKotlin("1.4")
@OptIn(kotlin.experimental.ExperimentalTypeInference::class)
@OverloadResolutionByLambdaReturnType
@kotlin.internal.InlineOnly
public inline fun <T, R>
Iterable<T>.minOfWithOrNull(comparator: Comparator<in R>, selector: (T) -> R): R? {
    val iterator = iterator()
    if (!iterator.hasNext()) return null
    var minValue = selector(iterator.next())
    while (iterator.hasNext()) {
        val v = selector(iterator.next())
        if (comparator.compare(minValue, v) > 0) {
            minValue = v
        }
    }
    return minValue
}
* Returns the smallest element or `null` if there are no elements.
* If any of elements is `NaN` returns `NaN`.
*^@SinceKotlin("1.4")
public fun
Iterable<Double>.minOrNull(): Double? {
    val iterator = iterator()
    if (!iterator.hasNext()) return null
    var min = iterator.next()
    while (iterator.hasNext()) {
        val e = iterator.next()
        min = minOf(min, e)
    }
    return min
}
* Returns the smallest element or `null` if there are no elements.
* If any of elements is `NaN` returns `NaN`.
*^@SinceKotlin("1.4")
public fun
Iterable<Float>.minOrNull(): Float? {
    val iterator = iterator()
    if (!iterator.hasNext()) return null
    var min = iterator.next()
    while (iterator.hasNext()) {
        val e = iterator.next()
        min = minOf(min, e)
    }
    return min
}
* Returns the smallest element or `null` if there are no elements.
*^@SinceKotlin("1.4")
public fun <T : Comparable<T>>
Iterable<T>.minOrNull(): T? {
    val iterator = iterator()
    if (!iterator.hasNext()) return null
    var min = iterator.next()
    while (iterator.hasNext()) {
        val e = iterator.next()
        if (min > e) min = e
    }
    return min
}
@Deprecated("Use minWithOrNull instead.")
ReplaceWith("this.minWithOrNull(comparator)")
@DeprecatedSinceKotlin(warningSince = "1.4", errorSince = "1.5", hiddenSince = "1.6")
public fun <T> Iterable<T>.minWith(comparator: Comparator<in T>): T? {
    return minWithOrNull(comparator)
}
* Returns the first element having the smallest value according to the provided [comparator] or `null` if there are no elements.
*^@SinceKotlin("1.4")
public fun <T>
Iterable<T>.minWithOrNull(comparator: Comparator<in T>): T? {
    val iterator = iterator()
    if (!iterator.hasNext()) return null
    var min = iterator.next()
    while (iterator.hasNext()) {
        val e = iterator.next()
        if (comparator.compare(min, e) > 0) min = e
    }
    return min
}
* Returns `true` if the collection has no elements.
* @sample samples.collections.Collections.Aggregates.none
*^@public fun
<T> Iterable<T>.none(): Boolean {
    if (this is Collection) return isEmpty()
    return !iterator().hasNext()
}
* Returns `true` if no elements match the given [predicate].
* @sample samples.collections.Collections.Aggregates.noneWithPredicate
*^@public inline fun <T>
Iterable<T>.none(predicate: (T) -> Boolean): Boolean {
    if (this is Collection && isEmpty()) return true
    for (element in this) if (predicate(element)) return false
    return true
}
* Performs the given [action] on each element and returns the collection itself afterwards.
*^@SinceKotlin("1.1")
public inline fun <T, C :
Iterable<T>> C.onEach(action: (T) -> Unit): C {
    return apply { for (element in this) action(element) }
}
* Performs the given [action] on each element, providing sequential index with the element,
* and returns the collection itself afterwards.
* @param [action] function that takes the index of an element and the element itself
* and performs the action on the element.
*^@SinceKotlin("1.4")
public inline fun <T, C :
Iterable<T>> C.onEachIndexed(action: (index: Int, T) -> Unit): C {
    return apply { forEachIndexed(action) }
}
* Accumulates value starting with the first element and applying [operation] from left to right
* to current accumulator value and each element.
* @param [operation] function that takes current accumulator value and an element,
* and calculates the next accumulator value.
* @sample samples.collections.Collections.Aggregates.reduce
*^@public inline fun <S, T : S> Iterable<T>.reduce(operation: (acc: S, T) -> S): S {
    val iterator = this.iterator()
    if (!iterator.hasNext()) throw UnsupportedOperationException("Empty collection can't be reduced.")
    var accumulator: S = iterator.next()
    while (iterator.hasNext()) {
        accumulator = operation(accumulator, iterator.next())
    }
    return accumulator
}
* Accumulates value starting with the first element and applying [operation] from left to right
* to current accumulator value and each element with its index in the original collection.
* Throws an exception if this collection is empty. If the collection can be empty in an

```

expected way, please use [reduceIndexedOrNull] instead. It returns `null` when its receiver is empty.

```

    @param [operation] function that takes the index of an element, current accumulator value and the element itself,
    * and calculates the next accumulator value.
    @sample samples.collections.Collections.Aggregates.reduce
    *
    public inline fun <S, T : S> Iterable<T>.reduceIndexed(operation: (index: Int, acc: S, T) -> S): S {
        val iterator = this.iterator()
        if (!iterator.hasNext()) throw UnsupportedOperationException("Empty collection can't be reduced.")
        var index = 1
        var accumulator: S = iterator.next()
        while (iterator.hasNext()) {
            accumulator = operation(checkIndexOverflow(index++), accumulator, iterator.next())
        }
        return accumulator
    }
    * Accumulates value starting with the first element and applying [operation] from left to right
    * to current accumulator value and each element with its index in the original collection.
    * Returns `null` if the collection is empty.
    @param [operation] function that takes the index of an element, current accumulator value and the element itself,
    * and calculates the next accumulator value.
    @sample samples.collections.Collections.Aggregates.reduceOrNull
    *
    @SinceKotlin("1.4")
    public inline fun <S, T : S> Iterable<T>.reduceIndexedOrNull(operation: (index: Int, acc: S, T) -> S): S? {
        val iterator = this.iterator()
        if (!iterator.hasNext()) return null
        var index = 1
        var accumulator: S = iterator.next()
        while (iterator.hasNext()) {
            accumulator = operation(checkIndexOverflow(index++), accumulator, iterator.next())
        }
        return accumulator
    }
    * Accumulates value starting with the first element and applying [operation] from left to right
    * to current accumulator value and each element.
    * Returns `null` if the collection is empty.
    @param [operation] function that takes current accumulator value and an element,
    * and calculates the next accumulator value.
    @sample samples.collections.Collections.Aggregates.reduceOrNull
    *
    @SinceKotlin("1.4")
    @WasExperimental(ExperimentalStdlibApi::class)
    public inline fun <S, T : S> Iterable<T>.reduceOrNull(operation: (acc: S, T) -> S): S? {
        val iterator = this.iterator()
        if (!iterator.hasNext()) return null
        var accumulator: S = iterator.next()
        while (iterator.hasNext()) {
            accumulator = operation(accumulator, iterator.next())
        }
        return accumulator
    }
    * Accumulates value starting with the last element and applying [operation] from right to left
    * to each element and current accumulator value.
    * Throws an exception if this list is empty. If the list can be empty in an expected way,
    * please use [reduceRightOrNull] instead. It returns `null` when its receiver is empty.
    @param [operation] function that takes an element and current accumulator value,
    * and calculates the next accumulator value.
    @sample samples.collections.Collections.Aggregates.reduceRight
    *
    public inline fun <S, T : S> List<T>.reduceRight(operation: (T, acc: S) -> S): S {
        val iterator = listIterator(size)
        if (!iterator.hasPrevious())
            throw UnsupportedOperationException("Empty list can't be reduced.")
        var accumulator: S = iterator.previous()
        while (iterator.hasPrevious()) {
            accumulator = operation(iterator.previous(), accumulator)
        }
        return accumulator
    }
    * Accumulates value starting with the last element and applying [operation] from right to left
    * to each element with its index in the original list and current accumulator value.
    * Throws an exception if this list is empty. If the list can be empty in an expected way,
    * please use [reduceRightIndexedOrNull] instead. It returns `null` when its receiver is empty.
    @param [operation] function that takes the index of an element, the element itself and current accumulator
    value,
    * and calculates the next accumulator value.
    @sample samples.collections.Collections.Aggregates.reduceRight
    *
    public inline fun <S, T : S> List<T>.reduceRightIndexed(operation: (index: Int, T, acc: S) -> S): S {
        val iterator = listIterator(size)
        if (!iterator.hasPrevious())
            throw UnsupportedOperationException("Empty list can't be reduced.")
        var accumulator: S = iterator.previous()
        while (iterator.hasPrevious()) {
            val index = iterator.previousIndex()
            accumulator = operation(index, iterator.previous(), accumulator)
        }
        return accumulator
    }
    * Accumulates value starting with the last element and applying [operation] from right to left
    * to each element with its index in the original list and current accumulator value.
    * Returns `null` if the list is empty.
    @param [operation] function that takes the index of an element, the element itself and current accumulator
    value,
    * and calculates the next accumulator value.
    @sample samples.collections.Collections.Aggregates.reduceRightOrNull
    *
    @SinceKotlin("1.4")
    public inline fun <S, T : S> List<T>.reduceRightIndexedOrNull(operation: (index: Int, T, acc: S) -> S): S? {
        val iterator =

```

```

listIterator(size)\n if (!iterator.hasPrevious())\n     return null\n     var accumulator: S = iterator.previous()\n while (iterator.hasPrevious()) {\n     val index = iterator.previousIndex()\n     accumulator = operation(index,\n iterator.previous(), accumulator)\n } \n return accumulator\n}\n\n/**\n * Accumulates value starting with the last\n element and applying [operation] from right to left\n * to each element and current accumulator value.\n * \n * Returns `null` if the list is empty.\n * \n * @param [operation] function that takes an element and current\n accumulator value,\n * and calculates the next accumulator value.\n * \n * @sample\n samples.collections.Collections.Aggregates.reduceRightOrNull\n\n*/\n\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\npublic inline fun <S, T : S>\n List<T>.reduceRightOrNull(operation: (T, acc: S) -> S): S? {\n     val iterator = listIterator(size)\n     if\n (!iterator.hasPrevious())\n         return null\n         var accumulator: S = iterator.previous()\n         while\n (iterator.hasPrevious()) {\n             accumulator = operation(iterator.previous(), accumulator)\n         }\n         return\n accumulator\n}\n\n/**\n * Returns a list containing successive accumulation values generated by applying\n [operation] from left to right\n * to each element and current accumulator value that starts with [initial] value.\n * \n * Note that `acc` value passed to [operation] function should not be mutated;\n * otherwise it would affect the\n previous value in resulting list.\n * \n * @param [operation] function that takes current accumulator value and an\n element, and calculates the next accumulator value.\n * \n * @sample\n samples.collections.Collections.Aggregates.runningFold\n\n*/\n\n@SinceKotlin("1.4")\npublic inline fun <T, R>\n Iterable<T>.runningFold(initial: R, operation: (acc: R, T) -> R): List<R> {\n     val estimatedSize =\n collectionSizeOrDefault(9)\n     if (estimatedSize == 0) return listOf(initial)\n     val result =\n ArrayList<R>(estimatedSize + 1).apply { add(initial) }\n     var accumulator = initial\n     for (element in this) {\n         accumulator = operation(accumulator, element)\n         result.add(accumulator)\n     }\n     return result\n}\n\n/**\n * Returns a list containing successive accumulation values generated by applying\n [operation] from left to right\n * to each element, its index in the original collection and current accumulator value that starts with [initial] value.\n * \n * Note that `acc` value passed to [operation] function should not be mutated;\n * otherwise it would affect the\n previous value in resulting list.\n * \n * @param [operation] function that takes the index of an element, current\n accumulator value\n * and the element itself, and calculates the next accumulator value.\n * \n * @sample\n samples.collections.Collections.Aggregates.runningFold\n\n*/\n\n@SinceKotlin("1.4")\npublic inline fun <T, R>\n Iterable<T>.runningFoldIndexed(initial: R, operation: (index: Int, acc: R, T) -> R): List<R> {\n     val estimatedSize =\n collectionSizeOrDefault(9)\n     if (estimatedSize == 0) return listOf(initial)\n     val result =\n ArrayList<R>(estimatedSize + 1).apply { add(initial) }\n     var index = 0\n     var accumulator = initial\n     for\n (element in this) {\n         accumulator = operation(index++, accumulator, element)\n         result.add(accumulator)\n     }\n     return result\n}\n\n/**\n * Returns a list containing successive accumulation values generated by applying\n [operation] from left to right\n * to each element and current accumulator value that starts with the first element of\n this collection.\n * \n * Note that `acc` value passed to [operation] function should not be mutated;\n * otherwise it\n would affect the previous value in resulting list.\n * \n * @param [operation] function that takes current accumulator\n value and the element, and calculates the next accumulator value.\n * \n * @sample\n samples.collections.Collections.Aggregates.runningReduce\n\n*/\n\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\npublic inline fun <S, T : S>\n Iterable<T>.runningReduce(operation: (acc: S, T) -> S): List<S> {\n     val iterator = this.iterator()\n     if\n (!iterator.hasNext()) return emptyList()\n     var accumulator: S = iterator.next()\n     val result =\n ArrayList<S>(collectionSizeOrDefault(10)).apply { add(accumulator) }\n     while (iterator.hasNext()) {\n         accumulator = operation(accumulator, iterator.next())\n         result.add(accumulator)\n     }\n     return\n result\n}\n\n/**\n * Returns a list containing successive accumulation values generated by applying [operation] from\n left to right\n * to each element, its index in the original collection and current accumulator value that starts with the\n first element of this collection.\n * \n * Note that `acc` value passed to [operation] function should not be mutated;\n * otherwise it\n would affect the previous value in resulting list.\n * \n * @param [operation] function that takes the\n index of an element, current accumulator value\n * and the element itself, and calculates the next accumulator\n value.\n * \n * @sample\n samples.collections.Collections.Aggregates.runningReduce\n\n*/

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*\n@SinceKotlin("1.4")\npublic inline fun <S, T : S> Iterable<T>.runningReduceIndexed(operation: (index: Int,
acc: S, T) -> S): List<S> {\n    val iterator = this.iterator()\n    if (!iterator.hasNext()) return emptyList()\n    var
accumulator: S = iterator.next()\n    val result = ArrayList<S>(collectionSizeOrDefault(10)).apply {
add(accumulator) }\n    var index = 1\n    while (iterator.hasNext()) {\n        accumulator = operation(index++,
accumulator, iterator.next())\n        result.add(accumulator)\n    }\n    return result\n}\n\n/**\n * Returns a list
containing successive accumulation values generated by applying [operation] from left to right\n * to each element
and current accumulator value that starts with [initial] value.\n * \n * Note that `acc` value passed to [operation]
function should not be mutated;\n * otherwise it would affect the previous value in resulting list.\n * \n * @param
[operation] function that takes current accumulator value and an element, and calculates the next accumulator
value.\n * \n * @sample samples.collections.Collections.Aggregates.scan\n
*\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\npublic inline fun <T, R>
Iterable<T>.scan(initial: R, operation: (acc: R, T) -> R): List<R> {\n    return runningFold(initial,
operation)\n}\n\n/**\n * Returns a list containing successive accumulation values generated by applying [operation]
from left to right\n * to each element, its index in the original collection and current accumulator value that starts
with [initial] value.\n * \n * Note that `acc` value passed to [operation] function should not be mutated;\n *
otherwise it would affect the previous value in resulting list.\n * \n * @param [operation] function that takes the
index of an element, current accumulator value\n * and the element itself, and calculates the next accumulator
value.\n * \n * @sample samples.collections.Collections.Aggregates.scan\n
*\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\npublic inline fun <T, R>
Iterable<T>.scanIndexed(initial: R, operation: (index: Int, acc: R, T) -> R): List<R> {\n    return
runningFoldIndexed(initial, operation)\n}\n\n/**\n * Returns the sum of all values produced by [selector] function
applied to each element in the collection.\n * \n * @Deprecated("Use sumOf instead.")\n * ReplaceWith("this.sumOf(selector)")\n * @DeprecatedSinceKotlin(warningSince = "1.5")\n * public inline fun <T>
Iterable<T>.sumBy(selector: (T) -> Int): Int {\n    var sum: Int = 0\n    for (element in this) {\n        sum +=
selector(element)\n    }\n    return sum\n}\n\n/**\n * Returns the sum of all values produced by [selector] function
applied to each element in the collection.\n * \n * @Deprecated("Use sumOf instead.")\n * ReplaceWith("this.sumOf(selector)")\n * @DeprecatedSinceKotlin(warningSince = "1.5")\n * public inline fun <T>
Iterable<T>.sumByDouble(selector: (T) -> Double): Double {\n    var sum: Double = 0.0\n    for (element in this)
{\n        sum += selector(element)\n    }\n    return sum\n}\n\n/**\n * Returns the sum of all values produced by
[selector] function applied to each element in the collection.\n
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.jvm.JvmName("sumOfDouble")\n@kotlin.internal.InlineOnly\npublic inline fun
<T> Iterable<T>.sumOf(selector: (T) -> Double): Double {\n    var sum: Double = 0.toDouble()\n    for (element in
this) {\n        sum += selector(element)\n    }\n    return sum\n}\n\n/**\n * Returns the sum of all values produced by
[selector] function applied to each element in the collection.\n
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.jvm.JvmName("sumOfInt")\n@kotlin.internal.InlineOnly\npublic inline fun <T>
Iterable<T>.sumOf(selector: (T) -> Int): Int {\n    var sum: Int = 0.toInt()\n    for (element in this) {\n       
sum += selector(element)\n    }\n    return sum\n}\n\n/**\n * Returns the sum of all values produced by [selector]
function applied to each element in the collection.\n
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.jvm.JvmName("sumOfLong")\n@kotlin.internal.InlineOnly\npublic inline fun
<T> Iterable<T>.sumOf(selector: (T) -> Long): Long {\n    var sum: Long = 0.toLong()\n    for (element in this) {\n
        sum += selector(element)\n    }\n    return sum\n}\n\n/**\n * Returns the sum of all values produced by [selector]
function applied to each element in the collection.\n
*\n@SinceKotlin("1.5")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.jvm.JvmName("sumOfUInt")\n@WasExperimental(ExperimentalUnsignedType
s::class)\n@kotlin.internal.InlineOnly\npublic inline fun <T> Iterable<T>.sumOf(selector: (T) -> UInt): UInt {\n

```

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var sum: UInt = 0.toUInt()\n  for (element in this) {\n    sum += selector(element)\n  }\n  return
sum\n}\n\n/**\n * Returns the sum of all values produced by [selector] function applied to each element in the
collection.\n
*/\n@SinceKotlin("1.5")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.jvm.JvmName("\sumOfULong")\n@WasExperimental(ExperimentalUnsignedTy
pes::class)\n@kotlin.internal.InlineOnly\npublic inline fun <T> Iterable<T>.sumOf(selector: (T) -> ULong): ULong
{\n  var sum: ULong = 0.toULong()\n  for (element in this) {\n    sum += selector(element)\n  }\n  return
sum\n}\n\n/**\n * Returns an original collection containing all the non-`null` elements, throwing an
[IllegalArgumentException] if there are any `null` elements.\n
*/\npublic fun <T : Any>
Iterable<T?>.requireNoNulls(): Iterable<T> {\n  for (element in this) {\n    if (element == null) {\n      throw
IllegalArgumentException("\null element found in $this.")\n    }\n  }\n
}\n
@Suppress("\UNCHECKED_CAST")\n  return this as Iterable<T>\n}\n\n/**\n * Returns an original collection
containing all the non-`null` elements, throwing an [IllegalArgumentException] if there are any `null` elements.\n
*/\npublic fun <T : Any> List<T?>.requireNoNulls(): List<T> {\n  for (element in this) {\n    if (element ==
null) {\n      throw IllegalArgumentException("\null element found in $this.")\n    }\n  }\n
}\n
@Suppress("\UNCHECKED_CAST")\n  return this as List<T>\n}\n\n/**\n * Splits this collection into a list of
lists each not exceeding the given [size].\n * \n * The last list in the resulting list may have fewer elements than the
given [size].\n * \n * @param size the number of elements to take in each list, must be positive and can be greater
than the number of elements in this collection.\n * \n * @sample
samples.collections.Collections.Transformations.chunked\n
*/\n@SinceKotlin("1.2")\npublic fun <T>
Iterable<T>.chunked(size: Int): List<List<T>> {\n  return windowed(size, size, partialWindows = true)\n}\n\n/**\n
* Splits this collection into several lists each not exceeding the given [size]\n * and applies the given [transform]
function to an each.\n * \n * @return list of results of the [transform] applied to an each list.\n * \n * Note that the
list passed to the [transform] function is ephemeral and is valid only inside that function.\n * You should not store it
or allow it to escape in some way, unless you made a snapshot of it.\n * The last list may have fewer elements than
the given [size].\n * \n * @param size the number of elements to take in each list, must be positive and can be
greater than the number of elements in this collection.\n * \n * @sample samples.text.Strings.chunkedTransform\n
*/\n@SinceKotlin("1.2")\npublic fun <T, R> Iterable<T>.chunked(size: Int, transform: (List<T>) -> R): List<R>
{\n  return windowed(size, size, partialWindows = true, transform = transform)\n}\n\n/**\n * Returns a list
containing all elements of the original collection without the first occurrence of the given [element].\n
*/\npublic
operator fun <T> Iterable<T>.minus(element: T): List<T> {\n  val result =
ArrayList<T>(collectionSizeOrDefault(10))\n  var removed = false\n  return this.filterTo(result) { if (!removed
&& it == element) { removed = true; false } else true }\n}\n\n/**\n * Returns a list containing all elements of the
original collection except the elements contained in the given [elements] array.\n * \n * Before Kotlin 1.6, the
[elements] array may have been converted to a [HashSet] to speed up the operation, thus the elements were required
to have\n * a correct and stable implementation of `hashCode()` that didn't change between successive
invocations.\n * \n * On JVM, you can enable this behavior back with the system property
`kotlin.collections.convert_arg_to_set_in_removeAll` set to `true`.\n
*/\npublic operator fun <T>
Iterable<T>.minus(elements: Array<out T>): List<T> {\n  if (elements.isEmpty()) return this.toList()\n  val other
= elements.convertToSetForSetOperation()\n  return this.filterNot { it in other }\n}\n\n/**\n * Returns a list
containing all elements of the original collection except the elements contained in the given [elements] collection.\n
* \n * Before Kotlin 1.6, the [elements] collection may have been converted to a [HashSet] to speed up the
operation, thus the elements were required to have\n * a correct and stable implementation of `hashCode()` that
didn't change between successive invocations.\n * \n * On JVM, you can enable this behavior back with the system
property `kotlin.collections.convert_arg_to_set_in_removeAll` set to `true`.\n
*/\npublic operator fun <T>
Iterable<T>.minus(elements: Iterable<T>): List<T> {\n  val other =
elements.convertToSetForSetOperationWith(this)\n  if (other.isEmpty())\n    return this.toList()\n  return
this.filterNot { it in other }\n}\n\n/**\n * Returns a list containing all elements of the original collection except the

```


elements contained in the given [elements] sequence.

Before Kotlin 1.6, the [elements] sequence may have been converted to a [HashSet] to speed up the operation, thus the elements were required to have a correct and stable implementation of `hashCode()` that didn't change between successive invocations.

On JVM, you can enable this behavior back with the system property `kotlin.collections.convert_arg_to_set_in_removeAll` set to `true`.

```

public operator fun <T> Iterable<T>.minus(elements: Sequence<T>): List<T> {
    val other = elements.convertToSetForSetOperation()
    if (other.isEmpty()) return this.toList()
    return this.filterNot { it in other }
}

Returns a list containing all elements of the original collection without the first occurrence of the given [element].
@kotlin.internal.InlineOnly
public inline fun <T> Iterable<T>.minusElement(element: T): List<T> {
    return minus(element)
}

Splits the original collection into pair of lists, where *first* list contains elements for which [predicate] yielded true, while *second* list contains elements for which [predicate] yielded false.
@sample
samples.collections.Iterables.Operations.partition
public inline fun <T> Iterable<T>.partition(predicate: (T) -> Boolean): Pair<List<T>, List<T>> {
    val first = ArrayList<T>()
    val second = ArrayList<T>()
    for (element in this) {
        if (predicate(element)) first.add(element)
        else second.add(element)
    }
    return Pair(first, second)
}

Returns a list containing all elements of the original collection and then the given [element].
public operator fun <T> Iterable<T>.plus(element: T): List<T> {
    if (this is Collection) return this.plus(element)
    val result = ArrayList<T>()
    result.addAll(this)
    result.add(element)
    return result
}

Returns a list containing all elements of the original collection and then the given [element].
public operator fun <T> Collection<T>.plus(element: T): List<T> {
    val result = ArrayList<T>(size + 1)
    result.addAll(this)
    result.add(element)
    return result
}

Returns a list containing all elements of the original collection and then all elements of the given [elements] array.
public operator fun <T> Iterable<T>.plus(elements: Array<out T>): List<T> {
    if (this is Collection) return this.plus(elements)
    val result = ArrayList<T>()
    result.addAll(this)
    result.addAll(elements)
    return result
}

Returns a list containing all elements of the original collection and then all elements of the given [elements] array.
public operator fun <T> Collection<T>.plus(elements: Array<out T>): List<T> {
    val result = ArrayList<T>(this.size + elements.size)
    result.addAll(this)
    result.addAll(elements)
    return result
}

Returns a list containing all elements of the original collection and then all elements of the given [elements] collection.
public operator fun <T> Iterable<T>.plus(elements: Iterable<T>): List<T> {
    if (this is Collection) return this.plus(elements)
    val result = ArrayList<T>()
    result.addAll(this)
    result.addAll(elements)
    return result
}

Returns a list containing all elements of the original collection and then all elements of the given [elements] collection.
public operator fun <T> Collection<T>.plus(elements: Iterable<T>): List<T> {
    if (elements is Collection) {
        val result = ArrayList<T>(this.size + elements.size)
        result.addAll(this)
        result.addAll(elements)
        return result
    } else {
        val result = ArrayList<T>(this)
        result.addAll(elements)
        return result
    }
}

Returns a list containing all elements of the original collection and then all elements of the given [elements] sequence.
public operator fun <T> Iterable<T>.plus(elements: Sequence<T>): List<T> {
    val result = ArrayList<T>()
    result.addAll(this)
    result.addAll(elements)
    return result
}

Returns a list containing all elements of the original collection and then all elements of the given [elements] sequence.
public operator fun <T> Collection<T>.plus(elements: Sequence<T>): List<T> {
    val result = ArrayList<T>(this.size + 10)
    result.addAll(this)
    result.addAll(elements)
    return result
}

Returns a list containing all elements of the original collection and then the given [element].
@kotlin.internal.InlineOnly
public inline fun <T> Iterable<T>.plusElement(element: T): List<T> {
    return plus(element)
}

Returns a list containing all elements of the original collection and then the given [element].
@kotlin.internal.InlineOnly
public inline fun <T> Collection<T>.plusElement(element: T): List<T> {
    return plus(element)
}

Returns a list of snapshots of the window of the given [size] sliding along this collection with the given [step], where each snapshot is a list. Several last lists may have fewer elements than the given [size]. Both [size] and [step] must be positive and can be greater than the number of elements in this collection.
@param size the

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number of elements to take in each window\n * @param step the number of elements to move the window forward
by on an each step, by default 1\n * @param partialWindows controls whether or not to keep partial windows in the
end if any,\n * by default `false` which means partial windows won't be preserved\n * \n * @sample
samples.collections.Sequences.Transformations.takeWindows\n * \n * @SinceKotlin("1.2")\npublic fun <T>
Iterable<T>.windowed(size: Int, step: Int = 1, partialWindows: Boolean = false): List<List<T>> {\n
checkWindowSizeStep(size, step)\n if (this is RandomAccess && this is List) {\n val thisSize = this.size\n
val resultCapacity = thisSize / step + if (thisSize % step == 0) 0 else 1\n val result =
ArrayList<List<T>>(resultCapacity)\n var index = 0\n while (index in 0 until thisSize) {\n val
windowSize = size.coerceAtMost(thisSize - index)\n if (windowSize < size && !partialWindows) break\n
result.add(List(windowSize) { this[it + index] })\n index += step\n }\n return result\n }\n val
result = ArrayList<List<T>>()\n windowedIterator(iterator(), size, step, partialWindows, reuseBuffer =
false).forEach {\n result.add(it)\n }\n return result\n }\n\n\n * Returns a list of results of applying the
given [transform] function to\n * an each list representing a view over the window of the given [size]\n * sliding
along this collection with the given [step].\n * \n * Note that the list passed to the [transform] function is ephemeral
and is valid only inside that function.\n * You should not store it or allow it to escape in some way, unless you made
a snapshot of it.\n * Several last lists may have fewer elements than the given [size].\n * \n * Both [size] and [step]
must be positive and can be greater than the number of elements in this collection.\n * @param size the number of
elements to take in each window\n * @param step the number of elements to move the window forward by on an
each step, by default 1\n * @param partialWindows controls whether or not to keep partial windows in the end if
any,\n * by default `false` which means partial windows won't be preserved\n * \n * @sample
samples.collections.Sequences.Transformations.averageWindows\n * \n * @SinceKotlin("1.2")\npublic fun <T, R>
Iterable<T>.windowed(size: Int, step: Int = 1, partialWindows: Boolean = false, transform: (List<T>) -> R):
List<R> {\n checkWindowSizeStep(size, step)\n if (this is RandomAccess && this is List) {\n val thisSize =
this.size\n val resultCapacity = thisSize / step + if (thisSize % step == 0) 0 else 1\n val result =
ArrayList<R>(resultCapacity)\n val window = MovingSubList(this)\n var index = 0\n while (index in 0
until thisSize) {\n val windowSize = size.coerceAtMost(thisSize - index)\n if (!partialWindows &&
windowSize < size) break\n window.move(index, index + windowSize)\n
result.add(transform(window))\n index += step\n }\n return result\n }\n val result =
ArrayList<R>()\n windowedIterator(iterator(), size, step, partialWindows, reuseBuffer = true).forEach {\n
result.add(transform(it))\n }\n return result\n }\n\n\n * Returns a list of pairs built from the elements of `this`
collection and the [other] array with the same index.\n * The returned list has length of the shortest collection.\n * \n *
@sample samples.collections.Iterables.Operations.zipIterable\n * \n * @public infix fun <T, R> Iterable<T>.zip(other:
Array<out R>): List<Pair<T, R>> {\n return zip(other) { t1, t2 -> t1 to t2 }\n }\n\n\n * Returns a list of values
built from the elements of `this` collection and the [other] array with the same index\n * using the provided
[transform] function applied to each pair of elements.\n * The returned list has length of the shortest collection.\n *
\n * \n * @sample samples.collections.Iterables.Operations.zipIterableWithTransform\n * \n * @public inline fun <T, R, V>
Iterable<T>.zip(other: Array<out R>, transform: (a: T, b: R) -> V): List<V> {\n val arraySize = other.size\n val
list = ArrayList<V>(minOf(collectionSizeOrDefault(10), arraySize))\n var i = 0\n for (element in this) {\n if
(i >= arraySize) break\n list.add(transform(element, other[i++]))\n }\n return list\n }\n\n\n * Returns a list
of pairs built from the elements of `this` collection and [other] collection with the same index.\n * The returned list
has length of the shortest collection.\n * \n * \n * @sample samples.collections.Iterables.Operations.zipIterable\n *
\n * @public infix fun <T, R> Iterable<T>.zip(other: Iterable<R>): List<Pair<T, R>> {\n return zip(other) { t1, t2 ->
t1 to t2 }\n }\n\n\n * Returns a list of values built from the elements of `this` collection and the [other] collection
with the same index\n * using the provided [transform] function applied to each pair of elements.\n * The returned
list has length of the shortest collection.\n * \n * \n * @sample
samples.collections.Iterables.Operations.zipIterableWithTransform\n * \n * @public inline fun <T, R, V>
Iterable<T>.zip(other: Iterable<R>, transform: (a: T, b: R) -> V): List<V> {\n val first = iterator()\n val second
= other.iterator()\n val list = ArrayList<V>(minOf(collectionSizeOrDefault(10),

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other.collectionSizeOrDefault(10)))\n while (first.hasNext() && second.hasNext()) {\n
list.add(transform(first.next(), second.next()))\n } \n return list\n}\n\n/**\n * Returns a list of pairs of each two
adjacent elements in this collection.\n * \n * The returned list is empty if this collection contains less than two
elements.\n * \n * @sample samples.collections.Collections.Transformations.zipWithNext\n
*/\n\n@SinceKotlin("1.2")\npublic fun <T> Iterable<T>.zipWithNext(): List<Pair<T, T>> {\n return zipWithNext
{ a, b -> a to b }\n}\n\n/**\n * Returns a list containing the results of applying the given [transform] function\n * to
an each pair of two adjacent elements in this collection.\n * \n * The returned list is empty if this collection contains
less than two elements.\n * \n * @sample
samples.collections.Collections.Transformations.zipWithNextToFindDeltas\n
*/\n\n@SinceKotlin("1.2")\npublic
inline fun <T, R> Iterable<T>.zipWithNext(transform: (a: T, b: T) -> R): List<R> {\n val iterator = iterator()\n if
(!iterator.hasNext()) return emptyList()\n val result = mutableListOf<R>()\n var current = iterator.next()\n
while (iterator.hasNext()) {\n val next = iterator.next()\n result.add(transform(current, next))\n current
= next\n }\n return result\n}\n\n/**\n * Appends the string from all the elements separated using [separator] and
using the given [prefix] and [postfix] if supplied.\n * \n * If the collection could be huge, you can specify a non-
negative value of [limit], in which case only the first [limit]\n * elements will be appended, followed by the
[truncated] string (which defaults to "...").\n * \n * @sample
samples.collections.Collections.Transformations.joinTo\n
*/\n\npublic fun <T, A : Appendable>
Iterable<T>.joinTo(buffer: A, separator: CharSequence = '\n', '\n', prefix: CharSequence = "\n", postfix: CharSequence
= "\n", limit: Int = -1, truncated: CharSequence = "...", transform: ((T) -> CharSequence)? = null): A {\n
buffer.append(prefix)\n var count = 0\n for (element in this) {\n if (++count > 1) buffer.append(separator)\n
if (limit < 0 || count <= limit) {\n buffer.appendElement(element, transform)\n } else break\n }\n if
(limit >= 0 && count > limit) buffer.append(truncated)\n buffer.append(postfix)\n return buffer\n}\n\n/**\n *
Creates a string from all the elements separated using [separator] and using the given [prefix] and [postfix] if
supplied.\n * \n * If the collection could be huge, you can specify a non-negative value of [limit], in which case only
the first [limit]\n * elements will be appended, followed by the [truncated] string (which defaults to "...").\n * \n *
@sample samples.collections.Collections.Transformations.joinToString\n
*/\n\npublic fun <T>
Iterable<T>.joinToString(separator: CharSequence = '\n', '\n', prefix: CharSequence = "\n", postfix: CharSequence =
"\n", limit: Int = -1, truncated: CharSequence = "...", transform: ((T) -> CharSequence)? = null): String {\n return
joinTo(StringBuilder(), separator, prefix, postfix, limit, truncated, transform).toString()\n}\n\n/**\n * Returns this
collection as an [Iterable].\n */\n\n@kotlin.internal.InlineOnly\npublic inline fun <T> Iterable<T>.asIterable():
Iterable<T> {\n return this\n}\n\n/**\n * Creates a [Sequence] instance that wraps the original collection returning
its elements when being iterated.\n * \n * @sample
samples.collections.Sequences.Building.sequenceFromCollection\n
*/\n\npublic fun <T> Iterable<T>.asSequence():
Sequence<T> {\n return Sequence { this.iterator() }\n}\n\n/**\n * Returns an average value of elements in the
collection.\n */\n\n@kotlin.jvm.JvmName("averageOfByte")\npublic fun Iterable<Byte>.average(): Double {\n var
sum: Double = 0.0\n var count: Int = 0\n for (element in this) {\n sum += element\n
checkCountOverflow(++count)\n }\n return if (count == 0) Double.NaN else sum / count\n}\n\n/**\n * Returns
an average value of elements in the collection.\n */\n\n@kotlin.jvm.JvmName("averageOfShort")\npublic fun
Iterable<Short>.average(): Double {\n var sum: Double = 0.0\n var count: Int = 0\n for (element in this) {\n
sum += element\n checkCountOverflow(++count)\n }\n return if (count == 0) Double.NaN else sum /
count\n}\n\n/**\n * Returns an average value of elements in the collection.\n */\n\n@kotlin.jvm.JvmName("averageOfInt")\npublic fun Iterable<Int>.average(): Double {\n var sum: Double =
0.0\n var count: Int = 0\n for (element in this) {\n sum += element\n checkCountOverflow(++count)\n
}\n return if (count == 0) Double.NaN else sum / count\n}\n\n/**\n * Returns an average value of elements in the
collection.\n */\n\n@kotlin.jvm.JvmName("averageOfLong")\npublic fun Iterable<Long>.average(): Double {\n
var sum: Double = 0.0\n var count: Int = 0\n for (element in this) {\n sum += element\n
checkCountOverflow(++count)\n }\n return if (count == 0) Double.NaN else sum / count\n}\n\n/**\n * Returns
an average value of elements in the collection.\n */\n\n@kotlin.jvm.JvmName("averageOfFloat")\npublic fun

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Iterable<Float>.average(): Double {\n    var sum: Double = 0.0\n    var count: Int = 0\n    for (element in this) {\n        sum += element\n        checkCountOverflow(++count)\n    }\n    return if (count == 0) Double.NaN else sum / count\n}\n\n/**\n * Returns an average value of elements in the collection.\n */\n@kotlin.jvm.JvmName("averageOfDouble")\npublic fun Iterable<Double>.average(): Double {\n    var sum: Double = 0.0\n    var count: Int = 0\n    for (element in this) {\n        sum += element\n        checkCountOverflow(++count)\n    }\n    return if (count == 0) Double.NaN else sum / count\n}\n\n/**\n * Returns the sum of all elements in the collection.\n */\n@kotlin.jvm.JvmName("sumOfByte")\npublic fun Iterable<Byte>.sum(): Int {\n    var sum: Int = 0\n    for (element in this) {\n        sum += element\n    }\n    return sum\n}\n\n/**\n * Returns the sum of all elements in the collection.\n */\n@kotlin.jvm.JvmName("sumOfShort")\npublic fun Iterable<Short>.sum(): Int {\n    var sum: Int = 0\n    for (element in this) {\n        sum += element\n    }\n    return sum\n}\n\n/**\n * Returns the sum of all elements in the collection.\n */\n@kotlin.jvm.JvmName("sumOfInt")\npublic fun Iterable<Int>.sum(): Int {\n    var sum: Int = 0\n    for (element in this) {\n        sum += element\n    }\n    return sum\n}\n\n/**\n * Returns the sum of all elements in the collection.\n */\n@kotlin.jvm.JvmName("sumOfLong")\npublic fun Iterable<Long>.sum(): Long {\n    var sum: Long = 0L\n    for (element in this) {\n        sum += element\n    }\n    return sum\n}\n\n/**\n * Returns the sum of all elements in the collection.\n */\n@kotlin.jvm.JvmName("sumOfFloat")\npublic fun Iterable<Float>.sum(): Float {\n    var sum: Float = 0.0f\n    for (element in this) {\n        sum += element\n    }\n    return sum\n}\n\n/**\n * Returns the sum of all elements in the collection.\n */\n@kotlin.jvm.JvmName("sumOfDouble")\npublic fun Iterable<Double>.sum(): Double {\n    var sum: Double = 0.0\n    for (element in this) {\n        sum += element\n    }\n    return sum\n}\n\n"/>\n * Copyright 2010-2018 JetBrains s.r.o. and Kotlin Programming Language contributors.\n * Use of this source code is governed by the Apache 2.0 license that can be found in the license/LICENSE.txt file.\n */\n\npackage kotlin.collections\n\nimport kotlin.comparisons.naturalOrder\nimport kotlin.random.Random\n\n/**\n * Returns the array if it's not `null`, or an empty array otherwise.\n */\n@sample samples.collections.Arrays.Usage.arrayOrEmpty\n\n@kotlin.internal.InlineOnly\npublic actual inline fun <T> Array<out T>?.orEmpty(): Array<out T> = this ?: emptyArray<T>()\n\n/**\n * Returns a *typed* array containing all of the elements of this collection.\n */\n * Allocates an array of runtime type `T` having its size equal to the size of this collection\n * and populates the array with the elements of this collection.\n */\n@sample samples.collections.Collections.Collections.collectionToTypedArray\n\n@kotlin.internal.InlineOnly\npublic actual inline fun <T> Collection<T>.toArray(): Array<T> = copyToArray(this)\n\n@JsName("copyToArray")\n@PublishedApi\ninternal fun <T> copyToArray(collection: Collection<T>): Array<T> {\n    return if (collection.asDynamic().toArray !== undefined)\n        collection.asDynamic().toArray().unsafeCast<Array<T>>()\n    else\n        copyToArrayImpl(collection).unsafeCast<Array<T>>()\n}\n\n@JsName("copyToArrayImpl")\ninternal actual fun copyToArrayImpl(collection: Collection<*>): Array<Any?> {\n    val array = emptyArray<Any?>()\n    val iterator = collection.iterator()\n    while (iterator.hasNext())\n        array.asDynamic().push(iterator.next())\n    return array\n}\n\n@JsName("copyToExistingArrayImpl")\ninternal actual fun <T> copyToArrayImpl(collection: Collection<*>, array: Array<T>): Array<T> {\n    if (array.size < collection.size)\n        return copyToArrayImpl(collection).unsafeCast<Array<T>>()\n    val iterator = collection.iterator()\n    var index = 0\n    while (iterator.hasNext()) {\n        array[index++] = iterator.next().unsafeCast<T>()\n    }\n    if (index < array.size)\n        array[index] = null.unsafeCast<T>()\n    return array\n}\n\n/**\n * Returns an immutable list containing only the specified object [element].\n */\n@kotlin.jvm.JvmName("listOf")\npublic fun <T> listOf(element: T): List<T> = listOf(element)\n\n@kotlin.jvm.JvmName("listOf")\n@PublishedApi\n@SinceKotlin("1.3")\n@kotlin.internal.InlineOnly\ninternal actual inline fun <E> buildListInternal(builderAction: MutableList<E>.() -> Unit): List<E> {\n    return ArrayList<E>().apply(builderAction).build()\n}\n\n@kotlin.jvm.JvmName("listOf")\n@PublishedApi\n@SinceKotlin("1.3")\n@kotlin.internal.InlineOnly\ninternal actual inline fun <E> buildListInternal(capacity: Int, builderAction: MutableList<E>.() -> Unit): List<E> {\n    checkBuilderCapacity(capacity)\n    return ArrayList<E>(capacity).apply(builderAction).build()\n}\n\n/**\n * Returns an immutable set containing only the

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specified object [element].\n *^\\npublic fun <T> setOf(element: T): Set<T> =
hashSetOf(element)\\n\\n@PublishedApi\\n@SinceKotlin("1.3")\\n@kotlin.internal.InlineOnly\\ninternal actual inline
fun <E> buildSetInternal(builderAction: MutableSet<E>().-> Unit): Set<E> {\\n    return
LinkedHashSet<E>().apply(builderAction).build()\\n}\\n\\n@PublishedApi\\n@SinceKotlin("1.3")\\n@kotlin.internal.
InlineOnly\\ninternal actual inline fun <E> buildSetInternal(capacity: Int, builderAction: MutableSet<E>().-> Unit):
Set<E> {\\n    return LinkedHashSet<E>(capacity).apply(builderAction).build()\\n}\\n\\n/**\\n * Returns an
immutable map, mapping only the specified key to the\\n * specified value.\\n *^\\npublic fun <K, V> mapOf(pair:
Pair<K, V>): Map<K, V> =
hashMapOf(pair)\\n\\n@PublishedApi\\n@SinceKotlin("1.3")\\n@kotlin.internal.InlineOnly\\ninternal actual inline
fun <K, V> buildMapInternal(builderAction: MutableMap<K, V>().-> Unit): Map<K, V> {\\n    return
LinkedHashMap<K,
V>().apply(builderAction).build()\\n}\\n\\n@PublishedApi\\n@SinceKotlin("1.3")\\n@kotlin.internal.InlineOnly\\ninte
rnal actual inline fun <K, V> buildMapInternal(capacity: Int, builderAction: MutableMap<K, V>().-> Unit):
Map<K, V> {\\n    return LinkedHashMap<K, V>(capacity).apply(builderAction).build()\\n}\\n\\n/**\\n * Fills the
list with the provided [value].\\n *^\\n * Each element in the list gets replaced with the [value].\\n
*^\\n@SinceKotlin("1.2")\\npublic actual fun <T> MutableList<T>.fill(value: T): Unit {\\n    for (index in
0..lastIndex) {\\n        this[index] = value\\n    }\\n}\\n\\n/**\\n * Randomly shuffles elements in this list.\\n *^\\n * See:
https://en.wikipedia.org/wiki/Fisher%20%80%93Yates\_shuffle#The\_modern\_algorithm\\n
*^\\n@SinceKotlin("1.2")\\npublic actual fun <T> MutableList<T>.shuffle(): Unit = shuffle(Random)\\n\\n/**\\n *
Returns a new list with the elements of this list randomly shuffled.\\n *^\\n@SinceKotlin("1.2")\\npublic actual fun
<T> Iterable<T>.shuffled(): List<T> = toMutableList().apply { shuffle() }\\n\\n/**\\n * Sorts elements in the list in-
place according to their natural sort order.\\n *^\\n * The sort is _stable_. It means that equal elements preserve their
order relative to each other after sorting.\\n *^\\n * @sample samples.collections.Collections.Sorting.sortMutableList\\n
*^\\npublic actual fun <T : Comparable<T>> MutableList<T>.sort(): Unit {\\n    collectionsSort(this,
naturalOrder())\\n}\\n\\n/**\\n * Sorts elements in the list in-place according to the order specified with [comparator].\\n
*^\\n * The sort is _stable_. It means that equal elements preserve their order relative to each other after sorting.\\n *^\\n
* @sample samples.collections.Collections.Sorting.sortMutableListWith\\n *^\\npublic actual fun <T>
MutableList<T>.sortWith(comparator: Comparator<in T>): Unit {\\n    collectionsSort(this,
comparator)\\n}\\n\\nprivate fun <T> collectionsSort(list: MutableList<T>, comparator: Comparator<in T>) {\\n    if
(list.size <= 1) return\\n    val array = copyToArray(list)\\n    sortArrayWith(array, comparator)\\n    for (i in 0 until
array.size) {\\n        list[i] = array[i]\\n    }\\n}\\n\\ninternal actual fun <T> arrayOfNulls(reference: Array<T>, size: Int):
Array<T> {\\n    return
arrayOfNulls<Any>(size).unsafeCast<Array<T>>()\\n}\\n\\n@SinceKotlin("1.3")\\n@PublishedApi\\n@JsName("arrayCopy")\\ninternal fun <T> arrayCopy(source: Array<out T>, destination: Array<in T>, destinationOffset: Int,
startIndex: Int, endIndex: Int) {\\n    AbstractList.checkRangeIndexes(startIndex, endIndex, source.size)\\n    val
rangeSize = endIndex - startIndex\\n    AbstractList.checkRangeIndexes(destinationOffset, destinationOffset +
rangeSize, destination.size)\\n    if (js("ArrayBuffer").isView(destination) &&
js("ArrayBuffer").isView(source)) {\\n        val subrange = source.asDynamic().subarray(startIndex, endIndex)\\n
        destination.asDynamic().set(subrange, destinationOffset)\\n    } else {\\n        if (source !== destination ||
destinationOffset <= startIndex) {\\n            for (index in 0 until rangeSize) {\\n
                destination[destinationOffset + index] = source[startIndex + index]\\n            }\\n        } else {\\n            for (index in
rangeSize - 1 downTo 0) {\\n                destination[destinationOffset + index] = source[startIndex + index]\\n            }\\n        }\\n    }\\n}\\n}\\n}\\n}\\n\\n// no singleton map implementation in js, return map as
is\\n@Suppress("NOTHING_TO_INLINE")\\ninternal actual inline fun <K, V> Map<K,
V>.toSingletonMapOrSelf(): Map<K, V> = this\\n\\n@Suppress("NOTHING_TO_INLINE")\\ninternal actual inline
fun <K, V> Map<out K, V>.toSingletonMap(): Map<K, V> =
this.toMutableMap()\\n\\n@Suppress("NOTHING_TO_INLINE")\\ninternal actual inline fun <T> Array<out
T>.copyToArrayOfAny(isVarargs: Boolean): Array<out Any?> =\\n    if (isVarargs)\\n        // no need to copy vararg

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array in JS\n    this\n    else\n    this.copyOfOf()\n\n\n@PublishedApi\ninternal actual fun
checkIndexOverflow(index: Int): Int {\n    if (index < 0) {\n        throwIndexOverflow()\n    }\n    return
index\n}\n\n@PublishedApi\ninternal actual fun checkCountOverflow(count: Int): Int {\n    if (count < 0) {\n
throwCountOverflow()\n    }\n    return count\n}\n\n\n/**\n * JS map and set implementations do not make use of
capacities or load factors.\n *\n@PublishedApi\ninternal actual fun mapCapacity(expectedSize: Int) =
expectedSize\n\n\n/**\n * Checks a collection builder function capacity argument.\n * In JS no validation is made in
Map/Set constructor yet.\n *\n@SinceKotlin("1.3")\n@PublishedApi\ninternal fun
checkBuilderCapacity(capacity: Int) {\n    require(capacity >= 0) { "capacity must be non-negative."
}\n}\n\n\ninternal actual fun brittleContainsOptimizationEnabled(): Boolean = false", "/*\n * Copyright 2010-2018
JetBrains s.r.o. and Kotlin Programming Language contributors.\n * Use of this source code is governed by the
Apache 2.0 license that can be found in the license/LICENSE.txt file.\n
*\n\n@file:kotlin.jvm.JvmMultifileClass\n@file:kotlin.jvm.JvmName("CollectionsKt")\n\npackage
kotlin.collections\n\n\n/**\n * Returns the given iterator itself. This allows to use an instance of iterator in a `for`
loop.\n * @sample samples.collections.Iterators.iterator\n *\n@kotlin.internal.InlineOnly\npublic inline operator
fun <T> Iterator<T>.iterator(): Iterator<T> = this\n\n\n/**\n * Returns an [Iterator] that wraps each element produced
by the original iterator\n * into an [IndexedValue] containing the index of that element and the element itself.\n *\n
* @sample samples.collections.Iterators.withIndexIterator\n *\npublic fun <T> Iterator<T>.withIndex():
Iterator<IndexedValue<T>> = IndexingIterator(this)\n\n\n/**\n * Performs the given [operation] on each element of
this [Iterator].\n * @sample samples.collections.Iterators.forEachIterator\n *\npublic inline fun <T>
Iterator<T>.forEach(operation: (T) -> Unit): Unit {\n    for (element in this) operation(element)\n}\n\n\n\n/**\n *
Iterator transforming original `iterator` into iterator of [IndexedValue], counting index from zero.\n *\n\ninternal class
IndexingIterator<out T>(private val iterator: Iterator<T>) : Iterator<IndexedValue<T>> {\n    private var index =
0\n    final override fun hasNext(): Boolean = iterator.hasNext()\n    final override fun next(): IndexedValue<T> =
IndexedValue(checkIndexOverflow(index++), iterator.next())\n}\n\n", "/*\n * Copyright 2010-2021 JetBrains s.r.o.
and Kotlin Programming Language contributors.\n * Use of this source code is governed by the Apache 2.0 license
that can be found in the license/LICENSE.txt file.\n
*\n\n@file:kotlin.jvm.JvmMultifileClass\n@file:kotlin.jvm.JvmName("ComparisonsKt")\n\npackage
kotlin.comparisons\n\n\n// NOTE: THIS FILE IS AUTO-GENERATED by the GenerateStandardLib.kt\n// See:
https://github.com/JetBrains/kotlin/tree/master/libraries/stdlib\n\n\nimport kotlin.random.*\n\n\n/**\n * Returns the
greater of two values.\n * \n * If values are equal, returns the first one.\n *\n@SinceKotlin("1.1")\npublic expect
fun <T : Comparable<T>> maxOf(a: T, b: T): T\n\n\n/**\n * Returns the greater of two values.\n *\n@SinceKotlin("1.1")\n@kotlin.internal.InlineOnly\npublic expect inline fun maxOf(a: Byte, b: Byte):
Byte\n\n\n/**\n * Returns the greater of two values.\n *\n@SinceKotlin("1.1")\n@kotlin.internal.InlineOnly\npublic
expect inline fun maxOf(a: Short, b: Short): Short\n\n\n/**\n * Returns the greater of two values.\n *\n@SinceKotlin("1.1")\n@kotlin.internal.InlineOnly\npublic expect inline fun maxOf(a: Int, b: Int): Int\n\n\n\n/**\n * Returns the greater of two values.\n *\n@SinceKotlin("1.1")\n@kotlin.internal.InlineOnly\npublic expect inline
fun maxOf(a: Long, b: Long): Long\n\n\n/**\n * Returns the greater of two values.\n * \n * If either value is `NaN`,
returns `NaN`.\n *\n@SinceKotlin("1.1")\n@kotlin.internal.InlineOnly\npublic expect inline fun maxOf(a: Float,
b: Float): Float\n\n\n/**\n * Returns the greater of two values.\n * \n * If either value is `NaN`, returns `NaN`.\n *\n
@SinceKotlin("1.1")\n@kotlin.internal.InlineOnly\npublic expect inline fun maxOf(a: Double, b: Double):
Double\n\n\n/**\n * Returns the greater of three values.\n * \n * If there are multiple equal maximal values, returns the
first of them.\n *\n@SinceKotlin("1.1")\npublic expect fun <T : Comparable<T>> maxOf(a: T, b: T, c: T):
T\n\n\n/**\n * Returns the greater of three values.\n *\n@SinceKotlin("1.1")\n@kotlin.internal.InlineOnly\npublic
expect inline fun maxOf(a: Byte, b: Byte, c: Byte): Byte\n\n\n/**\n * Returns the greater of three values.\n *\n
@SinceKotlin("1.1")\n@kotlin.internal.InlineOnly\npublic expect inline fun maxOf(a: Short, b: Short, c:
Short): Short\n\n\n/**\n * Returns the greater of three values.\n *\n@SinceKotlin("1.1")\n@kotlin.internal.InlineOnly\npublic
expect inline fun maxOf(a: Int, b: Int, c: Int):
Int\n\n\n/**\n * Returns the greater of three values.\n *\n@SinceKotlin("1.1")\n@kotlin.internal.InlineOnly\npublic

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expect inline fun maxOf(a: Long, b: Long, c: Long): Long\n\n/**\n * Returns the greater of three values.\n * \n * If
any value is `NaN`, returns `NaN`.\n */\n@SinceKotlin("1.1")\n@kotlin.internal.InlineOnly\npublic expect inline
fun maxOf(a: Float, b: Float, c: Float): Float\n\n/**\n * Returns the greater of three values.\n * \n * If any value is
`NaN`, returns `NaN`.\n */\n@SinceKotlin("1.1")\n@kotlin.internal.InlineOnly\npublic expect inline fun maxOf(a:
Double, b: Double, c: Double): Double\n\n/**\n * Returns the greater of three values according to the order
specified by the given [comparator].\n * \n * If there are multiple equal maximal values, returns the first of them.\n
*/\n@SinceKotlin("1.1")\npublic fun <T> maxOf(a: T, b: T, c: T, comparator: Comparator<in T>): T {\n    return
maxOf(a, maxOf(b, c, comparator), comparator)\n}\n\n/**\n * Returns the greater of two values according to the
order specified by the given [comparator].\n * \n * If values are equal, returns the first one.\n */\n@SinceKotlin("1.1")\npublic fun <T> maxOf(a: T, b: T, comparator: Comparator<in T>): T {\n    return if
(comparator.compare(a, b) >= 0) a else b\n}\n\n/**\n * Returns the greater of the given values.\n * \n * If there are
multiple equal maximal values, returns the first of them.\n */\n@SinceKotlin("1.4")\npublic expect fun <T :
Comparable<T>> maxOf(a: T, vararg other: T): T\n\n/**\n * Returns the greater of the given values.\n */\n@SinceKotlin("1.4")\npublic expect fun maxOf(a: Byte, vararg other: Byte): Byte\n\n/**\n * Returns the
greater of the given values.\n */\n@SinceKotlin("1.4")\npublic expect fun maxOf(a: Short, vararg other: Short):
Short\n\n/**\n * Returns the greater of the given values.\n */\n@SinceKotlin("1.4")\npublic expect fun maxOf(a:
Int, vararg other: Int): Int\n\n/**\n * Returns the greater of the given values.\n */\n@SinceKotlin("1.4")\npublic
expect fun maxOf(a: Long, vararg other: Long): Long\n\n/**\n * Returns the greater of the given values.\n * \n * If
any value is `NaN`, returns `NaN`.\n */\n@SinceKotlin("1.4")\npublic expect fun maxOf(a: Float, vararg other:
Float): Float\n\n/**\n * Returns the greater of the given values.\n * \n * If any value is `NaN`, returns `NaN`.\n
*/\n@SinceKotlin("1.4")\npublic expect fun maxOf(a: Double, vararg other: Double): Double\n\n/**\n * Returns
the greater of the given values according to the order specified by the given [comparator].\n * \n * If there are
multiple equal maximal values, returns the first of them.\n */\n@SinceKotlin("1.4")\npublic fun <T> maxOf(a: T,
vararg other: T, comparator: Comparator<in T>): T {\n    var max = a\n    for (e in other) if
(comparator.compare(max, e) < 0) max = e\n    return max\n}\n\n/**\n * Returns the smaller of two values.\n * \n * If
values are equal, returns the first one.\n */\n@SinceKotlin("1.1")\npublic expect fun <T : Comparable<T>>
minOf(a: T, b: T): T\n\n/**\n * Returns the smaller of two values.\n */\n@SinceKotlin("1.1")\n@kotlin.internal.InlineOnly\npublic expect inline fun minOf(a: Byte, b: Byte):
Byte\n\n/**\n * Returns the smaller of two values.\n */\n@SinceKotlin("1.1")\n@kotlin.internal.InlineOnly\npublic expect inline fun minOf(a: Short, b: Short):
Short\n\n/**\n * Returns the smaller of two values.\n */\n@SinceKotlin("1.1")\n@kotlin.internal.InlineOnly\npublic expect inline fun minOf(a: Int, b: Int): Int\n\n/**\n * Returns the smaller of two values.\n */\n@SinceKotlin("1.1")\n@kotlin.internal.InlineOnly\npublic expect inline
fun minOf(a: Long, b: Long): Long\n\n/**\n * Returns the smaller of two values.\n * \n * If either value is `NaN`,
returns `NaN`.\n */\n@SinceKotlin("1.1")\n@kotlin.internal.InlineOnly\npublic expect inline fun minOf(a: Float,
b: Float): Float\n\n/**\n * Returns the smaller of two values.\n * \n * If either value is `NaN`, returns `NaN`.\n
*/\n@SinceKotlin("1.1")\n@kotlin.internal.InlineOnly\npublic expect inline fun minOf(a: Double, b: Double):
Double\n\n/**\n * Returns the smaller of three values.\n * \n * If there are multiple equal minimal values, returns the
first of them.\n */\n@SinceKotlin("1.1")\npublic expect fun <T : Comparable<T>> minOf(a: T, b: T, c: T):
T\n\n/**\n * Returns the smaller of three values.\n */\n@SinceKotlin("1.1")\n@kotlin.internal.InlineOnly\npublic
expect inline fun minOf(a: Byte, b: Byte, c: Byte): Byte\n\n/**\n * Returns the smaller of three values.\n */\n@SinceKotlin("1.1")\n@kotlin.internal.InlineOnly\npublic expect inline fun minOf(a: Short, b: Short, c:
Short): Short\n\n/**\n * Returns the smaller of three values.\n */\n@SinceKotlin("1.1")\n@kotlin.internal.InlineOnly\npublic expect inline fun minOf(a: Int, b: Int, c: Int):
Int\n\n/**\n * Returns the smaller of three values.\n */\n@SinceKotlin("1.1")\n@kotlin.internal.InlineOnly\npublic
expect inline fun minOf(a: Long, b: Long, c: Long): Long\n\n/**\n * Returns the smaller of three values.\n * \n * If
any value is `NaN`, returns `NaN`.\n */\n@SinceKotlin("1.1")\n@kotlin.internal.InlineOnly\npublic expect inline
fun minOf(a: Float, b: Float, c: Float): Float\n\n/**\n * Returns the smaller of three values.\n * \n * If any value is

```

```

`NaN`, returns `NaN`.n *^@SinceKotlin("1.1")n@kotlin.internal.InlineOnlynpublic expect inline fun minOf(a:
Double, b: Double, c: Double): Doublen/n/**n * Returns the smaller of three values according to the order
specified by the given [comparator].n * n * If there are multiple equal minimal values, returns the first of them.n
*^@SinceKotlin("1.1")npublic fun <T> minOf(a: T, b: T, c: T, comparator: Comparator<in T>): T {n return
minOf(a, minOf(b, c, comparator), comparator)n/n/n/**n * Returns the smaller of two values according to the
order specified by the given [comparator].n * n * If values are equal, returns the first one.n
*^@SinceKotlin("1.1")npublic fun <T> minOf(a: T, b: T, comparator: Comparator<in T>): T {n return if
(comparator.compare(a, b) <= 0) a else b)n/n/n/**n * Returns the smaller of the given values.n * n * If there are
multiple equal minimal values, returns the first of them.n *^@SinceKotlin("1.4")npublic expect fun <T :
Comparable<T>> minOf(a: T, vararg other: T): Tn/n/**n * Returns the smaller of the given values.n
*^@SinceKotlin("1.4")npublic expect fun minOf(a: Byte, vararg other: Byte): Byten/n/**n * Returns the
smaller of the given values.n *^@SinceKotlin("1.4")npublic expect fun minOf(a: Short, vararg other: Short):
Shortn/n/**n * Returns the smaller of the given values.n *^@SinceKotlin("1.4")npublic expect fun minOf(a:
Int, vararg other: Int): Intn/n/**n * Returns the smaller of the given values.n *^@SinceKotlin("1.4")npublic
expect fun minOf(a: Long, vararg other: Long): Longn/n/**n * Returns the smaller of the given values.n * n *
If any value is `NaN`, returns `NaN`.n *^@SinceKotlin("1.4")npublic expect fun minOf(a: Float, vararg other:
Float): Floatn/n/**n * Returns the smaller of the given values.n * n * If any value is `NaN`, returns `NaN`.n
*^@SinceKotlin("1.4")npublic expect fun minOf(a: Double, vararg other: Double): Doublen/n/**n * Returns
the smaller of the given values according to the order specified by the given [comparator].n * n * If there are
multiple equal minimal values, returns the first of them.n *^@SinceKotlin("1.4")npublic fun <T> minOf(a: T,
vararg other: T, comparator: Comparator<in T>): T {n var min = an for (e in other) if
(comparator.compare(min, e) > 0) min = en return min)n/n/n/**n * Copyright 2010-2021 JetBrains s.r.o. and
Kotlin Programming Language contributors.n * Use of this source code is governed by the Apache 2.0 license that
can be found in the license/LICENSE.txt file.n
*^@n@file:kotlin.jvm.JvmMultifileClassn@file:kotlin.jvm.JvmName("MapsKt")npackage
kotlin.collectionsn/n/n// NOTE: THIS FILE IS AUTO-GENERATED by the GenerateStandardLib.kt// See:
https://github.com/JetBrains/kotlin/tree/master/libraries/stdlibn/n/nimport kotlin.random.*nimport
kotlin.ranges.containsnimport kotlin.ranges.reversedn/n/n/**n * Returns the first non-null value produced by
[transform] function being applied to entries of this map in iteration order,n * or throws
[NoSuchElementException] if no non-null value was produced.n * n * @sample
samples.collections.Collections.Transformations.firstNotNullOfn
*^@SinceKotlin("1.5")n@kotlin.internal.InlineOnlynpublic inline fun <K, V, R : Any> Map<out K,
V>.firstNotNullOf(transform: (Map.Entry<K, V>) -> R?): R {n return firstNotNullOfOrNull(transform) ?: throw
NoSuchElementException("No element of the map was transformed to a non-null value.")n/n/n/**n * Returns
the first non-null value produced by [transform] function being applied to entries of this map in iteration order,n *
or `null` if no non-null value was produced.n * n * @sample
samples.collections.Collections.Transformations.firstNotNullOfn
*^@SinceKotlin("1.5")n@kotlin.internal.InlineOnlynpublic inline fun <K, V, R : Any> Map<out K,
V>.firstNotNullOfOrNull(transform: (Map.Entry<K, V>) -> R?): R? {n for (element in this) {n val result =
transform(element)n if (result != null) {n return resultn }n }n return nulln/n/n/**n *
Returns a [List] containing all key-value pairs.n *^npublic fun <K, V> Map<out K, V>.toList(): List<Pair<K, V>>
{n if (size == 0)n return emptyList()n val iterator = entries.iterator()n if (!iterator.hasNext())n
return emptyList()n val first = iterator.next()n if (!iterator.hasNext())n return listOf(first.toPair())n val
result = ArrayList<Pair<K, V>>(size)n result.add(first.toPair())n do {n
result.add(iterator.next().toPair())n } while (iterator.hasNext())n return resultn/n/n/**n * Returns a single list
of all elements yielded from results of [transform] function being invoked on each entry of original map.n * n *
@sample samples.collections.Maps.Transformations.flatMapn *^npublic inline fun <K, V, R> Map<out K,
V>.flatMap(transform: (Map.Entry<K, V>) -> Iterable<R>): List<R> {n return flatMapTo(ArrayList<R>()),

```



```

transform)\n}\n\n/**\n * Returns a single list of all elements yielded from results of [transform] function being
invoked on each entry of original map.\n * \n * @sample samples.collections.Collections.Transformations.flatMap\n
*\n@\n@SinceKotlin("1.4")\n@\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@\n@OverloadResolution
ByLambdaReturnType\n@\n@kotlin.jvm.JvmName("flatMapSequence")\n\npublic inline fun <K, V, R> Map<out K,
V>.flatMap(transform: (Map.Entry<K, V>) -> Sequence<R>): List<R> {\n    return flatMapTo(ArrayList<R>(),
transform)\n}\n\n/**\n * Appends all elements yielded from results of [transform] function being invoked on each
entry of original map, to the given [destination].\n * \n\npublic inline fun <K, V, R, C : MutableCollection<in R>>
Map<out K, V>.flatMapTo(destination: C, transform: (Map.Entry<K, V>) -> Iterable<R>): C {\n    for (element in
this) {\n        val list = transform(element)\n        destination.addAll(list)\n    }\n    return destination\n}\n\n/**\n *
Appends all elements yielded from results of [transform] function being invoked on each entry of original map, to
the given [destination].\n
*\n@\n@SinceKotlin("1.4")\n@\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@\n@OverloadResolution
ByLambdaReturnType\n@\n@kotlin.jvm.JvmName("flatMapSequenceTo")\n\npublic inline fun <K, V, R, C :
MutableCollection<in R>> Map<out K, V>.flatMapTo(destination: C, transform: (Map.Entry<K, V>) ->
Sequence<R>): C {\n    for (element in this) {\n        val list = transform(element)\n        destination.addAll(list)\n
}\n    return destination\n}\n\n/**\n * Returns a list containing the results of applying the given [transform]
function\n * to each entry in the original map.\n * \n * @sample
samples.collections.Maps.Transformations.mapToList\n * \n\npublic inline fun <K, V, R> Map<out K,
V>.map(transform: (Map.Entry<K, V>) -> R): List<R> {\n    return mapTo(ArrayList<R>(size),
transform)\n}\n\n/**\n * Returns a list containing only the non-null results of applying the given [transform]
function\n * to each entry in the original map.\n * \n * @sample
samples.collections.Maps.Transformations.mapNotNull\n * \n\npublic inline fun <K, V, R : Any> Map<out K,
V>.mapNotNull(transform: (Map.Entry<K, V>) -> R?): List<R> {\n    return mapNotNullTo(ArrayList<R>()),
transform)\n}\n\n/**\n * Applies the given [transform] function to each entry in the original map\n * and appends
only the non-null results to the given [destination].\n * \n\npublic inline fun <K, V, R : Any, C : MutableCollection<in
R>> Map<out K, V>.mapNotNullTo(destination: C, transform: (Map.Entry<K, V>) -> R?): C {\n    forEach {
element -> transform(element)?.let { destination.add(it) } }\n    return destination\n}\n\n/**\n * Applies the given
[transform] function to each entry of the original map\n * and appends the results to the given [destination].\n
*\n\npublic inline fun <K, V, R, C : MutableCollection<in R>> Map<out K, V>.mapTo(destination: C, transform:
(Map.Entry<K, V>) -> R): C {\n    for (item in this)\n        destination.add(transform(item))\n    return
destination\n}\n\n/**\n * Returns `true` if all entries match the given [predicate].\n * \n * @sample
samples.collections.Collections.Aggregates.all\n * \n\npublic inline fun <K, V> Map<out K, V>.all(predicate:
(Map.Entry<K, V>) -> Boolean): Boolean {\n    if (isEmpty()) return true\n    for (element in this) if
(!predicate(element)) return false\n    return true\n}\n\n/**\n * Returns `true` if map has at least one entry.\n * \n *
@sample samples.collections.Collections.Aggregates.any\n * \n\npublic fun <K, V> Map<out K, V>.any(): Boolean
{\n    return !isEmpty()\n}\n\n/**\n * Returns `true` if at least one entry matches the given [predicate].\n * \n *
@sample samples.collections.Collections.Aggregates.anyWithPredicate\n * \n\npublic inline fun <K, V> Map<out K,
V>.any(predicate: (Map.Entry<K, V>) -> Boolean): Boolean {\n    if (isEmpty()) return false\n    for (element in
this) if (predicate(element)) return true\n    return false\n}\n\n/**\n * Returns the number of entries in this map.\n
*\n\n@kotlin.internal.InlineOnly\n\npublic inline fun <K, V> Map<out K, V>.count(): Int {\n    return size\n}\n\n/**\n *
Returns the number of entries matching the given [predicate].\n * \n\npublic inline fun <K, V> Map<out K,
V>.count(predicate: (Map.Entry<K, V>) -> Boolean): Int {\n    if (isEmpty()) return 0\n    var count = 0\n    for
(element in this) if (predicate(element)) ++count\n    return count\n}\n\n/**\n * Performs the given [action] on each
entry.\n * \n\n@kotlin.internal.HidesMembers\n\npublic inline fun <K, V> Map<out K, V>.forEach(action:
(Map.Entry<K, V>) -> Unit): Unit {\n    for (element in this) action(element)\n}\n\n@Deprecated("Use
maxByOrNull instead.", ReplaceWith("this.maxByOrNull(selector)"))\n\n@DeprecatedSinceKotlin(warningSince =
"1.4", errorSince = "1.5", hiddenSince = "1.6")\n\n@kotlin.internal.InlineOnly\n\npublic inline fun <K, V, R :
Comparable<R>> Map<out K, V>.maxBy(selector: (Map.Entry<K, V>) -> R): Map.Entry<K, V>? {\n    return

```

`maxByOrNull(selector)` Returns the first entry yielding the largest value of the given function or `null` if there are no entries.

```

@SinceKotlin("1.4")@kotlin.internal.InlineOnly
public inline fun <K, V, R : Comparable<R>> Map<out K, V>.maxByOrNull(selector: (Map.Entry<K, V>) -> R): Map.Entry<K, V>? {
    return entries.maxByOrNull(selector)
}

```

Returns the largest value among all values produced by [selector] function applied to each entry in the map. If any of values produced by [selector] function is `NaN`, the returned result is `NaN`.

```

@SinceKotlin("1.4")@OptIn(kotlin.experimental.ExperimentalTypeInference::class)
@OverloadResolutionByLambdaReturnType
@kotlin.internal.InlineOnly
public inline fun <K, V> Map<out K, V>.maxOf(selector: (Map.Entry<K, V>) -> Double): Double {
    return entries.maxOf(selector)
}

```

Returns the largest value among all values produced by [selector] function applied to each entry in the map. If any of values produced by [selector] function is `NaN`, the returned result is `NaN`.

```

@SinceKotlin("1.4")@OptIn(kotlin.experimental.ExperimentalTypeInference::class)
@OverloadResolutionByLambdaReturnType
@kotlin.internal.InlineOnly
public inline fun <K, V> Map<out K, V>.maxOf(selector: (Map.Entry<K, V>) -> Float): Float {
    return entries.maxOf(selector)
}

```

Returns the largest value among all values produced by [selector] function applied to each entry in the map.

```

@SinceKotlin("1.4")@OptIn(kotlin.experimental.ExperimentalTypeInference::class)
@OverloadResolutionByLambdaReturnType
@kotlin.internal.InlineOnly
public inline fun <K, V, R : Comparable<R>> Map<out K, V>.maxOf(selector: (Map.Entry<K, V>) -> R): R {
    return entries.maxOf(selector)
}

```

Returns the largest value among all values produced by [selector] function applied to each entry in the map or `null` if there are no entries. If any of values produced by [selector] function is `NaN`, the returned result is `NaN`.

```

@SinceKotlin("1.4")@OptIn(kotlin.experimental.ExperimentalTypeInference::class)
@OverloadResolutionByLambdaReturnType
@kotlin.internal.InlineOnly
public inline fun <K, V> Map<out K, V>.maxOfOrNull(selector: (Map.Entry<K, V>) -> Double): Double? {
    return entries.maxOfOrNull(selector)
}

```

Returns the largest value among all values produced by [selector] function applied to each entry in the map or `null` if there are no entries. If any of values produced by [selector] function is `NaN`, the returned result is `NaN`.

```

@SinceKotlin("1.4")@OptIn(kotlin.experimental.ExperimentalTypeInference::class)
@OverloadResolutionByLambdaReturnType
@kotlin.internal.InlineOnly
public inline fun <K, V> Map<out K, V>.maxOfOrNull(selector: (Map.Entry<K, V>) -> Float): Float? {
    return entries.maxOfOrNull(selector)
}

```

Returns the largest value among all values produced by [selector] function applied to each entry in the map or `null` if there are no entries.

```

@SinceKotlin("1.4")@OptIn(kotlin.experimental.ExperimentalTypeInference::class)
@OverloadResolutionByLambdaReturnType
@kotlin.internal.InlineOnly
public inline fun <K, V, R : Comparable<R>> Map<out K, V>.maxOfOrNull(selector: (Map.Entry<K, V>) -> R): R? {
    return entries.maxOfOrNull(selector)
}

```

Returns the largest value according to the provided [comparator] among all values produced by [selector] function applied to each entry in the map.

```

@SinceKotlin("1.4")@OptIn(kotlin.experimental.ExperimentalTypeInference::class)
@OverloadResolutionByLambdaReturnType
@kotlin.internal.InlineOnly
public inline fun <K, V, R> Map<out K, V>.maxOfWith(comparator: Comparator<in R>, selector: (Map.Entry<K, V>) -> R): R {
    return entries.maxOfWith(comparator, selector)
}

```

Returns the largest value according to the provided [comparator] among all values produced by [selector] function applied to each entry in the map or `null` if there are no entries.

```

@SinceKotlin("1.4")@OptIn(kotlin.experimental.ExperimentalTypeInference::class)
@OverloadResolutionByLambdaReturnType
@kotlin.internal.InlineOnly
public inline fun <K, V, R> Map<out K, V>.maxOfWithOrNull(comparator: Comparator<in R>, selector: (Map.Entry<K, V>) -> R): R? {
    return entries.maxOfWithOrNull(comparator, selector)
}

```

```

entries.maxOfWithOrNull(comparator, selector)\n}\n\n@Deprecated(\\"Use maxWithOrNull instead.\",
ReplaceWith(\\"this.maxWithOrNull(comparator)\")\n)\n@DeprecatedSinceKotlin(warningSince = \\"1.4\"", errorSince
= \\"1.5\"", hiddenSince = \\"1.6\"\n)\n@kotlin.internal.InlineOnly\npublic inline fun <K, V> Map<out K,
V>.maxWith(comparator: Comparator<in Map.Entry<K, V>>): Map.Entry<K, V>? {\n    return
maxWithOrNull(comparator)\n}\n\n/**\n * Returns the first entry having the largest value according to the provided
[comparator] or `null` if there are no entries.\n * ^\n@SinceKotlin(\\"1.4\"\n)\n@kotlin.internal.InlineOnly\npublic
inline fun <K, V> Map<out K, V>.maxWithOrNull(comparator: Comparator<in Map.Entry<K, V>>):
Map.Entry<K, V>? {\n    return entries.maxWithOrNull(comparator)\n}\n\n@Deprecated(\\"Use minByOrNull
instead.\", ReplaceWith(\\"this.minByOrNull(selector)\")\n)\n@DeprecatedSinceKotlin(warningSince = \\"1.4\"",
errorSince = \\"1.5\"", hiddenSince = \\"1.6\"\n)\npublic inline fun <K, V, R : Comparable<R>> Map<out K,
V>.minBy(selector: (Map.Entry<K, V>) -> R): Map.Entry<K, V>? {\n    return minByOrNull(selector)\n}\n\n/**\n * Returns the first entry yielding the smallest value of the given function or `null` if there are no entries.\n * \n *
@sample samples.collections.Collections.Aggregates.minByOrNull\n
*\n@SinceKotlin(\\"1.4\"\n)\n@kotlin.internal.InlineOnly\npublic inline fun <K, V, R : Comparable<R>> Map<out
K, V>.minByOrNull(selector: (Map.Entry<K, V>) -> R): Map.Entry<K, V>? {\n    return
entries.minByOrNull(selector)\n}\n\n/**\n * Returns the smallest value among all values produced by [selector]
function\n * applied to each entry in the map.\n * \n * If any of values produced by [selector] function is `NaN`, the
returned result is `NaN`.\n * \n * @throws NoSuchElementException if the map is empty.\n
*\n@SinceKotlin(\\"1.4\"\n)\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <K, V> Map<out K, V>.minOf(selector:
(Map.Entry<K, V>) -> Double): Double {\n    return entries.minOf(selector)\n}\n\n/**\n * Returns the smallest
value among all values produced by [selector] function\n * applied to each entry in the map.\n * \n * If any of values
produced by [selector] function is `NaN`, the returned result is `NaN`.\n * \n * @throws NoSuchElementException
if the map is empty.\n
*\n@SinceKotlin(\\"1.4\"\n)\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <K, V> Map<out K, V>.minOf(selector:
(Map.Entry<K, V>) -> Float): Float {\n    return entries.minOf(selector)\n}\n\n/**\n * Returns the smallest value
among all values produced by [selector] function\n * applied to each entry in the map.\n * \n * @throws
NoSuchElementException if the map is empty.\n
*\n@SinceKotlin(\\"1.4\"\n)\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <K, V, R : Comparable<R>> Map<out K,
V>.minOf(selector: (Map.Entry<K, V>) -> R): R {\n    return entries.minOf(selector)\n}\n\n/**\n * Returns the
smallest value among all values produced by [selector] function\n * applied to each entry in the map or `null` if
there are no entries.\n * \n * If any of values produced by [selector] function is `NaN`, the returned result is `NaN`.\n
*\n@SinceKotlin(\\"1.4\"\n)\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <K, V> Map<out K,
V>.minOfOrNull(selector: (Map.Entry<K, V>) -> Double): Double? {\n    return
entries.minOfOrNull(selector)\n}\n\n/**\n * Returns the smallest value among all values produced by [selector]
function\n * applied to each entry in the map or `null` if there are no entries.\n * \n * If any of values produced by
[selector] function is `NaN`, the returned result is `NaN`.\n
*\n@SinceKotlin(\\"1.4\"\n)\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <K, V> Map<out K,
V>.minOfOrNull(selector: (Map.Entry<K, V>) -> Float): Float? {\n    return
entries.minOfOrNull(selector)\n}\n\n/**\n * Returns the smallest value among all values produced by [selector]
function\n * applied to each entry in the map or `null` if there are no entries.\n
*\n@SinceKotlin(\\"1.4\"\n)\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <K, V, R : Comparable<R>> Map<out K,
V>.minOfOrNull(selector: (Map.Entry<K, V>) -> R): R? {\n    return entries.minOfOrNull(selector)\n}\n\n/**\n

```

```

Returns the smallest value according to the provided [comparator] among all values produced by [selector]
function applied to each entry in the map.
 * @throws NoSuchElementException if the map is empty.
 * \n @SinceKotlin("1.4") \n @OptIn(kotlin.experimental.ExperimentalTypeInference::class) \n @OverloadResolution
ByLambdaReturnType \n @kotlin.internal.InlineOnly \n public inline fun <K, V, R> Map<out K,
V>.minOfWith(comparator: Comparator<in R>, selector: (Map.Entry<K, V>) -> R): R { \n return
entries.minOfWith(comparator, selector) \n } \n \n /** \n * Returns the smallest value according to the provided
[comparator] among all values produced by [selector] function applied to each entry in the map or `null` if there
are no entries. \n
 * \n @SinceKotlin("1.4") \n @OptIn(kotlin.experimental.ExperimentalTypeInference::class) \n @OverloadResolution
ByLambdaReturnType \n @kotlin.internal.InlineOnly \n public inline fun <K, V, R> Map<out K,
V>.minOfWithOrNull(comparator: Comparator<in R>, selector: (Map.Entry<K, V>) -> R): R? { \n return
entries.minOfWithOrNull(comparator, selector) \n } \n \n @Deprecated("Use minWithOrNull instead.",
ReplaceWith("this.minWithOrNull(comparator)")) \n @DeprecatedSinceKotlin(warningSince = "1.4", errorSince
= "1.5", hiddenSince = "1.6") \n public fun <K, V> Map<out K, V>.minWith(comparator: Comparator<in
Map.Entry<K, V>>): Map.Entry<K, V>? { \n return minWithOrNull(comparator) \n } \n \n /** \n * Returns the first
entry having the smallest value according to the provided [comparator] or `null` if there are no entries. \n
 * \n @SinceKotlin("1.4") \n @kotlin.internal.InlineOnly \n public inline fun <K, V> Map<out K,
V>.minWithOrNull(comparator: Comparator<in Map.Entry<K, V>>): Map.Entry<K, V>? { \n return
entries.minWithOrNull(comparator) \n } \n \n /** \n * Returns `true` if the map has no entries. \n * \n * @sample
samples.collections.Collections.Aggregates.none \n * \n public fun <K, V> Map<out K, V>.none(): Boolean { \n
return isEmpty() \n } \n \n /** \n * Returns `true` if no entries match the given [predicate]. \n * \n * @sample
samples.collections.Collections.Aggregates.noneWithPredicate \n * \n public inline fun <K, V> Map<out K,
V>.none(predicate: (Map.Entry<K, V>) -> Boolean): Boolean { \n if (isEmpty()) return true \n for (element in
this) if (predicate(element)) return false \n return true \n } \n \n /** \n * Performs the given [action] on each entry and
returns the map itself afterwards. \n * \n @SinceKotlin("1.1") \n public inline fun <K, V, M : Map<out K, V>>
M.onEach(action: (Map.Entry<K, V>) -> Unit): M { \n return apply { for (element in this) action(element)
} \n } \n \n /** \n * Performs the given [action] on each entry, providing sequential index with the entry, \n * and returns
the map itself afterwards. \n * @param [action] function that takes the index of an entry and the entry itself \n * and
performs the action on the entry. \n * \n @SinceKotlin("1.4") \n public inline fun <K, V, M : Map<out K, V>>
M.onEachIndexed(action: (index: Int, Map.Entry<K, V>) -> Unit): M { \n return apply {
entries.forEachIndexed(action) \n } \n } \n \n /** \n * Creates an [Iterable] instance that wraps the original map returning
its entries when being iterated. \n * \n @kotlin.internal.InlineOnly \n public inline fun <K, V> Map<out K,
V>.asIterable(): Iterable<Map.Entry<K, V>> { \n return entries \n } \n \n /** \n * Creates a [Sequence] instance that
wraps the original map returning its entries when being iterated. \n * \n public fun <K, V> Map<out K,
V>.asSequence(): Sequence<Map.Entry<K, V>> { \n return entries.asSequence() \n } \n \n ", /* \n * Copyright 2010-
2021 JetBrains s.r.o. and Kotlin Programming Language contributors. \n * Use of this source code is governed by the
Apache 2.0 license that can be found in the license/LICENSE.txt file. \n * \n \n package kotlin.text \n \n \n // NOTE:
THIS FILE IS AUTO-GENERATED by the GenerateUnicodeData.kt \n // See:
https://github.com/JetBrains/kotlin/tree/master/libraries/stdlib \n \n \n // 10 mappings totally \n \n internal fun
Char.titlecaseImpl(): String { \n val uppercase = uppercase() \n if (uppercase.length > 1) { \n return if (this ==
"\u0149") uppercase else uppercase[0] + uppercase.substring(1).lowercase() \n } \n return
titlecaseChar().toString() \n } \n \n ", /* \n * Copyright 2010-2021 JetBrains s.r.o. and Kotlin Programming Language
contributors. \n * Use of this source code is governed by the Apache 2.0 license that can be found in the
license/LICENSE.txt file. \n * \n \n package kotlin.text \n \n /** \n * Converts this character to lower case using Unicode
mapping rules of the invariant locale. \n * \n @Deprecated("Use lowercaseChar() instead.",
ReplaceWith("lowercaseChar()")) \n @DeprecatedSinceKotlin(warningSince =
"1.5") \n @kotlin.internal.InlineOnly \n public actual inline fun Char.toLowerCase(): Char =
lowercaseChar() \n \n /** \n * Converts this character to lower case using Unicode mapping rules of the invariant

```

locale.
 * This function performs one-to-one character mapping.
 * To support one-to-many character mapping use the [lowercase] function.
 * If this character has no mapping equivalent, the character itself is returned.
 * @sample samples.text.Chars.lowercase

```

*^@SinceKotlin("1.5")^@WasExperimental(ExperimentalStdlibApi::class)^@kotlin.internal.InlineOnly^public
actual inline fun Char.lowercaseChar(): Char = lowercase()[0]

```

* Converts this character to lower case using Unicode mapping rules of the invariant locale.
 * This function supports one-to-many character mapping, thus the length of the returned string can be greater than one.
 * For example, `'\u0130'.lowercase()` returns `'\u0069\u0307'`, where `'\u0130'` is the LATIN CAPITAL LETTER I WITH DOT ABOVE character (`^\u0130`).
 * If this character has no lower case mapping, the result of `toString()` of this char is returned.
 * @sample samples.text.Chars.lowercase

```

*^@SinceKotlin("1.5")^@WasExperimental(ExperimentalStdlibApi::class)^@kotlin.internal.InlineOnly^public
actual inline fun Char.lowercase(): String = toString().asDynamic().toLowerCase().unsafeCast<String>()

```

* Converts this character to upper case using Unicode mapping rules of the invariant locale.
 * @Deprecated("Use uppercaseChar() instead.")

```

ReplaceWith("uppercaseChar()")^@DeprecatedSinceKotlin(warningSince = "1.5")^@kotlin.internal.InlineOnly^public
actual inline fun Char.toUpperCase(): Char = uppercaseChar()

```

* Converts this character to upper case using Unicode mapping rules of the invariant locale.
 * This function performs one-to-one character mapping.
 * To support one-to-many character mapping use the [uppercase] function.
 * If this character has no mapping equivalent, the character itself is returned.
 * @sample samples.text.Chars.uppercase

```

*^@SinceKotlin("1.5")^@WasExperimental(ExperimentalStdlibApi::class)^public
actual fun Char.toUpperCaseChar(): Char {
    val uppercase = uppercase()
    return if (uppercase.length > 1) this else uppercase[0]
}

```

* Converts this character to upper case using Unicode mapping rules of the invariant locale.
 * This function supports one-to-many character mapping, thus the length of the returned string can be greater than one.
 * For example, `'\uFB00'.uppercase()` returns `'\u0046\u0046'`, where `'\uFB00'` is the LATIN SMALL LIGATURE FF character (`^\ufb00`).
 * If this character has no upper case mapping, the result of `toString()` of this char is returned.
 * @sample samples.text.Chars.uppercase

```

*^@SinceKotlin("1.5")^@WasExperimental(ExperimentalStdlibApi::class)^@kotlin.internal.InlineOnly^public
actual inline fun Char.toUpperCase(): String = toString().asDynamic().toUpperCase().unsafeCast<String>()

```

* Converts this character to title case using Unicode mapping rules of the invariant locale.
 * This function performs one-to-one character mapping.
 * To support one-to-many character mapping use the [titlecase] function.
 * If this character has no mapping equivalent, the result of calling [uppercaseChar] is returned.
 * @sample samples.text.Chars.titlecase

```

*^@SinceKotlin("1.5")^public
actual fun Char.titlecaseChar(): Char = titlecaseCharImpl()

```

* Returns `true` if this character is a Unicode high-surrogate code unit (also known as leading-surrogate code unit).
 * @public actual fun Char.isHighSurrogate(): Boolean = this in Char.MIN_HIGH_SURROGATE..Char.MAX_HIGH_SURROGATE

```

*^@SinceKotlin("1.5")^public
actual fun Char.isLowSurrogate(): Boolean = this in Char.MIN_LOW_SURROGATE..Char.MAX_LOW_SURROGATE

```

* Returns the Unicode general category of this character.
 * @SinceKotlin("1.5")^public actual val Char.category: CharCategory
 * get() = CharCategory.valueOf(getCategoryValue())

```

*^@SinceKotlin("1.5")^public
actual fun Char.isDefined(): Boolean {
    if (this < "\u0080") {
        return true
    }
    return getCategoryValue() != CharCategory.UNASSIGNED.value
}

```

* Returns `true` if this character is a letter.
 * A character is considered to be a letter if its [category] is [CharCategory.UPPERCASE_LETTER], [CharCategory.LOWERCASE_LETTER], [CharCategory.TITLECASE_LETTER], [CharCategory.MODIFIER_LETTER], or [CharCategory.OTHER_LETTER].
 * @sample

```

samples.text.Chars.isLetter\n */\n@SinceKotlin(\\"1.5\\")\npublic actual fun Char.isLetter(): Boolean {\n    if (this in 'a..'z' || this in 'A..'Z') {\n        return true\n    }\n    if (this < \"\u0080\") {\n        return false\n    }\n    return isLetterImpl()\n}\n\n/**\n * Returns `true` if this character is a letter or digit.\n * \n * @see isLetter\n * @see isDigit\n * \n * @sample samples.text.Chars.isLetterOrDigit\n */\n@SinceKotlin(\\"1.5\\")\npublic actual fun Char.isLetterOrDigit(): Boolean {\n    if (this in 'a..'z' || this in 'A..'Z' || this in '0..'9') {\n        return true\n    }\n    if (this < \"\u0080\") {\n        return false\n    }\n    return isDigitImpl() || isLetterImpl()\n}\n\n/**\n * Returns `true` if this character is a digit.\n * \n * A character is considered to be a digit if its [category] is [CharCategory.DECIMAL_DIGIT_NUMBER].\n * \n * @sample samples.text.Chars.isDigit\n */\n@SinceKotlin(\\"1.5\\")\npublic actual fun Char.isDigit(): Boolean {\n    if (this in '0..'9') {\n        return true\n    }\n    if (this < \"\u0080\") {\n        return false\n    }\n    return isDigitImpl()\n}\n\n/**\n * Returns `true` if this character is upper case.\n * \n * A character is considered to be an upper case character if its [category] is [CharCategory.UPPERCASE_LETTER],\n * or it has contributory property `Other_Uppercase` as defined by the Unicode Standard.\n * \n * @sample samples.text.Chars.isUpperCase\n */\n@SinceKotlin(\\"1.5\\")\npublic actual fun Char.isUpperCase(): Boolean {\n    if (this in 'A..'Z') {\n        return true\n    }\n    if (this < \"\u0080\") {\n        return false\n    }\n    return isUpperCaseImpl()\n}\n\n/**\n * Returns `true` if this character is lower case.\n * \n * A character is considered to be a lower case character if its [category] is [CharCategory.LOWERCASE_LETTER],\n * or it has contributory property `Other_Lowercase` as defined by the Unicode Standard.\n * \n * @sample samples.text.Chars.isLowerCase\n */\n@SinceKotlin(\\"1.5\\")\npublic actual fun Char.isLowerCase(): Boolean {\n    if (this in 'a..'z') {\n        return true\n    }\n    if (this < \"\u0080\") {\n        return false\n    }\n    return isLowerCaseImpl()\n}\n\n/**\n * Returns `true` if this character is a title case letter.\n * \n * A character is considered to be a title case letter if its [category] is [CharCategory.TITLECASE_LETTER].\n * \n * @sample samples.text.Chars.isTitleCase\n */\n@SinceKotlin(\\"1.5\\")\npublic actual fun Char.isTitleCase(): Boolean {\n    if (this < \"\u0080\") {\n        return false\n    }\n    return getCategoryValue() == CharCategory.TITLECASE_LETTER.value\n}\n\n/**\n * Returns `true` if this character is an ISO control character.\n * \n * A character is considered to be an ISO control character if its [category] is [CharCategory.CONTROL],\n * meaning the Char is in the range `\"\\u0000\"..\"\\u001F\"` or in the range `\"\\u007F\"..\"\\u009F\"`.\n * \n * @sample samples.text.Chars.isISOControl\n */\n@SinceKotlin(\\"1.5\\")\npublic actual fun Char.isISOControl(): Boolean {\n    return this <= \"\u001F\" || this in \"\u007F\"..\"\\u009F\"\n}\n\n/**\n * Determines whether a character is whitespace according to the Unicode standard.\n * \n * Returns `true` if the character is whitespace.\n * \n * @sample samples.text.Chars.isWhitespace\n */\n@SinceKotlin(\\"1.5\\")\npublic actual fun Char.isWhitespace(): Boolean = isWhitespaceImpl()\n\n/*\n * Copyright 2010-2021 JetBrains s.r.o. and Kotlin Programming Language contributors.\n * Use of this source code is governed by the Apache 2.0 license that can be found in the license/LICENSE.txt file.\n */\n\npackage kotlin.text\n\nimport kotlin.js.RegExp\n\n/**\n * Converts the characters in the specified array to a string.\n * \n * @SinceKotlin(\\"1.2\\")\n * @Deprecated(\\"Use CharArray.concatToString() instead\", ReplaceWith(\\"chars.concatToString()\"))\n */\n@DeprecatedSinceKotlin(warningSince = \\"1.4\", errorSince = \\"1.5\\")\npublic actual fun String(chars: CharArray): String {\n    var result = \"\"\n    for (char in chars) {\n        result += char\n    }\n    return result\n}\n\n/**\n * Converts the characters from a portion of the specified array to a string.\n * \n * @throws IndexOutOfBoundsException if either [offset] or [length] are less than zero\n * or `offset + length` is out of [chars] array bounds.\n * \n * @SinceKotlin(\\"1.2\\")\n * @Deprecated(\\"Use CharArray.concatToString(startIndex, endIndex) instead\", ReplaceWith(\\"chars.concatToString(offset, offset + length)\"))\n */\n@DeprecatedSinceKotlin(warningSince = \\"1.4\", errorSince = \\"1.5\\")\npublic actual fun String(chars: CharArray, offset: Int, length: Int): String {\n    if (offset < 0 || length < 0 || chars.size - offset < length)\n        throw IndexOutOfBoundsException(\\"size: ${chars.size}; offset: $offset; length: $length\")\n    var result = \"\"\n    for (index in offset until offset + length) {\n        result += chars[index]\n    }\n    return result\n}\n\n/**\n * Concatenates characters in this [CharArray] into a String.\n * \n * @SinceKotlin(\\"1.4\\")\n * @WasExperimental(ExperimentalStdlibApi::class)\n */\n@WasExperimental(ExperimentalStdlibApi::class)\npublic actual fun CharArray.concatToString(): String {\n    var result = \"\"\n    for (char in this) {\n        result += char\n    }\n    return result\n}\n\n/**\n * Concatenates characters in this [CharArray] or its subrange into a String.\n * \n * @param

```

startIndex the beginning (inclusive) of the subrange of characters, 0 by default.\n * @param endIndex the end (exclusive) of the subrange of characters, size of this array by default.\n * @throws IndexOutOfBoundsException if [startIndex] is less than zero or [endIndex] is greater than the size of this array.\n * @throws IllegalArgumentException if [startIndex] is greater than [endIndex].\n

```

*\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\n@Suppress("ACTUAL_FUNCTION_WITH_DEFAULT_ARGUMENTS")\npublic actual fun CharArray.concatToString(startIndex: Int = 0,
endIndex: Int = this.size): String {\n    AbstractList.checkBoundsIndexes(startIndex, endIndex, this.size)\n    var
result = ""\n    for (index in startIndex until endIndex) {\n        result += this[index]\n    }\n    return
result\n}\n\n/**\n * Returns a [CharArray] containing characters of this string.\n
*\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\npublic actual fun
String.toCharArray(): CharArray {\n    return CharArray(length) { get(it) }\n}\n\n/**\n * Returns a [CharArray]
containing characters of this string or its substring.\n * @param startIndex the beginning (inclusive) of the
substring, 0 by default.\n * @param endIndex the end (exclusive) of the substring, length of this string by
default.\n * @throws IndexOutOfBoundsException if [startIndex] is less than zero or [endIndex] is greater
than the length of this string.\n * @throws IllegalArgumentException if [startIndex] is greater than [endIndex].\n
*\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\n@Suppress("ACTUAL_FUNCTION_WITH_DEFAULT_ARGUMENTS")\npublic actual fun String.toCharArray(startIndex: Int = 0, endIndex: Int = this.length): CharArray {\n    AbstractList.checkBoundsIndexes(startIndex, endIndex, length)\n    return CharArray(endIndex - startIndex) { get(startIndex + it) }\n}\n\n/**\n * Decodes a string from the bytes in UTF-8 encoding in this array.\n * @param startIndex the beginning (inclusive) of the subrange to decode, 0 by default.\n * @param endIndex the end (exclusive) of the subrange to decode, size of this array by default.\n * @param throwOnInvalidSequence specifies whether to throw an exception on malformed byte sequence or replace it by the replacement char '\uFFFD'.\n
*\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\npublic actual fun
ByteArray.decodeToString(): String {\n    return decodeUtf8(this, 0, size, false)\n}\n\n/**\n * Decodes a string from the bytes in UTF-8 encoding in this array or its subrange.\n * @param startIndex the beginning (inclusive) of the subrange to decode, 0 by default.\n * @param endIndex the end (exclusive) of the subrange to decode, size of this array by default.\n * @param throwOnInvalidSequence specifies whether to throw an exception on malformed byte sequence or replace it by the replacement char '\uFFFD'.\n * @throws IndexOutOfBoundsException if [startIndex] is less than zero or [endIndex] is greater than the size of this array.\n * @throws IllegalArgumentException if [startIndex] is greater than [endIndex].\n * @throws CharacterCodingException if the byte array contains malformed UTF-8 byte sequence and [throwOnInvalidSequence] is true.\n
*\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\n@Suppress("ACTUAL_FUNCTION_WITH_DEFAULT_ARGUMENTS")\npublic actual fun ByteArray.decodeToString(\n    startIndex: Int = 0,\n    endIndex: Int = this.size,\n    throwOnInvalidSequence: Boolean = false\n): String {\n    AbstractList.checkBoundsIndexes(startIndex, endIndex, this.size)\n    return decodeUtf8(this, startIndex, endIndex, throwOnInvalidSequence)\n}\n\n/**\n * Encodes this string to an array of bytes in UTF-8 encoding.\n * @param startIndex the beginning (inclusive) of the substring to encode, 0 by default.\n * @param endIndex the end (exclusive) of the substring to encode, length of this string by default.\n * @param throwOnInvalidSequence specifies whether to throw an exception on malformed char sequence or replace.\n * @throws IndexOutOfBoundsException if [startIndex] is less than zero or [endIndex] is greater than the length of this string.\n * @throws IllegalArgumentException if [startIndex] is greater than [endIndex].\n * @throws CharacterCodingException if this string contains malformed char sequence and [throwOnInvalidSequence] is true.\n
*\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\npublic actual fun
String.encodeToByteArray(): ByteArray {\n    return encodeUtf8(this, 0, length, false)\n}\n\n/**\n * Encodes this string or its substring to an array of bytes in UTF-8 encoding.\n * @param startIndex the beginning (inclusive) of the substring to encode, 0 by default.\n * @param endIndex the end (exclusive) of the substring to encode, length of this string by default.\n * @param throwOnInvalidSequence specifies whether to throw an exception on malformed char sequence or replace.\n * @throws IndexOutOfBoundsException if [startIndex] is less than zero or [endIndex] is greater than the length of this string.\n * @throws IllegalArgumentException if [startIndex] is greater than [endIndex].\n * @throws CharacterCodingException if this string contains malformed char sequence and [throwOnInvalidSequence] is true.\n
*\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\n@Suppress("ACTUAL_FUNCTION_WITH_DEFAULT_ARGUMENTS")\npublic actual fun String.encodeToByteArray(\n    startIndex: Int = 0,\n    endIndex: Int = this.length,\n    throwOnInvalidSequence: Boolean = false\n): ByteArray {\n    AbstractList.checkBoundsIndexes(startIndex, endIndex, length)\n    return encodeUtf8(this, startIndex, endIndex,

```

```

throwOnInvalidSequence)\n}\n\n/**\n * Returns a copy of this string converted to upper case using the rules of the
default locale.\n */\n@Deprecated("Use uppercase() instead.\n",
ReplaceWith("uppercase()\n"))\n@DeprecatedSinceKotlin(warningSince =
"1.5")\n@kotlin.internal.InlineOnly\npublic actual inline fun String.toUpperCase(): String =
asDynamic().toUpperCase()\n\n/**\n * Returns a copy of this string converted to upper case using Unicode mapping
rules of the invariant locale.\n */\n * This function supports one-to-many and many-to-one character mapping,\n *
thus the length of the returned string can be different from the length of the original string.\n */\n * @sample
samples.text.Strings.uppercase\n
*/\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalStdlibApi::class)\n@kotlin.internal.InlineOnly\npubli
c actual inline fun String.toUpperCase(): String = asDynamic().toUpperCase()\n\n/**\n * Returns a copy of this string
converted to lower case using the rules of the default locale.\n */\n@Deprecated("Use lowercase() instead.\n",
ReplaceWith("lowercase()\n"))\n@DeprecatedSinceKotlin(warningSince =
"1.5")\n@kotlin.internal.InlineOnly\npublic actual inline fun String.toLowerCase(): String =
asDynamic().toLowerCase()\n\n/**\n * Returns a copy of this string converted to lower case using Unicode
mapping rules of the invariant locale.\n */\n * This function supports one-to-many and many-to-one character
mapping,\n *
thus the length of the returned string can be different from the length of the original string.\n */\n *
@sample samples.text.Strings.lowercase\n
*/\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalStdlibApi::class)\n@kotlin.internal.InlineOnly\npubli
c actual inline fun String.toLowerCase(): String = asDynamic().toLowerCase()\n\n@kotlin.internal.InlineOnly\n\ninternal
actual inline fun String.nativeIndexOf(str: String, fromIndex: Int): Int = asDynamic().indexOf(str,
fromIndex)\n\n@kotlin.internal.InlineOnly\n\ninternal actual inline fun String.nativeLastIndexOf(str: String,
fromIndex: Int): Int = asDynamic().lastIndexOf(str, fromIndex)\n\n@kotlin.internal.InlineOnly\n\ninternal inline fun
String.nativeStartsWith(s: String, position: Int): Boolean = asDynamic().startsWith(s,
position)\n\n@kotlin.internal.InlineOnly\n\ninternal inline fun String.nativeEndsWith(s: String): Boolean =
asDynamic().endsWith(s)\n\n@kotlin.internal.InlineOnly\n\npublic actual inline fun String.substring(startIndex: Int):
String = asDynamic().substring(startIndex)\n\n@kotlin.internal.InlineOnly\n\npublic actual inline fun
String.substring(startIndex: Int, endIndex: Int): String = asDynamic().substring(startIndex,
endIndex)\n\n@Deprecated("Use String.plus() instead", ReplaceWith("this +
str\n"))\n@DeprecatedSinceKotlin(warningSince = "1.6")\n@kotlin.internal.InlineOnly\n\npublic inline fun
String.concat(str: String): String = asDynamic().concat(str)\n\n@Deprecated("Use Regex.findAll() instead or
invoke matches() on String dynamically:
this.asDynamic().match(regex)\n")\n@DeprecatedSinceKotlin(warningSince =
"1.6")\n@kotlin.internal.InlineOnly\n\npublic inline fun String.match(regex: String): Array<String>? =
asDynamic().match(regex)\n\n//native public fun String.trim(): String\n\n//TODO: String.replace to implement
effective trimLeading and trimTrailing\n\n@kotlin.internal.InlineOnly\n\ninternal inline fun
String.nativeReplace(pattern: RegExp, replacement: String): String = asDynamic().replace(pattern,
replacement)\n\n/**\n * Compares two strings lexicographically, optionally ignoring case differences.\n */\n * If
[ignoreCase] is true, the result of `Char.toUpperCaseChar().toLowerCaseChar()` on each character is compared.\n
*/\n@SinceKotlin("1.2")\n@Suppress("ACTUAL_FUNCTION_WITH_DEFAULT_ARGUMENTS")\n\npublic
actual fun String.compareTo(other: String, ignoreCase: Boolean = false): Int {\n    if (ignoreCase) {\n        val n1 =
this.length\n        val n2 = other.length\n        val min = minOf(n1, n2)\n        if (min == 0) return n1 - n2\n        for
(index in 0 until min) {\n            var thisChar = this[index]\n            var otherChar = other[index]\n            if
(thisChar != otherChar) {\n                thisChar = thisChar.toUpperCaseChar()\n                otherChar =
otherChar.toUpperCaseChar()\n                if (thisChar != otherChar) {\n                    thisChar =
thisChar.toLowerCaseChar()\n                    otherChar = otherChar.toLowerCaseChar()\n                }\n                if (thisChar !=
otherChar) {\n                    return thisChar.compareTo(otherChar)\n                }\n            }\n        }\n        return n1 - n2\n    } else {\n        return compareTo(other)\n    }\n}\n\n/**\n * Returns `true` if the contents
of this char sequence are equal to the contents of the specified [other],\n * i.e. both char sequences contain the same

```



```

number of the same characters in the same order.\n * \n * @sample samples.text.Strings.contentEquals\n
*\n@SinceKotlin("1.5")\npublic actual infix fun CharSequence?.contentEquals(other: CharSequence?): Boolean =
contentEqualsImpl(other)\n\n/**\n * Returns `true` if the contents of this char sequence are equal to the contents of
the specified [other], optionally ignoring case difference.\n * \n * @param ignoreCase `true` to ignore character case
when comparing contents.\n * \n * @sample samples.text.Strings.contentEquals\n *\n@SinceKotlin("1.5")\npublic
actual fun CharSequence?.contentEquals(other: CharSequence?, ignoreCase: Boolean): Boolean {\n    return if
(ignoreCase)\n        this.contentEqualsIgnoreCaseImpl(other)\n    else\n
this.contentEqualsImpl(other)\n}\n\nprivate val STRING_CASE_INSENSITIVE_ORDER = Comparator<String>
{ a, b -> a.compareTo(b, ignoreCase = true) }\n\n@SinceKotlin("1.2")\npublic actual val
String.Companion.CASE_INSENSITIVE_ORDER: Comparator<String>\n    get() =
STRING_CASE_INSENSITIVE_ORDER\n", /*\n * Copyright 2010-2021 JetBrains s.r.o. and Kotlin Programming
Language contributors.\n * Use of this source code is governed by the Apache 2.0 license that can be found in the
license/LICENSE.txt file.\n
*\n@file:kotlin.jvm.JvmMultifileClass\n@file:kotlin.jvm.JvmName("CharsKt")\n\npackage kotlin.text\n\n/**\n
* Returns the numeric value of the decimal digit that this Char represents.\n * Throws an exception if this Char is
not a valid decimal digit.\n * \n * A Char is considered to represent a decimal digit if [isDigit] is true for the Char.\n
* \n * In this case, the Unicode decimal digit value of the character is returned.\n * \n * @sample
samples.text.Chars.digitToInt\n
*\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalStdlibApi::class)\npublic fun Char.digitToInt(): Int
{\n    return digitOf(this, 10).also {\n        if (it < 0) throw IllegalArgumentException("Char $this is not a decimal
digit")\n    }\n}\n\n/**\n * Returns the numeric value of the digit that this Char represents in the specified [radix].\n
* Throws an exception if the [radix] is not in the range `2..36` or if this Char is not a valid digit in the specified
[radix].\n * \n * A Char is considered to represent a digit in the specified [radix] if at least one of the following is
true:\n * - [isDigit] is `true` for the Char and the Unicode decimal digit value of the character is less than the
specified [radix]. In this case the decimal digit value is returned.\n * - The Char is one of the uppercase Latin letters
'A' through 'Z' and its [code] is less than `radix + 'A'.code - 10`. In this case, `this.code - 'A'.code + 10` is
returned.\n * - The Char is one of the lowercase Latin letters 'a' through 'z' and its [code] is less than `radix +
'a'.code - 10`. In this case, `this.code - 'a'.code + 10` is returned.\n * - The Char is one of the fullwidth Latin
capital letters '\uFF21' through '\uFF3A' and its [code] is less than `radix + 0xFF21 - 10`. In this case, `this.code -
0xFF21 + 10` is returned.\n * - The Char is one of the fullwidth Latin small letters '\uFF41' through '\uFF5A' and its
[code] is less than `radix + 0xFF41 - 10`. In this case, `this.code - 0xFF41 + 10` is returned.\n * \n * @sample
samples.text.Chars.digitToInt\n
*\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalStdlibApi::class)\npublic fun Char.digitToInt(radix:
Int): Int {\n    return digitToIntOrNull(radix) ?: throw IllegalArgumentException("Char $this is not a digit in the
given radix=$radix")\n}\n\n/**\n * Returns the numeric value of the decimal digit that this Char represents, or
`null` if this Char is not a valid decimal digit.\n * \n * A Char is considered to represent a decimal digit if [isDigit]
is true for the Char.\n * \n * In this case, the Unicode decimal digit value of the character is returned.\n * \n * @sample
samples.text.Chars.digitToIntOrNull\n
*\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalStdlibApi::class)\npublic fun
Char.digitToIntOrNull(): Int? {\n    return digitOf(this, 10).takeIf { it >= 0 }\n}\n\n/**\n * Returns the numeric
value of the digit that this Char represents in the specified [radix], or `null` if this Char is not a valid digit in the
specified [radix].\n * Throws an exception if the [radix] is not in the range `2..36`.\n * \n * A Char is considered to
represent a digit in the specified [radix] if at least one of the following is true:\n * - [isDigit] is `true` for the
Char and the Unicode decimal digit value of the character is less than the specified [radix]. In this case the decimal
digit value is returned.\n * - The Char is one of the uppercase Latin letters 'A' through 'Z' and its [code] is less
than `radix + 'A'.code - 10`. In this case, `this.code - 'A'.code + 10` is returned.\n * - The Char is one of the
lowercase Latin letters 'a' through 'z' and its [code] is less than `radix + 'a'.code - 10`. In this case, `this.code -
'a'.code + 10` is returned.\n * - The Char is one of the fullwidth Latin capital letters '\uFF21' through '\uFF3A' and
its [code] is less

```

than `radix + 0xFF21 - 10`. In this case, `this.code - 0xFF21 + 10` is returned.

`Char` is one of the fullwidth Latin small letters `U+FF41` through `U+FF5A` and its [code] is less than `radix + 0xFF41 - 10`. In this case, `this.code - 0xFF41 + 10` is returned.

```

@sample samples.text.Chars.digitToIntOrNull
*
@SinceKotlin("1.5")
@WasExperimental(ExperimentalStdlibApi::class)
npublic fun
Char.digitToIntOrNull(radix: Int): Int? {
    checkRadix(radix)
    return digitOf(this, radix).takeIf { it >= 0 }
}
n/n/**
 * Returns the Char that represents this decimal digit.
 * Throws an exception if this value is not in the range `0..9`.
 * If this value is in `0..9`, the decimal digit Char with code `0.code + this` is returned.
 *
 @sample samples.text.Chars.digitToChar
*
@SinceKotlin("1.5")
@WasExperimental(ExperimentalStdlibApi::class)
npublic fun Int.digitToChar(): Char {
    if (this in 0..9) {
        return '0' + this
    }
    throw IllegalArgumentException("Int $this is not a decimal digit")
}
n/n/**
 * Returns the Char that represents this numeric digit value in the specified [radix].
 * Throws an exception if the [radix] is not in the range `2..36` or if this value is not in the range `0` until radix.
 * If this value is less than `10`, the decimal digit Char with code `0.code + this` is returned.
 * Otherwise, the uppercase Latin letter with code `A.code + this - 10` is returned.
 *
 @sample samples.text.Chars.digitToChar
*
@SinceKotlin("1.5")
@WasExperimental(ExperimentalStdlibApi::class)
npublic fun Int.digitToChar(radix: Int): Char {
    if (radix !in 2..36) {
        throw IllegalArgumentException("Invalid radix: $radix. Valid radix values are in range 2..36")
    }
    if (this < 0 || this >= radix) {
        throw IllegalArgumentException("Digit $this does not represent a valid digit in radix $radix")
    }
    return if (this < 10) {
        '0' + this
    } else {
        'A' + this - 10
    }
}
n/n/**
 * Converts this character to lower case using Unicode mapping rules of the invariant locale.
 *
 @Deprecated("Use lowercaseChar() instead.")
ReplaceWith("lowercaseChar()")
@DeprecatedSinceKotlin(warningSince = "1.5")
npublic expect fun
Char.toLowerCase(): Char
n/n/**
 * Converts this character to lower case using Unicode mapping rules of the invariant locale.
 * This function performs one-to-one character mapping.
 * To support one-to-many character mapping use the [lowercase] function.
 * If this character has no mapping equivalent, the character itself is returned.
 *
 @sample samples.text.Chars.lowercase
*
@SinceKotlin("1.5")
@WasExperimental(ExperimentalStdlibApi::class)
npublic expect fun
Char.lowercaseChar(): Char
n/n/**
 * Converts this character to lower case using Unicode mapping rules of the invariant locale.
 * This function supports one-to-many character mapping, thus the length of the returned string can be greater than one.
 * For example, U+0130.toLowerCase() returns U+0069U+0307, where U+0130 is the LATIN CAPITAL LETTER I WITH DOT ABOVE character (U+FFFD).
 * If this character has no lower case mapping, the result of toString() of this char is returned.
 *
 @sample samples.text.Chars.lowercase
*
@SinceKotlin("1.5")
@WasExperimental(ExperimentalStdlibApi::class)
npublic expect fun
Char.lowercase(): String
n/n/**
 * Converts this character to upper case using Unicode mapping rules of the invariant locale.
 *
 @Deprecated("Use uppercaseChar() instead.")
ReplaceWith("uppercaseChar()")
@DeprecatedSinceKotlin(warningSince = "1.5")
npublic expect fun
Char.toUpperCase(): Char
n/n/**
 * Converts this character to upper case using Unicode mapping rules of the invariant locale.
 * This function performs one-to-one character mapping.
 * To support one-to-many character mapping use the [uppercase] function.
 * If this character has no mapping equivalent, the character itself is returned.
 *
 @sample samples.text.Chars.uppercase
*
@SinceKotlin("1.5")
@WasExperimental(ExperimentalStdlibApi::class)
npublic expect fun
Char.uppercaseChar(): Char
n/n/**
 * Converts this character to upper case using Unicode mapping rules of the invariant locale.
 * This function supports one-to-many character mapping, thus the length of the returned string can be greater than one.
 * For example, U+FB00.toUpperCase() returns U+0046U+0046, where U+FB00 is the LATIN SMALL LIGATURE FF character (U+FFFD).
 * If this character has no upper case mapping, the result of toString() of this char is returned.
 *
 @sample samples.text.Chars.uppercase
*
@SinceKotlin("1.5")
@WasExperimental(ExperimentalStdlibApi::class)
npublic expect fun
Char.uppercase(): String
n/n/**
 * Converts this character to title case using Unicode mapping rules of the

```

invariant locale.
 * This function performs one-to-one character mapping.
 * To support one-to-many character mapping use the [titlecase] function.
 * If this character has no mapping equivalent, the result of calling [uppercaseChar] is returned.
 * @sample samples.text.Chars.titlecase
 *
 * Since Kotlin 1.5
 * public expect fun Char.titlecaseChar(): Char
 * Converts this character to title case using Unicode mapping rules of the invariant locale.
 * This function supports one-to-many character mapping, thus the length of the returned string can be greater than one.
 * For example, `'\uFB00'.titlecase()` returns `'\u0046\u0066'`, where `'\uFB00'` is the LATIN SMALL LIGATURE FF character (`\ufffd\uuffd\uuffd`).
 * If this character has no title case mapping, the result of [uppercase] is returned instead.
 * @sample samples.text.Chars.titlecase
 *
 * Since Kotlin 1.5
 * public fun Char.titlecase(): String = titlecaseImpl()
 * Concatenates this Char and a String.
 * @sample samples.text.Chars.plus
 *
 * kotlin.internal.InlineOnly
 * public inline operator fun Char.plus(other: String): String = this.toString() + other
 * Returns `true` if this character is equal to the [other] character, optionally ignoring character case.
 * Two characters are considered equal ignoring case if `Char.uppercaseChar().lowercaseChar()` on each character produces the same result.
 * @param ignoreCase `true` to ignore character case when comparing characters. By default `false`.
 * @sample samples.text.Chars.equals
 *
 * public fun Char.equals(other: Char, ignoreCase: Boolean = false): Boolean {
 * if (this == other) return true
 * if (!ignoreCase) return false
 * val thisUpper = this.uppercaseChar()
 * val otherUpper = other.uppercaseChar()
 * return thisUpper == otherUpper || thisUpper.lowercaseChar() == otherUpper.lowercaseChar()
 * }
 * Returns `true` if this character is a Unicode surrogate code unit.
 *
 * public fun Char.isSurrogate(): Boolean = this in Char.MIN_SURROGATE..Char.MAX_SURROGATE
 * Returns the Unicode general category of this character.
 *
 * Since Kotlin 1.5
 * public expect val Char.category: CharCategory
 * Returns `true` if this character (Unicode code point) is defined in Unicode.
 * A character is considered to be defined in Unicode if its [category] is not [CharCategory.UNASSIGNED].
 *
 * Since Kotlin 1.5
 * public expect fun Char.isDefined(): Boolean
 * Returns `true` if this character is a letter.
 * A character is considered to be a letter if its [category] is [CharCategory.UPPERCASE_LETTER], [CharCategory.LOWERCASE_LETTER], [CharCategory.TITLECASE_LETTER], [CharCategory.MODIFIER_LETTER], or [CharCategory.OTHER_LETTER].
 * @sample samples.text.Chars.isLetter
 *
 * Since Kotlin 1.5
 * public expect fun Char.isLetter(): Boolean
 * Returns `true` if this character is a letter or digit.
 * @see isLetter
 * @see isDigit
 * @sample samples.text.Chars.isLetterOrDigit
 *
 * Since Kotlin 1.5
 * public expect fun Char.isLetterOrDigit(): Boolean
 * Returns `true` if this character is a digit.
 * A character is considered to be a digit if its [category] is [CharCategory.DECIMAL_DIGIT_NUMBER].
 * @sample samples.text.Chars.isDigit
 *
 * Since Kotlin 1.5
 * public expect fun Char.isDigit(): Boolean
 * Returns `true` if this character is upper case.
 * A character is considered to be an upper case character if its [category] is [CharCategory.UPPERCASE_LETTER], or it has contributory property `Other_Uppercase` as defined by the Unicode Standard.
 * @sample samples.text.Chars.isUpperCase
 *
 * Since Kotlin 1.5
 * public expect fun Char.isUpperCase(): Boolean
 * Returns `true` if this character is lower case.
 * A character is considered to be a lower case character if its [category] is [CharCategory.LOWERCASE_LETTER], or it has contributory property `Other_Lowercase` as defined by the Unicode Standard.
 * @sample samples.text.Chars.isLowerCase
 *
 * Since Kotlin 1.5
 * public expect fun Char.isLowerCase(): Boolean
 * Returns `true` if this character is a title case letter.
 * A character is considered to be a title case letter if its [category] is [CharCategory.TITLECASE_LETTER].
 * @sample samples.text.Chars.isTitleCase
 *
 * Since Kotlin 1.5
 * public expect fun Char.isTitleCase(): Boolean
 * Returns `true` if this character is an ISO control character.
 * A character is considered to be an ISO control character if its [category] is [CharCategory.CONTROL], meaning the Char is in the range `'\u0000'..'u001F'` or in the range `'\u007F'..'u009F'`.
 * @sample samples.text.Chars.isISOControl
 *
 * Since Kotlin 1.5
 * public expect fun Char.isISOControl(): Boolean
 * Determines whether a character is whitespace according to the Unicode standard.
 * Returns `true` if the character is whitespace.

```

@sample samples.text.Chars.isWhitespace\n */\npublic expect fun Char.isWhitespace(): Boolean\n","/*\n *
Copyright 2010-2021 JetBrains s.r.o. and Kotlin Programming Language contributors.\n * Use of this source code is
governed by the Apache 2.0 license that can be found in the license/LICENSE.txt file.\n */\n\npackage
kotlin\n\n\n/**\n * Creates a Char with the specified [code], or throws an exception if the [code] is out of
`Char.MIN_VALUE.code..Char.MAX_VALUE.code`\n *\n * If the program that calls this function is written in a
way that only valid [code] is passed as the argument,\n * using the overload that takes a [UShort] argument is
preferable (`Char(intValue.toUShort())`).\n * That overload doesn't check validity of the argument, and may
improve program performance when the function is called routinely inside a loop.\n *\n * @sample
samples.text.Chars.charFromCode\n
*/\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalStdlibApi::class)\n@kotlin.internal.InlineOnly\npubli
c inline fun Char(code: Int): Char {\n    if (code < Char.MIN_VALUE.code || code > Char.MAX_VALUE.code) {\n
        throw IllegalArgumentException("Invalid Char code: $code")\n    }\n    return code.toChar()\n}\n\n/**\n *
Creates a Char with the specified [code].\n *\n * @sample samples.text.Chars.charFromCode\n
*/\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalStdlibApi::class)\n@Suppress("NO_ACTUAL_FOR
_EXPECT")\n\npublic expect fun Char(code: UShort): Char\n\n/**\n * Returns the code of this Char.\n *\n * Code of
a Char is the value it was constructed with, and the UTF-16 code unit corresponding to this Char.\n *\n * @sample
samples.text.Chars.code\n
*/\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalStdlibApi::class)\n@kotlin.internal.InlineOnly\n@Su
ppress("DEPRECATION")\n\npublic inline val Char.code: Int get() = this.toInt()\n","/*\n * Copyright 2010-2021
JetBrains s.r.o. and Kotlin Programming Language contributors.\n * Use of this source code is governed by the
Apache 2.0 license that can be found in the license/LICENSE.txt file.\n
*/\n\n@file:kotlin.jvm.JvmMultifileClass\n@file:kotlin.jvm.JvmName("SequencesKt")\n\npackage
kotlin.sequences\n\n\n// NOTE: THIS FILE IS AUTO-GENERATED by the GenerateStandardLib.kt\n// See:
https://github.com/JetBrains/kotlin/tree/master/libraries/stdlib\n\n\nimport kotlin.random.*\n\n/**\n * Returns
`true` if [element] is found in the sequence.\n *\n * The operation is _terminal_.\n *\n\npublic operator fun
<@kotlin.internal.OnlyInputTypes T> Sequence<T>.contains(element: T): Boolean {\n    return indexOf(element)
>= 0\n}\n\n/**\n * Returns an element at the given [index] or throws an [IndexOutOfBoundsException] if the
[index] is out of bounds of this sequence.\n *\n * The operation is _terminal_.\n *\n * @sample
samples.collections.Collections.Elements.elementAt\n\n\npublic fun <T> Sequence<T>.elementAt(index: Int): T
{\n    return elementAtOrElse(index) { throw IndexOutOfBoundsException("Sequence doesn't contain element at
index $index.") }\n}\n\n/**\n * Returns an element at the given [index] or the result of calling the [defaultValue]
function if the [index] is out of bounds of this sequence.\n *\n * The operation is _terminal_.\n *\n * @sample
samples.collections.Collections.Elements.elementAtOrElse\n\n\npublic fun <T>
Sequence<T>.elementAtOrElse(index: Int, defaultValue: (Int) -> T): T {\n    if (index < 0)\n        return
defaultValue(index)\n    val iterator = iterator()\n    var count = 0\n    while (iterator.hasNext()) {\n        val element
= iterator.next()\n        if (index == count++)\n            return element\n    }\n    return
defaultValue(index)\n}\n\n/**\n * Returns an element at the given [index] or `null` if the [index] is out of bounds of
this sequence.\n *\n * The operation is _terminal_.\n *\n * @sample
samples.collections.Collections.Elements.elementAtOrNull\n\n\npublic fun <T>
Sequence<T>.elementOrNull(index: Int): T? {\n    if (index < 0)\n        return null\n    val iterator = iterator()\n
var count = 0\n    while (iterator.hasNext()) {\n        val element = iterator.next()\n        if (index == count++)\n
return element\n    }\n    return null\n}\n\n/**\n * Returns the first element matching the given [predicate], or `null`
if no such element was found.\n *\n * The operation is _terminal_.\n *\n * @sample
samples.collections.Collections.Elements.find\n\n\n@kotlin.internal.InlineOnly\n\npublic inline fun <T>
Sequence<T>.find(predicate: (T) -> Boolean): T? {\n    return firstOrNull(predicate)\n}\n\n/**\n * Returns the last
element matching the given [predicate], or `null` if no such element was found.\n *\n * The operation is
_terminal_.\n *\n * @sample samples.collections.Collections.Elements.find\n
*/\n@kotlin.internal.InlineOnly\n\npublic inline fun <T> Sequence<T>.findLast(predicate: (T) -> Boolean): T? {\n

```

```

return lastOrNull(predicate)\n\n\n**\n * Returns first element.\n * @throws [NoSuchElementException] if the
sequence is empty.\n *\n * The operation is _terminal_.\n */\npublic fun <T> Sequence<T>.first(): T {\n    val
iterator = iterator()\n    if (!iterator.hasNext())\n        throw NoSuchElementException("Sequence is empty.")\n    return iterator.next()\n}\n\n\n**\n * Returns the first element matching the given [predicate].\n * @throws
[NoSuchElementException] if no such element is found.\n *\n * The operation is _terminal_.\n */\npublic inline fun
<T> Sequence<T>.first(predicate: (T) -> Boolean): T {\n    for (element in this) if (predicate(element)) return
element\n    throw NoSuchElementException("Sequence contains no element matching the predicate.")\n}\n\n\n**\n * Returns the first non-null value produced by [transform] function being applied to elements of this sequence in
iteration order,\n * or throws [NoSuchElementException] if no non-null value was produced.\n *\n * The operation
is _terminal_.\n *\n * @sample samples.collections.Collections.Transformations.firstNotNullOf\n
*/\n@SinceKotlin("1.5")\n@kotlin.internal.InlineOnly\npublic inline fun <T, R : Any>
Sequence<T>.firstNotNullOf(transform: (T) -> R?): R {\n    return firstNotNullOfOrNull(transform) ?: throw
NoSuchElementException("No element of the sequence was transformed to a non-null value.")\n}\n\n\n**\n * Returns the first non-null value produced by [transform] function being applied to elements of this sequence in
iteration order,\n * or `null` if no non-null value was produced.\n *\n * The operation is _terminal_.\n *\n *
@sample samples.collections.Collections.Transformations.firstNotNullOf\n
*/\n@SinceKotlin("1.5")\n@kotlin.internal.InlineOnly\npublic inline fun <T, R : Any>
Sequence<T>.firstNotNullOfOrNull(transform: (T) -> R?): R? {\n    for (element in this) {\n        val result =
transform(element)\n        if (result != null) {\n            return result\n        }\n    }\n    return null\n}\n\n\n**\n * Returns the first element, or `null` if the sequence is empty.\n *\n * The operation is _terminal_.\n */\npublic fun
<T> Sequence<T>.firstOrNull(): T? {\n    val iterator = iterator()\n    if (!iterator.hasNext())\n        return null\n    return iterator.next()\n}\n\n\n**\n * Returns the first element matching the given [predicate], or `null` if element was
not found.\n *\n * The operation is _terminal_.\n */\npublic inline fun <T> Sequence<T>.firstOrNull(predicate: (T)
-> Boolean): T? {\n    for (element in this) if (predicate(element)) return element\n    return null\n}\n\n\n**\n * Returns first index of [element], or -1 if the sequence does not contain element.\n *\n * The operation is
_terminal_.\n */\npublic fun <@kotlin.internal.OnlyInputTypes T> Sequence<T>.indexOf(element: T): Int {\n    var
index = 0\n    for (item in this) {\n        checkIndexOverflow(index)\n        if (element == item)\n            return
index\n        index++\n    }\n    return -1\n}\n\n\n**\n * Returns index of the first element matching the given
[predicate], or -1 if the sequence does not contain such element.\n *\n * The operation is _terminal_.\n */\npublic
inline fun <T> Sequence<T>.indexOfFirst(predicate: (T) -> Boolean): Int {\n    var index = 0\n    for (item in this)
{\n        checkIndexOverflow(index)\n        if (predicate(item))\n            return index\n        index++\n    }\n    return -
1\n}\n\n\n**\n * Returns index of the last element matching the given [predicate], or -1 if the sequence does not
contain such element.\n *\n * The operation is _terminal_.\n */\npublic inline fun <T>
Sequence<T>.indexOfLast(predicate: (T) -> Boolean): Int {\n    var lastIndex = -1\n    var index = 0\n    for (item in
this) {\n        checkIndexOverflow(index)\n        if (predicate(item))\n            lastIndex = index\n            index++\n
    }\n    return lastIndex\n}\n\n\n**\n * Returns the last element.\n *\n * The operation is _terminal_.\n *\n * @throws
NoSuchElementException if the sequence is empty.\n *\n * @sample
samples.collections.Collections.Elements.last\n */\npublic fun <T> Sequence<T>.last(): T {\n    val iterator =
iterator()\n    if (!iterator.hasNext())\n        throw NoSuchElementException("Sequence is empty.")\n    var last =
iterator.next()\n    while (iterator.hasNext())\n        last = iterator.next()\n    return last\n}\n\n\n**\n * Returns the last
element matching the given [predicate].\n *\n * The operation is _terminal_.\n *\n * @throws
NoSuchElementException if no such element is found.\n *\n * @sample
samples.collections.Collections.Elements.last\n */\npublic inline fun <T> Sequence<T>.last(predicate: (T) ->
Boolean): T {\n    var last: T? = null\n    var found = false\n    for (element in this) {\n        if (predicate(element))
{\n            last = element\n            found = true\n        }\n    }\n    if (!found) throw
NoSuchElementException("Sequence contains no element matching the predicate.")\n}\n\n\n**\n * Returns last index of [element], or -1 if the
sequence does not contain element.\n *\n * The operation is _terminal_.\n */\npublic fun

```

```

<@kotlin.internal.OnlyInputTypes T> Sequence<T>.lastIndexOf(element: T): Int {
    var lastIndex = -1
    var index = 0
    for (item in this) {
        checkIndexOverflow(index)
        if (element == item)
            lastIndex = index
        index++
    }
    return lastIndex
}

/** Returns the last element, or `null` if the sequence is empty.
 * The operation is _terminal_.
 * @sample samples.collections.Collections.Elements.last
 */
public fun <T> Sequence<T>.lastOrNull(): T? {
    val iterator = iterator()
    if (!iterator.hasNext())
        return null
    var last = iterator.next()
    while (iterator.hasNext())
        last = iterator.next()
    return last
}

/** Returns the last element matching the given [predicate], or `null` if no such element was found.
 * The operation is _terminal_.
 * @sample samples.collections.Collections.Elements.last
 */
public inline fun <T> Sequence<T>.lastOrNull(predicate: (T) -> Boolean): T? {
    var last: T? = null
    for (element in this) {
        if (predicate(element))
            last = element
    }
    return last
}

/** Returns the single element, or throws an exception if the sequence is empty or has more than one element.
 * The operation is _terminal_.
 */
public fun <T> Sequence<T>.single(): T {
    val iterator = iterator()
    if (!iterator.hasNext())
        throw NoSuchElementException("Sequence is empty.")
    val single = iterator.next()
    if (iterator.hasNext())
        throw IllegalArgumentException("Sequence has more than one element.")
    return single
}

/** Returns the single element matching the given [predicate], or throws exception if there is no or more than one matching element.
 * The operation is _terminal_.
 */
public inline fun <T> Sequence<T>.single(predicate: (T) -> Boolean): T {
    var single: T? = null
    var found = false
    for (element in this) {
        if (predicate(element)) {
            if (found) throw IllegalArgumentException("Sequence contains more than one matching element.")
            single = element
            found = true
        }
    }
    if (!found) throw NoSuchElementException("Sequence contains no element matching the predicate.")
    @Suppress("UNCHECKED_CAST")
    return single as T
}

/** Returns single element, or `null` if the sequence is empty or has more than one element.
 * The operation is _terminal_.
 */
public fun <T> Sequence<T>.singleOrNull(): T? {
    val iterator = iterator()
    if (!iterator.hasNext())
        return null
    val single = iterator.next()
    if (iterator.hasNext())
        return null
    return single
}

/** Returns the single element matching the given [predicate], or `null` if element was not found or more than one element was found.
 * The operation is _terminal_.
 */
public inline fun <T> Sequence<T>.singleOrNull(predicate: (T) -> Boolean): T? {
    var single: T? = null
    var found = false
    for (element in this) {
        if (predicate(element)) {
            if (found) return null
            single = element
            found = true
        }
    }
    if (!found) return null
    return single
}

/** Returns a sequence containing all elements except first [n] elements.
 * The operation is _intermediate_ and _stateless_.
 * @throws IllegalArgumentException if [n] is negative.
 * @sample samples.collections.Collections.Transformations.drop
 */
public fun <T> Sequence<T>.drop(n: Int): Sequence<T> {
    require(n >= 0) { "Requested element count $n is less than zero." }
    return when {
        n == 0 -> this
        this is DropTakeSequence -> this.drop(n)
        else -> DropSequence(this, n)
    }
}

/** Returns a sequence containing all elements except first elements that satisfy the given [predicate].
 * The operation is _intermediate_ and _stateless_.
 * @sample samples.collections.Collections.Transformations.dropWhile
 */
public fun <T> Sequence<T>.dropWhile(predicate: (T) -> Boolean): Sequence<T> {
    return DropWhileSequence(this, predicate)
}

/** Returns a sequence containing only elements matching the given [predicate].
 * The operation is _intermediate_ and _stateless_.
 * @sample samples.collections.Collections.Filtering.filter
 */
public fun <T> Sequence<T>.filter(predicate: (T) -> Boolean): Sequence<T> {
    return FilteringSequence(this, true, predicate)
}

/** Returns a sequence containing only elements matching the given [predicate].
 * @param [predicate] function that takes the index of an element and the element itself
 * and returns the result of predicate evaluation on the element.
 * The operation is _intermediate_ and _stateless_.
 * @sample samples.collections.Collections.Filtering.filterIndexed
 */
public fun <T> Sequence<T>.filterIndexed(predicate: (index: Int, T) -> Boolean): Sequence<T> {
    // TODO: Rewrite with generalized MapFilterIndexingSequence
    return TransformingSequence(FilteringSequence(IndexingSequence(this), true, { predicate(it.index, it.value) }), { it.value })
}

/** Appends all elements matching the given [predicate] to the given [destination].
 * @param [predicate] function that takes the index of an element and the element itself
 * and returns the result of predicate

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evaluation on the element.
 The operation is `_terminal_` and `_stateless_`.
 @sample
 samples.collections.Collections.Filtering.filterIndexedTo
 Sequence<T>.filterIndexedTo(destination: C, predicate: (index: Int, T) -> Boolean): C {
 for (element in this) if (predicate(index, element)) destination.add(element)
 return destination
 }
 Returns a sequence containing all elements that are instances of specified type parameter R.
 The operation is `_intermediate_` and `_stateless_`.
 @sample
 samples.collections.Collections.Filtering.filterIsInstance
 Sequence<*>.filterIsInstance(): Sequence<@kotlin.internal.NoInfer R> {
 @Suppress("UNCHECKED_CAST") return filter { it is R } as Sequence<R>
 }
 Appends all elements that are instances of specified type parameter R to the given [destination].
 The operation is `_terminal_` and `_stateless_`.
 @sample
 samples.collections.Collections.Filtering.filterIsInstanceTo
 Sequence<*>.filterIsInstanceTo(destination: C): C {
 for (element in this) if (element is R) destination.add(element)
 return destination
 }
 Returns a sequence containing all elements not matching the given [predicate].
 The operation is `_intermediate_` and `_stateless_`.
 @sample
 samples.collections.Collections.Filtering.filterNot
 Sequence<T>.filterNot(predicate: (T) -> Boolean): Sequence<T> {
 return FilteringSequence(this, false, predicate)
 }
 Returns a sequence containing all elements that are not `null`.
 The operation is `_intermediate_` and `_stateless_`.
 @sample
 samples.collections.Collections.Filtering.filterNotNull
 Sequence<T?>.filterNotNull(): Sequence<T> {
 @Suppress("UNCHECKED_CAST") return filterNot { it == null } as Sequence<T>
 }
 Appends all elements that are not `null` to the given [destination].
 The operation is `_terminal_`.
 @sample
 samples.collections.Collections.Filtering.filterNotNullTo
 Sequence<T?>.filterNotNullTo(destination: C): C {
 for (element in this) if (element != null) destination.add(element)
 return destination
 }
 Appends all elements not matching the given [predicate] to the given [destination].
 The operation is `_terminal_`.
 @sample
 samples.collections.Collections.Filtering.filterTo
 Sequence<T>.filterTo(destination: C, predicate: (T) -> Boolean): C {
 for (element in this) if (!predicate(element)) destination.add(element)
 return destination
 }
 Appends all elements matching the given [predicate] to the given [destination].
 The operation is `_terminal_`.
 @sample
 samples.collections.Collections.Filtering.filterTo
 Sequence<T>.filterTo(destination: C, predicate: (T) -> Boolean): C {
 for (element in this) if (predicate(element)) destination.add(element)
 return destination
 }
 Returns a sequence containing first [n] elements.
 The operation is `_intermediate_` and `_stateless_`.
 @throws IllegalArgumentException if [n] is negative.
 @sample
 samples.collections.Collections.Transformations.take
 Sequence<T>.take(n: Int): Sequence<T> {
 require(n >= 0) { "Requested element count \$n is less than zero." }
 return when {
 n == 0 -> emptySequence()
 this is DropTakeSequence -> this.take(n)
 else -> TakeSequence(this, n)
 }
 }
 Returns a sequence containing first elements satisfying the given [predicate].
 The operation is `_intermediate_` and `_stateless_`.
 @sample
 samples.collections.Collections.Transformations.takeWhile
 Sequence<T>.takeWhile(predicate: (T) -> Boolean): Sequence<T> {
 return TakeWhileSequence(this, predicate)
 }
 Returns a sequence that yields elements of this sequence sorted according to their natural sort order.
 The sort is `_stable_`. It means that equal elements preserve their order relative to each other after sorting.
 The operation is `_intermediate_` and `_stateful_`.
 @sample
 samples.collections.Collections.Sorting.sorted
 Sequence<T>.sorted(): Sequence<T> {
 return object : Sequence<T> {
 override fun iterator(): Iterator<T> {
 val sortedList = this@sorted.toList()
 sortedList.sort()
 return sortedList.iterator()
 }
 }
 }
 Returns a sequence that yields elements of this sequence sorted according to natural sort order of the value returned by specified [selector] function.
 The sort is `_stable_`. It means that equal elements preserve their order relative to each other after sorting.
 The operation is `_intermediate_` and `_stateful_`.
 @sample
 samples.collections.Collections.Sorting.sortedBy
 Sequence<T>.sortedBy(crossinline selector: (T) -> R?): Sequence<T> {

return sortedWith(compareBy(selector))\n\n/**\n * Returns a sequence that yields elements of this sequence sorted descending according to natural sort order of the value returned by specified [selector] function.\n * \n * The sort is `_stable_`. It means that equal elements preserve their order relative to each other after sorting.\n *\n * The operation is `_intermediate_` and `_stateful_`.\n */\npublic inline fun <T, R : Comparable<R>> Sequence<T>.sortedByDescending(crossinline selector: (T) -> R?): Sequence<T> {\n return sortedWith(compareByDescending(selector))\n}\n\n/**\n * Returns a sequence that yields elements of this sequence sorted descending according to their natural sort order.\n * \n * The sort is `_stable_`. It means that equal elements preserve their order relative to each other after sorting.\n *\n * The operation is `_intermediate_` and `_stateful_`.\n */\npublic fun <T : Comparable<T>> Sequence<T>.sortedDescending(): Sequence<T> {\n return sortedWith(reverseOrder())\n}\n\n/**\n * Returns a sequence that yields elements of this sequence sorted according to the specified [comparator].\n * \n * The sort is `_stable_`. It means that equal elements preserve their order relative to each other after sorting.\n *\n * The operation is `_intermediate_` and `_stateful_`.\n */\npublic fun <T> Sequence<T>.sortedWith(comparator: Comparator<in T>): Sequence<T> {\n return object : Sequence<T> {\n override fun iterator(): Iterator<T> {\n val sortedList = this@sortedWith.toMutableList()\n sortedList.sortWith(comparator)\n return sortedList.iterator()\n } }\n}\n\n/**\n * Returns a [Map] containing key-value pairs provided by [transform] function\n * applied to elements of the given sequence.\n * \n * If any of two pairs would have the same key the last one gets added to the map.\n * \n * The returned map preserves the entry iteration order of the original sequence.\n *\n * The operation is `_terminal_`.\n *\n * @sample samples.collections.Collections.Transformations.associate\n */\npublic inline fun <T, K, V> Sequence<T>.associate(transform: (T) -> Pair<K, V>): Map<K, V> {\n return associateTo(LinkedHashMap<K, V>(), transform)\n}\n\n/**\n * Returns a [Map] containing the elements from the given sequence indexed by the key\n * returned from [keySelector] function applied to each element.\n * \n * If any two elements would have the same key returned by [keySelector] the last one gets added to the map.\n * \n * The returned map preserves the entry iteration order of the original sequence.\n *\n * The operation is `_terminal_`.\n *\n * @sample samples.collections.Collections.Transformations.associateBy\n */\npublic inline fun <T, K> Sequence<T>.associateBy(keySelector: (T) -> K): Map<K, T> {\n return associateByTo(LinkedHashMap<K, T>(), keySelector)\n}\n\n/**\n * Returns a [Map] containing the values provided by [valueTransform] and indexed by [keySelector] functions applied to elements of the given sequence.\n * \n * If any two elements would have the same key returned by [keySelector] the last one gets added to the map.\n * \n * The returned map preserves the entry iteration order of the original sequence.\n *\n * The operation is `_terminal_`.\n *\n * @sample samples.collections.Collections.Transformations.associateByWithValueTransform\n */\npublic inline fun <T, K, V> Sequence<T>.associateBy(keySelector: (T) -> K, valueTransform: (T) -> V): Map<K, V> {\n return associateByTo(LinkedHashMap<K, V>(), keySelector, valueTransform)\n}\n\n/**\n * Populates and returns the [destination] mutable map with key-value pairs,\n * where key is provided by the [keySelector] function applied to each element of the given sequence\n * and value is the element itself.\n * \n * If any two elements would have the same key returned by [keySelector] the last one gets added to the map.\n *\n * The operation is `_terminal_`.\n *\n * @sample samples.collections.Collections.Transformations.associateByTo\n */\npublic inline fun <T, K, M : MutableMap<in K, in T>> Sequence<T>.associateByTo(destination: M, keySelector: (T) -> K): M {\n for (element in this) {\n destination.put(keySelector(element), element)\n }\n return destination\n}\n\n/**\n * Populates and returns the [destination] mutable map with key-value pairs,\n * where key is provided by the [keySelector] function and\n * and value is provided by the [valueTransform] function applied to elements of the given sequence.\n * \n * If any two elements would have the same key returned by [keySelector] the last one gets added to the map.\n *\n * The operation is `_terminal_`.\n *\n * @sample samples.collections.Collections.Transformations.associateByToWithValueTransform\n */\npublic inline fun <T, K, V, M : MutableMap<in K, in V>> Sequence<T>.associateByTo(destination: M, keySelector: (T) -> K, valueTransform: (T) -> V): M {\n for (element in this) {\n destination.put(keySelector(element), valueTransform(element))\n }\n return destination\n}\n\n/**\n * Populates and returns the [destination] mutable map with key-value pairs\n * provided by [transform] function applied to each element of the given sequence.\n * \n *\n */\n

* If any of two pairs would have the same key the last one gets added to the map.\n * The operation is

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_terminal_.\n * \n * @sample samples.collections.Collections.Transformations.associateTo\n * \n public inline fun
<T, K, V, M : MutableMap<in K, in V>> Sequence<T>.associateTo(destination: M, transform: (T) -> Pair<K, V>):
M {\n for (element in this) {\n destination += transform(element)\n }\n return destination\n}\n\n/**\n *
Returns a [Map] where keys are elements from the given sequence and values are\n * produced by the
[valueSelector] function applied to each element.\n * \n * If any two elements are equal, the last one gets added to
the map.\n * \n * The returned map preserves the entry iteration order of the original sequence.\n * \n * The
operation is _terminal_.\n * \n * @sample samples.collections.Collections.Transformations.associateWith\n
*/\n @SinceKotlin("1.3")\n public inline fun <K, V> Sequence<K>.associateWith(valueSelector: (K) -> V):
Map<K, V> {\n val result = LinkedHashMap<K, V>()\n return associateWithTo(result,
valueSelector)\n}\n\n/**\n * Populates and returns the [destination] mutable map with key-value pairs for each
element of the given sequence,\n * where key is the element itself and value is provided by the [valueSelector]
function applied to that key.\n * \n * If any two elements are equal, the last one overwrites the former value in the
map.\n * \n * The operation is _terminal_.\n * \n * @sample
samples.collections.Collections.Transformations.associateWithTo\n * \n @SinceKotlin("1.3")\n public inline fun
<K, V, M : MutableMap<in K, in V>> Sequence<K>.associateWithTo(destination: M, valueSelector: (K) -> V): M
{\n for (element in this) {\n destination.put(element, valueSelector(element))\n }\n return
destination\n}\n\n/**\n * Appends all elements to the given [destination] collection.\n * \n * The operation is
_terminal_.\n * \n @public fun <T, C : MutableCollection<in T>> Sequence<T>.toCollection(destination: C): C {\n
for (item in this) {\n destination.add(item)\n }\n return destination\n}\n\n/**\n * Returns a new [HashSet] of
all elements.\n * \n * The operation is _terminal_.\n * \n @public fun <T> Sequence<T>.toHashSet(): HashSet<T> {\n
return toCollection(HashSet<T>())\n}\n\n/**\n * Returns a [List] containing all elements.\n * \n * The operation is
_terminal_.\n * \n @public fun <T> Sequence<T>.toList(): List<T> {\n return
this.toMutableList().optimizeReadOnlyList()\n}\n\n/**\n * Returns a new [MutableList] filled with all elements of
this sequence.\n * \n * The operation is _terminal_.\n * \n @public fun <T> Sequence<T>.toMutableList():
MutableList<T> {\n return toCollection(ArrayList<T>())\n}\n\n/**\n * Returns a [Set] of all elements.\n * \n *
The returned set preserves the element iteration order of the original sequence.\n * \n * The operation is
_terminal_.\n * \n @public fun <T> Sequence<T>.toSet(): Set<T> {\n return
toCollection(LinkedHashSet<T>()).optimizeReadOnlySet()\n}\n\n/**\n * Returns a single sequence of all elements
from results of [transform] function being invoked on each element of original sequence.\n * \n * The operation is
_intermediate_ and _stateless_.\n * \n * @sample samples.collections.Collections.Transformations.flatMap\n
*/\n @SinceKotlin("1.4")\n @OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n @OverloadResolution
ByLambdaReturnType\n @kotlin.jvm.JvmName("flatMapIterable")\n public fun <T, R>
Sequence<T>.flatMap(transform: (T) -> Iterable<R>): Sequence<R> {\n return FlatteningSequence(this,
transform, Iterable<R>::iterator)\n}\n\n/**\n * Returns a single sequence of all elements from results of [transform]
function being invoked on each element of original sequence.\n * \n * The operation is _intermediate_ and
_stateless_.\n * \n * @sample samples.collections.Collections.Transformations.flatMap\n * \n @public fun <T, R>
Sequence<T>.flatMap(transform: (T) -> Sequence<R>): Sequence<R> {\n return FlatteningSequence(this,
transform, Sequence<R>::iterator)\n}\n\n/**\n * Returns a single sequence of all elements yielded from results of
[transform] function being invoked on each element\n * and its index in the original sequence.\n * \n * The operation
is _intermediate_ and _stateless_.\n * \n * @sample
samples.collections.Collections.Transformations.flatMapIndexed\n
*/\n @SinceKotlin("1.4")\n @OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n @OverloadResolution
ByLambdaReturnType\n @kotlin.jvm.JvmName("flatMapIndexedIterable")\n public fun <T, R>
Sequence<T>.flatMapIndexed(transform: (index: Int, T) -> Iterable<R>): Sequence<R> {\n return
flatMapIndexed(this, transform, Iterable<R>::iterator)\n}\n\n/**\n * Returns a single sequence of all elements
yielded from results of [transform] function being invoked on each element\n * and its index in the original
sequence.\n * \n * The operation is _intermediate_ and _stateless_.\n * \n * @sample

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samples.collections.Collections.Transformations.flatMapIndexed\n
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.jvm.JvmName("flatMapIndexedSequence")\npublic fun <T, R>
Sequence<T>.flatMapIndexed(transform: (index: Int, T) -> Sequence<R>): Sequence<R> {\n return
flatMapIndexed(this, transform, Sequence<R>::iterator)\n}\n\n**\n * Appends all elements yielded from results of
[transform] function being invoked on each element\n * and its index in the original sequence, to the given
[destination].\n *\n * The operation is _terminal_.\n
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.jvm.JvmName("flatMapIndexedIterableTo")\n@kotlin.internal.InlineOnly\npubli
c inline fun <T, R, C : MutableCollection<in R>> Sequence<T>.flatMapIndexedTo(destination: C, transform:
(index: Int, T) -> Iterable<R>): C {\n var index = 0\n for (element in this) {\n val list =
transform(checkIndexOverflow(index++), element)\n destination.addAll(list)\n }\n return
destination\n}\n\n**\n * Appends all elements yielded from results of [transform] function being invoked on each
element\n * and its index in the original sequence, to the given [destination].\n *\n * The operation is _terminal_.\n
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.jvm.JvmName("flatMapIndexedSequenceTo")\n@kotlin.internal.InlineOnly\npub
lic inline fun <T, R, C : MutableCollection<in R>> Sequence<T>.flatMapIndexedTo(destination: C, transform:
(index: Int, T) -> Sequence<R>): C {\n var index = 0\n for (element in this) {\n val list =
transform(checkIndexOverflow(index++), element)\n destination.addAll(list)\n }\n return
destination\n}\n\n**\n * Appends all elements yielded from results of [transform] function being invoked on each
element of original sequence, to the given [destination].\n *\n * The operation is _terminal_.\n
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.jvm.JvmName("flatMapIterableTo")\npublic inline fun <T, R, C :
MutableCollection<in R>> Sequence<T>.flatMapTo(destination: C, transform: (T) -> Iterable<R>): C {\n for
(element in this) {\n val list = transform(element)\n destination.addAll(list)\n }\n return
destination\n}\n\n**\n * Appends all elements yielded from results of [transform] function being invoked on each
element of original sequence, to the given [destination].\n *\n * The operation is _terminal_.\n *\npublic inline fun
<T, R, C : MutableCollection<in R>> Sequence<T>.flatMapTo(destination: C, transform: (T) -> Sequence<R>): C
{\n for (element in this) {\n val list = transform(element)\n destination.addAll(list)\n }\n return
destination\n}\n\n**\n * Groups elements of the original sequence by the key returned by the given [keySelector]
function\n * applied to each element and returns a map where each group key is associated with a list of
corresponding elements.\n *\n * The returned map preserves the entry iteration order of the keys produced from the
original sequence.\n *\n * The operation is _terminal_.\n *\n * @sample
samples.collections.Collections.Transformations.groupBy\n *\npublic inline fun <T, K>
Sequence<T>.groupBy(keySelector: (T) -> K): Map<K, List<T>> {\n return groupByTo(LinkedHashMap<K,
MutableList<T>>(), keySelector)\n}\n\n**\n * Groups values returned by the [valueTransform] function applied to
each element of the original sequence\n * by the key returned by the given [keySelector] function applied to the
element\n * and returns a map where each group key is associated with a list of corresponding values.\n *\n * The
returned map preserves the entry iteration order of the keys produced from the original sequence.\n *\n * The
operation is _terminal_.\n *\n * @sample
samples.collections.Collections.Transformations.groupByKeysAndValues\n *\npublic inline fun <T, K, V>
Sequence<T>.groupBy(keySelector: (T) -> K, valueTransform: (T) -> V): Map<K, List<V>> {\n return
groupByTo(LinkedHashMap<K, MutableList<V>>(), keySelector, valueTransform)\n}\n\n**\n * Groups elements
of the original sequence by the key returned by the given [keySelector] function\n * applied to each element and
puts to the [destination] map each group key associated with a list of corresponding elements.\n *\n * @return The
[destination] map.\n *\n * The operation is _terminal_.\n *\n * @sample
samples.collections.Collections.Transformations.groupBy\n *\npublic inline fun <T, K, M : MutableMap<in K,
MutableList<T>>> Sequence<T>.groupByTo(destination: M, keySelector: (T) -> K): M {\n for (element in this)

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{\n    val key = keySelector(element)\n    val list = destination.getOrPut(key) { ArrayList<T>() }\n    list.add(element)\n }{\n    return destination\n}\n\n/**\n * Groups values returned by the [valueTransform] function\n applied to each element of the original sequence\n * by the key returned by the given [keySelector] function applied\n to the element\n * and puts to the [destination] map each group key associated with a list of corresponding values.\n *\n * @return The [destination] map.\n *\n * The operation is _terminal_.\n *\n * @sample\n samples.collections.Collections.Transformations.groupByKeyAndValues\n */\npublic inline fun <T, K, V, M : MutableMap<in K, MutableList<V>>> Sequence<T>.groupByTo(destination: M, keySelector: (T) -> K,\n valueTransform: (T) -> V): M {\n    for (element in this) {\n        val key = keySelector(element)\n        val list =\n destination.getOrPut(key) { ArrayList<V>() }\n        list.add(valueTransform(element))\n    }\n    return\n destination\n}\n\n/**\n * Creates a [Grouping] source from a sequence to be used later with one of group-and-fold\n operations\n * using the specified [keySelector] function to extract a key from each element.\n *\n * The operation is\n _intermediate_ and _stateless_.\n *\n * @sample\n samples.collections.Grouping.groupingByEachCount\n */\n@SinceKotlin("1.1")\npublic inline fun <T, K> Sequence<T>.groupingBy(crossinline keySelector: (T) -> K):\n Grouping<T, K> {\n    return object : Grouping<T, K> {\n        override fun sourceIterator(): Iterator<T> =\n this@groupingBy.iterator()\n        override fun keyOf(element: T): K = keySelector(element)\n    }\n}\n\n/**\n * Returns a sequence containing the results of applying the given [transform] function\n * to each element in the\n original sequence.\n *\n * The operation is _intermediate_ and _stateless_.\n *\n * @sample\n samples.collections.Collections.Transformations.map\n */\npublic fun <T, R> Sequence<T>.map(transform: (T) ->\n R): Sequence<R> {\n    return TransformingSequence(this, transform)\n}\n\n/**\n * Returns a sequence containing\n the results of applying the given [transform] function\n * to each element and its index in the original sequence.\n *\n * @param [transform] function that takes the index of an element and the element itself\n * and returns the result of\n the transform applied to the element.\n *\n * The operation is _intermediate_ and _stateless_.\n */\npublic fun <T,\n R> Sequence<T>.mapIndexed(transform: (index: Int, T) -> R): Sequence<R> {\n    return\n TransformingIndexedSequence(this, transform)\n}\n\n/**\n * Returns a sequence containing only the non-null\n results of applying the given [transform] function\n * to each element and its index in the original sequence.\n *\n * @param [transform] function that takes the index of an element and the element itself\n * and returns the result of\n the transform applied to the element.\n *\n * The operation is _intermediate_ and _stateless_.\n */\npublic fun <T, R : Any> Sequence<T>.mapIndexedNotNull(transform: (index: Int, T) -> R?): Sequence<R> {\n    return\n TransformingIndexedSequence(this, transform).filterNotNull()\n}\n\n/**\n * Applies the given [transform] function\n to each element and its index in the original sequence\n * and appends only the non-null results to the given\n [destination].\n *\n * @param [transform] function that takes the index of an element and the element itself\n * and\n returns the result of the transform applied to the element.\n *\n * The operation is _terminal_.\n */\npublic inline fun\n <T, R : Any, C : MutableCollection<in R>> Sequence<T>.mapIndexedNotNullTo(destination: C,\n transform: (index:\n Int, T) -> R?): C {\n    forEachIndexed { index, element -> transform(index, element)?.let { destination.add(it) } }\n    return\n destination\n}\n\n/**\n * Applies the given [transform] function to each element and its index in the original\n sequence\n * and appends the results to the given [destination].\n *\n * @param [transform] function that takes the\n index of an element and the element itself\n * and returns the result of the transform applied to the element.\n *\n * The operation is\n _terminal_.\n */\npublic inline fun\n <T, R : Any, C : MutableCollection<in R>> Sequence<T>.mapIndexedNotNullTo(destination: C,\n transform: (T) -> R?): C {\n    forEach { element -> transform(element)?.let { destination.add(it) } }\n    return\n destination\n}\n\n/**\n * Returns a sequence containing only the non-null results of applying the given [transform] function\n * to each\n element in the original sequence.\n *\n * The operation is _intermediate_ and _stateless_.\n *\n * @sample\n samples.collections.Collections.Transformations.mapNotNull\n */\npublic fun <T, R : Any>\n Sequence<T>.mapNotNull(transform: (T) -> R?): Sequence<R> {\n    return TransformingSequence(this,\n transform).filterNotNull()\n}\n\n/**\n * Applies the given [transform] function to each element in the original\n sequence\n * and appends only the non-null results to the given [destination].\n *\n * The operation is\n _terminal_.\n */\npublic inline fun\n <T, R : Any, C : MutableCollection<in R>> Sequence<T>.mapNotNullTo(destination: C,\n transform: (T) -> R?): C {\n    forEach { element -> transform(element)?.let { destination.add(it) } }\n    return\n destination\n}\n

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_terminal_.\n *^npublic inline fun <T> Sequence<T>.forEach(action: (T) -> Unit): Unit {\n  for (element in this)
action(element)\n}\n\n/**\n * Performs the given [action] on each element, providing sequential index with the
element.\n * @param [action] function that takes the index of an element and the element itself\n * and performs the
action on the element.\n *\n * The operation is _terminal_.\n */\npublic inline fun <T>
Sequence<T>.forEachIndexed(action: (index: Int, T) -> Unit): Unit {\n  var index = 0\n  for (item in this)
action(checkIndexOverflow(index++), item)\n}\n\n@Deprecated("Use maxOrNull instead.",
ReplaceWith("this.maxOrNull()"))\n@DeprecatedSinceKotlin(warningSince = "1.4", errorSince = "1.5",
hiddenSince = "1.6")\n@SinceKotlin("1.1")\npublic fun Sequence<Double>.max(): Double? {\n  return
maxOrNull()\n}\n\n@Deprecated("Use maxOrNull instead.",
ReplaceWith("this.maxOrNull()"))\n@DeprecatedSinceKotlin(warningSince = "1.4", errorSince = "1.5",
hiddenSince = "1.6")\n@SinceKotlin("1.1")\npublic fun Sequence<Float>.max(): Float? {\n  return
maxOrNull()\n}\n\n@Deprecated("Use maxOrNull instead.",
ReplaceWith("this.maxOrNull()"))\n@DeprecatedSinceKotlin(warningSince = "1.4", errorSince = "1.5",
hiddenSince = "1.6")\npublic fun <T : Comparable<T>> Sequence<T>.max(): T? {\n  return
maxOrNull()\n}\n\n@Deprecated("Use maxByOrNull instead.",
ReplaceWith("this.maxByOrNull(selector)"))\n@DeprecatedSinceKotlin(warningSince = "1.4", errorSince =
"1.5", hiddenSince = "1.6")\npublic inline fun <T, R : Comparable<R>> Sequence<T>.maxBy(selector: (T) ->
R): T? {\n  return maxByOrNull(selector)\n}\n\n/**\n * Returns the first element yielding the largest value of the
given function or `null` if there are no elements.\n *\n * The operation is _terminal_.\n *\n * @sample
samples.collections.Collections.Aggregates.maxByOrNull\n */\n@SinceKotlin("1.4")\npublic inline fun <T, R :
Comparable<R>> Sequence<T>.maxByOrNull(selector: (T) -> R): T? {\n  val iterator = iterator()\n  if
(!iterator.hasNext()) return null\n  var maxElem = iterator.next()\n  if (!iterator.hasNext()) return maxElem\n  var
maxValue = selector(maxElem)\n  do {\n    val e = iterator.next()\n    val v = selector(e)\n    if (maxValue <
v) {\n      maxElem = e\n      maxValue = v\n    }\n  } while (iterator.hasNext())\n  return
maxElem\n}\n\n/**\n * Returns the largest value among all values produced by [selector] function\n * applied to
each element in the sequence.\n *\n * If any of values produced by [selector] function is `NaN`, the returned result
is `NaN`.\n *\n * @throws NoSuchElementException if the sequence is empty.\n *\n * The operation is
_terminal_.\n */\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <T> Sequence<T>.maxOf(selector: (T) ->
Double): Double {\n  val iterator = iterator()\n  if (!iterator.hasNext()) throw NoSuchElementException()\n  var
maxValue = selector(iterator.next())\n  while (iterator.hasNext()) {\n    val v = selector(iterator.next())\n
maxValue = maxOf(maxValue, v)\n  }\n  return maxValue\n}\n\n/**\n * Returns the largest value among all
values produced by [selector] function\n * applied to each element in the sequence.\n *\n * If any of values
produced by [selector] function is `NaN`, the returned result is `NaN`.\n *\n * @throws NoSuchElementException
if the sequence is empty.\n *\n * The operation is _terminal_.\n */\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <T> Sequence<T>.maxOf(selector: (T) ->
Float): Float {\n  val iterator = iterator()\n  if (!iterator.hasNext()) throw NoSuchElementException()\n  var
maxValue = selector(iterator.next())\n  while (iterator.hasNext()) {\n    val v = selector(iterator.next())\n
maxValue = maxOf(maxValue, v)\n  }\n  return maxValue\n}\n\n/**\n * Returns the largest value among all
values produced by [selector] function\n * applied to each element in the sequence.\n *\n * @throws
NoSuchElementException if the sequence is empty.\n *\n * The operation is _terminal_.\n */\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <T, R : Comparable<R>>
Sequence<T>.maxOf(selector: (T) -> R): R {\n  val iterator = iterator()\n  if (!iterator.hasNext()) throw
NoSuchElementException()\n  var maxValue = selector(iterator.next())\n  while (iterator.hasNext()) {\n    val v
= selector(iterator.next())\n    if (maxValue < v) {\n      maxValue = v\n    }\n  }\n  return

```

`maxValue` Returns the largest value among all values produced by [selector] function applied to each element in the sequence or `null` if there are no elements. If any of values produced by [selector] function is `NaN`, the returned result is `NaN`. The operation is `_terminal_`.

```

*SinceKotlin("1.4")@OptIn(kotlin.experimental.ExperimentalTypeInference::class)@OverloadResolution
ByLambdaReturnType@kotlin.internal.InlineOnly\npublic inline fun <T> Sequence<T>.maxOrNull(selector:
(T) -> Double): Double? {\n    val iterator = iterator()\n    if (!iterator.hasNext()) return null\n    var max =
selector(iterator.next())\n    while (iterator.hasNext()) {\n        val v = selector(iterator.next())\n        max =
maxOf(max, v)\n    }\n    return max\n}

```

`maxOfOrNull` Returns the largest value among all values produced by [selector] function applied to each element in the sequence or `null` if there are no elements. If any of values produced by [selector] function is `NaN`, the returned result is `NaN`. The operation is `_terminal_`.

```

*SinceKotlin("1.4")@OptIn(kotlin.experimental.ExperimentalTypeInference::class)@OverloadResolution
ByLambdaReturnType@kotlin.internal.InlineOnly\npublic inline fun <T> Sequence<T>.maxOfOrNull(selector:
(T) -> Float): Float? {\n    val iterator = iterator()\n    if (!iterator.hasNext()) return null\n    var max =
selector(iterator.next())\n    while (iterator.hasNext()) {\n        val v = selector(iterator.next())\n        max =
maxOf(max, v)\n    }\n    return max\n}

```

`maxOfOrNull` Returns the largest value among all values produced by [selector] function applied to each element in the sequence or `null` if there are no elements. The operation is `_terminal_`.

```

*SinceKotlin("1.4")@OptIn(kotlin.experimental.ExperimentalTypeInference::class)@OverloadResolution
ByLambdaReturnType@kotlin.internal.InlineOnly\npublic inline fun <T, R : Comparable<R>>
Sequence<T>.maxOfOrNull(selector: (T) -> R): R? {\n    val iterator = iterator()\n    if (!iterator.hasNext()) return
null\n    var max = selector(iterator.next())\n    while (iterator.hasNext()) {\n        val v =
selector(iterator.next())\n        if (max < v) {\n            max = v\n        }\n    }\n    return
max\n}

```

`maxOfOrNull` Returns the largest value according to the provided [comparator] among all values produced by [selector] function applied to each element in the sequence. @throws `NoSuchElementException` if the sequence is empty. The operation is `_terminal_`.

```

*SinceKotlin("1.4")@OptIn(kotlin.experimental.ExperimentalTypeInference::class)@OverloadResolution
ByLambdaReturnType@kotlin.internal.InlineOnly\npublic inline fun <T, R>
Sequence<T>.maxOfWith(comparator: Comparator<in R>, selector: (T) -> R): R {\n    val iterator = iterator()\n    if
(!iterator.hasNext()) throw NoSuchElementException()\n    var max = selector(iterator.next())\n    while
(iterator.hasNext()) {\n        val v = selector(iterator.next())\n        if (comparator.compare(max, v) < 0) {\n
            max = v\n        }\n    }\n    return max\n}

```

`maxOfWith` Returns the largest value according to the provided [comparator] among all values produced by [selector] function applied to each element in the sequence or `null` if there are no elements. The operation is `_terminal_`.

```

*SinceKotlin("1.4")@OptIn(kotlin.experimental.ExperimentalTypeInference::class)@OverloadResolution
ByLambdaReturnType@kotlin.internal.InlineOnly\npublic inline fun <T, R>
Sequence<T>.maxOfWithOrNull(comparator: Comparator<in R>, selector: (T) -> R): R? {\n    val iterator =
iterator()\n    if (!iterator.hasNext()) return null\n    var max = selector(iterator.next())\n    while
(iterator.hasNext()) {\n        val v = selector(iterator.next())\n        if (comparator.compare(max, v) < 0) {\n
            max = v\n        }\n    }\n    return max\n}

```

`maxOfWithOrNull` Returns the largest element or `null` if there are no elements. If any of elements is `NaN` returns `NaN`. The operation is `_terminal_`.

```

*SinceKotlin("1.4")\npublic fun Sequence<Double>.maxOrNull(): Double? {\n    val iterator = iterator()\n    if
(!iterator.hasNext()) return null\n    var max = iterator.next()\n    while (iterator.hasNext()) {\n        val e =
iterator.next()\n        max = maxOf(max, e)\n    }\n    return max\n}

```

`maxOrNull` Returns the largest element or `null` if there are no elements. If any of elements is `NaN` returns `NaN`. The operation is `_terminal_`.

```

*SinceKotlin("1.4")\npublic fun Sequence<Float>.maxOrNull(): Float? {\n    val iterator = iterator()\n    if
(!iterator.hasNext()) return null\n    var max = iterator.next()\n    while (iterator.hasNext()) {\n        val e =
iterator.next()\n        max = maxOf(max, e)\n    }\n    return max\n}

```

`maxOrNull` Returns the largest element or `null` if there are no elements. The operation is `_terminal_`.

```

*SinceKotlin("1.4")\npublic fun <T :

```

```

Comparable<T>> Sequence<T>.maxOrNull(): T? {\n  val iterator = iterator()\n  if (!iterator.hasNext()) return\n  null\n  var max = iterator.next()\n  while (iterator.hasNext()) {\n    val e = iterator.next()\n    if (max < e) max\n    = e\n  }\n  return max\n}\n\n@Deprecated("Use maxWithOrNull instead.")\nReplaceWith("this.maxWithOrNull(comparator)")\n\n@DeprecatedSinceKotlin(warningSince = "1.4", errorSince\n= "1.5", hiddenSince = "1.6")\npublic fun <T> Sequence<T>.maxWith(comparator: Comparator<in T>): T? {\n  return maxWithOrNull(comparator)\n}\n\n/**\n * Returns the first element having the largest value according to the\n provided [comparator] or `null` if there are no elements.\n * \n * The operation is _terminal_.\n */\n\n@SinceKotlin("1.4")\npublic fun <T> Sequence<T>.maxWithOrNull(comparator: Comparator<in T>): T? {\n  val iterator = iterator()\n  if (!iterator.hasNext()) return null\n  var max = iterator.next()\n  while\n(iterator.hasNext()) {\n    val e = iterator.next()\n    if (comparator.compare(max, e) < 0) max = e\n  }\n  return max\n}\n\n@Deprecated("Use minOrNull instead.")\nReplaceWith("this.minOrNull()")\n\n@DeprecatedSinceKotlin(warningSince = "1.4", errorSince = "1.5",\nhiddenSince = "1.6")\n@SinceKotlin("1.1")\npublic fun Sequence<Double>.min(): Double? {\n  return\nminOrNull()\n}\n\n@Deprecated("Use minOrNull instead.")\nReplaceWith("this.minOrNull()")\n\n@DeprecatedSinceKotlin(warningSince = "1.4", errorSince = "1.5",\nhiddenSince = "1.6")\n@SinceKotlin("1.1")\npublic fun Sequence<Float>.min(): Float? {\n  return\nminOrNull()\n}\n\n@Deprecated("Use minOrNull instead.")\nReplaceWith("this.minOrNull()")\n\n@DeprecatedSinceKotlin(warningSince = "1.4", errorSince = "1.5",\nhiddenSince = "1.6")\npublic fun <T : Comparable<T>> Sequence<T>.min(): T? {\n  return\nminOrNull()\n}\n\n@Deprecated("Use minByOrNull instead.")\nReplaceWith("this.minByOrNull(selector)")\n\n@DeprecatedSinceKotlin(warningSince = "1.4", errorSince =\n"1.5", hiddenSince = "1.6")\npublic inline fun <T, R : Comparable<R>> Sequence<T>.minBy(selector: (T) ->\nR): T? {\n  return minByOrNull(selector)\n}\n\n/**\n * Returns the first element yielding the smallest value of the\n given function or `null` if there are no elements.\n * \n * The operation is _terminal_.\n * \n * @sample\n samples.collections.Collections.Aggregates.minByOrNull\n */\n\n@SinceKotlin("1.4")\npublic inline fun <T, R :\nComparable<R>> Sequence<T>.minByOrNull(selector: (T) -> R): T? {\n  val iterator = iterator()\n  if\n(!iterator.hasNext()) return null\n  var minElem = iterator.next()\n  if (!iterator.hasNext()) return minElem\n  var\nminValue = selector(minElem)\n  do {\n    val e = iterator.next()\n    val v = selector(e)\n    if (minValue >\nv) {\n      minElem = e\n      minValue = v\n    }\n  } while (iterator.hasNext())\n  return\nminElem\n}\n\n/**\n * Returns the smallest value among all values produced by [selector] function\n * applied to\n each element in the sequence.\n * \n * If any of values produced by [selector] function is `NaN`, the returned result\n is `NaN`.\n * \n * @throws NoSuchElementException if the sequence is empty.\n * \n * The operation is\n _terminal_.\n */\n\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution\nByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <T> Sequence<T>.minOf(selector: (T) ->\nDouble): Double {\n  val iterator = iterator()\n  if (!iterator.hasNext()) throw NoSuchElementException()\n  var\nminValue = selector(iterator.next())\n  while (iterator.hasNext()) {\n    val v = selector(iterator.next())\n    minValue = minOf(minValue, v)\n  }\n  return minValue\n}\n\n/**\n * Returns the smallest value among all\n values produced by [selector] function\n * applied to each element in the sequence.\n * \n * If any of values\n produced by [selector] function is `NaN`, the returned result is `NaN`.\n * \n * @throws NoSuchElementException\n if the sequence is empty.\n * \n * The operation is _terminal_.\n */\n\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution\nByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <T> Sequence<T>.minOf(selector: (T) ->\nFloat): Float {\n  val iterator = iterator()\n  if (!iterator.hasNext()) throw NoSuchElementException()\n  var\nminValue = selector(iterator.next())\n  while (iterator.hasNext()) {\n    val v = selector(iterator.next())\n    minValue = minOf(minValue, v)\n  }\n  return minValue\n}\n\n/**\n * Returns the smallest value among all\n values produced by [selector] function\n * applied to each element in the sequence.\n * \n * @throws\n NoSuchElementException if the sequence is empty.\n * \n * The operation is _terminal_.\n */

```

```

*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <T, R : Comparable<R>>
Sequence<T>.minOf(selector: (T) -> R): R {\n    val iterator = iterator()\n    if (!iterator.hasNext()) throw
NoSuchElementException()\n    var minValue = selector(iterator.next())\n    while (iterator.hasNext()) {\n        val v
= selector(iterator.next())\n        if (minValue > v) {\n            minValue = v\n        }\n    }\n    return
minValue\n}\n\n/**\n * Returns the smallest value among all values produced by [selector] function\n * applied to
each element in the sequence or `null` if there are no elements.\n * \n * If any of values produced by [selector]
function is `NaN`, the returned result is `NaN`.\n * \n * The operation is _terminal_.\n
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <T> Sequence<T>.minOrNull(selector:
(T) -> Double): Double? {\n    val iterator = iterator()\n    if (!iterator.hasNext()) return null\n    var
minValue = selector(iterator.next())\n    while (iterator.hasNext()) {\n        val v = selector(iterator.next())\n
        minValue =
minOf(minValue, v)\n    }\n    return minValue\n}\n\n/**\n * Returns the smallest value among all values produced
by [selector] function\n * applied to each element in the sequence or `null` if there are no elements.\n * \n * If
any of values produced by [selector] function is `NaN`, the returned result is `NaN`.\n * \n * The operation is
_terminal_.\n
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <T> Sequence<T>.minOrNull(selector:
(T) -> Float): Float? {\n    val iterator = iterator()\n    if (!iterator.hasNext()) return null\n    var
minValue =
selector(iterator.next())\n    while (iterator.hasNext()) {\n        val v = selector(iterator.next())\n       
minValue =
minOf(minValue, v)\n    }\n    return minValue\n}\n\n/**\n * Returns the smallest value among all values produced
by [selector] function\n * applied to each element in the sequence or `null` if there are no elements.\n * \n * The
operation is _terminal_.\n
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <T, R : Comparable<R>>
Sequence<T>.minOrNull(selector: (T) -> R): R? {\n    val iterator = iterator()\n    if (!iterator.hasNext()) return
null\n    var minValue = selector(iterator.next())\n    while (iterator.hasNext()) {\n        val v =
selector(iterator.next())\n        if (minValue > v) {\n            minValue = v\n        }\n    }\n    return
minValue\n}\n\n/**\n * Returns the smallest value according to the provided [comparator]\n * among all values
produced by [selector] function applied to each element in the sequence.\n * \n * @throws
NoSuchElementException if the sequence is empty.\n * \n * The operation is _terminal_.\n
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <T, R>
Sequence<T>.minOfWith(comparator: Comparator<in R>, selector: (T) -> R): R {\n    val iterator = iterator()\n    if
(!iterator.hasNext()) throw NoSuchElementException()\n    var minValue = selector(iterator.next())\n    while
(iterator.hasNext()) {\n        val v = selector(iterator.next())\n        if (comparator.compare(minValue, v) > 0) {\n
            minValue = v\n        }\n    }\n    return minValue\n}\n\n/**\n * Returns the smallest value according to the
provided [comparator]\n * among all values produced by [selector] function applied to each element in the sequence
or `null` if there are no elements.\n * \n * The operation is _terminal_.\n
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <T, R>
Sequence<T>.minOfWithOrNull(comparator: Comparator<in R>, selector: (T) -> R): R? {\n    val iterator =
iterator()\n    if (!iterator.hasNext()) return null\n    var minValue = selector(iterator.next())\n    while
(iterator.hasNext()) {\n        val v = selector(iterator.next())\n        if (comparator.compare(minValue, v) > 0) {\n
            minValue = v\n        }\n    }\n    return minValue\n}\n\n/**\n * Returns the smallest element or `null` if
there are
no elements.\n * \n * If any of elements is `NaN` returns `NaN`.\n * \n * The operation is _terminal_.\n
*\n@SinceKotlin("1.4")\npublic fun Sequence<Double>.minOrNull(): Double? {\n    val iterator = iterator()\n    if
(!iterator.hasNext()) return null\n    var min = iterator.next()\n    while (iterator.hasNext()) {\n        val e =
iterator.next()\n        min = minOf(min, e)\n    }\n    return min\n}\n\n/**\n * Returns the smallest element or `null` if

```



```

there are no elements.\n * \n * If any of elements is `NaN` returns `NaN`.\n * \n * The operation is _terminal_.\n
*\n@SinceKotlin("1.4")\npublic fun Sequence<Float>.minOrNull(): Float? {\n    val iterator = iterator()\n    if
(!iterator.hasNext()) return null\n    var min = iterator.next()\n    while (iterator.hasNext()) {\n        val e =
iterator.next()\n        min = minOf(min, e)\n    }\n    return min\n}\n\n/**\n * Returns the smallest element or `null` if
there are no elements.\n * \n * The operation is _terminal_.\n * \n@SinceKotlin("1.4")\npublic fun <T> :
Comparable<T>> Sequence<T>.minOrNull(): T? {\n    val iterator = iterator()\n    if (!iterator.hasNext()) return
null\n    var min = iterator.next()\n    while (iterator.hasNext()) {\n        val e = iterator.next()\n        if (min > e) min
= e\n    }\n    return min\n}\n\n@Deprecated("Use minWithOrNull instead.")
ReplaceWith("this.minWithOrNull(comparator)")\n@DeprecatedSinceKotlin(warningSince = "1.4", errorSince
= "1.5", hiddenSince = "1.6")\npublic fun <T> Sequence<T>.minWith(comparator: Comparator<in T>): T? {\n
return minWithOrNull(comparator)\n}\n\n/**\n * Returns the first element having the smallest value according to
the provided [comparator] or `null` if there are no elements.\n * \n * The operation is _terminal_.\n
*\n@SinceKotlin("1.4")\npublic fun <T> Sequence<T>.minWithOrNull(comparator: Comparator<in T>): T? {\n
val iterator = iterator()\n    if (!iterator.hasNext()) return null\n    var min = iterator.next()\n    while
(iterator.hasNext()) {\n        val e = iterator.next()\n        if (comparator.compare(min, e) > 0) min = e\n    }\n    return
min\n}\n\n/**\n * Returns `true` if the sequence has no elements.\n * \n * The operation is _terminal_.\n * \n *
@sample samples.collections.Collections.Aggregates.none\n * \n@SinceKotlin("1.4")\npublic fun <T> Sequence<T>.none(): Boolean {\n
return iterator().hasNext()\n}\n\n/**\n * Returns `true` if no elements match the given [predicate].\n * \n * The
operation is _terminal_.\n * \n * @sample samples.collections.Collections.Aggregates.noneWithPredicate\n
*\n@SinceKotlin("1.4")\npublic inline fun <T> Sequence<T>.none(predicate: (T) -> Boolean): Boolean {\n    for (element in this) if
(predicate(element)) return false\n    return true\n}\n\n/**\n * Returns a sequence which performs the given [action]
on each element of the original sequence as they pass through it.\n * \n * The operation is _intermediate_ and
_stateless_.\n * \n@SinceKotlin("1.1")\npublic fun <T> Sequence<T>.onEach(action: (T) -> Unit): Sequence<T>
{\n    return map {\n        action(it)\n        it\n    }\n}\n\n/**\n * Returns a sequence which performs the given
[action] on each element of the original sequence as they pass through it.\n * @param [action] function that takes
the index of an element and the element itself\n * and performs the action on the element.\n * \n * The operation is
_intermediate_ and _stateless_.\n * \n@SinceKotlin("1.4")\npublic fun <T> Sequence<T>.onEachIndexed(action:
(index: Int, T) -> Unit): Sequence<T> {\n    return mapIndexed { index, element ->\n        action(index, element)\n
        element\n    }\n}\n\n/**\n * Accumulates value starting with the first element and applying [operation] from left to
right\n * to current accumulator value and each element.\n * \n * Throws an exception if this sequence is empty. If
the sequence can be empty in an expected way,\n * please use [reduceOrNull] instead. It returns `null` when its
receiver is empty.\n * \n * @param [operation] function that takes current accumulator value and an element,\n *
and calculates the next accumulator value.\n * \n * The operation is _terminal_.\n * \n * @sample
samples.collections.Collections.Aggregates.reduce\n * \n@SinceKotlin("1.4")\npublic inline fun <S, T : S>
Sequence<T>.reduce(operation: (acc: S, T) -> S): S {\n    val iterator = this.iterator()\n    if (!iterator.hasNext())
throw UnsupportedOperationException("Empty sequence can't be reduced.")\n    var accumulator: S =
iterator.next()\n    while (iterator.hasNext()) {\n        accumulator = operation(accumulator, iterator.next())\n    }\n
return accumulator\n}\n\n/**\n * Accumulates value starting with the first element and applying [operation] from
left to right\n * to current accumulator value and each element with its index in the original sequence.\n * \n *
Throws an exception if this sequence is empty. If the sequence can be empty in an expected way,\n * please use
[reduceIndexedOrNull] instead. It returns `null` when its receiver is empty.\n * \n * @param [operation] function
that takes the index of an element, current accumulator value and the element itself,\n * and calculates the next
accumulator value.\n * \n * The operation is _terminal_.\n * \n * @sample
samples.collections.Collections.Aggregates.reduce\n * \n@SinceKotlin("1.4")\npublic inline fun <S, T : S>
Sequence<T>.reduceIndexed(operation: (index: Int, acc: S, T) -> S): S {\n    val iterator = this.iterator()\n    if
(!iterator.hasNext()) throw UnsupportedOperationException("Empty sequence can't be reduced.")\n    var index =
1\n    var accumulator: S = iterator.next()\n    while (iterator.hasNext()) {\n        accumulator =
operation(checkIndexOverflow(index++), accumulator, iterator.next())\n    }\n    return accumulator\n}\n\n/**\n

```



```

*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.jvm.JvmName("sumOfInt")\n@kotlin.internal.InlineOnly\npublic inline fun <T>
Sequence<T>.sumOf(selector: (T) -> Int): Int {\n    var sum: Int = 0.toInt()\n    for (element in this) {\n        sum +=
selector(element)\n    }\n    return sum\n}\n\n/**\n * Returns the sum of all values produced by [selector] function
applied to each element in the sequence.\n *\n * The operation is _terminal_.\n
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.jvm.JvmName("sumOfLong")\n@kotlin.internal.InlineOnly\npublic inline fun
<T> Sequence<T>.sumOf(selector: (T) -> Long): Long {\n    var sum: Long = 0.toLong()\n    for (element in this)
{\n        sum += selector(element)\n    }\n    return sum\n}\n\n/**\n * Returns the sum of all values produced by
[selector] function applied to each element in the sequence.\n *\n * The operation is _terminal_.\n
*\n@SinceKotlin("1.5")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.jvm.JvmName("sumOfUInt")\n@WasExperimental(ExperimentalUnsignedType
s::class)\n@kotlin.internal.InlineOnly\npublic inline fun <T> Sequence<T>.sumOf(selector: (T) -> UInt): UInt {\n
    var sum: UInt = 0.toUInt()\n    for (element in this) {\n        sum += selector(element)\n    }\n    return
sum\n}\n\n/**\n * Returns the sum of all values produced by [selector] function applied to each element in the
sequence.\n *\n * The operation is _terminal_.\n
*\n@SinceKotlin("1.5")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.jvm.JvmName("sumOfULong")\n@WasExperimental(ExperimentalUnsignedType
s::class)\n@kotlin.internal.InlineOnly\npublic inline fun <T> Sequence<T>.sumOf(selector: (T) -> ULong):
ULong {\n    var sum: ULong = 0.toULong()\n    for (element in this) {\n        sum += selector(element)\n    }\n
return sum\n}\n\n/**\n * Returns an original collection containing all the non-`null` elements, throwing an
[IllegalArgumentException] if there are any `null` elements.\n *\n * The operation is _intermediate_ and
_stateless_.\n *\npublic fun <T : Any> Sequence<T?>.requireNonNulls(): Sequence<T> {\n    return map { it ?
throw IllegalArgumentException("null element found in $this.") }\n}\n\n/**\n * Splits this sequence into a
sequence of lists each not exceeding the given [size].\n *\n * The last list in the resulting sequence may have fewer
elements than the given [size].\n *\n * @param size the number of elements to take in each list, must be positive
and can be greater than the number of elements in this sequence.\n *\n * The operation is _intermediate_ and
_stateful_.\n *\n * @sample samples.collections.Collections.Transformations.chunked\n
*\n@SinceKotlin("1.2")\npublic fun <T> Sequence<T>.chunked(size: Int): Sequence<List<T>> {\n    return
windowed(size, size, partialWindows = true)\n}\n\n/**\n * Splits this sequence into several lists each not exceeding
the given [size]\n * and applies the given [transform] function to an each.\n *\n * @return sequence of results of the
[transform] applied to an each list.\n *\n * Note that the list passed to the [transform] function is ephemeral and is
valid only inside that function.\n * You should not store it or allow it to escape in some way, unless you made a
snapshot of it.\n * The last list may have fewer elements than the given [size].\n *\n * @param size the number of
elements to take in each list, must be positive and can be greater than the number of elements in this sequence.\n
*\n * The operation is _intermediate_ and _stateful_.\n *\n * @sample samples.text.Strings.chunkedTransform\n
*\n@SinceKotlin("1.2")\npublic fun <T, R> Sequence<T>.chunked(size: Int, transform: (List<T>) -> R):
Sequence<R> {\n    return windowed(size, size, partialWindows = true, transform = transform)\n}\n\n/**\n * Returns a
sequence containing all elements of the original sequence without the first occurrence of the given
[element].\n *\n * The operation is _intermediate_ and _stateless_.\n *\npublic operator fun <T>
Sequence<T>.minus(element: T): Sequence<T> {\n    return object: Sequence<T> {\n        override fun iterator():
Iterator<T> {\n            var removed = false\n            return this@minus.filter { if (!removed && it == element) {\n
removed = true; false } else true }.iterator()\n        }\n    }\n}\n\n/**\n * Returns a sequence containing all elements
of original sequence except the elements contained in the given [elements] array.\n *\n * Note that the source
sequence and the array being subtracted are iterated only when an `iterator` is requested from\n * the resulting
sequence. Changing any of them between successive calls to `iterator` may affect the result.\n *\n * Before Kotlin
1.6, the [elements] array may have been converted to a [HashSet] to speed up the operation, thus the elements were
required to have\n * a correct and stable implementation of `hashCode()` that didn't change between successive

```

invocations.

- On JVM, you can enable this behavior back with the system property `kotlin.collections.convert_arg_to_set_in_removeAll` set to `true`.
- The operation is `_intermediate_` and `_stateful_`.

```

public operator fun <T> Sequence<T>.minus(elements: Array<out T>): Sequence<T> {
    if (elements.isEmpty()) return this
    return object: Sequence<T> {
        override fun iterator(): Iterator<T> {
            val other = elements.convertToSetForSetOperation()
            return this@minus.filterNot { it in other }.iterator()
        }
    }
}

```

- Returns a sequence containing all elements of original sequence except the elements contained in the given [elements] collection.
- Note that the source sequence and the collection being subtracted are iterated only when an `iterator` is requested from the resulting sequence. Changing any of them between successive calls to `iterator` may affect the result.
- Before Kotlin 1.6, the [elements] collection may have been converted to a [HashSet] to speed up the operation, thus the elements were required to have a correct and stable implementation of `hashCode()` that didn't change between successive invocations.
- On JVM, you can enable this behavior back with the system property `kotlin.collections.convert_arg_to_set_in_removeAll` set to `true`.
- The operation is `_intermediate_` and `_stateful_`.

```

public operator fun <T> Sequence<T>.minus(elements: Iterable<T>): Sequence<T> {
    return object: Sequence<T> {
        override fun iterator(): Iterator<T> {
            val other = elements.convertToSetForSetOperation()
            if (other.isEmpty()) return this@minus.iterator()
            else return this@minus.filterNot { it in other }.iterator()
        }
    }
}

```

- Returns a sequence containing all elements of original sequence except the elements contained in the given [elements] sequence.
- Note that the source sequence and the sequence being subtracted are iterated only when an `iterator` is requested from the resulting sequence. Changing any of them between successive calls to `iterator` may affect the result.
- The operation is `_intermediate_` for this sequence and `_terminal_` and `_stateful_` for the [elements] sequence.
- Before Kotlin 1.6, the [elements] sequence may have been converted to a [HashSet] to speed up the operation, thus the elements were required to have a correct and stable implementation of `hashCode()` that didn't change between successive invocations.
- On JVM, you can enable this behavior back with the system property `kotlin.collections.convert_arg_to_set_in_removeAll` set to `true`.

```

public operator fun <T> Sequence<T>.minus(elements: Sequence<T>): Sequence<T> {
    return object: Sequence<T> {
        override fun iterator(): Iterator<T> {
            val other = elements.convertToSetForSetOperation()
            if (other.isEmpty()) return this@minus.iterator()
            else return this@minus.filterNot { it in other }.iterator()
        }
    }
}

```

- Returns a sequence containing all elements of the original sequence without the first occurrence of the given [element].
- The operation is `_intermediate_` and `_stateless_`.

```

@kotlin.internal.InlineOnly
public inline fun <T> Sequence<T>.minusElement(element: T): Sequence<T> {
    return minus(element)
}

```

- Splits the original sequence into pair of lists, where `first` list contains elements for which [predicate] yielded `true`, while `second` list contains elements for which [predicate] yielded `false`.
- The operation is `_terminal_`.

```

@sample.samples.collections.Sequences.Transformations.partition
public inline fun <T> Sequence<T>.partition(predicate: (T) -> Boolean): Pair<List<T>, List<T>> {
    val first = ArrayList<T>()
    val second = ArrayList<T>()
    for (element in this) {
        if (predicate(element)) first.add(element)
        else second.add(element)
    }
    return Pair(first, second)
}

```

- Returns a sequence containing all elements of the original sequence and then the given [element].
- The operation is `_intermediate_` and `_stateless_`.

```

public operator fun <T> Sequence<T>.plus(element: T): Sequence<T> {
    return sequenceOf(this, sequenceOf(element)).flatten()
}

```

- Returns a sequence containing all elements of original sequence and then all elements of the given [elements] array.
- Note that the source sequence and the array being added are iterated only when an `iterator` is requested from the resulting sequence. Changing any of them between successive calls to `iterator` may affect the result.
- The operation is `_intermediate_` and `_stateless_`.

```

public operator fun <T> Sequence<T>.plus(elements: Array<out T>): Sequence<T> {
    return this.plus(elements.asList())
}

```

- Returns a sequence containing all elements of original sequence and then all elements of the given [elements] collection.
- Note that the source sequence and the collection being added are iterated only when an `iterator` is requested from the resulting sequence. Changing any of them between successive calls to `iterator` may affect the result.
- The operation is `_intermediate_` and `_stateless_`.

```

*public operator fun <T> Sequence<T>.plus(elements: Iterable<T>): Sequence<T> {
    return sequenceOf(this, elements.asSequence()).flatten()
}

* Returns a sequence containing all elements of original sequence and then all elements of the given [elements] sequence.
* Note that the source sequence and the sequence being added are iterated only when an `iterator` is requested from the resulting sequence. Changing any of them between successive calls to `iterator` may affect the result.
* The operation is _intermediate_ and _stateless_.

*public operator fun <T> Sequence<T>.plus(elements: Sequence<T>): Sequence<T> {
    return sequenceOf(this, elements).flatten()
}

* Returns a sequence containing all elements of the original sequence and then the given [element].
* The operation is _intermediate_ and _stateless_.

@kotlin.internal.InlineOnly
*public inline fun <T> Sequence<T>.plusElement(element: T): Sequence<T> {
    return plus(element)
}

* Returns a sequence of snapshots of the window of the given [size] sliding along this sequence with the given [step], where each snapshot is a list.
* Several last lists may have fewer elements than the given [size].
* Both [size] and [step] must be positive and can be greater than the number of elements in this sequence.
* @param size the number of elements to take in each window
* @param step the number of elements to move the window forward by on an each step, by default 1
* @param partialWindows controls whether or not to keep partial windows in the end if any, by default `false` which means partial windows won't be preserved
* @sample samples.collections.Sequences.Transformations.takeWindows

@SinceKotlin("1.2")
*public fun <T> Sequence<T>.windowed(size: Int, step: Int = 1, partialWindows: Boolean = false): Sequence<List<T>> {
    return windowedSequence(size, step, partialWindows, reuseBuffer = false)
}

* Returns a sequence of results of applying the given [transform] function to an each list representing a view over the window of the given [size] sliding along this sequence with the given [step].
* Note that the list passed to the [transform] function is ephemeral and is valid only inside that function.
* You should not store it or allow it to escape in some way, unless you made a snapshot of it.
* Several last lists may have fewer elements than the given [size].
* Both [size] and [step] must be positive and can be greater than the number of elements in this sequence.
* @param size the number of elements to take in each window
* @param step the number of elements to move the window forward by on an each step, by default 1
* @param partialWindows controls whether or not to keep partial windows in the end if any, by default `false` which means partial windows won't be preserved
* @sample samples.collections.Sequences.Transformations.averageWindows

@SinceKotlin("1.2")
*public fun <T, R> Sequence<T>.windowed(size: Int, step: Int = 1, partialWindows: Boolean = false, transform: (List<T>) -> R): Sequence<R> {
    return windowedSequence(size, step, partialWindows, reuseBuffer = true).map(transform)
}

* Returns a sequence of values built from the elements of `this` sequence and the [other] sequence with the same index.
* The resulting sequence ends as soon as the shortest input sequence ends.
* The operation is _intermediate_ and _stateless_.
* @sample samples.collections.Sequences.Transformations.zip

*public infix fun <T, R> Sequence<T>.zip(other: Sequence<R>): Sequence<Pair<T, R>> {
    return MergingSequence(this, other) { t1, t2 -> t1 to t2 }
}

* Returns a sequence of values built from the elements of `this` sequence and the [other] sequence with the same index using the provided [transform] function applied to each pair of elements.
* The resulting sequence ends as soon as the shortest input sequence ends.
* The operation is _intermediate_ and _stateless_.
* @sample samples.collections.Sequences.Transformations.zipWithTransform

*public fun <T, R, V> Sequence<T>.zip(other: Sequence<R>, transform: (a: T, b: R) -> V): Sequence<V> {
    return MergingSequence(this, other, transform)
}

* Returns a sequence of pairs of each two adjacent elements in this sequence.
* The returned sequence is empty if this sequence contains less than two elements.
* The operation is _intermediate_ and _stateless_.
* @sample samples.collections.Collections.Transformations.zipWithNext

@SinceKotlin("1.2")
*public fun <T> Sequence<T>.zipWithNext(): Sequence<Pair<T, T>> {
    return zipWithNext { a, b -> a to b }
}

* Returns a sequence containing the results of applying the given [transform] function to an each pair of two adjacent elements in this sequence.
* The returned sequence is empty if this sequence contains less than two elements.
* The operation is _intermediate_ and _stateless_.
* @sample

```

```

samples.collections.Collections.Transformations.zipWithNextToFindDeltas\n *\n@SinceKotlin("1.2")\npublic
fun <T, R> Sequence<T>.zipWithNext(transform: (a: T, b: T) -> R): Sequence<R> {\n  return sequence result@
{\n    val iterator = iterator()\n    if (!iterator.hasNext()) return@result\n    var current = iterator.next()\n
while (iterator.hasNext()) {\n    val next = iterator.next()\n    yield(transform(current, next))\n
current = next\n  }\n}\n\n/**\n * Appends the string from all the elements separated using [separator] and
using the given [prefix] and [postfix] if supplied.\n * \n * If the collection could be huge, you can specify a non-
negative value of [limit], in which case only the first [limit]\n * elements will be appended, followed by the
[truncated] string (which defaults to "...").\n * \n * The operation is _terminal_.\n * \n * @sample
samples.collections.Collections.Transformations.joinTo\n *\npublic fun <T, A : Appendable>
Sequence<T>.joinTo(buffer: A, separator: CharSequence = "\",", prefix: CharSequence = "\"", postfix:
CharSequence = "\"", limit: Int = -1, truncated: CharSequence = "...", transform: ((T) -> CharSequence)? = null): A
{\n  buffer.append(prefix)\n  var count = 0\n  for (element in this) {\n    if (++count > 1)
buffer.append(separator)\n    if (limit < 0 || count <= limit) {\n      buffer.appendElement(element, transform)\n
    } else break\n  }\n  if (limit >= 0 && count > limit) buffer.append(truncated)\n  buffer.append(postfix)\n
return buffer\n}\n\n/**\n * Creates a string from all the elements separated using [separator] and using the given
[prefix] and [postfix] if supplied.\n * \n * If the collection could be huge, you can specify a non-negative value of
[limit], in which case only the first [limit]\n * elements will be appended, followed by the [truncated] string (which
defaults to "...").\n * \n * The operation is _terminal_.\n * \n * @sample
samples.collections.Collections.Transformations.joinToString\n *\npublic fun <T>
Sequence<T>.joinToString(separator: CharSequence = "\",", prefix: CharSequence = "\"", postfix: CharSequence =
"\", limit: Int = -1, truncated: CharSequence = "...", transform: ((T) -> CharSequence)? = null): String {\n  return
joinTo(StringBuilder(), separator, prefix, postfix, limit, truncated, transform).toString()\n}\n\n/**\n * Creates an
[Iterable] instance that wraps the original sequence returning its elements when being iterated.\n *\npublic fun <T>
Sequence<T>.asIterable(): Iterable<T> {\n  return Iterable { this.iterator() }\n}\n\n/**\n * Returns this sequence as
a [Sequence].\n *\n@kotlin.internal.InlineOnly\npublic inline fun <T> Sequence<T>.asSequence(): Sequence<T>
{\n  return this\n}\n\n/**\n * Returns an average value of elements in the sequence.\n * \n * The operation is
_terminal_.\n *\n@kotlin.jvm.JvmName("averageOfByte")\npublic fun Sequence<Byte>.average(): Double {\n
var sum: Double = 0.0\n var count: Int = 0\n for (element in this) {\n  sum += element\n
checkCountOverflow(++count)\n }\n return if (count == 0) Double.NaN else sum / count\n}\n\n/**\n * Returns
an average value of elements in the sequence.\n * \n * The operation is _terminal_.\n
*\n@kotlin.jvm.JvmName("averageOfShort")\npublic fun Sequence<Short>.average(): Double {\n  var sum:
Double = 0.0\n  var count: Int = 0\n  for (element in this) {\n    sum += element\n
checkCountOverflow(++count)\n  }\n  return if (count == 0) Double.NaN else sum / count\n}\n\n/**\n * Returns
an average value of elements in the sequence.\n * \n * The operation is _terminal_.\n
*\n@kotlin.jvm.JvmName("averageOfInt")\npublic fun Sequence<Int>.average(): Double {\n  var sum: Double
= 0.0\n  var count: Int = 0\n  for (element in this) {\n    sum += element\n    checkCountOverflow(++count)\n
  }\n  return if (count == 0) Double.NaN else sum / count\n}\n\n/**\n * Returns an average value of elements in the
sequence.\n * \n * The operation is _terminal_.\n *\n@kotlin.jvm.JvmName("averageOfLong")\npublic fun
Sequence<Long>.average(): Double {\n  var sum: Double = 0.0\n  var count: Int = 0\n  for (element in this) {\n
sum += element\n    checkCountOverflow(++count)\n  }\n  return if (count == 0) Double.NaN else sum /
count\n}\n\n/**\n * Returns an average value of elements in the sequence.\n * \n * The operation is _terminal_.\n
*\n@kotlin.jvm.JvmName("averageOfFloat")\npublic fun Sequence<Float>.average(): Double {\n  var sum:
Double = 0.0\n  var count: Int = 0\n  for (element in this) {\n    sum += element\n
checkCountOverflow(++count)\n  }\n  return if (count == 0) Double.NaN else sum / count\n}\n\n/**\n * Returns
an average value of elements in the sequence.\n * \n * The operation is _terminal_.\n
*\n@kotlin.jvm.JvmName("averageOfDouble")\npublic fun Sequence<Double>.average(): Double {\n  var sum:
Double = 0.0\n  var count: Int = 0\n  for (element in this) {\n    sum += element\n
checkCountOverflow(++count)\n  }\n  return if (count == 0) Double.NaN else sum / count\n}\n\n/**\n * Returns

```

```

the sum of all elements in the sequence.\n *\n * The operation is _terminal_.\n
*\n@kotlin.jvm.JvmName("\sumOfByte")\npublic fun Sequence<Byte>.sum(): Int {\n    var sum: Int = 0\n    for (element in this) {\n        sum += element\n    }\n    return sum\n}\n\n**\n * Returns the sum of all elements in the sequence.\n *\n * The operation is _terminal_.\n *\n@kotlin.jvm.JvmName("\sumOfShort")\npublic fun Sequence<Short>.sum(): Int {\n    var sum: Int = 0\n    for (element in this) {\n        sum += element\n    }\n    return sum\n}\n\n**\n * Returns the sum of all elements in the sequence.\n *\n * The operation is _terminal_.\n *\n@kotlin.jvm.JvmName("\sumOfInt")\npublic fun Sequence<Int>.sum(): Int {\n    var sum: Int = 0\n    for (element in this) {\n        sum += element\n    }\n    return sum\n}\n\n**\n * Returns the sum of all elements in the sequence.\n *\n * The operation is _terminal_.\n *\n@kotlin.jvm.JvmName("\sumOfLong")\npublic fun Sequence<Long>.sum(): Long {\n    var sum: Long = 0L\n    for (element in this) {\n        sum += element\n    }\n    return sum\n}\n\n**\n * Returns the sum of all elements in the sequence.\n *\n * The operation is _terminal_.\n *\n@kotlin.jvm.JvmName("\sumOfFloat")\npublic fun Sequence<Float>.sum(): Float {\n    var sum: Float = 0.0f\n    for (element in this) {\n        sum += element\n    }\n    return sum\n}\n\n**\n * Returns the sum of all elements in the sequence.\n *\n * The operation is _terminal_.\n *\n@kotlin.jvm.JvmName("\sumOfDouble")\npublic fun Sequence<Double>.sum(): Double {\n    var sum: Double = 0.0\n    for (element in this) {\n        sum += element\n    }\n    return sum\n}\n\n", "\n * Copyright 2010-2021 JetBrains s.r.o. and Kotlin Programming Language contributors.\n * Use of this source code is governed by the Apache 2.0 license that can be found in the license/LICENSE.txt file.\n
*\n\n@file:kotlin.jvm.JvmMultifileClass\n@file:kotlin.jvm.JvmName("\SetsKt")\n\npackage kotlin.collections\n\n\n/\n// NOTE: THIS FILE IS AUTO-GENERATED by the GenerateStandardLib.kt\n// See: https://github.com/JetBrains/kotlin/tree/master/libraries/stdlib\n\nimport kotlin.random.*\nimport kotlin.ranges.contains\nimport kotlin.ranges.reversed\n\n**\n * Returns a set containing all elements of the original set except the given [element].\n *\n * The returned set preserves the element iteration order of the original set.\n *\npublic operator fun <T> Set<T>.minus(element: T): Set<T> {\n    val result = LinkedHashSet<T>(mapCapacity(size))\n    var removed = false\n    return this.filterTo(result) { if (!removed && it == element) { removed = true; false } else true }\n}\n\n**\n * Returns a set containing all elements of the original set except the elements contained in the given [elements] array.\n *\n * The returned set preserves the element iteration order of the original set.\n *\n * Before Kotlin 1.6, the [elements] array may have been converted to a [HashSet] to speed up the operation, thus the elements were required to have\n * a correct and stable implementation of `hashCode()` that didn't change between successive invocations.\n * On JVM, you can enable this behavior back with the system property `kotlin.collections.convert_arg_to_set_in_removeAll` set to `true`.\n *\npublic operator fun <T> Set<T>.minus(elements: Array<out T>): Set<T> {\n    val result = LinkedHashSet<T>(this)\n    result.removeAll(elements)\n    return result\n}\n\n**\n * Returns a set containing all elements of the original set except the elements contained in the given [elements] collection.\n *\n * The returned set preserves the element iteration order of the original set.\n *\n * Before Kotlin 1.6, the [elements] collection may have been converted to a [HashSet] to speed up the operation, thus the elements were required to have\n * a correct and stable implementation of `hashCode()` that didn't change between successive invocations.\n * On JVM, you can enable this behavior back with the system property `kotlin.collections.convert_arg_to_set_in_removeAll` set to `true`.\n *\npublic operator fun <T> Set<T>.minus(elements: Iterable<T>): Set<T> {\n    val other = elements.convertToSetForSetOperationWith(this)\n    if (other.isEmpty())\n        return this.toSet()\n    if (other is Set)\n        return this.filterNotTo(LinkedHashSet<T>()) { it in other }\n    val result = LinkedHashSet<T>(this)\n    result.removeAll(other)\n    return result\n}\n\n**\n * Returns a set containing all elements of the original set except the elements contained in the given [elements] sequence.\n *\n * The returned set preserves the element iteration order of the original set.\n *\n * Before Kotlin 1.6, the [elements] sequence may have been converted to a [HashSet] to speed up the operation, thus the elements were required to have\n * a correct and stable implementation of `hashCode()` that didn't change between successive invocations.\n * On JVM, you can enable this behavior back with the system property `kotlin.collections.convert_arg_to_set_in_removeAll` set to `true`.\n *\npublic operator fun <T> Set<T>.minus(elements: Sequence<T>): Set<T> {\n    val result = LinkedHashSet<T>(this)\n

```



```

(Char) -> Boolean): Char {
    for (element in this) if (predicate(element)) return element
    throw NoSuchElementException("Char sequence contains no character matching the predicate.")
}

Returns the first non-null value produced by [transform] function being applied to characters of this char sequence in iteration order, or throws [NoSuchElementException] if no non-null value was produced.

@sample samples.collections.Collections.Transformations.firstNotNullOf

*Since Kotlin("1.5")@kotlin.internal.InlineOnly
public inline fun <R : Any>
CharSequence.firstNotNullOf(transform: (Char) -> R?): R {
    return firstNotNullOfOrNull(transform) ?: throw
    NoSuchElementException("No element of the char sequence was transformed to a non-null value.")
}

Returns the first non-null value produced by [transform] function being applied to characters of this char sequence in iteration order, or `null` if no non-null value was produced.

@sample samples.collections.Collections.Transformations.firstNotNullOf

*Since Kotlin("1.5")@kotlin.internal.InlineOnly
public inline fun <R : Any>
CharSequence.firstNotNullOfOrNull(transform: (Char) -> R?): R? {
    for (element in this) {
        val result = transform(element)
        if (result != null) return result
    }
    return null
}

Returns the first character, or `null` if the char sequence is empty.

public fun CharSequence.firstOrNull(): Char? {
    return if (isEmpty()) null else this[0]
}

Returns the first character matching the given [predicate], or `null` if character was not found.

public inline fun CharSequence.firstOrNull(predicate: (Char) -> Boolean): Char? {
    for (element in this) if (predicate(element)) return element
    return null
}

Returns a character at the given [index] or the result of calling the [defaultValue] function if the [index] is out of bounds of this char sequence.

@kotlin.internal.InlineOnly
public inline fun CharSequence.getOrElse(index: Int, defaultValue: (Int) -> Char): Char {
    return if (index >= 0 && index <= lastIndex) get(index) else
    defaultValue(index)
}

Returns a character at the given [index] or `null` if the [index] is out of bounds of this char sequence.

@sample samples.collections.Elements.getOrNull

public fun
CharSequence.getOrNull(index: Int): Char? {
    return if (index >= 0 && index <= lastIndex) get(index) else
    null
}

Returns index of the first character matching the given [predicate], or -1 if the char sequence does not contain such character.

public inline fun CharSequence.indexOfFirst(predicate: (Char) -> Boolean): Int {
    for (index in indices) {
        if (predicate(this[index])) return index
    }
    return -1
}

Returns index of the last character matching the given [predicate], or -1 if the char sequence does not contain such character.

public inline fun CharSequence.indexOfLast(predicate: (Char) -> Boolean): Int {
    for (index in indices.reversed()) {
        if (predicate(this[index])) return index
    }
    return -1
}

Returns the last character.

@throws NoSuchElementException if the char sequence is empty.

@sample samples.text.Strings.last

public fun CharSequence.last(): Char {
    if (isEmpty())
        throw NoSuchElementException("Char sequence is empty.")
    return this[lastIndex]
}

Returns the last character matching the given [predicate].

@throws NoSuchElementException if no such character is found.

@sample samples.text.Strings.last

public inline fun CharSequence.last(predicate: (Char) -> Boolean): Char {
    for (index in this.indices.reversed()) {
        val element = this[index]
        if (predicate(element)) return element
    }
    throw NoSuchElementException("Char sequence contains no character matching the predicate.")
}

Returns the last character, or `null` if the char sequence is empty.

@sample samples.text.Strings.last

public fun CharSequence.lastOrNull(): Char? {
    return if (isEmpty()) null else this[length - 1]
}

Returns the last character matching the given [predicate], or `null` if no such character was found.

@sample samples.text.Strings.last

public inline fun
CharSequence.lastOrNull(predicate: (Char) -> Boolean): Char? {
    for (index in this.indices.reversed()) {
        val element = this[index]
        if (predicate(element)) return element
    }
    return null
}

Returns a random character from this char sequence.

@throws NoSuchElementException if this char sequence is empty.

@Since Kotlin("1.3")@kotlin.internal.InlineOnly
public inline fun CharSequence.random(): Char {
    return random(Random)
}

Returns a random character from this char sequence using the specified source of randomness.

@throws NoSuchElementException if this char sequence is empty.

*Since Kotlin("1.3")
public fun CharSequence.random(random: Random): Char {
    if (isEmpty())

```



```

@sample samples.text.Strings.drop\n *^\npublic inline fun String.dropWhile(predicate: (Char) -> Boolean): String
{\n for (index in this.indices)\n if (!predicate(this[index]))\n return substring(index)\n return
}\n}\n}\n\n/**\n * Returns a char sequence containing only those characters from the original char sequence that
match the given [predicate].\n * \n * @sample samples.text.Strings.filter\n *^\npublic inline fun
CharSequence.filter(predicate: (Char) -> Boolean): CharSequence {\n return filterTo(StringBuilder(),
predicate)\n}\n}\n\n/**\n * Returns a string containing only those characters from the original string that match the
given [predicate].\n * \n * @sample samples.text.Strings.filter\n *^\npublic inline fun String.filter(predicate: (Char) -
> Boolean): String {\n return filterTo(StringBuilder(), predicate).toString()\n}\n}\n\n/**\n * Returns a char sequence
containing only those characters from the original char sequence that match the given [predicate].\n * @param
[predicate] function that takes the index of a character and the character itself\n * and returns the result of predicate
evaluation on the character.\n * \n * @sample samples.collections.Collections.Filtering.filterIndexed\n *^\npublic
inline fun CharSequence.filterIndexed(predicate: (index: Int, Char) -> Boolean): CharSequence {\n return
filterIndexedTo(StringBuilder(), predicate)\n}\n}\n\n/**\n * Returns a string containing only those characters from the
original string that match the given [predicate].\n * @param [predicate] function that takes the index of a character
and the character itself\n * and returns the result of predicate evaluation on the character.\n * \n * @sample
samples.collections.Collections.Filtering.filterIndexed\n *^\npublic inline fun String.filterIndexed(predicate: (index:
Int, Char) -> Boolean): String {\n return filterIndexedTo(StringBuilder(), predicate).toString()\n}\n}\n\n/**\n *
Appends all characters matching the given [predicate] to the given [destination].\n * @param [predicate] function
that takes the index of a character and the character itself\n * and returns the result of predicate evaluation on the
character.\n * \n * @sample samples.collections.Collections.Filtering.filterIndexedTo\n *^\npublic inline fun <C :
Appendable> CharSequence.filterIndexedTo(destination: C, predicate: (index: Int, Char) -> Boolean): C {\n
forEachIndexed { index, element ->\n if (predicate(index, element)) destination.append(element)\n }\n
return destination\n}\n}\n\n/**\n * Returns a char sequence containing only those characters from the original char
sequence that do not match the given [predicate].\n * \n * @sample samples.text.Strings.filterNot\n *^\npublic inline
fun CharSequence.filterNot(predicate: (Char) -> Boolean): CharSequence {\n return filterNotTo(StringBuilder(),
predicate)\n}\n}\n\n/**\n * Returns a string containing only those characters from the original string that do not match
the given [predicate].\n * \n * @sample samples.text.Strings.filterNot\n *^\npublic inline fun
String.filterNot(predicate: (Char) -> Boolean): String {\n return filterNotTo(StringBuilder(),
predicate).toString()\n}\n}\n\n/**\n * Appends all characters not matching the given [predicate] to the given
[destination].\n * \n * @sample samples.collections.Collections.Filtering.filterNotTo\n *^\npublic inline fun <C :
Appendable> CharSequence.filterNotTo(destination: C, predicate: (Char) -> Boolean): C {\n for (element in this)
if (!predicate(element)) destination.append(element)\n return destination\n}\n}\n\n/**\n * Appends all characters
matching the given [predicate] to the given [destination].\n * \n * @sample
samples.collections.Collections.Filtering.filterTo\n *^\npublic inline fun <C : Appendable>
CharSequence.filterTo(destination: C, predicate: (Char) -> Boolean): C {\n for (index in 0 until length) {\n val
element = get(index)\n if (predicate(element)) destination.append(element)\n }\n return
destination\n}\n}\n\n/**\n * Returns a char sequence containing characters of the original char sequence at the
specified range of [indices].\n *^\npublic fun CharSequence.slice(indices: IntRange): CharSequence {\n if
(indices.isEmpty()) return ""\n return subSequence(indices)\n}\n}\n\n/**\n * Returns a string containing characters
of the original string at the specified range of [indices].\n *^\npublic fun String.slice(indices: IntRange): String {\n
if (indices.isEmpty()) return ""\n return substring(indices)\n}\n}\n\n/**\n * Returns a char sequence containing
characters of the original char sequence at specified [indices].\n *^\npublic fun CharSequence.slice(indices:
Iterable<Int>): CharSequence {\n val size = indices.collectionSizeOrDefault(10)\n if (size == 0) return ""\n
val result = StringBuilder(size)\n for (i in indices) {\n result.append(get(i))\n }\n return result\n}\n}\n\n/**\n *
Returns a string containing characters of the original string at specified [indices].\n
*\n *^\n@kotlin.internal.InlineOnly\npublic inline fun String.slice(indices: Iterable<Int>): String {\n return (this as
CharSequence).slice(indices).toString()\n}\n}\n\n/**\n * Returns a subsequence of this char sequence containing the
first [n] characters from this char sequence, or the entire char sequence if this char sequence is shorter.\n * \n *

```

```

@throws IllegalArgumentException if [n] is negative.\n * \n * @sample samples.text.Strings.take\n *^\npublic fun
CharSequence.take(n: Int): CharSequence {\n    require(n >= 0) {\n        "Requested character count $n is less than zero.\n"
    }\n    return subSequence(0, n.coerceAtMost(length))\n}\n\n/**\n * Returns a string containing the first [n]
characters from this string, or the entire string if this string is shorter.\n * \n * @throws IllegalArgumentException if
[n] is negative.\n * \n * @sample samples.text.Strings.take\n *^\npublic fun String.take(n: Int): String {\n    require(n
>= 0) {\n        "Requested character count $n is less than zero.\n"
    }\n    return substring(0,
n.coerceAtMost(length))\n}\n\n/**\n * Returns a subsequence of this char sequence containing the last [n]
characters from this char sequence, or the entire char sequence if this char sequence is shorter.\n * \n * @throws
IllegalArgumentException if [n] is negative.\n * \n * @sample samples.text.Strings.take\n *^\npublic fun
CharSequence.takeLast(n: Int): CharSequence {\n    require(n >= 0) {\n        "Requested character count $n is less than
zero.\n"
    }\n    val length = length\n    return subSequence(length - n.coerceAtMost(length), length)\n}\n\n/**\n *
Returns a string containing the last [n] characters from this string, or the entire string if this string is shorter.\n * \n *
@throws IllegalArgumentException if [n] is negative.\n * \n * @sample samples.text.Strings.take\n *^\npublic fun
String.takeLast(n: Int): String {\n    require(n >= 0) {\n        "Requested character count $n is less than zero.\n"
    }\n    val
length = length\n    return substring(length - n.coerceAtMost(length))\n}\n\n/**\n * Returns a subsequence of this
char sequence containing last characters that satisfy the given [predicate].\n * \n * @sample
samples.text.Strings.take\n *^\npublic inline fun CharSequence.takeLastWhile(predicate: (Char) -> Boolean):
CharSequence {\n    for (index in lastIndex downTo 0) {\n        if (!predicate(this[index])) {\n            return
subSequence(index + 1, length)\n        }\n    }\n    return subSequence(0, length)\n}\n\n/**\n * Returns a string
containing last characters that satisfy the given [predicate].\n * \n * @sample samples.text.Strings.take\n *^\npublic
inline fun String.takeLastWhile(predicate: (Char) -> Boolean): String {\n    for (index in lastIndex downTo 0) {\n
        if (!predicate(this[index])) {\n            return substring(index + 1)\n        }\n    }\n    return this\n}\n\n/**\n * Returns
a subsequence of this char sequence containing the first characters that satisfy the given [predicate].\n * \n *
@sample samples.text.Strings.take\n *^\npublic inline fun CharSequence.takeWhile(predicate: (Char) -> Boolean):
CharSequence {\n    for (index in 0 until length)\n        if (!predicate(get(index))) {\n            return subSequence(0,
index)\n        }\n    return subSequence(0, length)\n}\n\n/**\n * Returns a string containing the first characters that
satisfy the given [predicate].\n * \n * @sample samples.text.Strings.take\n *^\npublic inline fun
String.takeWhile(predicate: (Char) -> Boolean): String {\n    for (index in 0 until length)\n        if
(!predicate(get(index))) {\n            return substring(0, index)\n        }\n    return this\n}\n\n/**\n * Returns a char
sequence with characters in reversed order.\n *^\npublic fun CharSequence.reversed(): CharSequence {\n    return
StringBuilder(this).reverse()\n}\n\n/**\n * Returns a string with characters in reversed order.\n *^\n@kotlin.internal.InlineOnly\npublic inline fun String.reversed(): String {\n    return (this as
CharSequence).reversed().toString()\n}\n\n/**\n * Returns a [Map] containing key-value pairs provided by
[transform] function\n * applied to characters of the given char sequence.\n * \n * If any of two pairs would have the
same key the last one gets added to the map.\n * \n * The returned map preserves the entry iteration order of the
original char sequence.\n * \n * @sample samples.text.Strings.associate\n *^\npublic inline fun <K, V>
CharSequence.associate(transform: (Char) -> Pair<K, V>): Map<K, V> {\n    val capacity =
mapCapacity(length).coerceAtLeast(16)\n    return associateTo(LinkedHashMap<K, V>(capacity),
transform)\n}\n\n/**\n * Returns a [Map] containing the characters from the given char sequence indexed by the
key\n * returned from [keySelector] function applied to each character.\n * \n * If any two characters would have the
same key returned by [keySelector] the last one gets added to the map.\n * \n * The returned map preserves the entry
iteration order of the original char sequence.\n * \n * @sample samples.text.Strings.associateBy\n *^\npublic inline
fun <K> CharSequence.associateBy(keySelector: (Char) -> K): Map<K, Char> {\n    val capacity =
mapCapacity(length).coerceAtLeast(16)\n    return associateByTo(LinkedHashMap<K, Char>(capacity),
keySelector)\n}\n\n/**\n * Returns a [Map] containing the values provided by [valueTransform] and indexed by
[keySelector] functions applied to characters of the given char sequence.\n * \n * If any two characters would have
the same key returned by [keySelector] the last one gets added to the map.\n * \n * The returned map preserves the
entry iteration order of the original char sequence.\n * \n * @sample

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samples.text.Strings.associateByWithValueTransform\n *\npublic inline fun <K, V>
CharSequence.associateBy(keySelector: (Char) -> K, valueTransform: (Char) -> V): Map<K, V> {\n  val capacity
= mapCapacity(length).coerceAtLeast(16)\n  return associateByTo(LinkedHashMap<K, V>(capacity),
keySelector, valueTransform)\n}\n\n/**\n * Populates and returns the [destination] mutable map with key-value
pairs,\n * where key is provided by the [keySelector] function applied to each character of the given char sequence\n
* and value is the character itself.\n * \n * If any two characters would have the same key returned by [keySelector]
the last one gets added to the map.\n * \n * @sample samples.text.Strings.associateByTo\n *\npublic inline fun <K,
M : MutableMap<in K, in Char>> CharSequence.associateByTo(destination: M, keySelector: (Char) -> K): M {\n
for (element in this) {\n  destination.put(keySelector(element), element)\n } \n return destination\n}\n\n/**\n
* Populates and returns the [destination] mutable map with key-value pairs,\n * where key is provided by the
[keySelector] function and\n * and value is provided by the [valueTransform] function applied to characters of the
given char sequence.\n * \n * If any two characters would have the same key returned by [keySelector] the last one
gets added to the map.\n * \n * @sample samples.text.Strings.associateByToWithValueTransform\n *\npublic
inline fun <K, V, M : MutableMap<in K, in V>> CharSequence.associateByTo(destination: M, keySelector: (Char)
-> K, valueTransform: (Char) -> V): M {\n  for (element in this) {\n  destination.put(keySelector(element),
valueTransform(element))\n } \n return destination\n}\n\n/**\n * Populates and returns the [destination] mutable
map with key-value pairs\n * provided by [transform] function applied to each character of the given char
sequence.\n * \n * If any of two pairs would have the same key the last one gets added to the map.\n * \n * @sample
samples.text.Strings.associateTo\n *\npublic inline fun <K, V, M : MutableMap<in K, in V>>
CharSequence.associateTo(destination: M, transform: (Char) -> Pair<K, V>): M {\n  for (element in this) {\n
destination += transform(element)\n } \n return destination\n}\n\n/**\n * Returns a [Map] where keys are
characters from the given char sequence and values are\n * produced by the [valueSelector] function applied to each
character.\n * \n * If any two characters are equal, the last one gets added to the map.\n * \n * The returned map
preserves the entry iteration order of the original char sequence.\n * \n * @sample
samples.text.Strings.associateWith\n *\n@SinceKotlin("1.3")\npublic inline fun <V>
CharSequence.associateWith(valueSelector: (Char) -> V): Map<Char, V> {\n  val result = LinkedHashMap<Char,
V>(mapCapacity(length).coerceAtMost(128)).coerceAtLeast(16)\n  return associateWithTo(result,
valueSelector)\n}\n\n/**\n * Populates and returns the [destination] mutable map with key-value pairs for each
character of the given char sequence,\n * where key is the character itself and value is provided by the
[valueSelector] function applied to that key.\n * \n * If any two characters are equal, the last one overwrites the
former value in the map.\n * \n * @sample samples.text.Strings.associateWithTo\n
*\n@SinceKotlin("1.3")\npublic inline fun <V, M : MutableMap<in Char, in V>>
CharSequence.associateWithTo(destination: M, valueSelector: (Char) -> V): M {\n  for (element in this) {\n
destination.put(element, valueSelector(element))\n } \n return destination\n}\n\n/**\n * Appends all characters to
the given [destination] collection.\n *\npublic fun <C : MutableCollection<in Char>>
CharSequence.toCollection(destination: C): C {\n  for (item in this) {\n  destination.add(item)\n } \n return
destination\n}\n\n/**\n * Returns a new [HashSet] of all characters.\n *\npublic fun CharSequence.toHashSet():
HashSet<Char> {\n  return toCollection(HashSet<Char>(mapCapacity(length).coerceAtMost(128)))\n}\n\n/**\n
* Returns a [List] containing all characters.\n *\npublic fun CharSequence.toList(): List<Char> {\n  return when
(length) {\n  0 -> emptyList()\n  1 -> listOf(this[0])\n  else -> this.toMutableList()\n } \n}\n\n/**\n
* Returns a new [MutableList] filled with all characters of this char sequence.\n *\npublic fun
CharSequence.toMutableList(): MutableList<Char> {\n  return toCollection(ArrayList<Char>(length))\n}\n\n/**\n
* Returns a [Set] of all characters.\n * \n * The returned set preserves the element iteration order of the original
char sequence.\n *\npublic fun CharSequence.toSet(): Set<Char> {\n  return when (length) {\n  0 -> emptySet()\n
1 -> setOf(this[0])\n  else -> toCollection(LinkedHashSet<Char>(mapCapacity(length).coerceAtMost(128)))\n
}\n}\n\n/**\n * Returns a single list of all elements yielded from results of [transform] function being invoked on
each character of original char sequence.\n * \n * @sample
samples.collections.Collections.Transformations.flatMap\n *\npublic inline fun <R>

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CharSequence.flatMap(transform: (Char) -> Iterable<R>): List<R> {\n  return flatMapTo(ArrayList<R>(),
transform)\n}\n\n/**\n * Returns a single list of all elements yielded from results of [transform] function being
invoked on each character\n * and its index in the original char sequence.\n * \n * @sample
samples.collections.Collections.Transformations.flatMapIndexed\n
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.jvm.JvmName("flatMapIndexedIterable")\n@kotlin.internal.InlineOnly\npublic
inline fun <R> CharSequence.flatMapIndexed(transform: (index: Int, Char) -> Iterable<R>): List<R> {\n  return
flatMapIndexedTo(ArrayList<R>(), transform)\n}\n\n/**\n * Appends all elements yielded from results of
[transform] function being invoked on each character\n * and its index in the original char sequence, to the given
[destination].\n
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.jvm.JvmName("flatMapIndexedIterableTo")\n@kotlin.internal.InlineOnly\npubli
c inline fun <R, C : MutableCollection<in R>> CharSequence.flatMapIndexedTo(destination: C, transform: (index:
Int, Char) -> Iterable<R>): C {\n  var index = 0\n  for (element in this) {\n    val list = transform(index++,
element)\n    destination.addAll(list)\n  }\n  return destination\n}\n\n/**\n * Appends all elements yielded from
results of [transform] function being invoked on each character of original char sequence, to the given
[destination].\n *\npublic inline fun <R, C : MutableCollection<in R>> CharSequence.flatMapTo(destination: C,
transform: (Char) -> Iterable<R>): C {\n  for (element in this) {\n    val list = transform(element)\n
destination.addAll(list)\n  }\n  return destination\n}\n\n/**\n * Groups characters of the original char sequence by
the key returned by the given [keySelector] function\n * applied to each character and returns a map where each
group key is associated with a list of corresponding characters.\n * \n * The returned map preserves the entry
iteration order of the keys produced from the original char sequence.\n * \n * @sample
samples.collections.Collections.Transformations.groupBy\n *\npublic inline fun <K>
CharSequence.groupBy(keySelector: (Char) -> K): Map<K, List<Char>> {\n  return
groupByTo(LinkedHashMap<K, MutableList<Char>>(), keySelector)\n}\n\n/**\n * Groups values returned by the
[valueTransform] function applied to each character of the original char sequence\n * by the key returned by the
given [keySelector] function applied to the character\n * and returns a map where each group key is associated with
a list of corresponding values.\n * \n * The returned map preserves the entry iteration order of the keys produced
from the original char sequence.\n * \n * @sample
samples.collections.Collections.Transformations.groupByKeysAndValues\n *\npublic inline fun <K, V>
CharSequence.groupBy(keySelector: (Char) -> K, valueTransform: (Char) -> V): Map<K, List<V>> {\n  return
groupByTo(LinkedHashMap<K, MutableList<V>>(), keySelector, valueTransform)\n}\n\n/**\n * Groups
characters of the original char sequence by the key returned by the given [keySelector] function\n * applied to each
character and puts to the [destination] map each group key associated with a list of corresponding characters.\n * \n
*\n * @return The [destination] map.\n * \n * @sample samples.collections.Collections.Transformations.groupBy\n
*\npublic inline fun <K, M : MutableMap<in K, MutableList<Char>>> CharSequence.groupByTo(destination: M,
keySelector: (Char) -> K): M {\n  for (element in this) {\n    val key = keySelector(element)\n    val list =
destination.getOrPut(key) { ArrayList<Char>() }\n    list.add(element)\n  }\n  return destination\n}\n\n/**\n *
Groups values returned by the [valueTransform] function applied to each character of the original char sequence\n *
by the key returned by the given [keySelector] function applied to the character\n * and puts to the [destination]
map each group key associated with a list of corresponding values.\n * \n * @return The [destination] map.\n * \n *
@sample samples.collections.Collections.Transformations.groupByKeysAndValues\n *\npublic inline fun <K, V,
M : MutableMap<in K, MutableList<V>>> CharSequence.groupByTo(destination: M, keySelector: (Char) -> K,
valueTransform: (Char) -> V): M {\n  for (element in this) {\n    val key = keySelector(element)\n    val list =
destination.getOrPut(key) { ArrayList<V>() }\n    list.add(valueTransform(element))\n  }\n  return
destination\n}\n\n/**\n * Creates a [Grouping] source from a char sequence to be used later with one of group-and-
fold operations\n * using the specified [keySelector] function to extract a key from each character.\n * \n * @sample
samples.collections.Grouping.groupingByEachCount\n *\n@SinceKotlin("1.1")\npublic inline fun <K>

```

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CharSequence.groupingBy(crossinline keySelector: (Char) -> K): Grouping<Char, K> {\n  return object :
Grouping<Char, K> {\n    override fun sourceIterator(): Iterator<Char> = this@groupingBy.iterator()\n
override fun keyOf(element: Char): K = keySelector(element)\n  }\n}\n\n/**\n * Returns a list containing the
results of applying the given [transform] function\n * to each character in the original char sequence.\n * \n *
@sample samples.text.Strings.map\n */\npublic inline fun <R> CharSequence.map(transform: (Char) -> R):
List<R> {\n  return mapTo(ArrayList<R>(length), transform)\n}\n\n/**\n * Returns a list containing the results of
applying the given [transform] function\n * to each character and its index in the original char sequence.\n *
@param [transform] function that takes the index of a character and the character itself\n * and returns the result of
the transform applied to the character.\n */\npublic inline fun <R> CharSequence.mapIndexed(transform: (index:
Int, Char) -> R): List<R> {\n  return mapIndexedTo(ArrayList<R>(length), transform)\n}\n\n/**\n * Returns a list
containing only the non-null results of applying the given [transform] function\n * to each character and its index in
the original char sequence.\n * @param [transform] function that takes the index of a character and the character
itself\n * and returns the result of the transform applied to the character.\n */\npublic inline fun <R : Any>
CharSequence.mapIndexedNotNull(transform: (index: Int, Char) -> R?): List<R> {\n  return
mapIndexedNotNullTo(ArrayList<R>(), transform)\n}\n\n/**\n * Applies the given [transform] function to each
character and its index in the original char sequence\n * and appends only the non-null results to the given
[destination].\n * @param [transform] function that takes the index of a character and the character itself\n * and
returns the result of the transform applied to the character.\n */\npublic inline fun <R : Any, C :
MutableCollection<in R>> CharSequence.mapIndexedNotNullTo(destination: C, transform: (index: Int, Char) ->
R?): C {\n  forEachIndexed { index, element -> transform(index, element)?.let { destination.add(it) } }\n  return
destination\n}\n\n/**\n * Applies the given [transform] function to each character and its index in the original char
sequence\n * and appends the results to the given [destination].\n * @param [transform] function that takes the
index of a character and the character itself\n * and returns the result of the transform applied to the character.\n
*/\npublic inline fun <R, C : MutableCollection<in R>> CharSequence.mapIndexedTo(destination: C, transform:
(index: Int, Char) -> R): C {\n  var index = 0\n  for (item in this)\n    destination.add(transform(index++,
item))\n  return destination\n}\n\n/**\n * Returns a list containing only the non-null results of applying the given
[transform] function\n * to each character in the original char sequence.\n * \n * @sample
samples.collections.Collections.Transformations.mapNotNull\n */\npublic inline fun <R : Any>
CharSequence.mapNotNull(transform: (Char) -> R?): List<R> {\n  return mapNotNullTo(ArrayList<R>(),
transform)\n}\n\n/**\n * Applies the given [transform] function to each character in the original char sequence\n *
and appends only the non-null results to the given [destination].\n */\npublic inline fun <R : Any, C :
MutableCollection<in R>> CharSequence.mapNotNullTo(destination: C, transform: (Char) -> R?): C {\n  forEach
{ element -> transform(element)?.let { destination.add(it) } }\n  return destination\n}\n\n/**\n * Applies the given
[transform] function to each character of the original char sequence\n * and appends the results to the given
[destination].\n */\npublic inline fun <R, C : MutableCollection<in R>> CharSequence.mapTo(destination: C,
transform: (Char) -> R): C {\n  for (item in this)\n    destination.add(transform(item))\n  return
destination\n}\n\n/**\n * Returns a lazy [Iterable] that wraps each character of the original char sequence\n * into an
[IndexValue] containing the index of that character and the character itself.\n */\npublic fun
CharSequence.withIndex(): Iterable<IndexedValue<Char>> {\n  return IndexingIterable { iterator() }\n}\n\n/**\n *
Returns `true` if all characters match the given [predicate].\n * \n * @sample
samples.collections.Collections.Aggregates.all\n */\npublic inline fun CharSequence.all(predicate: (Char) ->
Boolean): Boolean {\n  for (element in this) if (!predicate(element)) return false\n  return true\n}\n\n/**\n *
Returns `true` if char sequence has at least one character.\n * \n * @sample
samples.collections.Collections.Aggregates.any\n */\npublic fun CharSequence.any(): Boolean {\n  return
!isEmpty()\n}\n\n/**\n * Returns `true` if at least one character matches the given [predicate].\n * \n * @sample
samples.collections.Collections.Aggregates.anyWithPredicate\n */\npublic inline fun CharSequence.any(predicate:
(Char) -> Boolean): Boolean {\n  for (element in this) if (predicate(element)) return true\n  return
false\n}\n\n/**\n * Returns the length of this char sequence.\n */\n@kotlin.internal.InlineOnly\npublic inline fun

```



```

CharSequence.count(): Int {\n  return length}\n\n/**\n * Returns the number of characters matching the given
[predicate].\n */\npublic inline fun CharSequence.count(predicate: (Char) -> Boolean): Int {\n  var count = 0\n  for (element in this) if (predicate(element)) ++count\n  return count}\n\n/**\n * Accumulates value starting with
[initial] value and applying [operation] from left to right\n * to current accumulator value and each character.\n *
Returns the specified [initial] value if the char sequence is empty.\n * \n * @param [operation] function that takes
current accumulator value and a character, and calculates the next accumulator value.\n */\npublic inline fun <R>
CharSequence.fold(initial: R, operation: (acc: R, Char) -> R): R {\n  var accumulator = initial\n  for (element in
this) accumulator = operation(accumulator, element)\n  return accumulator}\n\n/**\n * Accumulates value
starting with [initial] value and applying [operation] from left to right\n * to current accumulator value and each
character with its index in the original char sequence.\n * \n * Returns the specified [initial] value if the char
sequence is empty.\n * \n * @param [operation] function that takes the index of a character, current accumulator
value\n * and the character itself, and calculates the next accumulator value.\n */\npublic inline fun <R>
CharSequence.foldIndexed(initial: R, operation: (index: Int, acc: R, Char) -> R): R {\n  var index = 0\n  var
accumulator = initial\n  for (element in this) accumulator = operation(index++, accumulator, element)\n  return
accumulator}\n\n/**\n * Accumulates value starting with [initial] value and applying [operation] from right to
left\n * to each character and current accumulator value.\n * \n * Returns the specified [initial] value if the char
sequence is empty.\n * \n * @param [operation] function that takes a character and current accumulator value, and
calculates the next accumulator value.\n */\npublic inline fun <R> CharSequence.foldRight(initial: R, operation:
(Char, acc: R) -> R): R {\n  var index = lastIndex\n  var accumulator = initial\n  while (index >= 0) {\n
accumulator = operation(get(index--), accumulator)\n  }\n  return accumulator}\n\n/**\n * Accumulates value
starting with [initial] value and applying [operation] from right to left\n * to each character with its index in the
original char sequence and current accumulator value.\n * \n * Returns the specified [initial] value if the char
sequence is empty.\n * \n * @param [operation] function that takes the index of a character, the character itself\n *
and current accumulator value, and calculates the next accumulator value.\n */\npublic inline fun <R>
CharSequence.foldRightIndexed(initial: R, operation: (index: Int, Char, acc: R) -> R): R {\n  var index =
lastIndex\n  var accumulator = initial\n  while (index >= 0) {\n    accumulator = operation(index, get(index),
accumulator)\n    --index\n  }\n  return accumulator}\n\n/**\n * Performs the given [action] on each
character.\n */\npublic inline fun CharSequence.forEach(action: (Char) -> Unit): Unit {\n  for (element in this)
action(element)}\n\n/**\n * Performs the given [action] on each character, providing sequential index with the
character.\n * @param [action] function that takes the index of a character and the character itself\n * and performs
the action on the character.\n */\npublic inline fun CharSequence.forEachIndexed(action: (index: Int, Char) -> Unit):
Unit {\n  var index = 0\n  for (item in this) action(index++, item)}\n\n@Deprecated("Use maxOrNull
instead.", ReplaceWith("this.maxOrNull()"))\n@DeprecatedSinceKotlin(warningSince = "1.4", errorSince =
"1.5", hiddenSince = "1.6")\npublic fun CharSequence.max(): Char? {\n  return
maxOrNull()\n}\n\n@Deprecated("Use maxByOrNull instead.",
ReplaceWith("this.maxByOrNull(selector)"))\n@DeprecatedSinceKotlin(warningSince = "1.4", errorSince =
"1.5", hiddenSince = "1.6")\npublic inline fun <R : Comparable<R>> CharSequence.maxBy(selector: (Char) ->
R): Char? {\n  return maxByOrNull(selector)\n}\n\n/**\n * Returns the first character yielding the largest value of
the given function or `null` if there are no characters.\n * \n * @sample
samples.collections.Collections.Aggregates.maxByOrNull\n */\n@SinceKotlin("1.4")\npublic inline fun <R :
Comparable<R>> CharSequence.maxByOrNull(selector: (Char) -> R): Char? {\n  if (isEmpty()) return null\n  var
maxElem = this[0]\n  val lastIndex = this.lastIndex\n  if (lastIndex == 0) return maxElem\n  var maxV =
selector(maxElem)\n  for (i in 1..lastIndex) {\n    val e = this[i]\n    val v = selector(e)\n    if (maxV < v)
{\n      maxElem = e\n      maxV = v\n    }\n  }\n  return maxElem}\n\n/**\n * Returns the largest
value among all values produced by [selector] function\n * applied to each character in the char sequence.\n * \n * If
any of values produced by [selector] function is `NaN`, the returned result is `NaN`.\n * \n * @throws
NoSuchElementException if the char sequence is empty.\n
*/\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution

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ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun CharSequence.maxOf(selector: (Char) ->
Double): Double {\n  if (isEmpty()) throw NoSuchElementException()\n  var maxValue = selector(this[0])\n  for
(i in 1..lastIndex) {\n    val v = selector(this[i])\n    maxValue = maxOf(maxValue, v)\n  }\n  return
maxValue\n}\n\n/**\n * Returns the largest value among all values produced by [selector] function\n * applied to
each character in the char sequence.\n * \n * If any of values produced by [selector] function is `NaN`, the returned
result is `NaN`.\n * \n * @throws NoSuchElementException if the char sequence is empty.\n
*\n*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun CharSequence.maxOf(selector: (Char) ->
Float): Float {\n  if (isEmpty()) throw NoSuchElementException()\n  var maxValue = selector(this[0])\n  for (i
in 1..lastIndex) {\n    val v = selector(this[i])\n    maxValue = maxOf(maxValue, v)\n  }\n  return
maxValue\n}\n\n/**\n * Returns the largest value among all values produced by [selector] function\n * applied to
each character in the char sequence.\n * \n * @throws NoSuchElementException if the char sequence is empty.\n
*\n*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <R : Comparable<R>>
CharSequence.maxOf(selector: (Char) -> R): R {\n  if (isEmpty()) throw NoSuchElementException()\n  var
maxValue = selector(this[0])\n  for (i in 1..lastIndex) {\n    val v = selector(this[i])\n    if (maxValue < v) {\n
      maxValue = v\n    }\n  }\n  return maxValue\n}\n\n/**\n * Returns the largest value among all values
produced by [selector] function\n * applied to each character in the char sequence or `null` if there are no
characters.\n * \n * If any of values produced by [selector] function is `NaN`, the returned result is `NaN`.\n
*\n*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun CharSequence.maxOfOrNull(selector:
(Char) -> Double): Double? {\n  if (isEmpty()) return null\n  var maxValue = selector(this[0])\n  for (i in
1..lastIndex) {\n    val v = selector(this[i])\n    maxValue = maxOf(maxValue, v)\n  }\n  return
maxValue\n}\n\n/**\n * Returns the largest value among all values produced by [selector] function\n * applied to
each character in the char sequence or `null` if there are no characters.\n * \n * If any of values produced by
[selector] function is `NaN`, the returned result is `NaN`.\n
*\n*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun CharSequence.maxOfOrNull(selector:
(Char) -> Float): Float? {\n  if (isEmpty()) return null\n  var maxValue = selector(this[0])\n  for (i in
1..lastIndex) {\n    val v = selector(this[i])\n    maxValue = maxOf(maxValue, v)\n  }\n  return
maxValue\n}\n\n/**\n * Returns the largest value among all values produced by [selector] function\n * applied to
each character in the char sequence or `null` if there are no characters.\n
*\n*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <R : Comparable<R>>
CharSequence.maxOfOrNull(selector: (Char) -> R): R? {\n  if (isEmpty()) return null\n  var maxValue =
selector(this[0])\n  for (i in 1..lastIndex) {\n    val v = selector(this[i])\n    if (maxValue < v) {\n
      maxValue = v\n    }\n  }\n  return maxValue\n}\n\n/**\n * Returns the largest value according to the provided
[comparator]\n * among all values produced by [selector] function applied to each character in the char sequence.\n
*\n * \n * @throws NoSuchElementException if the char sequence is empty.\n
*\n*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <R> CharSequence.maxOfWith(comparator:
Comparator<in R>, selector: (Char) -> R): R {\n  if (isEmpty()) throw NoSuchElementException()\n  var
maxValue = selector(this[0])\n  for (i in 1..lastIndex) {\n    val v = selector(this[i])\n    if
(comparator.compare(maxValue, v) < 0) {\n      maxValue = v\n    }\n  }\n  return maxValue\n}\n\n/**\n * Returns the largest value according to the provided [comparator]\n * among all values produced by [selector]
function applied to each character in the char sequence or `null` if there are no characters.\n
*\n*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <R>

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CharSequence.maxOfWithOrNull(comparator: Comparator<in R>, selector: (Char) -> R): R? {\n  if (isEmpty())
return null\n  var max = selector(this[0])\n  for (i in 1..lastIndex) {\n    val v = selector(this[i])\n    if
(comparator.compare(max, v) < 0) {\n      max = v\n    }\n  }\n  return max\n}\n\nReturns the largest character or `null` if there are no characters.\n\n*/\n\n@SinceKotlin("1.4")\npublic fun
CharSequence.maxOrNull(): Char? {\n  if (isEmpty()) return null\n  var max = this[0]\n  for (i in 1..lastIndex)
{\n    val e = this[i]\n    if (max < e) max = e\n  }\n  return max\n}\n\n@Deprecated("Use maxWithOrNull
instead.", ReplaceWith("this.maxWithOrNull(comparator)"))\n@DeprecatedSinceKotlin(warningSince = "1.4",
errorSince = "1.5", hiddenSince = "1.6")\npublic fun CharSequence.maxWith(comparator: Comparator<in
Char>): Char? {\n  return maxWithOrNull(comparator)\n}\n\n*/\n\nReturns the first character having the largest
value according to the provided [comparator] or `null` if there are no characters.\n\n*/\n\n@SinceKotlin("1.4")\npublic fun CharSequence.maxWithOrNull(comparator: Comparator<in Char>): Char?
{\n  if (isEmpty()) return null\n  var max = this[0]\n  for (i in 1..lastIndex) {\n    val e = this[i]\n    if
(comparator.compare(max, e) < 0) max = e\n  }\n  return max\n}\n\n@Deprecated("Use minOrNull instead.",
ReplaceWith("this.minOrNull()"))\n@DeprecatedSinceKotlin(warningSince = "1.4", errorSince = "1.5",
hiddenSince = "1.6")\npublic fun CharSequence.min(): Char? {\n  return minOrNull()\n}\n\n@Deprecated("Use
minByOrNull instead.", ReplaceWith("this.minByOrNull(selector)"))\n@DeprecatedSinceKotlin(warningSince =
"1.4", errorSince = "1.5", hiddenSince = "1.6")\npublic inline fun <R : Comparable<R>>
CharSequence.minBy(selector: (Char) -> R): Char? {\n  return minByOrNull(selector)\n}\n\n*/\n\nReturns the
first character yielding the smallest value of the given function or `null` if there are no characters.\n\n*/\n\n@sample
collections.Collections.Aggregates.minByOrNull\n\n*/\n\n@SinceKotlin("1.4")\npublic inline fun <R :
Comparable<R>> CharSequence.minByOrNull(selector: (Char) -> R): Char? {\n  if (isEmpty()) return null\n  var
minElem = this[0]\n  val lastIndex = this.lastIndex\n  if (lastIndex == 0) return minElem\n  var minValue =
selector(minElem)\n  for (i in 1..lastIndex) {\n    val e = this[i]\n    val v = selector(e)\n    if (minValue > v)
{\n      minElem = e\n      minValue = v\n    }\n  }\n  return minElem\n}\n\n*/\n\nReturns the smallest
value among all values produced by [selector] function\n\n*/\n\n*/\n\nIf any of values produced by [selector] function is `NaN`, the returned result is `NaN`. \n\n*/\n\n*/\n\n@throws
NoSuchElementException if the char sequence is empty.\n\n*/\n\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun CharSequence.minOf(selector: (Char) ->
Double): Double {\n  if (isEmpty()) throw NoSuchElementException()\n  var min = selector(this[0])\n  for (i in
1..lastIndex) {\n    val v = selector(this[i])\n    min = minOf(min, v)\n  }\n  return
min\n}\n\n*/\n\nReturns the smallest value among all values produced by [selector] function\n\n*/\n\n*/\n\nIf any of values produced by [selector] function is `NaN`, the returned
result is `NaN`. \n\n*/\n\n*/\n\n@throws NoSuchElementException if the char sequence is empty.\n\n*/\n\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun CharSequence.minOf(selector: (Char) ->
Float): Float {\n  if (isEmpty()) throw NoSuchElementException()\n  var min = selector(this[0])\n  for (i in
1..lastIndex) {\n    val v = selector(this[i])\n    min = minOf(min, v)\n  }\n  return
min\n}\n\n*/\n\nReturns the smallest value among all values produced by [selector] function\n\n*/\n\n*/\n\nIf any of values produced by [selector] function is `NaN`, the returned
result is `NaN`. \n\n*/\n\n*/\n\n@throws NoSuchElementException if the char sequence is empty.\n\n*/\n\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <R : Comparable<R>>
CharSequence.minOf(selector: (Char) -> R): R {\n  if (isEmpty()) throw NoSuchElementException()\n  var
min = selector(this[0])\n  for (i in 1..lastIndex) {\n    val v = selector(this[i])\n    if (min > v) {\n
min = v\n    }\n  }\n  return min\n}\n\n*/\n\nReturns the smallest value among all values
produced by [selector] function\n\n*/\n\n*/\n\nIf any of values produced by [selector] function is `NaN`, the returned result is `NaN`. \n\n*/\n\n*/\n\n@throws NoSuchElementException if the char sequence is empty.\n\n*/\n\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution

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ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun CharSequence.minOrNull(selector:
(Char) -> Double): Double? {\n  if (isEmpty()) return null\n  var minValue = selector(this[0])\n  for (i in
1..lastIndex) {\n    val v = selector(this[i])\n    minValue = minOf(minValue, v)\n  }\n  return
minValue\n}\n\n/**\n * Returns the smallest value among all values produced by [selector] function\n * applied to
each character in the char sequence or `null` if there are no characters.\n * \n * If any of values produced by
[selector] function is `NaN`, the returned result is `NaN`.\n
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun CharSequence.minOrNull(selector:
(Char) -> Float): Float? {\n  if (isEmpty()) return null\n  var minValue = selector(this[0])\n  for (i in
1..lastIndex) {\n    val v = selector(this[i])\n    minValue = minOf(minValue, v)\n  }\n  return
minValue\n}\n\n/**\n * Returns the smallest value among all values produced by [selector] function\n * applied to
each character in the char sequence or `null` if there are no characters.\n
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <R : Comparable<R>>
CharSequence.minOrNull(selector: (Char) -> R): R? {\n  if (isEmpty()) return null\n  var minValue =
selector(this[0])\n  for (i in 1..lastIndex) {\n    val v = selector(this[i])\n    if (minValue > v) {\n
minValue = v\n    }\n  }\n  return minValue\n}\n\n/**\n * Returns the smallest value according to the provided
[comparator]\n * among all values produced by [selector] function applied to each character in the char sequence.\n
*\n * @throws NoSuchElementException if the char sequence is empty.\n
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <R> CharSequence.minOfWith(comparator:
Comparator<in R>, selector: (Char) -> R): R {\n  if (isEmpty()) throw NoSuchElementException()\n  var
minValue = selector(this[0])\n  for (i in 1..lastIndex) {\n    val v = selector(this[i])\n    if
(comparator.compare(minValue, v) > 0) {\n      minValue = v\n    }\n  }\n  return minValue\n}\n\n/**\n * Returns the smallest value according to the provided [comparator]\n * among all values produced by [selector]
function applied to each character in the char sequence or `null` if there are no characters.\n
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.internal.InlineOnly\npublic inline fun <R>
CharSequence.minOfWithOrNull(comparator: Comparator<in R>, selector: (Char) -> R): R? {\n  if (isEmpty())
return null\n  var minValue = selector(this[0])\n  for (i in 1..lastIndex) {\n    val v = selector(this[i])\n    if
(comparator.compare(minValue, v) > 0) {\n      minValue = v\n    }\n  }\n  return minValue\n}\n\n/**\n * Returns the smallest character or `null` if there are no characters.\n
*\n@SinceKotlin("1.4")\npublic fun
CharSequence.minOrNull(): Char? {\n  if (isEmpty()) return null\n  var min = this[0]\n  for (i in 1..lastIndex) {\n
val e = this[i]\n  if (min > e) min = e\n  }\n  return min\n}\n\n@Deprecated("Use minWithOrNull
instead.", ReplaceWith("this.minWithOrNull(comparator)"))\n@DeprecatedSinceKotlin(warningSince = "1.4",
errorSince = "1.5", hiddenSince = "1.6")\npublic fun CharSequence.minWith(comparator: Comparator<in
Char>): Char? {\n  return minWithOrNull(comparator)\n}\n\n/**\n * Returns the first character having the smallest
value according to the provided [comparator] or `null` if there are no characters.\n
*\n@SinceKotlin("1.4")\npublic fun CharSequence.minWithOrNull(comparator: Comparator<in Char>): Char?
{\n  if (isEmpty()) return null\n  var min = this[0]\n  for (i in 1..lastIndex) {\n    val e = this[i]\n    if
(comparator.compare(min, e) > 0) min = e\n  }\n  return min\n}\n\n/**\n * Returns `true` if the char sequence has
no characters.\n * \n * @sample samples.collections.Collections.Aggregates.none\n *\npublic fun
CharSequence.none(): Boolean {\n  return isEmpty()\n}\n\n/**\n * Returns `true` if no characters match the given
[predicate].\n * \n * @sample samples.collections.Collections.Aggregates.noneWithPredicate\n *\npublic inline fun
CharSequence.none(predicate: (Char) -> Boolean): Boolean {\n  for (element in this) if (predicate(element)) return
false\n  return true\n}\n\n/**\n * Performs the given [action] on each character and returns the char sequence itself
afterwards.\n *\n@SinceKotlin("1.1")\npublic inline fun <S : CharSequence> S.onEach(action: (Char) -> Unit): S
{\n  return apply { for (element in this) action(element) }\n}\n\n/**\n * Performs the given [action] on each

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character, providing sequential index with the character,\n * and returns the char sequence itself afterwards.\n *

@param [action] function that takes the index of a character and the character itself\n * and performs the action on the character.\n */\n@SinceKotlin("1.4")\npublic inline fun <S : CharSequence> S.onEachIndexed(action: (index: Int, Char) -> Unit): S {\n return apply { forEachIndexed(action) }\n}\n\n/**\n * Accumulates value starting with the first character and applying [operation] from left to right\n * to current accumulator value and each character.\n *\n * Throws an exception if this char sequence is empty. If the char sequence can be empty in an expected way,\n * please use [reduceOrNull] instead. It returns `null` when its receiver is empty.\n *\n * @param [operation] function that takes current accumulator value and a character,\n * and calculates the next accumulator value.\n *\n * @sample samples.collections.Collections.Aggregates.reduce\n */\n\npublic inline fun\nCharSequence.reduce(operation: (acc: Char, Char) -> Char): Char {\n if (isEmpty())\n throw\nUnsupportedOperationException("Empty char sequence can't be reduced.")\n var accumulator = this[0]\n for\n(index in 1..lastIndex) {\n accumulator = operation(accumulator, this[index])\n }\n return\naccumulator\n}\n\n/**\n * Accumulates value starting with the first character and applying [operation] from left to\n * right\n * to current accumulator value and each character with its index in the original char sequence.\n *\n * Throws an exception if this char sequence is empty. If the char sequence can be empty in an expected way,\n * please use [reduceIndexedOrNull] instead. It returns `null` when its receiver is empty.\n *\n * @param [operation]\n * function that takes the index of a character, current accumulator value and the character itself,\n * and calculates the\n * next accumulator value.\n *\n * @sample samples.collections.Collections.Aggregates.reduce\n */\n\npublic inline fun\nCharSequence.reduceIndexed(operation: (index: Int, acc: Char, Char) -> Char): Char {\n if (isEmpty())\n throw\nUnsupportedOperationException("Empty char sequence can't be reduced.")\n var accumulator = this[0]\n for\n(index in 1..lastIndex) {\n accumulator = operation(index, accumulator, this[index])\n }\n return\naccumulator\n}\n\n/**\n * Accumulates value starting with the first character and applying [operation] from left to\n * right\n * to current accumulator value and each character with its index in the original char sequence.\n *\n * Returns `null` if the char sequence is empty.\n *\n * @param [operation] function that takes the index of a\n * character, current accumulator value and the character itself,\n * and calculates the next accumulator value.\n *\n * @sample samples.collections.Collections.Aggregates.reduceOrNull\n */\n\n@SinceKotlin("1.4")\npublic inline fun\nCharSequence.reduceIndexedOrNull(operation: (index: Int, acc: Char, Char) -> Char): Char? {\n if (isEmpty())\n return null\n var accumulator = this[0]\n for\n(index in 1..lastIndex) {\n accumulator = operation(index,\naccumulator, this[index])\n }\n return accumulator\n}\n\n/**\n * Accumulates value starting with the first\n * character and applying [operation] from left to right\n * to current accumulator value and each character.\n *\n * Returns `null` if the char sequence is empty.\n *\n * @param [operation] function that takes current accumulator\n * value and a character,\n * and calculates the next accumulator value.\n *\n * @sample\n * samples.collections.Collections.Aggregates.reduceOrNull\n */\n\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\npublic inline fun\nCharSequence.reduceOrNull(operation: (acc: Char, Char) -> Char): Char? {\n if (isEmpty())\n return null\n var accumulator = this[0]\n for\n(index in 1..lastIndex) {\n accumulator = operation(accumulator, this[index])\n }\n return accumulator\n}\n\n/**\n * Accumulates value starting with the last character and applying [operation]\n * from right to left\n * to each character and current accumulator value.\n *\n * Throws an exception if this char\n * sequence is empty. If the char sequence can be empty in an expected way,\n * please use [reduceRightOrNull]\n * instead. It returns `null` when its receiver is empty.\n *\n * @param [operation] function that takes a character and\n * current accumulator value,\n * and calculates the next accumulator value.\n *\n * @sample\n * samples.collections.Collections.Aggregates.reduceRight\n */\n\npublic inline fun\nCharSequence.reduceRight(operation: (Char, acc: Char) -> Char): Char {\n var index = lastIndex\n if (index < 0)\n throw\nUnsupportedOperationException("Empty char sequence can't be reduced.")\n var accumulator = get(index--)\n while\n(index >= 0) {\n accumulator = operation(get(index--), accumulator)\n }\n return\naccumulator\n}\n\n/**\n * Accumulates value starting with the last character and applying [operation] from right to\n * left\n * to each character with its index in the original char sequence and current accumulator value.\n *\n * Throws\n * an exception if this char sequence is empty. If the char sequence can be empty in an expected way,\n * please use

[reduceRightIndexedOrNull] instead. It returns `null` when its receiver is empty.

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\n * \n * @param [operation]
function that takes the index of a character, the character itself and current accumulator value,\n * and calculates the
next accumulator value.\n * \n * @sample samples.collections.Collections.Aggregates.reduceRight\n *
\n * public
inline fun CharSequence.reduceRightIndexed(operation: (index: Int, Char, acc: Char) -> Char): Char {\n  var index
= lastIndex\n  if (index < 0) throw UnsupportedOperationException("Empty char sequence can't be reduced.")\n
\n  var accumulator = get(index--)\n  while (index >= 0) {\n    accumulator = operation(index, get(index),
accumulator)\n    --index\n  }\n  return accumulator\n}\n\n\n * Accumulates value starting with the last
character and applying [operation] from right to left\n * to each character with its index in the original char sequence
and current accumulator value.\n * \n * Returns `null` if the char sequence is empty.\n * \n * @param [operation]
function that takes the index of a character, the character itself and current accumulator value,\n * and calculates the
next accumulator value.\n * \n * @sample samples.collections.Collections.Aggregates.reduceRightOrNull\n
\n *
\n * @SinceKotlin("1.4")\n * public inline fun CharSequence.reduceRightIndexedOrNull(operation: (index: Int, Char,
acc: Char) -> Char): Char? {\n  var index = lastIndex\n  if (index < 0) return null\n  var accumulator = get(index-
-)\n  while (index >= 0) {\n    accumulator = operation(index, get(index), accumulator)\n    --index\n  }\n
\n  return accumulator\n}\n\n\n * Accumulates value starting with the last character and applying [operation] from
right to left\n * to each character and current accumulator value.\n * \n * Returns `null` if the char sequence is
empty.\n * \n * @param [operation] function that takes a character and current accumulator value,\n * and calculates
the next accumulator value.\n * \n * @sample samples.collections.Collections.Aggregates.reduceRightOrNull\n
\n *
\n * @SinceKotlin("1.4")\n * @WasExperimental(ExperimentalStdlibApi::class)\n * public inline fun
CharSequence.reduceRightOrNull(operation: (Char, acc: Char) -> Char): Char? {\n  var index = lastIndex\n  if
(index < 0) return null\n  var accumulator = get(index--)\n  while (index >= 0) {\n    accumulator =
operation(get(index--), accumulator)\n  }\n  return accumulator\n}\n\n\n * Returns a list containing successive
accumulation values generated by applying [operation] from left to right\n * to each character and current
accumulator value that starts with [initial] value.\n * \n * Note that `acc` value passed to [operation] function should
not be mutated;\n * otherwise it would affect the previous value in resulting list.\n * \n * @param [operation]
function that takes current accumulator value and a character, and calculates the next accumulator value.\n * \n *
\n * @sample samples.collections.Collections.Aggregates.runningFold\n *
\n * @SinceKotlin("1.4")\n * public inline fun
<R> CharSequence.runningFold(initial: R, operation: (acc: R, Char) -> R): List<R> {\n  if (isEmpty()) return
listOf(initial)\n  val result = ArrayList<R>(length + 1).apply { add(initial) }\n  var accumulator = initial\n  for
(element in this) {\n    accumulator = operation(accumulator, element)\n    result.add(accumulator)\n  }\n
\n  return result\n}\n\n\n * Returns a list containing successive accumulation values generated by applying
[operation] from left to right\n * to each character, its index in the original char sequence and current accumulator
value that starts with [initial] value.\n * \n * Note that `acc` value passed to [operation] function should not be
mutated;\n * otherwise it would affect the previous value in resulting list.\n * \n * @param [operation] function that
takes the index of a character, current accumulator value\n * and the character itself, and calculates the next
accumulator value.\n * \n * @sample samples.collections.Collections.Aggregates.runningFold\n
\n *
\n * @SinceKotlin("1.4")\n * public inline fun <R> CharSequence.runningFoldIndexed(initial: R, operation: (index:
Int, acc: R, Char) -> R): List<R> {\n  if (isEmpty()) return listOf(initial)\n  val result = ArrayList<R>(length +
1).apply { add(initial) }\n  var accumulator = initial\n  for (index in indices) {\n    accumulator =
operation(index, accumulator, this[index])\n    result.add(accumulator)\n  }\n  return result\n}\n\n\n *
Returns a list containing successive accumulation values generated by applying [operation] from left to right\n * to
each character and current accumulator value that starts with the first character of this char sequence.\n * \n * Note
that `acc` value passed to [operation] function should not be mutated;\n * otherwise it would affect the previous
value in resulting list.\n * \n * @param [operation] function that takes current accumulator value and a character,
and calculates the next accumulator value.\n * \n * @sample
samples.collections.Collections.Aggregates.runningReduce\n *
\n * @SinceKotlin("1.4")\n * public inline fun
CharSequence.runningReduce(operation: (acc: Char, Char) -> Char): List<Char> {\n  if (isEmpty()) return
emptyList()\n  var accumulator = this[0]\n  val result = ArrayList<Char>(length).apply { add(accumulator) }\n

```



```

ByLambdaReturnType\n@kotlin.jvm.JvmName("\sumOfLong")\n@kotlin.internal.InlineOnly\npublic inline fun
CharSequence.sumOf(selector: (Char) -> Long): Long {\n    var sum: Long = 0.toLong()\n    for (element in this) {\n
        sum += selector(element)\n    }\n    return sum\n}\n\n/**\n * Returns the sum of all values produced by
[selector] function applied to each character in the char sequence.\n
*\n@SinceKotlin("1.5")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.jvm.JvmName("\sumOfUInt")\n@WasExperimental(ExperimentalUnsignedType
s::class)\n@kotlin.internal.InlineOnly\npublic inline fun CharSequence.sumOf(selector: (Char) -> UInt): UInt {\n
var sum: UInt = 0.toUInt()\n    for (element in this) {\n        sum += selector(element)\n    }\n    return
sum\n}\n\n/**\n * Returns the sum of all values produced by [selector] function applied to each character in the char
sequence.\n
*\n@SinceKotlin("1.5")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@kotlin.jvm.JvmName("\sumOfULong")\n@WasExperimental(ExperimentalUnsignedTy
pes::class)\n@kotlin.internal.InlineOnly\npublic inline fun CharSequence.sumOf(selector: (Char) -> ULong):
ULong {\n    var sum: ULong = 0.toULong()\n    for (element in this) {\n        sum += selector(element)\n    }\n
return sum\n}\n\n/**\n * Splits this char sequence into a list of strings each not exceeding the given [size].\n * \n *
The last string in the resulting list may have fewer characters than the given [size].\n * \n * @param size the number
of elements to take in each string, must be positive and can be greater than the number of elements in this char
sequence.\n * \n * @sample samples.text.Strings.chunked\n *\n@SinceKotlin("1.2")\npublic fun
CharSequence.chunked(size: Int): List<String> {\n    return windowed(size, size, partialWindows =
true)\n}\n\n/**\n * Splits this char sequence into several char sequences each not exceeding the given [size]\n * and
applies the given [transform] function to an each.\n * \n * @return list of results of the [transform] applied to an
each char sequence.\n * \n * Note that the char sequence passed to the [transform] function is ephemeral and is valid
only inside that function.\n * You should not store it or allow it to escape in some way, unless you made a snapshot
of it.\n * The last char sequence may have fewer characters than the given [size].\n * \n * @param size the number
of elements to take in each char sequence, must be positive and can be greater than the number of elements in this
char sequence.\n * \n * @sample samples.text.Strings.chunkedTransform\n *\n@SinceKotlin("1.2")\npublic fun
<R> CharSequence.chunked(size: Int, transform: (CharSequence) -> R): List<R> {\n    return windowed(size, size,
partialWindows = true, transform = transform)\n}\n\n/**\n * Splits this char sequence into a sequence of strings
each not exceeding the given [size].\n * \n * The last string in the resulting sequence may have fewer characters than
the given [size].\n * \n * @param size the number of elements to take in each string, must be positive and can be
greater than the number of elements in this char sequence.\n * \n * @sample
samples.collections.Collections.Transformations.chunked\n *\n@SinceKotlin("1.2")\npublic fun
CharSequence.chunkedSequence(size: Int): Sequence<String> {\n    return chunkedSequence(size) { it.toString()
}\n}\n\n/**\n * Splits this char sequence into several char sequences each not exceeding the given [size]\n * and
applies the given [transform] function to an each.\n * \n * @return sequence of results of the [transform] applied to
an each char sequence.\n * \n * Note that the char sequence passed to the [transform] function is ephemeral and is
valid only inside that function.\n * You should not store it or allow it to escape in some way, unless you made a
snapshot of it.\n * The last char sequence may have fewer characters than the given [size].\n * \n * @param size the
number of elements to take in each char sequence, must be positive and can be greater than the number of elements
in this char sequence.\n * \n * @sample samples.text.Strings.chunkedTransformToSequence\n
*\n@SinceKotlin("1.2")\npublic fun <R> CharSequence.chunkedSequence(size: Int, transform: (CharSequence) -
> R): Sequence<R> {\n    return windowedSequence(size, size, partialWindows = true, transform =
transform)\n}\n\n/**\n * Splits the original char sequence into pair of char sequences,\n * where *first* char
sequence contains characters for which [predicate] yielded `true`,\n * while *second* char sequence contains
characters for which [predicate] yielded `false`.\n * \n * @sample samples.text.Strings.partition\n *\npublic inline
fun CharSequence.partition(predicate: (Char) -> Boolean): Pair<CharSequence, CharSequence> {\n    val first =
StringBuilder()\n    val second = StringBuilder()\n    for (element in this) {\n        if (predicate(element)) {\n
            first.append(element)\n        } else {\n            second.append(element)\n        }\n    }\n    return Pair(first,

```



```

second)\n}\n\n/**\n * Splits the original string into pair of strings,\n * where *first* string contains characters for
which [predicate] yielded `true`,\n * while *second* string contains characters for which [predicate] yielded
`false`.\n * \n * @sample samples.text.Strings.partition\n */\npublic inline fun String.partition(predicate: (Char) ->
Boolean): Pair<String, String> {\n    val first = StringBuilder()\n    val second = StringBuilder()\n    for (element in
this) {\n        if (predicate(element)) {\n            first.append(element)\n        } else {\n
second.append(element)\n        }\n    }\n    return Pair(first.toString(), second.toString())\n}\n\n/**\n * Returns a list
of snapshots of the window of the given [size]\n * sliding along this char sequence with the given [step], where
each\n * snapshot is a string.\n * \n * Several last strings may have fewer characters than the given [size].\n * \n *
Both [size] and [step] must be positive and can be greater than the number of elements in this char sequence.\n *
@param size the number of elements to take in each window\n * @param step the number of elements to move the
window forward by on an each step, by default 1\n * @param partialWindows controls whether or not to keep
partial windows in the end if any,\n * by default `false` which means partial windows won't be preserved\n * \n *
@sample samples.collections.Sequences.Transformations.takeWindows\n */\n@SinceKotlin("1.2")\npublic fun
CharSequence.windowed(size: Int, step: Int = 1, partialWindows: Boolean = false): List<String> {\n    return
windowed(size, step, partialWindows) { it.toString() }\n}\n\n/**\n * Returns a list of results of applying the given
[transform] function to\n * an each char sequence representing a view over the window of the given [size]\n *
sliding along this char sequence with the given [step].\n * \n * Note that the char sequence passed to the [transform]
function is ephemeral and is valid only inside that function.\n * You should not store it or allow it to escape in some
way, unless you made a snapshot of it.\n * Several last char sequences may have fewer characters than the given
[size].\n * \n * Both [size] and [step] must be positive and can be greater than the number of elements in this char
sequence.\n * @param size the number of elements to take in each window\n * @param step the number of
elements to move the window forward by on an each step, by default 1\n * @param partialWindows controls
whether or not to keep partial windows in the end if any,\n * by default `false` which means partial windows won't
be preserved\n * \n * @sample samples.collections.Sequences.Transformations.averageWindows\n
*/\n@SinceKotlin("1.2")\npublic fun <R> CharSequence.windowed(size: Int, step: Int = 1, partialWindows:
Boolean = false, transform: (CharSequence) -> R): List<R> {\n    checkWindowSizeStep(size, step)\n    val thisSize
= this.length\n    val resultCapacity = thisSize / step + if (thisSize % step == 0) 0 else 1\n    val result =
ArrayList<R>(resultCapacity)\n    var index = 0\n    while (index in 0 until thisSize) {\n        val end = index + size\n
val coercedEnd = if (end < 0 || end > thisSize) { if (partialWindows) thisSize else break } else end\n
result.add(transform(subSequence(index, coercedEnd)))\n        index += step\n    }\n    return result\n}\n\n/**\n *
Returns a sequence of snapshots of the window of the given [size]\n * sliding along this char sequence with the
given [step], where each\n * snapshot is a string.\n * \n * Several last strings may have fewer characters than the
given [size].\n * \n * Both [size] and [step] must be positive and can be greater than the number of elements in this
char sequence.\n * @param size the number of elements to take in each window\n * @param step the number of
elements to move the window forward by on an each step, by default 1\n * @param partialWindows controls
whether or not to keep partial windows in the end if any,\n * by default `false` which means partial windows won't
be preserved\n * \n * @sample samples.collections.Sequences.Transformations.takeWindows\n
*/\n@SinceKotlin("1.2")\npublic fun CharSequence.windowedSequence(size: Int, step: Int = 1, partialWindows:
Boolean = false): Sequence<String> {\n    return windowedSequence(size, step, partialWindows) { it.toString()
}\n}\n\n/**\n * Returns a sequence of results of applying the given [transform] function to\n * an each char
sequence representing a view over the window of the given [size]\n * sliding along this char sequence with the given
[step].\n * \n * Note that the char sequence passed to the [transform] function is ephemeral and is valid only inside
that function.\n * You should not store it or allow it to escape in some way, unless you made a snapshot of it.\n *
Several last char sequences may have fewer characters than the given [size].\n * \n * Both [size] and [step] must be
positive and can be greater than the number of elements in this char sequence.\n * @param size the number of
elements to take in each window\n * @param step the number of elements to move the window forward by on an
each step, by default 1\n * @param partialWindows controls whether or not to keep partial windows in the end if
any,\n * by default `false` which means partial windows won't be preserved\n * \n * @sample

```


String.lowercase(): String\n\n/**\n * Returns a copy of this string having its first letter titlecased using the rules of the default locale,\n * or the original string if it's empty or already starts with a title case letter.\n *\n * The title case of a character is usually the same as its upper case with several exceptions.\n * The particular list of characters with the special title case form depends on the underlying platform.\n *\n * @sample samples.text.Strings.capitalize\n *\n * @Deprecated("Use replaceFirstChar instead.", ReplaceWith("replaceFirstChar { if (it.isLowerCase()) it.titlecase() else it.toString() }"))\n * @DeprecatedSinceKotlin(warningSince = "1.5")\n * public expect fun

String.capitalize(): String\n\n/**\n * Returns a copy of this string having its first letter lowercased using the rules of the default locale,\n * or the original string if it's empty or already starts with a lower case letter.\n *\n * @sample samples.text.Strings.decapitalize\n *\n * @Deprecated("Use replaceFirstChar instead.", ReplaceWith("replaceFirstChar { it.lowercase() }"))\n * @DeprecatedSinceKotlin(warningSince = "1.5")\n * public expect fun

String.decapitalize(): String\n\n/**\n * Returns a sub sequence of this char sequence having leading and trailing characters matching the [predicate] removed.\n *\n * public inline fun CharSequence.trim(predicate: (Char) -> Boolean): CharSequence {\n var startIndex = 0\n var endIndex = length - 1\n var startFound = false\n\n while (startIndex <= endIndex) {\n val index = if (!startFound) startIndex else endIndex\n val match = predicate(this[index])\n if (!startFound) {\n if (!match)\n startFound = true\n else\n startIndex += 1\n } else {\n if (!match)\n break\n else\n endIndex -= 1\n }\n }\n\n return subSequence(startIndex, endIndex + 1)\n}\n\n/**\n * Returns a string having leading and trailing characters matching the [predicate] removed.\n *\n * public inline fun String.trim(predicate: (Char) -> Boolean): String =\n (this as CharSequence).trim(predicate).toString()\n\n/**\n * Returns a sub sequence of this char sequence having leading characters matching the [predicate] removed.\n *\n * public inline fun CharSequence.trimStart(predicate: (Char) -> Boolean): CharSequence {\n for (index in this.indices)\n if (!predicate(this[index]))\n return subSequence(index, length)\n\n return ""\n}\n\n/**\n * Returns a string having leading characters matching the [predicate] removed.\n *\n * public inline fun String.trimStart(predicate: (Char) -> Boolean): String =\n (this as CharSequence).trimStart(predicate).toString()\n\n/**\n * Returns a sub sequence of this char sequence having trailing characters matching the [predicate] removed.\n *\n * public inline fun CharSequence.trimEnd(predicate: (Char) -> Boolean): CharSequence {\n for (index in this.indices.reversed())\n if (!predicate(this[index]))\n return subSequence(0, index + 1)\n\n return ""\n}\n\n/**\n * Returns a string having trailing characters matching the [predicate] removed.\n *\n * public inline fun String.trimEnd(predicate: (Char) -> Boolean): String =\n (this as CharSequence).trimEnd(predicate).toString()\n\n/**\n * Returns a sub sequence of this char sequence having leading and trailing characters from the [chars] array removed.\n *\n * public fun CharSequence.trim(vararg chars: Char): CharSequence = trim { it in chars }\n\n/**\n * Returns a string having leading and trailing characters from the [chars] array removed.\n *\n * public fun String.trim(vararg chars: Char): String = trim { it in chars }\n\n/**\n * Returns a sub sequence of this char sequence having leading characters from the [chars] array removed.\n *\n * public fun CharSequence.trimStart(vararg chars: Char): CharSequence = trimStart { it in chars }\n\n/**\n * Returns a string having leading characters from the [chars] array removed.\n *\n * public fun String.trimStart(vararg chars: Char): String = trimStart { it in chars }\n\n/**\n * Returns a sub sequence of this char sequence having trailing characters from the [chars] array removed.\n *\n * public fun CharSequence.trimEnd(vararg chars: Char): CharSequence = trimEnd { it in chars }\n\n/**\n * Returns a string having trailing characters from the [chars] array removed.\n *\n * public fun String.trimEnd(vararg chars: Char): String = trimEnd { it in chars }\n\n/**\n * Returns a sub sequence of this char sequence having leading and trailing whitespace removed.\n *\n * public fun CharSequence.trim(): CharSequence = trim(Char::isWhitespace)\n\n/**\n * Returns a string having leading and trailing whitespace removed.\n *\n * @kotlin.internal.InlineOnly\n * public inline fun String.trim(): String = (this as CharSequence).trim().toString()\n\n/**\n * Returns a sub sequence of this char sequence having leading whitespace removed.\n *\n * public fun CharSequence.trimStart(): CharSequence = trimStart(Char::isWhitespace)\n\n/**\n * Returns a string having leading whitespace removed.\n *\n * @kotlin.internal.InlineOnly\n * public inline fun String.trimStart(): String = (this as CharSequence).trimStart().toString()\n\n/**\n * Returns a sub sequence of this char sequence having trailing whitespace removed.\n *\n * public fun CharSequence.trimEnd(): CharSequence = trimEnd(Char::isWhitespace)\n\n/**\n * Returns a string having trailing whitespace removed.\n

```

*  

@kotlin.internal.InlineOnly  

public inline fun String.trimEnd(): String = (this as  

CharSequence).trimEnd().toString()  

  

* Returns a char sequence with content of this char sequence padded at  

the beginning  

* to the specified [length] with the specified character or space.  

* @param length the desired  

string length.  

* @param padChar the character to pad string with, if it has length less than the [length] specified.  

Space is used by default.  

* @return Returns a char sequence of length at least [length] consisting of `this` char  

sequence prepended with [padChar] as many times  

* as are necessary to reach that length.  

* @sample  

samples.text.Strings.padStart  

  

@kotlin.internal.InlineOnly  

public fun CharSequence.padStart(length: Int, padChar: Char = ' '):  

CharSequence {  

    if (length < 0) throw IllegalArgumentException("Desired length $length is less than  

zero.")  

    if (length <= this.length) return this.subSequence(0, this.length)  

    val sb =  

StringBuilder(length)  

    for (i in 1..(length - this.length)) sb.append(padChar)  

    sb.append(this)  

    return  

sb  

}  

  

* Pads the string to the specified [length] at the beginning with the specified character or space.  

* @param length the desired string length.  

* @param padChar the character to pad string with, if it has length less  

than the [length] specified. Space is used by default.  

* @return Returns a string of length at least [length]  

consisting of `this` string prepended with [padChar] as many times  

* as are necessary to reach that length.  

* @sample  

samples.text.Strings.padStart  

  

@kotlin.internal.InlineOnly  

public fun String.padStart(length: Int, padChar: Char = ' '): String =  

(this as CharSequence).padStart(length, padChar).toString()  

  

* Returns a char sequence with content of this  

char sequence padded at the end  

* to the specified [length] with the specified character or space.  

* @param  

length the desired string length.  

* @param padChar the character to pad string with, if it has length less than the  

[length] specified. Space is used by default.  

* @return Returns a char sequence of length at least [length]  

consisting of `this` char sequence appended with [padChar] as many times  

* as are necessary to reach that  

length.  

* @sample  

samples.text.Strings.padEnd  

  

@kotlin.internal.InlineOnly  

public fun CharSequence.padEnd(length: Int, padChar: Char  

= ' '): CharSequence {  

    if (length < 0) throw IllegalArgumentException("Desired length $length is less  

than zero.")  

    if (length <= this.length) return this.subSequence(0, this.length)  

    val sb =  

StringBuilder(length)  

    sb.append(this)  

    for (i in 1..(length - this.length)) sb.append(padChar)  

    return  

sb  

}  

  

* Pads the string to the specified [length] at the end with the specified character or space.  

* @param  

length the desired string length.  

* @param padChar the character to pad string with, if it has length less  

than the [length] specified. Space is used by default.  

* @return Returns a string of length at least [length]  

consisting of `this` string appended with [padChar] as many times  

* as are necessary to reach that length.  

* @sample  

samples.text.Strings.padEnd  

  

@kotlin.internal.InlineOnly  

public fun String.padEnd(length: Int, padChar: Char = ' '): String =  

(this as CharSequence).padEnd(length, padChar).toString()  

  

* Returns `true` if this nullable char sequence is  

either `null` or empty.  

* @sample  

samples.text.Strings.stringOrNullEmpty  

  

@kotlin.internal.InlineOnly  

public inline fun CharSequence?.isNullOrEmpty(): Boolean {  

    contract {  

        returns(false) implies (this@isNullOrEmpty != null)  

    }  

    return this == null || this.length == 0  

}  

  

* Returns `true` if this char sequence is empty (contains no characters).  

* @sample  

samples.text.Strings.stringIsEmpty  

  

@kotlin.internal.InlineOnly  

public inline fun CharSequence.isEmpty():  

Boolean = length == 0  

  

* Returns `true` if this char sequence is not empty.  

* @sample  

samples.text.Strings.stringIsNotEmpty  

  

@kotlin.internal.InlineOnly  

public inline fun  

CharSequence.isNotEmpty(): Boolean = length > 0  

// implemented differently in JVM and JS  

  

public fun  

String.isBlank(): Boolean = length() == 0 || all { it.isWhitespace() }  

  

* Returns `true` if this char sequence  

is not empty and contains some characters except of whitespace characters.  

* @sample  

samples.text.Strings.stringIsNotBlank  

  

@kotlin.internal.InlineOnly  

public inline fun  

CharSequence.isNotBlank(): Boolean = !isBlank()  

  

* Returns `true` if this nullable char sequence is either  

`null` or empty or consists solely of whitespace characters.  

* @sample  

samples.text.Strings.stringOrNullBlank  

  

@kotlin.internal.InlineOnly  

public inline fun  

CharSequence?.isNullOrBlank(): Boolean {  

    contract {  

        returns(false) implies (this@isNullOrBlank !=  

null)  

    }  

    return this == null || this.isBlank()  

}  

  

* Iterator for characters of the given char sequence.  

  

@kotlin.internal.InlineOnly  

public operator fun CharSequence.iterator(): CharIterator = object : CharIterator() {  

    private var index = 0  

    public override fun nextChar(): Char = get(index++)  

    public override fun hasNext(): Boolean = index <

```

```

length\n}\n\n/** Returns the string if it is not `null`, or the empty string otherwise.
*\n\n@kotlin.internal.InlineOnly\npublic inline fun String?.orEmpty(): String = this ?: ""\n\n/** Returns this
char sequence if it's not empty\n * or the result of calling [defaultValue] function if the char sequence is empty.\n
*\n * @sample samples.text.Strings.stringIfEmpty\n
*\n\n@SinceKotlin("1.3")\n@kotlin.internal.InlineOnly\npublic inline fun <C, R> C.ifEmpty(defaultValue: () ->
R): R where C : CharSequence, C : R =\n    if (isEmpty()) defaultValue() else this\n\n/** Returns this char
sequence if it is not empty and doesn't consist solely of whitespace characters,\n * or the result of calling
[defaultValue] function otherwise.\n * \n * @sample samples.text.Strings.stringIfBlank\n
*\n\n@SinceKotlin("1.3")\n@kotlin.internal.InlineOnly\npublic inline fun <C, R> C.ifBlank(defaultValue: () -> R):
R where C : CharSequence, C : R =\n    if (isBlank()) defaultValue() else this\n\n\n/** Returns the range of valid
character indices for this char sequence.\n * \n\npublic val CharSequence.indices: IntRange\n    get() = 0..length -
1\n\n/** Returns the index of the last character in the char sequence or -1 if it is empty.\n * \n\npublic val
CharSequence.lastIndex: Int\n    get() = this.length - 1\n\n/** Returns `true` if this CharSequence has Unicode
surrogate pair at the specified [index].\n * \n\npublic fun CharSequence.hasSurrogatePairAt(index: Int): Boolean {\n
return index in 0..length - 2\n    && this[index].isHighSurrogate()\n    && this[index +
1].isLowSurrogate()\n}\n\n\n/** Returns a substring specified by the given [range] of indices.\n * \n\npublic fun
String.substring(range: IntRange): String = substring(range.start, range.endInclusive + 1)\n\n\n/** Returns a
subsequence of this char sequence specified by the given [range] of indices.\n * \n\npublic fun
CharSequence.subSequence(range: IntRange): CharSequence = subSequence(range.start, range.endInclusive +
1)\n\n\n/** Returns a subsequence of this char sequence.\n * \n * This extension is chosen only for invocation with
old-named parameters.\n * Replace parameter names with the same as those of [CharSequence.subSequence].\n
*\n\n@kotlin.internal.InlineOnly\n@Suppress("EXTENSION_SHADOWED_BY_MEMBER") // false
warning\n@Deprecated("Use parameters named startIndex and endIndex.", ReplaceWith("subSequence(startIndex
= start, endIndex = end)"))\npublic inline fun String.subSequence(start: Int, end: Int): CharSequence =
subSequence(start, end)\n\n\n/** Returns a substring of chars from a range of this char sequence starting at the
[startIndex] and ending right before the [endIndex].\n * \n * @param startIndex the start index (inclusive).\n *
@param endIndex the end index (exclusive). If not specified, the length of the char sequence is used.\n
*\n\n@kotlin.internal.InlineOnly\npublic inline fun CharSequence.substring(startIndex: Int, endIndex: Int = length):
String = subSequence(startIndex, endIndex).toString()\n\n\n/** Returns a substring of chars at indices from the
specified [range] of this char sequence.\n * \n\npublic fun CharSequence.substring(range: IntRange): String =
subSequence(range.start, range.endInclusive + 1).toString()\n\n\n/** Returns a substring before the first
occurrence of [delimiter].\n * If the string does not contain the delimiter, returns [missingDelimiterValue] which
defaults to the original string.\n * \n\npublic fun String.substringBefore(delimiter: Char, missingDelimiterValue:
String = this): String {\n    val index = indexOf(delimiter)\n    return if (index == -1) missingDelimiterValue else
substring(0, index)\n}\n\n\n/** Returns a substring before the first occurrence of [delimiter].\n * If the string does
not contain the delimiter, returns [missingDelimiterValue] which defaults to the original string.\n * \n\npublic fun
String.substringBefore(delimiter: String, missingDelimiterValue: String = this): String {\n    val index =
indexOf(delimiter)\n    return if (index == -1) missingDelimiterValue else substring(0, index)\n}\n\n\n/** Returns
a substring after the first occurrence of [delimiter].\n * If the string does not contain the delimiter, returns
[missingDelimiterValue] which defaults to the original string.\n * \n\npublic fun String.substringAfter(delimiter:
Char, missingDelimiterValue: String = this): String {\n    val index = indexOf(delimiter)\n    return if (index == -1)
missingDelimiterValue else substring(index + 1, length)\n}\n\n\n/** Returns a substring after the first occurrence
of [delimiter].\n * If the string does not contain the delimiter, returns [missingDelimiterValue] which defaults to the
original string.\n * \n\npublic fun String.substringAfter(delimiter: String, missingDelimiterValue: String = this):
String {\n    val index = indexOf(delimiter)\n    return if (index == -1) missingDelimiterValue else substring(index +
delimiter.length, length)\n}\n\n\n/** Returns a substring before the last occurrence of [delimiter].\n * If the string
does not contain the delimiter, returns [missingDelimiterValue] which defaults to the original string.\n * \n\npublic
fun String.substringBeforeLast(delimiter: Char, missingDelimiterValue: String = this): String {\n    val index =

```

```

lastIndexOf(delimiter)\n    return if (index == -1) missingDelimiterValue else substring(0, index)\n}\n\n/**\n *
Returns a substring before the last occurrence of [delimiter].\n * If the string does not contain the delimiter, returns
[missingDelimiterValue] which defaults to the original string.\n */\npublic fun String.substringBeforeLast(delimiter:
String, missingDelimiterValue: String = this): String {\n    val index = lastIndexOf(delimiter)\n    return if (index ==
-1) missingDelimiterValue else substring(0, index)\n}\n\n/**\n * Returns a substring after the last occurrence of
[delimiter].\n * If the string does not contain the delimiter, returns [missingDelimiterValue] which defaults to the
original string.\n */\npublic fun String.substringAfterLast(delimiter: Char, missingDelimiterValue: String = this):
String {\n    val index = lastIndexOf(delimiter)\n    return if (index == -1) missingDelimiterValue else
substring(index + 1, length)\n}\n\n/**\n * Returns a substring after the last occurrence of [delimiter].\n * If the
string does not contain the delimiter, returns [missingDelimiterValue] which defaults to the original string.\n */\n
public fun String.substringAfterLast(delimiter: String, missingDelimiterValue: String = this): String {\n    val
index = lastIndexOf(delimiter)\n    return if (index == -1) missingDelimiterValue else substring(index +
delimiter.length, length)\n}\n\n/**\n * Returns a char sequence with content of this char sequence where its part at
the given range\n * is replaced with the [replacement] char sequence.\n * @param startIndex the index of the first
character to be replaced.\n * @param endIndex the index of the first character after the replacement to keep in the
string.\n */\npublic fun CharSequence.replaceRange(startIndex: Int, endIndex: Int, replacement: CharSequence):
CharSequence {\n    if (endIndex < startIndex)\n        throw IndexOutOfBoundsException("\u201cEnd index ($endIndex)
is less than start index ($startIndex).\u201c")\n    val sb = StringBuilder()\n    sb.appendRange(this, 0, startIndex)\n
sb.append(replacement)\n    sb.appendRange(this, endIndex, length)\n    return sb\n}\n\n/**\n * Replaces the part of
the string at the given range with the [replacement] char sequence.\n * @param startIndex the index of the first
character to be replaced.\n * @param endIndex the index of the first character after the replacement to keep in the
string.\n */\n@kotlin.internal.InlineOnly\npublic inline fun String.replaceRange(startIndex: Int, endIndex: Int,
replacement: CharSequence): String =\n    (this as CharSequence).replaceRange(startIndex, endIndex,
replacement).toString()\n\n/**\n * Returns a char sequence with content of this char sequence where its part at the
given [range]\n * is replaced with the [replacement] char sequence.\n * \n * The end index of the [range] is included
in the part to be replaced.\n */\npublic fun CharSequence.replaceRange(range: IntRange, replacement:
CharSequence): CharSequence =\n    replaceRange(range.start, range.endInclusive + 1, replacement)\n\n/**\n * Replace
the part of string at the given [range] with the [replacement] string.\n * \n * The end index of the [range] is
included in the part to be replaced.\n */\n@kotlin.internal.InlineOnly\npublic inline fun String.replaceRange(range:
IntRange, replacement: CharSequence): String =\n    (this as CharSequence).replaceRange(range,
replacement).toString()\n\n/**\n * Returns a char sequence with content of this char sequence where its part at the
given range is removed.\n * \n * @param startIndex the index of the first character to be removed.\n * @param
endIndex the index of the first character after the removed part to keep in the string.\n * [endIndex] is not
included in the removed part.\n */\npublic fun CharSequence.removeRange(startIndex: Int, endIndex: Int):
CharSequence {\n    if (endIndex < startIndex)\n        throw IndexOutOfBoundsException("\u201cEnd index ($endIndex)
is less than start index ($startIndex).\u201c")\n    if (endIndex == startIndex)\n        return this.subSequence(0,
length)\n    val sb = StringBuilder(length - (endIndex - startIndex))\n    sb.appendRange(this, 0, startIndex)\n
sb.appendRange(this, endIndex, length)\n    return sb\n}\n\n/**\n * Removes the part of a string at a given range.\n *
@param startIndex the index of the first character to be removed.\n * @param endIndex the index of the first
character after the removed part to keep in the string.\n * [endIndex] is not included in the removed part.\n */\n
@kotlin.internal.InlineOnly\npublic inline fun String.removeRange(startIndex: Int, endIndex: Int): String =\n    (this
as CharSequence).removeRange(startIndex, endIndex).toString()\n\n/**\n * Returns a char sequence with
content of this char sequence where its part at the given [range] is removed.\n * \n * The end index of the [range]
is included in the removed part.\n */\npublic fun CharSequence.removeRange(range: IntRange): CharSequence =
removeRange(range.start, range.endInclusive + 1)\n\n/**\n * Removes the part of a string at the given [range].\n * \n
* The end index of the [range] is included in the removed part.\n */\n@kotlin.internal.InlineOnly\npublic inline fun
String.removeRange(range: IntRange): String =\n    (this as CharSequence).removeRange(range).toString()\n\n/**\n * If
this char sequence starts with the given [prefix], returns a new char sequence\n * with the prefix removed.

```

Otherwise, returns a new char sequence with the same characters.

```

public fun CharSequence.removePrefix(prefix: CharSequence): CharSequence {
    if (startsWith(prefix)) {
        return subSequence(prefix.length, length)
    }
    return subSequence(0, length)
}

```

If this string starts with the given [prefix], returns a copy of this string with the prefix removed. Otherwise, returns this string.

```

public fun String.removePrefix(prefix: CharSequence): String {
    if (startsWith(prefix)) {
        return substring(prefix.length)
    }
    return this
}

```

If this char sequence ends with the given [suffix], returns a new char sequence with the suffix removed. Otherwise, returns a new char sequence with the same characters.

```

public fun CharSequence.removeSuffix(suffix: CharSequence): CharSequence {
    if (endsWith(suffix)) {
        return subSequence(0, length - suffix.length)
    }
    return subSequence(0, length)
}

```

If this string ends with the given [suffix], returns a copy of this string with the suffix removed. Otherwise, returns this string.

```

public fun String.removeSuffix(suffix: CharSequence): String {
    if (endsWith(suffix)) {
        return substring(0, length - suffix.length)
    }
    return this
}

```

When this char sequence starts with the given [prefix] and ends with the given [suffix], returns a new char sequence having both the given [prefix] and [suffix] removed. Otherwise returns a new char sequence with the same characters.

```

public fun CharSequence.removeSurrounding(prefix: CharSequence, suffix: CharSequence): CharSequence {
    if ((length >= prefix.length + suffix.length) && startsWith(prefix) && endsWith(suffix)) {
        return subSequence(prefix.length, length - suffix.length)
    }
    return subSequence(0, length)
}

```

Removes from a string both the given [prefix] and [suffix] if and only if it starts with the [prefix] and ends with the [suffix]. Otherwise returns this string unchanged.

```

public fun String.removeSurrounding(prefix: CharSequence, suffix: CharSequence): String {
    if ((length >= prefix.length + suffix.length) && startsWith(prefix) && endsWith(suffix)) {
        return substring(prefix.length, length - suffix.length)
    }
    return this
}

```

When this char sequence starts with and ends with the given [delimiter], returns a new char sequence having this [delimiter] removed both from the start and end. Otherwise returns a new char sequence with the same characters.

```

public fun CharSequence.removeSurrounding(delimiter: CharSequence): CharSequence =
    removeSurrounding(delimiter, delimiter)

```

Removes the given [delimiter] string from both the start and the end of this string if and only if it starts with and ends with the [delimiter]. Otherwise returns this string unchanged.

```

public fun String.removeSurrounding(delimiter: CharSequence): String =
    removeSurrounding(delimiter, delimiter)

```

Replace part of string before the first occurrence of given delimiter with the [replacement] string. If the string does not contain the delimiter, returns [missingDelimiterValue] which defaults to the original string.

```

public fun String.replaceBefore(delimiter: Char, replacement: String, missingDelimiterValue: String = this): String {
    val index = indexOf(delimiter)
    return if (index == -1) missingDelimiterValue else replaceRange(0, index, replacement)
}

```

Replace part of string before the first occurrence of given delimiter with the [replacement] string. If the string does not contain the delimiter, returns [missingDelimiterValue] which defaults to the original string.

```

public fun String.replaceBefore(delimiter: String, replacement: String, missingDelimiterValue: String = this): String {
    val index = indexOf(delimiter)
    return if (index == -1) missingDelimiterValue else replaceRange(0, index, replacement)
}

```

Replace part of string after the first occurrence of given delimiter with the [replacement] string. If the string does not contain the delimiter, returns [missingDelimiterValue] which defaults to the original string.

```

public fun String.replaceAfter(delimiter: Char, replacement: String, missingDelimiterValue: String = this): String {
    val index = indexOf(delimiter)
    return if (index == -1) missingDelimiterValue else replaceRange(index + 1, length, replacement)
}

```

Replace part of string after the first occurrence of given delimiter with the [replacement] string. If the string does not contain the delimiter, returns [missingDelimiterValue] which defaults to the original string.

```

public fun String.replaceAfter(delimiter: String, replacement: String, missingDelimiterValue: String = this): String {
    val index = indexOf(delimiter)
    return if (index == -1) missingDelimiterValue else replaceRange(index + delimiter.length, length, replacement)
}

```

Replace part of string after the last occurrence of given delimiter with the [replacement] string. If the string does not contain the delimiter, returns [missingDelimiterValue] which defaults to the original string.

```

public fun String.replaceAfterLast(delimiter: String, replacement: String, missingDelimiterValue: String = this): String {

```

```

val index = lastIndexOf(delimiter)\n    return if (index == -1) missingDelimiterValue else replaceRange(index +
delimiter.length, length, replacement)\n}\n\n/**\n * Replace part of string after the last occurrence of given
delimiter with the [replacement] string.\n * If the string does not contain the delimiter, returns
[missingDelimiterValue] which defaults to the original string.\n */\npublic fun String.replaceAfterLast(delimiter:
Char, replacement: String, missingDelimiterValue: String = this): String {\n    val index = lastIndexOf(delimiter)\n
return if (index == -1) missingDelimiterValue else replaceRange(index + 1, length, replacement)\n}\n\n/**\n *
Replace part of string before the last occurrence of given delimiter with the [replacement] string.\n * If the string
does not contain the delimiter, returns [missingDelimiterValue] which defaults to the original string.\n */\npublic
fun String.replaceBeforeLast(delimiter: Char, replacement: String, missingDelimiterValue: String = this): String {\n
    val index = lastIndexOf(delimiter)\n    return if (index == -1) missingDelimiterValue else replaceRange(0, index,
replacement)\n}\n\n/**\n * Replace part of string before the last occurrence of given delimiter with the
[replacement] string.\n * If the string does not contain the delimiter, returns [missingDelimiterValue] which defaults
to the original string.\n */\npublic fun String.replaceBeforeLast(delimiter: String, replacement: String,
missingDelimiterValue: String = this): String {\n    val index = lastIndexOf(delimiter)\n    return if (index == -1)
missingDelimiterValue else replaceRange(0, index, replacement)\n}\n\n// public fun String.replace(oldChar: Char,
newChar: Char, ignoreCase: Boolean): String // JVM- and JS-specific\n// public fun String.replace(oldValue: String,
newValue: String, ignoreCase: Boolean): String // JVM- and JS-specific\n\n/**\n * Returns a new string obtained by
replacing each substring of this char sequence that matches the given regular expression\n * with the given
[replacement].\n * The [replacement] can consist of any combination of literal text and $-substitutions. To treat
the replacement string\n * literally escape it with the [kotlin.text.Regex.Companion.escapeReplacement] method.\n
*/\n\n@kotlin.internal.InlineOnly\npublic inline fun CharSequence.replace(regex: Regex, replacement: String): String
= regex.replace(this, replacement)\n\n/**\n * Returns a new string obtained by replacing each substring of this char
sequence that matches the given regular expression\n * with the result of the given function [transform] that takes
[MatchResult] and returns a string to be used as a\n * replacement for that match.\n
*/\n\n@kotlin.internal.InlineOnly\npublic inline fun CharSequence.replace(regex: Regex, noinline transform:
(MatchResult) -> CharSequence): String =\n    regex.replace(this, transform)\n\n/**\n * Replaces the first
occurrence of the given regular expression [regex] in this char sequence with specified [replacement] expression.\n
*/\n * @param replacement A replacement expression that can include substitutions. See [Regex.replaceFirst] for
details.\n */\n\n@kotlin.internal.InlineOnly\npublic inline fun CharSequence.replaceFirst(regex: Regex, replacement:
String): String = regex.replaceFirst(this, replacement)\n\n/**\n * Returns a copy of this string having its first
character replaced with the result of the specified [transform],\n * or the original string if it's empty.\n */\n * @param
transform function that takes the first character and returns the result of the transform applied to the character.\n
*/\n * @sample samples.text.Strings.replaceFirstChar\n
*/\n\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalStdlibApi::class)\n@OptIn(kotlin.experimental.Exper
imentalTypeInference::class)\n@OverloadResolutionByLambdaReturnType\n@JvmName("replaceFirstCharWithC
har")\n\n@kotlin.internal.InlineOnly\npublic inline fun String.replaceFirstChar(transform: (Char) -> Char): String {\n
    return if (isEmpty()) transform(this[0]) + substring(1) else this\n}\n\n/**\n * Returns a copy of this string
having its first character replaced with the result of the specified [transform],\n * or the original string if it's empty.\n
*/\n * @param transform function that takes the first character and returns the result of the transform applied to the
character.\n */\n * @sample samples.text.Strings.replaceFirstChar\n
*/\n\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalStdlibApi::class)\n@OptIn(kotlin.experimental.Exper
imentalTypeInference::class)\n@OverloadResolutionByLambdaReturnType\n@JvmName("replaceFirstCharWithC
harSequence")\n\n@kotlin.internal.InlineOnly\npublic inline fun String.replaceFirstChar(transform: (Char) ->
CharSequence): String {\n    return if (isEmpty()) transform(this[0]).toString() + substring(1) else
this\n}\n\n/**\n * Returns `true` if this char sequence matches the given regular expression.\n
*/\n\n@kotlin.internal.InlineOnly\npublic inline infix fun CharSequence.matches(regex: Regex): Boolean =
regex.matches(this)\n\n/**\n * Implementation of [regionMatches] for CharSequences.\n * Invoked when it's
already known that arguments are not Strings, so that no additional type checks are performed.\n */\n\ninternal fun

```



```

CharSequence.regionMatchesImpl(thisOffset: Int, other: CharSequence, otherOffset: Int, length: Int, ignoreCase: Boolean): Boolean {\n  if ((otherOffset < 0) || (thisOffset < 0) || (thisOffset > this.length - length) || (otherOffset > other.length - length)) {\n    return false\n  }\n  for (index in 0 until length) {\n    if (!this[thisOffset + index].equals(other[otherOffset + index], ignoreCase))\n      return false\n  }\n  return true\n}\n\n/**\n * Returns `true` if this char sequence starts with the specified character.\n */\npublic fun\nCharSequence.startsWith(char: Char, ignoreCase: Boolean = false): Boolean =\n  this.length > 0 &&\n  this[0].equals(char, ignoreCase)\n\n/**\n * Returns `true` if this char sequence ends with the specified character.\n */\npublic fun\nCharSequence.endsWith(char: Char, ignoreCase: Boolean = false): Boolean =\n  this.length > 0 &&\n  this[lastIndex].equals(char, ignoreCase)\n\n/**\n * Returns `true` if this char sequence starts with the specified prefix.\n */\npublic fun\nCharSequence.startsWith(prefix: CharSequence, ignoreCase: Boolean = false): Boolean {\n  if (!ignoreCase && this is String && prefix is String)\n    return this.startsWith(prefix)\n  else\n    return\n    regionMatchesImpl(0, prefix, 0, prefix.length, ignoreCase)\n}\n\n/**\n * Returns `true` if a substring of this char sequence starting at the specified offset [startIndex] starts with the specified prefix.\n */\npublic fun\nCharSequence.startsWith(prefix: CharSequence, startIndex: Int, ignoreCase: Boolean = false): Boolean {\n  if (!ignoreCase && this is String && prefix is String)\n    return this.startsWith(prefix, startIndex)\n  else\n    return\n    regionMatchesImpl(startIndex, prefix, 0, prefix.length, ignoreCase)\n}\n\n/**\n * Returns `true` if this char sequence ends with the specified suffix.\n */\npublic fun\nCharSequence.endsWith(suffix: CharSequence, ignoreCase: Boolean = false): Boolean {\n  if (!ignoreCase && this is String && suffix is String)\n    return\n    this.endsWith(suffix)\n  else\n    return\n    regionMatchesImpl(length - suffix.length, suffix, 0, suffix.length, ignoreCase)\n}\n\n/**\n * Returns the longest string `prefix` such that this char sequence and [other] char sequence both start with this prefix,\n * taking care not to split surrogate pairs.\n * If this and [other] have no common prefix, returns the empty string.\n * @param ignoreCase `true` to ignore character case when matching a character. By default `false`.\n * @sample samples.text.Strings.commonPrefixWith\n */\npublic fun\nCharSequence.commonPrefixWith(other: CharSequence, ignoreCase: Boolean = false): String {\n  val shortestLength = minOf(this.length, other.length)\n  var i = 0\n  while (i < shortestLength && this[i].equals(other[i], ignoreCase = ignoreCase)) {\n    i++\n  }\n  if (this.hasSurrogatePairAt(i - 1) || other.hasSurrogatePairAt(i - 1)) {\n    i--\n  }\n  return\n    subSequence(0, i).toString()\n}\n\n/**\n * Returns the longest string `suffix` such that this char sequence and [other] char sequence both end with this suffix,\n * taking care not to split surrogate pairs.\n * If this and [other] have no common suffix, returns the empty string.\n * @param ignoreCase `true` to ignore character case when matching a character. By default `false`.\n * @sample samples.text.Strings.commonSuffixWith\n */\npublic fun\nCharSequence.commonSuffixWith(other: CharSequence, ignoreCase: Boolean = false): String {\n  val thisLength = this.length\n  val otherLength = other.length\n  val shortestLength = minOf(thisLength, otherLength)\n  var i = 0\n  while (i < shortestLength && this[thisLength - i - 1].equals(other[otherLength - i - 1], ignoreCase = ignoreCase)) {\n    i++\n  }\n  if (this.hasSurrogatePairAt(thisLength - i - 1) || other.hasSurrogatePairAt(otherLength - i - 1)) {\n    i--\n  }\n  return\n    subSequence(thisLength - i, thisLength).toString()\n}\n\n/**\n * Finds the index of the first occurrence of any of the specified [chars] in this char sequence,\n * starting from the specified [startIndex] and optionally ignoring the case.\n * @param ignoreCase `true` to ignore character case when matching a character. By default `false`.\n * @return An index of the first occurrence of matched character from [chars] or -1 if none of [chars] are found.\n */\npublic fun\nCharSequence.indexOfAny(chars: CharArray, startIndex: Int = 0, ignoreCase: Boolean = false): Int {\n  if (!ignoreCase && chars.size == 1 && this is String) {\n    val char = chars.single()\n    return\n      nativeIndexOf(char, startIndex)\n  }\n  for (index in startIndex.coerceAtLeast(0)..lastIndex) {\n    val charAtIndex = get(index)\n    if (chars.any { it.equals(charAtIndex, ignoreCase) })\n      return\n        index\n  }\n  return\n    -1\n}\n\n/**\n * Finds the index of the last occurrence of any of the specified [chars] in this char sequence,\n * starting from the specified [startIndex] and optionally ignoring the case.\n * @param startIndex The index of character to start searching at. The search proceeds backward toward the beginning of the string.\n * @param ignoreCase `true` to ignore character case when matching a character. By default `false`.\n * @return An index of the last occurrence of matched character from [chars] or -1 if none of [chars] are found.\n */\npublic fun

```

```

CharSequence.lastIndexOfAny(chars: CharArray, startIndex: Int = lastIndex, ignoreCase: Boolean = false): Int {
    if (!ignoreCase && chars.size == 1 && this is String) {
        val char = chars.single()
        return nativeLastIndexOf(char, startIndex)
    }
    for (index in startIndex.coerceAtMost(lastIndex) downTo 0) {
        val charAtIndex = get(index)
        if (chars.any { it.equals(charAtIndex, ignoreCase) })
            return index
    }
    return -1
}

private fun CharSequence.indexOf(other: CharSequence, startIndex: Int, endIndex: Int, ignoreCase: Boolean, last: Boolean = false): Int {
    val indices = if (!last)
        startIndex.coerceAtLeast(0)..endIndex.coerceAtMost(length)
    else
        startIndex.coerceAtMost(lastIndex)
        downTo endIndex.coerceAtLeast(0)
    if (this is String && other is String) { // smart cast
        for (index in indices) {
            if (other.regionMatches(0, this, index, other.length, ignoreCase))
                return index
        }
    } else {
        for (index in indices) {
            if (other.regionMatchesImpl(0, this, index, other.length, ignoreCase))
                return index
        }
    }
    return -1
}

private fun CharSequence.findAnyOf(strings: Collection<String>, startIndex: Int, ignoreCase: Boolean, last: Boolean): Pair<Int, String>? {
    if (!ignoreCase && strings.size == 1) {
        val string = strings.single()
        val index = if (!last) indexOf(string, startIndex) else lastIndexOf(string, startIndex)
        return if (index < 0) null else index to string
    }
    val indices = if (!last)
        startIndex.coerceAtLeast(0)..length else startIndex.coerceAtMost(lastIndex)
        downTo 0
    if (this is String) {
        for (index in indices) {
            val matchingString = strings.firstOrNull { it.regionMatches(0, this, index, it.length, ignoreCase) }
            if (matchingString != null)
                return index to matchingString
        }
    } else {
        for (index in indices) {
            val matchingString = strings.firstOrNull { it.regionMatchesImpl(0, this, index, it.length, ignoreCase) }
            if (matchingString != null)
                return index to matchingString
        }
    }
    return null
}

/**
 * Finds the first occurrence of any of the specified [strings] in this char sequence,
 * starting from the specified [startIndex] and optionally ignoring the case.
 * @param ignoreCase `true` to ignore character case when matching a string. By default `false`.
 * @return A pair of an index of the first occurrence of matched string from [strings] and the string matched
 * or `null` if none of [strings] are found.
 * To avoid ambiguous results when strings in [strings] have characters in common, this method proceeds from
 * the beginning to the end of this string, and finds at each position the first element in [strings]
 * that matches this string at that position.
 */
public fun CharSequence.findAnyOf(strings: Collection<String>, startIndex: Int = 0, ignoreCase: Boolean = false): Pair<Int, String>? =
    findAnyOf(strings, startIndex, ignoreCase, last = false)

/**
 * Finds the last occurrence of any of the specified [strings] in this char sequence,
 * starting from the specified [startIndex] and optionally ignoring the case.
 * @param startIndex The index of character to start searching at. The search proceeds backward toward the beginning of the string.
 * @param ignoreCase `true` to ignore character case when matching a string. By default `false`.
 * @return A pair of an index of the last occurrence of matched string from [strings] and the string matched
 * or `null` if none of [strings] are found.
 * To avoid ambiguous results when strings in [strings] have characters in common, this method proceeds from
 * the end toward the beginning of this string, and finds at each position the first element in [strings]
 * that matches this string at that position.
 */
public fun CharSequence.findLastAnyOf(strings: Collection<String>, startIndex: Int = lastIndex, ignoreCase: Boolean = false): Pair<Int, String>? =
    findAnyOf(strings, startIndex, ignoreCase, last = true)

/**
 * Finds the index of the first occurrence of any of the specified [strings] in this char sequence,
 * starting from the specified [startIndex] and optionally ignoring the case.
 * @param ignoreCase `true` to ignore character case when matching a string. By default `false`.
 * @return An index of the first occurrence of matched string from [strings] or -1 if none of [strings] are found.
 * To avoid ambiguous results when strings in [strings] have characters in common, this method proceeds from
 * the beginning to the end of this string, and finds at each position the first element in [strings]
 * that matches this string at that position.
 */
public fun CharSequence.indexOfAny(strings: Collection<String>, startIndex: Int = 0, ignoreCase: Boolean = false): Int =
    findAnyOf(strings, startIndex, ignoreCase, last = false)?.first ?: -1

/**
 * Finds the index of the last occurrence of any of the specified [strings] in this char sequence,
 * starting from the specified [startIndex] and optionally ignoring the case.
 * @param startIndex The index of character to start searching at. The search proceeds backward toward the beginning of the string.
 * @param ignoreCase `true` to ignore character case when matching a string. By default `false`.
 * @return An index of the last occurrence of matched string from [strings] or -1 if

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none of [strings] are found.\n * To avoid ambiguous results when strings in [strings] have characters in common, this method proceeds from\n * the end toward the beginning of this string, and finds at each position the first element in [strings]\n * that matches this string at that position.\n */\npublic fun CharSequence.lastIndexOfAny(strings: Collection<String>, startIndex: Int = lastIndex, ignoreCase: Boolean = false): Int =\n findAnyOf(strings, startIndex, ignoreCase, last = true)?.first ?: -1\n\n// indexOf\n\n/**\n * Returns the index within this string of the first occurrence of the specified character, starting from the specified [startIndex].\n * @param ignoreCase `true` to ignore character case when matching a character. By default `false`.\n * @return An index of the first occurrence of [char] or -1 if none is found.\n */\npublic fun CharSequence.indexOf(char: Char, startIndex: Int = 0, ignoreCase: Boolean = false): Int {\n return if (ignoreCase || this !is String)\n indexOfAny(charArrayOf(char), startIndex, ignoreCase)\n else\n nativeIndexOf(char, startIndex)\n}\n\n/**\n * Returns the index within this char sequence of the first occurrence of the specified [string],\n * starting from the specified [startIndex].\n * @param ignoreCase `true` to ignore character case when matching a string. By default `false`.\n * @return An index of the first occurrence of [string] or -1 if none is found.\n * @sample samples.text.Strings.indexOf\n */\npublic fun CharSequence.indexOf(string: String, startIndex: Int = 0, ignoreCase: Boolean = false): Int {\n return if (ignoreCase || this !is String)\n indexOf(string, startIndex, length, ignoreCase)\n else\n nativeIndexOf(string, startIndex)\n}\n\n/**\n * Returns the index within this char sequence of the last occurrence of the specified character,\n * starting from the specified [startIndex].\n * @param startIndex The index of character to start searching at. The search proceeds backward toward the beginning of the string.\n * @param ignoreCase `true` to ignore character case when matching a character. By default `false`.\n * @return An index of the last occurrence of [char] or -1 if none is found.\n */\npublic fun CharSequence.lastIndexOf(char: Char, startIndex: Int = lastIndex, ignoreCase: Boolean = false): Int {\n return if (ignoreCase || this !is String)\n lastIndexOfAny(charArrayOf(char), startIndex, ignoreCase)\n else\n nativeLastIndexOf(char, startIndex)\n}\n\n/**\n * Returns the index within this char sequence of the last occurrence of the specified [string],\n * starting from the specified [startIndex].\n * @param startIndex The index of character to start searching at. The search proceeds backward toward the beginning of the string.\n * @param ignoreCase `true` to ignore character case when matching a string. By default `false`.\n * @return An index of the last occurrence of [string] or -1 if none is found.\n */\npublic fun CharSequence.lastIndexOf(string: String, startIndex: Int = lastIndex, ignoreCase: Boolean = false): Int {\n return if (ignoreCase || this !is String)\n lastIndexOfAny(charArrayOf(char), startIndex, ignoreCase)\n else\n nativeLastIndexOf(string, startIndex)\n}\n\n/**\n * Returns `true` if this char sequence contains the specified [other] sequence of characters as a substring.\n * @param ignoreCase `true` to ignore character case when comparing strings. By default `false`.\n */\n@Suppress("INAPPLICABLE_OPERATOR_MODIFIER")\npublic operator fun CharSequence.contains(other: CharSequence, ignoreCase: Boolean = false): Boolean =\n if (other is String)\n indexOf(other, ignoreCase = ignoreCase) >= 0\n else\n indexOf(other, 0, length, ignoreCase) >= 0\n\n/**\n * Returns `true` if this char sequence contains the specified character [char].\n * @param ignoreCase `true` to ignore character case when comparing characters. By default `false`.\n */\n@Suppress("INAPPLICABLE_OPERATOR_MODIFIER")\npublic operator fun CharSequence.contains(char: Char, ignoreCase: Boolean = false): Boolean =\n indexOf(char, ignoreCase = ignoreCase) >= 0\n\n/**\n * Returns `true` if this char sequence contains at least one match of the specified regular expression [regex].\n */\n@kotlin.internal.InlineOnly\npublic inline operator fun CharSequence.contains(regex: Regex): Boolean =\n regex.containsMatchIn(this)\n\n// rangesDelimitedBy\n\nprivate class DelimitedRangesSequence(\n private val input: CharSequence,\n private val startIndex: Int,\n private val limit: Int,\n private val getNextMatch: CharSequence.(currentIndex: Int) -> Pair<Int, Int>?) : Sequence<IntRange> {\n override fun iterator(): Iterator<IntRange> = object : Iterator<IntRange> {\n var nextState: Int = -1 // -1 for unknown, 0 for done, 1 for continue\n var currentStartIndex: Int = startIndex.coerceIn(0, input.length)\n var nextSearchIndex: Int = currentStartIndex\n var nextItem: IntRange? = null\n var counter: Int = 0\n private fun calcNext() {\n if (nextSearchIndex < 0) {\n nextState = 0\n nextItem = null\n } else {\n if (limit > 0 && ++counter >= limit || nextSearchIndex > input.length) {\n nextItem =\n


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null || other == null || this.length != other.length) return false\n\n for (i in 0 until length) {\n    if
(!this[i].equals(other[i], ignoreCase = true)) {\n        return false\n    }\n}\n\n return true\n}\n\ninternal fun
CharSequence?.contentEqualsImpl(other: CharSequence?): Boolean {\n    if (this is String && other is String) {\n
return this == other\n    }\n\n    if (this === other) return true\n    if (this == null || other == null || this.length !=
other.length) return false\n\n    for (i in 0 until length) {\n        if (this[i] != other[i]) {\n            return false\n        }\n    }\n\n    return true\n}\n\n/**\n * Returns `true` if the content of this string is equal to the word `true`, `false` if it is
equal to `false`,\n * and throws an exception otherwise.\n * There is also a lenient version of the function
available on nullable String, [String?.toBoolean].\n * Note that this function is case-sensitive.\n * @sample
samples.text.Strings.toBooleanStrict\n * @SinceKotlin("1.5")\npublic fun String.toBooleanStrict(): Boolean =
when (this) {\n    "true" -> true\n    "false" -> false\n    else -> throw IllegalArgumentException("The string
doesn't represent a boolean value: $this")\n}\n\n/**\n * Returns `true` if the content of this string is equal to the
word `true`, `false` if it is equal to `false`,\n * and `null` otherwise.\n * There is also a lenient version of the
function available on nullable String, [String?.toBoolean].\n * Note that this function is case-sensitive.\n * @sample
samples.text.Strings.toBooleanStrictOrNull\n * @SinceKotlin("1.5")\npublic fun
String.toBooleanStrictOrNull(): Boolean? = when (this) {\n    "true" -> true\n    "false" -> false\n    else ->
null\n},"*\n * Copyright 2010-2022 JetBrains s.r.o. and Kotlin Programming Language contributors.\n * Use of
this source code is governed by the Apache 2.0 license that can be found in the license/LICENSE.txt file.\n * @n\n//
Auto-generated file. DO NOT EDIT!\n\npackage kotlin\n\nimport
kotlin.jvm.*\n\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@JvmInline\npublic value class
UByteArray\n@PublishedApi\ninternal constructor(@PublishedApi internal val storage: ByteArray) :
Collection<UByte> {\n\n    /** Creates a new array of the specified [size], with all elements initialized to zero. *\n
public constructor(size: Int) : this(ByteArray(size))\n\n    /**\n     * Returns the array element at the given [index].
This method can be called using the index operator.\n     *\n     * If the [index] is out of bounds of this array, throws
an [IndexOutOfBoundsException] except in Kotlin/JS\n     * where the behavior is unspecified.\n     *\n     public
operator fun get(index: Int): UByte = storage[index].toUByte()\n\n     /**\n     * Sets the element at the given [index]
to the given [value]. This method can be called using the index operator.\n     *\n     * If the [index] is out of bounds
of this array, throws an [IndexOutOfBoundsException] except in Kotlin/JS\n     * where the behavior is
unspecified.\n     *\n     public operator fun set(index: Int, value: UByte) {\n        storage[index] = value.toByte()\n
}\n\n     /** Returns the number of elements in the array. *\n     public override val size: Int get() = storage.size\n
}\n\n     /** Creates an iterator over the elements of the array. *\n     public override operator fun iterator():
kotlin.collections.Iterator<UByte> = Iterator(storage)\n\n     @Suppress("DEPRECATION_ERROR")\n     private
class Iterator(private val array: ByteArray) : UByteIterator() {\n        private var index = 0\n        override fun
hasNext() = index < array.size\n        override fun nextUByte() = if (index < array.size) array[index++].toUByte()
else throw NoSuchElementException(index.toString())\n    }\n\n     override fun contains(element: UByte): Boolean
{\n        // TODO: Eliminate this check after KT-30016 gets fixed.\n        // Currently JS BE does not generate
special bridge method for this method.\n        @Suppress("USELESS_CAST")\n        if ((element as Any?) !is
UByte) return false\n\n        return storage.contains(element.toByte())\n    }\n\n     override fun containsAll(elements:
Collection<UByte>): Boolean {\n        return (elements as Collection<*>).all { it is UByte &&
storage.contains(it.toByte()) }\n    }\n\n     override fun isEmpty(): Boolean = this.storage.size == 0\n}\n\n/**\n *
Creates a new array of the specified [size], where each element is calculated by calling the specified\n * [init]
function.\n * The function [init] is called for each array element sequentially starting from the first one.\n * It
should return the value for an array element given its index.\n
*\n * @SinceKotlin("1.3")\n * @ExperimentalUnsignedTypes\n * @kotlin.internal.InlineOnly\n * public inline fun
UByteArray(size: Int, init: (Int) -> UByte): UByteArray {\n    return UByteArray(ByteArray(size) { index ->
init(index).toByte()
})\n}\n\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
ubyteArrayOf(vararg elements: UByte): UByteArray = elements\n},"*\n * Copyright 2010-2022 JetBrains s.r.o. and
Kotlin Programming Language contributors.\n * Use of this source code is governed by the Apache 2.0 license that

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can be found in the license/LICENSE.txt file.\n *\n\n// Auto-generated file. DO NOT EDIT!\n\npackage
kotlin\n\nimport kotlin.jvm.*\n\n@SinceKotlin("1.3")\n\n@ExperimentalUnsignedTypes\n\n@JvmInline\n\npublic
value class UIntArray\n\n@PublishedApi\n\ninternal constructor(@PublishedApi internal val storage: IntArray) :
Collection<UInt> {\n\n    /** Creates a new array of the specified [size], with all elements initialized to zero. *\n
public constructor(size: Int) : this(IntArray(size))\n\n    /**\n    * Returns the array element at the given [index].
This method can be called using the index operator.\n    *\n    * If the [index] is out of bounds of this array, throws
an [IndexOutOfBoundsException] except in Kotlin/JS\n    * where the behavior is unspecified.\n    *\n    public
operator fun get(index: Int): UInt = storage[index].toInt()\n\n    /**\n    * Sets the element at the given [index] to
the given [value]. This method can be called using the index operator.\n    *\n    * If the [index] is out of bounds of
this array, throws an [IndexOutOfBoundsException] except in Kotlin/JS\n    * where the behavior is unspecified.\n
*\n    public operator fun set(index: Int, value: UInt) {\n        storage[index] = value.toInt()\n    }\n\n    /** Returns
the number of elements in the array. *\n    public override val size: Int get() = storage.size\n\n    /** Creates an
iterator over the elements of the array. *\n    public override operator fun iterator(): kotlin.collections.Iterator<UInt>
= Iterator(storage)\n\n    @Suppress("DEPRECATION_ERROR")\n    private class Iterator(private val array:
IntArray) : UIntIterator() {\n        private var index = 0\n        override fun hasNext() = index < array.size\n
override fun nextUInt() = if (index < array.size) array[index++].toInt() else throw
NoSuchElementException(index.toString())\n    }\n\n    override fun contains(element: UInt): Boolean {\n        //
TODO: Eliminate this check after KT-30016 gets fixed.\n        // Currently JS BE does not generate special bridge
method for this method.\n        @Suppress("USELESS_CAST")\n        if ((element as Any?) !is UInt) return
false\n\n        return storage.contains(element.toInt())\n    }\n\n    override fun containsAll(elements:
Collection<UInt>): Boolean {\n        return (elements as Collection<*>).all { it is UInt &&
storage.contains(it.toInt()) }\n    }\n\n    override fun isEmpty(): Boolean = this.storage.size == 0\n}\n\n/**\n
Creates a new array of the specified [size], where each element is calculated by calling the specified\n * [init]
function.\n * The function [init] is called for each array element sequentially starting from the first one.\n * It
should return the value for an array element given its index.\n
*\n\n@SinceKotlin("1.3")\n\n@ExperimentalUnsignedTypes\n\n@kotlin.internal.InlineOnly\n\npublic inline fun
UIntArray(size: Int, init: (Int) -> UInt): UIntArray {\n    return UIntArray(IntArray(size) { index ->
init(index).toInt()
})\n}\n\n@SinceKotlin("1.3")\n\n@ExperimentalUnsignedTypes\n\n@kotlin.internal.InlineOnly\n\npublic inline fun
uintArrayOf(vararg elements: UInt): UIntArray = elements\n", "/*\n * Copyright 2010-2022 JetBrains s.r.o. and
Kotlin Programming Language contributors.\n * Use of this source code is governed by the Apache 2.0 license that
can be found in the license/LICENSE.txt file.\n *\n\n// Auto-generated file. DO NOT EDIT!\n\npackage
kotlin\n\nimport kotlin.jvm.*\n\n@SinceKotlin("1.3")\n\n@ExperimentalUnsignedTypes\n\n@JvmInline\n\npublic
value class ULongArray\n\n@PublishedApi\n\ninternal constructor(@PublishedApi internal val storage: LongArray) :
Collection<ULong> {\n\n    /** Creates a new array of the specified [size], with all elements initialized to zero. *\n
public constructor(size: Int) : this(LongArray(size))\n\n    /**\n    * Returns the array element at the given [index].
This method can be called using the index operator.\n    *\n    * If the [index] is out of bounds of this array, throws
an [IndexOutOfBoundsException] except in Kotlin/JS\n    * where the behavior is unspecified.\n    *\n    public
operator fun get(index: Int): ULong = storage[index].toULong()\n\n    /**\n    * Sets the element at the given
[index] to the given [value]. This method can be called using the index operator.\n    *\n    * If the [index] is out of
bounds of this array, throws an [IndexOutOfBoundsException] except in Kotlin/JS\n    * where the behavior is
unspecified.\n    *\n    public operator fun set(index: Int, value: ULong) {\n        storage[index] = value.toLong()\n
}\n\n    /** Returns the number of elements in the array. *\n    public override val size: Int get() = storage.size\n
*\n    /** Creates an iterator over the elements of the array. *\n    public override operator fun iterator():
kotlin.collections.Iterator<ULong> = Iterator(storage)\n\n    @Suppress("DEPRECATION_ERROR")\n    private
class Iterator(private val array: LongArray) : ULongIterator() {\n        private var index = 0\n        override fun
hasNext() = index < array.size\n        override fun nextULong() = if (index < array.size) array[index++].toULong()
else throw NoSuchElementException(index.toString())\n    }\n\n    override fun contains(element: ULong): Boolean

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{\n    // TODO: Eliminate this check after KT-30016 gets fixed.\n    // Currently JS BE does not generate
special bridge method for this method.\n    @Suppress("USELESS_CAST")\n    if ((element as Any?) !is
ULong) return false\n\n    return storage.contains(element.toLong())\n } \n\n override fun
containsAll(elements: Collection<ULong>): Boolean {\n    return (elements as Collection<*>).all { it is ULong
&& storage.contains(it.toLong()) } \n } \n\n override fun isEmpty(): Boolean = this.storage.size == 0\n}\n\n/**\n * Creates a new array of the specified [size], where each element is calculated by calling the specified\n * [init]
function.\n * \n * The function [init] is called for each array element sequentially starting from the first one.\n * It
should return the value for an array element given its index.\n
*\n*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
ULongArray(size: Int, init: (Int) -> ULong): ULongArray {\n    return ULongArray(LongArray(size) { index ->
init(index).toLong()
})\n}\n\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
ulongArrayOf(vararg elements: ULong): ULongArray = elements\n", /*\n * Copyright 2010-2022 JetBrains s.r.o.
and Kotlin Programming Language contributors.\n * Use of this source code is governed by the Apache 2.0 license
that can be found in the license/LICENSE.txt file.\n */\n\n// Auto-generated file. DO NOT EDIT!\n\npackage
kotlin\n\nimport kotlin.jvm.*\n\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@JvmInline\npublic
value class UShortArray\n@PublishedApi\ninternal constructor(@PublishedApi internal val storage: ShortArray) :
Collection<UShort> {\n\n    /** Creates a new array of the specified [size], with all elements initialized to zero. *\n
*\n    public constructor(size: Int) : this(ShortArray(size))\n\n    /**\n     * Returns the array element at the given [index].
This method can be called using the index operator.\n     * \n     * If the [index] is out of bounds of this array, throws
an [IndexOutOfBoundsException] except in Kotlin/JS\n     * where the behavior is unspecified.\n     *\n     public
operator fun get(index: Int): UShort = storage[index].toUShort()\n\n     /**\n     * Sets the element at the given
[index] to the given [value]. This method can be called using the index operator.\n     * \n     * If the [index] is out of
bounds of this array, throws an [IndexOutOfBoundsException] except in Kotlin/JS\n     * where the behavior is
unspecified.\n     *\n     public operator fun set(index: Int, value: UShort) {\n        storage[index] = value.toShort()\n
}\n\n     /** Returns the number of elements in the array. *\n     *\n     public override val size: Int get() = storage.size\n\n
/** Creates an iterator over the elements of the array. *\n     *\n     public override operator fun iterator():
kotlin.collections.Iterator<UShort> = Iterator(storage)\n\n     @Suppress("DEPRECATION_ERROR")\n     private
class Iterator(private val array: ShortArray) : UShortIterator() {\n        private var index = 0\n        override fun
hasNext() = index < array.size\n        override fun nextUShort() = if (index < array.size) array[index++].toUShort()
else throw NoSuchElementException(index.toString())\n    } \n\n    override fun contains(element: UShort): Boolean
{\n        // TODO: Eliminate this check after KT-30016 gets fixed.\n        // Currently JS BE does not generate
special bridge method for this method.\n        @Suppress("USELESS_CAST")\n        if ((element as Any?) !is
UShort) return false\n\n        return storage.contains(element.toShort())\n } \n\n override fun
containsAll(elements: Collection<UShort>): Boolean {\n    return (elements as Collection<*>).all { it is UShort
&& storage.contains(it.toShort()) } \n } \n\n override fun isEmpty(): Boolean = this.storage.size == 0\n}\n\n/**\n * Creates a new array of the specified [size], where each element is calculated by calling the specified\n * [init]
function.\n * \n * The function [init] is called for each array element sequentially starting from the first one.\n * It
should return the value for an array element given its index.\n
*\n*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UShortArray(size: Int, init: (Int) -> UShort): UShortArray {\n    return UShortArray(ShortArray(size) { index ->
init(index).toShort()
})\n}\n\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
ushortArrayOf(vararg elements: UShort): UShortArray = elements\n", /*\n * Copyright 2010-2021 JetBrains s.r.o.
and Kotlin Programming Language contributors.\n * Use of this source code is governed by the Apache 2.0 license
that can be found in the license/LICENSE.txt file.\n */\n\n*\n*\n@file:kotlin.jvm.JvmMultifileClass\n@file:kotlin.jvm.JvmName("UArraysKt")\n@file:kotlin.jvm.JvmPacka
geName("kotlin.collections.unsigned")\n\npackage kotlin.collections\n\n/\n\n// NOTE: THIS FILE IS AUTO-

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GENERATED by the GenerateStandardLib.kt\n// See:

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https://github.com/JetBrains/kotlin/tree/master/libraries/stdlib\n\nimport kotlin.random.*\nimport kotlin.ranges.contains\nimport kotlin.ranges.reversed\n\n * Returns 1st *element* from the array.\n * \n * If the size of this array is less than 1, throws an [IndexOutOfBoundsException] except in Kotlin/JS\n * where the behavior is unspecified.\n\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline operator fun UIntArray.component1(): UInt {\n    return get(0)\n}\n\n * Returns 1st *element* from the array.\n * \n * If the size of this array is less than 1, throws an [IndexOutOfBoundsException] except in Kotlin/JS\n * where the behavior is unspecified.\n\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline operator fun ULongArray.component1(): ULong {\n    return get(0)\n}\n\n * Returns 1st *element* from the array.\n * \n * If the size of this array is less than 1, throws an [IndexOutOfBoundsException] except in Kotlin/JS\n * where the behavior is unspecified.\n\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline operator fun UByteArray.component1(): UByte {\n    return get(0)\n}\n\n * Returns 1st *element* from the array.\n * \n * If the size of this array is less than 1, throws an [IndexOutOfBoundsException] except in Kotlin/JS\n * where the behavior is unspecified.\n\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline operator fun UShortArray.component1(): UShort {\n    return get(0)\n}\n\n * Returns 2nd *element* from the array.\n * \n * If the size of this array is less than 2, throws an [IndexOutOfBoundsException] except in Kotlin/JS\n * where the behavior is unspecified.\n\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline operator fun UIntArray.component2(): UInt {\n    return get(1)\n}\n\n * Returns 2nd *element* from the array.\n * \n * If the size of this array is less than 2, throws an [IndexOutOfBoundsException] except in Kotlin/JS\n * where the behavior is unspecified.\n\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline operator fun ULongArray.component2(): ULong {\n    return get(1)\n}\n\n * Returns 2nd *element* from the array.\n * \n * If the size of this array is less than 2, throws an [IndexOutOfBoundsException] except in Kotlin/JS\n * where the behavior is unspecified.\n\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline operator fun UByteArray.component2(): UByte {\n    return get(1)\n}\n\n * Returns 2nd *element* from the array.\n * \n * If the size of this array is less than 2, throws an [IndexOutOfBoundsException] except in Kotlin/JS\n * where the behavior is unspecified.\n\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline operator fun UShortArray.component2(): UShort {\n    return get(1)\n}\n\n * Returns 3rd *element* from the array.\n * \n * If the size of this array is less than 3, throws an [IndexOutOfBoundsException] except in Kotlin/JS\n * where the behavior is unspecified.\n\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline operator fun UIntArray.component3(): UInt {\n    return get(2)\n}\n\n * Returns 3rd *element* from the array.\n * \n * If the size of this array is less than 3, throws an [IndexOutOfBoundsException] except in Kotlin/JS\n * where the behavior is unspecified.\n\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline operator fun ULongArray.component3(): ULong {\n    return get(2)\n}\n\n * Returns 3rd *element* from the array.\n * \n * If the size of this array is less than 3, throws an [IndexOutOfBoundsException] except in Kotlin/JS\n * where the behavior is unspecified.\n\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline operator fun UByteArray.component3(): UByte {\n    return get(2)\n}\n\n * Returns 3rd *element* from the array.\n * \n * If the size of this array is less than 3, throws an [IndexOutOfBoundsException] except in Kotlin/JS\n * where the behavior is unspecified.
```

*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline operator fun UShortArray.component3(): UShort {\n return get(2)\n}\n\n/**\n * Returns 4th *element* from the array.\n * \n * If the size of this array is less than 4, throws an [IndexOutOfBoundsException] except in Kotlin/JS\n * where the behavior is unspecified.\n

*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline operator fun UIntArray.component4(): UInt {\n return get(3)\n}\n\n/**\n * Returns 4th *element* from the array.\n * \n * If the size of this array is less than 4, throws an [IndexOutOfBoundsException] except in Kotlin/JS\n * where the behavior is unspecified.\n

*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline operator fun ULongArray.component4(): ULong {\n return get(3)\n}\n\n/**\n * Returns 4th *element* from the array.\n * \n * If the size of this array is less than 4, throws an [IndexOutOfBoundsException] except in Kotlin/JS\n * where the behavior is unspecified.\n

*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline operator fun UByteArray.component4(): UByte {\n return get(3)\n}\n\n/**\n * Returns 4th *element* from the array.\n * \n * If the size of this array is less than 4, throws an [IndexOutOfBoundsException] except in Kotlin/JS\n * where the behavior is unspecified.\n

*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline operator fun UShortArray.component4(): UShort {\n return get(3)\n}\n\n/**\n * Returns 5th *element* from the array.\n * \n * If the size of this array is less than 5, throws an [IndexOutOfBoundsException] except in Kotlin/JS\n * where the behavior is unspecified.\n

*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline operator fun UIntArray.component5(): UInt {\n return get(4)\n}\n\n/**\n * Returns 5th *element* from the array.\n * \n * If the size of this array is less than 5, throws an [IndexOutOfBoundsException] except in Kotlin/JS\n * where the behavior is unspecified.\n

*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline operator fun ULongArray.component5(): ULong {\n return get(4)\n}\n\n/**\n * Returns 5th *element* from the array.\n * \n * If the size of this array is less than 5, throws an [IndexOutOfBoundsException] except in Kotlin/JS\n * where the behavior is unspecified.\n

*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline operator fun UByteArray.component5(): UByte {\n return get(4)\n}\n\n/**\n * Returns 5th *element* from the array.\n * \n * If the size of this array is less than 5, throws an [IndexOutOfBoundsException] except in Kotlin/JS\n * where the behavior is unspecified.\n

*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline operator fun UShortArray.component5(): UShort {\n return get(4)\n}\n\n/**\n * Returns an element at the given [index] or throws an [IndexOutOfBoundsException] if the [index] is out of bounds of this array.\n * \n * @sample samples.collections.Collections.Elements.elementAt\n

*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic expect fun UIntArray.elementAt(index: Int): UInt\n\n/**\n * Returns an element at the given [index] or throws an [IndexOutOfBoundsException] if the [index] is out of bounds of this array.\n * \n * @sample samples.collections.Collections.Elements.elementAt\n

*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic expect fun ULongArray.elementAt(index: Int): ULong\n\n/**\n * Returns an element at the given [index] or throws an [IndexOutOfBoundsException] if the [index] is out of bounds of this array.\n * \n * @sample samples.collections.Collections.Elements.elementAt\n

*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic expect fun UByteArray.elementAt(index: Int): UByte\n\n/**\n * Returns an element at the given [index] or throws an [IndexOutOfBoundsException] if the [index] is out of bounds of this array.\n * \n * @sample samples.collections.Collections.Elements.elementAt\n

*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic expect fun UShortArray.elementAt(index: Int): UShort\n\n/**\n * Returns an element at the given [index] or the result of calling the [defaultValue] function if the [index] is out of bounds of this array.\n * \n * @sample samples.collections.Collections.Elements.elementAtOrElse\n

*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun

```

UIntArray.elementAtOrElse(index: Int, defaultValue: (Int) -> UInt): UInt {\n  return if (index >= 0 && index <=
lastIndex) get(index) else defaultValue(index)\n}\n\n/**\n * Returns an element at the given [index] or the result of
calling the [defaultValue] function if the [index] is out of bounds of this array.\n * \n * @sample
samples.collections.Collections.Elements.elementAtOrElse\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
ULongArray.elementAtOrElse(index: Int, defaultValue: (Int) -> ULong): ULong {\n  return if (index >= 0 &&
index <= lastIndex) get(index) else defaultValue(index)\n}\n\n/**\n * Returns an element at the given [index] or the
result of calling the [defaultValue] function if the [index] is out of bounds of this array.\n * \n * @sample
samples.collections.Collections.Elements.elementAtOrElse\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UByteArray.elementAtOrElse(index: Int, defaultValue: (Int) -> UByte): UByte {\n  return if (index >= 0 && index
<= lastIndex) get(index) else defaultValue(index)\n}\n\n/**\n * Returns an element at the given [index] or the result
of calling the [defaultValue] function if the [index] is out of bounds of this array.\n * \n * @sample
samples.collections.Collections.Elements.elementAtOrElse\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UShortArray.elementAtOrElse(index: Int, defaultValue: (Int) -> UShort): UShort {\n  return if (index >= 0 &&
index <= lastIndex) get(index) else defaultValue(index)\n}\n\n/**\n * Returns an element at the given [index] or
`null` if the [index] is out of bounds of this array.\n * \n * @sample
samples.collections.Collections.Elements.elementAtOrNull\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UIntArray.elementAtOrNull(index: Int): UInt? {\n  return this.getOrNull(index)\n}\n\n/**\n * Returns an element
at the given [index] or `null` if the [index] is out of bounds of this array.\n * \n * @sample
samples.collections.Collections.Elements.elementAtOrNull\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
ULongArray.elementAtOrNull(index: Int): ULong? {\n  return this.getOrNull(index)\n}\n\n/**\n * Returns an
element at the given [index] or `null` if the [index] is out of bounds of this array.\n * \n * @sample
samples.collections.Collections.Elements.elementAtOrNull\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UByteArray.elementAtOrNull(index: Int): UByte? {\n  return this.getOrNull(index)\n}\n\n/**\n * Returns an
element at the given [index] or `null` if the [index] is out of bounds of this array.\n * \n * @sample
samples.collections.Collections.Elements.elementAtOrNull\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UShortArray.elementAtOrNull(index: Int): UShort? {\n  return this.getOrNull(index)\n}\n\n/**\n * Returns the
first element matching the given [predicate], or `null` if no such element was found.\n * \n * @sample
samples.collections.Collections.Elements.find\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UIntArray.find(predicate: (UInt) -> Boolean): UInt? {\n  return firstOrNull(predicate)\n}\n\n/**\n * Returns the
first element matching the given [predicate], or `null` if no such element was found.\n * \n * @sample
samples.collections.Collections.Elements.find\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
ULongArray.find(predicate: (ULong) -> Boolean): ULong? {\n  return firstOrNull(predicate)\n}\n\n/**\n *
Returns the first element matching the given [predicate], or `null` if no such element was found.\n * \n * @sample
samples.collections.Collections.Elements.find\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UByteArray.find(predicate: (UByte) -> Boolean): UByte? {\n  return firstOrNull(predicate)\n}\n\n/**\n * Returns
the first element matching the given [predicate], or `null` if no such element was found.\n * \n * @sample
samples.collections.Collections.Elements.find\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun

```

```

UShortArray.find(predicate: (UShort) -> Boolean): UShort? {\n  return firstOrNull(predicate)\n}\n\n/**\n * Returns the last element matching the given [predicate], or `null` if no such element was found.\n * \n * @sample\n samples.collections.Collections.Elements.find\n *\n @SinceKotlin("1.3")\n @ExperimentalUnsignedTypes\n @kotlin.internal.InlineOnly\n public inline fun
UIntArray.findLast(predicate: (UInt) -> Boolean): UInt? {\n  return lastOrNull(predicate)\n}\n\n/**\n * Returns the\n last element matching the given [predicate], or `null` if no such element was found.\n * \n * @sample\n samples.collections.Collections.Elements.find\n *\n @SinceKotlin("1.3")\n @ExperimentalUnsignedTypes\n @kotlin.internal.InlineOnly\n public inline fun
ULongArray.findLast(predicate: (ULong) -> Boolean): ULong? {\n  return lastOrNull(predicate)\n}\n\n/**\n * Returns the\n last element matching the given [predicate], or `null` if no such element was found.\n * \n * @sample\n samples.collections.Collections.Elements.find\n *\n @SinceKotlin("1.3")\n @ExperimentalUnsignedTypes\n @kotlin.internal.InlineOnly\n public inline fun
UByteArray.findLast(predicate: (UByte) -> Boolean): UByte? {\n  return lastOrNull(predicate)\n}\n\n/**\n * Returns the\n last element matching the given [predicate], or `null` if no such element was found.\n * \n * @sample\n samples.collections.Collections.Elements.find\n *\n @SinceKotlin("1.3")\n @ExperimentalUnsignedTypes\n @kotlin.internal.InlineOnly\n public inline fun
UShortArray.findLast(predicate: (UShort) -> Boolean): UShort? {\n  return lastOrNull(predicate)\n}\n\n/**\n * Returns\n first element.\n * @throws [NoSuchElementException] if the array is empty.\n *\n @SinceKotlin("1.3")\n @ExperimentalUnsignedTypes\n @kotlin.internal.InlineOnly\n public inline fun
UIntArray.first(): UInt {\n  return storage.first().toUInt()\n}\n\n/**\n * Returns first element.\n * @throws\n [NoSuchElementException] if the array is empty.\n *\n @SinceKotlin("1.3")\n @ExperimentalUnsignedTypes\n @kotlin.internal.InlineOnly\n public inline fun
ULongArray.first(): ULong {\n  return storage.first().toULong()\n}\n\n/**\n * Returns first element.\n * @throws\n [NoSuchElementException] if the array is empty.\n *\n @SinceKotlin("1.3")\n @ExperimentalUnsignedTypes\n @kotlin.internal.InlineOnly\n public inline fun
UByteArray.first(): UByte {\n  return storage.first().toUByte()\n}\n\n/**\n * Returns first element.\n * @throws\n [NoSuchElementException] if the array is empty.\n *\n @SinceKotlin("1.3")\n @ExperimentalUnsignedTypes\n @kotlin.internal.InlineOnly\n public inline fun
UShortArray.first(): UShort {\n  return storage.first().toUShort()\n}\n\n/**\n * Returns the first element matching\n the given [predicate].\n * @throws [NoSuchElementException] if no such element is found.\n *\n @SinceKotlin("1.3")\n @ExperimentalUnsignedTypes\n @kotlin.internal.InlineOnly\n public inline fun
UIntArray.first(predicate: (UInt) -> Boolean): UInt {\n  for (element in this) if (predicate(element)) return\n element\n  throw NoSuchElementException("Array contains no element matching the predicate.")\n}\n\n/**\n * Returns the\n first element matching the given [predicate].\n * @throws [NoSuchElementException] if no such\n element is found.\n *\n @SinceKotlin("1.3")\n @ExperimentalUnsignedTypes\n @kotlin.internal.InlineOnly\n public inline fun
ULongArray.first(predicate: (ULong) -> Boolean): ULong {\n  for (element in this) if (predicate(element)) return\n element\n  throw NoSuchElementException("Array contains no element matching the predicate.")\n}\n\n/**\n * Returns the\n first element matching the given [predicate].\n * @throws [NoSuchElementException] if no such\n element is found.\n *\n @SinceKotlin("1.3")\n @ExperimentalUnsignedTypes\n @kotlin.internal.InlineOnly\n public inline fun
UByteArray.first(predicate: (UByte) -> Boolean): UByte {\n  for (element in this) if (predicate(element)) return\n element\n  throw NoSuchElementException("Array contains no element matching the predicate.")\n}\n\n/**\n * Returns the\n first element matching the given [predicate].\n * @throws [NoSuchElementException] if no such\n element is found.\n *\n @SinceKotlin("1.3")\n @ExperimentalUnsignedTypes\n @kotlin.internal.InlineOnly\n public inline fun
UShortArray.first(predicate: (UShort) -> Boolean): UShort {\n  for (element in this) if (predicate(element)) return\n element\n  throw NoSuchElementException("Array contains no element matching the predicate.")\n}\n\n/**

```

Returns the first element, or `null` if the array is empty.

```
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun UIntArray.firstOrNull(): UInt? {\n    return\n    if (isEmpty()) null else this[0]\n}\n\n*\n * Returns the first element, or `null` if the array is empty.\n*\n*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun ULongArray.firstOrNull(): ULong? {\n\n    return\n    if (isEmpty()) null else this[0]\n}\n\n*\n * Returns the first element, or `null` if the array is empty.\n*\n*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun UByteArray.firstOrNull(): UByte? {\n\n    return\n    if (isEmpty()) null else this[0]\n}\n\n*\n * Returns the first element, or `null` if the array is empty.\n*\n*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun UShortArray.firstOrNull(): UShort? {\n\n    return\n    if (isEmpty()) null else this[0]\n}\n\n*\n * Returns the first element matching the given [predicate], or `null`\n    if element was not found.\n*\n*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun\n    UIntArray.firstOrNull(predicate: (UInt) -> Boolean): UInt? {\n    for (element in this) if (predicate(element)) return\n    element\n    return null\n}\n\n*\n * Returns the first element matching the given [predicate], or `null` if element\n    was not found.\n*\n*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic\n    inline fun ULongArray.firstOrNull(predicate: (ULong) -> Boolean): ULong? {\n    for (element in this) if\n    (predicate(element)) return element\n    return null\n}\n\n*\n * Returns the first element matching the given\n    [predicate], or `null` if element was not found.\n*\n*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun\n    UByteArray.firstOrNull(predicate: (UByte) -> Boolean): UByte? {\n    for (element in this) if (predicate(element))\n    return element\n    return null\n}\n\n*\n * Returns the first element matching the given [predicate], or `null` if\n    element was not found.\n*\n*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun\n    UShortArray.firstOrNull(predicate: (UShort) -> Boolean): UShort? {\n    for (element in this) if (predicate(element))\n    return element\n    return null\n}\n\n*\n * Returns an element at the given [index] or the result of calling the\n    [defaultValue] function if the [index] is out of bounds of this array.\n*\n*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun\n    UIntArray.getOrNull(index: Int, defaultValue: (Int) -> UInt): UInt? {\n    return\n    if (index >= 0 && index <=\n    lastIndex) get(index) else defaultValue(index)\n}\n\n*\n * Returns an element at the given [index] or the result of\n    calling the [defaultValue] function if the [index] is out of bounds of this array.\n*\n*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun\n    ULongArray.getOrNull(index: Int, defaultValue: (Int) -> ULong): ULong? {\n    return\n    if (index >= 0 && index <=\n    lastIndex) get(index) else defaultValue(index)\n}\n\n*\n * Returns an element at the given [index] or the result of\n    calling the [defaultValue] function if the [index] is out of bounds of this array.\n*\n*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun\n    UByteArray.getOrNull(index: Int, defaultValue: (Int) -> UByte): UByte? {\n    return\n    if (index >= 0 && index <=\n    lastIndex) get(index) else defaultValue(index)\n}\n\n*\n * Returns an element at the given [index] or the result of\n    calling the [defaultValue] function if the [index] is out of bounds of this array.\n*\n*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun\n    UShortArray.getOrNull(index: Int, defaultValue: (Int) -> UShort): UShort? {\n    return\n    if (index >= 0 && index <=\n    lastIndex) get(index) else defaultValue(index)\n}\n\n*\n * Returns an element at the given [index] or `null` if the\n    [index] is out of bounds of this array.\n*\n * \n * @sample samples.collections.Collections.Elements.getOrNull\n*\n*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun UIntArray.getOrNull(index: Int): UInt? {\n    return\n    if (index >= 0 && index <= lastIndex) get(index) else null\n}\n\n*\n * Returns an element at the given\n    [index] or `null` if the [index] is out of bounds of this array.\n*\n * \n * @sample\n    samples.collections.Collections.Elements.getOrNull\n*\n*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun ULongArray.getOrNull(index: Int):\n    ULong? {\n    return\n    if (index >= 0 && index <= lastIndex) get(index) else null\n}\n\n*\n * Returns an element at\n    the given [index] or `null` if the [index] is out of bounds of this array.\n*\n * \n * @sample
```

```

samples.collections.Collections.Elements.getOrNull\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun UByteArray.getOrNull(index: Int): UByte?\n
{\n    return if (index >= 0 && index <= lastIndex) get(index) else null\n}\n\n/**\n * Returns an element at the\n
given [index] or `null` if the [index] is out of bounds of this array.\n * \n * @sample
samples.collections.Collections.Elements.getOrNull\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun UShortArray.getOrNull(index: Int):\n
UShort? {\n    return if (index >= 0 && index <= lastIndex) get(index) else null\n}\n\n/**\n * Returns first index of\n
[element], or -1 if the array does not contain element.\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun\n
UIntArray.indexOf(element: UInt): Int {\n    return storage.indexOf(element.toInt())\n}\n\n/**\n * Returns first\n
index of [element], or -1 if the array does not contain element.\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun\n
ULongArray.indexOf(element: ULong): Int {\n    return storage.indexOf(element.toLong())\n}\n\n/**\n * Returns\n
first index of [element], or -1 if the array does not contain element.\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun\n
UByteArray.indexOf(element: UByte): Int {\n    return storage.indexOf(element.toByte())\n}\n\n/**\n * Returns\n
first index of [element], or -1 if the array does not contain element.\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun\n
UShortArray.indexOf(element: UShort): Int {\n    return storage.indexOf(element.toShort())\n}\n\n/**\n * Returns\n
index of the first element matching the given [predicate], or -1 if the array does not contain such element.\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun\n
UIntArray.indexOfFirst(predicate: (UInt) -> Boolean): Int {\n    return storage.indexOfFirst { predicate(it.toUInt())\n
}\n}\n\n/**\n * Returns index of the first element matching the given [predicate], or -1 if the array does not contain\n
such element.\n * \n *\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic\n
inline fun ULongArray.indexOfFirst(predicate: (ULong) -> Boolean): Int {\n    return storage.indexOfFirst {\n
predicate(it.toULong()) }\n}\n\n/**\n * Returns index of the first element matching the given [predicate], or -1 if the\n
array does not contain such element.\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun\n
UByteArray.indexOfFirst(predicate: (UByte) -> Boolean): Int {\n    return storage.indexOfFirst {\n
predicate(it.toUByte()) }\n}\n\n/**\n * Returns index of the first element matching the given [predicate], or -1 if the\n
array does not contain such element.\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun\n
UShortArray.indexOfFirst(predicate: (UShort) -> Boolean): Int {\n    return storage.indexOfFirst {\n
predicate(it.toUShort()) }\n}\n\n/**\n * Returns index of the last element matching the given [predicate], or -1 if the\n
array does not contain such element.\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun\n
UIntArray.indexOfLast(predicate: (UInt) -> Boolean): Int {\n    return storage.indexOfLast { predicate(it.toUInt())\n
}\n}\n\n/**\n * Returns index of the last element matching the given [predicate], or -1 if the array does not contain\n
such element.\n * \n *\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic\n
inline fun ULongArray.indexOfLast(predicate: (ULong) -> Boolean): Int {\n    return storage.indexOfLast {\n
predicate(it.toULong()) }\n}\n\n/**\n * Returns index of the last element matching the given [predicate], or -1 if the\n
array does not contain such element.\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun\n
UByteArray.indexOfLast(predicate: (UByte) -> Boolean): Int {\n    return storage.indexOfLast {\n
predicate(it.toUByte()) }\n}\n\n/**\n * Returns index of the last element matching the given [predicate], or -1 if the\n
array does not contain such element.\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun\n
UShortArray.indexOfLast(predicate: (UShort) -> Boolean): Int {\n    return storage.indexOfLast {\n

```


Returns last index of [element], or -1 if the array does not contain element.\n

```

*^@SinceKotlin("1.3")^@ExperimentalUnsignedTypes^@kotlin.internal.InlineOnly^public inline fun
UShortArray.lastIndexOf(element: UShort): Int {^n   return storage.lastIndexOf(element.toShort())^n}^n/^n/**^n *
Returns the last element, or `null` if the array is empty.^n * ^n * @sample
samples.collections.Collections.Elements.last^n
*^@SinceKotlin("1.3")^@ExperimentalUnsignedTypes^public
fun UIntArray.lastOrNull(): UInt? {^n   return if (isEmpty()) null else this[size - 1]^n}^n/^n/**^n * Returns the last
element, or `null` if the array is empty.^n * ^n * @sample samples.collections.Collections.Elements.last^n
*^@SinceKotlin("1.3")^@ExperimentalUnsignedTypes^public fun ULongArray.lastOrNull(): ULong? {^n
return if (isEmpty()) null else this[size - 1]^n}^n/^n/**^n * Returns the last element, or `null` if the array is empty.^n *
^n * @sample samples.collections.Collections.Elements.last^n
*^@SinceKotlin("1.3")^@ExperimentalUnsignedTypes^public fun UByteArray.lastOrNull(): UByte? {^n
return if (isEmpty()) null else this[size - 1]^n}^n/^n/**^n * Returns the last element, or `null` if the array is empty.^n *
^n * @sample samples.collections.Collections.Elements.last^n
*^@SinceKotlin("1.3")^@ExperimentalUnsignedTypes^public fun UShortArray.lastOrNull(): UShort? {^n
return if (isEmpty()) null else this[size - 1]^n}^n/^n/**^n * Returns the last element matching the given [predicate], or
`null` if no such element was found.^n * ^n * @sample samples.collections.Collections.Elements.last^n
*^@SinceKotlin("1.3")^@ExperimentalUnsignedTypes^@kotlin.internal.InlineOnly^public inline fun
UIntArray.lastOrNull(predicate: (UInt) -> Boolean): UInt? {^n   for (index in this.indices.reversed()) {^n       val
element = this[index]^n       if (predicate(element)) return element^n   }^n   return null^n}^n/^n/**^n * Returns the last
element matching the given [predicate], or `null` if no such element was found.^n * ^n * @sample
samples.collections.Collections.Elements.last^n
*^@SinceKotlin("1.3")^@ExperimentalUnsignedTypes^@kotlin.internal.InlineOnly^public inline fun
ULongArray.lastOrNull(predicate: (ULong) -> Boolean): ULong? {^n   for (index in this.indices.reversed()) {^n       val
element = this[index]^n       if (predicate(element)) return element^n   }^n   return null^n}^n/^n/**^n * Returns the
last element matching the given [predicate], or `null` if no such element was found.^n * ^n * @sample
samples.collections.Collections.Elements.last^n
*^@SinceKotlin("1.3")^@ExperimentalUnsignedTypes^@kotlin.internal.InlineOnly^public inline fun
UByteArray.lastOrNull(predicate: (UByte) -> Boolean): UByte? {^n   for (index in this.indices.reversed()) {^n       val
element = this[index]^n       if (predicate(element)) return element^n   }^n   return null^n}^n/^n/**^n * Returns the
last element matching the given [predicate], or `null` if no such element was found.^n * ^n * @sample
samples.collections.Collections.Elements.last^n
*^@SinceKotlin("1.3")^@ExperimentalUnsignedTypes^@kotlin.internal.InlineOnly^public inline fun
UShortArray.lastOrNull(predicate: (UShort) -> Boolean): UShort? {^n   for (index in this.indices.reversed()) {^n       val
element = this[index]^n       if (predicate(element)) return element^n   }^n   return null^n}^n/^n/**^n * Returns a
random element from this array.^n * ^n * @throws NoSuchElementException if this array is empty.^n
*^@SinceKotlin("1.3")^@ExperimentalUnsignedTypes^@kotlin.internal.InlineOnly^public inline fun
UIntArray.random(): UInt {^n   return random(Random)^n}^n/^n/**^n * Returns a random element from this array.^n
* ^n * @throws NoSuchElementException if this array is empty.^n
*^@SinceKotlin("1.3")^@ExperimentalUnsignedTypes^@kotlin.internal.InlineOnly^public inline fun
ULongArray.random(): ULong {^n   return random(Random)^n}^n/^n/**^n * Returns a random element from this
array.^n * ^n * @throws NoSuchElementException if this array is empty.^n
*^@SinceKotlin("1.3")^@ExperimentalUnsignedTypes^@kotlin.internal.InlineOnly^public inline fun
UByteArray.random(): UByte {^n   return random(Random)^n}^n/^n/**^n * Returns a random element from this
array.^n * ^n * @throws NoSuchElementException if this array is empty.^n
*^@SinceKotlin("1.3")^@ExperimentalUnsignedTypes^@kotlin.internal.InlineOnly^public inline fun
UShortArray.random(): UShort {^n   return random(Random)^n}^n/^n/**^n * Returns a random element from this
array using the specified source of randomness.^n * ^n * @throws NoSuchElementException if this array is empty.^n
*^@SinceKotlin("1.3")^@ExperimentalUnsignedTypes^public fun UIntArray.random(random: Random): UInt

```



```

{\n if (isEmpty())\n    throw NoSuchElementException("Array is empty.")\n return
get(random.nextInt(size))\n}\n\n/**\n * Returns a random element from this array using the specified source of
randomness.\n * \n * @throws NoSuchElementException if this array is empty.\n
*\n*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun ULongArray.random(random: Random):
ULong {\n if (isEmpty())\n    throw NoSuchElementException("Array is empty.")\n return
get(random.nextInt(size))\n}\n\n/**\n * Returns a random element from this array using the specified source of
randomness.\n * \n * @throws NoSuchElementException if this array is empty.\n
*\n*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun UByteArray.random(random: Random):
UByte {\n if (isEmpty())\n    throw NoSuchElementException("Array is empty.")\n return
get(random.nextInt(size))\n}\n\n/**\n * Returns a random element from this array using the specified source of
randomness.\n * \n * @throws NoSuchElementException if this array is empty.\n
*\n*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun UShortArray.random(random: Random):
UShort {\n if (isEmpty())\n    throw NoSuchElementException("Array is empty.")\n return
get(random.nextInt(size))\n}\n\n/**\n * Returns a random element from this array, or `null` if this array is empty.\n
*\n*\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\n@WasExperimental(ExperimentalStdlibApi::class)\n
@kotlin.internal.InlineOnly\npublic inline fun UIntArray.randomOrNull(): UInt? {\n return
randomOrNull(Random)\n}\n\n/**\n * Returns a random element from this array, or `null` if this array is empty.\n
*\n*\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\n@WasExperimental(ExperimentalStdlibApi::class)\n
@kotlin.internal.InlineOnly\npublic inline fun ULongArray.randomOrNull(): ULong? {\n return
randomOrNull(Random)\n}\n\n/**\n * Returns a random element from this array, or `null` if this array is empty.\n
*\n*\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\n@WasExperimental(ExperimentalStdlibApi::class)\n
@kotlin.internal.InlineOnly\npublic inline fun UByteArray.randomOrNull(): UByte? {\n return
randomOrNull(Random)\n}\n\n/**\n * Returns a random element from this array, or `null` if this array is empty.\n
*\n*\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\n@WasExperimental(ExperimentalStdlibApi::class)\n
@kotlin.internal.InlineOnly\npublic inline fun UShortArray.randomOrNull(): UShort? {\n return
randomOrNull(Random)\n}\n\n/**\n * Returns a random element from this array using the specified source of
randomness, or `null` if this array is empty.\n
*\n*\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\n@WasExperimental(ExperimentalStdlibApi::class)\n
public fun UIntArray.randomOrNull(random: Random): UInt? {\n if (isEmpty())\n    return null\n return
get(random.nextInt(size))\n}\n\n/**\n * Returns a random element from this array using the specified source of
randomness, or `null` if this array is empty.\n
*\n*\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\n@WasExperimental(ExperimentalStdlibApi::class)\n
public fun ULongArray.randomOrNull(random: Random): ULong? {\n if (isEmpty())\n    return null\n return
get(random.nextInt(size))\n}\n\n/**\n * Returns a random element from this array using the specified source of
randomness, or `null` if this array is empty.\n
*\n*\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\n@WasExperimental(ExperimentalStdlibApi::class)\n
public fun UByteArray.randomOrNull(random: Random): UByte? {\n if (isEmpty())\n    return null\n return
get(random.nextInt(size))\n}\n\n/**\n * Returns a random element from this array using the specified source of
randomness, or `null` if this array is empty.\n
*\n*\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\n@WasExperimental(ExperimentalStdlibApi::class)\n
public fun UShortArray.randomOrNull(random: Random): UShort? {\n if (isEmpty())\n    return null\n return
get(random.nextInt(size))\n}\n\n/**\n * Returns the single element, or throws an exception if the array is empty or
has more than one element.\n
*\n*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UIntArray.single(): UInt {\n return storage.single().toUInt()\n}\n\n/**\n * Returns the single element, or throws an
exception if the array is empty or has more than one element.\n
*\n*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
ULongArray.single(): ULong {\n return storage.single().toULong()\n}\n\n/**\n * Returns the single element, or

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```

throws an exception if the array is empty or has more than one element.\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UByteArray.single(): UByte {\n    return storage.single().toUByte()\n}\n/**\n * Returns the single element, or
throws an exception if the array is empty or has more than one element.\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UShortArray.single(): UShort {\n    return storage.single().toUShort()\n}\n/**\n * Returns the single element
matching the given [predicate], or throws exception if there is no or more than one matching element.\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UIntArray.single(predicate: (UInt) -> Boolean): UInt {\n    var single: UInt? = null\n    var found = false\n    for
(element in this) {\n        if (predicate(element)) {\n            if (found) throw IllegalArgumentException("Array
contains more than one matching element.")\n            single = element\n            found = true\n        }\n    }\n    if
(!found) throw NoSuchElementException("Array contains no element matching the predicate.")\n    @Suppress("UNCHECKED_CAST")\n    return single as UInt\n}\n/**\n * Returns the single element matching
the given [predicate], or throws exception if there is no or more than one matching element.\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
ULongArray.single(predicate: (ULong) -> Boolean): ULong {\n    var single: ULong? = null\n    var found = false\n
for (element in this) {\n        if (predicate(element)) {\n            if (found) throw IllegalArgumentException("Array
contains more than one matching element.")\n            single = element\n            found = true\n        }\n    }\n    if
(!found) throw NoSuchElementException("Array contains no element matching the predicate.")\n    @Suppress("UNCHECKED_CAST")\n    return single as ULong\n}\n/**\n * Returns the single element
matching the given [predicate], or throws exception if there is no or more than one matching element.\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UByteArray.single(predicate: (UByte) -> Boolean): UByte {\n    var single: UByte? = null\n    var found = false\n
for (element in this) {\n        if (predicate(element)) {\n            if (found) throw IllegalArgumentException("Array
contains more than one matching element.")\n            single = element\n            found = true\n        }\n    }\n    if
(!found) throw NoSuchElementException("Array contains no element matching the predicate.")\n    @Suppress("UNCHECKED_CAST")\n    return single as UByte\n}\n/**\n * Returns the single element
matching the given [predicate], or throws exception if there is no or more than one matching element.\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UShortArray.single(predicate: (UShort) -> Boolean): UShort {\n    var single: UShort? = null\n    var found = false\n
for (element in this) {\n        if (predicate(element)) {\n            if (found) throw IllegalArgumentException("Array
contains more than one matching element.")\n            single = element\n            found = true\n        }\n    }\n    if
(!found) throw NoSuchElementException("Array contains no element matching the predicate.")\n    @Suppress("UNCHECKED_CAST")\n    return single as UShort\n}\n/**\n * Returns single element, or `null` if
the array is empty or has more than one element.\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun UIntArray.singleOrNull(): UInt? {\n    return if (size == 1) this[0] else null\n}\n/**\n * Returns single element, or `null` if the array is empty or has more
than one element.\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun
ULongArray.singleOrNull(): ULong? {\n    return if (size == 1) this[0] else null\n}\n/**\n * Returns single
element, or `null` if the array is empty or has more than one element.\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun UByteArray.singleOrNull(): UByte? {\n    return if (size == 1) this[0] else null\n}\n/**\n * Returns single element, or `null` if the array is empty or has more
than one element.\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun
UShortArray.singleOrNull(): UShort? {\n    return if (size == 1) this[0] else null\n}\n/**\n * Returns the single
element matching the given [predicate], or `null` if element was not found or more than one element was found.\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UIntArray.singleOrNull(predicate: (UInt) -> Boolean): UInt? {\n    var single: UInt? = null\n    var found = false\n
for (element in this) {\n        if (predicate(element)) {\n            if (found) return null\n            single = element\n        }\n    }\n    return single\n}\n

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    found = true\n    }\n }\n if (!found) return null\n    return single\n}\n\n/**\n * Returns the single element
matching the given [predicate], or `null` if element was not found or more than one element was found.\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
ULongArray.singleOrNull(predicate: (ULong) -> Boolean): ULong? {\n    var single: ULong? = null\n    var found
= false\n    for (element in this) {\n        if (predicate(element)) {\n            if (found) return null\n            single =
element\n            found = true\n        }\n    }\n    if (!found) return null\n    return single\n}\n\n/**\n * Returns the
single element matching the given [predicate], or `null` if element was not found or more than one element was
found.\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline
fun UByteArray.singleOrNull(predicate: (UByte) -> Boolean): UByte? {\n    var single: UByte? = null\n    var found
= false\n    for (element in this) {\n        if (predicate(element)) {\n            if (found) return null\n            single =
element\n            found = true\n        }\n    }\n    if (!found) return null\n    return single\n}\n\n/**\n * Returns the
single element matching the given [predicate], or `null` if element was not found or more than one element was
found.\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline
fun UShortArray.singleOrNull(predicate: (UShort) -> Boolean): UShort? {\n    var single: UShort? = null\n    var
found = false\n    for (element in this) {\n        if (predicate(element)) {\n            if (found) return null\n            single
= element\n            found = true\n        }\n    }\n    if (!found) return null\n    return single\n}\n\n/**\n * Returns a list
containing all elements except first [n] elements.\n
*\n * @throws IllegalArgumentException if [n] is negative.\n
*\n * @sample samples.collections.Collections.Transformations.drop\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun UIntArray.drop(n: Int): List<UInt> {\n
    require(n >= 0) { "Requested element count $n is less than zero." }\n    return takeLast((size -
n).coerceAtLeast(0))\n}\n\n/**\n * Returns a list containing all elements except first [n] elements.\n
*\n * @throws
IllegalArgumentException if [n] is negative.\n
*\n * @sample
samples.collections.Collections.Transformations.drop\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun ULongArray.drop(n: Int): List<ULong> {\n
    require(n >= 0) { "Requested element count $n is less than zero." }\n    return takeLast((size -
n).coerceAtLeast(0))\n}\n\n/**\n * Returns a list containing all elements except first [n] elements.\n
*\n * @throws
IllegalArgumentException if [n] is negative.\n
*\n * @sample
samples.collections.Collections.Transformations.drop\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun UByteArray.drop(n: Int): List<UByte> {\n
    require(n >= 0) { "Requested element count $n is less than zero." }\n    return takeLast((size -
n).coerceAtLeast(0))\n}\n\n/**\n * Returns a list containing all elements except first [n] elements.\n
*\n * @throws
IllegalArgumentException if [n] is negative.\n
*\n * @sample
samples.collections.Collections.Transformations.drop\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun UShortArray.drop(n: Int): List<UShort> {\n
    require(n >= 0) { "Requested element count $n is less than zero." }\n    return takeLast((size -
n).coerceAtLeast(0))\n}\n\n/**\n * Returns a list containing all elements except last [n] elements.\n
*\n * @throws
IllegalArgumentException if [n] is negative.\n
*\n * @sample
samples.collections.Collections.Transformations.drop\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun UIntArray.dropLast(n: Int): List<UInt> {\n
    require(n >= 0) { "Requested element count $n is less than zero." }\n    return take((size -
n).coerceAtLeast(0))\n}\n\n/**\n * Returns a list containing all elements except last [n] elements.\n
*\n * @throws
IllegalArgumentException if [n] is negative.\n
*\n * @sample
samples.collections.Collections.Transformations.drop\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun ULongArray.dropLast(n: Int):
List<ULong> {\n    require(n >= 0) { "Requested element count $n is less than zero." }\n    return take((size -
n).coerceAtLeast(0))\n}\n\n/**\n * Returns a list containing all elements except last [n] elements.\n
*\n * @throws
IllegalArgumentException if [n] is negative.\n
*\n * @sample
samples.collections.Collections.Transformations.drop\n

```

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*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun UByteArray.dropLast(n: Int): List<UByte>
{\n    require(n >= 0) { "Requested element count $n is less than zero." }\n    return take((size -
n).coerceAtLeast(0))\n}\n\n/**\n * Returns a list containing all elements except last [n] elements.\n * \n * @throws
IllegalArgumentOutOfRangeException if [n] is negative.\n * \n * @sample
samples.collections.Collections.Transformations.drop\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun UShortArray.dropLast(n: Int):
List<UShort> {\n    require(n >= 0) { "Requested element count $n is less than zero." }\n    return take((size -
n).coerceAtLeast(0))\n}\n\n/**\n * Returns a list containing all elements except last elements that satisfy the given
[predicate].\n * \n * @sample samples.collections.Collections.Transformations.drop\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UIntArray.dropLastWhile(predicate: (UInt) -> Boolean): List<UInt> {\n    for (index in lastIndex downTo 0) {\n
if (!predicate(this[index])) {\n        return take(index + 1)\n    }\n}\n    return emptyList()\n}\n\n/**\n *
Returns a list containing all elements except last elements that satisfy the given [predicate].\n * \n * @sample
samples.collections.Collections.Transformations.drop\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
ULongArray.dropLastWhile(predicate: (ULong) -> Boolean): List<ULong> {\n    for (index in lastIndex downTo 0)
{\n    if (!predicate(this[index])) {\n        return take(index + 1)\n    }\n}\n    return emptyList()\n}\n\n/**\n *
Returns a list containing all elements except last elements that satisfy the given [predicate].\n * \n * @sample
samples.collections.Collections.Transformations.drop\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UByteArray.dropLastWhile(predicate: (UByte) -> Boolean): List<UByte> {\n    for (index in lastIndex downTo 0)
{\n    if (!predicate(this[index])) {\n        return take(index + 1)\n    }\n}\n    return emptyList()\n}\n\n/**\n *
Returns a list containing all elements except last elements that satisfy the given [predicate].\n * \n * @sample
samples.collections.Collections.Transformations.drop\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UShortArray.dropLastWhile(predicate: (UShort) -> Boolean): List<UShort> {\n    for (index in lastIndex downTo
0) {\n    if (!predicate(this[index])) {\n        return take(index + 1)\n    }\n}\n    return
emptyList()\n}\n\n/**\n * Returns a list containing all elements except first elements that satisfy the given
[predicate].\n * \n * @sample samples.collections.Collections.Transformations.drop\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UIntArray.dropWhile(predicate: (UInt) -> Boolean): List<UInt> {\n    var yielding = false\n    val list =
ArrayList<UInt>()\n    for (item in this)\n        if (yielding)\n            list.add(item)\n        else if (!predicate(item)) {\n
            list.add(item)\n            yielding = true\n        }\n    return list\n}\n\n/**\n * Returns a list containing all
elements except first elements that satisfy the given [predicate].\n * \n * @sample
samples.collections.Collections.Transformations.drop\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
ULongArray.dropWhile(predicate: (ULong) -> Boolean): List<ULong> {\n    var yielding = false\n    val list =
ArrayList<ULong>()\n    for (item in this)\n        if (yielding)\n            list.add(item)\n        else if (!predicate(item))
{\n            list.add(item)\n            yielding = true\n        }\n    return list\n}\n\n/**\n * Returns a list containing all
elements except first elements that satisfy the given [predicate].\n * \n * @sample
samples.collections.Collections.Transformations.drop\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UByteArray.dropWhile(predicate: (UByte) -> Boolean): List<UByte> {\n    var yielding = false\n    val list =
ArrayList<UByte>()\n    for (item in this)\n        if (yielding)\n            list.add(item)\n        else if (!predicate(item))
{\n            list.add(item)\n            yielding = true\n        }\n    return list\n}\n\n/**\n * Returns a list containing all
elements except first elements that satisfy the given [predicate].\n * \n * @sample
samples.collections.Collections.Transformations.drop\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun

```

```

UShortArray.dropWhile(predicate: (UShort) -> Boolean): List<UShort> {
    var yielding = false
    val list = ArrayList<UShort>()
    for (item in this)
        if (yielding)
            list.add(item)
        else if (!predicate(item))
            list.add(item)
            yielding = true
    }
    return list
}

```

* Returns a list containing only elements matching the given [predicate].

@sample samples.collections.Collections.Filtering.filter

```

@SinceKotlin("1.3")
@ExperimentalUnsignedTypes
@kotlin.internal.InlineOnly
public inline fun
UIntArray.filter(predicate: (UInt) -> Boolean): List<UInt> {
    return filterTo(ArrayList<UInt>(),
predicate)
}

```

* Returns a list containing only elements matching the given [predicate].

@sample samples.collections.Collections.Filtering.filter

```

@SinceKotlin("1.3")
@ExperimentalUnsignedTypes
@kotlin.internal.InlineOnly
public inline fun
ULongArray.filter(predicate: (ULong) -> Boolean): List<ULong> {
    return filterTo(ArrayList<ULong>(),
predicate)
}

```

* Returns a list containing only elements matching the given [predicate].

@sample samples.collections.Collections.Filtering.filter

```

@SinceKotlin("1.3")
@ExperimentalUnsignedTypes
@kotlin.internal.InlineOnly
public inline fun
UByteArray.filter(predicate: (UByte) -> Boolean): List<UByte> {
    return filterTo(ArrayList<UByte>(),
predicate)
}

```

* Returns a list containing only elements matching the given [predicate].

@sample samples.collections.Collections.Filtering.filter

```

@SinceKotlin("1.3")
@ExperimentalUnsignedTypes
@kotlin.internal.InlineOnly
public inline fun
UShortArray.filter(predicate: (UShort) -> Boolean): List<UShort> {
    return filterTo(ArrayList<UShort>(),
predicate)
}

```

* Returns a list containing only elements matching the given [predicate].

@param [predicate] function that takes the index of an element and the element itself and returns the result of predicate evaluation on the element.

@sample samples.collections.Collections.Filtering.filterIndexed

```

@SinceKotlin("1.3")
@ExperimentalUnsignedTypes
@kotlin.internal.InlineOnly
public inline fun
UIntArray.filterIndexed(predicate: (index: Int, UInt) -> Boolean): List<UInt> {
    return
filterIndexedTo(ArrayList<UInt>(), predicate)
}

```

* Returns a list containing only elements matching the given [predicate].

@param [predicate] function that takes the index of an element and the element itself and returns the result of predicate evaluation on the element.

@sample samples.collections.Collections.Filtering.filterIndexed

```

@SinceKotlin("1.3")
@ExperimentalUnsignedTypes
@kotlin.internal.InlineOnly
public inline fun
ULongArray.filterIndexed(predicate: (index: Int, ULong) -> Boolean): List<ULong> {
    return
filterIndexedTo(ArrayList<ULong>(), predicate)
}

```

* Returns a list containing only elements matching the given [predicate].

@param [predicate] function that takes the index of an element and the element itself and returns the result of predicate evaluation on the element.

@sample samples.collections.Collections.Filtering.filterIndexed

```

@SinceKotlin("1.3")
@ExperimentalUnsignedTypes
@kotlin.internal.InlineOnly
public inline fun
UByteArray.filterIndexed(predicate: (index: Int, UByte) -> Boolean): List<UByte> {
    return
filterIndexedTo(ArrayList<UByte>(), predicate)
}

```

* Returns a list containing only elements matching the given [predicate].

@param [predicate] function that takes the index of an element and the element itself and returns the result of predicate evaluation on the element.

@sample samples.collections.Collections.Filtering.filterIndexed

```

@SinceKotlin("1.3")
@ExperimentalUnsignedTypes
@kotlin.internal.InlineOnly
public inline fun
UShortArray.filterIndexed(predicate: (index: Int, UShort) -> Boolean): List<UShort> {
    return
filterIndexedTo(ArrayList<UShort>(), predicate)
}

```

* Appends all elements matching the given [predicate] to the given [destination].

@param [predicate] function that takes the index of an element and the element itself and returns the result of predicate evaluation on the element.

@sample samples.collections.Collections.Filtering.filterIndexedTo

```

@SinceKotlin("1.3")
@ExperimentalUnsignedTypes
@kotlin.internal.InlineOnly
public inline fun <C :
MutableCollection<in UInt>> UIntArray.filterIndexedTo(destination: C, predicate: (index: Int, UInt) -> Boolean): C {
    forEachIndexed { index, element ->
        if (predicate(index, element)) destination.add(element)
    }
}

```

```

return destination\n}\n\n/**\n * Appends all elements matching the given [predicate] to the given [destination].\n *
@param [predicate] function that takes the index of an element and the element itself\n * and returns the result of
predicate evaluation on the element.\n * \n * @sample samples.collections.Collections.Filtering.filterIndexedTo\n
*/\n\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun <C :
MutableCollection<in ULong>> ULongArray.filterIndexedTo(destination: C, predicate: (index: Int, ULong) ->
Boolean): C {\n    forEachIndexed { index, element ->\n        if (predicate(index, element))
destination.add(element)\n    }\n    return destination\n}\n\n/**\n * Appends all elements matching the given
[predicate] to the given [destination].\n * @param [predicate] function that takes the index of an element and the
element itself\n * and returns the result of predicate evaluation on the element.\n * \n * @sample
samples.collections.Collections.Filtering.filterIndexedTo\n
*/\n\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun <C :
MutableCollection<in UByte>> UByteArray.filterIndexedTo(destination: C, predicate: (index: Int, UByte) ->
Boolean): C {\n    forEachIndexed { index, element ->\n        if (predicate(index, element))
destination.add(element)\n    }\n    return destination\n}\n\n/**\n * Appends all elements matching the given
[predicate] to the given [destination].\n * @param [predicate] function that takes the index of an element and the
element itself\n * and returns the result of predicate evaluation on the element.\n * \n * @sample
samples.collections.Collections.Filtering.filterIndexedTo\n
*/\n\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun <C :
MutableCollection<in UShort>> UShortArray.filterIndexedTo(destination: C, predicate: (index: Int, UShort) ->
Boolean): C {\n    forEachIndexed { index, element ->\n        if (predicate(index, element))
destination.add(element)\n    }\n    return destination\n}\n\n/**\n * Returns a list containing all elements not
matching the given [predicate].\n * \n * @sample samples.collections.Collections.Filtering.filter\n
*/\n\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UIntArray.filterNot(predicate: (UInt) -> Boolean): List<UInt> {\n    return filterNotTo(ArrayList<UInt>(),
predicate)\n}\n\n/**\n * Returns a list containing all elements not matching the given [predicate].\n * \n * @sample
samples.collections.Collections.Filtering.filter\n
*/\n\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
ULongArray.filterNot(predicate: (ULong) -> Boolean): List<ULong> {\n    return filterNotTo(ArrayList<ULong>(),
predicate)\n}\n\n/**\n * Returns a list containing all elements not matching the given [predicate].\n * \n * @sample
samples.collections.Collections.Filtering.filter\n
*/\n\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UByteArray.filterNot(predicate: (UByte) -> Boolean): List<UByte> {\n    return filterNotTo(ArrayList<UByte>(),
predicate)\n}\n\n/**\n * Returns a list containing all elements not matching the given [predicate].\n * \n * @sample
samples.collections.Collections.Filtering.filter\n
*/\n\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UShortArray.filterNot(predicate: (UShort) -> Boolean): List<UShort> {\n    return
filterNotTo(ArrayList<UShort>(), predicate)\n}\n\n/**\n * Appends all elements not matching the given [predicate]
to the given [destination].\n * \n * @sample samples.collections.Collections.Filtering.filterTo\n
*/\n\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun <C :
MutableCollection<in UInt>> UIntArray.filterNotTo(destination: C, predicate: (UInt) -> Boolean): C {\n    for
(element in this) if (!predicate(element)) destination.add(element)\n    return destination\n}\n\n/**\n * Appends all
elements not matching the given [predicate] to the given [destination].\n * \n * @sample
samples.collections.Collections.Filtering.filterTo\n
*/\n\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun <C :
MutableCollection<in ULong>> ULongArray.filterNotTo(destination: C, predicate: (ULong) -> Boolean): C {\n    for
(element in this) if (!predicate(element)) destination.add(element)\n    return destination\n}\n\n/**\n * Appends
all elements not matching the given [predicate] to the given [destination].\n * \n * @sample
samples.collections.Collections.Filtering.filterTo\n

```

```

*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun <C :
MutableCollection<in UByte>> UByteArray.filterNotTo(destination: C, predicate: (UByte) -> Boolean): C {\n for
(element in this) if (!predicate(element)) destination.add(element)\n return destination\n}\n\n/**\n * Appends all
elements not matching the given [predicate] to the given [destination].\n * \n * @sample
samples.collections.Collections.Filtering.filterTo\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun <C :
MutableCollection<in UShort>> UShortArray.filterNotTo(destination: C, predicate: (UShort) -> Boolean): C {\n
for (element in this) if (!predicate(element)) destination.add(element)\n return destination\n}\n\n/**\n * Appends
all elements matching the given [predicate] to the given [destination].\n * \n * @sample
samples.collections.Collections.Filtering.filterTo\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun <C :
MutableCollection<in UInt>> UIntArray.filterTo(destination: C, predicate: (UInt) -> Boolean): C {\n for (element
in this) if (predicate(element)) destination.add(element)\n return destination\n}\n\n/**\n * Appends all elements
matching the given [predicate] to the given [destination].\n * \n * @sample
samples.collections.Collections.Filtering.filterTo\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun <C :
MutableCollection<in ULong>> ULongArray.filterTo(destination: C, predicate: (ULong) -> Boolean): C {\n for
(element in this) if (predicate(element)) destination.add(element)\n return destination\n}\n\n/**\n * Appends all
elements matching the given [predicate] to the given [destination].\n * \n * @sample
samples.collections.Collections.Filtering.filterTo\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun <C :
MutableCollection<in UByte>> UByteArray.filterTo(destination: C, predicate: (UByte) -> Boolean): C {\n for
(element in this) if (predicate(element)) destination.add(element)\n return destination\n}\n\n/**\n * Appends all
elements matching the given [predicate] to the given [destination].\n * \n * @sample
samples.collections.Collections.Filtering.filterTo\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun <C :
MutableCollection<in UShort>> UShortArray.filterTo(destination: C, predicate: (UShort) -> Boolean): C {\n for
(element in this) if (predicate(element)) destination.add(element)\n return destination\n}\n\n/**\n * Returns a list
containing elements at indices in the specified [indices] range.\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun UIntArray.slice(indices: IntRange):
List<UInt> {\n if (indices.isEmpty()) return listOf()\n return copyOfRange(indices.start, indices.endInclusive +
1).asList()\n}\n\n/**\n * Returns a list containing elements at indices in the specified [indices] range.\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun ULongArray.slice(indices: IntRange):
List<ULong> {\n if (indices.isEmpty()) return listOf()\n return copyOfRange(indices.start, indices.endInclusive
+ 1).asList()\n}\n\n/**\n * Returns a list containing elements at indices in the specified [indices] range.\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun UByteArray.slice(indices: IntRange):
List<UByte> {\n if (indices.isEmpty()) return listOf()\n return copyOfRange(indices.start, indices.endInclusive
+ 1).asList()\n}\n\n/**\n * Returns a list containing elements at indices in the specified [indices] range.\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun UShortArray.slice(indices: IntRange):
List<UShort> {\n if (indices.isEmpty()) return listOf()\n return copyOfRange(indices.start, indices.endInclusive
+ 1).asList()\n}\n\n/**\n * Returns a list containing elements at specified [indices].\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun UIntArray.slice(indices: Iterable<Int>):
List<UInt> {\n val size = indices.collectionSizeOrDefault(10)\n if (size == 0) return emptyList()\n val list =
ArrayList<UInt>(size)\n for (index in indices) {\n list.add(get(index))\n }\n return list\n}\n\n/**\n *
Returns a list containing elements at specified [indices].\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun ULongArray.slice(indices: Iterable<Int>):
List<ULong> {\n val size = indices.collectionSizeOrDefault(10)\n if (size == 0) return emptyList()\n val list =
ArrayList<ULong>(size)\n for (index in indices) {\n list.add(get(index))\n }\n return list\n}\n\n/**\n *
Returns a list containing elements at specified [indices].\n

```

Returns a list containing elements at specified [indices].\n

```
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun UByteArray.slice(indices: Iterable<Int>):  
List<UByte> {\n    val size = indices.collectionSizeOrDefault(10)\n    if (size == 0) return emptyList()\n    val list =  
    ArrayList<UByte>(size)\n    for (index in indices) {\n        list.add(get(index))\n    }\n    return list\n}\n\n/**\n *
```

Returns a list containing elements at specified [indices].\n

```
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun UShortArray.slice(indices: Iterable<Int>):  
List<UShort> {\n    val size = indices.collectionSizeOrDefault(10)\n    if (size == 0) return emptyList()\n    val list =  
    ArrayList<UShort>(size)\n    for (index in indices) {\n        list.add(get(index))\n    }\n    return list\n}\n\n/**\n *
```

Returns an array containing elements of this array at specified [indices].\n

```
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun UIntArray.sliceArray(indices:  
Collection<Int>): UIntArray {\n    return UIntArray(storage.sliceArray(indices))\n}\n\n/**\n * Returns an array  
containing elements of this array at specified [indices].\n
```

```
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun ULongArray.sliceArray(indices:  
Collection<Int>): ULongArray {\n    return ULongArray(storage.sliceArray(indices))\n}\n\n/**\n * Returns an array  
containing elements of this array at specified [indices].\n
```

```
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun UByteArray.sliceArray(indices:  
Collection<Int>): UByteArray {\n    return UByteArray(storage.sliceArray(indices))\n}\n\n/**\n * Returns an array  
containing elements of this array at specified [indices].\n
```

```
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun UShortArray.sliceArray(indices:  
Collection<Int>): UShortArray {\n    return UShortArray(storage.sliceArray(indices))\n}\n\n/**\n * Returns an  
array containing elements at indices in the specified [indices] range.\n
```

```
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun UIntArray.sliceArray(indices: IntRange):  
UIntArray {\n    return UIntArray(storage.sliceArray(indices))\n}\n\n/**\n * Returns an array containing elements at  
indices in the specified [indices] range.\n
```

```
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun  
ULongArray.sliceArray(indices: IntRange): ULongArray {\n    return  
    ULongArray(storage.sliceArray(indices))\n}\n\n/**\n * Returns an array containing elements at indices in the  
specified [indices] range.\n
```

```
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun  
UByteArray.sliceArray(indices: IntRange): UByteArray {\n    return  
    UByteArray(storage.sliceArray(indices))\n}\n\n/**\n * Returns an array containing elements at indices in the  
specified [indices] range.\n
```

```
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun  
UShortArray.sliceArray(indices: IntRange): UShortArray {\n    return  
    UShortArray(storage.sliceArray(indices))\n}\n\n/**\n * Returns a list containing first [n] elements.\n
```

```
\n * @throws IllegalArgumentException if [n] is negative.\n * \n * @sample  
samples.collections.Collections.Transformations.take\n
```

```
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun UIntArray.take(n: Int): List<UInt> {\n    require(n >= 0) { "Requested element count $n is less than zero." }\n    if (n == 0) return emptyList()\n    if (n >=  
size) return toList()\n    if (n == 1) return listOf(this[0])\n    var count = 0\n    val list = ArrayList<UInt>(n)\n    for  
(item in this) {\n        list.add(item)\n        if (++count == n)\n            break\n    }\n    return list\n}\n\n/**\n * Returns  
a list containing first [n] elements.\n
```

```
\n * @throws IllegalArgumentException if [n] is negative.\n * \n * @sample  
samples.collections.Collections.Transformations.take\n
```

```
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun UByteArray.take(n: Int): List<UByte> {\n    require(n >= 0) { "Requested element count $n is less than zero." }\n    if (n == 0) return emptyList()\n    if (n >=
```



```

size) return toList()\n if (n == 1) return listOf(this[0])\n var count = 0\n val list = ArrayList<UByte>(n)\n for
(item in this) {\n list.add(item)\n if (++count == n)\n break\n }\n return list\n}\n\n/**\n * Returns
a list containing first [n] elements.\n * \n * @throws IllegalArgumentException if [n] is negative.\n * \n * @sample
samples.collections.Collections.Transformations.take\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun UShortArray.take(n: Int): List<UShort> {\n
require(n >= 0) { \"Requested element count $n is less than zero.\" }\n if (n == 0) return emptyList()\n if (n >=
size) return toList()\n if (n == 1) return listOf(this[0])\n var count = 0\n val list = ArrayList<UShort>(n)\n for
(item in this) {\n list.add(item)\n if (++count == n)\n break\n }\n return list\n}\n\n/**\n * Returns
a list containing last [n] elements.\n * \n * @throws IllegalArgumentException if [n] is negative.\n * \n * @sample
samples.collections.Collections.Transformations.take\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun UIntArray.takeLast(n: Int): List<UInt> {\n
require(n >= 0) { \"Requested element count $n is less than zero.\" }\n if (n == 0) return emptyList()\n val size =
size\n if (n >= size) return toList()\n if (n == 1) return listOf(this[size - 1])\n val list = ArrayList<UInt>(n)\n
for (index in size - n until size)\n list.add(this[index])\n return list\n}\n\n/**\n * Returns a list containing last
[n] elements.\n * \n * @throws IllegalArgumentException if [n] is negative.\n * \n * @sample
samples.collections.Collections.Transformations.take\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun ULongArray.takeLast(n: Int): List<ULong>
{\n require(n >= 0) { \"Requested element count $n is less than zero.\" }\n if (n == 0) return emptyList()\n val
size = size\n if (n >= size) return toList()\n if (n == 1) return listOf(this[size - 1])\n val list =
ArrayList<ULong>(n)\n for (index in size - n until size)\n list.add(this[index])\n return list\n}\n\n/**\n *
Returns a list containing last [n] elements.\n * \n * @throws IllegalArgumentException if [n] is negative.\n * \n *
@sample samples.collections.Collections.Transformations.take\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun UByteArray.takeLast(n: Int): List<UByte>
{\n require(n >= 0) { \"Requested element count $n is less than zero.\" }\n if (n == 0) return emptyList()\n val
size = size\n if (n >= size) return toList()\n if (n == 1) return listOf(this[size - 1])\n val list =
ArrayList<UByte>(n)\n for (index in size - n until size)\n list.add(this[index])\n return list\n}\n\n/**\n *
Returns a list containing last [n] elements.\n * \n * @throws IllegalArgumentException if [n] is negative.\n * \n *
@sample samples.collections.Collections.Transformations.take\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun UShortArray.takeLast(n: Int): List<UShort>
{\n require(n >= 0) { \"Requested element count $n is less than zero.\" }\n if (n == 0) return emptyList()\n val
size = size\n if (n >= size) return toList()\n if (n == 1) return listOf(this[size - 1])\n val list =
ArrayList<UShort>(n)\n for (index in size - n until size)\n list.add(this[index])\n return list\n}\n\n/**\n *
Returns a list containing last elements satisfying the given [predicate].\n * \n * @sample
samples.collections.Collections.Transformations.take\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UIntArray.takeLastWhile(predicate: (UInt) -> Boolean): List<UInt> {\n for (index in lastIndex downTo 0) {\n
if (!predicate(this[index])) {\n return drop(index + 1)\n }\n }\n return toList()\n}\n\n/**\n * Returns a
list containing last elements satisfying the given [predicate].\n * \n * @sample
samples.collections.Collections.Transformations.take\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
ULongArray.takeLastWhile(predicate: (ULong) -> Boolean): List<ULong> {\n for (index in lastIndex downTo 0)
{\n if (!predicate(this[index])) {\n return drop(index + 1)\n }\n }\n return toList()\n}\n\n/**\n *
Returns a list containing last elements satisfying the given [predicate].\n * \n * @sample
samples.collections.Collections.Transformations.take\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UByteArray.takeLastWhile(predicate: (UByte) -> Boolean): List<UByte> {\n for (index in lastIndex downTo 0)
{\n if (!predicate(this[index])) {\n return drop(index + 1)\n }\n }\n return toList()\n}\n\n/**\n *
Returns a list containing last elements satisfying the given [predicate].\n * \n * @sample

```

```

samples.collections.Collections.Transformations.take\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UShortArray.takeLastWhile(predicate: (UShort) -> Boolean): List<UShort> {\n  for (index in lastIndex downTo 0)
{\n    if (!predicate(this[index])) {\n      return drop(index + 1)\n    }\n  }\n  return toList()\n}\n\n/**\n *
Returns a list containing first elements satisfying the given [predicate].\n * \n * @sample
samples.collections.Collections.Transformations.take\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UIntArray.takeWhile(predicate: (UInt) -> Boolean): List<UInt> {\n  val list = ArrayList<UInt>()\n  for (item in
this) {\n    if (!predicate(item))\n      break\n    list.add(item)\n  }\n  return list\n}\n\n/**\n * Returns a list
containing first elements satisfying the given [predicate].\n * \n * @sample
samples.collections.Collections.Transformations.take\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
ULongArray.takeWhile(predicate: (ULong) -> Boolean): List<ULong> {\n  val list = ArrayList<ULong>()\n  for
(item in this) {\n    if (!predicate(item))\n      break\n    list.add(item)\n  }\n  return list\n}\n\n/**\n *
Returns a list containing first elements satisfying the given [predicate].\n * \n * @sample
samples.collections.Collections.Transformations.take\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UByteArray.takeWhile(predicate: (UByte) -> Boolean): List<UByte> {\n  val list = ArrayList<UByte>()\n  for
(item in this) {\n    if (!predicate(item))\n      break\n    list.add(item)\n  }\n  return list\n}\n\n/**\n *
Returns a list containing first elements satisfying the given [predicate].\n * \n * @sample
samples.collections.Collections.Transformations.take\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UShortArray.takeWhile(predicate: (UShort) -> Boolean): List<UShort> {\n  val list = ArrayList<UShort>()\n  for
(item in this) {\n    if (!predicate(item))\n      break\n    list.add(item)\n  }\n  return list\n}\n\n/**\n *
Reverses elements in the array in-place.\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UIntArray.reverse(): Unit {\n  storage.reverse()\n}\n\n/**\n * Reverses elements in the array in-place.\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
ULongArray.reverse(): Unit {\n  storage.reverse()\n}\n\n/**\n * Reverses elements in the array in-place.\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UByteArray.reverse(): Unit {\n  storage.reverse()\n}\n\n/**\n * Reverses elements in the array in-place.\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UShortArray.reverse(): Unit {\n  storage.reverse()\n}\n\n/**\n * Reverses elements of the array in the specified
range in-place.\n * \n * @param fromIndex the start of the range (inclusive) to reverse.\n * @param toIndex the end
of the range (exclusive) to reverse.\n * \n * @throws IndexOutOfBoundsException if [fromIndex] is less than zero
or [toIndex] is greater than the size of this array.\n * @throws IllegalArgumentException if [fromIndex] is greater
than [toIndex].\n
*\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic
inline fun UIntArray.reverse(fromIndex: Int, toIndex: Int): Unit {\n  storage.reverse(fromIndex,
toIndex)\n}\n\n/**\n * Reverses elements of the array in the specified range in-place.\n * \n * @param fromIndex
the start of the range (inclusive) to reverse.\n * @param toIndex the end of the range (exclusive) to reverse.\n *
\n * @throws IndexOutOfBoundsException if [fromIndex] is less than zero or [toIndex] is greater than the size of
this array.\n * @throws IllegalArgumentException if [fromIndex] is greater than [toIndex].\n
*\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
ULongArray.reverse(fromIndex: Int, toIndex: Int): Unit {\n  storage.reverse(fromIndex, toIndex)\n}\n\n/**\n *
Reverses elements of the array in the specified range in-place.\n * \n * @param fromIndex the start of the range
(inclusive) to reverse.\n * @param toIndex the end of the range (exclusive) to reverse.\n * \n * @throws
IndexOutOfBoundsException if [fromIndex] is less than zero or [toIndex] is greater than the size of this array.\n *
@throws IllegalArgumentException if [fromIndex] is greater than [toIndex].\n

```

```

*\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UByteArray.reverse(fromIndex: Int, toIndex: Int): Unit {\n    storage.reverse(fromIndex, toIndex)\n}\n\n/**\n *
Reverses elements of the array in the specified range in-place.\n * \n * @param fromIndex the start of the range
(inclusive) to reverse.\n * @param toIndex the end of the range (exclusive) to reverse.\n * \n * @throws
IndexOutOfBoundsException if [fromIndex] is less than zero or [toIndex] is greater than the size of this array.\n *
@throws IllegalArgumentException if [fromIndex] is greater than [toIndex].\n
*\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UShortArray.reverse(fromIndex: Int, toIndex: Int): Unit {\n    storage.reverse(fromIndex, toIndex)\n}\n\n/**\n *
Returns a list with elements in reversed order.\n *\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic
fun UIntArray.reversed(): List<UInt> {\n    if (isEmpty()) return emptyList()\n    val list = toMutableList()\n
list.reverse()\n    return list\n}\n\n/**\n * Returns a list with elements in reversed order.\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun ULongArray.reversed(): List<ULong> {\n
if (isEmpty()) return emptyList()\n    val list = toMutableList()\n    list.reverse()\n    return list\n}\n\n/**\n *
Returns a list with elements in reversed order.\n *\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun
UByteArray.reversed(): List<UByte> {\n    if (isEmpty()) return emptyList()\n    val list = toMutableList()\n
list.reverse()\n    return list\n}\n\n/**\n * Returns a list with elements in reversed order.\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun UShortArray.reversed(): List<UShort> {\n
if (isEmpty()) return emptyList()\n    val list = toMutableList()\n    list.reverse()\n    return list\n}\n\n/**\n *
Returns an array with elements of this array in reversed order.\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UIntArray.reversedArray(): UIntArray {\n    return UIntArray(storage.reversedArray())\n}\n\n/**\n * Returns an
array with elements of this array in reversed order.\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
ULongArray.reversedArray(): ULongArray {\n    return ULongArray(storage.reversedArray())\n}\n\n/**\n *
Returns an array with elements of this array in reversed order.\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UByteArray.reversedArray(): UByteArray {\n    return UByteArray(storage.reversedArray())\n}\n\n/**\n * Returns
an array with elements of this array in reversed order.\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UShortArray.reversedArray(): UShortArray {\n    return UShortArray(storage.reversedArray())\n}\n\n/**\n *
Randomly shuffles elements in this array in-place.\n
*\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\npublic fun UIntArray.shuffle(): Unit {\n
shuffle(Random)\n}\n\n/**\n * Randomly shuffles elements in this array in-place.\n
*\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\npublic fun ULongArray.shuffle(): Unit {\n
shuffle(Random)\n}\n\n/**\n * Randomly shuffles elements in this array in-place.\n
*\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\npublic fun UByteArray.shuffle(): Unit {\n
shuffle(Random)\n}\n\n/**\n * Randomly shuffles elements in this array in-place.\n
*\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\npublic fun UShortArray.shuffle(): Unit {\n
shuffle(Random)\n}\n\n/**\n * Randomly shuffles elements in this array in-place using the specified [random]
instance as the source of randomness.\n * \n * See:
https://en.wikipedia.org/wiki/Fisher%20%80%93Yates\_shuffle#The\_modern\_algorithm\n
*\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\npublic fun UIntArray.shuffle(random: Random): Unit
{\n    for (i in lastIndex downTo 1) {\n        val j = random.nextInt(i + 1)\n        val copy = this[i]\n        this[i] =
this[j]\n        this[j] = copy\n    }\n}\n\n/**\n * Randomly shuffles elements in this array in-place using the specified
[random] instance as the source of randomness.\n * \n * See:
https://en.wikipedia.org/wiki/Fisher%20%80%93Yates\_shuffle#The\_modern\_algorithm\n
*\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\npublic fun ULongArray.shuffle(random: Random):
Unit {\n    for (i in lastIndex downTo 1) {\n        val j = random.nextInt(i + 1)\n        val copy = this[i]\n        this[i] =

```

```

this[j]\n    this[j] = copy\n    }\n}\n\n/**\n * Randomly shuffles elements in this array in-place using the specified
[random] instance as the source of randomness.\n * \n * See:
https://en.wikipedia.org/wiki/Fisher%20%80%93Yates\_shuffle#The\_modern\_algorithm\n
*\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\npublic fun UByteArray.shuffle(random: Random):
Unit {\n    for (i in lastIndex downTo 1) {\n        val j = random.nextInt(i + 1)\n        val copy = this[i]\n        this[i] =
this[j]\n        this[j] = copy\n    }\n}\n\n/**\n * Randomly shuffles elements in this array in-place using the specified
[random] instance as the source of randomness.\n * \n * See:
https://en.wikipedia.org/wiki/Fisher%20%80%93Yates\_shuffle#The\_modern\_algorithm\n
*\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\npublic fun UShortArray.shuffle(random: Random):
Unit {\n    for (i in lastIndex downTo 1) {\n        val j = random.nextInt(i + 1)\n        val copy = this[i]\n        this[i] =
this[j]\n        this[j] = copy\n    }\n}\n\n/**\n * Sorts elements in the array in-place descending according to their
natural sort order.\n *\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun
UIntArray.sortDescending(): Unit {\n    if (size > 1) {\n        sort()\n        reverse()\n    }\n}\n\n/**\n * Sorts elements
in the array in-place descending according to their natural sort order.\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun ULongArray.sortDescending(): Unit {\n    if
(size > 1) {\n        sort()\n        reverse()\n    }\n}\n\n/**\n * Sorts elements in the array in-place descending
according to their natural sort order.\n *\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun
UByteArray.sortDescending(): Unit {\n    if (size > 1) {\n        sort()\n        reverse()\n    }\n}\n\n/**\n * Sorts
elements in the array in-place descending according to their natural sort order.\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun UShortArray.sortDescending(): Unit {\n    if
(size > 1) {\n        sort()\n        reverse()\n    }\n}\n\n/**\n * Returns a list of all elements sorted according to their
natural sort order.\n *\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun UIntArray.sorted():
List<UInt> {\n    return copyOf().apply { sort() }.asList()\n}\n\n/**\n * Returns a list of all elements sorted
according to their natural sort order.\n *\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun
ULongArray.sorted(): List<ULong> {\n    return copyOf().apply { sort() }.asList()\n}\n\n/**\n * Returns a list of all
elements sorted according to their natural sort order.\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun UByteArray.sorted(): List<UByte> {\n    return
copyOf().apply { sort() }.asList()\n}\n\n/**\n * Returns a list of all elements sorted according to their natural
sort order.\n *\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun UShortArray.sorted():
List<UShort> {\n    return copyOf().apply { sort() }.asList()\n}\n\n/**\n * Returns an array with all elements of this
array sorted according to their natural sort order.\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun UIntArray.sortedArray(): UIntArray {\n    if
(isEmpty()) return this\n    return this.copyOf().apply { sort() }\n}\n\n/**\n * Returns an array with all elements of
this array sorted according to their natural sort order.\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun ULongArray.sortedArray(): ULongArray {\n    if
(isEmpty()) return this\n    return this.copyOf().apply { sort() }\n}\n\n/**\n * Returns an array with all
elements of this array sorted according to their natural sort order.\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun UByteArray.sortedArray(): UByteArray {\n    if
(isEmpty()) return this\n    return this.copyOf().apply { sort() }\n}\n\n/**\n * Returns an array with all elements
of this array sorted according to their natural sort order.\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun UShortArray.sortedArray(): UShortArray {\n    if
(isEmpty()) return this\n    return this.copyOf().apply { sort() }\n}\n\n/**\n * Returns an array with all
elements of this array sorted descending according to their natural sort order.\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun UIntArray.sortedArrayDescending():
UIIntArray {\n    if (isEmpty()) return this\n    return this.copyOf().apply { sortDescending() }\n}\n\n/**\n * Returns
an array with all elements of this array sorted descending according to their natural sort order.\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun ULongArray.sortedArrayDescending():
ULongArray {\n    if (isEmpty()) return this\n    return this.copyOf().apply { sortDescending() }\n}\n\n/**\n *

```

Returns an array with all elements of this array sorted descending according to their natural sort order.

```
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun UByteArray.sortedArrayDescending():  
UByteArray {\n    if (isEmpty()) return this\n    return this.copyOf().apply { sortDescending() }\n}\n\n/**\n * Returns an array with all elements of this array sorted descending according to their natural sort order.\n */
```

Returns an array with all elements of this array sorted descending according to their natural sort order.

```
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun UShortArray.sortedArrayDescending():  
UShortArray {\n    if (isEmpty()) return this\n    return this.copyOf().apply { sortDescending() }\n}\n\n/**\n * Returns a list of all elements sorted descending according to their natural sort order.\n * \n * The sort is _stable_. It means that equal elements preserve their order relative to each other after sorting.\n */
```

Returns a list of all elements sorted descending according to their natural sort order. The sort is `_stable_`. It means that equal elements preserve their order relative to each other after sorting.

```
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun UIntArray.sortedDescending(): List<UInt>  
{\n    return copyOf().apply { sort() }.reversed()\n}\n\n/**\n * Returns a list of all elements sorted descending according to their natural sort order.\n * \n * The sort is _stable_. It means that equal elements preserve their order relative to each other after sorting.\n */
```

Returns a list of all elements sorted descending according to their natural sort order. The sort is `_stable_`. It means that equal elements preserve their order relative to each other after sorting.

```
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun ULongArray.sortedDescending(): List<ULong> {\n    return copyOf().apply { sort() }.reversed()\n}\n\n/**\n * Returns a list of all elements sorted descending according to their natural sort order.\n * \n * The sort is _stable_. It means that equal elements preserve their order relative to each other after sorting.\n */
```

Returns a list of all elements sorted descending according to their natural sort order. The sort is `_stable_`. It means that equal elements preserve their order relative to each other after sorting.

```
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun UByteArray.sortedDescending():  
List<UByte> {\n    return copyOf().apply { sort() }.reversed()\n}\n\n/**\n * Returns a list of all elements sorted descending according to their natural sort order.\n * \n * The sort is _stable_. It means that equal elements preserve their order relative to each other after sorting.\n */
```

Returns an array of type `[UShort]`, which is a view of this array where each element is a signed reinterpretation of the corresponding element of this array.

```
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun UShortArray.sortedDescending(): List<UShort> {\n    return copyOf().apply { sort() }.reversed()\n}\n\n/**\n * Returns an array of type [ByteArray], which is a view of this array where each element is a signed reinterpretation\n * of the corresponding element of this array.\n */
```

Returns an array of type `[ByteArray]`, which is a view of this array where each element is a signed reinterpretation of the corresponding element of this array.

```
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun  
UByteArray.asByteArray(): ByteArray {\n    return storage\n}\n\n/**\n * Returns an array of type [IntArray], which is a view of this array where each element is a signed reinterpretation\n * of the corresponding element of this array.\n */
```

Returns an array of type `[IntArray]`, which is a view of this array where each element is a signed reinterpretation of the corresponding element of this array.

```
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun  
UIntArray.asIntArray(): IntArray {\n    return storage\n}\n\n/**\n * Returns a [List] that wraps the original array.\n */
```

Returns a `[List]` that wraps the original array.

```
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic expect fun UIntArray.asList():  
List<UInt>\n\n/**\n * Returns a [List] that wraps the original array.\n */
```

Returns a `[List]` that wraps the original array.

```
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic expect fun ULongArray.asList():  
List<ULong>\n\n/**\n * Returns a [List] that wraps the original array.\n */
```

Returns a `[List]` that wraps the original array.

```
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic expect fun UByteArray.asList():  
List<UByte>\n\n/**\n * Returns a [List] that wraps the original array.\n */
```

Returns a `[List]` that wraps the original array.

```
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic expect fun UShortArray.asList():  
List<UShort>\n\n/**\n * Returns an array of type [LongArray], which is a view of this array where each element is a signed reinterpretation\n * of the corresponding element of this array.\n */
```

Returns an array of type `[LongArray]`, which is a view of this array where each element is a signed reinterpretation of the corresponding element of this array.

```
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun  
ULongArray.asLongArray(): LongArray {\n    return storage\n}\n\n/**\n * Returns an array of type [ShortArray], which is a view of this array where each element is a signed reinterpretation\n * of the corresponding element of this array.\n */
```

Returns an array of type `[ShortArray]`, which is a view of this array where each element is a signed reinterpretation of the corresponding element of this array.

```
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun  
UShortArray.asShortArray(): ShortArray {\n    return storage\n}\n\n/**\n * Returns an array of type [UByteArray], which is a view of this array where each element is an unsigned reinterpretation\n * of the corresponding element of this array.\n */
```

Returns an array of type `[UByteArray]`, which is a view of this array where each element is an unsigned reinterpretation of the corresponding element of this array.

```
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun  
ByteArray.asUByteArray(): UByteArray {\n    return UByteArray(this)\n}\n\n/**\n * Returns an array of type [UIntArray], which is a view of this array where each element is an unsigned reinterpretation\n * of the corresponding element of this array.\n */
```

Returns an array of type `[UIntArray]`, which is a view of this array where each element is an unsigned reinterpretation of the corresponding element of this array.

```
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun  
IntArray.asUIntArray(): UIntArray {\n    return UIntArray(this)\n}\n\n/**\n * Returns an array of type
```

[UIntArray], which is a view of this array where each element is an unsigned reinterpretation of the corresponding element of this array.

```
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun  
LongArray.asUIntArray(): UIntArray {\n    return UIntArray(this)\n}\n/**\n * Returns an array of type  
[UShortArray], which is a view of this array where each element is an unsigned reinterpretation of the  
corresponding element of this array.
```

```
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun  
ShortArray.asUShortArray(): UShortArray {\n    return UShortArray(this)\n}\n/**\n * Returns `true` if the two  
specified arrays are *structurally* equal to one another, i.e. contain the same number of the same elements in the  
same order.
```

```
*\n@Deprecated("Use Kotlin compiler 1.4 to avoid deprecation  
warning.")\n@SinceKotlin("1.3")\n@DeprecatedSinceKotlin(hiddenSince =  
"1.4")\n@ExperimentalUnsignedTypes\npublic infix fun UIntArray.contentEquals(other: UIntArray): Boolean {\n    return this.contentEquals(other)\n}\n/**\n * Returns `true` if the two specified arrays are *structurally* equal to  
one another, i.e. contain the same number of the same elements in the same order.
```

```
*\n@Deprecated("Use Kotlin compiler 1.4 to avoid deprecation  
warning.")\n@SinceKotlin("1.3")\n@DeprecatedSinceKotlin(hiddenSince =  
"1.4")\n@ExperimentalUnsignedTypes\npublic infix fun ULongArray.contentEquals(other: ULongArray):  
Boolean {\n    return this.contentEquals(other)\n}\n/**\n * Returns `true` if the two specified arrays are  
*structurally* equal to one another, i.e. contain the same number of the same elements in the same order.
```

```
*\n@Deprecated("Use Kotlin compiler 1.4 to avoid deprecation  
warning.")\n@SinceKotlin("1.3")\n@DeprecatedSinceKotlin(hiddenSince =  
"1.4")\n@ExperimentalUnsignedTypes\npublic infix fun UByteArray.contentEquals(other: UByteArray): Boolean  
{\n    return this.contentEquals(other)\n}\n/**\n * Returns `true` if the two specified arrays are *structurally* equal  
to one another, i.e. contain the same number of the same elements in the same order.
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*\n@Deprecated("Use Kotlin compiler 1.4 to avoid deprecation  
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"1.4")\n@ExperimentalUnsignedTypes\npublic infix fun UShortArray.contentEquals(other: UShortArray):  
Boolean {\n    return this.contentEquals(other)\n}\n/**\n * Returns `true` if the two specified arrays are  
*structurally* equal to one another, i.e. contain the same number of the same elements in the same order.
```

```
*\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\npublic infix fun UIntArray?.contentEquals(other:  
UIntArray?): Boolean {\n    return this?.storage.contentEquals(other?.storage)\n}\n/**\n * Returns `true` if the two  
specified arrays are *structurally* equal to one another, i.e. contain the same number of the same elements in the  
same order.
```

```
*\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\npublic infix fun  
ULongArray?.contentEquals(other: ULongArray?): Boolean {\n    return  
this?.storage.contentEquals(other?.storage)\n}\n/**\n * Returns `true` if the two specified arrays are *structurally*  
equal to one another, i.e. contain the same number of the same elements in the same order.
```

```
*\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\npublic infix fun UByteArray?.contentEquals(other:  
UByteArray?): Boolean {\n    return this?.storage.contentEquals(other?.storage)\n}\n/**\n * Returns `true` if the  
two specified arrays are *structurally* equal to one another, i.e. contain the same number of the same elements  
in the same order.
```

```
*\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\npublic infix fun  
UShortArray?.contentEquals(other: UShortArray?): Boolean {\n    return  
this?.storage.contentEquals(other?.storage)\n}\n/**\n * Returns a hash code based on the contents of this array as  
if it is [List].
```

```
*\n@Deprecated("Use Kotlin compiler 1.4 to avoid deprecation  
warning.")\n@SinceKotlin("1.3")\n@DeprecatedSinceKotlin(hiddenSince =  
"1.4")\n@ExperimentalUnsignedTypes\npublic fun UIntArray.contentHashCode(): Int {\n    return  
this.contentHashCode()\n}\n/**\n * Returns a hash code based on the contents of this array as if it is [List].
```

```
*\n@Deprecated("Use Kotlin compiler 1.4 to avoid deprecation  
warning.")\n@SinceKotlin("1.3")\n@DeprecatedSinceKotlin(hiddenSince =
```

```

\1.4\)\n@ExperimentalUnsignedTypes\npublic fun ULongArray.contentHashCode(): Int {\n  return
this.contentHashCode()\n}\n\n/**\n * Returns a hash code based on the contents of this array as if it is [List].\n
*/\n@Deprecated("Use Kotlin compiler 1.4 to avoid deprecation
warning.\")\n@SinceKotlin("1.3")\n@DeprecatedSinceKotlin(hiddenSince =
\1.4\)\n@ExperimentalUnsignedTypes\npublic fun UByteArray.contentHashCode(): Int {\n  return
this.contentHashCode()\n}\n\n/**\n * Returns a hash code based on the contents of this array as if it is [List].\n
*/\n@Deprecated("Use Kotlin compiler 1.4 to avoid deprecation
warning.\")\n@SinceKotlin("1.3")\n@DeprecatedSinceKotlin(hiddenSince =
\1.4\)\n@ExperimentalUnsignedTypes\npublic fun UShortArray.contentHashCode(): Int {\n  return
this.contentHashCode()\n}\n\n/**\n * Returns a hash code based on the contents of this array as if it is [List].\n
*/\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\npublic fun UIntArray?.contentHashCode(): Int {\n
return this?.storage.contentHashCode()\n}\n\n/**\n * Returns a hash code based on the contents of this array as if it
is [List].\n */\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\npublic fun
ULongArray?.contentHashCode(): Int {\n  return this?.storage.contentHashCode()\n}\n\n/**\n * Returns a hash
code based on the contents of this array as if it is [List].\n
*/\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\npublic fun UByteArray?.contentHashCode(): Int {\n
return this?.storage.contentHashCode()\n}\n\n/**\n * Returns a hash code based on the contents of this array as if it
is [List].\n */\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\npublic fun
UShortArray?.contentHashCode(): Int {\n  return this?.storage.contentHashCode()\n}\n\n/**\n * Returns a string
representation of the contents of the specified array as if it is [List].\n */\n * @sample
samples.collections.Arrays.ContentOperations.contentToString\n */\n@Deprecated("Use Kotlin compiler 1.4 to
avoid deprecation warning.\")\n@SinceKotlin("1.3")\n@DeprecatedSinceKotlin(hiddenSince =
\1.4\)\n@ExperimentalUnsignedTypes\npublic fun UIntArray.contentToString(): String {\n  return
this.contentToString()\n}\n\n/**\n * Returns a string representation of the contents of the specified array as if it is
[List].\n */\n * @sample samples.collections.Arrays.ContentOperations.contentToString\n */\n@Deprecated("Use
Kotlin compiler 1.4 to avoid deprecation
warning.\")\n@SinceKotlin("1.3")\n@DeprecatedSinceKotlin(hiddenSince =
\1.4\)\n@ExperimentalUnsignedTypes\npublic fun ULongArray.contentToString(): String {\n  return
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[List].\n */\n * @sample samples.collections.Arrays.ContentOperations.contentToString\n */\n@Deprecated("Use
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\1.4\)\n@ExperimentalUnsignedTypes\npublic fun UByteArray.contentToString(): String {\n  return
this.contentToString()\n}\n\n/**\n * Returns a string representation of the contents of the specified array as if it is
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\1.4\)\n@ExperimentalUnsignedTypes\npublic fun UShortArray.contentToString(): String {\n  return
this.contentToString()\n}\n\n/**\n * Returns a string representation of the contents of the specified array as if it is
[List].\n */\n * @sample samples.collections.Arrays.ContentOperations.contentToString\n
*/\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\npublic fun UIntArray?.contentToString(): String {\n
return this?.joinToString(", ", "[", "]") ?: "null"\n}\n\n/**\n * Returns a string representation of the contents of
the specified array as if it is [List].\n */\n * @sample
samples.collections.Arrays.ContentOperations.contentToString\n
*/\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\npublic fun ULongArray?.contentToString(): String {\n
return this?.joinToString(", ", "[", "]") ?: "null"\n}\n\n/**\n * Returns a string representation of the contents of
the specified array as if it is [List].\n */\n * @sample
samples.collections.Arrays.ContentOperations.contentToString\n

```

*\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\npublic fun UByteArray?.contentToString(): String {\n return this?.joinToString(", ", "[", "]") ?: "null"\n}\n\n/**\n * Returns a string representation of the contents of the specified array as if it is [List].\n * \n * @sample samples.collections.Arrays.ContentOperations.contentToString\n

*\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\npublic fun UShortArray?.contentToString(): String {\n return this?.joinToString(", ", "[", "]") ?: "null"\n}\n\n/**\n * Copies this array or its subrange into the [destination] array and returns that array.\n * \n * It's allowed to pass the same array in the [destination] and even specify the subrange so that it overlaps with the destination range.\n * \n * @param destination the array to copy to.\n * @param destinationOffset the position in the [destination] array to copy to, 0 by default.\n * @param startIndex the beginning (inclusive) of the subrange to copy, 0 by default.\n * @param endIndex the end (exclusive) of the subrange to copy, size of this array by default.\n * @throws IndexOutOfBoundsException or [IllegalArgumentException] when [startIndex] or [endIndex] is out of range of this array indices or when `startIndex > endIndex`.\n * @throws IndexOutOfBoundsException when the subrange doesn't fit into the [destination] array starting at the specified [destinationOffset],\n * or when that index is out of the [destination] array indices range.\n * \n * @return the [destination] array.\n

*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun UIntArray.copyInto(destination: UIntArray, destinationOffset: Int = 0, startIndex: Int = 0, endIndex: Int = size): UIntArray {\n storage.copyInto(destination.storage, destinationOffset, startIndex, endIndex)\n return destination\n}\n\n/**\n * Copies this array or its subrange into the [destination] array and returns that array.\n * \n * It's allowed to pass the same array in the [destination] and even specify the subrange so that it overlaps with the destination range.\n * \n * @param destination the array to copy to.\n * @param destinationOffset the position in the [destination] array to copy to, 0 by default.\n * @param startIndex the beginning (inclusive) of the subrange to copy, 0 by default.\n * @param endIndex the end (exclusive) of the subrange to copy, size of this array by default.\n * @throws IndexOutOfBoundsException or [IllegalArgumentException] when [startIndex] or [endIndex] is out of range of this array indices or when `startIndex > endIndex`.\n * @throws IndexOutOfBoundsException when the subrange doesn't fit into the [destination] array starting at the specified [destinationOffset],\n * or when that index is out of the [destination] array indices range.\n * \n * @return the [destination] array.\n

*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun ULongArray.copyInto(destination: ULongArray, destinationOffset: Int = 0, startIndex: Int = 0, endIndex: Int = size): ULongArray {\n storage.copyInto(destination.storage, destinationOffset, startIndex, endIndex)\n return destination\n}\n\n/**\n * Copies this array or its subrange into the [destination] array and returns that array.\n * \n * It's allowed to pass the same array in the [destination] and even specify the subrange so that it overlaps with the destination range.\n * \n * @param destination the array to copy to.\n * @param destinationOffset the position in the [destination] array to copy to, 0 by default.\n * @param startIndex the beginning (inclusive) of the subrange to copy, 0 by default.\n * @param endIndex the end (exclusive) of the subrange to copy, size of this array by default.\n * @throws IndexOutOfBoundsException or [IllegalArgumentException] when [startIndex] or [endIndex] is out of range of this array indices or when `startIndex > endIndex`.\n * @throws IndexOutOfBoundsException when the subrange doesn't fit into the [destination] array starting at the specified [destinationOffset],\n * or when that index is out of the [destination] array indices range.\n * \n * @return the [destination] array.\n

*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun UByteArray.copyInto(destination: UByteArray, destinationOffset: Int = 0, startIndex: Int = 0, endIndex: Int = size): UByteArray {\n storage.copyInto(destination.storage, destinationOffset, startIndex, endIndex)\n return destination\n}\n\n/**\n * Copies this array or its subrange into the [destination] array and returns that array.\n * \n * It's allowed to pass the same array in the [destination] and even specify the subrange so that it overlaps with the destination range.\n * \n * @param destination the array to copy to.\n * @param destinationOffset the position in the [destination] array to copy to, 0 by default.\n * @param startIndex the beginning (inclusive) of the subrange to copy, 0 by default.\n * @param endIndex the end (exclusive) of the subrange to copy, size of this array by default.\n * @throws IndexOutOfBoundsException or [IllegalArgumentException] when [startIndex] or [endIndex] is out of

range of this array indices or when `startIndex > endIndex`. \n * @throws IndexOutOfBoundsException when the subrange doesn't fit into the [destination] array starting at the specified [destinationOffset], \n * or when that index is out of the [destination] array indices range. \n * \n * @return the [destination] array. \n

```

*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UShortArray.copyInto(destination: UShortArray, destinationOffset: Int = 0, startIndex: Int = 0, endIndex: Int =
size): UShortArray {\n    storage.copyInto(destination.storage, destinationOffset, startIndex, endIndex)\n    return
destination\n}\n\n/**\n * Returns new array which is a copy of the original array. \n * \n * @sample
samples.collections.Arrays.CopyOfOperations.copyOfOf\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UIntArray.copyOfOf(): UIntArray {\n    return UIntArray(storage.copyOfOf())\n}\n\n/**\n * Returns new array which is
a copy of the original array. \n * \n * @sample samples.collections.Arrays.CopyOfOperations.copyOfOf\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
ULongArray.copyOfOf(): ULongArray {\n    return ULongArray(storage.copyOfOf())\n}\n\n/**\n * Returns new array
which is a copy of the original array. \n * \n * @sample samples.collections.Arrays.CopyOfOperations.copyOfOf\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UByteArray.copyOfOf(): UByteArray {\n    return UByteArray(storage.copyOfOf())\n}\n\n/**\n * Returns new array
which is a copy of the original array. \n * \n * @sample samples.collections.Arrays.CopyOfOperations.copyOfOf\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UShortArray.copyOfOf(): UShortArray {\n    return UShortArray(storage.copyOfOf())\n}\n\n/**\n * Returns new array
which is a copy of the original array, resized to the given [newSize]. \n * The copy is either truncated or padded at
the end with zero values if necessary. \n * \n * - If [newSize] is less than the size of the original array, the copy array
is truncated to the [newSize]. \n * - If [newSize] is greater than the size of the original array, the extra elements in the
copy array are filled with zero values. \n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UIntArray.copyOfOf(newSize: Int): UIntArray {\n    return UIntArray(storage.copyOfOf(newSize))\n}\n\n/**\n *
Returns new array which is a copy of the original array, resized to the given [newSize]. \n * The copy is either
truncated or padded at the end with zero values if necessary. \n * \n * - If [newSize] is less than the size of the
original array, the copy array is truncated to the [newSize]. \n * - If [newSize] is greater than the size of the original
array, the extra elements in the copy array are filled with zero values. \n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
ULongArray.copyOfOf(newSize: Int): ULongArray {\n    return ULongArray(storage.copyOfOf(newSize))\n}\n\n/**\n *
Returns new array which is a copy of the original array, resized to the given [newSize]. \n * The copy is either
truncated or padded at the end with zero values if necessary. \n * \n * - If [newSize] is less than the size of the
original array, the copy array is truncated to the [newSize]. \n * - If [newSize] is greater than the size of the original
array, the extra elements in the copy array are filled with zero values. \n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UByteArray.copyOfOf(newSize: Int): UByteArray {\n    return UByteArray(storage.copyOfOf(newSize))\n}\n\n/**\n *
Returns new array which is a copy of the original array, resized to the given [newSize]. \n * The copy is either
truncated or padded at the end with zero values if necessary. \n * \n * - If [newSize] is less than the size of the
original array, the copy array is truncated to the [newSize]. \n * - If [newSize] is greater than the size of the original
array, the extra elements in the copy array are filled with zero values. \n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UShortArray.copyOfOf(newSize: Int): UShortArray {\n    return UShortArray(storage.copyOfOf(newSize))\n}\n\n/**\n *
Returns a new array which is a copy of the specified range of the original array. \n * \n * @param fromIndex the start
of the range (inclusive) to copy. \n * @param toIndex the end of the range (exclusive) to copy. \n * \n * @throws
IndexOutOfBoundsException if [fromIndex] is less than zero or [toIndex] is greater than the size of this array. \n *
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun

```

```

UIntArray.copyOfRange(fromIndex: Int, toIndex: Int): UIntArray {
    return
    UIntArray(storage.copyOfRange(fromIndex, toIndex))
}

/**
 * Returns a new array which is a copy of the
 * specified range of the original array.
 * @param fromIndex the start of the range (inclusive) to copy.
 * @param toIndex the end of the range (exclusive) to copy.
 * @throws IndexOutOfBoundsException if
 * [fromIndex] is less than zero or [toIndex] is greater than the size of this array.
 * @throws
 * IllegalArgumentException if [fromIndex] is greater than [toIndex].
 */
@SinceKotlin("1.3")
@ExperimentalUnsignedTypes
@kotlin.internal.InlineOnly
public inline fun
ULongArray.copyOfRange(fromIndex: Int, toIndex: Int): ULongArray {
    return
    ULongArray(storage.copyOfRange(fromIndex, toIndex))
}

/**
 * Returns a new array which is a copy of the
 * specified range of the original array.
 * @param fromIndex the start of the range (inclusive) to copy.
 * @param toIndex the end of the range (exclusive) to copy.
 * @throws IndexOutOfBoundsException if
 * [fromIndex] is less than zero or [toIndex] is greater than the size of this array.
 * @throws
 * IllegalArgumentException if [fromIndex] is greater than [toIndex].
 */
@SinceKotlin("1.3")
@ExperimentalUnsignedTypes
@kotlin.internal.InlineOnly
public inline fun
UByteArray.copyOfRange(fromIndex: Int, toIndex: Int): UByteArray {
    return
    UByteArray(storage.copyOfRange(fromIndex, toIndex))
}

/**
 * Returns a new array which is a copy of the
 * specified range of the original array.
 * @param fromIndex the start of the range (inclusive) to copy.
 * @param toIndex the end of the range (exclusive) to copy.
 * @throws IndexOutOfBoundsException if
 * [fromIndex] is less than zero or [toIndex] is greater than the size of this array.
 * @throws
 * IllegalArgumentException if [fromIndex] is greater than [toIndex].
 */
@SinceKotlin("1.3")
@ExperimentalUnsignedTypes
@kotlin.internal.InlineOnly
public inline fun
UShortArray.copyOfRange(fromIndex: Int, toIndex: Int): UShortArray {
    return
    UShortArray(storage.copyOfRange(fromIndex, toIndex))
}

/**
 * Fills this array or its subrange with the
 * specified [element] value.
 * @param fromIndex the start of the range (inclusive) to fill, 0 by default.
 * @param toIndex the end of the range (exclusive) to fill, size of this array by default.
 * @throws
 * IndexOutOfBoundsException if [fromIndex] is less than zero or [toIndex] is greater than the size of this array.
 * @throws
 * IllegalArgumentException if [fromIndex] is greater than [toIndex].
 */
@SinceKotlin("1.3")
@ExperimentalUnsignedTypes
public fun UIntArray.fill(element: UInt, fromIndex:
Int = 0, toIndex: Int = size): Unit {
    storage.fill(element.toInt(), fromIndex, toIndex)
}

/**
 * Fills this array
 * or its subrange with the specified [element] value.
 * @param fromIndex the start of the range (inclusive) to
 * fill, 0 by default.
 * @param toIndex the end of the range (exclusive) to fill, size of this array by default.
 * @throws
 * IndexOutOfBoundsException if [fromIndex] is less than zero or [toIndex] is greater than the size of this
 * array.
 * @throws
 * IllegalArgumentException if [fromIndex] is greater than [toIndex].
 */
@SinceKotlin("1.3")
@ExperimentalUnsignedTypes
public fun ULongArray.fill(element: ULong,
fromIndex: Int = 0, toIndex: Int = size): Unit {
    storage.fill(element.toLong(), fromIndex, toIndex)
}

/**
 * Fills this array or its subrange with the specified [element] value.
 * @param fromIndex the start of the range
 * (inclusive) to fill, 0 by default.
 * @param toIndex the end of the range (exclusive) to fill, size of this array by
 * default.
 * @throws
 * IndexOutOfBoundsException if [fromIndex] is less than zero or [toIndex] is greater than
 * the size of this array.
 * @throws
 * IllegalArgumentException if [fromIndex] is greater than [toIndex].
 */
@SinceKotlin("1.3")
@ExperimentalUnsignedTypes
public fun UByteArray.fill(element: UByte,
fromIndex: Int = 0, toIndex: Int = size): Unit {
    storage.fill(element.toByte(), fromIndex, toIndex)
}

/**
 * Fills this array or its subrange with the specified [element] value.
 * @param fromIndex the start of the range
 * (inclusive) to fill, 0 by default.
 * @param toIndex the end of the range (exclusive) to fill, size of this array by
 * default.
 * @throws
 * IndexOutOfBoundsException if [fromIndex] is less than zero or [toIndex] is greater than
 * the size of this array.
 * @throws
 * IllegalArgumentException if [fromIndex] is greater than [toIndex].
 */
@SinceKotlin("1.3")
@ExperimentalUnsignedTypes
public fun UShortArray.fill(element: UShort,
fromIndex: Int = 0, toIndex: Int = size): Unit {
    storage.fill(element.toShort(), fromIndex, toIndex)
}

/**
 * Returns the range of valid indices for the array.
 */

```

```

*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic inline val UIntArray.indices: IntRange\n  get()
= storage.indices\n\n/**\n * Returns the range of valid indices for the array.\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic inline val ULongArray.indices: IntRange\n
get() = storage.indices\n\n/**\n * Returns the range of valid indices for the array.\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic inline val UByteArray.indices: IntRange\n
get() = storage.indices\n\n/**\n * Returns the range of valid indices for the array.\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic inline val UShortArray.indices: IntRange\n
get() = storage.indices\n\n/**\n * Returns the last valid index for the array.\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic inline val UIntArray.lastIndex: Int\n  get() =
storage.lastIndex\n\n/**\n * Returns the last valid index for the array.\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic inline val ULongArray.lastIndex: Int\n  get() =
storage.lastIndex\n\n/**\n * Returns the last valid index for the array.\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic inline val UByteArray.lastIndex: Int\n  get() =
storage.lastIndex\n\n/**\n * Returns the last valid index for the array.\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic inline val UShortArray.lastIndex: Int\n  get() =
storage.lastIndex\n\n/**\n * Returns an array containing all elements of the original array and then the given
[element].\n *\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline
operator fun UIntArray.plus(element: UInt): UIntArray {\n  return UIntArray(storage +
element.toInt())\n}\n\n/**\n * Returns an array containing all elements of the original array and then the given
[element].\n *\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline
operator fun ULongArray.plus(element: ULong): ULongArray {\n  return ULongArray(storage +
element.toLong())\n}\n\n/**\n * Returns an array containing all elements of the original array and then the given
[element].\n *\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline
operator fun UByteArray.plus(element: UByte): UByteArray {\n  return UByteArray(storage +
element.toByte())\n}\n\n/**\n * Returns an array containing all elements of the original array and then the given
[element].\n *\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline
operator fun UShortArray.plus(element: UShort): UShortArray {\n  return UShortArray(storage +
element.toShort())\n}\n\n/**\n * Returns an array containing all elements of the original array and then all elements
of the given [elements] collection.\n *\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic operator
fun UIntArray.plus(elements: Collection<UInt>): UIntArray {\n  var index = size\n  val result =
storage.copyOfOf(size + elements.size)\n  for (element in elements) result[index++] = element.toInt()\n  return
UIntArray(result)\n}\n\n/**\n * Returns an array containing all elements of the original array and then all elements
of the given [elements] collection.\n *\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic operator
fun ULongArray.plus(elements: Collection<ULong>): ULongArray {\n  var index = size\n  val result =
storage.copyOfOf(size + elements.size)\n  for (element in elements) result[index++] = element.toLong()\n  return
ULongArray(result)\n}\n\n/**\n * Returns an array containing all elements of the original array and then all
elements of the given [elements] collection.\n *\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic
operator fun UByteArray.plus(elements: Collection<UByte>): UByteArray {\n  var index = size\n  val result =
storage.copyOfOf(size + elements.size)\n  for (element in elements) result[index++] = element.toByte()\n  return
UByteArray(result)\n}\n\n/**\n * Returns an array containing all elements of the original array and then all elements
of the given [elements] collection.\n *\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic operator
fun UShortArray.plus(elements: Collection<UShort>): UShortArray {\n  var index = size\n  val result =
storage.copyOfOf(size + elements.size)\n  for (element in elements) result[index++] = element.toShort()\n  return
UShortArray(result)\n}\n\n/**\n * Returns an array containing all elements of the original array and then all
elements of the given [elements] array.\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline operator fun
UIntArray.plus(elements: UIntArray): UIntArray {\n  return UIntArray(storage + elements.storage)\n}\n\n/**\n *
Returns an array containing all elements of the original array and then all elements of the given [elements] array.\n

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*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline operator fun
ULongArray.plus(elements: ULongArray): ULongArray {\n    return ULongArray(storage +
elements.storage)\n}\n\n**\n * Returns an array containing all elements of the original array and then all elements
of the given [elements] array.\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline operator fun
UByteArray.plus(elements: UByteArray): UByteArray {\n    return UByteArray(storage +
elements.storage)\n}\n\n**\n * Returns an array containing all elements of the original array and then all elements
of the given [elements] array.\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline operator fun
UShortArray.plus(elements: UShortArray): UShortArray {\n    return UShortArray(storage +
elements.storage)\n}\n\n**\n * Sorts the array in-place.\n * \n * @sample
samples.collections.Arrays.Sorting.sortArray\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic
fun UIntArray.sort(): Unit {\n    if (size > 1) sortArray(this, 0, size)\n}\n\n**\n * Sorts the array in-place.\n * \n *
@sample samples.collections.Arrays.Sorting.sortArray\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun ULongArray.sort(): Unit {\n    if (size > 1)
sortArray(this, 0, size)\n}\n\n**\n * Sorts the array in-place.\n * \n * @sample
samples.collections.Arrays.Sorting.sortArray\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic
fun UByteArray.sort(): Unit {\n    if (size > 1) sortArray(this, 0, size)\n}\n\n**\n * Sorts the array in-place.\n * \n *
@sample samples.collections.Arrays.Sorting.sortArray\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun UShortArray.sort(): Unit {\n    if (size > 1)
sortArray(this, 0, size)\n}\n\n**\n * Sorts a range in the array in-place.\n * \n * @param fromIndex the start of the
range (inclusive) to sort, 0 by default.\n * @param toIndex the end of the range (exclusive) to sort, size of this array
by default.\n * \n * @throws IndexOutOfBoundsException if [fromIndex] is less than zero or [toIndex] is greater
than the size of this array.\n * @throws IllegalArgumentException if [fromIndex] is greater than [toIndex].\n * \n *
@sample samples.collections.Arrays.Sorting.sortRangeOfArray\n
*\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\npublic fun UIntArray.sort(fromIndex: Int = 0, toIndex:
Int = size): Unit {\n    AbstractList.checkRangeIndexes(fromIndex, toIndex, size)\n    sortArray(this, fromIndex,
toIndex)\n}\n\n**\n * Sorts a range in the array in-place.\n * \n * @param fromIndex the start of the range
(inclusive) to sort, 0 by default.\n * @param toIndex the end of the range (exclusive) to sort, size of this array by
default.\n * \n * @throws IndexOutOfBoundsException if [fromIndex] is less than zero or [toIndex] is greater than
the size of this array.\n * @throws IllegalArgumentException if [fromIndex] is greater than [toIndex].\n * \n *
@sample samples.collections.Arrays.Sorting.sortRangeOfArray\n
*\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\npublic fun ULongArray.sort(fromIndex: Int = 0,
toIndex: Int = size): Unit {\n    AbstractList.checkRangeIndexes(fromIndex, toIndex, size)\n    sortArray(this,
fromIndex, toIndex)\n}\n\n**\n * Sorts a range in the array in-place.\n * \n * @param fromIndex the start of the
range (inclusive) to sort, 0 by default.\n * @param toIndex the end of the range (exclusive) to sort, size of this array
by default.\n * \n * @throws IndexOutOfBoundsException if [fromIndex] is less than zero or [toIndex] is greater
than the size of this array.\n * @throws IllegalArgumentException if [fromIndex] is greater than [toIndex].\n * \n *
@sample samples.collections.Arrays.Sorting.sortRangeOfArray\n
*\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\npublic fun UByteArray.sort(fromIndex: Int = 0,
toIndex: Int = size): Unit {\n    AbstractList.checkRangeIndexes(fromIndex, toIndex, size)\n    sortArray(this,
fromIndex, toIndex)\n}\n\n**\n * Sorts a range in the array in-place.\n * \n * @param fromIndex the start of the
range (inclusive) to sort, 0 by default.\n * @param toIndex the end of the range (exclusive) to sort, size of this array
by default.\n * \n * @throws IndexOutOfBoundsException if [fromIndex] is less than zero or [toIndex] is greater
than the size of this array.\n * @throws IllegalArgumentException if [fromIndex] is greater than [toIndex].\n * \n *
@sample samples.collections.Arrays.Sorting.sortRangeOfArray\n
*\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\npublic fun UShortArray.sort(fromIndex: Int = 0,
toIndex: Int = size): Unit {\n    AbstractList.checkRangeIndexes(fromIndex, toIndex, size)\n    sortArray(this,

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fromIndex, toIndex)\n}\n\n/**\n * Sorts elements of the array in the specified range in-place.\n * The elements are sorted descending according to their natural sort order.\n * \n * @param fromIndex the start of the range (inclusive) to sort.\n * @param toIndex the end of the range (exclusive) to sort.\n * \n * @throws IndexOutOfBoundsException if [fromIndex] is less than zero or [toIndex] is greater than the size of this array.\n * @throws

IllegalArgumentException if [fromIndex] is greater than [toIndex].\n

```
*/\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\npublic fun UIntArray.sortDescending(fromIndex: Int, toIndex: Int): Unit {\n    sort(fromIndex, toIndex)\n    reverse(fromIndex, toIndex)\n}\n\n/**\n * Sorts elements of the array in the specified range in-place.\n * The elements are sorted descending according to their natural sort order.\n * \n * @param fromIndex the start of the range (inclusive) to sort.\n * @param toIndex the end of the range (exclusive) to sort.\n * \n * @throws IndexOutOfBoundsException if [fromIndex] is less than zero or [toIndex] is greater than the size of this array.\n * @throws IllegalArgumentException if [fromIndex] is greater than [toIndex].\n
```

```
*/\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\npublic fun ULongArray.sortDescending(fromIndex: Int, toIndex: Int): Unit {\n    sort(fromIndex, toIndex)\n    reverse(fromIndex, toIndex)\n}\n\n/**\n * Sorts elements of the array in the specified range in-place.\n * The elements are sorted descending according to their natural sort order.\n * \n * @param fromIndex the start of the range (inclusive) to sort.\n * @param toIndex the end of the range (exclusive) to sort.\n * \n * @throws IndexOutOfBoundsException if [fromIndex] is less than zero or [toIndex] is greater than the size of this array.\n * @throws IllegalArgumentException if [fromIndex] is greater than [toIndex].\n
```

```
*/\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\npublic fun UByteArray.sortDescending(fromIndex: Int, toIndex: Int): Unit {\n    sort(fromIndex, toIndex)\n    reverse(fromIndex, toIndex)\n}\n\n/**\n * Sorts elements of the array in the specified range in-place.\n * The elements are sorted descending according to their natural sort order.\n * \n * @param fromIndex the start of the range (inclusive) to sort.\n * @param toIndex the end of the range (exclusive) to sort.\n * \n * @throws IndexOutOfBoundsException if [fromIndex] is less than zero or [toIndex] is greater than the size of this array.\n * @throws IllegalArgumentException if [fromIndex] is greater than [toIndex].\n
```

```
*/\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\npublic fun UShortArray.sortDescending(fromIndex: Int, toIndex: Int): Unit {\n    sort(fromIndex, toIndex)\n    reverse(fromIndex, toIndex)\n}\n\n/**\n * Returns an array of type [ByteArray], which is a copy of this array where each element is a signed reinterpretation\n * of the corresponding element of this array.\n
```

```
*/\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun UByteArray.toByteArray(): ByteArray {\n    return storage.copyOf()\n}\n\n/**\n * Returns an array of type [IntArray], which is a copy of this array where each element is a signed reinterpretation\n * of the corresponding element of this array.\n
```

```
*/\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun UIntArray.toIntArray(): IntArray {\n    return storage.copyOf()\n}\n\n/**\n * Returns an array of type [LongArray], which is a copy of this array where each element is a signed reinterpretation\n * of the corresponding element of this array.\n */\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun ULongArray.toLongArray(): LongArray {\n    return storage.copyOf()\n}\n\n/**\n * Returns an array of type [ShortArray], which is a copy of this array where each element is a signed reinterpretation\n * of the corresponding element of this array.\n
```

```
*/\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun UShortArray.toShortArray(): ShortArray {\n    return storage.copyOf()\n}\n\n/**\n * Returns a *typed* object array containing all of the elements of this primitive array.\n
```

```
*/\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun UIntArray.toTypedArray(): Array<UInt> {\n    return Array(size) { index -> this[index] }\n}\n\n/**\n * Returns a *typed* object array containing all of the elements of this primitive array.\n */\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun ULongArray.toTypedArray(): Array<ULong> {\n    return Array(size) { index -> this[index] }\n}\n\n/**\n * Returns a *typed* object array containing all of the elements of this primitive array.\n
```

```
*/\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun UByteArray.toTypedArray(): Array<UByte> {\n    return Array(size) { index -> this[index] }\n}\n\n/**\n * Returns a *typed* object array
```

containing all of the elements of this primitive array.\n

```
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun UShortArray.toTypedArray():  
Array<UShort> {\n    return Array(size) { index -> this[index] }\n}\n\n/**\n * Returns an array of UByte containing  
all of the elements of this generic array.\n */\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun  
Array<out UByte>.toUByteArray(): UByteArray {\n    return UByteArray(size) { index -> this[index] }\n}\n\n/**\n * Returns an array of type [UByteArray], which is a copy of this array where each element is an unsigned  
reinterpretation\n * of the corresponding element of this array.\n
```

```
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun  
ByteArray.toUByteArray(): UByteArray {\n    return UByteArray(this.copyOf())\n}\n\n/**\n * Returns an array of  
UInt containing all of the elements of this generic array.\n
```

```
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun Array<out UInt>.toUIntArray(): UIntArray  
{\n    return UIntArray(size) { index -> this[index] }\n}\n\n/**\n * Returns an array of type [UIntArray], which is a  
copy of this array where each element is an unsigned reinterpretation\n * of the corresponding element of this  
array.\n */\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun  
IntArray.toUIntArray(): UIntArray {\n    return UIntArray(this.copyOf())\n}\n\n/**\n * Returns an array of ULong  
containing all of the elements of this generic array.\n
```

```
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun Array<out ULong>.toULongArray():  
ULongArray {\n    return ULongArray(size) { index -> this[index] }\n}\n\n/**\n * Returns an array of type  
[ULongArray], which is a copy of this array where each element is an unsigned reinterpretation\n * of the  
corresponding element of this array.\n
```

```
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun  
LongArray.toULongArray(): ULongArray {\n    return ULongArray(this.copyOf())\n}\n\n/**\n * Returns an array  
of UShort containing all of the elements of this generic array.\n
```

```
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun Array<out UShort>.toUShortArray():  
UShortArray {\n    return UShortArray(size) { index -> this[index] }\n}\n\n/**\n * Returns an array of type  
[UShortArray], which is a copy of this array where each element is an unsigned reinterpretation\n * of the  
corresponding element of this array.\n
```

```
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun  
ShortArray.toUShortArray(): UShortArray {\n    return UShortArray(this.copyOf())\n}\n\n/**\n * Returns a [Map]  
where keys are elements from the given array and values are\n * produced by the [valueSelector] function applied to  
each element.\n * \n * If any two elements are equal, the last one gets added to the map.\n * \n * The returned map  
preserves the entry iteration order of the original array.\n * \n * @sample  
samples.collections.Collections.Transformations.associateWith\n
```

```
*\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun <V>  
UIntArray.associateWith(valueSelector: (UInt) -> V): Map<UInt, V> {\n    val result = LinkedHashMap<UInt,  
V>(mapCapacity(size).coerceAtLeast(16))\n    return associateWithTo(result, valueSelector)\n}\n\n/**\n * Returns a  
[Map] where keys are elements from the given array and values are\n * produced by the [valueSelector] function  
applied to each element.\n * \n * If any two elements are equal, the last one gets added to the map.\n * \n * The  
returned map preserves the entry iteration order of the original array.\n * \n * @sample  
samples.collections.Collections.Transformations.associateWith\n
```

```
*\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun <V>  
ULongArray.associateWith(valueSelector: (ULong) -> V): Map<ULong, V> {\n    val result =  
LinkedHashMap<ULong, V>(mapCapacity(size).coerceAtLeast(16))\n    return associateWithTo(result,  
valueSelector)\n}\n\n/**\n * Returns a [Map] where keys are elements from the given array and values are\n * produced by the [valueSelector] function applied to each element.\n * \n * If any two elements are equal, the last one  
gets added to the map.\n * \n * The returned map preserves the entry iteration order of the original array.\n * \n * @sample  
samples.collections.Collections.Transformations.associateWith\n
```

```
*\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun <V>
```

```

UByteArray.associateWith(valueSelector: (UByte) -> V): Map<UByte, V> {
    val result =
    LinkedHashMap<UByte, V>(mapCapacity(size).coerceAtLeast(16))
    return associateWithTo(result,
    valueSelector)
}

/**
 * Returns a [Map] where keys are elements from the given array and values are
 * produced by the [valueSelector] function applied to each element.
 * If any two elements are equal, the last one
 * gets added to the map.
 * The returned map preserves the entry iteration order of the original array.
 *
 * @sample samples.collections.Collections.Transformations.associateWith
 */
@SinceKotlin("1.4")
@ExperimentalUnsignedTypes
@kotlin.internal.InlineOnly
public inline fun <V>
UShortArray.associateWith(valueSelector: (UShort) -> V): Map<UShort, V> {
    val result =
    LinkedHashMap<UShort, V>(mapCapacity(size).coerceAtLeast(16))
    return associateWithTo(result,
    valueSelector)
}

/**
 * Populates and returns the [destination] mutable map with key-value pairs for each
 * element of the given array,
 * where key is the element itself and value is provided by the [valueSelector] function
 * applied to that key.
 * If any two elements are equal, the last one overwrites the former value in the map.
 *
 * @sample samples.collections.Collections.Transformations.associateWithTo
 */
@SinceKotlin("1.4")
@ExperimentalUnsignedTypes
@kotlin.internal.InlineOnly
public inline fun <V, M :
MutableMap<in UInt, in V>> UIntArray.associateWithTo(destination: M, valueSelector: (UInt) -> V): M {
    for
    (element in this) {
        destination.put(element, valueSelector(element))
    }
    return destination
}

/**
 * Populates and returns the [destination] mutable map with key-value pairs for each element of the given array,
 * where key is the element itself and value is provided by the [valueSelector] function applied to that key.
 * If any two elements are equal, the last one overwrites the former value in the map.
 *
 * @sample
    samples.collections.Collections.Transformations.associateWithTo
 */
@SinceKotlin("1.4")
@ExperimentalUnsignedTypes
@kotlin.internal.InlineOnly
public inline fun <V, M :
MutableMap<in ULong, in V>> ULongArray.associateWithTo(destination: M, valueSelector: (ULong) -> V): M
{
    for (element in this) {
        destination.put(element, valueSelector(element))
    }
    return
    destination
}

/**
 * Populates and returns the [destination] mutable map with key-value pairs for each element
 * of the given array,
 * where key is the element itself and value is provided by the [valueSelector] function applied
 * to that key.
 * If any two elements are equal, the last one overwrites the former value in the map.
 *
 * @sample samples.collections.Collections.Transformations.associateWithTo
 */
@SinceKotlin("1.4")
@ExperimentalUnsignedTypes
@kotlin.internal.InlineOnly
public inline fun <V, M :
MutableMap<in UByte, in V>> UByteArray.associateWithTo(destination: M, valueSelector: (UByte) -> V): M {
    for (element in this) {
        destination.put(element, valueSelector(element))
    }
    return
    destination
}

/**
 * Populates and returns the [destination] mutable map with key-value pairs for each element
 * of the given array,
 * where key is the element itself and value is provided by the [valueSelector] function applied
 * to that key.
 * If any two elements are equal, the last one overwrites the former value in the map.
 *
 * @sample samples.collections.Collections.Transformations.associateWithTo
 */
@SinceKotlin("1.4")
@ExperimentalUnsignedTypes
@kotlin.internal.InlineOnly
public inline fun <V, M :
MutableMap<in UShort, in V>> UShortArray.associateWithTo(destination: M, valueSelector: (UShort) -> V): M
{
    for (element in this) {
        destination.put(element, valueSelector(element))
    }
    return
    destination
}

/**
 * Returns a single list of all elements yielded from results of [transform] function being
 * invoked on each element of original array.
 *
 * @sample
    samples.collections.Collections.Transformations.flatMap
 */
@SinceKotlin("1.3")
@ExperimentalUnsignedTypes
@kotlin.internal.InlineOnly
public inline fun <R>
UIntArray.flatMap(transform: (UInt) -> Iterable<R>): List<R> {
    return flatMapTo(ArrayList<R>(),
    transform)
}

/**
 * Returns a single list of all elements yielded from results of [transform] function being
 * invoked on each element of original array.
 *
 * @sample
    samples.collections.Collections.Transformations.flatMap
 */
@SinceKotlin("1.3")
@ExperimentalUnsignedTypes
@kotlin.internal.InlineOnly
public inline fun <R>
ULongArray.flatMap(transform: (ULong) -> Iterable<R>): List<R> {
    return flatMapTo(ArrayList<R>(),
    transform)
}

/**
 * Returns a single list of all elements yielded from results of [transform] function being

```

invoked on each element of original array.\n * \n * @sample
samples.collections.Collections.Transformations.flatMap\n

```
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun <R>  

UByteArray.flatMap(transform: (UByte) -> Iterable<R>): List<R> {\n    return flatMapTo(ArrayList<R>(),  

transform)\n}\n\n/**\n * Returns a single list of all elements yielded from results of [transform] function being  

invoked on each element of original array.\n * \n * @sample  

samples.collections.Collections.Transformations.flatMap\n
```

```
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun <R>  

UShortArray.flatMap(transform: (UShort) -> Iterable<R>): List<R> {\n    return flatMapTo(ArrayList<R>(),  

transform)\n}\n\n/**\n * Returns a single list of all elements yielded from results of [transform] function being  

invoked on each element\n * and its index in the original array.\n * \n * @sample  

samples.collections.Collections.Transformations.flatMapIndexed\n
```

```
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution  

ByLambdaReturnType\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun <R>  

UIntArray.flatMapIndexed(transform: (index: Int, UInt) -> Iterable<R>): List<R> {\n    return  

flatMapIndexedTo(ArrayList<R>(), transform)\n}\n\n/**\n * Returns a single list of all elements yielded from  

results of [transform] function being invoked on each element\n * and its index in the original array.\n * \n *  

@sample samples.collections.Collections.Transformations.flatMapIndexed\n
```

```
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution  

ByLambdaReturnType\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun <R>  

ULongArray.flatMapIndexed(transform: (index: Int, ULong) -> Iterable<R>): List<R> {\n    return  

flatMapIndexedTo(ArrayList<R>(), transform)\n}\n\n/**\n * Returns a single list of all elements yielded from  

results of [transform] function being invoked on each element\n * and its index in the original array.\n * \n *  

@sample samples.collections.Collections.Transformations.flatMapIndexed\n
```

```
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution  

ByLambdaReturnType\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun <R>  

UByteArray.flatMapIndexed(transform: (index: Int, UByte) -> Iterable<R>): List<R> {\n    return  

flatMapIndexedTo(ArrayList<R>(), transform)\n}\n\n/**\n * Returns a single list of all elements yielded from  

results of [transform] function being invoked on each element\n * and its index in the original array.\n * \n *  

@sample samples.collections.Collections.Transformations.flatMapIndexed\n
```

```
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution  

ByLambdaReturnType\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun <R>  

UShortArray.flatMapIndexed(transform: (index: Int, UShort) -> Iterable<R>): List<R> {\n    return  

flatMapIndexedTo(ArrayList<R>(), transform)\n}\n\n/**\n * Appends all elements yielded from results of  

[transform] function being invoked on each element\n * and its index in the original array, to the given  

[destination].\n
```

```
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution  

ByLambdaReturnType\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun <R, C :  

MutableCollection<in R>> UIntArray.flatMapIndexedTo(destination: C, transform: (index: Int, UInt) ->  

Iterable<R>): C {\n    var index = 0\n    for (element in this) {\n        val list = transform(index++, element)\n    destination.addAll(list)\n    }\n    return destination\n}\n\n/**\n * Appends all elements yielded from results of  

[transform] function being invoked on each element\n * and its index in the original array, to the given  

[destination].\n
```

```
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution  

ByLambdaReturnType\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun <R, C :  

MutableCollection<in R>> ULongArray.flatMapIndexedTo(destination: C, transform: (index: Int, ULong) ->  

Iterable<R>): C {\n    var index = 0\n    for (element in this) {\n        val list = transform(index++, element)\n    destination.addAll(list)\n    }\n    return destination\n}\n\n/**\n * Appends all elements yielded from results of
```


[transform] function being invoked on each element\n * and its index in the original array, to the given [destination].\n

```
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution\nByLambdaReturnType\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun <R, C : MutableCollection<in R>> UByteArray.flatMapIndexedTo(destination: C, transform: (index: Int, UByte) -> Iterable<R>): C {\n    var index = 0\n    for (element in this) {\n        val list = transform(index++, element)\n        destination.addAll(list)\n    }\n    return destination\n}\n\n/**\n * Appends all elements yielded from results of [transform] function being invoked on each element\n * and its index in the original array, to the given [destination].\n */
```

```
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution\nByLambdaReturnType\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun <R, C : MutableCollection<in R>> UShortArray.flatMapIndexedTo(destination: C, transform: (index: Int, UShort) -> Iterable<R>): C {\n    var index = 0\n    for (element in this) {\n        val list = transform(index++, element)\n        destination.addAll(list)\n    }\n    return destination\n}\n\n/**\n * Appends all elements yielded from results of [transform] function being invoked on each element of original array, to the given [destination].\n */
```

```
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun <R, C : MutableCollection<in R>> UIntArray.flatMapTo(destination: C, transform: (UInt) -> Iterable<R>): C {\n    for (element in this) {\n        val list = transform(element)\n        destination.addAll(list)\n    }\n    return destination\n}\n\n/**\n * Appends all elements yielded from results of [transform] function being invoked on each element of original array, to the given [destination].\n */
```

```
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun <R, C : MutableCollection<in R>> ULongArray.flatMapTo(destination: C, transform: (ULong) -> Iterable<R>): C {\n    for (element in this) {\n        val list = transform(element)\n        destination.addAll(list)\n    }\n    return destination\n}\n\n/**\n * Appends all elements yielded from results of [transform] function being invoked on each element of original array, to the given [destination].\n */
```

```
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun <R, C : MutableCollection<in R>> UByteArray.flatMapTo(destination: C, transform: (UByte) -> Iterable<R>): C {\n    for (element in this) {\n        val list = transform(element)\n        destination.addAll(list)\n    }\n    return destination\n}\n\n/**\n * Appends all elements yielded from results of [transform] function being invoked on each element of original array, to the given [destination].\n */
```

```
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun <R, C : MutableCollection<in R>> UShortArray.flatMapTo(destination: C, transform: (UShort) -> Iterable<R>): C {\n    for (element in this) {\n        val list = transform(element)\n        destination.addAll(list)\n    }\n    return destination\n}\n\n/**\n * Groups elements of the original array by the key returned by the given [keySelector] function\n * applied to each element and returns a map where each group key is associated with a list of\n * corresponding elements.\n * \n * The returned map preserves the entry iteration order of the keys produced from the original array.\n * \n * @sample samples.collections.Collections.Transformations.groupBy\n */
```

```
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun <K> UIntArray.groupBy(keySelector: (UInt) -> K): Map<K, List<UInt>> {\n    return groupByTo(LinkedHashMap<K, MutableList<UInt>>(), keySelector)\n}\n\n/**\n * Groups elements of the original array by the key returned by the given [keySelector] function\n * applied to each element and returns a map where each group key is associated with a list of\n * corresponding elements.\n * \n * The returned map preserves the entry iteration order of the keys produced from the original array.\n * \n * @sample samples.collections.Collections.Transformations.groupBy\n */
```

```
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun <K> ULongArray.groupBy(keySelector: (ULong) -> K): Map<K, List<ULong>> {\n    return groupByTo(LinkedHashMap<K, MutableList<ULong>>(), keySelector)\n}\n\n/**\n * Groups elements of the original array by the key returned by the given [keySelector] function\n * applied to each element and returns a map where each group key is associated with a list of\n * corresponding elements.\n * \n * The returned map preserves the
```

entry iteration order of the keys produced from the original array.\n * \n * @sample
samples.collections.Collections.Transformations.groupBy\n

```
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun <K>  

UByteArray.groupBy(keySelector: (UByte) -> K): Map<K, List<UByte>> {\n return  

groupByTo(LinkedHashMap<K, MutableList<UByte>>(), keySelector)\n}\n\n/**\n * Groups elements of the  

original array by the key returned by the given [keySelector] function\n * applied to each element and returns a map  

where each group key is associated with a list of corresponding elements.\n * \n * The returned map preserves the  

entry iteration order of the keys produced from the original array.\n * \n * @sample  

samples.collections.Collections.Transformations.groupBy\n
```

```
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun <K>  

UShortArray.groupBy(keySelector: (UShort) -> K): Map<K, List<UShort>> {\n return  

groupByTo(LinkedHashMap<K, MutableList<UShort>>(), keySelector)\n}\n\n/**\n * Groups values returned by  

the [valueTransform] function applied to each element of the original array\n * by the key returned by the given  

[keySelector] function applied to the element\n * and returns a map where each group key is associated with a list of  

corresponding values.\n * \n * The returned map preserves the entry iteration order of the keys produced from the  

original array.\n * \n * @sample samples.collections.Collections.Transformations.groupByKeysAndValues\n
```

```
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun <K, V>  

UIntArray.groupBy(keySelector: (UInt) -> K, valueTransform: (UInt) -> V): Map<K, List<V>> {\n return  

groupByTo(LinkedHashMap<K, MutableList<V>>(), keySelector, valueTransform)\n}\n\n/**\n * Groups values  

returned by the [valueTransform] function applied to each element of the original array\n * by the key returned by  

the given [keySelector] function applied to the element\n * and returns a map where each group key is associated  

with a list of corresponding values.\n * \n * The returned map preserves the entry iteration order of the keys  

produced from the original array.\n * \n * @sample  

samples.collections.Collections.Transformations.groupByKeysAndValues\n
```

```
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun <K, V>  

ULongArray.groupBy(keySelector: (ULong) -> K, valueTransform: (ULong) -> V): Map<K, List<V>> {\n return  

groupByTo(LinkedHashMap<K, MutableList<V>>(), keySelector, valueTransform)\n}\n\n/**\n * Groups values  

returned by the [valueTransform] function applied to each element of the original array\n * by the key returned by  

the given [keySelector] function applied to the element\n * and returns a map where each group key is associated  

with a list of corresponding values.\n * \n * The returned map preserves the entry iteration order of the keys  

produced from the original array.\n * \n * @sample  

samples.collections.Collections.Transformations.groupByKeysAndValues\n
```

```
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun <K, V>  

UByteArray.groupBy(keySelector: (UByte) -> K, valueTransform: (UByte) -> V): Map<K, List<V>> {\n return  

groupByTo(LinkedHashMap<K, MutableList<V>>(), keySelector, valueTransform)\n}\n\n/**\n * Groups values  

returned by the [valueTransform] function applied to each element of the original array\n * by the key returned by  

the given [keySelector] function applied to the element\n * and returns a map where each group key is associated  

with a list of corresponding values.\n * \n * The returned map preserves the entry iteration order of the keys  

produced from the original array.\n * \n * @sample  

samples.collections.Collections.Transformations.groupByKeysAndValues\n
```

```
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun <K, V>  

UShortArray.groupBy(keySelector: (UShort) -> K, valueTransform: (UShort) -> V): Map<K, List<V>> {\n return  

groupByTo(LinkedHashMap<K, MutableList<V>>(), keySelector, valueTransform)\n}\n\n/**\n * Groups elements  

of the original array by the key returned by the given [keySelector] function\n * applied to each element and puts to  

the [destination] map each group key associated with a list of corresponding elements.\n * \n * @return The  

[destination] map.\n * \n * @sample samples.collections.Collections.Transformations.groupBy\n
```

```
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun <K, M>  

MutableMap<in K, MutableList<UInt>>> UIntArray.groupByTo(destination: M, keySelector: (UInt) -> K): M {\n
```

```

for (element in this) {
    val key = keySelector(element)
    val list = destination.getOrPut(key) {
        ArrayList<UInt>()
    }
    list.add(element)
}
return destination
}

/**
 * Groups elements of the original array by the key returned by the given [keySelector] function * applied to each element and puts to the [destination] map each group key associated with a list of corresponding elements.
 *
 * @return The [destination] map.
 *
 * @sample samples.collections.Collections.Transformations.groupBy
 */
@SinceKotlin("1.3")
@ExperimentalUnsignedTypes
@kotlin.internal.InlineOnly
public inline fun <K, M : MutableMap<in K, MutableList<ULong>>>> ULongArray.groupByTo(destination: M, keySelector: (ULong) -> K): M {
    for (element in this) {
        val key = keySelector(element)
        val list = destination.getOrPut(key) {
            ArrayList<ULong>()
        }
        list.add(element)
    }
    return destination
}

/**
 * Groups elements of the original array by the key returned by the given [keySelector] function * applied to each element and puts to the [destination] map each group key associated with a list of corresponding elements.
 *
 * @return The [destination] map.
 *
 * @sample samples.collections.Collections.Transformations.groupBy
 */
@SinceKotlin("1.3")
@ExperimentalUnsignedTypes
@kotlin.internal.InlineOnly
public inline fun <K, M : MutableMap<in K, MutableList<UByte>>>> UByteArray.groupByTo(destination: M, keySelector: (UByte) -> K): M {
    for (element in this) {
        val key = keySelector(element)
        val list = destination.getOrPut(key) {
            ArrayList<UByte>()
        }
        list.add(element)
    }
    return destination
}

/**
 * Groups values returned by the [valueTransform] function applied to each element of the original array * by the key returned by the given [keySelector] function applied to the element * and puts to the [destination] map each group key associated with a list of corresponding values.
 *
 * @return The [destination] map.
 *
 * @sample samples.collections.Collections.Transformations.groupByKeysAndValues
 */
@SinceKotlin("1.3")
@ExperimentalUnsignedTypes
@kotlin.internal.InlineOnly
public inline fun <K, M : MutableMap<in K, MutableList<UShort>>>> UShortArray.groupByTo(destination: M, keySelector: (UShort) -> K): M {
    for (element in this) {
        val key = keySelector(element)
        val list = destination.getOrPut(key) {
            ArrayList<UShort>()
        }
        list.add(element)
    }
    return destination
}

/**
 * Groups values returned by the [valueTransform] function applied to each element of the original array * by the key returned by the given [keySelector] function applied to the element * and puts to the [destination] map each group key associated with a list of corresponding values.
 *
 * @return The [destination] map.
 *
 * @sample samples.collections.Collections.Transformations.groupByKeysAndValues
 */
@SinceKotlin("1.3")
@ExperimentalUnsignedTypes
@kotlin.internal.InlineOnly
public inline fun <K, V, M : MutableMap<in K, MutableList<V>>>> UIntArray.groupByTo(destination: M, keySelector: (UInt) -> K, valueTransform: (UInt) -> V): M {
    for (element in this) {
        val key = keySelector(element)
        val list = destination.getOrPut(key) {
            ArrayList<V>()
        }
        list.add(valueTransform(element))
    }
    return destination
}

/**
 * Groups values returned by the [valueTransform] function applied to each element of the original array * by the key returned by the given [keySelector] function applied to the element * and puts to the [destination] map each group key associated with a list of corresponding values.
 *
 * @return The [destination] map.
 *
 * @sample samples.collections.Collections.Transformations.groupByKeysAndValues
 */
@SinceKotlin("1.3")
@ExperimentalUnsignedTypes
@kotlin.internal.InlineOnly
public inline fun <K, V, M : MutableMap<in K, MutableList<V>>>> ULongArray.groupByTo(destination: M, keySelector: (ULong) -> K, valueTransform: (ULong) -> V): M {
    for (element in this) {
        val key = keySelector(element)
        val list = destination.getOrPut(key) {
            ArrayList<V>()
        }
        list.add(valueTransform(element))
    }
    return destination
}

/**
 * Groups values returned by the [valueTransform] function applied to each element of the original array * by the key returned by the given [keySelector] function applied to the element * and puts to the [destination] map each group key associated with a list of corresponding values.
 *
 * @return The [destination] map.
 *
 * @sample samples.collections.Collections.Transformations.groupByKeysAndValues
 */
@SinceKotlin("1.3")
@ExperimentalUnsignedTypes
@kotlin.internal.InlineOnly
public inline fun <K, V, M : MutableMap<in K, MutableList<V>>>> UByteArray.groupByTo(destination: M, keySelector: (UByte) -> K, valueTransform: (UByte) -> V): M {
    for (element in this) {
        val key = keySelector(element)
        val list = destination.getOrPut(key) {
            ArrayList<V>()
        }
        list.add(valueTransform(element))
    }
    return destination
}

/**
 * Groups values returned by the [valueTransform] function applied to each element of the

```

original array\n * by the key returned by the given [keySelector] function applied to the element\n * and puts to the [destination] map each group key associated with a list of corresponding values.\n * \n * @return The [destination] map.\n * \n * @sample samples.collections.Collections.Transformations.groupByKeyAndValues\n * \n * @SinceKotlin("1.3")\n * @ExperimentalUnsignedTypes\n * @kotlin.internal.InlineOnly\n * public inline fun <K, V, M : MutableMap<in K, MutableList<V>>> UShortArray.groupByTo(destination: M, keySelector: (UShort) -> K, valueTransform: (UShort) -> V): M {\n * for (element in this) {\n * val key = keySelector(element)\n * val list = destination.getOrPut(key) { ArrayList<V>() }\n * list.add(valueTransform(element))\n * }\n * return destination\n * }\n * \n * Returns a list containing the results of applying the given [transform] function\n * to each element in the original array.\n * \n * @sample samples.collections.Collections.Transformations.map\n * \n * @SinceKotlin("1.3")\n * @ExperimentalUnsignedTypes\n * @kotlin.internal.InlineOnly\n * public inline fun <R> UIntArray.map(transform: (UInt) -> R): List<R> {\n * return mapTo(ArrayList<R>(size), transform)\n * }\n * \n * Returns a list containing the results of applying the given [transform] function\n * to each element in the original array.\n * \n * @sample samples.collections.Collections.Transformations.map\n * \n * @SinceKotlin("1.3")\n * @ExperimentalUnsignedTypes\n * @kotlin.internal.InlineOnly\n * public inline fun <R> ULongArray.map(transform: (ULong) -> R): List<R> {\n * return mapTo(ArrayList<R>(size), transform)\n * }\n * \n * Returns a list containing the results of applying the given [transform] function\n * to each element in the original array.\n * \n * @sample samples.collections.Collections.Transformations.map\n * \n * @SinceKotlin("1.3")\n * @ExperimentalUnsignedTypes\n * @kotlin.internal.InlineOnly\n * public inline fun <R> UByteArray.map(transform: (UByte) -> R): List<R> {\n * return mapTo(ArrayList<R>(size), transform)\n * }\n * \n * Returns a list containing the results of applying the given [transform] function\n * to each element in the original array.\n * \n * @sample samples.collections.Collections.Transformations.map\n * \n * @SinceKotlin("1.3")\n * @ExperimentalUnsignedTypes\n * @kotlin.internal.InlineOnly\n * public inline fun <R> UShortArray.map(transform: (UShort) -> R): List<R> {\n * return mapTo(ArrayList<R>(size), transform)\n * }\n * \n * Returns a list containing the results of applying the given [transform] function\n * to each element and its index in the original array.\n * \n * @param [transform] function that takes the index of an element and the element itself\n * and returns the result of the transform applied to the element.\n * \n * @SinceKotlin("1.3")\n * @ExperimentalUnsignedTypes\n * @kotlin.internal.InlineOnly\n * public inline fun <R> UIntArray.mapIndexed(transform: (index: Int, UInt) -> R): List<R> {\n * return mapIndexedTo(ArrayList<R>(size), transform)\n * }\n * \n * Returns a list containing the results of applying the given [transform] function\n * to each element and its index in the original array.\n * \n * @param [transform] function that takes the index of an element and the element itself\n * and returns the result of the transform applied to the element.\n * \n * @SinceKotlin("1.3")\n * @ExperimentalUnsignedTypes\n * @kotlin.internal.InlineOnly\n * public inline fun <R> ULongArray.mapIndexed(transform: (index: Int, ULong) -> R): List<R> {\n * return mapIndexedTo(ArrayList<R>(size), transform)\n * }\n * \n * Returns a list containing the results of applying the given [transform] function\n * to each element and its index in the original array.\n * \n * @param [transform] function that takes the index of an element and the element itself\n * and returns the result of the transform applied to the element.\n * \n * @SinceKotlin("1.3")\n * @ExperimentalUnsignedTypes\n * @kotlin.internal.InlineOnly\n * public inline fun <R> UByteArray.mapIndexed(transform: (index: Int, UByte) -> R): List<R> {\n * return mapIndexedTo(ArrayList<R>(size), transform)\n * }\n * \n * Returns a list containing the results of applying the given [transform] function\n * to each element and its index in the original array.\n * \n * @param [transform] function that takes the index of an element and the element itself\n * and returns the result of the transform applied to the element.\n * \n * @SinceKotlin("1.3")\n * @ExperimentalUnsignedTypes\n * @kotlin.internal.InlineOnly\n * public inline fun <R> UShortArray.mapIndexed(transform: (index: Int, UShort) -> R): List<R> {\n * return mapIndexedTo(ArrayList<R>(size), transform)\n * }\n * \n * Applies the given [transform] function to each element and its index in the original array\n * and appends the results to the given [destination].\n * \n * @param [transform] function that takes the index of an element and the element itself\n * and returns the result of the transform applied to the element.\n * \n * @SinceKotlin("1.3")\n * @ExperimentalUnsignedTypes\n * @kotlin.internal.InlineOnly\n * public inline fun <R, C :

`MutableCollection<in R>> UIntArray.mapIndexedTo(destination: C, transform: (index: Int, UInt) -> R): C` {
var index = 0
for (item in this)
destination.add(transform(index++, item))
return destination
}
Applies the given [transform] function to each element and its index in the original array
and appends the results to the given [destination].
@param [transform] function that takes the index of an element and the element
itself and returns the result of the transform applied to the element.

*
@SinceKotlin("1.3")
@ExperimentalUnsignedTypes
@kotlin.internal.InlineOnly
public inline fun <R, C :
MutableCollection<in R>> ULongArray.mapIndexedTo(destination: C, transform: (index: Int, ULong) -> R): C {
var index = 0
for (item in this)
destination.add(transform(index++, item))
return
destination
}
Applies the given [transform] function to each element and its index in the original array
and appends the results to the given [destination].
@param [transform] function that takes the index of an
element and the element itself and returns the result of the transform applied to the element.

*
@SinceKotlin("1.3")
@ExperimentalUnsignedTypes
@kotlin.internal.InlineOnly
public inline fun <R, C :
MutableCollection<in R>> UByteArray.mapIndexedTo(destination: C, transform: (index: Int, UByte) -> R): C {
var index = 0
for (item in this)
destination.add(transform(index++, item))
return
destination
}
Applies the given [transform] function to each element and its index in the original array
and appends the results to the given [destination].
@param [transform] function that takes the index of an
element and the element itself and returns the result of the transform applied to the element.

*
@SinceKotlin("1.3")
@ExperimentalUnsignedTypes
@kotlin.internal.InlineOnly
public inline fun <R, C :
MutableCollection<in R>> UShortArray.mapIndexedTo(destination: C, transform: (index: Int, UShort) -> R): C {
var index = 0
for (item in this)
destination.add(transform(index++, item))
return
destination
}
Applies the given [transform] function to each element of the original array
and appends the results to the given [destination].

*
@SinceKotlin("1.3")
@ExperimentalUnsignedTypes
@kotlin.internal.InlineOnly
public inline fun <R, C :
MutableCollection<in R>> UIntArray.mapTo(destination: C, transform: (UInt) -> R): C {
for (item in this)
destination.add(transform(item))
return destination
}
Applies the given [transform] function to each
element of the original array
and appends the results to the given [destination].

*
@SinceKotlin("1.3")
@ExperimentalUnsignedTypes
@kotlin.internal.InlineOnly
public inline fun <R, C :
MutableCollection<in R>> ULongArray.mapTo(destination: C, transform: (ULong) -> R): C {
for (item in
this)
destination.add(transform(item))
return destination
}
Applies the given [transform]
function to each element of the original array
and appends the results to the given [destination].

*
@SinceKotlin("1.3")
@ExperimentalUnsignedTypes
@kotlin.internal.InlineOnly
public inline fun <R, C :
MutableCollection<in R>> UByteArray.mapTo(destination: C, transform: (UByte) -> R): C {
for (item in this)
destination.add(transform(item))
return destination
}
Applies the given [transform] function to
each element of the original array
and appends the results to the given [destination].

*
@SinceKotlin("1.3")
@ExperimentalUnsignedTypes
@kotlin.internal.InlineOnly
public inline fun <R, C :
MutableCollection<in R>> UShortArray.mapTo(destination: C, transform: (UShort) -> R): C {
for (item in
this)
destination.add(transform(item))
return destination
}
Returns a lazy [Iterable] that wraps
each element of the original array
into an [IndexedValue] containing the index of that element and the element
itself.

*
@SinceKotlin("1.3")
@ExperimentalUnsignedTypes
public fun UIntArray.withIndex():

Iterable<IndexedValue<UInt>> {
return IndexingIterable { iterator() }
}
Returns a lazy [Iterable]
that wraps each element of the original array
into an [IndexedValue] containing the index of that element and the
element itself.

*
@SinceKotlin("1.3")
@ExperimentalUnsignedTypes
public fun ULongArray.withIndex():

Iterable<IndexedValue<ULong>> {
return IndexingIterable { iterator() }
}
Returns a lazy [Iterable]
that wraps each element of the original array
into an [IndexedValue] containing the index of that element and the
element itself.

*
@SinceKotlin("1.3")
@ExperimentalUnsignedTypes
public fun UByteArray.withIndex():

Iterable<IndexedValue<UByte>> {
return IndexingIterable { iterator() }
}
Returns a lazy [Iterable]
that wraps each element of the original array
into an [IndexedValue] containing the index of that element and the
element itself.

*
@SinceKotlin("1.3")
@ExperimentalUnsignedTypes
public fun UShortArray.withIndex():


```

[predicate].\n *\n@SinceKotlin(\\"1.3\\")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic
inline fun ULongArray.count(predicate: (ULong) -> Boolean): Int {\n  var count = 0\n  for (element in this) if
(predicate(element)) ++count\n  return count\n}\n\n/**\n * Returns the number of elements matching the given
[predicate].\n *\n@SinceKotlin(\\"1.3\\")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic
inline fun UByteArray.count(predicate: (UByte) -> Boolean): Int {\n  var count = 0\n  for (element in this) if
(predicate(element)) ++count\n  return count\n}\n\n/**\n * Returns the number of elements matching the given
[predicate].\n *\n@SinceKotlin(\\"1.3\\")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic
inline fun UShortArray.count(predicate: (UShort) -> Boolean): Int {\n  var count = 0\n  for (element in this) if
(predicate(element)) ++count\n  return count\n}\n\n/**\n * Accumulates value starting with [initial] value and
applying [operation] from left to right\n * to current accumulator value and each element.\n * \n * Returns the
specified [initial] value if the array is empty.\n * \n * @param [operation] function that takes current accumulator
value and an element, and calculates the next accumulator value.\n
*\n@SinceKotlin(\\"1.3\\")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun <R>
UIntArray.fold(initial: R, operation: (acc: R, UInt) -> R): R {\n  var accumulator = initial\n  for (element in this)
accumulator = operation(accumulator, element)\n  return accumulator\n}\n\n/**\n * Accumulates value starting
with [initial] value and applying [operation] from left to right\n * to current accumulator value and each element.\n *
Returns the specified [initial] value if the array is empty.\n * \n * @param [operation] function that takes
current accumulator value and an element, and calculates the next accumulator value.\n
*\n@SinceKotlin(\\"1.3\\")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun <R>
ULongArray.fold(initial: R, operation: (acc: R, ULong) -> R): R {\n  var accumulator = initial\n  for (element in
this) accumulator = operation(accumulator, element)\n  return accumulator\n}\n\n/**\n * Accumulates value
starting with [initial] value and applying [operation] from left to right\n * to current accumulator value and each
element.\n * \n * Returns the specified [initial] value if the array is empty.\n * \n * @param [operation] function that
takes current accumulator value and an element, and calculates the next accumulator value.\n
*\n@SinceKotlin(\\"1.3\\")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun <R>
UByteArray.fold(initial: R, operation: (acc: R, UByte) -> R): R {\n  var accumulator = initial\n  for (element in
this) accumulator = operation(accumulator, element)\n  return accumulator\n}\n\n/**\n * Accumulates value
starting with [initial] value and applying [operation] from left to right\n * to current accumulator value and each
element.\n * \n * Returns the specified [initial] value if the array is empty.\n * \n * @param [operation] function that
takes current accumulator value and an element, and calculates the next accumulator value.\n
*\n@SinceKotlin(\\"1.3\\")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun <R>
UShortArray.fold(initial: R, operation: (acc: R, UShort) -> R): R {\n  var accumulator = initial\n  for (element in
this) accumulator = operation(accumulator, element)\n  return accumulator\n}\n\n/**\n * Accumulates value
starting with [initial] value and applying [operation] from left to right\n * to current accumulator value and each
element with its index in the original array.\n * \n * Returns the specified [initial] value if the array is empty.\n *
\n * @param [operation] function that takes the index of an element, current accumulator value\n * and the element
itself, and calculates the next accumulator value.\n
*\n@SinceKotlin(\\"1.3\\")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun <R>
UIntArray.foldIndexed(initial: R, operation: (index: Int, acc: R, UInt) -> R): R {\n  var index = 0\n  var
accumulator = initial\n  for (element in this) accumulator = operation(index++, accumulator, element)\n  return
accumulator\n}\n\n/**\n * Accumulates value starting with [initial] value and applying [operation] from left to
right\n * to current accumulator value and each element with its index in the original array.\n * \n * Returns the
specified [initial] value if the array is empty.\n * \n * @param [operation] function that takes the index of an
element, current accumulator value\n * and the element itself, and calculates the next accumulator value.\n
*\n@SinceKotlin(\\"1.3\\")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun <R>
ULongArray.foldIndexed(initial: R, operation: (index: Int, acc: R, ULong) -> R): R {\n  var index = 0\n  var
accumulator = initial\n  for (element in this) accumulator = operation(index++, accumulator, element)\n  return
accumulator\n}\n\n/**\n * Accumulates value starting with [initial] value and applying [operation] from left to

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right\n * to current accumulator value and each element with its index in the original array.\n * \n * Returns the
specified [initial] value if the array is empty.\n * \n * @param [operation] function that takes the index of an
element, current accumulator value\n * and the element itself, and calculates the next accumulator value.\n
*\n @SinceKotlin("1.3")\n @ExperimentalUnsignedTypes\n @kotlin.internal.InlineOnly\n public inline fun <R>
UByteArray.foldIndexed(initial: R, operation: (index: Int, acc: R, UByte) -> R): R {\n   var index = 0\n   var
accumulator = initial\n   for (element in this) accumulator = operation(index++, accumulator, element)\n   return
accumulator\n}\n\n/**\n * Accumulates value starting with [initial] value and applying [operation] from left to
right\n * to current accumulator value and each element with its index in the original array.\n * \n * Returns the
specified [initial] value if the array is empty.\n * \n * @param [operation] function that takes the index of an
element, current accumulator value\n * and the element itself, and calculates the next accumulator value.\n
*\n @SinceKotlin("1.3")\n @ExperimentalUnsignedTypes\n @kotlin.internal.InlineOnly\n public inline fun <R>
UShortArray.foldIndexed(initial: R, operation: (index: Int, acc: R, UShort) -> R): R {\n   var index = 0\n   var
accumulator = initial\n   for (element in this) accumulator = operation(index++, accumulator, element)\n   return
accumulator\n}\n\n/**\n * Accumulates value starting with [initial] value and applying [operation] from right to
left\n * to each element and current accumulator value.\n * \n * Returns the specified [initial] value if the array is
empty.\n * \n * @param [operation] function that takes an element and current accumulator value, and calculates the
next accumulator value.\n
*\n @SinceKotlin("1.3")\n @ExperimentalUnsignedTypes\n @kotlin.internal.InlineOnly\n public inline fun <R>
UIntArray.foldRight(initial: R, operation: (UInt, acc: R) -> R): R {\n   var index = lastIndex\n   var accumulator =
initial\n   while (index >= 0) {\n     accumulator = operation(get(index--), accumulator)\n   }\n   return
accumulator\n}\n\n/**\n * Accumulates value starting with [initial] value and applying [operation] from right to
left\n * to each element and current accumulator value.\n * \n * Returns the specified [initial] value if the array is
empty.\n * \n * @param [operation] function that takes an element and current accumulator value, and calculates the
next accumulator value.\n
*\n @SinceKotlin("1.3")\n @ExperimentalUnsignedTypes\n @kotlin.internal.InlineOnly\n public inline fun <R>
ULongArray.foldRight(initial: R, operation: (ULong, acc: R) -> R): R {\n   var index = lastIndex\n   var
accumulator = initial\n   while (index >= 0) {\n     accumulator = operation(get(index--), accumulator)\n   }\n
return accumulator\n}\n\n/**\n * Accumulates value starting with [initial] value and applying [operation] from right
to left\n * to each element and current accumulator value.\n * \n * Returns the specified [initial] value if the array is
empty.\n * \n * @param [operation] function that takes an element and current accumulator value, and calculates the
next accumulator value.\n
*\n @SinceKotlin("1.3")\n @ExperimentalUnsignedTypes\n @kotlin.internal.InlineOnly\n public inline fun <R>
UByteArray.foldRight(initial: R, operation: (UByte, acc: R) -> R): R {\n   var index = lastIndex\n   var
accumulator = initial\n   while (index >= 0) {\n     accumulator = operation(get(index--), accumulator)\n   }\n
return accumulator\n}\n\n/**\n * Accumulates value starting with [initial] value and applying [operation] from right
to left\n * to each element and current accumulator value.\n * \n * Returns the specified [initial] value if the array is
empty.\n * \n * @param [operation] function that takes an element and current accumulator value, and calculates the
next accumulator value.\n
*\n @SinceKotlin("1.3")\n @ExperimentalUnsignedTypes\n @kotlin.internal.InlineOnly\n public inline fun <R>
UShortArray.foldRight(initial: R, operation: (UShort, acc: R) -> R): R {\n   var index = lastIndex\n   var
accumulator = initial\n   while (index >= 0) {\n     accumulator = operation(get(index--), accumulator)\n   }\n
return accumulator\n}\n\n/**\n * Accumulates value starting with [initial] value and applying [operation] from right
to left\n * to each element with its index in the original array and current accumulator value.\n * \n * Returns the
specified [initial] value if the array is empty.\n * \n * @param [operation] function that takes the index of an
element, the element itself\n * and current accumulator value, and calculates the next accumulator value.\n
*\n @SinceKotlin("1.3")\n @ExperimentalUnsignedTypes\n @kotlin.internal.InlineOnly\n public inline fun <R>
UIntArray.foldRightIndexed(initial: R, operation: (index: Int, UInt, acc: R) -> R): R {\n   var index = lastIndex\n
var accumulator = initial\n   while (index >= 0) {\n     accumulator = operation(index, get(index), accumulator)\n

```



```

--index\n } \n return accumulator\n}\n\n/**\n * Accumulates value starting with [initial] value and applying
[operation] from right to left\n * to each element with its index in the original array and current accumulator value.\n
*\n * Returns the specified [initial] value if the array is empty.\n *\n * @param [operation] function that takes the
index of an element, the element itself\n * and current accumulator value, and calculates the next accumulator
value.\n *\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
<R> ULongArray.foldRightIndexed(initial: R, operation: (index: Int, ULong, acc: R) -> R): R {\n    var index =
lastIndex\n    var accumulator = initial\n    while (index >= 0) {\n        accumulator = operation(index, get(index),
accumulator)\n        --index\n    }\n    return accumulator\n}\n\n/**\n * Accumulates value starting with [initial]
value and applying [operation] from right to left\n * to each element with its index in the original array and current
accumulator value.\n *\n * Returns the specified [initial] value if the array is empty.\n *\n * @param [operation]
function that takes the index of an element, the element itself\n * and current accumulator value, and calculates the
next accumulator value.\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun <R>
UByteArray.foldRightIndexed(initial: R, operation: (index: Int, UByte, acc: R) -> R): R {\n    var index =
lastIndex\n    var accumulator = initial\n    while (index >= 0) {\n        accumulator = operation(index, get(index),
accumulator)\n        --index\n    }\n    return accumulator\n}\n\n/**\n * Accumulates value starting with [initial]
value and applying [operation] from right to left\n * to each element with its index in the original array and current
accumulator value.\n *\n * Returns the specified [initial] value if the array is empty.\n *\n * @param [operation]
function that takes the index of an element, the element itself\n * and current accumulator value, and calculates the
next accumulator value.\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun <R>
UShortArray.foldRightIndexed(initial: R, operation: (index: Int, UShort, acc: R) -> R): R {\n    var index =
lastIndex\n    var accumulator = initial\n    while (index >= 0) {\n        accumulator = operation(index, get(index),
accumulator)\n        --index\n    }\n    return accumulator\n}\n\n/**\n * Performs the given [action] on each
element.\n *\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline
fun UIntArray.forEach(action: (UInt) -> Unit): Unit {\n    for (element in this) action(element)\n}\n\n/**\n *
Performs the given [action] on each element.\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
ULongArray.forEach(action: (ULong) -> Unit): Unit {\n    for (element in this) action(element)\n}\n\n/**\n *
Performs the given [action] on each element.\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UByteArray.forEach(action: (UByte) -> Unit): Unit {\n    for (element in this) action(element)\n}\n\n/**\n *
Performs the given [action] on each element.\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UShortArray.forEach(action: (UShort) -> Unit): Unit {\n    for (element in this) action(element)\n}\n\n/**\n *
Performs the given [action] on each element, providing sequential index with the element.\n *\n * @param [action]
function that takes the index of an element and the element itself\n * and performs the action on the element.\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UIntArray.forEachIndexed(action: (index: Int, UInt) -> Unit): Unit {\n    var index = 0\n    for (item in this)
action(index++, item)\n}\n\n/**\n * Performs the given [action] on each element, providing sequential index with
the element.\n *\n * @param [action] function that takes the index of an element and the element itself\n * and performs
the action on the element.\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
ULongArray.forEachIndexed(action: (index: Int, ULong) -> Unit): Unit {\n    var index = 0\n    for (item in this)
action(index++, item)\n}\n\n/**\n * Performs the given [action] on each element, providing sequential index with
the element.\n *\n * @param [action] function that takes the index of an element and the element itself\n * and performs
the action on the element.\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun

```

UByteArray.forEachIndexed(action: (index: Int, UByte) -> Unit): Unit {\n var index = 0\n for (item in this) action(index++, item)\n}\n\n/**\n * Performs the given [action] on each element, providing sequential index with the element.\n * @param [action] function that takes the index of an element and the element itself\n * and performs the action on the element.\n

```
*/\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun\nUShortArray.forEachIndexed(action: (index: Int, UShort) -> Unit): Unit {\n var index = 0\n for (item in this) action(index++, item)\n}\n\n@Deprecated("Use maxOrNull instead.")\nReplaceWith("this.maxOrNull()")\n@DeprecatedSinceKotlin(warningSince = "1.4", errorSince = "1.5",\nhiddenSince = "1.6")\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun UIntArray.max():\nUInt? {\n return maxOrNull()\n}\n\n@Deprecated("Use maxOrNull instead.")\nReplaceWith("this.maxOrNull()")\n@DeprecatedSinceKotlin(warningSince = "1.4", errorSince = "1.5",\nhiddenSince = "1.6")\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun ULongArray.max():\nULong? {\n return maxOrNull()\n}\n\n@Deprecated("Use maxOrNull instead.")\nReplaceWith("this.maxOrNull()")\n@DeprecatedSinceKotlin(warningSince = "1.4", errorSince = "1.5",\nhiddenSince = "1.6")\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun UByteArray.max():\nUByte? {\n return maxOrNull()\n}\n\n@Deprecated("Use maxOrNull instead.")\nReplaceWith("this.maxOrNull()")\n@DeprecatedSinceKotlin(warningSince = "1.4", errorSince = "1.5",\nhiddenSince = "1.6")\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun UShortArray.max():\nUShort? {\n return maxOrNull()\n}\n\n@Deprecated("Use maxByOrNull instead.")\nReplaceWith("this.maxByOrNull(selector)")\n@DeprecatedSinceKotlin(warningSince = "1.4", errorSince =\n"1.5", hiddenSince =\n"1.6")\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun\n<R : Comparable<R>> UIntArray.maxBy(selector: (UInt) -> R): UInt? {\n return\nmaxByOrNull(selector)\n}\n\n@Deprecated("Use maxByOrNull instead.")\nReplaceWith("this.maxByOrNull(selector)")\n@DeprecatedSinceKotlin(warningSince = "1.4", errorSince =\n"1.5", hiddenSince =\n"1.6")\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun\n<R : Comparable<R>> ULongArray.maxBy(selector: (ULong) -> R): ULong? {\n return\nmaxByOrNull(selector)\n}\n\n@Deprecated("Use maxByOrNull instead.")\nReplaceWith("this.maxByOrNull(selector)")\n@DeprecatedSinceKotlin(warningSince = "1.4", errorSince =\n"1.5", hiddenSince =\n"1.6")\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun\n<R : Comparable<R>> UByteArray.maxBy(selector: (UByte) -> R): UByte? {\n return\nmaxByOrNull(selector)\n}\n\n@Deprecated("Use maxByOrNull instead.")\nReplaceWith("this.maxByOrNull(selector)")\n@DeprecatedSinceKotlin(warningSince = "1.4", errorSince =\n"1.5", hiddenSince =\n"1.6")\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun\n<R : Comparable<R>> UShortArray.maxBy(selector: (UShort) -> R): UShort? {\n return\nmaxByOrNull(selector)\n}\n\n/**\n * Returns the first element yielding the largest value of the given function or\n * `null` if there are no elements.\n * \n * @sample samples.collections.Collections.Aggregates.maxByOrNull\n */\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun <R : Comparable<R>> UIntArray.maxByOrNull(selector: (UInt) -> R): UInt? {\n if (isEmpty()) return null\n var\nmaxElem = this[0]\n val lastIndex = this.lastIndex\n if (lastIndex == 0) return maxElem\n var maxValue =\nselector(maxElem)\n for (i in 1..lastIndex) {\n val e = this[i]\n val v = selector(e)\n if (maxValue < v)\n {\n maxElem = e\n maxValue = v\n }\n }\n return maxElem\n}\n\n/**\n * Returns the first\n element yielding the largest value of the given function or `null` if there are no elements.\n * \n * @sample\n samples.collections.Collections.Aggregates.maxByOrNull\n */\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun <R :
```

```
Comparable<R>> ULongArray.maxByOrNull(selector: (ULong) -> R): ULong? {\n  if (isEmpty()) return null\n  var maxElem = this[0]\n  val lastIndex = this.lastIndex\n  if (lastIndex == 0) return maxElem\n  var maxValue = selector(maxElem)\n  for (i in 1..lastIndex) {\n    val e = this[i]\n    val v = selector(e)\n    if (maxValue < v)\n      {\n        maxElem = e\n        maxValue = v\n      }\n  }\n  return maxElem\n}\n\n/**\n * Returns the first element yielding the largest value of the given function or `null` if there are no elements.\n * \n * @sample samples.collections.Collections.Aggregates.maxByOrNull
```

```
*\n * @SinceKotlin("1.4")\n * @ExperimentalUnsignedTypes\n * @kotlin.internal.InlineOnly\n * public inline fun <R : Comparable<R>> UByteArray.maxByOrNull(selector: (UByte) -> R): UByte? {\n  if (isEmpty()) return null\n  var maxElem = this[0]\n  val lastIndex = this.lastIndex\n  if (lastIndex == 0) return maxElem\n  var maxValue = selector(maxElem)\n  for (i in 1..lastIndex) {\n    val e = this[i]\n    val v = selector(e)\n    if (maxValue < v)\n      {\n        maxElem = e\n        maxValue = v\n      }\n  }\n  return maxElem\n}\n\n/**\n * Returns the first element yielding the largest value of the given function or `null` if there are no elements.\n * \n * @sample samples.collections.Collections.Aggregates.maxByOrNull
```

```
*\n * @SinceKotlin("1.4")\n * @ExperimentalUnsignedTypes\n * @kotlin.internal.InlineOnly\n * public inline fun <R : Comparable<R>> UShortArray.maxByOrNull(selector: (UShort) -> R): UShort? {\n  if (isEmpty()) return null\n  var maxElem = this[0]\n  val lastIndex = this.lastIndex\n  if (lastIndex == 0) return maxElem\n  var maxValue = selector(maxElem)\n  for (i in 1..lastIndex) {\n    val e = this[i]\n    val v = selector(e)\n    if (maxValue < v)\n      {\n        maxElem = e\n        maxValue = v\n      }\n  }\n  return maxElem\n}\n\n/**\n * Returns the largest value among all values produced by [selector] function\n * applied to each element in the array.\n * \n * If any of values produced by [selector] function is `NaN`, the returned result is `NaN`.\n * \n * @throws NoSuchElementException if the array is empty.
```

```
\n\n/**\n * @SinceKotlin("1.4")\n * @OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n * @OverloadResolutionByLambdaReturnType\n * @ExperimentalUnsignedTypes\n * @kotlin.internal.InlineOnly\n * public inline fun UIntArray.maxOf(selector: (UInt) -> Double): Double {\n  if (isEmpty()) throw NoSuchElementException()\n  var maxValue = selector(this[0])\n  for (i in 1..lastIndex) {\n    val v = selector(this[i])\n    maxValue = maxOf(maxValue, v)\n  }\n  return maxValue\n}\n\n/**\n * Returns the largest value among all values produced by [selector] function\n * applied to each element in the array.\n * \n * If any of values produced by [selector] function is `NaN`, the returned result is `NaN`.\n * \n * @throws NoSuchElementException if the array is empty.
```

```
\n\n/**\n * @SinceKotlin("1.4")\n * @OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n * @OverloadResolutionByLambdaReturnType\n * @ExperimentalUnsignedTypes\n * @kotlin.internal.InlineOnly\n * public inline fun ULongArray.maxOf(selector: (ULong) -> Double): Double {\n  if (isEmpty()) throw NoSuchElementException()\n  var maxValue = selector(this[0])\n  for (i in 1..lastIndex) {\n    val v = selector(this[i])\n    maxValue = maxOf(maxValue, v)\n  }\n  return maxValue\n}\n\n/**\n * Returns the largest value among all values produced by [selector] function\n * applied to each element in the array.\n * \n * If any of values produced by [selector] function is `NaN`, the returned result is `NaN`.\n * \n * @throws NoSuchElementException if the array is empty.
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```
\n\n/**\n * @SinceKotlin("1.4")\n * @OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n * @OverloadResolutionByLambdaReturnType\n * @ExperimentalUnsignedTypes\n * @kotlin.internal.InlineOnly\n * public inline fun UByteArray.maxOf(selector: (UByte) -> Double): Double {\n  if (isEmpty()) throw NoSuchElementException()\n  var maxValue = selector(this[0])\n  for (i in 1..lastIndex) {\n    val v = selector(this[i])\n    maxValue = maxOf(maxValue, v)\n  }\n  return maxValue\n}\n\n/**\n * Returns the largest value among all values produced by [selector] function\n * applied to each element in the array.\n * \n * If any of values produced by [selector] function is `NaN`, the returned result is `NaN`.\n * \n * @throws NoSuchElementException if the array is empty.
```

```
\n\n/**\n * @SinceKotlin("1.4")\n * @OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n * @OverloadResolutionByLambdaReturnType\n * @ExperimentalUnsignedTypes\n * @kotlin.internal.InlineOnly\n * public inline fun UShortArray.maxOf(selector: (UShort) -> Double): Double {\n  if (isEmpty()) throw NoSuchElementException()\n  var maxValue = selector(this[0])\n  for (i in 1..lastIndex) {\n    val v = selector(this[i])\n    maxValue = maxOf(maxValue, v)\n  }\n  return maxValue\n}\n\n/**\n * Returns the largest value among all values produced by [selector] function\n * applied to each element in the array.\n * \n * If
```

any of values produced by [selector] function is `NaN`, the returned result is `NaN`.
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Since Kotlin 1.4
OptIn(kotlin.experimental.ExperimentalTypeInference::class)
OverloadResolutionByLambdaReturnType
ExperimentalUnsignedTypes
kotlin.internal.InlineOnly
public inline fun

```
UIntArray.maxOf(selector: (UInt) -> Float): Float {  
    if (isEmpty()) throw NoSuchElementException()  
    var max = selector(this[0])  
    for (i in 1..lastIndex) {  
        val v = selector(this[i])  
        max = maxOf(max, v)  
    }  
    return max  
}
```

Returns the largest value among all values produced by [selector] function applied to each element in the array.
If any of values produced by [selector] function is `NaN`, the returned result is `NaN`.
@throws NoSuchElementException if the array is empty.

```
UByteArray.maxOf(selector: (UByte) -> Float): Float {  
    if (isEmpty()) throw NoSuchElementException()  
    var max = selector(this[0])  
    for (i in 1..lastIndex) {  
        val v = selector(this[i])  
        max = maxOf(max, v)  
    }  
    return max  
}
```

Returns the largest value among all values produced by [selector] function applied to each element in the array.
If any of values produced by [selector] function is `NaN`, the returned result is `NaN`.
@throws NoSuchElementException if the array is empty.

```
UShortArray.maxOf(selector: (UShort) -> Float): Float {  
    if (isEmpty()) throw NoSuchElementException()  
    var max = selector(this[0])  
    for (i in 1..lastIndex) {  
        val v = selector(this[i])  
        max = maxOf(max, v)  
    }  
    return max  
}
```

Returns the largest value among all values produced by [selector] function applied to each element in the array.
@throws NoSuchElementException if the array is empty.

```
UShortArray.maxOf(selector: (UShort) -> R): R {  
    if (isEmpty()) throw NoSuchElementException()  
    var max = selector(this[0])  
    for (i in 1..lastIndex) {  
        val v = selector(this[i])  
        if (max < v) max = v  
    }  
    return max  
}
```

Returns the largest value among all values produced by [selector] function applied to each element in the array.
@throws NoSuchElementException if the array is empty.

```
UShortArray.maxOf(selector: (UShort) -> R): R {  
    if (isEmpty()) throw NoSuchElementException()  
    var max = selector(this[0])  
    for (i in 1..lastIndex) {  
        val v = selector(this[i])  
        if (max < v) max = v  
    }  
    return max  
}
```

Returns the largest value among all values produced by [selector] function applied to each element in the array.
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```
UShortArray.maxOf(selector: (UShort) -> R): R {  
    if (isEmpty()) throw NoSuchElementException()  
    var max = selector(this[0])  
    for (i in 1..lastIndex) {  
        val v = selector(this[i])  
        if (max < v) max = v  
    }  
    return max  
}
```

Returns the largest value among all values produced by [selector] function applied to each element in the array.
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```
UShortArray.maxOf(selector: (UShort) -> R): R {  
    if (isEmpty()) throw NoSuchElementException()  
    var max = selector(this[0])  
    for (i in 1..lastIndex) {  
        val v = selector(this[i])  
        if (max < v) max = v  
    }  
    return max  
}
```

Returns the largest value among all values produced by [selector] function applied to each element in the array.
@throws NoSuchElementException if the array is empty.

```

selector(this[i])\n    if (maxValue < v) {\n        maxValue = v\n    }\n    }\n    return maxValue\n}\n\n/**\n * Returns the largest value among all values produced by [selector] function\n * applied to each element in the array.\n * \n * @throws NoSuchElementException if the array is empty.\n */\n\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution\nByLambdaReturnType\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun <R : Comparable<R>> UShortArray.maxOf(selector: (UShort) -> R): R {\n    if (isEmpty()) throw\n    NoSuchElementException()\n    var maxValue = selector(this[0])\n    for (i in 1..lastIndex) {\n        val v =\n        selector(this[i])\n        if (maxValue < v) {\n            maxValue = v\n        }\n    }\n    return maxValue\n}\n\n/**\n * Returns the largest value among all values produced by [selector] function\n * applied to each element in the array or `null` if there are no elements.\n * \n * If any of values produced by [selector] function is `NaN`, the returned\n * result is `NaN`.\n */\n\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution\nByLambdaReturnType\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun\nUIntArray.maxOfOrNull(selector: (UInt) -> Double): Double? {\n    if (isEmpty()) return null\n    var maxValue =\n    selector(this[0])\n    for (i in 1..lastIndex) {\n        val v = selector(this[i])\n        maxValue = maxOf(maxValue, v)\n    }\n    return maxValue\n}\n\n/**\n * Returns the largest value among all values produced by [selector] function\n * applied to each element in the array or `null` if there are no elements.\n * \n * If any of values produced by [selector]\n * function is `NaN`, the returned result is `NaN`.\n */\n\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution\nByLambdaReturnType\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun\nULongArray.maxOfOrNull(selector: (ULong) -> Double): Double? {\n    if (isEmpty()) return null\n    var\n    maxValue = selector(this[0])\n    for (i in 1..lastIndex) {\n        val v = selector(this[i])\n        maxValue =\n        maxOf(maxValue, v)\n    }\n    return maxValue\n}\n\n/**\n * Returns the largest value among all values produced\n * by [selector] function\n * applied to each element in the array or `null` if there are no elements.\n * \n * If any of\n * values produced by [selector] function is `NaN`, the returned result is `NaN`.\n */\n\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution\nByLambdaReturnType\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun\nUByteArray.maxOfOrNull(selector: (UByte) -> Double): Double? {\n    if (isEmpty()) return null\n    var maxValue\n    = selector(this[0])\n    for (i in 1..lastIndex) {\n        val v = selector(this[i])\n        maxValue = maxOf(maxValue,\n        v)\n    }\n    return maxValue\n}\n\n/**\n * Returns the largest value among all values produced by [selector]\n * function\n * applied to each element in the array or `null` if there are no elements.\n * \n * If any of values produced\n * by [selector] function is `NaN`, the returned result is `NaN`.\n */\n\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution\nByLambdaReturnType\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun\nUShortArray.maxOfOrNull(selector: (UShort) -> Double): Double? {\n    if (isEmpty()) return null\n    var\n    maxValue = selector(this[0])\n    for (i in 1..lastIndex) {\n        val v = selector(this[i])\n        maxValue =\n        maxOf(maxValue, v)\n    }\n    return maxValue\n}\n\n/**\n * Returns the largest value among all values produced\n * by [selector] function\n * applied to each element in the array or `null` if there are no elements.\n * \n * If any of\n * values produced by [selector] function is `NaN`, the returned result is `NaN`.\n */\n\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution\nByLambdaReturnType\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun\nUIntArray.maxOfOrNull(selector: (UInt) -> Float): Float? {\n    if (isEmpty()) return null\n    var maxValue =\n    selector(this[0])\n    for (i in 1..lastIndex) {\n        val v = selector(this[i])\n        maxValue = maxOf(maxValue, v)\n    }\n    return maxValue\n}\n\n/**\n * Returns the largest value among all values produced by [selector] function\n * applied to each element in the array or `null` if there are no elements.\n * \n * If any of values produced by [selector]\n * function is `NaN`, the returned result is `NaN`.\n */\n\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution\nByLambdaReturnType\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun

```

```
ULongArray.maxOrNull(selector: (ULong) -> Float): Float? {\n  if (isEmpty()) return null\n  var maxValue = selector(this[0])\n  for (i in 1..lastIndex) {\n    val v = selector(this[i])\n    maxValue = maxOf(maxValue, v)\n  }\n  return maxValue\n}\n\n/**\n * Returns the largest value among all values produced by [selector] function\n * applied to each element in the array or `null` if there are no elements.\n * \n * If any of values produced by [selector] function is `NaN`, the returned result is `NaN`.\n
```

```
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolutionByLambdaReturnType\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun\nUByteArray.maxOrNull(selector: (UByte) -> Float): Float? {\n  if (isEmpty()) return null\n  var maxValue = selector(this[0])\n  for (i in 1..lastIndex) {\n    val v = selector(this[i])\n    maxValue = maxOf(maxValue, v)\n  }\n  return maxValue\n}\n\n/**\n * Returns the largest value among all values produced by [selector] function\n * applied to each element in the array or `null` if there are no elements.\n * \n * If any of values produced by [selector] function is `NaN`, the returned result is `NaN`.\n
```

```
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolutionByLambdaReturnType\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun\nUShortArray.maxOrNull(selector: (UShort) -> Float): Float? {\n  if (isEmpty()) return null\n  var maxValue = selector(this[0])\n  for (i in 1..lastIndex) {\n    val v = selector(this[i])\n    maxValue = maxOf(maxValue, v)\n  }\n  return maxValue\n}\n\n/**\n * Returns the largest value among all values produced by [selector] function\n * applied to each element in the array or `null` if there are no elements.\n
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```
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
```

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ByLambdaReturnType\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun <R>
UShortArray.maxOfWithOrNull(comparator: Comparator<in R>, selector: (UShort) -> R): R? {\n  if (isEmpty())
return null\n  var maxValue = selector(this[0])\n  for (i in 1..lastIndex) {\n    val v = selector(this[i])\n    if
(comparator.compare(maxValue, v) < 0) {\n      maxValue = v\n    }\n  }\n  return maxValue\n}\n\n/**\n *
Returns the largest element or `null` if there are no elements.\n
*\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\npublic fun UIntArray.maxOrNull(): UInt? {\n  if
(isEmpty()) return null\n  var max = this[0]\n  for (i in 1..lastIndex) {\n    val e = this[i]\n    if (max < e) max
= e\n  }\n  return max\n}\n\n/**\n * Returns the largest element or `null` if there are no elements.\n
*\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\npublic fun ULongArray.maxOrNull(): ULong? {\n  if
(isEmpty()) return null\n  var max = this[0]\n  for (i in 1..lastIndex) {\n    val e = this[i]\n    if (max < e) max
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= e\n  }\n  return max\n}\n\n/**\n * Returns the largest element or `null` if there are no elements.\n
*\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\npublic fun UShortArray.maxOrNull(): UShort? {\n  if
(isEmpty()) return null\n  var max = this[0]\n  for (i in 1..lastIndex) {\n    val e = this[i]\n    if (max < e) max
= e\n  }\n  return max\n}\n\n@Deprecated("Use maxWithOrNull instead.")
ReplaceWith("this.maxWithOrNull(comparator)")\n@DeprecatedSinceKotlin(warningSince = "1.4", errorSince
= "1.5", hiddenSince = "1.6")\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun
UIntArray.maxWith(comparator: Comparator<in UInt>): UInt? {\n  return
maxWithOrNull(comparator)\n}\n\n@Deprecated("Use maxWithOrNull instead.")
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ULongArray.maxWith(comparator: Comparator<in ULong>): ULong? {\n  return
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UShortArray.maxWith(comparator: Comparator<in UShort>): UShort? {\n  return
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Comparator<in UInt>): UInt? {\n  if (isEmpty()) return null\n  var max = this[0]\n  for (i in 1..lastIndex) {\n
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    val e = this[i]\n    if (comparator.compare(max, e) < 0) max = e\n    }\n    return
max\n}\n\n@Deprecated("Use minOrNull instead.\",
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hiddenSince = \"1.6\")\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun UShortArray.min():
UShort? {\n    return minOrNull()\n}\n\n@Deprecated("Use minByOrNull instead.\",
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<R : Comparable<R>> UIntArray.minBy(selector: (UInt) -> R): UInt? {\n    return
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<R : Comparable<R>> UShortArray.minBy(selector: (UShort) -> R): UShort? {\n    return
minByOrNull(selector)\n}\n\n/**\n * Returns the first element yielding the smallest value of the given function or
`null` if there are no elements.\n * \n * @sample samples.collections.Collections.Aggregates.minByOrNull\n
*/\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun <R :
Comparable<R>> UIntArray.minByOrNull(selector: (UInt) -> R): UInt? {\n    if (isEmpty()) return null\n    var
minElem = this[0]\n    val lastIndex = this.lastIndex\n    if (lastIndex == 0) return minElem\n    var minValue =
selector(minElem)\n    for (i in 1..lastIndex) {\n        val e = this[i]\n        val v = selector(e)\n        if (minValue > v)
{\n            minElem = e\n            minValue = v\n        }\n    }\n    return minElem\n}\n\n/**\n * Returns the first
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Comparable<R>> ULongArray.minByOrNull(selector: (ULong) -> R): ULong? {\n    if (isEmpty()) return null\n
var minElem = this[0]\n    val lastIndex = this.lastIndex\n    if (lastIndex == 0) return minElem\n    var minValue =
selector(minElem)\n    for (i in 1..lastIndex) {\n        val e = this[i]\n        val v = selector(e)\n        if (minValue > v)
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samples.collections.Collections.Aggregates.minByOrNull\n
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*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolutionByLambdaReturnType\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun UIntArray.minOf(selector: (UInt) -> Float): Float {\n if (isEmpty()) throw NoSuchElementException()\n var minValue = selector(this[0])\n for (i in 1..lastIndex) {\n val v = selector(this[i])\n minValue =

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minOf(minValue, v)\n } return minValue\n}\n\n/**\n * Returns the smallest value among all values produced
by [selector] function\n * applied to each element in the array.\n * \n * If any of values produced by [selector]
function is `NaN`, the returned result is `NaN`.\n * \n * @throws NoSuchElementException if the array is empty.\n
*\n * \n *\n */\n\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
ULongArray.minOf(selector: (ULong) -> Float): Float {\n if (isEmpty()) throw NoSuchElementException()\n
var minValue = selector(this[0])\n for (i in 1..lastIndex) {\n val v = selector(this[i])\n minValue =
minOf(minValue, v)\n }\n return minValue\n}\n\n/**\n * Returns the smallest value among all values produced
by [selector] function\n * applied to each element in the array.\n * \n * If any of values produced by [selector]
function is `NaN`, the returned result is `NaN`.\n * \n * @throws NoSuchElementException if the array is empty.\n
*\n * \n *\n */\n\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UByteArray.minOf(selector: (UByte) -> Float): Float {\n if (isEmpty()) throw NoSuchElementException()\n var
minValue = selector(this[0])\n for (i in 1..lastIndex) {\n val v = selector(this[i])\n minValue =
minOf(minValue, v)\n }\n return minValue\n}\n\n/**\n * Returns the smallest value among all values produced
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UShortArray.minOf(selector: (UShort) -> Float): Float {\n if (isEmpty()) throw NoSuchElementException()\n
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ByLambdaReturnType\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun <R :
Comparable<R>> UIntArray.minOf(selector: (UInt) -> R): R {\n if (isEmpty()) throw
NoSuchElementException()\n var minValue = selector(this[0])\n for (i in 1..lastIndex) {\n val v =
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Comparable<R>> ULongArray.minOf(selector: (ULong) -> R): R {\n if (isEmpty()) throw
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Comparable<R>> UShortArray.minOf(selector: (UShort) -> R): R {\n if (isEmpty()) throw

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NoSuchElementException)\n var minValue = selector(this[0])\n for (i in 1..lastIndex) {\n val v = selector(this[i])\n if (minValue > v) {\n minValue = v\n }\n }\n return minValue\n}\n\n/**\n * Returns the smallest value among all values produced by [selector] function\n * applied to each element in the array or `null` if there are no elements.\n * \n * If any of values produced by [selector] function is `NaN`, the returned result is `NaN`.\n

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```

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*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
```

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ByLambdaReturnType\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UByteArray.minOfOrNull(selector: (UByte) -> Float): Float? {\n  if (isEmpty()) return null\n  var minValue =
selector(this[0])\n  for (i in 1..lastIndex) {\n    val v = selector(this[i])\n    minValue = minOf(minValue, v)\n  }\n  return minValue\n}\n\n/**\n * Returns the smallest value among all values produced by [selector] function\n * applied to each element in the array or `null` if there are no elements.\n * \n * If any of values produced by [selector] function is `NaN`, the returned result is `NaN`.\n */\n\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
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UShortArray.minOfOrNull(selector: (UShort) -> Float): Float? {\n  if (isEmpty()) return null\n  var minValue =
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minValue = selector(this[0])\n  for (i in 1..lastIndex) {\n    val v = selector(this[i])\n    if (minValue > v) {\n      minValue = v\n    }\n  }\n  return minValue\n}\n\n/**\n * Returns the smallest value among all values
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UIntArray.minOfWith(comparator: Comparator<in R>, selector: (UInt) -> R): R {\n  if (isEmpty()) throw
NoSuchElementException()\n  var minValue = selector(this[0])\n  for (i in 1..lastIndex) {\n    val v =
selector(this[i])\n    if (comparator.compare(minValue, v) > 0) {\n      minValue = v\n    }\n  }\n  return
minValue\n}\n\n/**\n * Returns the smallest value according to the provided [comparator]\n * among all values
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ULongArray.minOfWith(comparator: Comparator<in R>, selector: (ULong) -> R): R {\n  if (isEmpty()) throw

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NoSuchElementException()\n    var minValue = selector(this[0])\n    for (i in 1..lastIndex) {\n        val v =
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UIntArray.minOfWithOrNull(comparator: Comparator<in R>, selector: (UInt) -> R): R? {\n    if (isEmpty()) return
null\n    var minValue = selector(this[0])\n    for (i in 1..lastIndex) {\n        val v = selector(this[i])\n        if
(comparator.compare(minValue, v) > 0) {\n            minValue = v\n        }\n    }\n    return minValue\n}\n\n/**\n * Returns the smallest value according to the provided [comparator]\n * among all values produced by [selector]
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ULongArray.minOfWithOrNull(comparator: Comparator<in R>, selector: (ULong) -> R): R? {\n    if (isEmpty())
return null\n    var minValue = selector(this[0])\n    for (i in 1..lastIndex) {\n        val v = selector(this[i])\n        if
(comparator.compare(minValue, v) > 0) {\n            minValue = v\n        }\n    }\n    return minValue\n}\n\n/**\n * Returns the smallest value according to the provided [comparator]\n * among all values produced by [selector]
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ByLambdaReturnType\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun <R>
UShortArray.minOfWithOrNull(comparator: Comparator<in R>, selector: (UShort) -> R): R? {\n    if (isEmpty())
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(comparator.compare(minValue, v) > 0) {\n            minValue = v\n        }\n    }\n    return minValue\n}\n\n/**\n * Returns the smallest element or `null` if there are no elements.\n
*\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\npublic fun UIntArray.minOrNull(): UInt? {\n    if

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(isEmpty()) return null\n    var min = this[0]\n    for (i in 1..lastIndex) {\n        val e = this[i]\n        if (min > e) min = e\n    }\n    return min\n}\n\n/**\n * Returns the smallest element or `null` if there are no elements.\n */\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\npublic fun ULongArray.minOrNull(): ULong? {\n    if (isEmpty()) return null\n    var min = this[0]\n    for (i in 1..lastIndex) {\n        val e = this[i]\n        if (min > e) min = e\n    }\n    return min\n}\n\n/**\n * Returns the smallest element or `null` if there are no elements.\n */\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\npublic fun UByteArray.minOrNull(): UByte? {\n    if (isEmpty()) return null\n    var min = this[0]\n    for (i in 1..lastIndex) {\n        val e = this[i]\n        if (min > e) min = e\n    }\n    return min\n}\n\n/**\n * Returns the smallest element or `null` if there are no elements.\n */\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\npublic fun UShortArray.minOrNull(): UShort? {\n    if (isEmpty()) return null\n    var min = this[0]\n    for (i in 1..lastIndex) {\n        val e = this[i]\n        if (min > e) min = e\n    }\n    return min\n}\n\n@Deprecated("Use minOrNull instead.")\nReplaceWith("this.minOrNull(comparator)")\n@DeprecatedSinceKotlin(warningSince = "1.4", errorSince = "1.5", hiddenSince = "1.6")\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun UIntArray.minWith(comparator: Comparator<in UInt>): UInt? {\n    return minWithOrNull(comparator)\n}\n\n@Deprecated("Use minOrNull instead.")\nReplaceWith("this.minWithOrNull(comparator)")\n@DeprecatedSinceKotlin(warningSince = "1.4", errorSince = "1.5", hiddenSince = "1.6")\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun ULongArray.minWith(comparator: Comparator<in ULong>): ULong? {\n    return minWithOrNull(comparator)\n}\n\n@Deprecated("Use minOrNull instead.")\nReplaceWith("this.minWithOrNull(comparator)")\n@DeprecatedSinceKotlin(warningSince = "1.4", errorSince = "1.5", hiddenSince = "1.6")\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun UByteArray.minWith(comparator: Comparator<in UByte>): UByte? {\n    return minWithOrNull(comparator)\n}\n\n@Deprecated("Use minOrNull instead.")\nReplaceWith("this.minWithOrNull(comparator)")\n@DeprecatedSinceKotlin(warningSince = "1.4", errorSince = "1.5", hiddenSince = "1.6")\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun UShortArray.minWith(comparator: Comparator<in UShort>): UShort? {\n    return minWithOrNull(comparator)\n}\n\n/**\n * Returns the first element having the smallest value according to the provided [comparator] or `null` if there are no elements.\n */\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\npublic fun UIntArray.minWithOrNull(comparator: Comparator<in UInt>): UInt? {\n    if (isEmpty()) return null\n    var min = this[0]\n    for (i in 1..lastIndex) {\n        val e = this[i]\n        if (comparator.compare(min, e) > 0) min = e\n    }\n    return min\n}\n\n/**\n * Returns the first element having the smallest value according to the provided [comparator] or `null` if there are no elements.\n */\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\npublic fun ULongArray.minWithOrNull(comparator: Comparator<in ULong>): ULong? {\n    if (isEmpty()) return null\n    var min = this[0]\n    for (i in 1..lastIndex) {\n        val e = this[i]\n        if (comparator.compare(min, e) > 0) min = e\n    }\n    return min\n}\n\n/**\n * Returns the first element having the smallest value according to the provided [comparator] or `null` if there are no elements.\n */\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\npublic fun UByteArray.minWithOrNull(comparator: Comparator<in UByte>): UByte? {\n    if (isEmpty()) return null\n    var min = this[0]\n    for (i in 1..lastIndex) {\n        val e = this[i]\n        if (comparator.compare(min, e) > 0) min = e\n    }\n    return min\n}\n\n/**\n * Returns the first element having the smallest value according to the provided [comparator] or `null` if there are no elements.\n */\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\npublic fun UShortArray.minWithOrNull(comparator: Comparator<in UShort>): UShort? {\n    if (isEmpty()) return null\n    var min = this[0]\n    for (i in 1..lastIndex) {\n        val e = this[i]\n        if (comparator.compare(min, e) > 0) min = e\n    }\n    return min\n}\n\ntrue` if the array has no elements.\n * \n * @sample samples.collections.Collections.Aggregates.none\n */\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun UIntArray.none(): Boolean {\n    return isEmpty()\n}\n\n/**\n * Returns `true` if the array has no elements.\n * \n * @sample samples.collections.Collections.Aggregates.none\n */\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun

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UByteArray.none(): Boolean {\n  return isEmpty()\n}\n\n/**\n * Returns `true` if the array has no elements.\n * \n
 * @sample samples.collections.Collections.Aggregates.none\n
*\n\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UByteArray.none(): Boolean {\n  return isEmpty()\n}\n\n/**\n * Returns `true` if the array has no elements.\n * \n
 * @sample samples.collections.Collections.Aggregates.none\n
*\n\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UShortArray.none(): Boolean {\n  return isEmpty()\n}\n\n/**\n * Returns `true` if no elements match the given
[predicate].\n * \n * @sample samples.collections.Collections.Aggregates.noneWithPredicate\n
*\n\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UIntArray.none(predicate: (UInt) -> Boolean): Boolean {\n  for (element in this) if (predicate(element)) return
false\n  return true\n}\n\n/**\n * Returns `true` if no elements match the given [predicate].\n * \n * @sample
samples.collections.Collections.Aggregates.noneWithPredicate\n
*\n\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UByteArray.none(predicate: (UByte) -> Boolean): Boolean {\n  for (element in this) if (predicate(element)) return
false\n  return true\n}\n\n/**\n * Returns `true` if no elements match the given [predicate].\n * \n * @sample
samples.collections.Collections.Aggregates.noneWithPredicate\n
*\n\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UShortArray.none(predicate: (UShort) -> Boolean): Boolean {\n  for (element in this) if (predicate(element))
return false\n  return true\n}\n\n/**\n * Performs the given [action] on each element and returns the array itself
afterwards.\n * \n\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic
inline fun UIntArray.onEach(action: (UInt) -> Unit): UIntArray {\n  return apply { for (element in this)
action(element) }\n}\n\n/**\n * Performs the given [action] on each element and returns the array itself
afterwards.\n * \n\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic
inline fun ULongArray.onEach(action: (ULong) -> Unit): ULongArray {\n  return apply { for (element in this)
action(element) }\n}\n\n/**\n * Performs the given [action] on each element and returns the array itself
afterwards.\n * \n\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic
inline fun UByteArray.onEach(action: (UByte) -> Unit): UByteArray {\n  return apply { for (element in this)
action(element) }\n}\n\n/**\n * Performs the given [action] on each element and returns the array itself
afterwards.\n * \n\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic
inline fun UShortArray.onEach(action: (UShort) -> Unit): UShortArray {\n  return apply { for (element in this)
action(element) }\n}\n\n/**\n * Performs the given [action] on each element, providing sequential index with the
element,\n * and returns the array itself afterwards.\n * @param [action] function that takes the index of an element
and the element itself\n * and performs the action on the element.\n
*\n\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UIntArray.onEachIndexed(action: (index: Int, UInt) -> Unit): UIntArray {\n  return apply {
forEachIndexed(action) }\n}\n\n/**\n * Performs the given [action] on each element, providing sequential index
with the element,\n * and returns the array itself afterwards.\n * @param [action] function that takes the index of an
element and the element itself\n * and performs the action on the element.\n
*\n\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
ULongArray.onEachIndexed(action: (index: Int, ULong) -> Unit): ULongArray {\n  return apply {
forEachIndexed(action) }\n}\n\n/**\n * Performs the given [action] on each element, providing sequential index
with the element,\n * and returns the array itself afterwards.\n * @param [action] function that takes the index of an
element and the element itself\n * and performs the action on the element.\n
*\n\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun

```



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*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UIntArray.reduceIndexed(operation: (index: Int, acc: UInt, UInt) -> UInt): UInt {\n if (isEmpty())\n throw
UnsupportedOperationException("Empty array can't be reduced.")\n var accumulator = this[0]\n for (index in
1..lastIndex) {\n accumulator = operation(index, accumulator, this[index])\n }\n return
accumulator}\n}\n/**\n * Accumulates value starting with the first element and applying [operation] from left to
right\n * to current accumulator value and each element with its index in the original array.\n * \n * Throws an
exception if this array is empty. If the array can be empty in an expected way,\n * please use [reduceIndexedOrNull]
instead. It returns `null` when its receiver is empty.\n * \n * @param [operation] function that takes the index of an
element, current accumulator value and the element itself,\n * and calculates the next accumulator value.\n * \n *
@sample samples.collections.Collections.Aggregates.reduce\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
ULongArray.reduceIndexed(operation: (index: Int, acc: ULong, ULong) -> ULong): ULong {\n if (isEmpty())\n
throw UnsupportedOperationException("Empty array can't be reduced.")\n var accumulator = this[0]\n for
(index in 1..lastIndex) {\n accumulator = operation(index, accumulator, this[index])\n }\n return
accumulator}\n}\n/**\n * Accumulates value starting with the first element and applying [operation] from left to
right\n * to current accumulator value and each element with its index in the original array.\n * \n * Throws an
exception if this array is empty. If the array can be empty in an expected way,\n * please use [reduceIndexedOrNull]
instead. It returns `null` when its receiver is empty.\n * \n * @param [operation] function that takes the index of an
element, current accumulator value and the element itself,\n * and calculates the next accumulator value.\n * \n *
@sample samples.collections.Collections.Aggregates.reduce\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UByteArray.reduceIndexed(operation: (index: Int, acc: UByte, UByte) -> UByte): UByte {\n if (isEmpty())\n
throw UnsupportedOperationException("Empty array can't be reduced.")\n var accumulator = this[0]\n for
(index in 1..lastIndex) {\n accumulator = operation(index, accumulator, this[index])\n }\n return
accumulator}\n}\n/**\n * Accumulates value starting with the first element and applying [operation] from left to
right\n * to current accumulator value and each element with its index in the original array.\n * \n * Throws an
exception if this array is empty. If the array can be empty in an expected way,\n * please use [reduceIndexedOrNull]
instead. It returns `null` when its receiver is empty.\n * \n * @param [operation] function that takes the index of an
element, current accumulator value and the element itself,\n * and calculates the next accumulator value.\n * \n *
@sample samples.collections.Collections.Aggregates.reduce\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UShortArray.reduceIndexed(operation: (index: Int, acc: UShort, UShort) -> UShort): UShort {\n if (isEmpty())\n
throw UnsupportedOperationException("Empty array can't be reduced.")\n var accumulator = this[0]\n for
(index in 1..lastIndex) {\n accumulator = operation(index, accumulator, this[index])\n }\n return
accumulator}\n}\n/**\n * Accumulates value starting with the first element and applying [operation] from left to
right\n * to current accumulator value and each element with its index in the original array.\n * \n * Returns `null` if
the array is empty.\n * \n * @param [operation] function that takes the index of an element, current accumulator
value and the element itself,\n * and calculates the next accumulator value.\n * \n * @sample
samples.collections.Collections.Aggregates.reduceOrNull\n
*\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UIntArray.reduceIndexedOrNull(operation: (index: Int, acc: UInt, UInt) -> UInt): UInt? {\n if (isEmpty())\n
return null\n var accumulator = this[0]\n for (index in 1..lastIndex) {\n accumulator = operation(index,
accumulator, this[index])\n }\n return accumulator}\n}\n/**\n * Accumulates value starting with the first
element and applying [operation] from left to right\n * to current accumulator value and each element with its index
in the original array.\n * \n * Returns `null` if the array is empty.\n * \n * @param [operation] function that takes the
index of an element, current accumulator value and the element itself,\n * and calculates the next accumulator
value.\n * \n * @sample samples.collections.Collections.Aggregates.reduceOrNull\n
*\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun

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ULongArray.reduceIndexedOrNull(operation: (index: Int, acc: ULong, ULong) -> ULong): ULong? {\n  if
(isEmpty())\n    return null\n  var accumulator = this[0]\n  for (index in 1..lastIndex) {\n    accumulator =
operation(index, accumulator, this[index])\n  }\n  return accumulator\n}\n\n/**\n * Accumulates value starting
with the first element and applying [operation] from left to right\n * to current accumulator value and each element
with its index in the original array.\n * \n * Returns `null` if the array is empty.\n * \n * @param [operation]
function that takes the index of an element, current accumulator value and the element itself,\n * and calculates the
next accumulator value.\n * \n * @sample samples.collections.Collections.Aggregates.reduceOrNull\n
*/\n\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UByteArray.reduceIndexedOrNull(operation: (index: Int, acc: UByte, UByte) -> UByte): UByte? {\n  if
(isEmpty())\n    return null\n  var accumulator = this[0]\n  for (index in 1..lastIndex) {\n    accumulator =
operation(index, accumulator, this[index])\n  }\n  return accumulator\n}\n\n/**\n * Accumulates value starting
with the first element and applying [operation] from left to right\n * to current accumulator value and each element
with its index in the original array.\n * \n * Returns `null` if the array is empty.\n * \n * @param [operation]
function that takes the index of an element, current accumulator value and the element itself,\n * and calculates the
next accumulator value.\n * \n * @sample samples.collections.Collections.Aggregates.reduceOrNull\n
*/\n\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UShortArray.reduceIndexedOrNull(operation: (index: Int, acc: UShort, UShort) -> UShort): UShort? {\n  if
(isEmpty())\n    return null\n  var accumulator = this[0]\n  for (index in 1..lastIndex) {\n    accumulator =
operation(index, accumulator, this[index])\n  }\n  return accumulator\n}\n\n/**\n * Accumulates value starting
with the first element and applying [operation] from left to right\n * to current accumulator value and each
element.\n * \n * Returns `null` if the array is empty.\n * \n * @param [operation] function that takes current
accumulator value and an element,\n * and calculates the next accumulator value.\n * \n * @sample
samples.collections.Collections.Aggregates.reduceOrNull\n
*/\n\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\n@WasExperimental(ExperimentalStdlibApi::class)\n
@kotlin.internal.InlineOnly\npublic inline fun UIntArray.reduceOrNull(operation: (acc: UInt, UInt) -> UInt): UInt?
{\n  if (isEmpty())\n    return null\n  var accumulator = this[0]\n  for (index in 1..lastIndex) {\n
accumulator = operation(accumulator, this[index])\n  }\n  return accumulator\n}\n\n/**\n * Accumulates value
starting with the first element and applying [operation] from left to right\n * to current accumulator value and each
element.\n * \n * Returns `null` if the array is empty.\n * \n * @param [operation] function that takes current
accumulator value and an element,\n * and calculates the next accumulator value.\n * \n * @sample
samples.collections.Collections.Aggregates.reduceOrNull\n
*/\n\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\n@WasExperimental(ExperimentalStdlibApi::class)\n
@kotlin.internal.InlineOnly\npublic inline fun ULongArray.reduceOrNull(operation: (acc: ULong, ULong) ->
ULong): ULong? {\n  if (isEmpty())\n    return null\n  var accumulator = this[0]\n  for (index in 1..lastIndex)
{\n    accumulator = operation(accumulator, this[index])\n  }\n  return accumulator\n}\n\n/**\n * Accumulates
value starting with the first element and applying [operation] from left to right\n * to current accumulator value and
each element.\n * \n * Returns `null` if the array is empty.\n * \n * @param [operation] function that takes current
accumulator value and an element,\n * and calculates the next accumulator value.\n * \n * @sample
samples.collections.Collections.Aggregates.reduceOrNull\n
*/\n\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\n@WasExperimental(ExperimentalStdlibApi::class)\n
@kotlin.internal.InlineOnly\npublic inline fun UByteArray.reduceOrNull(operation: (acc: UByte, UByte) ->
UByte): UByte? {\n  if (isEmpty())\n    return null\n  var accumulator = this[0]\n  for (index in 1..lastIndex)
{\n    accumulator = operation(accumulator, this[index])\n  }\n  return accumulator\n}\n\n/**\n * Accumulates
value starting with the first element and applying [operation] from left to right\n * to current accumulator value and
each element.\n * \n * Returns `null` if the array is empty.\n * \n * @param [operation] function that takes current
accumulator value and an element,\n * and calculates the next accumulator value.\n * \n * @sample
samples.collections.Collections.Aggregates.reduceOrNull\n
*/\n\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\n@WasExperimental(ExperimentalStdlibApi::class)\n

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@kotlin.internal.InlineOnly\npublic inline fun UShortArray.reduceOrNull(operation: (acc: UShort, UShort) ->
UShort): UShort? {\n  if (isEmpty())\n    return null\n  var accumulator = this[0]\n  for (index in 1..lastIndex)
{\n    accumulator = operation(accumulator, this[index])\n  }\n  return accumulator\n}\n\n/**\n * Accumulates
value starting with the last element and applying [operation] from right to left\n * to each element and current
accumulator value.\n * \n * Throws an exception if this array is empty. If the array can be empty in an expected
way,\n * please use [reduceRightOrNull] instead. It returns `null` when its receiver is empty.\n * \n * @param
[operation] function that takes an element and current accumulator value,\n * and calculates the next accumulator
value.\n * \n * @sample samples.collections.Collections.Aggregates.reduceRight\n
*/\n\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UIntArray.reduceRight(operation: (UInt, acc: UInt) -> UInt): UInt {\n  var index = lastIndex\n  if (index < 0)
throw UnsupportedOperationException("Empty array can't be reduced.")\n  var accumulator = get(index--)\n
while (index >= 0) {\n    accumulator = operation(get(index--), accumulator)\n  }\n  return
accumulator\n}\n\n/**\n * Accumulates value starting with the last element and applying [operation] from right to
left\n * to each element and current accumulator value.\n * \n * Throws an exception if this array is empty. If the
array can be empty in an expected way,\n * please use [reduceRightOrNull] instead. It returns `null` when its
receiver is empty.\n * \n * @param [operation] function that takes an element and current accumulator value,\n *
and calculates the next accumulator value.\n * \n * @sample
samples.collections.Collections.Aggregates.reduceRight\n
*/\n\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
ULongArray.reduceRight(operation: (ULong, acc: ULong) -> ULong): ULong {\n  var index = lastIndex\n  if
(index < 0) throw UnsupportedOperationException("Empty array can't be reduced.")\n  var accumulator =
get(index--)\n  while (index >= 0) {\n    accumulator = operation(get(index--), accumulator)\n  }\n  return
accumulator\n}\n\n/**\n * Accumulates value starting with the last element and applying [operation] from right to
left\n * to each element and current accumulator value.\n * \n * Throws an exception if this array is empty. If the
array can be empty in an expected way,\n * please use [reduceRightOrNull] instead. It returns `null` when its
receiver is empty.\n * \n * @param [operation] function that takes an element and current accumulator value,\n *
and calculates the next accumulator value.\n * \n * @sample
samples.collections.Collections.Aggregates.reduceRight\n
*/\n\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UByteArray.reduceRight(operation: (UByte, acc: UByte) -> UByte): UByte {\n  var index = lastIndex\n  if (index
< 0) throw UnsupportedOperationException("Empty array can't be reduced.")\n  var accumulator = get(index--)\n
while (index >= 0) {\n    accumulator = operation(get(index--), accumulator)\n  }\n  return
accumulator\n}\n\n/**\n * Accumulates value starting with the last element and applying [operation] from right to
left\n * to each element and current accumulator value.\n * \n * Throws an exception if this array is empty. If the
array can be empty in an expected way,\n * please use [reduceRightOrNull] instead. It returns `null` when its
receiver is empty.\n * \n * @param [operation] function that takes an element and current accumulator value,\n *
and calculates the next accumulator value.\n * \n * @sample
samples.collections.Collections.Aggregates.reduceRight\n
*/\n\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UShortArray.reduceRight(operation: (UShort, acc: UShort) -> UShort): UShort {\n  var index = lastIndex\n  if
(index < 0) throw UnsupportedOperationException("Empty array can't be reduced.")\n  var accumulator =
get(index--)\n  while (index >= 0) {\n    accumulator = operation(get(index--), accumulator)\n  }\n  return
accumulator\n}\n\n/**\n * Accumulates value starting with the last element and applying [operation] from right to
left\n * to each element with its index in the original array and current accumulator value.\n * \n * Throws an
exception if this array is empty. If the array can be empty in an expected way,\n * please use
[reduceRightIndexedOrNull] instead. It returns `null` when its receiver is empty.\n * \n * @param [operation]
function that takes the index of an element, the element itself and current accumulator value,\n * and calculates the
next accumulator value.\n * \n * @sample samples.collections.Collections.Aggregates.reduceRight\n

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*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UIntArray.reduceRightIndexed(operation: (index: Int, UInt, acc: UInt) -> UInt): UInt {\n  var index = lastIndex\n
if (index < 0) throw UnsupportedOperationException("Empty array can't be reduced.")\n  var accumulator =
get(index--)\n  while (index >= 0) {\n    accumulator = operation(index, get(index), accumulator)\n    --index\n
  }\n  return accumulator\n}\n\n/**\n * Accumulates value starting with the last element and applying [operation]
from right to left\n * to each element with its index in the original array and current accumulator value.\n * \n *
Throws an exception if this array is empty. If the array can be empty in an expected way,\n * please use
[reduceRightIndexedOrNull] instead. It returns `null` when its receiver is empty.\n * \n * @param [operation]
function that takes the index of an element, the element itself and current accumulator value,\n * and calculates the
next accumulator value.\n * \n * @sample samples.collections.Collections.Aggregates.reduceRight\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
ULongArray.reduceRightIndexed(operation: (index: Int, ULong, acc: ULong) -> ULong): ULong {\n  var index =
lastIndex\n  if (index < 0) throw UnsupportedOperationException("Empty array can't be reduced.")\n  var
accumulator = get(index--)\n  while (index >= 0) {\n    accumulator = operation(index, get(index),
accumulator)\n    --index\n  }\n  return accumulator\n}\n\n/**\n * Accumulates value starting with the last
element and applying [operation] from right to left\n * to each element with its index in the original array and
current accumulator value.\n * \n * Throws an exception if this array is empty. If the array can be empty in an
expected way,\n * please use [reduceRightIndexedOrNull] instead. It returns `null` when its receiver is empty.\n * \n
* @param [operation] function that takes the index of an element, the element itself and current accumulator
value,\n * and calculates the next accumulator value.\n * \n * @sample
samples.collections.Collections.Aggregates.reduceRight\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UByteArray.reduceRightIndexed(operation: (index: Int, UByte, acc: UByte) -> UByte): UByte {\n  var index =
lastIndex\n  if (index < 0) throw UnsupportedOperationException("Empty array can't be reduced.")\n  var
accumulator = get(index--)\n  while (index >= 0) {\n    accumulator = operation(index, get(index),
accumulator)\n    --index\n  }\n  return accumulator\n}\n\n/**\n * Accumulates value starting with the last
element and applying [operation] from right to left\n * to each element with its index in the original array and
current accumulator value.\n * \n * Throws an exception if this array is empty. If the array can be empty in an
expected way,\n * please use [reduceRightIndexedOrNull] instead. It returns `null` when its receiver is empty.\n * \n
* @param [operation] function that takes the index of an element, the element itself and current accumulator
value,\n * and calculates the next accumulator value.\n * \n * @sample
samples.collections.Collections.Aggregates.reduceRight\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UShortArray.reduceRightIndexed(operation: (index: Int, UShort, acc: UShort) -> UShort): UShort {\n  var index =
lastIndex\n  if (index < 0) throw UnsupportedOperationException("Empty array can't be reduced.")\n  var
accumulator = get(index--)\n  while (index >= 0) {\n    accumulator = operation(index, get(index),
accumulator)\n    --index\n  }\n  return accumulator\n}\n\n/**\n * Accumulates value starting with the last
element and applying [operation] from right to left\n * to each element with its index in the original array and
current accumulator value.\n * \n * Returns `null` if the array is empty.\n * \n * @param [operation] function that
takes the index of an element, the element itself and current accumulator value,\n * and calculates the next
accumulator value.\n * \n * @sample samples.collections.Collections.Aggregates.reduceRightOrNull\n
*\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UIntArray.reduceRightIndexedOrNull(operation: (index: Int, UInt, acc: UInt) -> UInt?): UInt? {\n  var index =
lastIndex\n  if (index < 0) return null\n  var accumulator = get(index--)\n  while (index >= 0) {\n
accumulator = operation(index, get(index), accumulator)\n    --index\n  }\n  return accumulator\n}\n\n/**\n *
Accumulates value starting with the last element and applying [operation] from right to left\n * to each element with
its index in the original array and current accumulator value.\n * \n * Returns `null` if the array is empty.\n * \n
* @param [operation] function that takes the index of an element, the element itself and current accumulator value,\n

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* and calculates the next accumulator value.\n * \n * @sample
samples.collections.Collections.Aggregates.reduceRightOrNull\n
*\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
ULongArray.reduceRightIndexedOrNull(operation: (index: Int, ULong, acc: ULong) -> ULong): ULong? {\n  var
index = lastIndex\n  if (index < 0) return null\n  var accumulator = get(index--)\n  while (index >= 0) {\n
accumulator = operation(index, get(index), accumulator)\n    --index\n  }\n  return accumulator\n}\n\n/**\n *
Accumulates value starting with the last element and applying [operation] from right to left\n * to each element with
its index in the original array and current accumulator value.\n * \n * Returns `null` if the array is empty.\n * \n *
@param [operation] function that takes the index of an element, the element itself and current accumulator value,\n
* and calculates the next accumulator value.\n * \n * @sample
samples.collections.Collections.Aggregates.reduceRightOrNull\n
*\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UByteArray.reduceRightIndexedOrNull(operation: (index: Int, UByte, acc: UByte) -> UByte): UByte? {\n  var
index = lastIndex\n  if (index < 0) return null\n  var accumulator = get(index--)\n  while (index >= 0) {\n
accumulator = operation(index, get(index), accumulator)\n    --index\n  }\n  return accumulator\n}\n\n/**\n *
Accumulates value starting with the last element and applying [operation] from right to left\n * to each element with
its index in the original array and current accumulator value.\n * \n * Returns `null` if the array is empty.\n * \n *
@param [operation] function that takes the index of an element, the element itself and current accumulator value,\n
* and calculates the next accumulator value.\n * \n * @sample
samples.collections.Collections.Aggregates.reduceRightOrNull\n
*\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UShortArray.reduceRightIndexedOrNull(operation: (index: Int, UShort, acc: UShort) -> UShort): UShort? {\n  var
index = lastIndex\n  if (index < 0) return null\n  var accumulator = get(index--)\n  while (index >= 0) {\n
accumulator = operation(index, get(index), accumulator)\n    --index\n  }\n  return accumulator\n}\n\n/**\n *
Accumulates value starting with the last element and applying [operation] from right to left\n * to each element and
current accumulator value.\n * \n * Returns `null` if the array is empty.\n * \n * @param [operation] function that
takes an element and current accumulator value,\n * and calculates the next accumulator value.\n * \n * @sample
samples.collections.Collections.Aggregates.reduceRightOrNull\n
*\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\n@WasExperimental(ExperimentalStdlibApi::class)\n
@kotlin.internal.InlineOnly\npublic inline fun UIntArray.reduceRightOrNull(operation: (UInt, acc: UInt) -> UInt):
UInt? {\n  var index = lastIndex\n  if (index < 0) return null\n  var accumulator = get(index--)\n  while (index
>= 0) {\n    accumulator = operation(get(index--), accumulator)\n  }\n  return accumulator\n}\n\n/**\n *
Accumulates value starting with the last element and applying [operation] from right to left\n * to each element and
current accumulator value.\n * \n * Returns `null` if the array is empty.\n * \n * @param [operation] function that
takes an element and current accumulator value,\n * and calculates the next accumulator value.\n * \n * @sample
samples.collections.Collections.Aggregates.reduceRightOrNull\n
*\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\n@WasExperimental(ExperimentalStdlibApi::class)\n
@kotlin.internal.InlineOnly\npublic inline fun ULongArray.reduceRightOrNull(operation: (ULong, acc: ULong) ->
ULong): ULong? {\n  var index = lastIndex\n  if (index < 0) return null\n  var accumulator = get(index--)\n
while (index >= 0) {\n    accumulator = operation(get(index--), accumulator)\n  }\n  return
accumulator\n}\n\n/**\n * Accumulates value starting with the last element and applying [operation] from right to
left\n * to each element and current accumulator value.\n * \n * Returns `null` if the array is empty.\n * \n * @param
[operation] function that takes an element and current accumulator value,\n * and calculates the next accumulator
value.\n * \n * @sample samples.collections.Collections.Aggregates.reduceRightOrNull\n
*\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\n@WasExperimental(ExperimentalStdlibApi::class)\n
@kotlin.internal.InlineOnly\npublic inline fun UByteArray.reduceRightOrNull(operation: (UByte, acc: UByte) ->
UByte): UByte? {\n  var index = lastIndex\n  if (index < 0) return null\n  var accumulator = get(index--)\n
while (index >= 0) {\n    accumulator = operation(get(index--), accumulator)\n  }\n  return

```

```

accumulator\n}\n\n/**\n * Accumulates value starting with the last element and applying [operation] from right to
left\n * to each element and current accumulator value.\n * \n * Returns `null` if the array is empty.\n * \n * @param
[operation] function that takes an element and current accumulator value,\n * and calculates the next accumulator
value.\n * \n * @sample samples.collections.Collections.Aggregates.reduceRightOrNull\n
*\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\n@WasExperimental(ExperimentalStdlibApi::class)\n
@kotlin.internal.InlineOnly\npublic inline fun UShortArray.reduceRightOrNull(operation: (UShort, acc: UShort) ->
UShort): UShort? {\n    var index = lastIndex\n    if (index < 0) return null\n    var accumulator = get(index--)\n
while (index >= 0) {\n    accumulator = operation(get(index--), accumulator)\n    }\n    return
accumulator\n}\n\n/**\n * Returns a list containing successive accumulation values generated by applying
[operation] from left to right\n * to each element and current accumulator value that starts with [initial] value.\n * \n
* Note that `acc` value passed to [operation] function should not be mutated;\n * otherwise it would affect the
previous value in resulting list.\n * \n * @param [operation] function that takes current accumulator value and an
element, and calculates the next accumulator value.\n * \n * @sample
samples.collections.Collections.Aggregates.runningFold\n
*\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun <R>
UIntArray.runningFold(initial: R, operation: (acc: R, UInt) -> R): List<R> {\n    if (isEmpty()) return
listOf(initial)\n    val result = ArrayList<R>(size + 1).apply { add(initial) }\n    var accumulator = initial\n
for (element in this) {\n    accumulator = operation(accumulator, element)\n    result.add(accumulator)\n    }\n
return result\n}\n\n/**\n * Returns a list containing successive accumulation values generated by applying
[operation] from left to right\n * to each element and current accumulator value that starts with [initial] value.\n * \n
* Note that `acc` value passed to [operation] function should not be mutated;\n * otherwise it would affect the
previous value in resulting list.\n * \n * @param [operation] function that takes current accumulator value and an
element, and calculates the next accumulator value.\n * \n * @sample
samples.collections.Collections.Aggregates.runningFold\n
*\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun <R>
ULongArray.runningFold(initial: R, operation: (acc: R, ULong) -> R): List<R> {\n    if (isEmpty()) return
listOf(initial)\n    val result = ArrayList<R>(size + 1).apply { add(initial) }\n    var accumulator = initial\n
for (element in this) {\n    accumulator = operation(accumulator, element)\n    result.add(accumulator)\n    }\n
return result\n}\n\n/**\n * Returns a list containing successive accumulation values generated by applying
[operation] from left to right\n * to each element and current accumulator value that starts with [initial] value.\n * \n
* Note that `acc` value passed to [operation] function should not be mutated;\n * otherwise it would affect the
previous value in resulting list.\n * \n * @param [operation] function that takes current @accumulator value and an
element, and calculates the next accumulator value.\n * \n * @sample
samples.collections.Collections.Aggregates.runningFold\n
*\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun <R>
UByteArray.runningFold(initial: R, operation: (acc: R, UByte) -> R): List<R> {\n    if (isEmpty()) return
listOf(initial)\n    val result = ArrayList<R>(size + 1).apply { add(initial) }\n    var accumulator = initial\n
for (element in this) {\n    accumulator = operation(accumulator, element)\n    result.add(accumulator)\n    }\n
return result\n}\n\n/**\n * Returns a list containing successive accumulation values generated by applying
[operation] from left to right\n * to each element and current accumulator value that starts with [initial] value.\n * \n
* Note that `acc` value passed to [operation] function should not be mutated;\n * otherwise it would affect the
previous value in resulting list.\n * \n * @param [operation] function that takes current accumulator value and an
element, and calculates the next accumulator value.\n * \n * @sample
samples.collections.Collections.Aggregates.runningFold\n
*\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun <R>
UShortArray.runningFold(initial: R, operation: (acc: R, UShort) -> R): List<R> {\n    if (isEmpty()) return
listOf(initial)\n    val result = ArrayList<R>(size + 1).apply { add(initial) }\n    var accumulator = initial\n
for (element in this) {\n    accumulator = operation(accumulator, element)\n    result.add(accumulator)\n    }\n
}

```

return result\n}\n\n/**\n * Returns a list containing successive accumulation values generated by applying [operation] from left to right\n * to each element, its index in the original array and current accumulator value that starts with [initial] value.\n * \n * Note that `acc` value passed to [operation] function should not be mutated;\n * otherwise it would affect the previous value in resulting list.\n * \n * @param [operation] function that takes the index of an element, current accumulator value\n * and the element itself, and calculates the next accumulator value.\n * \n * @sample samples.collections.Collections.Aggregates.runningFold\n

```

*\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun <R>
UIntArray.runningFoldIndexed(initial: R, operation: (index: Int, acc: R, UInt) -> R): List<R> {\n if (isEmpty())
return listOf(initial)\n val result = ArrayList<R>(size + 1).apply { add(initial) }\n var accumulator = initial\n for (index in indices) {\n accumulator = operation(index, accumulator, this[index])\n result.add(accumulator)\n }\n return result\n}\n\n/**\n * Returns a list containing successive accumulation
values generated by applying [operation] from left to right\n * to each element, its index in the original array and
current accumulator value that starts with [initial] value.\n * \n * Note that `acc` value passed to [operation] function
should not be mutated;\n * otherwise it would affect the previous value in resulting list.\n * \n * @param [operation]
function that takes the index of an element, current accumulator value\n * and the element itself, and calculates the
next accumulator value.\n * \n * @sample samples.collections.Collections.Aggregates.runningFold\n
*\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun <R>
ULongArray.runningFoldIndexed(initial: R, operation: (index: Int, acc: R, ULong) -> R): List<R> {\n if
(isEmpty()) return listOf(initial)\n val result = ArrayList<R>(size + 1).apply { add(initial) }\n var accumulator =
initial\n for (index in indices) {\n accumulator = operation(index, accumulator, this[index])\n result.add(accumulator)\n }\n return result\n}\n\n/**\n * Returns a list containing successive accumulation
values generated by applying [operation] from left to right\n * to each element, its index in the original array and
current accumulator value that starts with [initial] value.\n * \n * Note that `acc` value passed to [operation] function
should not be mutated;\n * otherwise it would affect the previous value in resulting list.\n * \n * @param [operation]
function that takes the index of an element, current accumulator value\n * and the element itself, and calculates the
next accumulator value.\n * \n * @sample samples.collections.Collections.Aggregates.runningFold\n
*\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun <R>
UByteArray.runningFoldIndexed(initial: R, operation: (index: Int, acc: R, UByte) -> R): List<R> {\n if
(isEmpty()) return listOf(initial)\n val result = ArrayList<R>(size + 1).apply { add(initial) }\n var accumulator =
initial\n for (index in indices) {\n accumulator = operation(index, accumulator, this[index])\n result.add(accumulator)\n }\n return result\n}\n\n/**\n * Returns a list containing successive accumulation
values generated by applying [operation] from left to right\n * to each element, its index in the original array and
current accumulator value that starts with [initial] value.\n * \n * Note that `acc` value passed to [operation] function
should not be mutated;\n * otherwise it would affect the previous value in resulting list.\n * \n * @param [operation]
function that takes the index of an element, current accumulator value\n * and the element itself, and calculates the
next accumulator value.\n * \n * @sample samples.collections.Collections.Aggregates.runningFold\n
*\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun <R>
UShortArray.runningFoldIndexed(initial: R, operation: (index: Int, acc: R, UShort) -> R): List<R> {\n if
(isEmpty()) return listOf(initial)\n val result = ArrayList<R>(size + 1).apply { add(initial) }\n var accumulator =
initial\n for (index in indices) {\n accumulator = operation(index, accumulator, this[index])\n result.add(accumulator)\n }\n return result\n}\n\n/**\n * Returns a list containing successive accumulation
values generated by applying [operation] from left to right\n * to each element and current accumulator value that
starts with the first element of this array.\n * \n * Note that `acc` value passed to [operation] function should not be
mutated;\n * otherwise it would affect the previous value in resulting list.\n * \n * @param [operation] function that
takes current accumulator value and an element, and calculates the next accumulator value.\n * \n * @sample
samples.collections.Collections.Aggregates.runningReduce\n
*\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UIntArray.runningReduce(operation: (acc: UInt, UInt) -> UInt): List<UInt> {\n if (isEmpty()) return

```



```

emptyList()\n  var accumulator = this[0]\n  val result = ArrayList<UInt>(size).apply { add(accumulator) }\n  for (index in 1 until size) {\n    accumulator = operation(accumulator, this[index])\n    result.add(accumulator)\n  }\n  return result\n}\n\n/**\n * Returns a list containing successive accumulation values generated by applying\n [operation] from left to right\n * to each element and current accumulator value that starts with the first element of\n this array.\n * \n * Note that `acc` value passed to [operation] function should not be mutated;\n * otherwise it would\n affect the previous value in resulting list.\n * \n * @param [operation] function that takes current accumulator value\n and an element, and calculates the next accumulator value.\n * \n * @sample\n samples.collections.Collections.Aggregates.runningReduce\n\n*\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun\n ULongArray.runningReduce(operation: (acc: ULong, ULong) -> ULong): List<ULong> {\n  if (isEmpty()) return\n emptyList()\n  var accumulator = this[0]\n  val result = ArrayList<ULong>(size).apply { add(accumulator) }\n  for (index in 1 until size) {\n    accumulator = operation(accumulator, this[index])\n    result.add(accumulator)\n  }\n  return result\n}\n\n/**\n * Returns a list containing successive accumulation values generated by applying\n [operation] from left to right\n * to each element and current accumulator value that starts with the first element of\n this array.\n * \n * Note that `acc` value passed to [operation] function should not be mutated;\n * otherwise it would\n affect the previous value in resulting list.\n * \n * @param [operation] function that takes current accumulator value\n and an element, and calculates the next accumulator value.\n * \n * @sample\n samples.collections.Collections.Aggregates.runningReduce\n\n*\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun\n UByteArray.runningReduce(operation: (acc: UByte, UByte) -> UByte): List<UByte> {\n  if (isEmpty()) return\n emptyList()\n  var accumulator = this[0]\n  val result = ArrayList<UByte>(size).apply { add(accumulator) }\n  for (index in 1 until size) {\n    accumulator = operation(accumulator, this[index])\n    result.add(accumulator)\n  }\n  return result\n}\n\n/**\n * Returns a list containing successive accumulation values generated by applying\n [operation] from left to right\n * to each element and current accumulator value that starts with the first element of\n this array.\n * \n * Note that `acc` value passed to [operation] function should not be mutated;\n * otherwise it would\n affect the previous value in resulting list.\n * \n * @param [operation] function that takes current accumulator value\n and an element, and calculates the next accumulator value.\n * \n * @sample\n samples.collections.Collections.Aggregates.runningReduce\n\n*\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun\n UShortArray.runningReduce(operation: (acc: UShort, UShort) -> UShort): List<UShort> {\n  if (isEmpty()) return\n emptyList()\n  var accumulator = this[0]\n  val result = ArrayList<UShort>(size).apply { add(accumulator) }\n  for (index in 1 until size) {\n    accumulator = operation(accumulator, this[index])\n    result.add(accumulator)\n  }\n  return result\n}\n\n/**\n * Returns a list containing successive accumulation values generated by applying\n [operation] from left to right\n * to each element, its index in the original array and current accumulator value that\n starts with the first element of this array.\n * \n * Note that `acc` value passed to [operation] function should not be\n mutated;\n * otherwise it would affect the previous value in resulting list.\n * \n * @param [operation] function that\n takes the index of an element, current accumulator value\n * and the element itself, and calculates the next\n accumulator value.\n * \n * @sample\n samples.collections.Collections.Aggregates.runningReduce\n\n*\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun\n UIntArray.runningReduceIndexed(operation: (index: Int, acc: UInt, UInt) -> UInt): List<UInt> {\n  if (isEmpty())\n return emptyList()\n  var accumulator = this[0]\n  val result = ArrayList<UInt>(size).apply { add(accumulator)\n }\n  for (index in 1 until size) {\n    accumulator = operation(index, accumulator, this[index])\n    result.add(accumulator)\n  }\n  return result\n}\n\n/**\n * Returns a list containing successive accumulation\n values generated by applying [operation] from left to right\n * to each element, its index in the original array and\n current accumulator value that starts with the first element of this array.\n * \n * Note that `acc` value passed to\n [operation] function should not be mutated;\n * otherwise it would affect the previous value in resulting list.\n * \n * @param [operation] function that takes the index of an element, current accumulator value\n * and the element\n itself, and calculates the next accumulator value.\n * \n * @sample

```

```

samples.collections.Collections.Aggregates.runningReduce\n
*\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
ULongArray.runningReduceIndexed(operation: (index: Int, acc: ULong, ULong) -> ULong): List<ULong> {\n  if
(isEmpty()) return emptyList()\n  var accumulator = this[0]\n  val result = ArrayList<ULong>(size).apply {\n
add(accumulator) }\n  for (index in 1 until size) {\n    accumulator = operation(index, accumulator, this[index])\n
    result.add(accumulator)\n  }\n  return result\n}\n\n/**\n * Returns a list containing successive accumulation
values generated by applying [operation] from left to right\n * to each element, its index in the original array and
current accumulator value that starts with the first element of this array.\n * \n * Note that `acc` value passed to
[operation] function should not be mutated;\n * otherwise it would affect the previous value in resulting list.\n * \n *
@param [operation] function that takes the index of an element, current accumulator value\n * and the element
itself, and calculates the next accumulator value.\n * \n * @sample

```

```

samples.collections.Collections.Aggregates.runningReduce\n
*\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UByteArray.runningReduceIndexed(operation: (index: Int, acc: UByte, UByte) -> UByte): List<UByte> {\n  if
(isEmpty()) return emptyList()\n  var accumulator = this[0]\n  val result = ArrayList<UByte>(size).apply {\n
add(accumulator) }\n  for (index in 1 until size) {\n    accumulator = operation(index, accumulator, this[index])\n
    result.add(accumulator)\n  }\n  return result\n}\n\n/**\n * Returns a list containing successive accumulation
values generated by applying [operation] from left to right\n * to each element, its index in the original array and
current accumulator value that starts with the first element of this array.\n * \n * Note that `acc` value passed to
[operation] function should not be mutated;\n * otherwise it would affect the previous value in resulting list.\n * \n *
@param [operation] function that takes the index of an element, current accumulator value\n * and the element
itself, and calculates the next accumulator value.\n * \n * @sample

```

```

samples.collections.Collections.Aggregates.runningReduce\n
*\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UShortArray.runningReduceIndexed(operation: (index: Int, acc: UShort, UShort) -> UShort): List<UShort> {\n  if
(isEmpty()) return emptyList()\n  var accumulator = this[0]\n  val result = ArrayList<UShort>(size).apply {\n
add(accumulator) }\n  for (index in 1 until size) {\n    accumulator = operation(index, accumulator, this[index])\n
    result.add(accumulator)\n  }\n  return result\n}\n\n/**\n * Returns a list containing successive accumulation
values generated by applying [operation] from left to right\n * to each element and current accumulator value that
starts with [initial] value.\n * \n * Note that `acc` value passed to [operation] function should not be mutated;\n *
otherwise it would affect the previous value in resulting list.\n * \n * @param [operation] function that takes current
accumulator value and an element, and calculates the next accumulator value.\n * \n * @sample

```

```

samples.collections.Collections.Aggregates.scan\n
*\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\n@WasExperimental(ExperimentalStdlibApi::class)\n
@kotlin.internal.InlineOnly\npublic inline fun <R> UIntArray.scan(initial: R, operation: (acc: R, UInt) -> R):
List<R> {\n  return runningFold(initial, operation)\n}\n\n/**\n * Returns a list containing successive accumulation
values generated by applying [operation] from left to right\n * to each element and current accumulator value that
starts with [initial] value.\n * \n * Note that `acc` value passed to [operation] function should not be mutated;\n *
otherwise it would affect the previous value in resulting list.\n * \n * @param [operation] function that takes current
accumulator value and an element, and calculates the next accumulator value.\n * \n * @sample

```

```

samples.collections.Collections.Aggregates.scan\n
*\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\n@WasExperimental(ExperimentalStdlibApi::class)\n
@kotlin.internal.InlineOnly\npublic inline fun <R> ULongArray.scan(initial: R, operation: (acc: R, ULong) -> R):
List<R> {\n  return runningFold(initial, operation)\n}\n\n/**\n * Returns a list containing successive accumulation
values generated by applying [operation] from left to right\n * to each element and current accumulator value that
starts with [initial] value.\n * \n * Note that `acc` value passed to [operation] function should not be mutated;\n *
otherwise it would affect the previous value in resulting list.\n * \n * @param [operation] function that takes current
accumulator value and an element, and calculates the next accumulator value.\n * \n * @sample

```

```
samples.collections.Collections.Aggregates.scan\n*\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\n@WasExperimental(ExperimentalStdlibApi::class)\n@kotlin.internal.InlineOnly\npublic inline fun <R> UByteArray.scan(initial: R, operation: (acc: R, UByte) -> R): List<R> {\n    return runningFold(initial, operation)\n}\n\n/**\n * Returns a list containing successive accumulation values generated by applying [operation] from left to right\n * to each element and current accumulator value that starts with [initial] value.\n * \n * Note that `acc` value passed to [operation] function should not be mutated;\n * otherwise it would affect the previous value in resulting list.\n * \n * @param [operation] function that takes current accumulator value and an element, and calculates the next accumulator value.\n * \n * @sample
```

```
samples.collections.Collections.Aggregates.scan\n*\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\n@WasExperimental(ExperimentalStdlibApi::class)\n@kotlin.internal.InlineOnly\npublic inline fun <R> UShortArray.scan(initial: R, operation: (acc: R, UShort) -> R): List<R> {\n    return runningFold(initial, operation)\n}\n\n/**\n * Returns a list containing successive accumulation values generated by applying [operation] from left to right\n * to each element, its index in the original array and current accumulator value that starts with [initial] value.\n * \n * Note that `acc` value passed to [operation] function should not be mutated;\n * otherwise it would affect the previous value in resulting list.\n * \n * @param [operation] function that takes the index of an element, current accumulator value\n * and the element itself, and calculates the next accumulator value.\n * \n * @sample
```

```
samples.collections.Collections.Aggregates.scan\n*\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\n@WasExperimental(ExperimentalStdlibApi::class)\n@kotlin.internal.InlineOnly\npublic inline fun <R> UIntArray.scanIndexed(initial: R, operation: (index: Int, acc: R, UInt) -> R): List<R> {\n    return runningFoldIndexed(initial, operation)\n}\n\n/**\n * Returns a list containing successive accumulation values generated by applying [operation] from left to right\n * to each element, its index in the original array and current accumulator value that starts with [initial] value.\n * \n * Note that `acc` value passed to [operation] function should not be mutated;\n * otherwise it would affect the previous value in resulting list.\n * \n * @param [operation] function that takes the index of an element, current accumulator value\n * and the element itself, and calculates the next accumulator value.\n * \n * @sample
```

```
samples.collections.Collections.Aggregates.scan\n*\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\n@WasExperimental(ExperimentalStdlibApi::class)\n@kotlin.internal.InlineOnly\npublic inline fun <R> ULongArray.scanIndexed(initial: R, operation: (index: Int, acc: R, ULong) -> R): List<R> {\n    return runningFoldIndexed(initial, operation)\n}\n\n/**\n * Returns a list containing successive accumulation values generated by applying [operation] from left to right\n * to each element, its index in the original array and current accumulator value that starts with [initial] value.\n * \n * Note that `acc` value passed to [operation] function should not be mutated;\n * otherwise it would affect the previous value in resulting list.\n * \n * @param [operation] function that takes the index of an element, current accumulator value\n * and the element itself, and calculates the next accumulator value.\n * \n * @sample
```

```
samples.collections.Collections.Aggregates.scan\n*\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\n@WasExperimental(ExperimentalStdlibApi::class)\n@kotlin.internal.InlineOnly\npublic inline fun <R> UByteArray.scanIndexed(initial: R, operation: (index: Int, acc: R, UByte) -> R): List<R> {\n    return runningFoldIndexed(initial, operation)\n}\n\n/**\n * Returns a list containing successive accumulation values generated by applying [operation] from left to right\n * to each element, its index in the original array and current accumulator value that starts with [initial] value.\n * \n * Note that `acc` value passed to [operation] function should not be mutated;\n * otherwise it would affect the previous value in resulting list.\n * \n * @param [operation] function that takes the index of an element, current accumulator value\n * and the element itself, and calculates the next accumulator value.\n * \n * @sample
```

```
samples.collections.Collections.Aggregates.scan\n*\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\n@WasExperimental(ExperimentalStdlibApi::class)\n@kotlin.internal.InlineOnly\npublic inline fun <R> UShortArray.scanIndexed(initial: R, operation: (index: Int, acc: R, UShort) -> R): List<R> {\n    return runningFoldIndexed(initial, operation)\n}\n\n/**\n * Returns the sum of all values produced by [selector] function applied to each element in the array.\n * \n * @Deprecated("Use sumOf
```

```

instead.\", ReplaceWith(\"this.sumOf(selector)\")\n@DeprecatedSinceKotlin(warningSince =
\"1.5\")\n@SinceKotlin(\"1.3\")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UIntArray.sumBy(selector: (UInt) -> UInt): UInt {\n    var sum: UInt = 0u\n    for (element in this) {\n        sum +=
selector(element)\n    }\n    return sum\n}\n\n/**\n * Returns the sum of all values produced by [selector] function
applied to each element in the array.\n */\n@Deprecated(\"Use sumOf instead.\",
ReplaceWith(\"this.sumOf(selector)\")\n@DeprecatedSinceKotlin(warningSince =
\"1.5\")\n@SinceKotlin(\"1.3\")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
ULongArray.sumBy(selector: (ULong) -> UInt): UInt {\n    var sum: UInt = 0u\n    for (element in this) {\n        sum
+= selector(element)\n    }\n    return sum\n}\n\n/**\n * Returns the sum of all values produced by [selector]
function applied to each element in the array.\n */\n@Deprecated(\"Use sumOf instead.\",
ReplaceWith(\"this.sumOf(selector)\")\n@DeprecatedSinceKotlin(warningSince =
\"1.5\")\n@SinceKotlin(\"1.3\")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UByteArray.sumBy(selector: (UByte) -> UInt): UInt {\n    var sum: UInt = 0u\n    for (element in this) {\n        sum
+= selector(element)\n    }\n    return sum\n}\n\n/**\n * Returns the sum of all values produced by [selector]
function applied to each element in the array.\n */\n@Deprecated(\"Use sumOf instead.\",
ReplaceWith(\"this.sumOf(selector)\")\n@DeprecatedSinceKotlin(warningSince =
\"1.5\")\n@SinceKotlin(\"1.3\")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UShortArray.sumBy(selector: (UShort) -> UInt): UInt {\n    var sum: UInt = 0u\n    for (element in this) {\n
sum += selector(element)\n    }\n    return sum\n}\n\n/**\n * Returns the sum of all values produced by [selector]
function applied to each element in the array.\n */\n@Deprecated(\"Use sumOf instead.\",
ReplaceWith(\"this.sumOf(selector)\")\n@DeprecatedSinceKotlin(warningSince =
\"1.5\")\n@SinceKotlin(\"1.3\")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UIntArray.sumByDouble(selector: (UInt) -> Double): Double {\n    var sum: Double = 0.0\n    for (element in this)
{\n        sum += selector(element)\n    }\n    return sum\n}\n\n/**\n * Returns the sum of all values produced by
[selector] function applied to each element in the array.\n */\n@Deprecated(\"Use sumOf instead.\",
ReplaceWith(\"this.sumOf(selector)\")\n@DeprecatedSinceKotlin(warningSince =
\"1.5\")\n@SinceKotlin(\"1.3\")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
ULongArray.sumByDouble(selector: (ULong) -> Double): Double {\n    var sum: Double = 0.0\n    for (element in
this) {\n        sum += selector(element)\n    }\n    return sum\n}\n\n/**\n * Returns the sum of all values produced by
[selector] function applied to each element in the array.\n */\n@Deprecated(\"Use sumOf instead.\",
ReplaceWith(\"this.sumOf(selector)\")\n@DeprecatedSinceKotlin(warningSince =
\"1.5\")\n@SinceKotlin(\"1.3\")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UByteArray.sumByDouble(selector: (UByte) -> Double): Double {\n    var sum: Double = 0.0\n    for (element in
this) {\n        sum += selector(element)\n    }\n    return sum\n}\n\n/**\n * Returns the sum of all values produced by
[selector] function applied to each element in the array.\n */\n@Deprecated(\"Use sumOf instead.\",
ReplaceWith(\"this.sumOf(selector)\")\n@DeprecatedSinceKotlin(warningSince =
\"1.5\")\n@SinceKotlin(\"1.3\")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UShortArray.sumByDouble(selector: (UShort) -> Double): Double {\n    var sum: Double = 0.0\n    for (element in
this) {\n        sum += selector(element)\n    }\n    return sum\n}\n\n/**\n * Returns the sum of all values produced by
[selector] function applied to each element in the array.\n */\n@Deprecated(\"Use sumOf instead.\",
*\n@SinceKotlin(\"1.4\")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@Suppress(\"INAPPLICABLE_JVM_NAME\")\n@kotlin.jvm.JvmName(\"sumOfDouble\")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun UIntArray.sumOf(selector:
(UInt) -> Double): Double {\n    var sum: Double = 0.toDouble()\n    for (element in this) {\n        sum +=
selector(element)\n    }\n    return sum\n}\n\n/**\n * Returns the sum of all values produced by [selector] function
applied to each element in the array.\n */\n@Deprecated(\"Use sumOf instead.\",
*\n@SinceKotlin(\"1.4\")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@Suppress(\"INAPPLICABLE_JVM_NAME\")\n@kotlin.jvm.JvmName(\"sumOfDouble\")

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")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun ULongArray.sumOf(selector:
(ULong) -> Double): Double {\n    var sum: Double = 0.toDouble()\n    for (element in this) {\n        sum +=
selector(element)\n    }\n    return sum\n}\n\n/**\n * Returns the sum of all values produced by [selector] function
applied to each element in the array.\n
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@Suppress("INAPPLICABLE_JVM_NAME")\n@kotlin.jvm.JvmName("sumOfDouble")
)\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun UByteArray.sumOf(selector:
(UByte) -> Double): Double {\n    var sum: Double = 0.toDouble()\n    for (element in this) {\n        sum +=
selector(element)\n    }\n    return sum\n}\n\n/**\n * Returns the sum of all values produced by [selector] function
applied to each element in the array.\n
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@Suppress("INAPPLICABLE_JVM_NAME")\n@kotlin.jvm.JvmName("sumOfDouble")
)\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun UShortArray.sumOf(selector:
(UShort) -> Double): Double {\n    var sum: Double = 0.toDouble()\n    for (element in this) {\n        sum +=
selector(element)\n    }\n    return sum\n}\n\n/**\n * Returns the sum of all values produced by [selector] function
applied to each element in the array.\n
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@Suppress("INAPPLICABLE_JVM_NAME")\n@kotlin.jvm.JvmName("sumOfInt")\n
)\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun UIntArray.sumOf(selector: (UInt) -
> Int): Int {\n    var sum: Int = 0.toInt()\n    for (element in this) {\n        sum += selector(element)\n    }\n    return
sum\n}\n\n/**\n * Returns the sum of all values produced by [selector] function applied to each element in the
array.\n
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@Suppress("INAPPLICABLE_JVM_NAME")\n@kotlin.jvm.JvmName("sumOfInt")\n
)\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun ULongArray.sumOf(selector:
(ULong) -> Int): Int {\n    var sum: Int = 0.toInt()\n    for (element in this) {\n        sum += selector(element)\n    }\n    return
sum\n}\n\n/**\n * Returns the sum of all values produced by [selector] function applied to each element in
the array.\n
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@Suppress("INAPPLICABLE_JVM_NAME")\n@kotlin.jvm.JvmName("sumOfInt")\n
)\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun UByteArray.sumOf(selector:
(UByte) -> Int): Int {\n    var sum: Int = 0.toInt()\n    for (element in this) {\n        sum += selector(element)\n    }\n    return
sum\n}\n\n/**\n * Returns the sum of all values produced by [selector] function applied to each element in
the array.\n
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@Suppress("INAPPLICABLE_JVM_NAME")\n@kotlin.jvm.JvmName("sumOfInt")\n
)\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun UShortArray.sumOf(selector:
(UShort) -> Int): Int {\n    var sum: Int = 0.toInt()\n    for (element in this) {\n        sum += selector(element)\n    }\n    return
sum\n}\n\n/**\n * Returns the sum of all values produced by [selector] function applied to each element in
the array.\n
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@Suppress("INAPPLICABLE_JVM_NAME")\n@kotlin.jvm.JvmName("sumOfLong")
)\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun UIntArray.sumOf(selector: (UInt)
-> Long): Long {\n    var sum: Long = 0.toLong()\n    for (element in this) {\n        sum += selector(element)\n    }\n    return
sum\n}\n\n/**\n * Returns the sum of all values produced by [selector] function applied to each element in
the array.\n
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@Suppress("INAPPLICABLE_JVM_NAME")\n@kotlin.jvm.JvmName("sumOfLong")
)

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\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun ULongArray.sumOf(selector:
(ULong) -> Long): Long {\n    var sum: Long = 0.toLong()\n    for (element in this) {\n        sum +=
selector(element)\n    }\n    return sum\n}\n\n/**\n * Returns the sum of all values produced by [selector] function
applied to each element in the array.\n
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@Suppress("INAPPLICABLE_JVM_NAME")\n@kotlin.jvm.JvmName("sumOfLong")
\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun UByteArray.sumOf(selector:
(UByte) -> Long): Long {\n    var sum: Long = 0.toLong()\n    for (element in this) {\n        sum +=
selector(element)\n    }\n    return sum\n}\n\n/**\n * Returns the sum of all values produced by [selector] function
applied to each element in the array.\n
*\n@SinceKotlin("1.4")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@Suppress("INAPPLICABLE_JVM_NAME")\n@kotlin.jvm.JvmName("sumOfLong")
\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun UShortArray.sumOf(selector:
(UShort) -> Long): Long {\n    var sum: Long = 0.toLong()\n    for (element in this) {\n        sum +=
selector(element)\n    }\n    return sum\n}\n\n/**\n * Returns the sum of all values produced by [selector] function
applied to each element in the array.\n
*\n@SinceKotlin("1.5")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@Suppress("INAPPLICABLE_JVM_NAME")\n@kotlin.jvm.JvmName("sumOfUInt")\n
\n@ExperimentalUnsignedTypes\n@WasExperimental(ExperimentalUnsignedTypes::class)\n@kotlin.internal.Inline
Only\npublic inline fun UIntArray.sumOf(selector: (UInt) -> UInt): UInt {\n    var sum: UInt = 0.toUInt()\n    for
(element in this) {\n        sum += selector(element)\n    }\n    return sum\n}\n\n/**\n * Returns the sum of all values
produced by [selector] function applied to each element in the array.\n
*\n@SinceKotlin("1.5")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@Suppress("INAPPLICABLE_JVM_NAME")\n@kotlin.jvm.JvmName("sumOfUInt")\n
\n@ExperimentalUnsignedTypes\n@WasExperimental(ExperimentalUnsignedTypes::class)\n@kotlin.internal.Inline
Only\npublic inline fun ULongArray.sumOf(selector: (ULong) -> UInt): UInt {\n    var sum: UInt = 0.toUInt()\n
for (element in this) {\n        sum += selector(element)\n    }\n    return sum\n}\n\n/**\n * Returns the sum of all
values produced by [selector] function applied to each element in the array.\n
*\n@SinceKotlin("1.5")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@Suppress("INAPPLICABLE_JVM_NAME")\n@kotlin.jvm.JvmName("sumOfUInt")\n
\n@ExperimentalUnsignedTypes\n@WasExperimental(ExperimentalUnsignedTypes::class)\n@kotlin.internal.Inline
Only\npublic inline fun UByteArray.sumOf(selector: (UByte) -> UInt): UInt {\n    var sum: UInt = 0.toUInt()\n
for (element in this) {\n        sum += selector(element)\n    }\n    return sum\n}\n\n/**\n * Returns the sum of all
values produced by [selector] function applied to each element in the array.\n
*\n@SinceKotlin("1.5")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@Suppress("INAPPLICABLE_JVM_NAME")\n@kotlin.jvm.JvmName("sumOfUInt")\n
\n@ExperimentalUnsignedTypes\n@WasExperimental(ExperimentalUnsignedTypes::class)\n@kotlin.internal.Inline
Only\npublic inline fun UShortArray.sumOf(selector: (UShort) -> UInt): UInt {\n    var sum: UInt = 0.toUInt()\n
for (element in this) {\n        sum += selector(element)\n    }\n    return sum\n}\n\n/**\n * Returns the sum of all
values produced by [selector] function applied to each element in the array.\n
*\n@SinceKotlin("1.5")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@Suppress("INAPPLICABLE_JVM_NAME")\n@kotlin.jvm.JvmName("sumOfULong")\n
\n@ExperimentalUnsignedTypes\n@WasExperimental(ExperimentalUnsignedTypes::class)\n@kotlin.internal.Inli
neOnly\npublic inline fun UIntArray.sumOf(selector: (UInt) -> ULong): ULong {\n    var sum: ULong =
0.toULong()\n    for (element in this) {\n        sum += selector(element)\n    }\n    return sum\n}\n\n/**\n * Returns
the sum of all values produced by [selector] function applied to each element in the array.\n
*\n@SinceKotlin("1.5")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolution
ByLambdaReturnType\n@Suppress("INAPPLICABLE_JVM_NAME")\n@kotlin.jvm.JvmName("sumOfULong")

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")\n@ExperimentalUnsignedTypes\n@WasExperimental(ExperimentalUnsignedTypes::class)\n@kotlin.internal.InlineOnly\npublic inline fun ULongArray.sumOf(selector: (ULong) -> ULong): ULong {\n    var sum: ULong = 0.toULong()\n    for (element in this) {\n        sum += selector(element)\n    }\n    return sum\n}\n\n/**\n * Returns the sum of all values produced by [selector] function applied to each element in the array.\n */\n\n@SinceKotlin("1.5")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolutionByLambdaReturnType\n@Suppress("INAPPLICABLE_JVM_NAME")\n@kotlin.jvm.JvmName("sumOfULong")\n@ExperimentalUnsignedTypes\n@WasExperimental(ExperimentalUnsignedTypes::class)\n@kotlin.internal.InlineOnly\npublic inline fun UByteArray.sumOf(selector: (UByte) -> ULong): ULong {\n    var sum: ULong = 0.toULong()\n    for (element in this) {\n        sum += selector(element)\n    }\n    return sum\n}\n\n/**\n * Returns the sum of all values produced by [selector] function applied to each element in the array.\n */\n\n@SinceKotlin("1.5")\n@OptIn(kotlin.experimental.ExperimentalTypeInference::class)\n@OverloadResolutionByLambdaReturnType\n@Suppress("INAPPLICABLE_JVM_NAME")\n@kotlin.jvm.JvmName("sumOfULong")\n@ExperimentalUnsignedTypes\n@WasExperimental(ExperimentalUnsignedTypes::class)\n@kotlin.internal.InlineOnly\npublic inline fun UShortArray.sumOf(selector: (UShort) -> ULong): ULong {\n    var sum: ULong = 0.toULong()\n    for (element in this) {\n        sum += selector(element)\n    }\n    return sum\n}\n\n/**\n * Returns a list of pairs built from the elements of `this` array and the [other] array with the same index.\n * The returned list has length of the shortest collection.\n * \n * @sample samples.collections.Iterables.Operations.zipIterable\n */\n\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic infix fun <R> UIntArray.zip(other: Array<out R>): List<Pair<UInt, R>> {\n    return zip(other) { t1, t2 -> t1 to t2 }\n}\n\n/**\n * Returns a list of pairs built from the elements of `this` array and the [other] array with the same index.\n * The returned list has length of the shortest collection.\n * \n * @sample samples.collections.Iterables.Operations.zipIterable\n */\n\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic infix fun <R> ULongArray.zip(other: Array<out R>): List<Pair<ULong, R>> {\n    return zip(other) { t1, t2 -> t1 to t2 }\n}\n\n/**\n * Returns a list of pairs built from the elements of `this` array and the [other] array with the same index.\n * The returned list has length of the shortest collection.\n * \n * @sample samples.collections.Iterables.Operations.zipIterable\n */\n\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic infix fun <R> UByteArray.zip(other: Array<out R>): List<Pair<UByte, R>> {\n    return zip(other) { t1, t2 -> t1 to t2 }\n}\n\n/**\n * Returns a list of pairs built from the elements of `this` array and the [other] array with the same index.\n * The returned list has length of the shortest collection.\n * \n * @sample samples.collections.Iterables.Operations.zipIterable\n */\n\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic infix fun <R> UShortArray.zip(other: Array<out R>): List<Pair<UShort, R>> {\n    return zip(other) { t1, t2 -> t1 to t2 }\n}\n\n/**\n * Returns a list of values built from the elements of `this` array and the [other] array with the same index\n * using the provided [transform] function applied to each pair of elements.\n * The returned list has length of the shortest collection.\n * \n * @sample samples.collections.Iterables.Operations.zipIterableWithTransform\n */\n\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun <R, V> UIntArray.zip(other: Array<out R>, transform: (a: UInt, b: R) -> V): List<V> {\n    val size = minOf(size, other.size)\n    val list = ArrayList<V>(size)\n    for (i in 0 until size) {\n        list.add(transform(this[i], other[i]))\n    }\n    return list\n}\n\n/**\n * Returns a list of values built from the elements of `this` array and the [other] array with the same index\n * using the provided [transform] function applied to each pair of elements.\n * The returned list has length of the shortest collection.\n * \n * @sample samples.collections.Iterables.Operations.zipIterableWithTransform\n */\n\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun <R, V> ULongArray.zip(other: Array<out R>, transform: (a: ULong, b: R) -> V): List<V> {\n    val size = minOf(size, other.size)\n    val list = ArrayList<V>(size)\n    for (i in 0 until size) {\n        list.add(transform(this[i], other[i]))\n    }\n    return list\n}\n\n/**\n * Returns a list of values built from the elements of `this` array and the [other] array with the same index\n * using the provided [transform] function applied to each pair of elements.\n * The returned list has length of the shortest collection.\n * \n * @sample samples.collections.Iterables.Operations.zipIterableWithTransform\n */

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*^@SinceKotlin("1.3")@ExperimentalUnsignedTypes@kotlin.internal.InlineOnly\npublic inline fun <R, V>
UByteArray.zip(other: Array<out R>, transform: (a: UByte, b: R) -> V): List<V> {\n    val size = minOf(size,
other.size)\n    val list = ArrayList<V>(size)\n    for (i in 0 until size) {\n        list.add(transform(this[i], other[i]))\n    }\n    return list\n}\n\n/**\n * Returns a list of values built from the elements of `this` array and the [other] array
with the same index\n * using the provided [transform] function applied to each pair of elements.\n * The returned
list has length of the shortest collection.\n * \n * @sample
samples.collections.Iterables.Operations.zipIterableWithTransform\n
*^@SinceKotlin("1.3")@ExperimentalUnsignedTypes@kotlin.internal.InlineOnly\npublic inline fun <R, V>
UShortArray.zip(other: Array<out R>, transform: (a: UShort, b: R) -> V): List<V> {\n    val size = minOf(size,
other.size)\n    val list = ArrayList<V>(size)\n    for (i in 0 until size) {\n        list.add(transform(this[i], other[i]))\n    }\n    return list\n}\n\n/**\n * Returns a list of pairs built from the elements of `this` collection and [other] array with
the same index.\n * The returned list has length of the shortest collection.\n * \n * @sample
samples.collections.Iterables.Operations.zipIterable\n
*^@SinceKotlin("1.3")@ExperimentalUnsignedTypes\npublic infix fun <R> UIntArray.zip(other:
Iterable<R>): List<Pair<UInt, R>> {\n    return zip(other) { t1, t2 -> t1 to t2 }\n}\n\n/**\n * Returns a list of pairs
built from the elements of `this` collection and [other] array with the same index.\n * The returned list has length of
the shortest collection.\n * \n * @sample samples.collections.Iterables.Operations.zipIterable\n
*^@SinceKotlin("1.3")@ExperimentalUnsignedTypes\npublic infix fun <R> ULongArray.zip(other:
Iterable<R>): List<Pair<ULong, R>> {\n    return zip(other) { t1, t2 -> t1 to t2 }\n}\n\n/**\n * Returns a list of pairs
built from the elements of `this` collection and [other] array with the same index.\n * The returned list has length of
the shortest collection.\n * \n * @sample samples.collections.Iterables.Operations.zipIterable\n
*^@SinceKotlin("1.3")@ExperimentalUnsignedTypes\npublic infix fun <R> UByteArray.zip(other:
Iterable<R>): List<Pair<UByte, R>> {\n    return zip(other) { t1, t2 -> t1 to t2 }\n}\n\n/**\n * Returns a list of pairs
built from the elements of `this` collection and [other] array with the same index.\n * The returned list has length of
the shortest collection.\n * \n * @sample samples.collections.Iterables.Operations.zipIterable\n
*^@SinceKotlin("1.3")@ExperimentalUnsignedTypes\npublic infix fun <R> UShortArray.zip(other:
Iterable<R>): List<Pair<UShort, R>> {\n    return zip(other) { t1, t2 -> t1 to t2 }\n}\n\n/**\n * Returns a list of
values built from the elements of `this` array and the [other] collection with the same index\n * using the provided
[transform] function applied to each pair of elements.\n * The returned list has length of the shortest collection.\n *
\n * @sample samples.collections.Iterables.Operations.zipIterableWithTransform\n
*^@SinceKotlin("1.3")@ExperimentalUnsignedTypes@kotlin.internal.InlineOnly\npublic inline fun <R, V>
UIntArray.zip(other: Iterable<R>, transform: (a: UInt, b: R) -> V): List<V> {\n    val arraySize = size\n    val list =
ArrayList<V>(minOf(other.collectionSizeOrDefault(10), arraySize))\n    var i = 0\n    for (element in other) {\n
if (i >= arraySize) break\n        list.add(transform(this[i++], element))\n    }\n    return list\n}\n\n/**\n * Returns a
list of values built from the elements of `this` array and the [other] collection with the same index\n * using the
provided [transform] function applied to each pair of elements.\n * The returned list has length of the shortest
collection.\n * \n * @sample samples.collections.Iterables.Operations.zipIterableWithTransform\n
*^@SinceKotlin("1.3")@ExperimentalUnsignedTypes@kotlin.internal.InlineOnly\npublic inline fun <R, V>
ULongArray.zip(other: Iterable<R>, transform: (a: ULong, b: R) -> V): List<V> {\n    val arraySize = size\n    val
list = ArrayList<V>(minOf(other.collectionSizeOrDefault(10), arraySize))\n    var i = 0\n    for (element in other)
{\n        if (i >= arraySize) break\n        list.add(transform(this[i++], element))\n    }\n    return list\n}\n\n/**\n *
Returns a list of values built from the elements of `this` array and the [other] collection with the same index\n *
using the provided [transform] function applied to each pair of elements.\n * The returned list has length of the
shortest collection.\n * \n * @sample samples.collections.Iterables.Operations.zipIterableWithTransform\n
*^@SinceKotlin("1.3")@ExperimentalUnsignedTypes@kotlin.internal.InlineOnly\npublic inline fun <R, V>
UByteArray.zip(other: Iterable<R>, transform: (a: UByte, b: R) -> V): List<V> {\n    val arraySize = size\n    val
list = ArrayList<V>(minOf(other.collectionSizeOrDefault(10), arraySize))\n    var i = 0\n    for (element in other)
{\n        if (i >= arraySize) break\n        list.add(transform(this[i++], element))\n    }\n    return list\n}\n\n/**\n *
Returns a

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list of values built from the elements of `this` array and the [other] collection with the same index\n * using the provided [transform] function applied to each pair of elements.\n * The returned list has length of the shortest collection.\n * \n * @sample samples.collections.Iterables.Operations.zipIterableWithTransform\n

```
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun <R, V>\nUShortArray.zip(other: Iterable<R>, transform: (a: UShort, b: R) -> V): List<V> {\n    val arraySize = size\n    val list = ArrayList<V>(minOf(other.collectionSizeOrDefault(10), arraySize))\n    var i = 0\n    for (element in other)\n    {\n        if (i >= arraySize) break\n        list.add(transform(this[i++], element))\n    }\n    return list\n}\n\n/**\n * Returns a list of pairs built from the elements of `this` array and the [other] array with the same index.\n * The returned list has length of the shortest collection.\n * \n * @sample\n samples.collections.Iterables.Operations.zipIterable\n
```

```
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic infix fun UIntArray.zip(other: UIntArray):\nList<Pair<UInt, UInt>> {\n    return zip(other) { t1, t2 -> t1 to t2 }\n}\n\n/**\n * Returns a list of pairs built from the elements of `this` array and the [other] array with the same index.\n * The returned list has length of the shortest collection.\n * \n * @sample\n samples.collections.Iterables.Operations.zipIterable\n
```

```
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic infix fun ULongArray.zip(other: ULongArray):\nList<Pair<ULong, ULong>> {\n    return zip(other) { t1, t2 -> t1 to t2 }\n}\n\n/**\n * Returns a list of pairs built from the elements of `this` array and the [other] array with the same index.\n * The returned list has length of the shortest collection.\n * \n * @sample\n samples.collections.Iterables.Operations.zipIterable\n
```

```
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic infix fun UByteArray.zip(other: UByteArray):\nList<Pair<UByte, UByte>> {\n    return zip(other) { t1, t2 -> t1 to t2 }\n}\n\n/**\n * Returns a list of pairs built from the elements of `this` array and the [other] array with the same index.\n * The returned list has length of the shortest collection.\n * \n * @sample\n samples.collections.Iterables.Operations.zipIterable\n
```

```
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic infix fun UShortArray.zip(other: UShortArray):\nList<Pair<UShort, UShort>> {\n    return zip(other) { t1, t2 -> t1 to t2 }\n}\n\n/**\n * Returns a list of values built from the elements of `this` array and the [other] array with the same index\n * using the provided [transform] function applied to each pair of elements.\n * The returned list has length of the shortest array.\n * \n * @sample\n samples.collections.Iterables.Operations.zipIterableWithTransform\n
```

```
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun <V>\nUIntArray.zip(other: UIntArray, transform: (a: UInt, b: UInt) -> V): List<V> {\n    val size = minOf(size, other.size)\n    val list = ArrayList<V>(size)\n    for (i in 0 until size) {\n        list.add(transform(this[i], other[i]))\n    }\n    return list\n}\n\n/**\n * Returns a list of values built from the elements of `this` array and the [other] array with the same index\n * using the provided [transform] function applied to each pair of elements.\n * The returned list has length of the shortest array.\n * \n * @sample\n samples.collections.Iterables.Operations.zipIterableWithTransform\n
```

```
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun <V>\nULongArray.zip(other: ULongArray, transform: (a: ULong, b: ULong) -> V): List<V> {\n    val size = minOf(size, other.size)\n    val list = ArrayList<V>(size)\n    for (i in 0 until size) {\n        list.add(transform(this[i], other[i]))\n    }\n    return list\n}\n\n/**\n * Returns a list of values built from the elements of `this` array and the [other] array with the same index\n * using the provided [transform] function applied to each pair of elements.\n * The returned list has length of the shortest array.\n * \n * @sample\n samples.collections.Iterables.Operations.zipIterableWithTransform\n
```

```
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun <V>\nUByteArray.zip(other: UByteArray, transform: (a: UByte, b: UByte) -> V): List<V> {\n    val size = minOf(size, other.size)\n    val list = ArrayList<V>(size)\n    for (i in 0 until size) {\n        list.add(transform(this[i], other[i]))\n    }\n    return list\n}\n\n/**\n * Returns a list of values built from the elements of `this` array and the [other] array with the same index\n * using the provided [transform] function applied to each pair of elements.\n * The returned list has length of the shortest array.\n * \n * @sample\n samples.collections.Iterables.Operations.zipIterableWithTransform\n
```

```

*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun <V>
UShortArray.zip(other: UShortArray, transform: (a: UShort, b: UShort) -> V): List<V> {\n    val size = minOf(size,
other.size)\n    val list = ArrayList<V>(size)\n    for (i in 0 until size) {\n        list.add(transform(this[i], other[i]))\n    }\n    return list\n}\n\n/**\n * Returns the sum of all elements in the array.\n */
*\n@kotlin.jvm.JvmName("sumOfUInt")\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedT
ypes::class)\npublic fun Array<out UInt>.sum(): UInt {\n    var sum: UInt = 0u\n    for (element in this) {\n        sum
+= element\n    }\n    return sum\n}\n\n/**\n * Returns the sum of all elements in the array.\n */
*\n@kotlin.jvm.JvmName("sumOfULong")\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsigned
Types::class)\npublic fun Array<out ULong>.sum(): ULong {\n    var sum: ULong = 0uL\n    for (element in this)
{\n        sum += element\n    }\n    return sum\n}\n\n/**\n * Returns the sum of all elements in the array.\n */
*\n@kotlin.jvm.JvmName("sumOfUByte")\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsigned
Types::class)\npublic fun Array<out UByte>.sum(): UInt {\n    var sum: UInt = 0u\n    for (element in this) {\n
sum += element\n    }\n    return sum\n}\n\n/**\n * Returns the sum of all elements in the array.\n */
*\n@kotlin.jvm.JvmName("sumOfUShort")\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsigned
Types::class)\npublic fun Array<out UShort>.sum(): UInt {\n    var sum: UInt = 0u\n    for (element in this) {\n
sum += element\n    }\n    return sum\n}\n\n/**\n * Returns the sum of all elements in the array.\n */
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UIntArray.sum(): UInt {\n    return storage.sum().toUInt()\n}\n\n/**\n * Returns the sum of all elements in the
array.\n */
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
ULongArray.sum(): ULong {\n    return storage.sum().toULong()\n}\n\n/**\n * Returns the sum of all elements in
the array.\n */
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline
fun UByteArray.sum(): UInt {\n    return sumOf { it.toUInt() }\n}\n\n/**\n * Returns the sum of all elements in the
array.\n */
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\n@kotlin.internal.InlineOnly\npublic inline fun
UShortArray.sum(): UInt {\n    return sumOf { it.toUInt() }\n}\n\n", "\n * Copyright 2010-2021 JetBrains s.r.o. and
Kotlin Programming Language contributors.\n * Use of this source code is governed by the Apache 2.0 license that
can be found in the license/LICENSE.txt file.\n */
*\n\n@file:kotlin.jvm.JvmMultifileClass\n@file:kotlin.jvm.JvmName("UCollectionsKt")\n\npackage
kotlin.collections\n\n/\n// NOTE: THIS FILE IS AUTO-GENERATED by the GenerateStandardLib.kt\n// See:
https://github.com/JetBrains/kotlin/tree/master/libraries/stdlib\n\n/\n\nimport kotlin.random.*\nimport
kotlin.ranges.contains\nimport kotlin.ranges.reversed\n\n/**\n * Returns an array of UByte containing all of the
elements of this collection.\n */
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun
Collection<UByte>.toUByteArray(): UByteArray {\n    val result = UByteArray(size)\n    var index = 0\n    for
(element in this)\n        result[index++] = element\n    return result\n}\n\n/**\n * Returns an array of UInt containing
all of the elements of this collection.\n */
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun
Collection<UInt>.toUIntArray(): UIntArray {\n    val result = UIntArray(size)\n    var index = 0\n    for (element in
this)\n        result[index++] = element\n    return result\n}\n\n/**\n * Returns an array of ULong containing all of the
elements of this collection.\n */
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun
Collection<ULong>.toULongArray(): ULongArray {\n    val result = ULongArray(size)\n    var index = 0\n    for
(element in this)\n        result[index++] = element\n    return result\n}\n\n/**\n * Returns an array of UShort
containing all of the elements of this collection.\n */
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun Collection<UShort>.toUShortArray():
UShortArray {\n    val result = UShortArray(size)\n    var index = 0\n    for (element in this)\n        result[index++] =
element\n    return result\n}\n\n/**\n * Returns the sum of all elements in the collection.\n */
*\n@kotlin.jvm.JvmName("sumOfUInt")\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedT
ypes::class)\npublic fun Iterable<UInt>.sum(): UInt {\n    var sum: UInt = 0u\n    for (element in this) {\n        sum
+= element\n    }\n    return sum\n}\n\n/**\n * Returns the sum of all elements in the collection.\n */
*\n@kotlin.jvm.JvmName("sumOfULong")\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsigned
Types::class)\npublic fun Iterable<ULong>.sum(): ULong {\n    var sum: ULong = 0uL\n    for (element in this) {\n
sum += element\n    }\n    return sum\n}\n\n/**\n * Returns the sum of all elements in the collection.\n */

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    sum += element\n    }\n    return sum\n}\n\n/**\n * Returns the sum of all elements in the collection.\n
*\n@kotlin.jvm.JvmName("\sumOfUByte")\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsigned
Types::class)\npublic fun Iterable<UByte>.sum(): UInt {\n    var sum: UInt = 0u\n    for (element in this) {\n
sum += element\n    }\n    return sum\n}\n\n/**\n * Returns the sum of all elements in the collection.\n
*\n@kotlin.jvm.JvmName("\sumOfUShort")\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsigned
Types::class)\npublic fun Iterable<UShort>.sum(): UInt {\n    var sum: UInt = 0u\n    for (element in this) {\n
sum += element\n    }\n    return sum\n}\n\n"/*\n * Copyright 2010-2021 JetBrains s.r.o. and Kotlin Programming
Language contributors.\n * Use of this source code is governed by the Apache 2.0 license that can be found in the
license/LICENSE.txt file.\n
*\n@file:kotlin.jvm.JvmMultifileClass\n@file:kotlin.jvm.JvmName("UComparisonsKt")\n\npackage
kotlin.comparisons\n\n/\n// NOTE: THIS FILE IS AUTO-GENERATED by the GenerateStandardLib.kt\n// See:
https://github.com/JetBrains/kotlin/tree/master/libraries/stdlib\n\nimport kotlin.random.*\n\n/**\n * Returns the
greater of two values.\n
*\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class)\npublic fun maxOf(a: UInt, b:
UInt): UInt {\n    return if (a >= b) a else b\n}\n\n/**\n * Returns the greater of two values.\n
*\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class)\npublic fun maxOf(a: ULong,
b: ULong): ULong {\n    return if (a >= b) a else b\n}\n\n/**\n * Returns the greater of two values.\n
*\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class)\npublic fun maxOf(a: UByte,
b: UByte): UByte {\n    return if (a >= b) a else b\n}\n\n/**\n * Returns the greater of two values.\n
*\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class)\npublic fun maxOf(a: UShort,
b: UShort): UShort {\n    return if (a >= b) a else b\n}\n\n/**\n * Returns the greater of three values.\n
*\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class)\n@kotlin.internal.InlineOnly\n
public inline fun maxOf(a: UInt, b: UInt, c: UInt): UInt {\n    return maxOf(a, maxOf(b, c))\n}\n\n/**\n * Returns
the greater of three values.\n
*\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class)\n@kotlin.internal.InlineOnly\n
public inline fun maxOf(a: ULong, b: ULong, c: ULong): ULong {\n    return maxOf(a, maxOf(b, c))\n}\n\n/**\n *
Returns the greater of three values.\n
*\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class)\n@kotlin.internal.InlineOnly\n
public inline fun maxOf(a: UByte, b: UByte, c: UByte): UByte {\n    return maxOf(a, maxOf(b, c))\n}\n\n/**\n *
Returns the greater of three values.\n
*\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class)\n@kotlin.internal.InlineOnly\n
public inline fun maxOf(a: UShort, b: UShort, c: UShort): UShort {\n    return maxOf(a, maxOf(b, c))\n}\n\n/**\n
 * Returns the greater of the given values.\n
*\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\npublic fun
maxOf(a: UInt, vararg other: UInt): UInt {\n    var max = a\n    for (e in other) max = maxOf(max, e)\n    return
max\n}\n\n/**\n * Returns the greater of the given values.\n
*\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\npublic fun
maxOf(a: ULong, vararg other: ULong):
ULong {\n    var max = a\n    for (e in other) max = maxOf(max, e)\n    return max\n}\n\n/**\n * Returns the greater
of the given values.\n
*\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\npublic fun
maxOf(a: UByte,
vararg other: UByte): UByte {\n    var max = a\n    for (e in other) max = maxOf(max, e)\n    return max\n}\n\n/**\n
 * Returns the greater of the given values.\n
*\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\npublic fun
maxOf(a: UShort, vararg other: UShort): UShort {\n    var max = a\n    for (e in other) max = maxOf(max, e)\n
return max\n}\n\n/**\n * Returns the smaller of two values.\n
*\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class)\npublic fun minOf(a: UInt, b:
UInt): UInt {\n    return if (a <= b) a else b\n}\n\n/**\n * Returns the smaller of two values.\n
*\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class)\npublic fun minOf(a: ULong,
b: ULong): ULong {\n    return if (a <= b) a else b\n}\n\n/**\n * Returns the smaller of two values.\n
*\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class)\npublic fun minOf(a: UByte,
b: UByte): UByte {\n    return if (a <= b) a else b\n}\n\n/**\n * Returns the smaller of two values.\n

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*\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class)\npublic fun minOf(a: UShort,
b: UShort): UShort {\n    return if (a <= b) a else b\n}\n\n/**\n * Returns the smaller of three values.\n
*\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class)\n@kotlin.internal.InlineOnly\
npublic inline fun minOf(a: UInt, b: UInt, c: UInt): UInt {\n    return minOf(a, minOf(b, c))\n}\n\n/**\n * Returns
the smaller of three values.\n
*\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class)\n@kotlin.internal.InlineOnly\
npublic inline fun minOf(a: ULong, b: ULong, c: ULong): ULong {\n    return minOf(a, minOf(b, c))\n}\n\n/**\n *
Returns the smaller of three values.\n
*\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class)\n@kotlin.internal.InlineOnly\
npublic inline fun minOf(a: UByte, b: UByte, c: UByte): UByte {\n    return minOf(a, minOf(b, c))\n}\n\n/**\n *
Returns the smaller of three values.\n
*\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class)\n@kotlin.internal.InlineOnly\
npublic inline fun minOf(a: UShort, b: UShort, c: UShort): UShort {\n    return minOf(a, minOf(b, c))\n}\n\n/**\n *
Returns the smaller of the given values.\n
*\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\npublic fun
minOf(a: UInt, vararg other: UInt): UInt {\n    var min = a\n    for (e in other) min = minOf(min, e)\n    return
min\n}\n\n/**\n * Returns the smaller of the given values.\n
*\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\npublic fun minOf(a: ULong, vararg other: ULong):
ULong {\n    var min = a\n    for (e in other) min = minOf(min, e)\n    return min\n}\n\n/**\n * Returns the smaller
of the given values.\n
*\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\npublic fun minOf(a: UByte,
vararg other: UByte): UByte {\n    var min = a\n    for (e in other) min = minOf(min, e)\n    return min\n}\n\n/**\n *
Returns the smaller of the given values.\n
*\n@SinceKotlin("1.4")\n@ExperimentalUnsignedTypes\npublic fun
minOf(a: UShort, vararg other: UShort): UShort {\n    var min = a\n    for (e in other) min = minOf(min, e)\n
return min\n}\n\n"/**\n * Copyright 2010-2021 JetBrains s.r.o. and Kotlin Programming Language contributors.\n *
Use of this source code is governed by the Apache 2.0 license that can be found in the license/LICENSE.txt file.\n
*\n\n@file:kotlin.jvm.JvmMultifileClass\n@file:kotlin.jvm.JvmName("URangesKt")\n\npackage
kotlin.ranges\n\n/\n\nNOTE: THIS FILE IS AUTO-GENERATED by the GenerateStandardLib.kt\n\n See:
https://github.com/JetBrains/kotlin/tree/master/libraries/stdlib\n\n\nimport kotlin.random.*\n\n/**\n * Returns a
random element from this range.\n * \n * @throws IllegalArgumentException if this range is empty.\n
*\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class)\n@kotlin.internal.InlineOnly\
npublic inline fun UIntRange.random(): UInt {\n    return random(Random)\n}\n\n/**\n * Returns a random element
from this range.\n * \n * @throws IllegalArgumentException if this range is empty.\n
*\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class)\n@kotlin.internal.InlineOnly\
npublic inline fun ULongRange.random(): ULong {\n    return random(Random)\n}\n\n/**\n * Returns a random
element from this range using the specified source of randomness.\n * \n * @throws IllegalArgumentException if
this range is empty.\n
*\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class)\npublic
fun UIntRange.random(random: Random): UInt {\n    try {\n        return random.nextUInt(this)\n    } catch(e:
IllegalArgumentException) {\n        throw NoSuchElementException(e.message)\n    }\n}\n\n/**\n * Returns a
random element from this range using the specified source of randomness.\n * \n * @throws
IllegalArgument\nException if this range is empty.\n
*\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class)\npublic fun
ULongRange.random(random: Random): ULong {\n    try {\n        return random.nextULong(this)\n    } catch(e:
IllegalArgument\nException) {\n        throw NoSuchElementException(e.message)\n    }\n}\n\n/**\n * Returns a
random element from this range, or `null` if this range is empty.\n
*\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalStdlibApi::class,
ExperimentalUnsignedTypes::class)\n@kotlin.internal.InlineOnly\npublic inline fun UIntRange.randomOrNull():
UInt? {\n    return randomOrNull(Random)\n}\n\n/**\n * Returns a random element from this range, or `null` if this
range is empty.\n
*\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalStdlibApi::class,
ExperimentalUnsignedTypes::class)\n@kotlin.internal.InlineOnly\npublic inline fun ULongRange.randomOrNull():

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ULong? {\n    return randomOrNull(Random)\n}\n\n/**\n * Returns a random element from this range using the
specified source of randomness, or `null` if this range is empty.\n
*\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalStdlibApi::class,
ExperimentalUnsignedTypes::class)\npublic fun UIntRange.randomOrNull(random: Random): UInt? {\n    if
(isEmpty())\n        return null\n    return random.nextUInt(this)\n}\n\n/**\n * Returns a random element from this
range using the specified source of randomness, or `null` if this range is empty.\n
*\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalStdlibApi::class,
ExperimentalUnsignedTypes::class)\npublic fun ULongRange.randomOrNull(random: Random): ULong? {\n    if
(isEmpty())\n        return null\n    return random.nextULong(this)\n}\n\n/**\n * Returns `true` if this range contains
the specified [element].\n * \n * Always returns `false` if the [element] is `null`.\n
*\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class)\n@kotlin.internal.InlineOnly\n
public inline operator fun UIntRange.contains(element: UInt?): Boolean {\n    return element != null &&
contains(element)\n}\n\n/**\n * Returns `true` if this range contains the specified [element].\n * \n * Always returns
`false` if the [element] is `null`.\n
*\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class)\n@kotlin.internal.InlineOnly\n
public inline operator fun ULongRange.contains(element: ULong?): Boolean {\n    return element != null &&
contains(element)\n}\n\n/**\n * Checks if the specified [value] belongs to this range.\n
*\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class)\npublic operator fun
UIntRange.contains(value: UByte): Boolean {\n    return contains(value.toUInt())\n}\n\n/**\n * Checks if the
specified [value] belongs to this range.\n
*\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class)\npublic operator fun
ULongRange.contains(value: UByte): Boolean {\n    return contains(value.toULong())\n}\n\n/**\n * Checks if the
specified [value] belongs to this range.\n
*\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class)\npublic operator fun
ULongRange.contains(value: UInt): Boolean {\n    return contains(value.toULong())\n}\n\n/**\n * Checks if the
specified [value] belongs to this range.\n
*\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class)\npublic operator fun
UIntRange.contains(value: ULong): Boolean {\n    return (value shr UInt.SIZE_BITS) == 0uL &&
contains(value.toUInt())\n}\n\n/**\n * Checks if the specified [value] belongs to this range.\n
*\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class)\npublic operator fun
UIntRange.contains(value: UShort): Boolean {\n    return contains(value.toUInt())\n}\n\n/**\n * Checks if the
specified [value] belongs to this range.\n
*\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class)\npublic operator fun
ULongRange.contains(value: UShort): Boolean {\n    return contains(value.toULong())\n}\n\n/**\n * Returns a
progression from this value down to the specified [to] value with the step -1.\n * \n * The [to] value should be less
than or equal to `this` value.\n * If the [to] value is greater than `this` value the returned progression is empty.\n
*\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class)\npublic infix fun
UByte.downTo(to: UByte): UIntProgression {\n    return UIntProgression.fromClosedRange(this.toUInt(),
to.toUInt(), -1)\n}\n\n/**\n * Returns a progression from this value down to the specified [to] value with the step -
1.\n * \n * The [to] value should be less than or equal to `this` value.\n * If the [to] value is greater than `this`
value the returned progression is empty.\n
*\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class)\npublic infix fun
UInt.downTo(to: UInt): UIntProgression {\n    return UIntProgression.fromClosedRange(this, to, -1)\n}\n\n/**\n *
Returns a progression from this value down to the specified [to] value with the step -1.\n * \n * The [to] value should
be less than or equal to `this` value.\n * If the [to] value is greater than `this` value the returned progression is
empty.\n
*\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class)\npublic infix fun
ULong.downTo(to: ULong): ULongProgression {\n    return ULongProgression.fromClosedRange(this, to, -
1L)\n}\n\n/**\n * Returns a progression from this value down to the specified [to] value with the step -1.\n * \n *

```



```

UByte.coerceAtLeast(minimumValue: UByte): UByte {
    return if (this < minimumValue) minimumValue else
    this
}

@SinceKotlin("1.5")@WasExperimental(ExperimentalUnsignedTypes::class)
public fun
UShort.coerceAtLeast(minimumValue: UShort): UShort {
    return if (this < minimumValue) minimumValue else
    this
}

@SinceKotlin("1.5")@WasExperimental(ExperimentalUnsignedTypes::class)
public fun
UInt.coerceAtMost(maximumValue: UInt): UInt {
    return if (this > maximumValue) maximumValue else
    this
}

@SinceKotlin("1.5")@WasExperimental(ExperimentalUnsignedTypes::class)
public fun
ULong.coerceAtMost(maximumValue: ULong): ULong {
    return if (this > maximumValue) maximumValue else
    this
}

@SinceKotlin("1.5")@WasExperimental(ExperimentalUnsignedTypes::class)
public fun
UByte.coerceAtMost(maximumValue: UByte): UByte {
    return if (this > maximumValue) maximumValue else
    this
}

@SinceKotlin("1.5")@WasExperimental(ExperimentalUnsignedTypes::class)
public fun
UShort.coerceAtMost(maximumValue: UShort): UShort {
    return if (this > maximumValue) maximumValue
    else this
}

@SinceKotlin("1.5")@WasExperimental(ExperimentalUnsignedTypes::class)
public fun
UInt.coerceIn(minimumValue: UInt, maximumValue: UInt): UInt {
    if (minimumValue > maximumValue)
        throw IllegalArgumentException("Cannot coerce value to an empty range: maximum $maximumValue is less than
        minimum $minimumValue.")
    return if (this < minimumValue) minimumValue
    if (this > maximumValue)
        return maximumValue
    return this
}

@SinceKotlin("1.5")@WasExperimental(ExperimentalUnsignedTypes::class)
public fun
ULong.coerceIn(minimumValue: ULong, maximumValue: ULong): ULong {
    if (minimumValue >
    maximumValue) throw IllegalArgumentException("Cannot coerce value to an empty range: maximum
    $maximumValue is less than minimum $minimumValue.")
    return if (this < minimumValue) minimumValue
    if (this > maximumValue) return maximumValue
    return this
}

@SinceKotlin("1.5")@WasExperimental(ExperimentalUnsignedTypes::class)
public fun
UByte.coerceIn(minimumValue: UByte, maximumValue: UByte): UByte {
    if (minimumValue >

```

```

maximumValue) throw IllegalArgumentException("Cannot coerce value to an empty range: maximum
$maximumValue is less than minimum $minimumValue.")\n  if (this < minimumValue) return minimumValue\n
if (this > maximumValue) return maximumValue\n  return this\n}\n\n/**\n * Ensures that this value lies in the
specified range [minimumValue]..[maximumValue].\n * \n * @return this value if it's in the range, or
[minimumValue] if this value is less than [minimumValue], or [maximumValue] if this value is greater than
[maximumValue].\n * \n * @sample samples.comparisons.ComparableOps.coerceInUnsigned\n
*\n*\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class)\npublic fun
UShort.coerceIn(minimumValue: UShort, maximumValue: UShort): UShort {\n  if (minimumValue >
maximumValue) throw IllegalArgumentException("Cannot coerce value to an empty range: maximum
$maximumValue is less than minimum $minimumValue.")\n  if (this < minimumValue) return minimumValue\n
if (this > maximumValue) return maximumValue\n  return this\n}\n\n/**\n * Ensures that this value lies in the
specified [range].\n * \n * @return this value if it's in the [range], or `range.start` if this value is less than
`range.start`, or `range.endInclusive` if this value is greater than `range.endInclusive`.\n * \n * @sample
samples.comparisons.ComparableOps.coerceInUnsigned\n
*\n*\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class)\npublic fun
UInt.coerceIn(range: ClosedRange<UInt>): UInt {\n  if (range is ClosedFloatingPointRange) {\n    return
this.coerceIn<UInt>(range)\n  }\n  if (range.isEmpty()) throw IllegalArgumentException("Cannot coerce value to
an empty range: $range.")\n  return when {\n    this < range.start -> range.start\n    this > range.endInclusive -
> range.endInclusive\n    else -> this\n  }\n}\n\n/**\n * Ensures that this value lies in the specified [range].\n * \n
* @return this value if it's in the [range], or `range.start` if this value is less than `range.start`, or
`range.endInclusive` if this value is greater than `range.endInclusive`.\n * \n * @sample
samples.comparisons.ComparableOps.coerceInUnsigned\n
*\n*\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class)\npublic fun
ULong.coerceIn(range: ClosedRange<ULong>): ULong {\n  if (range is ClosedFloatingPointRange) {\n    return
this.coerceIn<ULong>(range)\n  }\n  if (range.isEmpty()) throw IllegalArgumentException("Cannot coerce value
to an empty range: $range.")\n  return when {\n    this < range.start -> range.start\n    this >
range.endInclusive -> range.endInclusive\n    else -> this\n  }\n}\n\n"/>\n * Copyright 2010-2021 JetBrains
s.r.o. and Kotlin Programming Language contributors.\n * Use of this source code is governed by the Apache 2.0
license that can be found in the license/LICENSE.txt file.\n
*\n*\n@file:kotlin.jvm.JvmMultifileClass\n@file:kotlin.jvm.JvmName("USequencesKt")\n\npackage
kotlin.sequences\n\n// NOTE: THIS FILE IS AUTO-GENERATED by the GenerateStandardLib.kt\n// See:
https://github.com/JetBrains/kotlin/tree/master/libraries/stdlib\n\nimport kotlin.random.*\n\n/**\n * Returns the
sum of all elements in the sequence.\n * \n * The operation is _terminal_.\n
*\n*\n@kotlin.jvm.JvmName("sumOfUInt")\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedT
ypes::class)\npublic fun Sequence<UInt>.sum(): UInt {\n  var sum: UInt = 0u\n  for (element in this) {\n    sum
+= element\n  }\n  return sum\n}\n\n/**\n * Returns the sum of all elements in the sequence.\n * \n * The
operation is _terminal_.\n
*\n*\n@kotlin.jvm.JvmName("sumOfULong")\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsigned
Types::class)\npublic fun Sequence<ULong>.sum(): ULong {\n  var sum: ULong = 0uL\n  for (element in this)
{\n    sum += element\n  }\n  return sum\n}\n\n/**\n * Returns the sum of all elements in the sequence.\n * \n
* The operation is _terminal_.\n
*\n*\n@kotlin.jvm.JvmName("sumOfUByte")\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsigned
Types::class)\npublic fun Sequence<UByte>.sum(): UInt {\n  var sum: UInt = 0u\n  for (element in this) {\n
sum += element\n  }\n  return sum\n}\n\n/**\n * Returns the sum of all elements in the sequence.\n * \n * The
operation is _terminal_.\n
*\n*\n@kotlin.jvm.JvmName("sumOfUShort")\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsigned
Types::class)\npublic fun Sequence<UShort>.sum(): UInt {\n  var sum: UInt = 0u\n  for (element in this) {\n
sum += element\n  }\n  return sum\n}\n\n"/>\n * Copyright 2010-2020 JetBrains s.r.o. and Kotlin Programming

```


Language contributors.\n * Use of this source code is governed by the Apache 2.0 license that can be found in the license/LICENSE.txt file.\n */\n\npackage kotlin\n\n\npublic expect open class Error : Throwable {\n\n constructor()\n constructor(message: String?)\n constructor(message: String?, cause: Throwable?)\n\n constructor(cause: Throwable?)\n}\n\n\npublic expect open class Exception : Throwable {\n\n constructor()\n\n constructor(message: String?)\n constructor(message: String?, cause: Throwable?)\n constructor(cause: Throwable?)\n}\n\n\npublic expect open class RuntimeException : Exception {\n\n constructor()\n\n constructor(message: String?)\n constructor(message: String?, cause: Throwable?)\n constructor(cause: Throwable?)\n}\n\n\npublic expect open class IllegalArgumentException : RuntimeException {\n\n constructor()\n\n constructor(message: String?)\n constructor(message: String?, cause: Throwable?)\n constructor(cause: Throwable?)\n}\n\n\npublic expect open class IllegalStateException : RuntimeException {\n\n constructor()\n\n constructor(message: String?)\n constructor(message: String?, cause: Throwable?)\n constructor(cause: Throwable?)\n}\n\n\npublic expect open class IndexOutOfBoundsException : RuntimeException {\n\n constructor()\n\n constructor(message: String?)\n}\n\n\npublic expect open class ConcurrentModificationException : RuntimeException {\n\n constructor()\n\n constructor(message: String?)\n\n @Deprecated(\n "The constructor is not supported on all platforms and will be removed from kotlin-stdlib-common soon.\n", level = DeprecationLevel.ERROR)\n constructor(message: String?, cause: Throwable?)\n\n @Deprecated(\n "The constructor is not supported on all platforms and will be removed from kotlin-stdlib-common soon.\n", level = DeprecationLevel.ERROR)\n constructor(cause: Throwable?)\n}\n\n\npublic expect open class UnsupportedOperationException : RuntimeException {\n\n constructor()\n constructor(message: String?)\n constructor(message: String?, cause: Throwable?)\n constructor(cause: Throwable?)\n}\n\n\npublic expect open class NumberFormatException : IllegalArgumentException {\n\n constructor()\n constructor(message: String?)\n}\n\n\npublic expect open class NullPointerException : RuntimeException {\n\n constructor()\n\n constructor(message: String?)\n}\n\n\npublic expect open class ClassCastException : RuntimeException {\n\n constructor()\n constructor(message: String?)\n}\n\n\npublic expect open class AssertionError : Error {\n\n constructor()\n constructor(message: Any?)\n}\n\n\npublic expect open class NoSuchElementException : RuntimeException {\n\n constructor()\n constructor(message: String?)\n}\n\n\n@SinceKotlin("1.3")\n\npublic expect open class ArithmeticException : RuntimeException {\n\n constructor()\n constructor(message: String?)\n}\n\n\n@Deprecated(\n "This exception type is not supposed to be thrown or caught in common code and will be removed from kotlin-stdlib-common soon.\n", level = DeprecationLevel.ERROR)\n\npublic expect open class NoWhenBranchMatchedException : RuntimeException {\n\n constructor()\n constructor(message: String?)\n constructor(message: String?, cause: Throwable?)\n constructor(cause: Throwable?)\n}\n\n\n@Deprecated(\n "This exception type is not supposed to be thrown or caught in common code and will be removed from kotlin-stdlib-common soon.\n", level = DeprecationLevel.ERROR)\n\npublic expect class UninitializedPropertyAccessException : RuntimeException {\n\n constructor()\n constructor(message: String?)\n constructor(message: String?, cause: Throwable?)\n constructor(cause: Throwable?)\n}\n\n\n/**\n * Thrown after invocation of a function or property that was expected to return `Nothing`, but returned something instead.\n */\n\n@SinceKotlin("1.4")\n\n@PublishedApi\n\ninternal class KotlinNothingValueException : RuntimeException {\n\n constructor() : super()\n constructor(message: String?) : super(message)\n constructor(message: String?, cause: Throwable?) : super(message, cause)\n constructor(cause: Throwable?) : super(cause)\n}\n\n\n/**\n * Returns the detailed description of this throwable with its stack trace.\n * The detailed description includes:\n * - the short description (see [Throwable.toString]) of this throwable;\n * - the complete stack trace;\n * - detailed descriptions of the exceptions that were [suppressed][suppressedExceptions] in order to deliver this exception;\n * - the detailed description of each throwable in the [Throwable.cause] chain.\n */\n\n@SinceKotlin("1.4")\n\npublic expect fun Throwable.stackTraceToString(): String\n\n/**\n * Prints the [detailed description][Throwable.stackTraceToString] of this throwable to the standard output or standard error output.\n */\n\n@SinceKotlin("1.4")\n\n@Suppress("EXTENSION_SHADOWED_BY_MEMBER")\n\npublic expect fun Throwable.printStackTrace(): Unit\n\n/**\n * When supported by the platform, adds the specified exception to the list of exceptions that were\n * suppressed in order to deliver this exception.\n */\n

```

*\n@SinceKotlin("1.4")\n@Suppress("EXTENSION_SHADOWED_BY_MEMBER")\npublic expect fun
Throwable.addSuppressed(exception: Throwable)\n\n/**\n * Returns a list of all exceptions that were suppressed in
order to deliver this exception.\n *\n * The list can be empty:\n * - if no exceptions were suppressed;\n * - if the
platform doesn't support suppressed exceptions;\n * - if this [Throwable] instance has disabled the suppression.\n
*\n@SinceKotlin("1.4")\npublic expect val Throwable.suppressedExceptions: List<Throwable>\n", "/*\n *
Copyright 2010-2018 JetBrains s.r.o. and Kotlin Programming Language contributors.\n * Use of this source code is
governed by the Apache 2.0 license that can be found in the license/LICENSE.txt file.\n *\n\npackage
kotlin.js\n\nimport kotlin.annotation.AnnotationTarget.*\n\n/**\n * Gives a declaration (a function, a property or a
class) specific name in JavaScript.\n *\n@Target(CLASS, FUNCTION, PROPERTY, CONSTRUCTOR,
PROPERTY_GETTER, PROPERTY_SETTER)\n@OptionalExpectation\npublic expect annotation class
JsName(val name: String)\n\n/**\n * Marks experimental JS export annotations.\n *\n * Note that behavior of these
annotations will likely be changed in the future.\n *\n * Usages of such annotations will be reported as warnings
unless an explicit opt-in with\n * the [OptIn] annotation, e.g. `@OptIn(ExperimentalJsExport::class)`,\n * or with
the `-opt-in=kotlin.js.ExperimentalJsExport` compiler option is given.\n *\n@RequiresOptIn(level =
RequiresOptIn.Level.WARNING)\n@MustBeDocumented\n@Retention(AnnotationRetention.BINARY)\n@Since
Kotlin("1.4")\npublic annotation class ExperimentalJsExport\n\n/**\n * Exports top-level declaration on JS
platform.\n *\n * Compiled module exposes declarations that are marked with this annotation without name
mangling.\n *\n * This annotation can be applied to either files or top-level declarations.\n *\n * It is currently
prohibited to export the following kinds of declarations:\n *\n * * `expect` declarations\n * * inline functions with
reified type parameters\n * * suspend functions\n * * secondary constructors without `@JsName`\n * *
extension properties\n * * enum classes\n * * annotation classes\n *\n * Signatures of exported declarations must
only contain "exportable" types:\n *\n * * `dynamic`, `Any`, `String`, `Boolean`, `Byte`, `Short`, `Int`, `Float`,
`Double`\n * * `BooleanArray`, `ByteArray`, `ShortArray`, `IntArray`, `FloatArray`, `DoubleArray`\n * *
`Array<exportable-type>`\n * * Function types with exportable parameters and return types\n * * `external` or
`@JsExport` classes and interfaces\n * * Nullable counterparts of types above\n * * Unit return type. Must not be
nullable\n *\n * This annotation is experimental, meaning that restrictions mentioned above are subject to change.\n
*\n@ExperimentalJsExport\n@Retention(AnnotationRetention.BINARY)\n@Target(CLASS, PROPERTY,
FUNCTION, FILE)\n@SinceKotlin("1.4")\n@OptionalExpectation\npublic expect annotation class
JsExport(), "/*\n * Copyright 2010-2018 JetBrains s.r.o. and Kotlin Programming Language contributors.\n * Use
of this source code is governed by the Apache 2.0 license that can be found in the license/LICENSE.txt file.\n
*\n\npackage kotlin.io\n\n/**\n * Prints the line separator to the standard output stream. *\npublic expect fun
println()\n\n/**\n * Prints the given [message] and the line separator to the standard output stream. *\npublic expect fun
println(message: Any?)\n\n/**\n * Prints the given [message] to the standard output stream. *\npublic expect fun
print(message: Any?)\n\n/**\n * Reads a line of input from the standard input stream and returns it,\n * or throws a
[RuntimeException] if EOF has already been reached when [readLn] is called.\n *\n * LF or CRLF is treated as the
line terminator. Line terminator is not included in the returned string.\n *\n * Currently this function is not supported
in Kotlin/JS and throws [UnsupportedOperationException].\n *\n@SinceKotlin("1.6")\npublic expect fun
readLn(): String\n\n/**\n * Reads a line of input from the standard input stream and returns it,\n * or return `null` if
EOF has already been reached when [readLnOrNull] is called.\n *\n * LF or CRLF is treated as the line terminator.
Line terminator is not included in the returned string.\n *\n * Currently this function is not supported in Kotlin/JS
and throws [UnsupportedOperationException].\n *\n@SinceKotlin("1.6")\npublic expect fun readLnOrNull():
String?\n\ninternal class ReadAfterEOFException(message: String?) : RuntimeException(message)\n\n\ninternal
expect interface Serializable\n", "/*\n * Copyright 2010-2020 JetBrains s.r.o. and Kotlin Programming Language
contributors.\n * Use of this source code is governed by the Apache 2.0 license that can be found in the
license/LICENSE.txt file.\n *\n\npackage kotlin.collections\n\nimport kotlin.internal.PlatformDependent\n\n/**\n *
Classes that inherit from this interface can be represented as a sequence of elements that can\n * be iterated over.\n
*\n * @param T the type of element being iterated over. The iterator is covariant in its element type.\n *\npublic interface
Iterable<out T> {\n\n    /**\n     * Returns an iterator over the elements of this object.\n     *\n     public operator fun

```

```

iterator(): Iterator<T>\n}\n\n/**\n * Classes that inherit from this interface can be represented as a sequence of
elements that can\n * be iterated over and that supports removing elements during iteration.\n * @param T the type
of element being iterated over. The mutable iterator is invariant in its element type.\n */\npublic interface
MutableIterable<out T> : Iterable<T> {\n // Query Operations\n /**\n * Returns an iterator over the elements of this sequence that
supports removing elements during iteration.\n */\n override fun iterator(): MutableIterator<T>\n}\n\n/**\n * A
generic collection of elements. Methods in this interface support only read-only access to the collection;\n *
read/write access is supported through the [MutableCollection] interface.\n * @param E the type of elements
contained in the collection. The collection is covariant in its element type.\n */\npublic interface Collection<out E> :
Iterable<E> {\n // Query Operations\n /**\n * Returns the size of the collection.\n */\n public val size:
Int\n\n /**\n * Returns `true` if the collection is empty (contains no elements), `false` otherwise.\n */\n
public fun isEmpty(): Boolean\n\n /**\n * Checks if the specified element is contained in this collection.\n
*/\n public operator fun contains(element: @UnsafeVariance E): Boolean\n\n override fun iterator():
Iterator<E>\n\n // Bulk Operations\n /**\n * Checks if all elements in the specified collection are contained in
this collection.\n */\n public fun containsAll(elements: Collection<@UnsafeVariance E>): Boolean\n}\n\n/**\n
* A generic collection of elements that supports adding and removing elements.\n */\n * @param E the type of
elements contained in the collection. The mutable collection is invariant in its element type.\n */\npublic interface
MutableCollection<E> : Collection<E>, MutableIterable<E> {\n // Query Operations\n override fun iterator():
MutableIterator<E>\n\n // Modification Operations\n /**\n * Adds the specified element to the collection.\n
*/\n * @return `true` if the element has been added, `false` if the collection does not support duplicates\n * and
the element is already contained in the collection.\n */\n public fun add(element: E): Boolean\n\n /**\n *
Removes a single instance of the specified element from this\n * collection, if it is present.\n */\n * @return
`true` if the element has been successfully removed; `false` if it was not present in the collection.\n */\n
public fun remove(element: E): Boolean\n\n // Bulk Modification Operations\n /**\n * Adds all of the elements of
the specified collection to this collection.\n */\n * @return `true` if any of the specified elements was added to
the collection, `false` if the collection was not modified.\n */\n public fun addAll(elements: Collection<E>):
Boolean\n\n /**\n * Removes all of this collection's elements that are also contained in the specified
collection.\n */\n * @return `true` if any of the specified elements was removed from the collection, `false` if
the collection was not modified.\n */\n public fun removeAll(elements: Collection<E>): Boolean\n\n /**\n
* Retains only the elements in this collection that are contained in the specified collection.\n */\n * @return
`true` if any element was removed from the collection, `false` if the collection was not modified.\n */\n
public fun retainAll(elements: Collection<E>): Boolean\n\n /**\n * Removes all elements from this collection.\n
*/\n public fun clear(): Unit\n}\n\n/**\n * A generic ordered collection of elements. Methods in this interface
support only read-only access to the list;\n * read/write access is supported through the [MutableList] interface.\n
*/\n * @param E the type of elements contained in the list. The list is covariant in its element type.\n */\npublic interface
List<out E> : Collection<E> {\n // Query Operations\n\n override val size: Int\n\n override fun isEmpty():
Boolean\n\n override fun contains(element: @UnsafeVariance E): Boolean\n\n override fun iterator():
Iterator<E>\n\n // Bulk Operations\n\n override fun containsAll(elements: Collection<@UnsafeVariance E>):
Boolean\n\n // Positional Access Operations\n /**\n * Returns the element at the specified index in the list.\n
*/\n public operator fun get(index: Int): E\n\n // Search Operations\n /**\n * Returns the index of the first
occurrence of the specified element in the list, or -1 if the specified\n * element is not contained in the list.\n
*/\n public fun indexOf(element: @UnsafeVariance E): Int\n\n /**\n * Returns the index of the last
occurrence of the specified element in the list, or -1 if the specified\n * element is not contained in the list.\n
*/\n public fun lastIndexOf(element: @UnsafeVariance E): Int\n\n // List Iterators\n /**\n * Returns a list
iterator over the elements in this list (in proper sequence).\n */\n public fun listIterator(): ListIterator<E>\n\n
/**\n * Returns a list iterator over the elements in this list (in proper sequence), starting at the specified [index].\n
*/\n public fun listIterator(index: Int): ListIterator<E>\n\n // View\n /**\n * Returns a view of the portion
of this list between the specified [fromIndex] (inclusive) and [toIndex] (exclusive).\n * The returned list is backed
by this list, so non-structural changes in the returned list are reflected in this list, and vice-versa.\n */\n
public fun view(fromIndex: Int, toIndex: Int): List\n}

```

Structural changes in the base list make the behavior of the view undefined.

```

    * public fun
    subList(fromIndex: Int, toIndex: Int): List<E>
    * A generic ordered collection of elements that supports
    adding and removing elements.
    * @param E the type of elements contained in the list. The mutable list is invariant
    in its element type.
    * public interface MutableList<E> : List<E>, MutableCollection<E> {
    // Modification
    Operations
    /**
    * Adds the specified element to the end of this list.
    * @return `true` because the
    list is always modified as the result of this operation.
    * override fun add(element: E): Boolean
    override fun remove(element: E): Boolean
    // Bulk Modification Operations
    /**
    * Adds all of the
    elements of the specified collection to the end of this list.
    * The elements are appended in the order they
    appear in the [elements] collection.
    * @return `true` if the list was changed as the result of the
    operation.
    * override fun addAll(elements: Collection<E>): Boolean
    /**
    * Inserts all of the
    elements of the specified collection [elements] into this list at the specified [index].
    * @return `true` if the
    list was changed as the result of the operation.
    * public fun addAll(index: Int, elements: Collection<E>):
    Boolean
    override fun removeAll(elements: Collection<E>): Boolean
    override fun retainAll(elements:
    Collection<E>): Boolean
    override fun clear(): Unit
    // Positional Access Operations
    /**
    * Replaces
    the element at the specified position in this list with the specified element.
    * @return the element
    previously at the specified position.
    * public operator fun set(index: Int, element: E): E
    /**
    *
    Inserts an element into the list at the specified [index].
    * public fun add(index: Int, element: E): Unit
    /**
    * Removes an element at the specified [index] from the list.
    * @return the element that has been
    removed.
    * public fun removeAt(index: Int): E
    // List Iterators
    override fun listIterator():
    MutableListIterator<E>
    override fun listIterator(index: Int): MutableListIterator<E>
    // View
    override
    fun subList(fromIndex: Int, toIndex: Int): MutableList<E>
    * A generic unordered collection of elements
    that does not support duplicate elements.
    * Methods in this interface support only read-only access to the set;
    * read/write access is supported through the [MutableSet] interface.
    * @param E the type of elements contained in
    the set. The set is covariant in its element type.
    * public interface Set<out E> : Collection<E> {
    // Query
    Operations
    override val size: Int
    override fun isEmpty(): Boolean
    override fun contains(element:
    @UnsafeVariance E): Boolean
    override fun iterator(): Iterator<E>
    // Bulk Operations
    override fun
    containsAll(elements: Collection<@UnsafeVariance E>): Boolean
    * A generic unordered collection of
    elements that does not support duplicate elements, and supports
    * adding and removing elements.
    * @param E
    the type of elements contained in the set. The mutable set is invariant in its element type.
    * public interface
    MutableSet<E> : Set<E>, MutableCollection<E> {
    // Query Operations
    override fun iterator():
    MutableIterator<E>
    // Modification Operations
    /**
    * Adds the specified element to the set.
    * @return `true` if the element has been added, `false` if the element is already contained in the set.
    * override fun add(element: E): Boolean
    override fun remove(element: E): Boolean
    // Bulk Modification
    Operations
    override fun addAll(elements: Collection<E>): Boolean
    override fun removeAll(elements:
    Collection<E>): Boolean
    override fun retainAll(elements: Collection<E>): Boolean
    override fun clear():
    Unit
    * A collection that holds pairs of objects (keys and values) and supports efficiently retrieving
    * the value corresponding to each key. Map keys are unique; the map holds only one value for each key.
    * Methods
    in this interface support only read-only access to the map; read-write access is supported through
    * the
    [MutableMap] interface.
    * @param K the type of map keys. The map is invariant in its key type, as it
    * can
    accept key as a parameter (of [containsKey] for example) and return it in [keys] set.
    * @param V the type of map
    values. The map is covariant in its value type.
    * public interface Map<K, out V> {
    // Query Operations
    /**
    * Returns the number of key/value pairs in the map.
    * public val size: Int
    /**
    * Returns
    `true` if the map is empty (contains no elements), `false` otherwise.
    * public fun isEmpty(): Boolean
    /**
    * Returns `true` if the map contains the specified [key].
    * public fun containsKey(key: K):
    Boolean
    /**
    * Returns `true` if the map maps one or more keys to the specified [value].
    * public
    fun containsValue(value: @UnsafeVariance V): Boolean
    /**
    * Returns the value corresponding to the
    given [key], or `null` if such a key is not present in the map.
    * public operator fun get(key: K): V?
    /**
    * Returns the value corresponding to the given [key], or [defaultValue] if such a key is not present in the

```

```

map.\n * \n * @since JDK 1.8.\n * \n @SinceKotlin("1.1")\n @PlatformDependent\n public fun
getOrDefault(key: K, defaultValue: @UnsafeVariance V): V {\n // See default implementation in JDK
sources\n throw NotImplementedError()\n }\n // Views\n /**\n * Returns a read-only [Set] of all keys
in this map.\n * \n public val keys: Set<K>\n // Views\n /**\n * Returns a read-only [Collection] of all values in this
map. Note that this collection may contain duplicate values.\n * \n public val values: Collection<V>\n // Views\n
* Returns a read-only [Set] of all key/value pairs in this map.\n * \n public val entries: Set<Map.Entry<K,
V>>\n // Views\n /**\n * Represents a key/value pair held by a [Map].\n * \n public interface Entry<out K, out V>
{\n // Views\n /**\n * Returns the key of this key/value pair.\n * \n public val key: K\n // Views\n
* Returns the value of this key/value pair.\n * \n public val value: V\n }\n /**\n * A modifiable
collection that holds pairs of objects (keys and values) and supports efficiently retrieving\n * the value
corresponding to each key. Map keys are unique; the map holds only one value for each key.\n * @param K the type
of map keys. The map is invariant in its key type.\n * @param V the type of map values. The mutable map is
invariant in its value type.\n * \n public interface MutableMap<K, V> : Map<K, V> {\n // Modification
Operations\n /**\n * Associates the specified [value] with the specified [key] in the map.\n * \n * @return
the previous value associated with the key, or `null` if the key was not present in the map.\n * \n public fun
put(key: K, value: V): V?\n // Views\n /**\n * Removes the specified key and its corresponding value from this map.\n
* \n * @return the previous value associated with the key, or `null` if the key was not present in the map.\n * \n
public fun remove(key: K): V?\n // Views\n /**\n * Removes the entry for the specified key only if it is mapped to the
specified value.\n * \n * @return true if entry was removed\n * \n @SinceKotlin("1.1")\n
@PlatformDependent\n public fun remove(key: K, value: V): Boolean {\n // See default implementation in
JDK sources\n return true\n }\n // Bulk Modification Operations\n /**\n * Updates this map with
key/value pairs from the specified map [from].\n * \n public fun putAll(from: Map<out K, V>): Unit\n // Views\n
/**\n * Removes all elements from this map.\n * \n public fun clear(): Unit\n // Views\n /**\n * Returns a
[MutableSet] of all keys in this map.\n * \n override val keys: MutableSet<K>\n // Views\n /**\n * Returns a
[MutableCollection] of all values in this map. Note that this collection may contain duplicate values.\n * \n
override val values: MutableCollection<V>\n // Views\n /**\n * Returns a [MutableSet] of all key/value pairs in this
map.\n * \n override val entries: MutableSet<MutableMap.MutableEntry<K, V>>\n // Views\n /**\n * Represents a
key/value pair held by a [MutableMap].\n * \n public interface MutableEntry<K, V> : Map.Entry<K, V> {\n
// Views\n /**\n * Changes the value associated with the key of this entry.\n * \n * @return the previous value
corresponding to the key.\n * \n public fun setValue(newValue: V): V\n }\n /**\n * Copyright 2010-
2022 JetBrains s.r.o. and Kotlin Programming Language contributors.\n * Use of this source code is governed by the
Apache 2.0 license that can be found in the license/LICENSE.txt file.\n * \n // Auto-generated file. DO NOT
EDIT!\n\npackage kotlin.collections\n\n/** An iterator over a sequence of values of type `Byte`. */\n\npublic abstract
class ByteIterator : Iterator<Byte> {\n override final fun next() = nextByte()\n // Views\n /** Returns the next value in
the sequence without boxing. */\n\n public abstract fun nextByte(): Byte\n}\n\n/** An iterator over a sequence of
values of type `Char`. */\n\npublic abstract class CharIterator : Iterator<Char> {\n override final fun next() =
nextChar()\n // Views\n /** Returns the next value in the sequence without boxing. */\n\n public abstract fun
nextChar(): Char\n}\n\n/** An iterator over a sequence of values of type `Short`. */\n\npublic abstract class ShortIterator :
Iterator<Short> {\n override final fun next() = nextShort()\n // Views\n /** Returns the next value in the sequence without
boxing. */\n\n public abstract fun nextShort(): Short\n}\n\n/** An iterator over a sequence of values of type `Int`. */\n\n
public abstract class IntIterator : Iterator<Int> {\n override final fun next() = nextInt()\n // Views\n /** Returns the
next value in the sequence without boxing. */\n\n public abstract fun nextInt(): Int\n}\n\n/** An iterator over a
sequence of values of type `Long`. */\n\npublic abstract class LongIterator : Iterator<Long> {\n override final fun
next() = nextLong()\n // Views\n /** Returns the next value in the sequence without boxing. */\n\n public abstract fun
nextLong(): Long\n}\n\n/** An iterator over a sequence of values of type `Float`. */\n\npublic abstract class
FloatIterator : Iterator<Float> {\n override final fun next() = nextFloat()\n // Views\n /** Returns the next value in the
sequence without boxing. */\n\n public abstract fun nextFloat(): Float\n}\n\n/** An iterator over a sequence of
values of type `Double`. */\n\npublic abstract class DoubleIterator : Iterator<Double> {\n override final fun next() =

```

```

nextDouble()\n\n /** Returns the next value in the sequence without boxing. */\n public abstract fun
nextDouble(): Double\n\n/** An iterator over a sequence of values of type `Boolean`. */\npublic abstract class
BooleanIterator : Iterator<Boolean> {\n override final fun next() = nextBoolean()\n\n /** Returns the next value
in the sequence without boxing. */\n public abstract fun nextBoolean(): Boolean\n\n"/**\n * Copyright 2010-
2022 JetBrains s.r.o. and Kotlin Programming Language contributors.\n * Use of this source code is governed by the
Apache 2.0 license that can be found in the license/LICENSE.txt file.\n */\n\n// Auto-generated file. DO NOT
EDIT!\n\npackage kotlin.ranges\n\n/**\n * An iterator over a progression of values of type `Char`. */\n * @property
step the number by which the value is incremented on each step.\n */\ninternal class CharProgressionIterator(first:
Char, last: Char, val step: Int) : CharIterator() {\n private val finalElement: Int = last.code\n private var hasNext:
Boolean = if (step > 0) first <= last else first >= last\n private var next: Int = if (hasNext) first.code else
finalElement\n\n override fun hasNext(): Boolean = hasNext\n\n override fun nextChar(): Char {\n val value
= next\n if (value == finalElement) {\n if (!hasNext) throw kotlin.NoSuchElementException()\n
hasNext = false\n }\n else {\n next += step\n }\n return value.toChar()\n }\n}\n\n/**\n *
An iterator over a progression of values of type `Int`. */\n * @property step the number by which the value is
incremented on each step.\n */\ninternal class IntProgressionIterator(first: Int, last: Int, val step: Int) : IntIterator()
{\n private val finalElement: Int = last\n private var hasNext: Boolean = if (step > 0) first <= last else first >=
last\n private var next: Int = if (hasNext) first else finalElement\n\n override fun hasNext(): Boolean =
hasNext\n\n override fun nextInt(): Int {\n val value = next\n if (value == finalElement) {\n if
(!hasNext) throw kotlin.NoSuchElementException()\n hasNext = false\n }\n else {\n next +=
step\n }\n return value\n }\n}\n\n/**\n * An iterator over a progression of values of type `Long`. */\n *
@property step the number by which the value is incremented on each step.\n */\ninternal class
LongProgressionIterator(first: Long, last: Long, val step: Long) : LongIterator() {\n private val finalElement: Long
= last\n private var hasNext: Boolean = if (step > 0) first <= last else first >= last\n private var next: Long = if
(hasNext) first else finalElement\n\n override fun hasNext(): Boolean = hasNext\n\n override fun nextLong():
Long {\n val value = next\n if (value == finalElement) {\n if (!hasNext) throw
kotlin.NoSuchElementException()\n hasNext = false\n }\n else {\n next += step\n }\n
return value\n }\n}\n\n"/**\n * Copyright 2010-2022 JetBrains s.r.o. and Kotlin Programming Language
contributors.\n * Use of this source code is governed by the Apache 2.0 license that can be found in the
license/LICENSE.txt file.\n */\n\n// Auto-generated file. DO NOT EDIT!\n\npackage kotlin.ranges\n\nimport
kotlin.internal.getProgressionLastElement\n\n/**\n * A progression of values of type `Char`. */\n\npublic open class
CharProgression\n internal constructor\n (\n start: Char,\n endInclusive: Char,\n step: Int\n
) : Iterable<Char> {\n init {\n if (step == 0) throw kotlin.IllegalArgumentException("\u0027Step must be non-
zero.\u0027")\n if (step == Int.MIN_VALUE) throw kotlin.IllegalArgumentException("\u0027Step must be greater than
Int.MIN_VALUE to avoid overflow on negation.\u0027")\n }\n\n /**\n * The first element in the progression. */\n
\n /**\n * The last element in the progression. */\n\n /**\n * The step of the
progression. */\n\n /**\n * Checks if the progression is empty. */\n\n /**\n * Progression
with a positive step is empty if its first element is greater than the last element. */\n\n /**\n * Progression with a negative
step is empty if its first element is less than the last element. */\n\n /**\n * public open fun isEmpty(): Boolean = if
(step > 0) first > last else first < last\n\n override fun equals(other: Any?): Boolean =\n other is
CharProgression && (isEmpty() && other.isEmpty() ||\n first == other.first && last == other.last && step ==
other.step)\n\n override fun hashCode(): Int =\n if (isEmpty()) -1 else (31 * (31 * first.code + last.code) +
step)\n\n override fun toString(): String = if (step > 0) \"$first..$last step $step\" else \"$first downTo $last step ${-
step}\"\n\n companion object {\n /**\n * Creates CharProgression within the specified bounds of a
closed range.\n * The progression starts with the [rangeStart] value and goes toward the [rangeEnd]
value not excluding it, with the specified [step].\n * In order to go backwards the [step] must be negative.\n
*\n * [step] must be greater than `Int.MIN_VALUE` and not equal to zero.\n */\n\n /**\n * public fun

```



```

T): Boolean = value >= start && value <= endInclusive\n\n  /**\n   * Checks whether the range is empty.\n   *\n   * The range is empty if its start value is greater than the end value.\n   */\n  public fun isEmpty(): Boolean = start > endInclusive\n}\n","/*\n * Copyright 2010-2015 JetBrains s.r.o.\n * Licensed under the Apache License, Version 2.0 (the "License");\n * you may not use this file except in compliance with the License.\n * You may obtain a copy of the License at\n * http://www.apache.org/licenses/LICENSE-2.0\n * Unless required by applicable law or agreed to in writing, software\n * distributed under the License is distributed on an "AS IS" BASIS,\n * WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.\n * See the License for the specific language governing permissions and\n * limitations under the License.\n */\n\npackage kotlin\n\n/**\n * The type with only one value: the `Unit` object. This type corresponds to the `void` type in Java.\n */\npublic object Unit {\n  override fun toString() = "kotlin.Unit"\n}\n","/*\n * Copyright 2010-2015 JetBrains s.r.o.\n * Licensed under the Apache License, Version 2.0 (the "License");\n * you may not use this file except in compliance with the License.\n * You may obtain a copy of the License at\n * http://www.apache.org/licenses/LICENSE-2.0\n * Unless required by applicable law or agreed to in writing, software\n * distributed under the License is distributed on an "AS IS" BASIS,\n * WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.\n * See the License for the specific language governing permissions and\n * limitations under the License.\n */\n\npackage kotlin.annotation\n\nimport kotlin.annotation.AnnotationTarget\n\n/**\n * Contains the list of code elements which are the possible annotation targets\n */\npublic enum class AnnotationTarget {\n  /** Class, interface or object, annotation class is also included */\n  CLASS,\n  /** Annotation class only */\n  ANNOTATION_CLASS,\n  /** Generic type parameter */\n  TYPE_PARAMETER,\n  /** Property */\n  PROPERTY,\n  /** Field, including property's backing field */\n  FIELD,\n  /** Local variable */\n  LOCAL_VARIABLE,\n  /** Value parameter of a function or a constructor */\n  VALUE_PARAMETER,\n  /** Constructor only (primary or secondary) */\n  CONSTRUCTOR,\n  /** Function (constructors are not included) */\n  FUNCTION,\n  /** Property getter only */\n  PROPERTY_GETTER,\n  /** Property setter only */\n  PROPERTY_SETTER,\n  /** Type usage */\n  TYPE,\n  /** Any expression */\n  EXPRESSION,\n  /** File */\n  FILE,\n  /** Type alias */\n  TYPEALIAS\n}\n\n/**\n * Contains the list of possible annotation's retentions.\n *\n * Determines how an annotation is stored in binary output.\n */\npublic enum class AnnotationRetention {\n  /** Annotation isn't stored in binary output */\n  SOURCE,\n  /** Annotation is stored in binary output, but invisible for reflection */\n  BINARY,\n  /** Annotation is stored in binary output and visible for reflection (default retention) */\n  RUNTIME\n}\n\n/**\n * This meta-annotation indicates the kinds of code elements which are possible targets of an annotation.\n *\n * If the target meta-annotation is not present on an annotation declaration, the annotation is applicable to the following elements: [CLASS], [PROPERTY], [FIELD], [LOCAL_VARIABLE], [VALUE_PARAMETER], [CONSTRUCTOR], [FUNCTION], [PROPERTY_GETTER], [PROPERTY_SETTER].\n *\n * @property allowedTargets list of allowed annotation targets\n */\n@Target(AnnotationTarget.ANNOTATION_CLASS)\n@MustBeDocumented\npublic annotation class Target(vararg val allowedTargets: AnnotationTarget)\n\n/**\n * This meta-annotation determines whether an annotation is stored in binary output and visible for reflection. By default, both are true.\n *\n * @property value necessary annotation retention (RUNTIME, BINARY or SOURCE)\n */\n@Target(AnnotationTarget.ANNOTATION_CLASS)\npublic annotation class Retention(val value: AnnotationRetention = AnnotationRetention.RUNTIME)\n\n/**\n * This meta-annotation determines that an annotation is applicable twice or more on a single code element\n */\n@Target(AnnotationTarget.ANNOTATION_CLASS)\npublic annotation class Repeatable\n\n/**\n * This meta-annotation determines that an annotation is a part of public API and therefore should be included in the generated\n * documentation for the element to which the annotation is applied.\n */\n@Target(AnnotationTarget.ANNOTATION_CLASS)\npublic annotation class MustBeDocumented\n","/*\n * Copyright 2010-2016 JetBrains s.r.o.\n * Licensed under the Apache License, Version 2.0 (the "License");\n * you may not use this file except in compliance with the License.\n * You may obtain a copy of the License at\n * http://www.apache.org/licenses/LICENSE-2.0\n * Unless required by applicable law or agreed to in writing,

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software\n * distributed under the License is distributed on an \"AS IS\" BASIS,\n * WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.\n * See the License for the specific language governing permissions and\n * limitations under the License.\n */\n\npackage kotlin.internal\n\n/**\n * Specifies that the corresponding type parameter is not used for unsafe operations such as casts or 'is' checks\n * That means it's completely safe to use generic types as argument for such parameter.\n */\n@Target(AnnotationTarget.TYPE_PARAMETER)\n@Retention(AnnotationRetention.BINARY)\ninternal annotation class PureReifiable\n\n/**\n * Specifies that the corresponding built-in method exists depending on platform.\n * Current implementation for JVM looks whether method with same JVM descriptor exists in the module JDK.\n * For example MutableMap.remove(K, V) available only if corresponding\n * method 'java/util/Map.remove(Ljava/lang/Object;Ljava/lang/Object;)Z' is defined in JDK (i.e. for major versions >= 8)\n */\n@Target(AnnotationTarget.FUNCTION)\n@Retention(AnnotationRetention.BINARY)\ninternal annotation class PlatformDependent\n\n"/\n * Copyright 2010-2018 JetBrains s.r.o. and Kotlin Programming Language contributors.\n * Use of this source code is governed by the Apache 2.0 license that can be found in the license/LICENSE.txt file.\n */\n\npackage kotlin.internal\n\n// a mod b (in arithmetical sense)\nprivate fun mod(a: Int, b: Int): Int {\n val mod = a % b\n return if (mod >= 0) mod else mod + b\n}\n\nprivate fun mod(a: Long, b: Long): Long {\n val mod = a % b\n return if (mod >= 0) mod else mod + b\n}\n\n// (a - b) mod c\nprivate fun differenceModulo(a: Int, b: Int, c: Int): Int {\n return mod(mod(a, c) - mod(b, c), c)\n}\n\nprivate fun differenceModulo(a: Long, b: Long, c: Long): Long {\n return mod(mod(a, c) - mod(b, c), c)\n}\n\n/**\n * Calculates the final element of a bounded arithmetic progression, i.e. the last element of the progression which is in the range\n * from [start] to [end] in case of a positive [step], or from [end] to [start] in case of a negative\n * [step].\n * No validation on passed parameters is performed. The given parameters should satisfy the condition:\n * - either `step > 0` and `start <= end`,\n * - or `step < 0` and `start >= end`.\n * @param start first element of the progression\n * @param end ending bound for the progression\n * @param step increment, or difference of successive elements in the progression\n * @return the final element of the progression\n */\n@suppress\n */\n@PublishedApi\ninternal fun getProgressionLastElement(start: Int, end: Int, step: Int): Int = when {\n step > 0 -> if (start >= end) end else end - differenceModulo(end, start, step)\n step < 0 -> if (start <= end) end else end + differenceModulo(start, end, -step)\n else -> throw kotlin.IllegalArgumentException("Step is zero.")\n}\n\n/**\n * Calculates the final element of a bounded arithmetic progression, i.e. the last element of the progression which is in the range\n * from [start] to [end] in case of a positive [step], or from [end] to [start] in case of a negative\n * [step].\n * No validation on passed parameters is performed. The given parameters should satisfy the condition:\n * - either `step > 0` and `start <= end`,\n * - or `step < 0` and `start >= end`.\n * @param start first element of the progression\n * @param end ending bound for the progression\n * @param step increment, or difference of successive elements in the progression\n * @return the final element of the progression\n */\n@suppress\n */\n@PublishedApi\ninternal fun getProgressionLastElement(start: Long, end: Long, step: Long): Long = when {\n step > 0 -> if (start >= end) end else end - differenceModulo(end, start, step)\n step < 0 -> if (start <= end) end else end + differenceModulo(start, end, -step)\n else -> throw\n kotlin.IllegalArgumentException("Step is zero.")\n}\n\n"/\n * Copyright 2010-2018 JetBrains s.r.o. and Kotlin Programming Language contributors.\n * Use of this source code is governed by the Apache 2.0 license that can be found in the license/LICENSE.txt file.\n */\n\n@JsName("arrayIterator")\ninternal fun arrayIterator(array: dynamic, type: String?) = when (type) {\n null -> {\n val arr: Array<dynamic> = array\n object : Iterator<dynamic> {\n var index = 0\n override fun hasNext() = index < arr.size\n override fun next() = if (index < arr.size) arr[index++] else throw NoSuchElementException("\$index")\n }\n }\n "BooleanArray" -> booleanArrayIterator(array)\n "ByteArray" -> byteArrayIterator(array)\n "ShortArray" -> shortArrayIterator(array)\n "CharArray" -> charArrayIterator(array)\n "IntArray" -> intArrayIterator(array)\n "LongArray" -> longArrayIterator(array)\n "FloatArray" -> floatArrayIterator(array)\n "DoubleArray" -> doubleArrayIterator(array)\n else -> throw\n IllegalStateException("Unsupported type argument for arrayIterator: \$type")\n}\n\n@JsName("booleanArrayIterator")\ninternal fun booleanArrayIterator(array: BooleanArray) =

```

object : BooleanIterator() {
    var index = 0
    override fun hasNext() = index < array.size
    override fun
nextBoolean() = if (index < array.size) array[index++] else throw
NoSuchElementException("$index")
}
@JsName("byteArrayIterator")
internal fun byteArrayIterator(array:
ByteArray) = object : ByteIterator() {
    var index = 0
    override fun hasNext() = index < array.size
    override
fun nextByte() = if (index < array.size) array[index++] else throw
NoSuchElementException("$index")
}
@JsName("shortArrayIterator")
internal fun
shortArrayIterator(array: ShortArray) = object : ShortIterator() {
    var index = 0
    override fun hasNext() =
index < array.size
    override fun nextShort() = if (index < array.size) array[index++] else throw
NoSuchElementException("$index")
}
@JsName("charArrayIterator")
internal fun charArrayIterator(array:
CharArray) = object : CharIterator() {
    var index = 0
    override fun hasNext() = index < array.size
    override
fun nextChar() = if (index < array.size) array[index++] else throw
NoSuchElementException("$index")
}
@JsName("intArrayIterator")
internal fun intArrayIterator(array:
IntArray) = object : IntIterator() {
    var index = 0
    override fun hasNext() = index < array.size
    override fun
nextInt() = if (index < array.size) array[index++] else throw
NoSuchElementException("$index")
}
@JsName("floatArrayIterator")
internal fun
floatArrayIterator(array: FloatArray) = object : FloatIterator() {
    var index = 0
    override fun hasNext() = index
< array.size
    override fun nextFloat() = if (index < array.size) array[index++] else throw
NoSuchElementException("$index")
}
@JsName("doubleArrayIterator")
internal fun
doubleArrayIterator(array: DoubleArray) = object : DoubleIterator() {
    var index = 0
    override fun hasNext()
= index < array.size
    override fun nextDouble() = if (index < array.size) array[index++] else throw
NoSuchElementException("$index")
}
@JsName("longArrayIterator")
internal fun longArrayIterator(array:
LongArray) = object : LongIterator() {
    var index = 0
    override fun hasNext() = index < array.size
    override fun nextLong() = if (index < array.size) array[index++] else throw
NoSuchElementException("$index")
}
@JsName("PropertyMetadata")
internal class
PropertyMetadata(@JsName("callableName") val name:
String)
@JsName("noWhenBranchMatched")
internal fun noWhenBranchMatched(): Nothing = throw
NoWhenBranchMatchedException()
@JsName("subSequence")
internal fun subSequence(c: CharSequence,
startIndex: Int, endIndex: Int): CharSequence {
    if (c is String) {
        return c.substring(startIndex, endIndex)
    } else {
        return c.asDynamic().`subSequence_vux9f0$`(startIndex, endIndex)
    }
}
@JsName("captureStack")
internal fun captureStack(@Suppress("UNUSED_PARAMETER")
baseClass: JsClass<in Throwable>, instance: Throwable) {
    if (js("Error").captureStackTrace) {
        // Using
uncropped stack traces due to KT-37563.
        // Precise stack traces are implemented in JS IR compiler and
stdlib
        js("Error").captureStackTrace(instance)
    } else {
        instance.asDynamic().stack = js("new
Error()").stack
    }
}
@JsName("newThrowable")
internal fun newThrowable(message: String?, cause:
Throwable?): Throwable {
    val throwable = js("new Error()")
    throwable.message = if (jsTypeOf(message)
== "undefined") {
        if (cause != null) cause.toString() else null
    } else {
        message
    }
    throwable.cause = cause
    throwable.name = "Throwable"
    return
throwable
}
@JsName("BoxedChar")
internal class BoxedChar(val c: Int) : Comparable<Int> {
    override
fun equals(other: Any?): Boolean {
        return other is BoxedChar && c == other.c
    }
    override fun
hashCode(): Int {
        return c
    }
    override fun toString(): String {
        return
js("this.c").unsafeCast<Char>().toString()
    }
    override fun compareTo(other: Int): Int {
        return
js("this.c - other").unsafeCast<Int>()
    }
}
@JsName("valueOf")
public fun valueOf(): Int {
    return c
}
@kotlin.internal.InlineOnly
internal inline fun <T> concat(args: Array<T>): T {
    val typed
= js("Array")(args.size)
    for (i in args.indices) {
        val arr = args[i]
        if (arr !is Array<*>) {
            typed[i] = js("[]").slice.call(arr)
        } else {
            typed[i] = arr
        }
    }
    return
js("[]").concat.apply(js("[]"), typed)
}
@PublishedApi
@JsName("arrayConcat")
@Suppress("UNUSED_PARAMETER")
internal fun <T>
arrayConcat(a: T, b: T): T {
    return concat(js("arguments"))
}
/** Concat primitive arrays. Main use:

```

prepare vararg arguments.\n * For compatibility with 1.1.0 the arguments may be a mixture of Array's and TypedArray's.\n * If the first argument is TypedArray (Byte-, Short-, Char-, Int-, Float-, and DoubleArray) returns a TypedArray, otherwise an Array.\n * If the first argument has the \$type\$ property (Boolean-, Char-, and LongArray) copy its value to result.\$type\$.\n * If the first argument is a regular Array without the \$type\$ property default to arrayConcat.\n

```
*\n@PublishedApi\n@jsName("primitiveArrayConcat")\n@Suppress("UNUSED_PARAMETER")\ninternal fun <T> primitiveArrayConcat(a: T, b: T): T {\n    val args: Array<T> = js("arguments")\n    if (a is Array<*> && a.asDynamic().`$type$` === undefined) {\n        return concat(args)\n    } else {\n        var size = 0\n        for (i in args.indices) {\n            size += args[i].asDynamic().length as Int\n        }\n        val result = js("new a.constructor(size)")\n        kotlin.copyArrayType(a, result)\n        size = 0\n        for (i in args.indices) {\n            val arr = args[i].asDynamic()\n            for (j in 0 until arr.length) {\n                result[size++] = arr[j]\n            }\n        }\n        return result\n    }\n}\n\n@jsName("booleanArrayOf")\ninternal fun booleanArrayOf() = withType("BooleanArray", js("[].slice.call(arguments)")\n)\n\n@jsName("charArrayOf") // The arguments have to be slice'd here because of Rhino (see KT-16974)\ninternal fun charArrayOf() = withType("CharArray", js("new Uint16Array([].slice.call(arguments))"))\n\n@jsName("longArrayOf")\ninternal fun longArrayOf() = withType("LongArray", js("[].slice.call(arguments)")\n)\n\n@jsName("withType")\n@kotlin.internal.InlineOnly\ninternal inline fun withType(type: String, array: dynamic): dynamic {\n    array.`$type$` = type\n    return array\n}\n/*\n * Copyright 2010-2018 JetBrains s.r.o. and Kotlin Programming Language contributors.\n * Use of this source code is governed by the Apache 2.0 license that can be found in the license/LICENSE.txt file.\n */\n\npackage kotlin.js\n\n/**\n * Function corresponding to JavaScript's `typeof` operator\n */\n\n@kotlin.internal.InlineOnly\n@Suppress("UNUSED_PARAMETER")\npublic inline fun jsTypeOf(a: Any?): String = js("typeof a")\n/*\n * Copyright 2010-2018 JetBrains s.r.o. and Kotlin Programming Language contributors.\n * Use of this source code is governed by the Apache 2.0 license that can be found in the license/LICENSE.txt file.\n */\n\n@file:Suppress("UNUSED_PARAMETER", "NOTHING_TO_INLINE")\npackage kotlin\n\n/**\n * Returns an empty array of the specified type [T].\n */\n\npublic inline fun <T> emptyArray(): Array<T> = js("[]")\n\n@library\npublic fun <T> arrayOf(vararg elements: T): Array<T> = definedExternally\n\n@library\npublic fun doubleArrayOf(vararg elements: Double): DoubleArray = definedExternally\n\n@library\npublic fun floatArrayOf(vararg elements: Float): FloatArray = definedExternally\n\n@library\npublic fun longArrayOf(vararg elements: Long): LongArray = definedExternally\n\n@library\npublic fun intArrayOf(vararg elements: Int): IntArray = definedExternally\n\n@library\npublic fun charArrayOf(vararg elements: Char): CharArray = definedExternally\n\n@library\npublic fun shortArrayOf(vararg elements: Short): ShortArray = definedExternally\n\n@library\npublic fun byteArrayOf(vararg elements: Byte): ByteArray = definedExternally\n\n@library\npublic fun booleanArrayOf(vararg elements: Boolean): BooleanArray = definedExternally\n\n/**\n * Creates a new instance of the [Lazy] that uses the specified initialization function [initializer].\n */\n\npublic actual fun <T> lazy(initializer: () -> T): Lazy<T> = UnsafeLazyImpl(initializer)\n\n/**\n * Creates a new instance of the [Lazy] that uses the specified initialization function [initializer].\n * The [mode] parameter is ignored.\n */\n\npublic actual fun <T> lazy(mode: LazyThreadSafetyMode, initializer: () -> T): Lazy<T> = UnsafeLazyImpl(initializer)\n\n/**\n * Creates a new instance of the [Lazy] that uses the specified initialization function [initializer].\n * The [lock] parameter is ignored.\n */\n\npublic actual fun <T> lazy(lock: Any?, initializer: () -> T): Lazy<T> = UnsafeLazyImpl(initializer)\n\n\ninternal fun fillFrom(src: dynamic, dst: dynamic): dynamic {\n    val srcLen: Int = src.length\n    val dstLen: Int = dst.length\n    var index: Int = 0\n    while (index < srcLen && index < dstLen) dst[index] = src[index++]\n    return dst\n}\n\n\ninternal fun arrayCopyResize(source: dynamic, newSize: Int, defaultValue: Any?): dynamic {\n    val result = source.slice(0, newSize)\n    copyArrayType(source, result)\n    var index: Int = source.length\n    if (newSize > index) {\n        result.length = newSize\n        while (index < newSize) result[index++] = defaultValue\n    }\n    return result\n}\n\n\ninternal fun <T> arrayPlusCollection(array: dynamic, collection: Collection<T>): dynamic {\n    val result = array.slice()\n
```

```

result.length += collection.size\n    copyArrayType(array, result)\n    var index: Int = array.length\n    for (element in
collection) result[index++] = element\n    return result\n}\n\ninternal fun <T> fillFromCollection(dst: dynamic,
startIndex: Int, collection: Collection<T>): dynamic {\n    var index = startIndex\n    for (element in collection)
dst[index++] = element\n    return dst\n}\n\ninternal inline fun copyArrayType(from: dynamic, to: dynamic) {\n    if
(from.`$type$` !== undefined) {\n        to.`$type$` = from.`$type$`\n    }\n}\n\ninternal inline fun jsIsType(obj:
dynamic, jsClass: dynamic) = js("Kotlin").isType(obj, jsClass)", /*\n * Copyright 2010-2021 JetBrains s.r.o. and
Kotlin Programming Language contributors.\n * Use of this source code is governed by the Apache 2.0 license that
can be found in the license/LICENSE.txt file.\n */\n\npackage kotlin\n\n/**\n * Creates a Char with the specified
[code].\n */\n * @sample samples.text.Chars.charFromCode\n
*/\n\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalStdlibApi::class)\n@kotlin.internal.InlineOnly\npublic
actual inline fun Char(code: UShort): Char {\n    return code.toInt().toChar()\n}\n", /*\n * Copyright 2010-2018
JetBrains s.r.o. and Kotlin Programming Language contributors.\n * Use of this source code is governed by the
Apache 2.0 license that can be found in the license/LICENSE.txt file.\n */\n\npackage kotlin.coroutines\n\nimport
kotlin.coroutines.intrinsics.COROUTINE_SUSPENDED\n\n@SinceKotlin("1.3")\n@JsName("CoroutineImpl")\n\ninternal
abstract class CoroutineImpl(private val resultContinuation: Continuation<Any?>) : Continuation<Any?>
{\n    protected var state = 0\n    protected var exceptionState = 0\n    protected var result: Any? = null\n    protected
var exception: Throwable? = null\n    protected var finallyPath: Array<Int>? = null\n\n    public override val context:
CoroutineContext = resultContinuation.context\n\n    private var intercepted_: Continuation<Any?>? = null\n\n    public
fun intercepted(): Continuation<Any?> =\n        intercepted_\n        ?:\n    (context[ContinuationInterceptor]?.interceptContinuation(this) ?: this)\n        .also { intercepted_ = it }\n\n    override fun resumeWith(result: Result<Any?>) {\n        var current = this\n        var currentResult: Any? =
result.getOrNull()\n        var currentException: Throwable? = result.exceptionOrNull()\n        // This loop unrolls
recursion in current.resumeWith(param) to make saner and shorter stack traces on resume\n        while (true) {\n
            with(current) {\n                val completion = resultContinuation\n                // Set result and exception
fields in the current continuation\n                if (currentException == null) {\n                    this.result =
currentResult\n                } else {\n                    state = exceptionState\n                    exception =
currentException\n                }\n            }\n            try {\n                val outcome = doResume()\n                if
(outcome === COROUTINE_SUSPENDED)\n            }\n            return\n                currentResult = outcome\n                currentException = null\n            } catch (exception:
dynamic) { // Catch all exceptions\n                currentResult = null\n                currentException =
exception.unsafeCast<Throwable>()\n            }\n            releaseIntercepted() // this state machine instance is
terminating\n            if (completion is CoroutineImpl) {\n                // unrolling recursion via loop\n                current =
completion\n            } else {\n                // top-level completion reached -- invoke and return\n                currentException?.let {\n                    completion.resumeWithException(it)\n                } ?:\n                completion.resume(currentResult)\n                return\n            }\n        }\n        private fun
releaseIntercepted() {\n            val intercepted = intercepted_\n            if (intercepted != null && intercepted !== this) {\n
                context[ContinuationInterceptor]!!.releaseInterceptedContinuation(intercepted)\n            }\n            this.intercepted_
= CompletedContinuation // just in case\n        }\n\n        protected abstract fun doResume(): Any?\n}\n\ninternal object
CompletedContinuation : Continuation<Any?> {\n    override val context: CoroutineContext\n        get() =
error("This continuation is already complete")\n\n    override fun resumeWith(result: Result<Any?>) {\n
        error("This continuation is already complete")\n    }\n\n    override fun toString(): String = "This continuation
is already complete"\n}\n", /*\n * Copyright 2010-2018 JetBrains s.r.o. and Kotlin Programming Language
contributors.\n * Use of this source code is governed by the Apache 2.0 license that can be found in the
license/LICENSE.txt file.\n */\n\n@file:Suppress("UNCHECKED_CAST",
"RedundantVisibilityModifier")\n\npackage kotlin\n\nimport kotlin.contracts.*\nimport
kotlin.internal.InlineOnly\nimport kotlin.jvm.JvmField\nimport kotlin.jvm.JvmInline\nimport
kotlin.jvm.JvmName\n\n/**\n * A discriminated union that encapsulates a successful outcome with a value of type
[T]\n * or a failure with an arbitrary [Throwable] exception.\n */\n\n@SinceKotlin("1.3")\n@JvmInline\npublic
value class Result<out T> @PublishedApi internal constructor(\n    @PublishedApi\n    internal val value: Any?) :

```

```

Serializable {
    // discovery
    /**
     * Returns `true` if this instance represents a successful outcome.
     * In this case [isFailure] returns `false`.
     */
    public val isSuccess: Boolean get() = value !is Failure

    /**
     * Returns `true` if this instance represents a failed outcome.
     * In this case [isSuccess] returns `false`.
     */
    public val isFailure: Boolean get() = value is Failure

    // value & exception retrieval
    /**
     * Returns the encapsulated value if this instance represents [success][Result.isSuccess] or `null` if it is
     [failure][Result.isFailure].
     */
    * This function is a shorthand for `getOrElse { null }` (see [getOrElse]) or
    * `fold(onSuccess = { it }, onFailure = { null })` (see [fold]).
    */
    @InlineOnly
    public inline fun
    getOrNull(): T? =
        when {
            isFailure -> null
            else -> value as T
        }

    /**
     * Returns the encapsulated [Throwable] exception if this instance represents [failure][isFailure] or `null` if it is
     [success][isSuccess].
     */
    * This function is a shorthand for `fold(onSuccess = { null }, onFailure = { it })`
     (see [fold]).
    */
    public fun exceptionOrNull(): Throwable? =
        when (value) {
            is Failure ->
            value.exception
            else -> null
        }

    /**
     * Returns a string `Success(v)` if this instance represents
     [success][Result.isSuccess]
     * where `v` is a string representation of the value or a string `Failure(x)` if
     * it is [failure][isFailure] where `x` is a string representation of the exception.
     */
    public override fun toString():
    String =
        when (value) {
            is Failure -> value.toString() // "Failure($exception)"
            else ->
            "Success($value)"
        }

    // companion with constructors
    /**
     * Companion object for [Result]
     class that contains its constructor functions
     * [success] and [failure].
     */
    public companion object {
        /**
         * Returns an instance that encapsulates the given [value] as successful value.
         */
        @Suppress("INAPPLICABLE_JVM_NAME")
        @InlineOnly
        @JvmName("success")
        public
        inline fun <T> success(value: T): Result<T> =
            Result(value)

        /**
         * Returns an instance that
         encapsulates the given [Throwable] [exception] as failure.
         */
        @Suppress("INAPPLICABLE_JVM_NAME")
        @InlineOnly
        @JvmName("failure")
        public
        inline fun <T> failure(exception: Throwable): Result<T> =
            Result(createFailure(exception))
    }

    internal class Failure(
        @JvmField
        val exception: Throwable
    ): Serializable {
        override fun
        equals(other: Any?): Boolean = other is Failure && exception == other.exception
        override fun hashCode():
        Int = exception.hashCode()
        override fun toString(): String = "Failure($exception)"
    }

    /**
     * Creates an instance of internal marker [Result.Failure] class to
     * make sure that this class is not exposed in ABI.
     */
    @PublishedApi
    @SinceKotlin("1.3")
    internal fun createFailure(exception: Throwable): Any =
    Result.Failure(exception)

    /**
     * Throws exception if the result is failure. This internal function minimizes
     * inlined bytecode for [getOrThrow] and makes sure that in the future we can
     * add some exception-augmenting
     logic here (if needed).
     */
    @PublishedApi
    @SinceKotlin("1.3")
    internal fun Result<*>.throwOnFailure() {
        if (value is Result.Failure) throw value.exception
    }

    /**
     * Calls the specified function [block] and returns its
     encapsulated result if invocation was successful,
     * catching any [Throwable] exception that was thrown from the
     [block] function execution and encapsulating it as a failure.
     */
    @InlineOnly
    @SinceKotlin("1.3")
    public
    inline fun <R> runCatching(block: () -> R): Result<R> {
        return try {
            Result.success(block())
        } catch
        (e: Throwable) {
            Result.failure(e)
        }
    }

    /**
     * Calls the specified function [block] with `this` value as
     its receiver and returns its encapsulated result if invocation was successful,
     * catching any [Throwable] exception
     that was thrown from the [block] function execution and encapsulating it as a failure.
     */
    @InlineOnly
    @SinceKotlin("1.3")
    public inline fun <T, R> T.runCatching(block: T.() -> R): Result<R> {
        return try {
            Result.success(block())
        } catch (e: Throwable) {
            Result.failure(e)
        }
    }

    /**
     * Returns the encapsulated value if this instance represents [success][Result.isSuccess] or
     throws the encapsulated [Throwable] exception
     * if it is [failure][Result.isFailure].
     */
    * This function is a
    shorthand for `getOrElse { throw it }` (see [getOrElse]).
    */
    @InlineOnly
    @SinceKotlin("1.3")
    public inline
    fun <T> Result<T>.getOrThrow(): T {
        throwOnFailure()
        return value as T
    }

    /**
     * Returns the
     encapsulated value if this instance represents [success][Result.isSuccess] or the
     * result of [onFailure] function for
     the encapsulated [Throwable] exception if it is [failure][Result.isFailure].
     */
    * Note, that this function rethrows
    any [Throwable] exception thrown by [onFailure] function.
    */
    * This function is a shorthand for `fold(onSuccess
    = { it }, onFailure = onFailure)` (see [fold]).
    */
    @InlineOnly
    @SinceKotlin("1.3")
    public inline fun <R, T :

```

```

R> Result<T>.getOrElse(onFailure: (exception: Throwable) -> R): R {
  contract {
    callsInPlace(onFailure,
InvocationKind.AT_MOST_ONCE)
  }
  return when (val exception = exceptionOrNull()) {
    null ->
value as T
    else -> onFailure(exception)
  }
}
/**
 * Returns the encapsulated value if this instance
represents [success][Result.isSuccess] or the
 * [defaultValue] if it is [failure][Result.isFailure].
 * This
function is a shorthand for `getOrElse { defaultValue }` (see [getOrElse]).
*/
@InlineOnly
@SinceKotlin("1.3")
public inline fun <R, T : R> Result<T>.getOrElse(defaultValue: R):
R {
  if (isFailure) return defaultValue
  return value as T
}
/**
 * Returns the result of [onSuccess] for the
encapsulated value if this instance represents [success][Result.isSuccess]
 * or the result of [onFailure] function for
the encapsulated [Throwable] exception if it is [failure][Result.isFailure].
 * Note, that this function rethrows
any [Throwable] exception thrown by [onSuccess] or by [onFailure] function.
*/
@InlineOnly
@SinceKotlin("1.3")
public inline fun <R, T> Result<T>.fold(
  onSuccess: (value: T) ->
R,
  onFailure: (exception: Throwable) -> R): R {
  contract {
    callsInPlace(onSuccess,
InvocationKind.AT_MOST_ONCE)
    callsInPlace(onFailure, InvocationKind.AT_MOST_ONCE)
  }
  return when (val exception = exceptionOrNull()) {
    null -> onSuccess(value as T)
    else ->
onFailure(exception)
  }
}
/**
 * Returns the encapsulated result of the given
[transform] function applied to the encapsulated value
 * if this instance represents [success][Result.isSuccess] or
the
 * original encapsulated [Throwable] exception if it is [failure][Result.isFailure].
 * Note, that this function
rethrows any [Throwable] exception thrown by [transform] function.
 * See [mapCatching] for an alternative that
encapsulates exceptions.
*/
@InlineOnly
@SinceKotlin("1.3")
public inline fun <R, T>
Result<T>.map(transform: (value: T) -> R): Result<R> {
  contract {
    callsInPlace(transform,
InvocationKind.AT_MOST_ONCE)
  }
  return when {
    isSuccess -> Result.success(transform(value as
T))
    else -> Result(value)
  }
}
/**
 * Returns the encapsulated result of the given [transform] function
applied to the encapsulated value
 * if this instance represents [success][Result.isSuccess] or the
original
 * encapsulated [Throwable] exception if it is [failure][Result.isFailure].
 * This function catches any [Throwable]
exception thrown by [transform] function and encapsulates it as a failure.
 * See [map] for an alternative that
rethrows exceptions from `transform` function.
*/
@InlineOnly
@SinceKotlin("1.3")
public inline fun <R,
T> Result<T>.mapCatching(transform: (value: T) -> R): Result<R> {
  return when {
    isSuccess ->
runCatching { transform(value as T) }
    else -> Result(value)
  }
}
/**
 * Returns the encapsulated
result of the given [transform] function applied to the encapsulated [Throwable] exception
 * if this instance
represents [failure][Result.isFailure] or the
 * original encapsulated value if it is [success][Result.isSuccess].
 * Note, that this function rethrows any [Throwable] exception thrown by [transform] function.
 * See
[recoverCatching] for an alternative that encapsulates exceptions.
*/
@InlineOnly
@SinceKotlin("1.3")
public inline fun <R, T : R> Result<T>.recover(transform: (exception:
Throwable) -> R): Result<R> {
  contract {
    callsInPlace(transform, InvocationKind.AT_MOST_ONCE)
  }
  return when (val exception = exceptionOrNull()) {
    null -> this
    else ->
Result.success(transform(exception))
  }
}
/**
 * Returns the encapsulated result of the given [transform]
function applied to the encapsulated [Throwable] exception
 * if this instance represents [failure][Result.isFailure]
or the
 * original encapsulated value if it is [success][Result.isSuccess].
 * This function catches any
[Throwable] exception thrown by [transform] function and encapsulates it as a failure.
 * See [recover] for an
alternative that rethrows exceptions.
*/
@InlineOnly
@SinceKotlin("1.3")
public inline fun <R, T : R>
Result<T>.recoverCatching(transform: (exception: Throwable) -> R): Result<R> {
  return when (val exception =
exceptionOrNull()) {
    null -> this
    else -> runCatching { transform(exception) }
  }
}
/**
 * Performs the given [action] on the encapsulated [Throwable] exception if
this instance represents [failure][Result.isFailure].
 * Returns the original `Result` unchanged.
*/
@InlineOnly
@SinceKotlin("1.3")
public inline fun <T> Result<T>.onFailure(action: (exception:
Throwable) -> Unit): Result<T> {
  contract {
    callsInPlace(action, InvocationKind.AT_MOST_ONCE)
  }
  exceptionOrNull()?.let { action(it) }
  return this
}
/**
 * Performs the given [action] on the
encapsulated value if this instance represents [success][Result.isSuccess].
 * Returns the original `Result`

```

```

unchanged.\n *\n@InlineOnly\n@SinceKotlin("1.3")\npublic inline fun <T> Result<T>.onSuccess(action: (value:
T) -> Unit): Result<T> {\n    contract {\n        callsInPlace(action, InvocationKind.AT_MOST_ONCE)\n    }\n    if
(isSuccess) action(value as T)\n    return this\n}\n\n// -----\n"/*\n * Copyright 2010-2020 JetBrains
s.r.o. and Kotlin Programming Language contributors.\n * Use of this source code is governed by the Apache 2.0
license that can be found in the license/LICENSE.txt file.\n *\n\npackage kotlin.coroutines\n\nimport
kotlin.contracts.*\nimport kotlin.coroutines.intrinsics.*\nimport kotlin.internal.InlineOnly\n\n/**\n * Interface
representing a continuation after a suspension point that returns a value of type `T`.\n
*\n@SinceKotlin("1.3")\npublic interface Continuation<in T> {\n    /**\n     * The context of the coroutine that
corresponds to this continuation.\n     *\n     * public val context: CoroutineContext\n     *\n     * Resumes the
execution of the corresponding coroutine passing a successful or failed [result] as the\n     * return value of the last
suspension point.\n     *\n     * public fun resumeWith(result: Result<T>)\n     *\n     */\n\n    /**\n     * Classes and interfaces marked
with this annotation are restricted when used as receivers for extension\n     * `suspend` functions. These `suspend`
extensions can only invoke other member or extension `suspend` functions on this particular\n     * receiver and are
restricted from calling arbitrary suspension functions.\n     *\n     */\n\n@Target(AnnotationTarget.CLASS)\n@Retention(AnnotationRetention.BINARY)\npublic
annotation class RestrictsSuspension\n\n/**\n * Resumes the execution of the corresponding coroutine passing
[value] as the return value of the last suspension point.\n *\n@SinceKotlin("1.3")\n@InlineOnly\npublic inline
fun <T> Continuation<T>.resume(value: T): Unit =\n    resumeWith(Result.success(value))\n\n/**\n * Resumes the
execution of the corresponding coroutine so that the [exception] is re-thrown right after the\n * last suspension
point.\n *\n@SinceKotlin("1.3")\n@InlineOnly\npublic inline fun <T>
Continuation<T>.resumeWithException(exception: Throwable): Unit =\n    resumeWith(Result.failure(exception))\n\n/**\n * Creates a [Continuation] instance with the given [context] and
implementation of [resumeWith] method.\n *\n@SinceKotlin("1.3")\n@InlineOnly\npublic inline fun <T>
Continuation(\n    context: CoroutineContext,\n    crossinline resumeWith: (Result<T>) -> Unit\n): Continuation<T>
=\n    object : Continuation<T> {\n        override val context: CoroutineContext\n            get() = context\n\n        override fun resumeWith(result: Result<T>) =\n            resumeWith(result)\n    }\n\n/**\n * Creates a coroutine
without a receiver and with result type [T].\n * This function creates a new, fresh instance of suspendable
computation every time it is invoked.\n * To start executing the created coroutine, invoke `resume(Unit)` on the
returned [Continuation] instance.\n * The [completion] continuation is invoked when the coroutine completes with a
result or an exception.\n * Subsequent invocation of any resume function on the resulting continuation will produce
an [IllegalStateException].\n *\n@SinceKotlin("1.3")\n@Suppress("UNCHECKED_CAST")\npublic fun <T>
(suspend () -> T).createCoroutine(\n    completion: Continuation<T>)\n): Continuation<Unit> =\n    SafeContinuation(createCoroutineUnintercepted(completion).intercepted(), COROUTINE_SUSPENDED)\n\n/**\n * Creates a coroutine with receiver type [R] and result type [T].\n * This function creates a new, fresh instance of
suspendable computation every time it is invoked.\n * To start executing the created coroutine, invoke
`resume(Unit)` on the returned [Continuation] instance.\n * The [completion] continuation is invoked when the
coroutine completes with a result or an exception.\n * Subsequent invocation of any resume function on the resulting
continuation will produce an [IllegalStateException].\n
*\n@SinceKotlin("1.3")\n@Suppress("UNCHECKED_CAST")\npublic fun <R, T> (suspend R.() ->
T).createCoroutine(\n    receiver: R,\n    completion: Continuation<T>)\n): Continuation<Unit> =\n    SafeContinuation(createCoroutineUnintercepted(receiver, completion).intercepted(),
COROUTINE_SUSPENDED)\n\n/**\n * Starts a coroutine without a receiver and with result type [T].\n * This
function creates and starts a new, fresh instance of suspendable computation every time it is invoked.\n * The
[completion] continuation is invoked when the coroutine completes with a result or an exception.\n
*\n@SinceKotlin("1.3")\n@Suppress("UNCHECKED_CAST")\npublic fun <T> (suspend () ->
T).startCoroutine(\n    completion: Continuation<T>)\n) {\n    createCoroutineUnintercepted(completion).intercepted().resume(Unit)\n}\n\n/**\n * Starts a coroutine with receiver
type [R] and result type [T].\n * This function creates and starts a new, fresh instance of suspendable computation

```


[Continuation.intercepted] can be used to acquire the intercepted continuation.

- * Invocation of `resume(Unit)` on intercepted continuation guarantees that execution of both the coroutine and [completion] happens in the invocation context established by [ContinuationInterceptor].
- * Repeated invocation of any resume function on the resulting continuation corrupts the state machine of the coroutine and may result in arbitrary behaviour or exception.

```

@SinceKotlin("1.3")
public actual fun <T> (suspend () -> T).createCoroutineUnintercepted(
    completion: Continuation<T>): Continuation<Unit> =
    // Kotlin/JS suspend lambdas have an extra parameter
    `suspended`
    if (this.asDynamic().length == 2) {
        // When `suspended` is true the continuation is created,
        but not executed
        this.asDynamic()(completion, true)
    } else {
        createCoroutineFromSuspendFunction(completion) {
            this.asDynamic()(completion)
        }
    }

```

- * Creates unintercepted coroutine with receiver type [R] and result type [T].
- * This function creates a new, fresh instance of suspendable computation every time it is invoked.
- * To start executing the created coroutine, invoke `resume(Unit)` on the returned [Continuation] instance.
- * The [completion] continuation is invoked when coroutine completes with result or exception.
- * This function returns unintercepted continuation.

Invocation of `resume(Unit)` starts coroutine immediately in the invoker's call stack without going through the [ContinuationInterceptor] that might be present in the completion's [CoroutineContext].

- * It is the invoker's responsibility to ensure that a proper invocation context is established.
- * Note that [completion] of this function may get invoked in an arbitrary context.

[Continuation.intercepted] can be used to acquire the intercepted continuation.

- * Invocation of `resume(Unit)` on intercepted continuation guarantees that execution of both the coroutine and [completion] happens in the invocation context established by [ContinuationInterceptor].
- * Repeated invocation of any resume function on the resulting continuation corrupts the state machine of the coroutine and may result in arbitrary behaviour or exception.

```

@SinceKotlin("1.3")
public actual fun <R, T> (suspend R.() -> T).createCoroutineUnintercepted(
    receiver: R, completion: Continuation<T>):
    Continuation<Unit> =
    // Kotlin/JS suspend lambdas have an extra parameter `suspended`
    if (this.asDynamic().length == 3) {
        // When `suspended` is true the continuation is created, but not executed
        this.asDynamic()(receiver, completion, true)
    } else {
        createCoroutineFromSuspendFunction(completion) {
            this.asDynamic()(receiver, completion)
        }
    }

```

- * Intercepts this continuation with [ContinuationInterceptor].
- * This function shall be used on the immediate result of [createCoroutineUnintercepted] or [suspendCoroutineUninterceptedOrReturn], in which case it checks for [ContinuationInterceptor] in the continuation's [context][Continuation.context], invokes [ContinuationInterceptor.interceptContinuation], caches and returns the result.
- * If this function is invoked on other [Continuation] instances it returns `this` continuation unchanged.

```

@SinceKotlin("1.3")
public actual fun <T> Continuation<T>.intercepted(): Continuation<T> =
    (this as? CoroutineImpl)?.intercepted() ?:
    this
private inline fun <T> createCoroutineFromSuspendFunction(
    completion: Continuation<T>,
    crossinline block: () -> Any?): Continuation<Unit> {
    @Suppress("UNCHECKED_CAST")
    return object : CoroutineImpl(completion as Continuation<Any?>) {
        override fun doResume(): Any? {
            exception?.let { throw it }
            return block()
        }
    }
}

```

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```

package kotlin.js
// Mirrors signature from JS IR
BE
// Used for
js.translator/testData/box/number/mulInt32.kt
@library
@JsName("imulEmulated")
@Suppress("UNUSED_PARAMETER")
internal fun imul(x: Int, y: Int): Int =
    definedExternally
@Suppress("NOTHING_TO_INLINE")
internal inline fun isArrayish(o: dynamic) =
    js("Kotlin").isArrayish(o)
"/>** Copyright 2010-2018 JetBrains s.r.o. and Kotlin Programming Language contributors.


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```

package kotlin
// NOTE: Do not author your exceptions as they are written in
this file, instead use this template:
public open class MyException : Exception {
 constructor() : super()
 constructor(message: String?) : super(message)
 constructor(message: String?, cause: Throwable?) :
 super(message, cause)
 constructor(cause: Throwable?) : super(cause)
}

```



"/>** TODO: remove primary


```

```

constructors, make all secondary
KT-22055\n\n@Suppress("USELESS_ELVIS_RIGHT_IS_NULL")\npublic
actual open class Error actual constructor(message: String?, cause: Throwable?): Throwable(message, cause ?: null)
{\n  actual constructor() : this(null, null)\n  actual constructor(message: String?) : this(message, null)\n  actual
constructor(cause: Throwable?) : this(undefiend,
cause)\n}\n\n@Suppress("USELESS_ELVIS_RIGHT_IS_NULL")\npublic actual open class Exception actual
constructor(message: String?, cause: Throwable?): Throwable(message, cause ?: null) {\n  actual constructor() :
this(null, null)\n  actual constructor(message: String?) : this(message, null)\n  actual constructor(cause:
Throwable?) : this(undefiend, cause)\n}\n\npublic actual open class RuntimeException actual constructor(message:
String?, cause: Throwable?): Exception(message, cause) {\n  actual constructor() : this(null, null)\n  actual
constructor(message: String?) : this(message, null)\n  actual constructor(cause: Throwable?) : this(undefiend,
cause)\n}\n\npublic actual open class IllegalArgumentException actual constructor(message: String?, cause:
Throwable?): RuntimeException(message, cause) {\n  actual constructor() : this(null, null)\n  actual
constructor(message: String?) : this(message, null)\n  actual constructor(cause: Throwable?) : this(undefiend,
cause)\n}\n\npublic actual open class IllegalStateException actual constructor(message: String?, cause: Throwable?)
: RuntimeException(message, cause) {\n  actual constructor() : this(null, null)\n  actual constructor(message:
String?) : this(message, null)\n  actual constructor(cause: Throwable?) : this(undefiend, cause)\n}\n\npublic actual
open class IndexOutOfBoundsException actual constructor(message: String?) : RuntimeException(message) {\n
actual constructor() : this(null)\n}\n\npublic actual open class ConcurrentModificationException actual
constructor(message: String?, cause: Throwable?): RuntimeException(message, cause) {\n  actual constructor() :
this(null, null)\n  actual constructor(message: String?) : this(message, null)\n  actual constructor(cause:
Throwable?) : this(undefiend, cause)\n}\n\npublic actual open class UnsupportedOperationException actual
constructor(message: String?, cause: Throwable?): RuntimeException(message, cause) {\n  actual constructor() :
this(null, null)\n  actual constructor(message: String?) : this(message, null)\n  actual constructor(cause:
Throwable?) : this(undefiend, cause)\n}\n\npublic actual open class NumberFormatException actual
constructor(message: String?) : IllegalArgumentException(message) {\n  actual constructor() :
this(null)\n}\n\npublic actual open class NullPointerException actual constructor(message: String?) :
RuntimeException(message) {\n  actual constructor() : this(null)\n}\n\npublic actual open class
ClassCastException actual constructor(message: String?) : RuntimeException(message) {\n  actual constructor() :
this(null)\n}\n\npublic actual open class AssertionError\n@SinceKotlin("1.4")\nconstructor(message: String?,
cause: Throwable?) : Error(message, cause) {\n  actual constructor() : this(null)\n  constructor(message: String?) :
this(message, null)\n  actual constructor(message: Any?) : this(message.toString(), message as?
Throwable)\n}\n\npublic actual open class NoSuchElementException actual constructor(message: String?) :
RuntimeException(message) {\n  actual constructor() : this(null)\n}\n\n@SinceKotlin("1.3")\npublic actual open
class ArithmeticException actual constructor(message: String?) : RuntimeException(message) {\n  actual
constructor() : this(null)\n}\n\npublic actual open class NoWhenBranchMatchedException actual
constructor(message: String?, cause: Throwable?): RuntimeException(message, cause) {\n  actual constructor() :
this(null, null)\n  actual constructor(message: String?) : this(message, null)\n  actual constructor(cause:
Throwable?) : this(undefiend, cause)\n}\n\npublic actual open class UninitializedPropertyAccessException actual
constructor(message: String?, cause: Throwable?): RuntimeException(message, cause) {\n  actual constructor() :
this(null, null)\n  actual constructor(message: String?) : this(message, null)\n  actual constructor(cause:
Throwable?) : this(undefiend, cause)\n}\n\n", /*\n * Copyright 2010-2019 JetBrains s.r.o. Use of this source code is
governed by the Apache 2.0 license\n * that can be found in the license/LICENSE.txt file.\n
*\n\n@file:Suppress("UNUSED_PARAMETER")\n\npackage kotlin.js\n\n@kotlinter.internal\ninline fun jsDeleteProperty(obj: Any, property: Any) {\n  js("delete
obj[property]")\n}\n\n@kotlinter.internal\ninline fun jsBitwiseOr(lhs: Any?, rhs: Any?): Int =\njs("lhs | rhs").unsafeCast<Int>()"/*\n * Copyright 2010-2018 JetBrains s.r.o. and Kotlin Programming Language
contributors.\n * Use of this source code is governed by the Apache 2.0 license that can be found in the
license/LICENSE.txt file.\n */\npackage kotlin.math\n\n/**\n * Returns this value with the sign bit same as of the

```

```

[sign] value.\n *\n * If [sign] is `NaN` the sign of the result is undefined.\n *\n@SinceKotlin("1.2")\npublic actual
fun Double.withSign(sign: Double): Double {\n    val thisSignBit =
js("Kotlin").doubleSignBit(this).unsafeCast<Int>()\n    val newSignBit =
js("Kotlin").doubleSignBit(sign).unsafeCast<Int>()\n    return if (thisSignBit == newSignBit) this else -
this\n}"/*\n * Copyright 2010-2018 JetBrains s.r.o. and Kotlin Programming Language contributors.\n * Use of
this source code is governed by the Apache 2.0 license that can be found in the license/LICENSE.txt file.\n
*\n\npackage kotlin\n\n/**\n * Returns a bit representation of the specified floating-point value as [Long]\n *
according to the IEEE 754 floating-point `double format` bit layout.\n
*\n@SinceKotlin("1.2")\n@library("doubleToBits")\npublic actual fun Double.toBits(): Long =
definedExternally\n\n/**\n * Returns a bit representation of the specified floating-point value as [Long]\n *
according to the IEEE 754 floating-point `double format` bit layout,\n * preserving `NaN` values exact layout.\n
*\n@SinceKotlin("1.2")\n@library("doubleToRawBits")\npublic actual fun Double.toRawBits(): Long =
definedExternally\n\n/**\n * Returns the [Double] value corresponding to a given bit representation.\n
*\n@SinceKotlin("1.2")\n@kotlin.internal.InlineOnly\npublic actual inline fun Double.Companion.fromBits(bits:
Long): Double = js("Kotlin").doubleFromBits(bits).unsafeCast<Double>()\n\n/**\n * Returns a bit representation
of the specified floating-point value as [Int]\n * according to the IEEE 754 floating-point `single format` bit
layout.\n *\n * Note that in Kotlin/JS [Float] range is wider than `single format` bit layout can represent,\n * so
some [Float] values may overflow, underflow or lose their accuracy after conversion to bits and back.\n
*\n@SinceKotlin("1.2")\n@library("floatToBits")\npublic actual fun Float.toBits(): Int =
definedExternally\n\n/**\n * Returns a bit representation of the specified floating-point value as [Int]\n * according
to the IEEE 754 floating-point `single format` bit layout,\n * preserving `NaN` values exact layout.\n *\n * Note
that in Kotlin/JS [Float] range is wider than `single format` bit layout can represent,\n * so some [Float] values
may overflow, underflow or lose their accuracy after conversion to bits and back.\n
*\n@SinceKotlin("1.2")\n@library("floatToRawBits")\npublic actual fun Float.toRawBits(): Int =
definedExternally\n\n/**\n * Returns the [Float] value corresponding to a given bit representation.\n
*\n@SinceKotlin("1.2")\n@kotlin.internal.InlineOnly\npublic actual inline fun Float.Companion.fromBits(bits:
Int): Float =
js("Kotlin").floatFromBits(bits).unsafeCast<Float>()\n\n@Suppress("NOTHING_TO_INLINE")\ninternal
inline fun Long(low: Int, high: Int) = js("Kotlin").Long.fromBits(low, high).unsafeCast<Long>()\ninternal inline
val Long.low: Int get() = this.asDynamic().getLowBits().unsafeCast<Int>()\ninternal inline val Long.high: Int get()
= this.asDynamic().getHighBits().unsafeCast<Int>()\n"/*\n * Copyright 2010-2020 JetBrains s.r.o. and Kotlin
Programming Language contributors.\n * Use of this source code is governed by the Apache 2.0 license that can be
found in the license/LICENSE.txt file.\n *\n\nimport kotlin.reflect.KClass\n\n@PublishedApi\ninternal fun <T :
Annotation> KClass<*>.findAssociatedObject(@Suppress("UNUSED_PARAMETER") annotationClass:
KClass<T>): Any? {\n    // This API is not supported in js-v1. Return `null` to be source-compatible with js-ir.\n
return null\n}\n"/*\n * Copyright 2010-2019 JetBrains s.r.o. and Kotlin Programming Language contributors.\n *
Use of this source code is governed by the Apache 2.0 license that can be found in the license/LICENSE.txt file.\n
*\n\npackage kotlin.text\n\n/**\n * Returns a string representation of this [Long] value in the specified [radix].\n
*\n * @throws IllegalArgumentException when [radix] is not a valid radix for number to string conversion.\n
*\n@SinceKotlin("1.2")\npublic actual fun Long.toString(radix: Int): String =
asDynamic().toString(checkRadix(radix))"/*\n * Copyright 2010-2021 JetBrains s.r.o. and Kotlin Programming
Language contributors.\n * Use of this source code is governed by the Apache 2.0 license that can be found in the
license/LICENSE.txt file.\n *\n\npackage kotlin.text\n\n/\n// NOTE: THIS FILE IS AUTO-GENERATED by the
GenerateUnicodeData.kt\n// See: https://github.com/JetBrains/kotlin/tree/master/libraries/stdlib\n/\n// 1343 ranges
totally\nprivate object Category {\n    val decodedRangeStart: IntArray\n    val decodedRangeCategory: IntArray\n
\n    init {\n        val toBase64 =
"\n        val fromBase64 =
IntArray(128)\n        for (i in toBase64.indices) {\n            fromBase64[toBase64[i].code] = i\n        }\n    }
//

```



```

44U1WY50Z5R46YRFRFxxQY44a41W54UYJZYB14W7XC15WZ12YYFEFEFRFRFRFlxRIIRxxa65b86axcZc
RQcR"\n    decodedRangeCategory = decodeVarLenBase64(rangeCategory, fromBase64, 1343)\n
}\n}\n\nprivate fun categoryValueFrom(code: Int, ch: Int): Int {\n    return when {\n        code < 0x20 -> code\n        code < 0x400 -> if ((ch and 1) == 1) code shr 5 else code and 0x1f\n            else ->\n                when (ch % 3) {\n                    2 -> code shr 10\n                    1 -> (code shr 5) and 0x1f\n                    else -> code and 0x1f\n                }\n            }\n}\n}\n}\n\n/**\n * Returns the Unicode general category of this character as an Int.\n */\ninternal fun Char.getCategoryValue(): Int\n{\n    val ch = this.code\n    val index = binarySearchRange(Category.decodedRangeStart, ch)\n    val start =\n        Category.decodedRangeStart[index]\n    val code = Category.decodedRangeCategory[index]\n    val value =\n        categoryValueFrom(code, ch - start)\n    return if (value == 17) CharCategory.UNASSIGNED.value else\n        value\n}\n}\n\ninternal fun decodeVarLenBase64(base64: String, fromBase64: IntArray, resultLength: Int): IntArray\n{\n    val result = IntArray(resultLength)\n    var index = 0\n    var int = 0\n    var shift = 0\n    for (char in base64)\n    {\n        val sixBit = fromBase64[char.code]\n        int = int or ((sixBit and 0x1f) shl shift)\n        if (sixBit < 0x20)\n        {\n            result[index++] = int\n            int = 0\n            shift = 0\n        } else {\n            shift += 5\n        }\n    }\n}\n\nreturn result\n}\n}\n\n"/*\n * Copyright 2010-2021 JetBrains s.r.o. and Kotlin Programming Language contributors.\n * Use of this source code is governed by the Apache 2.0 license that can be found in the license/LICENSE.txt file.\n */\n\npackage kotlin.collections\n\n/\n\nNOTE: THIS FILE IS AUTO-GENERATED by the\nGenerateStandardLib.kt\n\nSee: https://github.com/JetBrains/kotlin/tree/master/libraries/stdlib\n\nimport\nkotlin.js.*\nimport kotlin.ranges.contains\nimport kotlin.ranges.reversed\n\n/**\n * Reverses elements in the list in-  
place.\n */\npublic actual fun <T> MutableList<T>.reverse(): Unit {\n    val midPoint = (size / 2) - 1\n    if\n        (midPoint < 0) return\n    var reverseIndex = lastIndex\n    for (index in 0..midPoint) {\n        val tmp = this[index]\n        this[index] = this[reverseIndex]\n        this[reverseIndex] = tmp\n        reverseIndex--\n    }\n}\n\n"/*\n * Copyright 2010-2021 JetBrains s.r.o. and Kotlin Programming Language contributors.\n * Use of this source code is governed by the Apache 2.0 license that can be found in the license/LICENSE.txt file.\n */\n\npackage\nkotlin.text\n\n/\n\nNOTE: THIS FILE IS AUTO-GENERATED by the GenerateUnicodeData.kt\n\nSee:\nhttps://github.com/JetBrains/kotlin/tree/master/libraries/stdlib\n\n37 ranges totally\nprivate object Digit {\n    internal val rangeStart = intArrayOf(\n        0x0030, 0x0660, 0x06f0, 0x07c0, 0x0966, 0x09e6, 0x0a66, 0x0ae6,\n        0x0b66, 0x0be6, 0x0c66, 0x0ce6, 0x0d66, 0x0de6, 0x0e50, 0x0ed0, 0x0f20, 0x1040, 0x1090, 0x17e0, \n        0x1810, 0x1946, 0x19d0, 0x1a80, 0x1a90, 0x1b50, 0x1bb0, 0x1c40, 0x1c50, 0xa620, 0xa8d0, 0xa900, 0xa9d0,\n        0xa9f0, 0xaa50, 0xabf0, 0xff10, \n    )\n}\n\n/**\n * Returns the index of the largest element in [array] smaller or  
equal to the specified [needle],\n * or -1 if [needle] is smaller than the smallest element in [array].\n */\ninternal fun\nbinarySearchRange(array: IntArray, needle: Int): Int {\n    var bottom = 0\n    var top = array.size - 1\n    var middle\n        = -1\n    var value = 0\n    while (bottom <= top) {\n        middle = (bottom + top) / 2\n        value = array[middle]\n        if (needle > value)\n            bottom = middle + 1\n        else if (needle == value)\n            return middle\n        else\n            top = middle - 1\n    }\n    return middle - (if (needle < value) 1 else 0)\n}\n\n/**\n * Returns an integer  
from 0..9 indicating the digit this character represents,\n * or -1 if this character is not a digit.\n */\ninternal fun\nChar.digitToIntImpl(): Int {\n    val ch = this.code\n    val index = binarySearchRange(Digit.rangeStart, ch)\n    val\n        diff = ch - Digit.rangeStart[index]\n    return if (diff < 10) diff else -1\n}\n\n/**\n * Returns `true` if this character is  
a digit.\n */\ninternal fun Char.isDigitImpl(): Boolean {\n    return digitToIntImpl() >= 0\n}\n\n"/*\n * Copyright\n2010-2021 JetBrains s.r.o. and Kotlin Programming Language contributors.\n * Use of this source code is governed  
by the Apache 2.0 license that can be found in the license/LICENSE.txt file.\n */\n\npackage kotlin.text\n\n/\n\nNOTE: THIS FILE IS AUTO-GENERATED by the GenerateUnicodeData.kt\n\nSee:\nhttps://github.com/JetBrains/kotlin/tree/master/libraries/stdlib\n\n222 ranges totally\nprivate object Letter {\n    val decodedRangeStart: IntArray\n    val decodedRangeLength: IntArray\n    val decodedRangeCategory: IntArray\n\n    init {\n        val toBase64 =\n            \"ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz0123456789+/\n            val fromBase64 =\n                IntArray(128)\n                for (i in toBase64.indices) {\n                    fromBase64[toBase64[i].code] = i\n                }\n\n                //\n                rangeStartDiff.length = 356\n                val rangeStartDiff =\n                    \"hCgBpCQGYHZH5BRpBPPPPPRMP5BPPICPP6BkEPPPPcXPzBvBrB3BOiDoBHwD+E3DauCnFmBmB2D

```

```

6E1B1BTiBmB1BP5BhBiBrBvBjBqBnBPRtBiCmCtB1B0BmB5BiB7BmBgEmChBZgCoEoGVpBsFrhBPqKQ2B
wBYoFgB4CJuTiEvBuCuDrF5DgEgFIJ1DgFmBQtBsBRGsB+BPiBID1EIjDPRPPPPPPPPPGQSQS/DxENVNU+
B9zCwBwBPPCkDPNnBPqDYY1R8B7FkFgTgwGgwUwmBgKwBuBScmEP/BPPPPPrBP8B7F1B/ErBqC6B7B
iBmBfQsBUwCw/KwqIwLwETPcPjQgJxFgB1BsD"\n    val diff = decodeVarLenBase64(rangeStartDiff,
fromBase64, 222)\n    val start = IntArray(diff.size)\n    for (i in diff.indices) {\n        if (i == 0) start[i] =
diff[i]\n        else start[i] = start[i - 1] + diff[i]\n    }\n    decodedRangeStart = start\n    \n    //
rangeLength.length = 328\n    val rangeLength =
\"aaMBXHYH5BRpBPPPPPRMP5BPPICPPzBDOOPPcXPzBvBjB3B0hDmBBpB7DoDYxB+EiBP1DoExkBk
QhBekBPmBgBhBctBiBMWOOXhCsBpBkBUV3Ba4BkB0DiCgBXgBtD4FSdBfPhBPpKP0BvBXjEQ2CGsT8Dh
BtCqDpFvD1D3E0lrD2EkBjRBDObSb+BPiB1B1EIjDPPPPPPPPPPPGPPMNLsBNPNPKCvBvBPPCkDPBmBPh
DXXgD4B6FzEgDguG9vUtkB9JcuBSckEP/BPPPPPPBPf4FrBjEhBpC3B5BKaWPrBOWck/KsCuLqDHPbPxPsFt
EaaqDL\"\n    decodedRangeLength = decodeVarLenBase64(rangeLength, fromBase64, 222)\n    \n    //
rangeCategory.length = 959\n    val rangeCategory =
\"GFjgggUHGFFZZZmzpz5qB6s6020B60ptltB6smt2sB60mz22B1+vv+8BZZ5s2850BW5q1ymtB506smzBF3q1
q1qB1q1q1+Bgii4wDTm74g3KigxqM60q1q1Bq1o1q1BF1qlqrBZ2q5wprBGFZWWZGHFsjoioLowgmOowjkw
CkgoiIk7ligGogiioBkwkiYkzj2oNoi+sbkwj04DghhkQ8wgiYkgoioDsgnkwC4gikQ//v+85BkwvoIsgoyI4ygu0whiw
Eowri4CoghsJowgqYowgm4DkwgsY/nwnzPowhmYkg6wI8yggZswikwHgxgmIoxgqYkwwg4DkxgmIkgoioBsgsso
BgzyI8g9gL8g9kI0wgwJoxgkoC0wgioFkw/wI0w53iF4gioYowjmgBHGq1qkgwBF1q1q8qBHwghuIwghyKk0go
QkwgoQk3goQHGFHkyg0pBgxj6IoinkxDswno7Ikwhz9Bo0gioB8z48Rwli0xN0mpjoX8w78pDwltoqKHFGGwwg
sIHFH3q1q16BFHWFZ1q10q1B2qlwq1B1q10q1B2q1yq1B6q1gq1Biq1qhxBir1qp1Bqt1q1qB1g1q1+B//3q16B//q
1qBH/qlq9Bholqq9B1i00a1q10qD1op1HkwmigEigy6Cptogq1Bixo1kDq7/j00B2qgoBWGFm1lz50B6s5q1+BG
WhggzhwBFFhgk4//Bo2jigE8wgul8wgul8wgugUog1qoB4qjmIwwi2KgkYHHH4lBgiFWkgIWOghssMmz5smrBZ
3q1y50B5sm7gzBtz1smzB5smz50BqzqtzB5sgzqzBF2/9//5BowgoIwmnkzPkwgk4C8ys65BkgoqI0wgy6FghquZ0
2giY0ghiIsgH24B4ghsQ8QF/v1q1OFs008iCHHF1qggz/B8wg6Izvnv//B08QgohsjK0QGfK7hsQ4gB\"\n
decodedRangeCategory = decodeVarLenBase64(rangeCategory, fromBase64, 222)\n    }\n}\n\n/**\n * Returns
`true` if this character is a letter.\n */\ninternal fun Char.isLetterImpl(): Boolean {\n    return getLetterType() !=
0\n}\n\n/**\n * Returns `true` if this character is a lower case letter, or it has contributory property
`Other_Lowercase`.\n */\ninternal fun Char.isLowerCaseImpl(): Boolean {\n    return getLetterType() == 1 ||
code.isOtherLowercase()\n}\n\n/**\n * Returns `true` if this character is an upper case letter, or it has contributory
property `Other_Uppercase`.\n */\ninternal fun Char.isUpperCaseImpl(): Boolean {\n    return getLetterType() == 2
|| code.isOtherUppercase()\n}\n\n/**\n * Returns\n * - `1` if the character is a lower case letter,\n * - `2` if the
character is an upper case letter,\n * - `3` if the character is a letter but not a lower or upper case letter,\n * - `0`
otherwise.\n */\nprivate fun Char.getLetterType(): Int {\n    val ch = this.code\n    val index =
binarySearchRange(Letter.decodedRangeStart, ch)\n    val rangeStart = Letter.decodedRangeStart[index]\n    val
rangeEnd = rangeStart + Letter.decodedRangeLength[index] - 1\n    val code =
Letter.decodedRangeCategory[index]\n    if (ch > rangeEnd) {\n        return 0\n    }\n    val lastTwoBits = code
and 0x3\n    if (lastTwoBits == 0) { // gap pattern\n        var shift = 2\n        var threshold = rangeStart\n        for (i
in 0..1) {\n            threshold += (code shr shift) and 0x7f\n            if (threshold > ch) {\n                return 3\n
            }\n            shift += 7\n            threshold += (code shr shift) and 0x7f\n            if (threshold > ch) {\n                return
0\n            }\n            shift += 7\n        }\n        return 3\n    }\n    if (code <= 0x7) {\n        return lastTwoBits\n
    }\n    val distance = (ch - rangeStart)\n    val shift = if (code <= 0x1F) distance % 2 else distance\n    return (code
shr (2 * shift)) and 0x3\n}\n\n", /*\n * Copyright 2010-2021 JetBrains s.r.o. and Kotlin Programming Language
contributors.\n * Use of this source code is governed by the Apache 2.0 license that can be found in the
license/LICENSE.txt file.\n */\n\npackage kotlin.text\n\n/\n// NOTE: THIS FILE IS AUTO-GENERATED by the
GenerateUnicodeData.kt\n// See: https://github.com/JetBrains/kotlin/tree/master/libraries/stdlib\n\nprivate object
OtherLowercase {\n    internal val otherLowerStart = intArrayOf(\n        0x00aa, 0x00ba, 0x02b0, 0x02c0, 0x02e0,
0x0345, 0x037a, 0x1d2c, 0x1d78, 0x1d9b, 0x2071, 0x207f, 0x2090, 0x2170, 0x24d0, 0x2c7c, 0xa69c, 0xa770,
0xa7f8, 0xab5c, \n    )\n    internal val otherLowerLength = intArrayOf(\n        1, 1, 9, 2, 5, 1, 1, 63, 1, 37, 1, 1, 13,

```

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16, 26, 2, 2, 1, 2, 4, \n } \n \n internal fun Int.isOtherLowercase(): Boolean { \n val index =
binarySearchRange(OtherLowercase.otherLowerStart, this) \n return index >= 0 && this <
OtherLowercase.otherLowerStart[index] + OtherLowercase.otherLowerLength[index] \n } \n } \n /* \n * Copyright
2010-2021 JetBrains s.r.o. and Kotlin Programming Language contributors. \n * Use of this source code is governed
by the Apache 2.0 license that can be found in the license/LICENSE.txt file. \n * \n \n package kotlin.text \n \n \n //
NOTE: THIS FILE IS AUTO-GENERATED by the GenerateUnicodeData.kt \n // See:
https://github.com/JetBrains/kotlin/tree/master/libraries/stdlib \n \n \n internal fun Int.isOtherUppercase(): Boolean
{ \n return this in 0x2160..0x216f \n || this in 0x24b6..0x24cf \n } \n } \n /* \n * Copyright 2010-2021 JetBrains
s.r.o. and Kotlin Programming Language contributors. \n * Use of this source code is governed by the Apache 2.0
license that can be found in the license/LICENSE.txt file. \n * \n \n package kotlin.text \n \n \n // NOTE: THIS FILE IS
AUTO-GENERATED by the GenerateStandardLib.kt \n // See:
https://github.com/JetBrains/kotlin/tree/master/libraries/stdlib \n \n \n import kotlin.js.* \n \n /** \n * Returns a
character at the given [index] or throws an [IndexOutOfBoundsException] if the [index] is out of bounds of this char
sequence. \n * \n * @sample samples.collections.Collections.Elements.elementAt \n \n public actual fun
CharSequence.elementAt(index: Int): Char { \n return elementAtOrElse(index) { throw
IndexOutOfBoundsException("index: $index, length: $length") } \n } \n \n } \n /* \n * Copyright 2010-2021 JetBrains
s.r.o. and Kotlin Programming Language contributors. \n * Use of this source code is governed by the Apache 2.0
license that can be found in the license/LICENSE.txt file. \n * \n \n package kotlin.text \n \n \n // NOTE: THIS FILE IS
AUTO-GENERATED by the GenerateUnicodeData.kt \n // See:
https://github.com/JetBrains/kotlin/tree/master/libraries/stdlib \n \n \n // 4 ranges totally \n \n internal fun
Char.titlecaseCharImpl(): Char { \n val code = this.code \n // Letters repeating <Lu, Lt, Ll> sequence and code of
the Lt is a multiple of 3, e.g. <\u01c4, \u01c5, \u01c6> \n if (code in 0x01c4..0x01cc || code in 0x01f1..0x01f3) { \n
return (3 * ((code + 1) / 3)).toChar() \n } \n // Lower case letters whose title case mapping equivalent is equal
to the original letter \n if (code in 0x10d0..0x10fa || code in 0x10fd..0x10ff) { \n return this \n } \n return
uppercaseChar() \n } \n } \n /* \n * Copyright 2010-2021 JetBrains s.r.o. and Kotlin Programming Language
contributors. \n * Use of this source code is governed by the Apache 2.0 license that can be found in the
license/LICENSE.txt file. \n * \n \n package kotlin.collections \n \n \n // NOTE: THIS FILE IS AUTO-GENERATED
by the GenerateStandardLib.kt \n // See: https://github.com/JetBrains/kotlin/tree/master/libraries/stdlib \n \n \n import
kotlin.js.* \n import kotlin.ranges.contains \n import kotlin.ranges.reversed \n \n /** \n * Returns an element at the given
[index] or throws an [IndexOutOfBoundsException] if the [index] is out of bounds of this array. \n * \n * @sample
samples.collections.Collections.Elements.elementAt \n
*\n@SinceKotlin("1.3") \n @ExperimentalUnsignedTypes \n public actual fun UIntArray.elementAt(index: Int):
UInt { \n return elementAtOrElse(index) { throw IndexOutOfBoundsException("index: $index, size: $size") } \n } \n } \n /** \n * Returns an element at the given [index] or throws an [IndexOutOfBoundsException] if the [index] is
out of bounds of this array. \n * \n * @sample samples.collections.Collections.Elements.elementAt \n
*\n@SinceKotlin("1.3") \n @ExperimentalUnsignedTypes \n public actual fun ULongArray.elementAt(index: Int):
ULong { \n return elementAtOrElse(index) { throw IndexOutOfBoundsException("index: $index, size: $size") } \n } \n } \n /** \n * Returns an element at the given [index] or throws an [IndexOutOfBoundsException] if the [index] is
out of bounds of this array. \n * \n * @sample samples.collections.Collections.Elements.elementAt \n
*\n@SinceKotlin("1.3") \n @ExperimentalUnsignedTypes \n public actual fun UByteArray.elementAt(index: Int):
UByte { \n return elementAtOrElse(index) { throw IndexOutOfBoundsException("index: $index, size: $size") } \n } \n } \n /** \n * Returns an element at the given [index] or throws an [IndexOutOfBoundsException] if the [index] is
out of bounds of this array. \n * \n * @sample samples.collections.Collections.Elements.elementAt \n
*\n@SinceKotlin("1.3") \n @ExperimentalUnsignedTypes \n public actual fun UShortArray.elementAt(index: Int):
UShort { \n return elementAtOrElse(index) { throw IndexOutOfBoundsException("index: $index, size: $size") } \n } \n } \n /** \n * Returns a [List] that wraps the original array. \n
*\n@SinceKotlin("1.3") \n @ExperimentalUnsignedTypes \n public actual fun UIntArray.asList(): List<UInt> { \n
return object : AbstractList<UInt>(), RandomAccess { \n override val size: Int get() = this@asList.size \n

```


extension function with body using dynamic")\npublic annotation class nativeGetter\n\n@Target(FUNCTION)\n@Deprecated("Use inline extension function with body using dynamic")\npublic annotation class nativeSetter\n\n@Target(FUNCTION)\n@Deprecated("Use inline extension function with body using dynamic")\npublic annotation class nativeInvoke\n\n@Target(CLASS, FUNCTION, PROPERTY)\n\ninternal annotation class library(public val name: String = "")\n\n@Target(CLASS)\n\ninternal annotation class marker\n\n/**\n * Gives a declaration (a function, a property or a class) specific name in JavaScript.\n * This may be useful in the following cases:\n * * There are two functions for which the compiler gives same name in JavaScript, you can mark one with `@JsName(...)` to prevent the compiler from reporting error.\n * * You are writing a JavaScript library in Kotlin. The compiler produces mangled names for functions with parameters, which is unnatural for usual JavaScript developer. You can put `@JsName(...)` on functions you want to be available from JavaScript.\n * * For some reason you want to rename declaration, e.g. there's common term in JavaScript for a concept provided by the declaration, which is uncommon in Kotlin.\n * Example:\n * ``` kotlin\n * class Person(val name: String) {\n * fun hello() {\n * println("Hello \$name!")\n * }\n * @JsName("helloWithGreeting")\n * fun hello(greeting: String) {\n * println("\$greeting \$name!")\n * }\n * }\n * ```\n * @property name the name which compiler uses both for declaration itself and for all references to the declaration. It's required to denote a valid JavaScript identifier.\n * \n\n@Retention(AnnotationRetention.BINARY)\n@Target(CLASS, FUNCTION, PROPERTY, CONSTRUCTOR, PROPERTY_GETTER, PROPERTY_SETTER)\n\npublic actual annotation class JsName(actual val name: String)\n\n/**\n * Denotes an `external` declaration that must be imported from native JavaScript library.\n * The compiler produces the code relevant for the target module system, for example, in case of CommonJS, it will import the declaration via the `require(...)` function. The annotation can be used on top-level external declarations (classes, properties, functions) and files. In case of file (which can't be `external`) the following rule applies: all the declarations in the file must be `external`. By applying `@JsModule(...)` on a file you tell the compiler to import a JavaScript object that contain all the declarations from the file.\n * Example:\n * ``` kotlin\n * @JsModule("jquery")\n * external abstract class JQuery() {\n * // some declarations here\n * }\n * @JsModule("jquery")\n * external fun JQuery(element: Element): JQuery\n * ```\n * @property import name of a module to import declaration from. It is not interpreted by the Kotlin compiler, it's passed as is directly to the target module system.\n * @see JsNonModule\n * \n\n@Retention(AnnotationRetention.BINARY)\n@Target(CLASS, PROPERTY, FUNCTION, FILE)\n\npublic annotation class JsModule(val import: String)\n\n/**\n * Denotes an `external` declaration that can be used without module system. By default, an `external` declaration is available regardless your target module system. However, by applying [JsModule] annotation you can make a declaration unavailable to *plain* module system. Some JavaScript libraries are distributed both as a standalone downloadable piece of JavaScript and as a module available as an npm package. To tell the Kotlin compiler to accept both cases, you can augment [JsModule] with the `@JsNonModule` annotation. For example:\n * ``` kotlin\n * @JsModule("jquery")\n * @JsNonModule\n * @JsName("\$")\n * external abstract class JQuery() {\n * // some declarations here\n * }\n * @JsModule("jquery")\n * @JsNonModule\n * @JsName("\$")\n * external fun JQuery(element: Element): JQuery\n * ```\n * @see JsModule\n * \n\n@Retention(AnnotationRetention.BINARY)\n@Target(CLASS, PROPERTY, FUNCTION, FILE)\n\npublic annotation class JsNonModule\n\n/**\n * Adds prefix to `external` declarations in a source file. JavaScript does not have concept of packages (namespaces). They are usually emulated by nested objects. The compiler turns references to `external` declarations either to plain unprefix names (in case of *plain* modules) or to plain imports. However, if a JavaScript library provides its declarations in packages, you won't be satisfied with this. You can tell the compiler to generate additional prefix before references to `external` declarations using the `@JsQualifier(...)` annotation. Note that a file marked with the `@JsQualifier(...)` annotation can't contain non-`external` declarations. Example:\n * ```\n * @file:JsQualifier("my.jsPackageName")\n * package some.kotlinPackage\n * external fun foo(x: Int)\n * external fun bar(): String\n * ```\n * @property value the qualifier to add to the declarations in the generated code. It must be a sequence of valid JavaScript identifiers separated by the `.` character.


```

*/\n\n/*\n * Based on GWT AbstractList\n * Copyright 2007 Google Inc.\n*/\n\n\npackage
kotlin.collections\n\n/**\n * Provides a skeletal implementation of the [MutableList] interface.\n * \n * @param E
the type of elements contained in the list. The list is invariant in its element type.\n */\n\npublic actual abstract class
AbstractMutableList<E> protected actual constructor() : AbstractMutableCollection<E>(), MutableList<E> {\n
protected var modCount: Int = 0\n\n abstract override fun add(index: Int, element: E): Unit\n abstract override
fun removeAt(index: Int): E\n abstract override fun set(index: Int, element: E): E\n\n /**\n * Adds the
specified element to the end of this list.\n * \n * @return `true` because the list is always modified as the result
of this operation.\n */\n\n actual override fun add(element: E): Boolean {\n checkIsMutable()\n add(size,
element)\n return true\n }\n\n actual override fun addAll(index: Int, elements: Collection<E>): Boolean {\n
AbstractList.checkPositionIndex(index, size)\n checkIsMutable()\n var _index = index\n var
changed = false\n for (e in elements) {\n add(_index++, e)\n changed = true\n }\n return
changed\n }\n\n actual override fun clear() {\n checkIsMutable()\n removeRange(0, size)\n }\n\n
actual override fun removeAll(elements: Collection<E>): Boolean {\n checkIsMutable()\n return
removeAll { it in elements }\n }\n\n actual override fun retainAll(elements: Collection<E>): Boolean {\n
checkIsMutable()\n return removeAll { it !in elements }\n }\n\n\n actual override fun iterator():
MutableIterator<E> = IteratorImpl()\n\n actual override fun contains(element: E): Boolean = indexOf(element) >=
0\n\n actual override fun indexOf(element: E): Int {\n for (index in 0..lastIndex) {\n if (get(index) ==
element) {\n return index\n }\n }\n return -1\n }\n\n actual override fun
lastIndexOf(element: E): Int {\n for (index in lastIndex downTo 0) {\n if (get(index) == element) {\n
return index\n }\n }\n return -1\n }\n\n actual override fun listIterator():
MutableListIterator<E> = listIterator(0)\n\n actual override fun listIterator(index: Int): MutableListIterator<E> =
ListIteratorImpl(index)\n\n\n actual override fun subList(fromIndex: Int, toIndex: Int): MutableList<E> =
SubList(this, fromIndex, toIndex)\n\n /**\n * Removes the range of elements from this list starting from
[fromIndex] and ending with but not including [toIndex].\n */\n\n protected open fun removeRange(fromIndex:
Int, toIndex: Int) {\n val iterator = listIterator(fromIndex)\n repeat(toIndex - fromIndex) {\n
iterator.next()\n iterator.remove()\n }\n }\n\n /**\n * Compares this list with another list instance
with the ordered structural equality.\n * \n * @return true, if [other] instance is a [List] of the same size, which
contains the same elements in the same order.\n */\n\n override fun equals(other: Any?): Boolean {\n if (other
=== this) return true\n if (other !is List<*>) return false\n\n return AbstractList.orderedEquals(this, other)\n
}\n\n /**\n * Returns the hash code value for this list.\n */\n\n override fun hashCode(): Int =
AbstractList.orderedHashCode(this)\n\n\n private open inner class IteratorImpl : MutableIterator<E> {\n /**
the index of the item that will be returned on the next call to [next]() */\n protected var index = 0\n /** the
index of the item that was returned on the previous call to [next]()` * or [ListIterator.previous]()` (for
`ListIterator`),\n * -1 if no such item exists\n */\n protected var last = -1\n\n override fun
hasNext(): Boolean = index < size\n\n override fun next(): E {\n if (!hasNext()) throw
NoSuchElementException()\n last = index++\n return get(last)\n }\n\n override fun remove()
{\n check(last != -1) { \"Call next() or previous() before removing element from the iterator.\" }\n\n
removeAt(last)\n index = last\n last = -1\n }\n }\n\n /**\n * Implementation of
`MutableListIterator` for abstract lists.\n */\n\n private inner class ListIteratorImpl(index: Int) : IteratorImpl(),
MutableListIterator<E> {\n\n init {\n AbstractList.checkPositionIndex(index,
this@AbstractMutableList.size)\n this.index = index\n }\n\n override fun hasPrevious(): Boolean =
index > 0\n\n override fun nextIndex(): Int = index\n\n override fun previous(): E {\n if
(!hasPrevious()) throw NoSuchElementException()\n last = --index\n return get(last)\n }\n\n
override fun previousIndex(): Int = index - 1\n\n override fun add(element: E) {\n add(index, element)\n
index++\n last = -1\n }\n\n override fun set(element: E) {\n check(last != -1) { \"Call
next() or previous() before updating element value with the iterator.\" }\n set(last, element)\n }\n }\n\n
private class SubList<E>(private val list: AbstractMutableList<E>, private val fromIndex: Int, toIndex: Int) :
AbstractMutableList<E>(), RandomAccess {\n private var _size: Int = 0\n\n init {\n

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AbstractList.checkRangeIndexes(fromIndex, toIndex, list.size)\n        this._size = toIndex - fromIndex\n    }\n\n    override fun add(index: Int, element: E) {\n        AbstractList.checkPositionIndex(index, _size)\n    }\n\n    list.add(fromIndex + index, element)\n        _size++\n    }\n\n    override fun get(index: Int): E {\n        AbstractList.checkElementIndex(index, _size)\n        return list[fromIndex + index]\n    }\n\n    override fun removeAt(index: Int): E {\n        AbstractList.checkElementIndex(index, _size)\n        val result = list.removeAt(fromIndex + index)\n        _size--\n        return result\n    }\n\n    override fun set(index: Int, element: E): E {\n        AbstractList.checkElementIndex(index, _size)\n        return list.set(fromIndex + index, element)\n    }\n\n    override val size: Int get() = _size\n\n    internal override fun checkIsMutable(): Unit = list.checkIsMutable()\n    }\n\n}\n\n"/\n\n * Copyright 2010-2020 JetBrains s.r.o. and Kotlin Programming Language contributors.\n * Use of this source code is governed by the Apache 2.0 license that can be found in the license/LICENSE.txt file.\n */\n\n * Based on GWT AbstractMap\n * Copyright 2007 Google Inc.\n */\n\npackage kotlin.collections\n\n/**\n * Provides a skeletal implementation of the [MutableMap] interface.\n *\n * The implementor is required to implement [entries] property, which should return mutable set of map entries, and [put] function.\n *\n * @param K the type of map keys. The map is invariant in its key type.\n *\n * @param V the type of map values. The map is invariant in its value type.\n *\n * public actual abstract class AbstractMutableMap<K, V>\n * protected actual constructor() : AbstractMap<K, V>(), MutableMap<K, V> {\n *     /**\n *      * A mutable [Map.Entry] shared by several [Map] implementations.\n *      *\n *      internal open class SimpleEntry<K, V>(override val key: K, value: V) : MutableMap.MutableEntry<K, V> {\n *          constructor(entry: Map.Entry<K, V>) : this(entry.key, entry.value)\n *          private var _value = value\n *          override val value: V get() = _value\n *          override fun setValue(newValue: V): V {\n *              // Should check if the map containing this entry is mutable.\n *              // However, to not increase entry memory footprint it might be worthwhile not to check it here and\n *              // force subclasses that implement `build()` (freezing) operation to implement their own `MutableEntry`.\n *          }\n *          this@AbstractMutableMap.checkIsMutable()\n *          val oldValue = this._value\n *          this._value = newValue\n *          return oldValue\n *      }\n *      override fun hashCode(): Int = entryHashCode(this)\n *      override fun toString(): String = entryToString(this)\n *      override fun equals(other: Any?): Boolean = entryEquals(this, other)\n *      }\n *      // intermediate abstract class to workaround KT-43321\n *      internal abstract class AbstractEntrySet<E : Map.Entry<K, V>, K, V> : AbstractMutableSet<E>() {\n *          final override fun contains(element: E): Boolean = containsEntry(element)\n *          abstract fun containsEntry(element: Map.Entry<K, V>): Boolean\n *          final override fun remove(element: E): Boolean = removeEntry(element)\n *          abstract fun removeEntry(element: Map.Entry<K, V>): Boolean\n *          }\n *          actual override fun clear() {\n *              entries.clear()\n *          }\n *          private var _keys: MutableSet<K>? = null\n *          actual override val keys: MutableSet<K>\n *              get() {\n *                  if (_keys == null) {\n *                      _keys = object : AbstractMutableSet<K>() {\n *                          override fun add(element: K): Boolean = throw UnsupportedOperationException("Add is not supported on keys")\n *                          override fun clear() {\n *                              this@AbstractMutableMap.clear()\n *                          }\n *                          override operator fun contains(element: K): Boolean = containsKey(element)\n *                          override operator fun iterator(): MutableIterator<K> {\n *                              val entryIterator = entries.iterator()\n *                              return object : MutableIterator<K> {\n *                                  override fun hasNext(): Boolean = entryIterator.hasNext()\n *                                  override fun next(): K = entryIterator.next().key\n *                                  override fun remove() = entryIterator.remove()\n *                                  }\n *                              }\n *                          override fun remove(element: K): Boolean {\n *                              {\n *                                  checkIsMutable()\n *                                  if (containsKey(element)) {\n *                                      this@AbstractMutableMap.remove(element)\n *                                      return true\n *                                  }\n *                                  return false\n *                              }\n *                          override val size: Int get() = this@AbstractMutableMap.size\n *                          override fun checkIsMutable(): Unit = this@AbstractMutableMap.checkIsMutable()\n *                          }\n *                          }\n *                          return _keys!!\n *          }\n *          actual abstract override fun put(key: K, value: V): V?\n *          actual override fun putAll(from: Map<out K, V>) {\n *              checkIsMutable()\n *              for ((key, value) in from) {\n *                  put(key, value)\n *              }\n *          }\n *          private var _values: MutableCollection<V>? = null\n *          actual override val values: MutableCollection<V>\n *              get() {\n *                  if (_values == null) {\n *                      _values = object : AbstractMutableCollection<V>() {\n *                          override fun add(element: V): Boolean = throw

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UnsupportedOperationException("Add is not supported on values")\n        override fun clear() =
this@AbstractMutableMap.clear()\n        override operator fun contains(element: V): Boolean =
containsValue(element)\n        override operator fun iterator(): MutableIterator<V> {\n            val
entryIterator = entries.iterator()\n            return object : MutableIterator<V> {\n                override fun
hasNext(): Boolean = entryIterator.hasNext()\n                override fun next(): V = entryIterator.next().value\n                override fun remove() = entryIterator.remove()\n            }\n        }\n        override fun checkIsMutable(): Unit =
this@AbstractMutableMap.checkIsMutable()\n        }\n        }\n        return _values!!\n        }\n        actual
override fun remove(key: K): V? {\n            checkIsMutable()\n            val iter = entries.iterator()\n            while
(iter.hasNext()) {\n                val entry = iter.next()\n                val k = entry.key\n                if (key == k) {\n                    val
value = entry.value\n                    iter.remove()\n                    return value\n                }\n            }\n            return null\n        }\n        }\n        /**\n         * This method is called every time when a mutating method is called on this mutable map.\n         * Mutable
maps that are built (frozen) must throw `UnsupportedOperationException`.\n         */\n        internal open fun
checkIsMutable(): Unit {\n        }\n    },"/*\n    * Copyright 2010-2020 JetBrains s.r.o. and Kotlin Programming Language
contributors.\n    * Use of this source code is governed by the Apache 2.0 license that can be found in the
license/LICENSE.txt file.\n    */\n    package kotlin.collections\n    /**\n     * Provides a skeletal implementation of the
[MutableSet] interface.\n     */\n     * @param E the type of elements contained in the set. The set is invariant in its
element type.\n     */\n     * public actual abstract class AbstractMutableSet<E> protected actual constructor() :
AbstractMutableCollection<E>(), MutableSet<E> {\n     *     /**\n     *      * Compares this set with another set instance with
the unordered structural equality.\n     *     *     * @return `true`, if [other] instance is a [Set] of the same size, all
elements of which are contained in this set.\n     *     *     * override fun equals(other: Any?): Boolean {\n     *         if (other
=== this) return true\n     *         if (other !is Set<*>) return false\n     *         return AbstractSet.setEquals(this, other)\n     *     }\n     *     /**\n     *      * Returns the hash code value for this set.\n     *     *     * override fun hashCode(): Int =
AbstractSet.unorderedHashCode(this)\n     *     }\n    },"/*\n    * Copyright 2010-2018 JetBrains s.r.o. and Kotlin Programming
Language contributors.\n    * Use of this source code is governed by the Apache 2.0 license that can be found in the
license/LICENSE.txt file.\n    */\n    package kotlin.collections\n    /**\n     * Provides a [MutableList] implementation,
which uses a resizable array as its backing storage.\n     *     * This implementation doesn't provide a way to manage
capacity, as backing JS array is resizeable itself.\n     *     * There is no speed advantage to pre-allocating array sizes in
JavaScript, so this implementation does not include any of the\n     *     * capacity and "growth increment" concepts.\n     *     * public actual open class ArrayList<E> internal constructor(private var array: Array<Any?>) :
AbstractMutableList<E>(), MutableList<E>, RandomAccess {\n     *     private var isReadOnly: Boolean = false\n     *     /**\n     *      * Creates an empty [ArrayList].\n     *     *     * public actual constructor() : this(emptyArray()) {\n     *     }\n     *     /**\n     *      * Creates an empty [ArrayList].\n     *     *     * @param initialCapacity initial capacity (ignored)\n     *     *     * public actual
constructor(initialCapacity: Int) : this(emptyArray()) {\n     *     }\n     *     /**\n     *      * Creates an [ArrayList] filled from the
[elements] collection.\n     *     *     * public actual constructor(elements: Collection<E>) :
this(elements.toArray<Any?>()) {\n     *     }\n     *     @PublishedApi\n     *     internal fun build(): List<E> {\n     *     checkIsMutable()\n     *     isReadOnly = true\n     *     return this\n     *     }\n     *     /** Does nothing in this ArrayList
implementation.\n     *     *     * public actual fun trimToSize() {\n     *     }\n     *     /** Does nothing in this ArrayList implementation.
\n     *     *     * public actual fun ensureCapacity(minCapacity: Int) {\n     *     }\n     *     actual override val size: Int get() = array.size\n     *     @Suppress("UNCHECKED_CAST")\n     *     actual override fun get(index: Int): E = array[rangeCheck(index)] as E\n     *     actual override fun set(index: Int, element: E): E {\n     *         checkIsMutable()\n     *         rangeCheck(index)\n     *     @Suppress("UNCHECKED_CAST")\n     *         return array[index].apply { array[index] = element } as E\n     *     }\n     *     actual override fun add(element: E): Boolean {\n     *         checkIsMutable()\n     *         array.asDynamic().push(element)\n     *         modCount++\n     *         return true\n     *     }\n     *     actual override fun add(index: Int, element: E): Unit {\n     *         checkIsMutable()\n     *         array.asDynamic().splice(insertionRangeCheck(index), 0, element)\n     *         modCount++\n     *     }\n     *     actual override fun addAll(elements: Collection<E>): Boolean {\n     *         checkIsMutable()\n     *         if
(elements.isEmpty()) return false\n     *         array += elements.toArray<Any?>()\n     *         modCount++\n     *         return true\n     *     }\n     *     actual override fun addAll(index: Int, elements: Collection<E>): Boolean {\n

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checkIsMutable()\n    insertionRangeCheck(index)\n\n    if (index == size) return addAll(elements)\n    if (elements.isEmpty()) return false\n    when (index) {\n        size -> return addAll(elements)\n        0 -> array = elements.toArray<Any?>() + array\n        else -> array = array.copyOfRange(0, index).asDynamic().concat(elements.toArray<Any?>(), array.copyOfRange(index, size))\n    }\n\n    modCount++\n    return true\n}\n\n    actual override fun removeAt(index: Int): E {\n    checkIsMutable()\n    rangeCheck(index)\n    modCount++\n    return if (index == lastIndex)\n        array.asDynamic().pop()\n    else\n        array.asDynamic().splice(index, 1)[0]\n}\n\n    actual override fun remove(element: E): Boolean {\n    checkIsMutable()\n    for (index in array.indices) {\n        if (array[index] == element) {\n            array.asDynamic().splice(index, 1)\n            modCount++\n            return true\n        }\n    }\n    return false\n}\n\n    override fun removeRange(fromIndex: Int, toIndex: Int) {\n    checkIsMutable()\n    modCount++\n    array.asDynamic().splice(fromIndex, toIndex - fromIndex)\n}\n\n    actual override fun clear() {\n    checkIsMutable()\n    array = emptyArray()\n    modCount++\n}\n\n\n    actual override fun indexOf(element: E): Int = array.indexOf(element)\n\n    actual override fun lastIndexOf(element: E): Int = array.lastIndexOf(element)\n\n    override fun toString() = arrayToString(array)\n\n@Suppress("UNCHECKED_CAST")\n    override fun <T> toArray(array: Array<T>): Array<T> {\n    if (array.size < size) {\n        return toArray() as Array<T>\n    }\n\n    (this.array as Array<T>).copyInto(array)\n\n    if (array.size > size) {\n        array[size] = null as T // null-terminate\n    }\n\n    return array\n}\n\n    override fun toArray(): Array<Any?> {\n    return js("[]").slice.call(array)\n}\n\n\n    internal override fun checkIsMutable() {\n    if (isReadOnly) throw UnsupportedOperationException()\n}\n\n    private fun rangeCheck(index: Int) = index.apply {\n    AbstractList.checkElementIndex(index, size)\n}\n\n    private fun insertionRangeCheck(index: Int) = index.apply {\n    AbstractList.checkPositionIndex(index, size)\n}\n}\n\n    /*\n    * Copyright 2010-2019 JetBrains s.r.o. and Kotlin Programming Language contributors.\n    * Use of this source code is governed by the Apache 2.0 license that can be found in the license/LICENSE.txt file.\n    */\n\npackage kotlin.collections\n\n\n    internal fun <T> sortArrayWith(array: Array<out T>, comparison: (T, T) -> Int) {\n    if (getStableSortingIsSupported()) {\n        array.asDynamic().sort(comparison)\n    } else {\n        mergeSort(array.unsafeCast<Array<T>>(), 0, array.lastIndex, Comparator(comparison))\n    }\n}\n\n\n    internal fun <T> sortArrayWith(array: Array<out T>, comparator: Comparator<in T>) {\n    if (getStableSortingIsSupported()) {\n        val comparison = { a: T, b: T -> comparator.compare(a, b) }\n        array.asDynamic().sort(comparison)\n    } else {\n        mergeSort(array.unsafeCast<Array<T>>(), 0, array.lastIndex, comparator)\n    }\n}\n\n\n    internal fun <T> sortArrayWith(array: Array<out T>, fromIndex: Int, toIndex: Int, comparator: Comparator<in T>) {\n    if (fromIndex < toIndex - 1) {\n        mergeSort(array.unsafeCast<Array<T>>(), fromIndex, toIndex - 1, comparator)\n    }\n}\n\n\n    internal fun <T : Comparable<T>> sortArray(array: Array<out T>) {\n    if (getStableSortingIsSupported()) {\n        val comparison = { a: T, b: T -> a.compareTo(b) }\n        array.asDynamic().sort(comparison)\n    } else {\n        mergeSort(array.unsafeCast<Array<T>>(), 0, array.lastIndex, naturalOrder())\n    }\n}\n\n\n    private var _stableSortingIsSupported: Boolean? = null\n\n    private fun getStableSortingIsSupported(): Boolean {\n    _stableSortingIsSupported?.let { return it }\n    _stableSortingIsSupported = false\n\n    val array = js("[]").unsafeCast<Array<Int>>()\n    // known implementations may use stable sort for arrays of up to 512 elements\n    // so we create slightly more elements to test stability\n    for (index in 0 until 600) array.asDynamic().push(index)\n    val comparison = { a: Int, b: Int -> (a and 3) - (b and 3) }\n    array.asDynamic().sort(comparison)\n    for (index in 1 until array.size) {\n        val a = array[index - 1]\n        val b = array[index]\n        if ((a and 3) == (b and 3) && a >= b) return false\n    }\n    _stableSortingIsSupported = true\n    return true\n}\n\n\n    private fun <T> mergeSort(array: Array<T>, start: Int, endInclusive: Int, comparator: Comparator<in T>) {\n    val buffer = arrayOfNulls<Any?>(array.size).unsafeCast<Array<T>>()\n    val result = mergeSort(array, buffer, start, endInclusive, comparator)\n    if (result !== array) {\n        for (i in start..endInclusive) array[i] = result[i]\n    }\n}\n\n\n    // Both start and end are inclusive indices.\n    private fun <T> mergeSort(array: Array<T>, buffer: Array<T>, start: Int, end: Int, comparator: Comparator<in T>): Array<T> {\n    if (start == end) {\n        return array\n    }\n\n    val median = (start + end) / 2\n    val left = mergeSort(array, buffer, start, median, comparator)\n    val right =

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mergeSort(array, buffer, median + 1, end, comparator)\n\n    val target = if (left === buffer) array else buffer\n\n    // Merge.\n    var leftIndex = start\n    var rightIndex = median + 1\n    for (i in start..end) {\n        when {\n            leftIndex <= median && rightIndex <= end -> {\n                val leftValue = left[leftIndex]\n                val rightValue = right[rightIndex]\n                if (comparator.compare(leftValue, rightValue) <= 0) {\n                    target[i] = leftValue\n                    leftIndex++\n                } else {\n                    target[i] = rightValue\n                    rightIndex++\n                }\n            }\n            leftIndex <= median -> {\n                target[i] = left[leftIndex]\n                leftIndex++\n            }\n            else /* rightIndex <= end */ -> {\n                target[i] = right[rightIndex]\n                rightIndex++\n            }\n        }\n    }\n    Unit // TODO: Fix KT-31506\n}\n}\n}\n\nreturn target\n}"/**\n * Copyright 2010-2018 JetBrains s.r.o. and Kotlin Programming Language contributors.\n * Use of this source code is governed by the Apache 2.0 license that can be found in the license/LICENSE.txt file.\n */\n\npackage kotlin.collections\n\n@OptIn(ExperimentalUnsignedTypes::class)\n@SinceKotlin("1.3")\n@kotlin.js.JsName("contentDeepHashCodeImpl")\ninternal fun <T> Array<out T>?.contentDeepHashCodeImpl(): Int {\n    if (this == null) return 0\n    var result = 1\n    for (element in this) {\n        val elementHash = when {\n            element == null -> 0\n            isArrayish(element) -> (element.unsafeCast<Array<*>>()).contentDeepHashCodeImpl()\n            element is UByteArray -> element.contentHashCode()\n            element is UShortArray -> element.contentHashCode()\n            element is UIntArray -> element.contentHashCode()\n            element is ULongArray -> element.contentHashCode()\n            else -> element.hashCode()\n        }\n        result = 31 * result + elementHash\n    }\n    return result\n}"/**\n * Copyright 2010-2018 JetBrains s.r.o. and Kotlin Programming Language contributors.\n * Use of this source code is governed by the Apache 2.0 license that can be found in the license/LICENSE.txt file.\n */\n\npackage kotlin.collections\n\ninternal interface EqualityComparator {\n    /**\n     * Subclasses must override to return a value indicating whether or not two keys or values are equal.\n     */\n    abstract fun equals(value1: Any?, value2: Any?): Boolean\n\n    /**\n     * Subclasses must override to return the hash code of a given key.\n     */\n    abstract fun getHashCode(value: Any?): Int\n}\n\nobject hashCode : EqualityComparator {\n    override fun equals(value1: Any?, value2: Any?): Boolean = value1 == value2\n\n    override fun getHashCode(value: Any?): Int = value?.hashCode() ?: 0\n}\n}"/**\n * Copyright 2010-2020 JetBrains s.r.o. and Kotlin Programming Language contributors.\n * Use of this source code is governed by the Apache 2.0 license that can be found in the license/LICENSE.txt file.\n */\n\n/**\n * Based on GWT AbstractHashMap\n * Copyright 2008 Google Inc.\n */\n\npackage kotlin.collections\n\nimport kotlin.collections.MutableMap.MutableEntry\n\n/**\n * Hash table based implementation of the [MutableMap] interface.\n * This implementation makes no guarantees regarding the order of enumeration of [keys], [values] and [entries] collections.\n */\n\n// Classes that extend HashMap and implement `build()` (freezing) operation\n// have to make sure mutating methods check `checkIsMutable`.\npublic actual open class HashMap<K, V> : AbstractMutableMap<K, V>, MutableMap<K, V> {\n    private inner class EntrySet : AbstractEntrySet<MutableEntry<K, V>, K, V> {\n        override fun add(element: MutableEntry<K, V>): Boolean = throw UnsupportedOperationException("Add is not supported on entries")\n        override fun clear() {\n            this@HashMap.clear()\n        }\n        override fun containsEntry(element: Map.Entry<K, V>): Boolean = this@HashMap.containsEntry(element)\n        override operator fun iterator(): MutableIterator<MutableEntry<K, V>> = internalMap.iterator()\n        override fun removeEntry(element: Map.Entry<K, V>): Boolean {\n            if (contains(element)) {\n                this@HashMap.remove(element.key)\n            }\n            return true\n        }\n        override val size: Int get() = this@HashMap.size\n    }\n\n    /**\n     * Internal implementation of the map: either string-based or hashcode-based.\n     */\n    private val internalMap: InternalMap<K, V>\n    private val equality: EqualityComparator\n\n    internal constructor(internalMap: InternalMap<K, V>) : super() {\n        this.internalMap = internalMap\n        this.equality = internalMap.equality\n    }\n\n    /**\n     * Constructs an empty [HashMap] instance.\n     */\n    actual constructor() : this(InternalHashMap(EqualityComparator.HashCode))\n\n    /**\n     * Constructs an empty [HashMap] instance.\n     * @param initialCapacity the initial capacity (ignored)\n     * @param loadFactor the load factor (ignored)\n     * @throws IllegalArgumentException if the initial capacity or load factor are negative\n     */\n    actual constructor(initialCapacity: Int, loadFactor: Float) : this() // This

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implementation of HashMap has no need of load factors or capacities.\n    require(initialCapacity >= 0) {
    \Negative initial capacity: $initialCapacity"}\n    require(loadFactor >= 0) { \Non-positive load factor:
    $loadFactor"}\n    }\n\n    actual constructor(initialCapacity: Int) : this(initialCapacity, 0.0f)\n\n    /**\n     *
    Constructs an instance of [HashMap] filled with the contents of the specified [original] map.\n     *\n     * actual
    constructor(original: Map<out K, V>) : this() {\n     *    this.putAll(original)\n     * }\n\n     * actual override fun clear() {\n
    *    internalMap.clear()\n     * //    structureChanged(this)\n     * }\n\n     * actual override fun containsKey(key: K): Boolean
    = internalMap.containsKey()\n\n     * actual override fun containsValue(value: V): Boolean = internalMap.any {
    *    equality.equals(it.value, value) }\n\n     * private var _entries: MutableSet<MutableMap.MutableEntry<K, V>>? =
    * null\n     * actual override val entries: MutableSet<MutableMap.MutableEntry<K, V>>\n     *    get() {\n     *        if
    *        (_entries == null) {\n     *            _entries = createEntrySet()\n     *        }\n     *        return _entries!!\n     *    }\n\n     * internal
    open fun createEntrySet(): MutableSet<MutableMap.MutableEntry<K, V>> = EntrySet()\n\n     * actual override
    operator fun get(key: K): V? = internalMap.get(key)\n\n     * actual override fun put(key: K, value: V): V? =
    * internalMap.put(key, value)\n\n     * actual override fun remove(key: K): V? = internalMap.remove(key)\n\n     * actual
    override val size: Int get() = internalMap.size\n\n    }\n\n    /**\n     * Constructs the specialized implementation of
    * [HashMap] with [String] keys, which stores the keys as properties of\n     * JS object without hashing them.\n     *\n     * actual
    public fun <V> stringMapOf(vararg pairs: Pair<String, V>): HashMap<String, V> {\n     *    return
    *    HashMap<String, V>(InternalStringMap(EqualityComparator.HashCode)).apply { putAll(pairs) }\n     * }\n\n    "*/\n\n    * Copyright 2010-2018 JetBrains s.r.o. and Kotlin Programming Language contributors.\n    * Use of this source code is
    * governed by the Apache 2.0 license that can be found in the license/LICENSE.txt file.\n    * actual\n    * Based on GWT
    * HashSet\n    * Copyright 2008 Google Inc.\n    * actual\n    * package kotlin.collections\n    * actual\n    * The implementation of the
    * [MutableSet] interface, backed by a [HashMap] instance.\n    * actual\n    * // Classes that extend HashSet and implement
    * `build()` (freezing) operation\n    * actual\n    * // have to make sure mutating methods check `checkIsMutable`\n    * actual\n    * public actual open
    * class HashSet<E> : AbstractMutableSet<E>, MutableSet<E> {\n    *    internal val map: HashMap<E, Any>\n    * }\n\n    * actual\n    * /**\n     * Constructs a new empty [HashSet].\n     * actual\n     * constructor() {\n     *    map = HashMap<E, Any>()\n
    * }\n\n     * actual\n     * /**\n     * Constructs a new [HashSet] filled with the elements of the specified collection.\n     * actual\n     * constructor(elements: Collection<E>) {\n     *    map = HashMap<E, Any>(elements.size)\n     *    addAll(elements)\n
    * }\n\n     * actual\n     * /**\n     * Constructs a new empty [HashSet].\n     * actual\n     * @param initialCapacity the initial capacity
    * (ignored)\n     * @param loadFactor the load factor (ignored)\n     * actual\n     * @throws IllegalArgumentException if
    * the initial capacity or load factor are negative\n     * actual\n     * constructor(initialCapacity: Int, loadFactor: Float)
    * {\n     *    map = HashMap<E, Any>(initialCapacity, loadFactor)\n     * }\n\n     * actual\n     * constructor(initialCapacity: Int) :
    * this(initialCapacity, 0.0f)\n\n     * actual\n     * /**\n     * Protected constructor to specify the underlying map. This is used by\n     * actual\n     * LinkedHashSet.\n     * actual\n     * @param map underlying map to use.\n     * actual\n     * internal constructor(map: HashMap<E,
    * Any>) {\n     *    this.map = map\n     * }\n\n     * actual\n     * override fun add(element: E): Boolean {\n     *    val old =
    *    map.put(element, this)\n     *    return old == null\n     * }\n\n     * actual\n     * override fun clear() {\n     *    map.clear()\n     * }\n\n     * actual\n     * override fun clone(): Any {\n     *    //    return HashSet<E>(this)\n     *    // }\n\n     * actual\n     * override operator fun
    * contains(element: E): Boolean = map.containsKey(element)\n\n     * actual\n     * override fun isEmpty(): Boolean =
    * map.isEmpty()\n\n     * actual\n     * override fun iterator(): MutableIterator<E> = map.keys.iterator()\n\n     * actual\n     * override
    * fun remove(element: E): Boolean = map.remove(element) != null\n\n     * actual\n     * override val size: Int get() =
    * map.size\n\n    }\n\n    /**\n     * Creates a new instance of the specialized implementation of [HashSet] with the specified
    * [String] elements,\n     * which elements the keys as properties of JS object without hashing them.\n     * actual\n     * public fun
    * stringSetOf(vararg elements: String): HashSet<String> {\n     *    return HashSet(stringMapOf<Any>()).apply {
    *    addAll(elements) }\n     * }\n\n    "*/\n\n    * Copyright 2010-2018 JetBrains s.r.o. and Kotlin Programming Language
    * contributors.\n    * Use of this source code is governed by the Apache 2.0 license that can be found in the
    * license/LICENSE.txt file.\n    * actual\n    * Based on GWT InternalHashCodeMap\n    * Copyright 2008 Google Inc.\n    * actual\n    * package kotlin.collections\n    * actual\n    * import kotlin.collections.MutableMap.MutableEntry\n    * actual\n    * import
    * kotlin.collections.AbstractMutableMap.SimpleEntry\n\n    "*/\n\n    * A simple wrapper around JavaScriptObject to
    * provide [java.util.Map]-like semantics for any\n    * key type.\n    * actual\n    * * Implementation notes:\n    * actual\n    * * A key's
    * hashCode is the index in backingMap which should contain that key. Since several keys may\n    * have the same

```



```

hash, each value in hashCodeMap is actually an array containing all entries whose
 * keys share the same hash.
 *
internal class InternalHashMap<K, V>(override val equality: EqualityComparator) : InternalMap<K, V>
{
    private var backingMap: dynamic = createJsMap()
    override var size: Int = 0
    private set
    override fun put(key: K, value: V): V? {
        val hashCode = equality.getHashCode(key)
        val chainOrEntry = getChainOrEntryOrNull(hashCode)
        if (chainOrEntry == null) { // This is a new chain, put it to the
            backingMap[hashCode] = SimpleEntry(key, value)
        } else {
            if (chainOrEntry !is
                Array<*>) { // It is an entry
                val entry: SimpleEntry<K, V> = chainOrEntry
                if (equality.equals(entry.key, key)) {
                    return entry.setValue(value)
                } else {
                    backingMap[hashCode] = arrayOf(entry, SimpleEntry(key, value))
                    size++
                    return null
                }
            } else { // Chain already exists, perhaps key also exists.
                val chain:
                Array<MutableEntry<K, V>> = chainOrEntry
                val entry = chain.findEntryInChain(key)
                if (entry != null) {
                    return entry.setValue(value)
                }
                chain.asDynamic().push(SimpleEntry(key, value))
                size++
                structureChanged(host)
                return null
            }
        }
        override fun remove(key: K): V? {
            val hashCode = equality.getHashCode(key)
            val chainOrEntry = getChainOrEntryOrNull(hashCode) ?: return null
            if (chainOrEntry !is Array<*>) {
                val entry: MutableEntry<K, V> = chainOrEntry
                if (equality.equals(entry.key, key)) {
                    jsDeleteProperty(backingMap, hashCode)
                    size--
                    return entry.value
                } else {
                    return null
                }
            } else {
                val chain: Array<MutableEntry<K, V>> = chainOrEntry
                for (index in chain.indices) {
                    val entry = chain[index]
                    if (equality.equals(key, entry.key)) {
                        if (chain.size == 1) {
                            chain.asDynamic().length = 0 // remove the whole
                            array
                            jsDeleteProperty(backingMap, hashCode)
                        } else { // splice out
                            the entry we're removing
                            chain.asDynamic().splice(index, 1)
                            size--
                            structureChanged(host)
                            return entry.value
                        }
                    }
                }
                return null
            }
        }
        override fun clear() {
            backingMap = createJsMap()
            size = 0
        }
        override fun
        contains(key: K): Boolean = getEntry(key) != null
        override fun get(key: K): V? = getEntry(key)?.value
        private fun getEntry(key: K): MutableEntry<K, V>? {
            val chainOrEntry =
            getChainOrEntryOrNull(equality.getHashCode(key)) ?: return null
            if (chainOrEntry !is Array<*>) {
                val entry: MutableEntry<K, V> = chainOrEntry
                if (equality.equals(entry.key, key)) {
                    return
                    entry
                } else {
                    return null
                }
            } else {
                val chain: Array<MutableEntry<K,
                V>> = chainOrEntry
                return chain.findEntryInChain(key)
            }
        }
        private fun
        Array<MutableEntry<K, V>>.findEntryInChain(key: K): MutableEntry<K, V>? =
        firstOrNull { entry ->
        equality.equals(entry.key, key) }
        override fun iterator(): MutableIterator<MutableEntry<K, V>> {
            return object : MutableIterator<MutableEntry<K, V>> {
                var state = -1 // -1 not ready, 0 - ready, 1 -
                done
                val keys: Array<String> = js("Object").keys(backingMap)
                var keyIndex = -1
                var chainOrEntry: dynamic = null
                var isChain = false
                var itemIndex = -1
                var lastEntry:
                MutableEntry<K, V>? = null
                private fun computeNext(): Int {
                    if (chainOrEntry != null &&
                    isChain) {
                        val chainSize: Int = chainOrEntry.unsafeCast<Array<MutableEntry<K, V>>>().size
                        if (++itemIndex < chainSize) {
                            return 0
                        }
                        if (++keyIndex < keys.size) {
                            chainOrEntry = backingMap[keys[keyIndex]]
                            isChain = chainOrEntry is Array<*>
                            itemIndex = 0
                            return 0
                        } else {
                            chainOrEntry = null
                            return 1
                        }
                    }
                }
                override fun hasNext(): Boolean {
                    if (state == -1) {
                        state = computeNext()
                        return state == 0
                    }
                }
                override fun next(): MutableEntry<K, V> {
                    if (!hasNext()) throw NoSuchElementException()
                    val lastEntry = if (isChain) {
                        chainOrEntry.unsafeCast<Array<MutableEntry<K, V>>>()[itemIndex]
                    } else {
                        chainOrEntry.unsafeCast<MutableEntry<K, V>>()
                    }
                    this.lastEntry = lastEntry
                    state = -1
                    return lastEntry
                }
                override fun remove() {
                    checkNotNull(lastEntry)
                    this@InternalHashMap.remove(lastEntry!!.key)
                    lastEntry =
                    null // the chain being iterated just got modified by InternalHashMap.remove
                    itemIndex-

```



```

kotlin.collections\n\nimport kotlin.collections.MutableMap.MutableEntry\n\n/**\n * Hash table based
implementation of the [MutableMap] interface, which additionally preserves the insertion order\n * of entries during
the iteration.\n *\n * The insertion order is preserved by maintaining a doubly-linked list of all of its entries.\n
*/\n\npublic actual open class LinkedHashMap<K, V> : HashMap<K, V>, MutableMap<K, V> {\n\n    /**\n     * The
entry we use includes next/prev pointers for a doubly-linked circular\n     * list with a head node. This reduces the
special cases we have to deal with\n     * in the list operations.\n     *\n     * Note that we duplicate the key from the
underlying hash map so we can find\n     * the eldest entry. The alternative would have been to modify HashMap so
more\n     * of the code was directly usable here, but this would have added some\n     * overhead to HashMap, or to
reimplement most of the HashMap code here with\n     * small modifications. Paying a small storage cost only if
you use\n     * LinkedHashMap and minimizing code size seemed like a better tradeoff\n     */\n\n    private inner class
ChainEntry<K, V>(key: K, value: V) : AbstractMutableMap.SimpleEntry<K, V>(key, value) {\n        internal var
next: ChainEntry<K, V>? = null\n        internal var prev: ChainEntry<K, V>? = null\n\n        override fun
setValue(newValue: V): V {\n            this@LinkedHashMap.checkIsMutable()\n            return
super.setValue(newValue)\n        }\n    }\n\n    private inner class EntrySet : AbstractEntrySet<MutableEntry<K,
V>, K, V>() {\n        private inner class EntryIterator : MutableIterator<MutableEntry<K, V>> {\n            // The
last entry that was returned from this iterator.\n            private var last: ChainEntry<K, V>? = null\n\n            // The
next entry to return from this iterator.\n            private var next: ChainEntry<K, V>? = null\n\n            init {\n
                next = head\n            }\n\n            recordLastKnownStructure(map, this)\n\n            override fun hasNext():
Boolean {\n                return next != null\n            }\n\n            override fun next(): MutableEntry<K, V> {\n                //
checkStructuralChange(map, this)\n                if (!hasNext()) throw NoSuchElementException()\n                val
current = next!!\n                last = current\n                next = current.next.takeIf { it != head }\n                return
current\n            }\n\n            override fun remove() {\n                check(last != null)\n                this@EntrySet.checkIsMutable()\n                checkStructuralChange(map, this)\n                last!!.remove()\n                map.remove(last!!.key)\n                recordLastKnownStructure(map, this)\n                last = null\n            }\n\n            override fun add(element: MutableEntry<K, V>): Boolean = throw
UnsupportedOperationException("Add is not supported on entries")\n\n            override fun clear() {\n                this@LinkedHashMap.clear()\n            }\n\n            override fun containsEntry(element: Map.Entry<K, V>): Boolean =
this@LinkedHashMap.containsEntry(element)\n\n            override operator fun iterator():
MutableIterator<MutableEntry<K, V>> = EntryIterator()\n\n            override fun removeEntry(element: Map.Entry<K,
V>): Boolean {\n                checkIsMutable()\n                if (contains(element)) {\n                    this@LinkedHashMap.remove(element.key)\n                    return true\n                }\n                return false\n            }\n\n            override val size: Int get() = this@LinkedHashMap.size\n\n            override fun checkIsMutable(): Unit =
this@LinkedHashMap.checkIsMutable()\n        }\n\n        /**\n         * The head of the insert order chain, which is a doubly-
linked circular\n         * list.\n         *\n         * The most recently inserted node is at the end of the chain, ie.\n         * chain.prev.\n         */\n        private var head: ChainEntry<K, V>? = null\n\n        /**\n         * Add this node to the end of the chain.\n         */\n        private fun ChainEntry<K, V>.addToEnd() {\n            // This entry is not in the list.\n            check(next == null && prev
== null)\n\n            val _head = head\n            if (_head == null) {\n                head = this\n                next = this\n                prev =
this\n            } else {\n                // Chain is valid.\n                val _tail = checkNotNull(_head.prev)\n                // Update me.\n                prev = _tail\n                next = _head\n                // Update my new siblings: current head and old tail\n                _head.prev = this\n                _tail.next = this\n            }\n        }\n\n        /**\n         * Remove this node from the chain it is a part
of.\n         */\n        private fun ChainEntry<K, V>.remove() {\n            if (this.next === this) {\n                // if this is single
element, remove head\n                head = null\n            } else {\n                if (head === this) {\n                    // if this is first
element, move head to next\n                    head = next\n                }\n                next!!.prev = prev\n                prev!!.next =
next\n            }\n            next = null\n            prev = null\n        }\n\n        /**\n         * The hashmap that keeps track of our entries and
the chain. Note that we\n         * duplicate the key here to eliminate changes to HashMap and minimize the\n         * code
here, at the expense of additional space.\n         */\n        private val map: HashMap<K, ChainEntry<K, V>>\n\n        private
var isReadOnly: Boolean = false\n\n        /**\n         * Constructs an empty [LinkedHashMap] instance.\n         */\n        actual
constructor() : super() {\n            map = HashMap<K, ChainEntry<K, V>>()\n        }\n\n        internal

```



```

Apache 2.0 license that can be found in the license/LICENSE.txt file.\n *\n\npackage kotlin\n\nimport
kotlin.contracts.*\n\n\n@DeprecatedSinceKotlin(warningSince = \"1.6\")\n@Deprecated(\"Synchronization on any
object is not supported in Kotlin/JS\",
ReplaceWith(\"run(block)\"))\n@kotlin.internal.InlineOnly\n@Suppress(\"UNUSED_PARAMETER\")\npublic
inline fun <R> synchronized(lock: Any, block: () -> R): R {\n  contract {\n    callsInPlace(block,
InvocationKind.EXACTLY_ONCE)\n  }\n  return block()\n}\n\n\", \"/*\n * Copyright 2010-2018 JetBrains s.r.o. and
Kotlin Programming Language contributors.\n * Use of this source code is governed by the Apache 2.0 license that
can be found in the license/LICENSE.txt file.\n *\n\npackage kotlin.io\n\ninternal abstract class BaseOutput {\n
open fun println() {\n  print(\"\\n\")\n }\n\n open fun println(message: Any?) {\n  print(message)\n
println()\n }\n\n abstract fun print(message: Any?)\n\n open fun flush() {\n}\n\n\n/** JsName used to make the
declaration available outside of module to test it *\n\n@JsName(\"NodeJsOutput\")\ninternal class NodeJsOutput(val
outputStream: dynamic) : BaseOutput() {\n  override fun print(message: Any?) {\n    // TODO: Using local
variable because of bug in block decomposition lowering in IR backend\n    val messageString =
String(message)\n    outputStream.write(messageString)\n  }\n}\n\n\n/** JsName used to make the declaration
available outside of module to test it *\n\n@JsName(\"OutputToConsoleLog\")\ninternal class OutputToConsoleLog
: BaseOutput() {\n  override fun print(message: Any?) {\n    console.log(message)\n }\n\n override fun
println(message: Any?) {\n    console.log(message)\n }\n\n override fun println() {\n    console.log(\"\\n\")\n
}\n}\n\n\n/** JsName used to make the declaration available outside of module to test it and use at try.kotl.in
*\n\n@JsName(\"BufferedOutput\")\ninternal open class BufferedOutput : BaseOutput() {\n  var buffer = \"\\n\"\n
override fun print(message: Any?) {\n    buffer += String(message)\n }\n\n override fun flush() {\n    buffer
= \"\\n\"\n  }\n}\n\n\n/** JsName used to make the declaration available outside of module to test it
*\n\n@JsName(\"BufferedOutputToConsoleLog\")\ninternal class BufferedOutputToConsoleLog : BufferedOutput()
{\n  override fun print(message: Any?) {\n    var s = String(message)\n    val i = s.nativeLastIndexOf(\"\\n\",
0)\n    if (i >= 0) {\n      buffer += s.substring(0, i)\n      flush()\n      s = s.substring(i + 1)\n    }\n
buffer += s\n  }\n\n override fun flush() {\n    console.log(buffer)\n    buffer = \"\\n\"\n  }\n}\n\n\n/** JsName
used to make the declaration available outside of module to test it and use at try.kotl.in
*\n\n@JsName(\"output\")\ninternal var output = run {\n  val isNode: Boolean = js(\"typeof process !== 'undefined'
&& process.versions && !!process.versions.node\")\n  if (isNode) NodeJsOutput(js(\"process.stdout\")) else
BufferedOutputToConsoleLog()\n}\n\n\n@kotlin.internal.InlineOnly\nprivate inline fun String(value: Any?): String =
js(\"String\") (value)\n\n\n/** Prints the line separator to the standard output stream. *\n\npublic actual fun println() {\n
output.println()\n}\n\n\n/** Prints the given [message] and the line separator to the standard output stream. *\n\npublic
actual fun println(message: Any?) {\n  output.println(message)\n}\n\n\n/** Prints the given [message] to the standard
output stream. *\n\npublic actual fun print(message: Any?) {\n
output.print(message)\n}\n\n\n@SinceKotlin(\"1.6\")\npublic actual fun readln(): String = throw
UnsupportedOperationException(\"readln is not supported in Kotlin/JS\")\n\n\n@SinceKotlin(\"1.6\")\npublic actual
fun readlnOrNull(): String? = throw UnsupportedOperationException(\"readlnOrNull is not supported in
Kotlin/JS\")\n\n\n\", \"/*\n * Copyright 2010-2018 JetBrains s.r.o. and Kotlin Programming Language contributors.\n * Use
of this source code is governed by the Apache 2.0 license that can be found in the license/LICENSE.txt file.\n *\n\npackage kotlin.coroutines\n\nimport kotlin.coroutines.intrinsics.CoroutineSingletons.*\nimport
kotlin.coroutines.intrinsics.COROUTINE_SUSPENDED\n\n@PublishedApi\n@SinceKotlin(\"1.3\")\ninternal
actual class SafeContinuation<in T>\ninternal actual constructor(\n  private val delegate: Continuation<T>,\n
initialResult: Any?)\n: Continuation<T> {\n  @PublishedApi\n  internal actual constructor(delegate:
Continuation<T>) : this(delegate, UNDECIDED)\n\n  public actual override val context: CoroutineContext\n
get() = delegate.context\n\n  private var result: Any? = initialResult\n\n  public actual override fun
resumeWith(result: Result<T>) {\n    val cur = this.result\n    when {\n      cur === UNDECIDED -> {\n
this.result = result.value\n    }\n      cur === COROUTINE_SUSPENDED -> {\n        this.result =
RESUMED\n        delegate.resumeWith(result)\n      }\n      else -> throw
IllegalStateException(\"Already resumed\")\n    }\n  }\n}\n\n\n@PublishedApi\ninternal actual fun

```



```

second: String?\n\n    public var timeZoneName: String?\n    }\n}\n\npublic inline fun dateLocaleOptions(init:
Date.LocaleOptions.() -> Unit): Date.LocaleOptions {\n    val result = js(\n"new
Object()\n").unsafeCast<Date.LocaleOptions>()\n    init(result)\n    return result\n}", /*\n * Copyright 2010-2020
JetBrains s.r.o. and Kotlin Programming Language contributors.\n * Use of this source code is governed by the
Apache 2.0 license that can be found in the license/LICENSE.txt file.\n */\n\npackage kotlin.dom\n\nimport
org.w3c.dom.Document\nimport org.w3c.dom.Element\nimport
kotlin.internal.LowPriorityInOverloadResolution\nimport kotlinx.dom.appendElement as
newAppendElement\nimport kotlinx.dom.createElement as newCreateElement\n\n/**\n * Creates a new element
with the specified [name].\n */\n * The element is initialized with the specified [init] function.\n
*/\n\n@LowPriorityInOverloadResolution\n@Deprecated(\n    message = \n"This API is moved to another package,
use 'kotlinx.dom.createElement' instead.\n",\n    replaceWith = ReplaceWith(\n"this.createElement(name, init)\n",
\n"\"kotlinx.dom.createElement\"\n)\n)\n\n@DeprecatedSinceKotlin(warningSince = \n"1.4\n", errorSince = \n"1.6\n")\n\npublic
inline fun Document.createElement(name: String, noinline init: Element.() -> Unit): Element =
this.newCreateElement(name, init)\n\n/**\n * Appends a newly created element with the specified [name] to this
element.\n */\n * The element is initialized with the specified [init] function.\n
*/\n\n@LowPriorityInOverloadResolution\n@Deprecated(\n    message = \n"This API is moved to another package,
use 'kotlinx.dom.appendElement' instead.\n",\n    replaceWith = ReplaceWith(\n"this.appendElement(name, init)\n",
\n"\"kotlinx.dom.appendElement\"\n)\n)\n\n@DeprecatedSinceKotlin(warningSince = \n"1.4\n", errorSince = \n"1.6\n")\n\npublic
inline fun Element.appendElement(name: String, noinline init: Element.() -> Unit): Element =
this.newAppendElement(name, init)\n\n", /*\n * Copyright 2010-2018 JetBrains s.r.o. and Kotlin Programming
Language contributors.\n * Use of this source code is governed by the Apache 2.0 license that can be found in the
license/LICENSE.txt file.\n */\n\npackage kotlin.dom\n\nimport org.w3c.dom.Element\nimport
kotlin.internal.LowPriorityInOverloadResolution\nimport kotlinx.dom.addClass as newAddClass\nimport
kotlinx.dom.hasClass as newHasClass\nimport kotlinx.dom.removeClass as newRemoveClass\n\n/**\n * Returns true if
the element has the given CSS class style in its 'class' attribute
*/\n\n@LowPriorityInOverloadResolution\n@Deprecated(\n    message = \n"This API is moved to another package,
use 'kotlinx.dom.hasClass' instead.\n",\n    replaceWith = ReplaceWith(\n"this.hasClass(cssClass)\n",
\n"\"kotlinx.dom.hasClass\"\n)\n)\n\n@DeprecatedSinceKotlin(warningSince = \n"1.4\n", errorSince = \n"1.6\n")\n\ninline fun
Element.hasClass(cssClass: String): Boolean = this.newHasClass(cssClass)\n\n/**\n * Adds CSS class to element.
Has no effect if all specified classes are already in class attribute of the element\n */\n * @return true if at least one
class has been added\n */\n\n@LowPriorityInOverloadResolution\n@Deprecated(\n    message = \n"This API is moved
to another package, use 'kotlinx.dom.addClass' instead.\n",\n    replaceWith =
ReplaceWith(\n"this.addClass(cssClasses)\n", \n"\"kotlinx.dom.addClass\"\n)\n)\n\n@DeprecatedSinceKotlin(warningSince
= \n"1.4\n", errorSince = \n"1.6\n")\n\ninline fun Element.addClass(vararg cssClasses: String): Boolean =
this.newAddClass(*cssClasses)\n\n/**\n * Removes all [cssClasses] from element. Has no effect if all specified
classes are missing in class attribute of the element\n */\n * @return true if at least one class has been removed\n
*/\n\n@LowPriorityInOverloadResolution\n@Deprecated(\n    message = \n"This API is moved to another package,
use 'kotlinx.dom.removeClass' instead.\n",\n    replaceWith = ReplaceWith(\n"this.removeClass(cssClasses)\n",
\n"\"kotlinx.dom.removeClass\"\n)\n)\n\n@DeprecatedSinceKotlin(warningSince = \n"1.4\n", errorSince = \n"1.6\n")\n\ninline
fun Element.removeClass(vararg cssClasses: String): Boolean = this.newRemoveClass(*cssClasses)\n\n", /*\n *
Copyright 2010-2018 JetBrains s.r.o. and Kotlin Programming Language contributors.\n * Use of this source code is
governed by the Apache 2.0 license that can be found in the license/LICENSE.txt file.\n */\n\npackage
kotlin.dom\n\nimport org.w3c.dom.Element\nimport org.w3c.dom.Node\nimport
kotlin.internal.LowPriorityInOverloadResolution\nimport kotlinx.dom.isElement as newIsElement\nimport
kotlinx.dom.isText as newIsText\n\n/**\n * Gets a value indicating whether this node is a TEXT_NODE or a
CDATA_SECTION_NODE.\n */\n\n@LowPriorityInOverloadResolution\n@Deprecated(\n    message = \n"This API
is moved to another package, use 'kotlinx.dom.isText' instead.\n",\n    replaceWith = ReplaceWith(\n"this.isText\n",
\n"\"kotlinx.dom.isText\"\n)\n)\n\n@DeprecatedSinceKotlin(warningSince = \n"1.4\n", errorSince = \n"1.6\n")\n\npublic val

```

```

Node.isText: Boolean\n    inline get() = this.newIsText\n\n/**\n * Gets a value indicating whether this node is an
[Element].\n *\n@LowPriorityInOverloadResolution\n@Deprecated(\n    message = \"This API is moved to
another package, use 'kotlinx.dom.isElement' instead.\",\n    replaceWith = ReplaceWith(\"this.isElement\"),
\"kotlinx.dom.isElement\")\n)\n\n@DeprecatedSinceKotlin(warningSince = \"1.4\", errorSince = \"1.6\")\n\npublic val
Node.isElement: Boolean\n    inline get() = this.newIsElement\n\n\",/**\n * Copyright 2010-2018 JetBrains s.r.o. and
Kotlin Programming Language contributors.\n * Use of this source code is governed by the Apache 2.0 license that
can be found in the license/LICENSE.txt file.\n *\n\npackage org.w3c.dom.events\n\n\npublic fun
EventListener(handler: (Event) -> Unit): EventListener = EventListenerHandler(handler)\n\n\nprivate class
EventListenerHandler(private val handler: (Event) -> Unit) : EventListener {\n    public override fun
handleEvent(event: Event) {\n        handler(event)\n    }\n\n    public override fun toString(): String =
\"EventListenerHandler($handler)\"\n}\n\n\",/**\n * Copyright 2010-2018 JetBrains s.r.o. and Kotlin Programming
Language contributors.\n * Use of this source code is governed by the Apache 2.0 license that can be found in the
license/LICENSE.txt file.\n *\n\npackage org.w3c.dom\n\n\npublic external interface ItemArrayLike<out T> {\n
val length: Int\n    fun item(index: Int): T?\n}\n\n\n/**\n * Returns the view of this `ItemArrayLike<T>` collection as
`List<T>`\n *\n\npublic fun <T> ItemArrayLike<T>.asList(): List<T> = object : AbstractList<T>() {\n    override val
size: Int get() = this@asList.length\n\n    override fun get(index: Int): T = when (index) {\n        in 0..lastIndex ->
this@asList.item(index).unsafeCast<T>()\n        else -> throw IndexOutOfBoundsException(\"index $index is not in
range [0..$lastIndex]\")\n    }\n}\n\n\",/**\n * Copyright 2010-2018 JetBrains s.r.o. and Kotlin Programming Language
contributors.\n * Use of this source code is governed by the Apache 2.0 license that can be found in the
license/LICENSE.txt file.\n *\n\npackage kotlin.dom\n\n\nimport org.w3c.dom.Element\n\nimport
org.w3c.dom.Node\n\nimport kotlin.internal.LowPriorityInOverloadResolution\n\nimport kotlinox.dom.appendText as
newAppendText\n\nimport kotlinox.dom.clear as newClear\n\n\n/**\n * Removes all the children from this node.\n *\n\n@LowPriorityInOverloadResolution\n@Deprecated(\n    message = \"This API is moved to another package,
use 'kotlinx.dom.clear' instead.\",\n    replaceWith = ReplaceWith(\"this.clear()\"),
\"kotlinx.dom.clear\")\n)\n\n@DeprecatedSinceKotlin(warningSince = \"1.4\", errorSince = \"1.6\")\n\npublic inline fun
Node.clear() = this.newClear()\n\n\n/**\n * Creates text node and append it to the element.\n *\n *\n@LowPriorityInOverloadResolution\n@Deprecated(\n    message = \"This API is moved to another
package, use 'kotlinx.dom.appendText' instead.\",\n    replaceWith = ReplaceWith(\"this.appendText(text)\"),
\"kotlinx.dom.appendText\")\n)\n\n@DeprecatedSinceKotlin(warningSince = \"1.4\", errorSince = \"1.6\")\n\ninline fun
Element.appendText(text: String): Element = this.newAppendText(text)\n\n\n\",/**\n * Copyright 2010-2018 JetBrains
s.r.o. and Kotlin Programming Language contributors.\n * Use of this source code is governed by the Apache 2.0
license that can be found in the license/LICENSE.txt file.\n *\n\npackage kotlin.js\n\n\n/**\n * Reinterprets this value
as a value of the [dynamic type](/docs/reference/dynamic-type.html).\n *\n\n@kotlin.internal.InlineOnly\n\npublic
inline fun Any?.asDynamic(): dynamic = this\n\n\n/**\n * Reinterprets this value as a value of the specified type [T]
without any actual type checking.\n *\n\n@kotlin.internal.InlineOnly\n\npublic inline fun <T> Any?.unsafeCast():
@kotlin.internal.NoInfer T = this.asDynamic()\n\n\n/**\n * Reinterprets this `dynamic` value as a value of the
specified type [T] without any actual type checking.\n *\n\n@kotlin.internal.DynamicExtension\n\n@JsName(\"unsafeCastDynamic\")\n\n@kotlin.internal.InlineOnly\n\npublic
inline fun <T> dynamic.unsafeCast(): @kotlin.internal.NoInfer T = this\n\n\n/**\n * Allows to iterate this `dynamic`
object in the following cases:\n * - when it has an `iterator` function,\n * - when it is an array\n * - when it is an
instance of [kotlin.collections.Iterable]\n *\n\n@kotlin.internal.DynamicExtension\n\npublic operator fun
dynamic.iterator(): Iterator<dynamic> {\n    val r: Any? = this\n\n    return when {\n        this[\"iterator\"] != null ->
this[\"iterator\"]()\n        isArrayish(r) -> r.unsafeCast<Array<*>>().iterator()\n        else -> (r as
Iterable<*>).iterator()\n    }\n}\n\n\",/**\n * Copyright 2010-2018 JetBrains s.r.o. and Kotlin Programming
Language contributors.\n * Use of this source code is governed by the Apache 2.0 license that can be found in the
license/LICENSE.txt file.\n *\n\n// a package is omitted to get declarations directly under the
module\n\n@JsName(\"throwNPE\")\n\ninternal fun throwNPE(message: String) {\n    throw
NullPointerException(message)\n}\n\n@JsName(\"throwCCE\")\n\ninternal fun throwCCE() {\n    throw

```



```

ClassCastException("Illegal cast")\n}\n\n@JsName("throwISE")\ninternal fun throwISE(message: String) {\n
throw IllegalStateException(message)\n}\n\n@JsName("throwUPAE")\ninternal fun throwUPAE(propertyName:
String) {\n  throw UninitializedPropertyAccessException("lateinit property ${propertyName} has not been
initialized")\n}\n\n"/*\n * Copyright 2010-2018 JetBrains s.r.o. and Kotlin Programming Language contributors.\n
* Use of this source code is governed by the Apache 2.0 license that can be found in the license/LICENSE.txt file.\n
*/\npackage kotlin.collections\n\n/**\n * Groups elements from the [Grouping] source by key and counts elements
in each group.\n * @return a [Map] associating the key of each group with the count of elements in the group.\n
*/\n * @sample samples.collections.Grouping.groupingByEachCount\n */\n@SinceKotlin("1.1")\npublic actual fun
<T, K> Grouping<T, K>.eachCount(): Map<K, Int> =\n  fold(0) { acc, _ -> acc + 1 }\n\n"/*\n * Groups
elements from the [Grouping] source by key and sums values provided by the [valueSelector] function for elements
in each group.\n * @return a [Map] associating the key of each group with the count of element in the group.\n
*/\n@SinceKotlin("1.1")\npublic inline fun <T, K> Grouping<T, K>.eachSumOf(valueSelector: (T) -> Int):
Map<K, Int> =\n  fold(0) { acc, e -> acc + valueSelector(e) }\n\n"/*\n * Copyright 2010-2018 JetBrains s.r.o.
and Kotlin Programming Language contributors.\n * Use of this source code is governed by the Apache 2.0 license
that can be found in the license/LICENSE.txt file.\n
*/\n\n@file:kotlin.jvm.JvmName("GroupingKt")\n@file:kotlin.jvm.JvmMultifileClass\n\npackage
kotlin.collections\n\n/**\n * Represents a source of elements with a [keyOf] function, which can be applied to each
element to get its key.\n * A [Grouping] structure serves as an intermediate step in group-and-fold operations:\n
* they group elements by their keys and then fold each group with some aggregating operation.\n * It is created
by attaching `keySelector: (T) -> K` function to a source of elements.\n * To get an instance of [Grouping] use one
of `groupingBy` extension functions:\n * - [Iterable.groupingBy]\n * - [Sequence.groupingBy]\n * -
[Array.groupingBy]\n * - [CharSequence.groupingBy]\n * For the list of group-and-fold operations available,
see the [extension functions](#extension-functions) for `Grouping`.\n */\n@SinceKotlin("1.1")\npublic interface
Grouping<T, out K> {\n  /** Returns an [Iterator] over the elements of the source of this grouping. */\n  fun
sourceIterator(): Iterator<T>\n  /** Extracts the key of an [element]. */\n  fun keyOf(element: T): K\n}\n\n/**\n * Groups elements from the [Grouping] source by key and applies [operation] to the elements of each group
sequentially,\n * passing the previously accumulated value and the current element as arguments, and stores the
results in a new map.\n * The key for each element is provided by the [Grouping.keyOf] function.\n * @param
operation function is invoked on each element with the following parameters:\n * - `key`: the key of the
group this element belongs to;\n * - `accumulator`: the current value of the accumulator of the group, can be `null`
if it's the first `element` encountered in the group;\n * - `element`: the element from the source being aggregated;\n
* - `first`: indicates whether it's the first `element` encountered in the group.\n * @return a [Map] associating
the key of each group with the result of aggregation of the group elements.\n * @sample
samples.collections.Grouping.aggregateByRadix\n */\n@SinceKotlin("1.1")\npublic inline fun <T, K, R>
Grouping<T, K>.aggregate(\n  operation: (key: K, accumulator: R?, element: T, first: Boolean) -> R\n): Map<K,
R> {\n  return aggregateTo(mutableMapOf<K, R>(), operation)\n}\n\n/**\n * Groups elements from the
[Grouping] source by key and applies [operation] to the elements of each group sequentially,\n * passing the
previously accumulated value and the current element as arguments,\n * and stores the results in the given
[destination] map.\n * The key for each element is provided by the [Grouping.keyOf] function.\n * @param
operation a function that is invoked on each element with the following parameters:\n * - `key`: the key of the group
this element belongs to;\n * - `accumulator`: the current value of the accumulator of the group, can be `null` if it's
the first `element` encountered in the group;\n * - `element`: the element from the source being aggregated;\n * -
`first`: indicates whether it's the first `element` encountered in the group.\n * If the [destination] map already has
a value corresponding to some key,\n * then the elements being aggregated for that key are never considered as
`first`.\n * @return the [destination] map associating the key of each group with the result of aggregation of the
group elements.\n * @sample samples.collections.Grouping.aggregateByRadixTo\n
*/\n@SinceKotlin("1.1")\npublic inline fun <T, K, R, M : MutableMap<in K, R>> Grouping<T,
K>.aggregateTo(\n  destination: M,\n  operation: (key: K, accumulator: R?, element: T, first: Boolean) -> R\n): M

```

```

{\n  for (e in this.sourceIterator()) {\n      val key = keyOf(e)\n      val accumulator = destination[key]\n      destination[key] = operation(key, accumulator, e, accumulator == null && !destination.containsKey(key))\n  }\n  return destination\n}\n\n/**\n * Groups elements from the [Grouping] source by key and applies [operation] to the\n * elements of each group sequentially,\n * passing the previously accumulated value and the current element as\n * arguments, and stores the results in a new map.\n * An initial value of accumulator is provided by\n * [initialValueSelector] function.\n * @param initialValueSelector a function that provides an initial value of\n * accumulator for each group.\n * It's invoked with parameters:\n * - `key`: the key of the group;\n * - `element`: the first element being encountered in that group.\n * @param operation a function that is invoked on each element\n * with the following parameters:\n * - `key`: the key of the group this element belongs to;\n * - `accumulator`: the current value of the accumulator of the group;\n * - `element`: the element from the source being accumulated.\n * @return a [Map] associating the key of each group with the result of accumulating the group elements.\n * @sample samples.collections.Grouping.foldByEvenLengthWithComputedInitialValue\n */\n\n@SinceKotlin("1.1")\npublic inline fun <T, K, R> Grouping<T, K>.fold(\n  initialValueSelector: (key: K,\n  element: T) -> R,\n  operation: (key: K, accumulator: R, element: T) -> R\n): Map<K, R> =\n  @Suppress("UNCHECKED_CAST")\n  aggregate { key, acc, e, first -> operation(key, if (first)\n  initialValueSelector(key, e) else acc as R, e) }\n\n/**\n * Groups elements from the [Grouping] source by key and\n * applies [operation] to the elements of each group sequentially,\n * passing the previously accumulated value and the\n * current element as arguments,\n * and stores the results in the given [destination] map.\n * An initial value of\n * accumulator is provided by [initialValueSelector] function.\n * @param initialValueSelector a function that\n * provides an initial value of accumulator for each group.\n * It's invoked with parameters:\n * - `key`: the key of the\n * group;\n * - `element`: the first element being encountered in that group.\n * @param operation a function that is invoked on\n * each element with the following parameters:\n * - `key`: the key of the group this element belongs to;\n * -\n * `accumulator`: the current value of the accumulator of the group;\n * - `element`: the element from the source being\n * accumulated.\n * @return the [destination] map associating the key of each group with the result of\n * accumulating the group elements.\n * @sample\n * samples.collections.Grouping.foldByEvenLengthWithComputedInitialValueTo\n */\n\n@SinceKotlin("1.1")\npublic\n * inline fun <T, K, R, M : MutableMap<in K, R>> Grouping<T, K>.foldTo(\n * destination: M,\n * initialValueSelector: (key: K, element: T) -> R,\n * operation: (key: K, accumulator: R, element: T) -> R\n * ): M =\n * @Suppress("UNCHECKED_CAST")\n * aggregateTo(destination) { key, acc, e, first -> operation(key, if (first)\n * initialValueSelector(key, e) else acc as R, e) }\n\n/**\n * Groups elements from the [Grouping] source by key and\n * applies [operation] to the elements of each group sequentially,\n * passing the previously accumulated value and the\n * current element as arguments, and stores the results in a new map.\n * An initial value of accumulator is the same\n * [initialValue] for each group.\n * @param operation a function that is invoked on each element with the\n * following parameters:\n * - `accumulator`: the current value of the accumulator of the group;\n * - `element`: the\n * element from the source being accumulated.\n * @return a [Map] associating the key of each group with the\n * result of accumulating the group elements.\n * @sample\n * samples.collections.Grouping.foldByEvenLengthWithConstantInitialValue\n */\n\n@SinceKotlin("1.1")\npublic\n * inline fun <T, K, R> Grouping<T, K>.fold(\n * initialValue: R,\n * operation: (accumulator: R, element: T) -> R\n * ): Map<K, R> =\n * @Suppress("UNCHECKED_CAST")\n * aggregate { _, acc, e, first -> operation(if (first)\n * initialValue else acc as R, e) }\n\n/**\n * Groups elements from the [Grouping] source by key and applies\n * [operation] to the elements of each group sequentially,\n * passing the previously accumulated value and the current\n * element as arguments,\n * and stores the results in the given [destination] map.\n * An initial value of accumulator is\n * the same [initialValue] for each group.\n * @param operation a function that is invoked on each element with the following parameters:\n * - `accumulator`: the current value of\n * the accumulator of the group;\n * - `element`: the element from the source being accumulated.\n * @return the

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[destination] map associating the key of each group with the result of accumulating the group elements.\n *
@sample samples.collections.Grouping.foldByEvenLengthWithConstantInitialValueTo\n
*\n@SinceKotlin("1.1")\npublic inline fun <T, K, R, M : MutableMap<in K, R>> Grouping<T, K>.foldTo(\n
destination: M,\n initialValue: R,\n operation: (accumulator: R, element: T) -> R)\n: M =\n
@Suppress("UNCHECKED_CAST")\n aggregateTo(destination) { _, acc, e, first -> operation(if (first)
initialValue else acc as R, e) }\n\n**\n * Groups elements from the [Grouping] source by key and applies the
reducing [operation] to the elements of each group\n * sequentially starting from the second element of the group,\n
* passing the previously accumulated value and the current element as arguments,\n * and stores the results in a new
map.\n * An initial value of accumulator is the first element of the group.\n *\n * @param operation a function that
is invoked on each subsequent element of the group with the following parameters:\n * - `key`: the key of the group
this element belongs to;\n * - `accumulator`: the current value of the accumulator of the group;\n * - `element`: the
element from the source being accumulated.\n *\n * @return a [Map] associating the key of each group with the
result of accumulating the group elements.\n * @sample samples.collections.Grouping.reduceByMaxVowels\n
*\n@SinceKotlin("1.1")\npublic inline fun <S, T : S, K> Grouping<T, K>.reduce(\n operation: (key: K,
accumulator: S, element: T) -> S)\n: Map<K, S> =\n aggregate { key, acc, e, first ->\n
@Suppress("UNCHECKED_CAST")\n if (first) e else operation(key, acc as S, e)\n }\n\n**\n * Groups
elements from the [Grouping] source by key and applies the reducing [operation] to the elements of each group\n *
sequentially starting from the second element of the group,\n * passing the previously accumulated value and the
current element as arguments,\n * and stores the results in the given [destination] map.\n * An initial value of
accumulator is the first element of the group.\n *\n * If the [destination] map already has a value corresponding to
the key of some group,\n * that value is used as an initial value of the accumulator for that group and the first
element of that group is also\n * subjected to the [operation].\n *\n * @param operation a function that is invoked on
each subsequent element of the group with the following parameters:\n * - `accumulator`: the current value of the
accumulator of the group;\n * - `element`: the element from the source being folded;\n *\n * @return the
[destination] map associating the key of each group with the result of accumulating the group elements.\n *
@sample samples.collections.Grouping.reduceByMaxVowelsTo\n *\n@SinceKotlin("1.1")\npublic inline fun <S,
T : S, K, M : MutableMap<in K, S>> Grouping<T, K>.reduceTo(\n destination: M,\n operation: (key: K,
accumulator: S, element: T) -> S)\n: M =\n aggregateTo(destination) { key, acc, e, first ->\n
@Suppress("UNCHECKED_CAST")\n if (first) e else operation(key, acc as S, e)\n }\n\n**\n * Groups
elements from the [Grouping] source by key and counts elements in each group to the given [destination] map.\n *\n
* If the [destination] map already has a value corresponding to the key of some group,\n * that value is used as an
initial value of the counter for that group.\n *\n * @return the [destination] map associating the key of each group
with the count of elements in the group.\n *\n * @sample samples.collections.Grouping.groupingByEachCount\n
*\n@SinceKotlin("1.1")\npublic fun <T, K, M : MutableMap<in K, Int>> Grouping<T,
K>.eachCountTo(destination: M): M =\n foldTo(destination, 0) { acc, _ -> acc + 1 }\n\n**\n * Groups
elements from the [Grouping] source by key and sums values provided by the [valueSelector] function for elements
in each group\n * to the given [destination] map.\n *\n * If the [destination] map already has a value
corresponding to the key of some group,\n * that value is used as an initial value of the sum for that group.\n *\n
* @return the [destination] map associating the key of each group with the sum of elements in the group.\n *
*\n@SinceKotlin("1.1")\npublic inline fun <T, K, M : MutableMap<in K, Int>> Grouping<T,
K>.eachSumOfTo(destination: M, valueSelector: (T) -> Int): M =\n foldTo(destination, 0) { acc, e -> acc +
valueSelector(e) }\n\n**\n * TODO: sum by long and by double overloads\n\npublic inline fun <T, K, M :
MutableMap<in K, Long>> Grouping<T, K>.sumEachByLongTo(destination: M, valueSelector: (T) -> Long): M
=\n foldTo(destination, 0L) { acc, e -> acc + valueSelector(e) }\n\npublic inline fun <T, K> Grouping<T,
K>.sumEachByLong(valueSelector: (T) -> Long): Map<K, Long> =\n fold(0L) { acc, e -> acc +
valueSelector(e) }\n\npublic inline fun <T, K, M : MutableMap<in K, Double>> Grouping<T,
K>.sumEachByDoubleTo(destination: M, valueSelector: (T) -> Double): M =\n foldTo(destination, 0.0) { acc, e
-> acc + valueSelector(e) }\n\npublic inline fun <T, K> Grouping<T, K>.sumEachByDouble(valueSelector: (T) ->

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*\n@SinceKotlin("1.2")\n@InlineOnly\npublic actual inline fun acos(x: Double): Double =
nativeMath.acos(x)\n\n/**\n * Computes the arc tangent of the value [x];\n * the returned value is an angle in the
range from  $-\pi/2$  to  $\pi/2$  radians.\n * Special cases:\n * -  $\text{atan}(\text{NaN})$  is  $\text{NaN}$ \n
*\n@SinceKotlin("1.2")\n@InlineOnly\npublic actual inline fun atan(x: Double): Double =
nativeMath.atan(x)\n\n/**\n * Returns the angle  $\theta$  of the polar coordinates  $(r, \theta)$  that correspond\n * to the
rectangular coordinates  $(x, y)$  by computing the arc tangent of the value  $y / x$ ;\n * the returned value is an angle
in the range from  $-\pi$  to  $\pi$  radians.\n * Special cases:\n * -  $\text{atan2}(0.0, 0.0)$  is  $0.0$ \n * -  $\text{atan2}(0.0, x)$  is
 $0.0$  for  $x > 0$  and  $\pi$  for  $x < 0$ \n * -  $\text{atan2}(-0.0, x)$  is  $-0.0$  for  $x > 0$  and  $-\pi$  for  $x < 0$ \n * -  $\text{atan2}(y,
+\text{Inf})$  is  $0.0$  for  $0 < y < +\text{Inf}$  and  $-0.0$  for  $-\text{Inf} < y < 0$ \n * -  $\text{atan2}(y, -\text{Inf})$  is  $\pi$  for  $0 < y < +\text{Inf}$  and  $-\pi$ 
for  $-\text{Inf} < y < 0$ \n * -  $\text{atan2}(y, 0.0)$  is  $\pi/2$  for  $y > 0$  and  $-\pi/2$  for  $y < 0$ \n * -  $\text{atan2}(+\text{Inf}, x)$  is  $\pi/2$  for
finite  $x$ \n * -  $\text{atan2}(-\text{Inf}, x)$  is  $-\pi/2$  for finite  $x$ \n * -  $\text{atan2}(\text{NaN}, x)$  and  $\text{atan2}(y, \text{NaN})$  is  $\text{NaN}$ \n
*\n@SinceKotlin("1.2")\n@InlineOnly\npublic actual inline fun atan2(y: Double, x: Double): Double =
nativeMath.atan2(y, x)\n\n/**\n * Computes the hyperbolic sine of the value [x].\n * Special cases:\n * -
 $\sinh(\text{NaN})$  is  $\text{NaN}$ \n * -  $\sinh(+\text{Inf})$  is  $+\text{Inf}$ \n * -  $\sinh(-\text{Inf})$  is  $-\text{Inf}$ \n
*\n@SinceKotlin("1.2")\n@InlineOnly\npublic actual inline fun sinh(x: Double): Double =
nativeMath.sinh(x)\n\n/**\n * Computes the hyperbolic cosine of the value [x].\n * Special cases:\n * -
 $\cosh(\text{NaN})$  is  $\text{NaN}$ \n * -  $\cosh(+\text{Inf}-\text{Inf})$  is  $+\text{Inf}$ \n
*\n@SinceKotlin("1.2")\n@InlineOnly\npublic actual
inline fun cosh(x: Double): Double = nativeMath.cosh(x)\n\n/**\n * Computes the hyperbolic tangent of the value
[x].\n * Special cases:\n * -  $\tanh(\text{NaN})$  is  $\text{NaN}$ \n * -  $\tanh(+\text{Inf})$  is  $1.0$ \n * -  $\tanh(-\text{Inf})$  is  $-1.0$ \n
*\n@SinceKotlin("1.2")\n@InlineOnly\npublic actual inline fun tanh(x: Double): Double =
nativeMath.tanh(x)\n\n/**\n * Computes the inverse hyperbolic sine of the value [x].\n * The returned value is
 $y$  such that  $\sinh(y) == x$ .\n * Special cases:\n * -  $\text{asinh}(\text{NaN})$  is  $\text{NaN}$ \n * -  $\text{asinh}(+\text{Inf})$  is  $+\text{Inf}$ \n * -
 $\text{asinh}(-\text{Inf})$  is  $-\text{Inf}$ \n
*\n@SinceKotlin("1.2")\n@InlineOnly\npublic actual inline fun asinh(x: Double): Double =
nativeMath.asinh(x)\n\n/**\n * Computes the inverse hyperbolic cosine of the value [x].\n * The returned
value is positive  $y$  such that  $\cosh(y) == x$ .\n * Special cases:\n * -  $\text{acosh}(\text{NaN})$  is  $\text{NaN}$ \n * -  $\text{acosh}(x)$ 
is  $\text{NaN}$  when  $x < 1$ \n * -  $\text{acosh}(+\text{Inf})$  is  $+\text{Inf}$ \n
*\n@SinceKotlin("1.2")\n@InlineOnly\npublic actual inline
fun acosh(x: Double): Double = nativeMath.acosh(x)\n\n/**\n * Computes the inverse hyperbolic tangent of the
value [x].\n * The returned value is  $y$  such that  $\tanh(y) == x$ .\n * Special cases:\n * -  $\text{tanh}(\text{NaN})$  is
 $\text{NaN}$ \n * -  $\text{tanh}(x)$  is  $\text{NaN}$  when  $x > 1$  or  $x < -1$ \n * -  $\text{tanh}(1.0)$  is  $+\text{Inf}$ \n * -  $\text{tanh}(-1.0)$  is  $-\text{Inf}$ \n
*\n@SinceKotlin("1.2")\n@InlineOnly\npublic actual inline fun atanh(x: Double): Double =
nativeMath.atanh(x)\n\n/**\n * Computes  $\sqrt{x^2 + y^2}$  without intermediate overflow or underflow.\n * Special cases:\n * - returns  $+\text{Inf}$  if any of arguments is infinite\n * - returns  $\text{NaN}$  if any of arguments is  $\text{NaN}$ 
and the other is not infinite\n
*\n@SinceKotlin("1.2")\n@InlineOnly\npublic actual inline fun hypot(x: Double, y:
Double): Double = nativeMath.hypot(x, y)\n\n/**\n * Computes the positive square root of the value [x].\n * Special cases:\n * -  $\sqrt{x}$  is  $\text{NaN}$  when  $x < 0$  or  $x$  is  $\text{NaN}$ \n
*\n@SinceKotlin("1.2")\n@InlineOnly\npublic actual inline fun sqrt(x: Double): Double =
nativeMath.sqrt(x)\n\n/**\n * Computes Euler's number  $e$  raised to the power of the value [x].\n * Special
cases:\n * -  $\exp(\text{NaN})$  is  $\text{NaN}$ \n * -  $\exp(+\text{Inf})$  is  $+\text{Inf}$ \n * -  $\exp(-\text{Inf})$  is  $0.0$ \n
*\n@SinceKotlin("1.2")\n@InlineOnly\npublic actual inline fun exp(x: Double): Double =
nativeMath.exp(x)\n\n/**\n * Computes  $\exp(x) - 1$ .\n * This function can be implemented to produce more
precise result for [x] near zero.\n * Special cases:\n * -  $\text{expm1}(\text{NaN})$  is  $\text{NaN}$ \n * -  $\text{expm1}(+\text{Inf})$  is  $+\text{Inf}$ \n
* -  $\text{expm1}(-\text{Inf})$  is  $-1.0$ \n * @see [exp] function.\n
*\n@SinceKotlin("1.2")\n@InlineOnly\npublic actual
inline fun expm1(x: Double): Double = nativeMath.expm1(x)\n\n/**\n * Computes the logarithm of the value [x] to
the given [base].\n * Special cases:\n * -  $\log(x, b)$  is  $\text{NaN}$  if either  $x$  or  $b$  are  $\text{NaN}$ \n * -  $\log(x, b)$  is
 $\text{NaN}$  when  $x < 0$  or  $b \leq 0$  or  $b == 1.0$ \n * -  $\log(+\text{Inf}, +\text{Inf})$  is  $\text{NaN}$ \n * -  $\log(+\text{Inf}, b)$  is  $+\text{Inf}$  for  $b >
1$  and  $-\text{Inf}$  for  $b < 1$ \n * -  $\log(0.0, b)$  is  $-\text{Inf}$  for  $b > 1$  and  $+\text{Inf}$  for  $b > 1$ \n * See also logarithm
functions for common fixed bases: [ln], [log10] and [log2].\n
*\n@SinceKotlin("1.2")\npublic actual fun log(x:
Double, base: Double): Double {\n    if (base <= 0.0 || base == 1.0) return Double.NaN\n    return nativeMath.log(x)

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`/ nativeMath.log(base)` Computes the natural logarithm (base `E`) of the value `[x]`.
 Special cases: `-ln(NaN)` is `NaN`, `-ln(x)` is `NaN` when `x < 0.0`, `-ln(+Inf)` is `+Inf`, `-ln(0.0)` is `-Inf`.
`@SinceKotlin("1.2") @InlineOnly public actual inline fun ln(x: Double): Double = nativeMath.log(x)`
 Computes the common logarithm (base 10) of the value `[x]`.
 @see [ln] function for special cases.
`@SinceKotlin("1.2") @InlineOnly public actual inline fun log10(x: Double): Double = nativeMath.log10(x)`
 Computes the binary logarithm (base 2) of the value `[x]`.
 @see [ln] function for special cases.
`@SinceKotlin("1.2") @InlineOnly public actual inline fun log2(x: Double): Double = nativeMath.log2(x)`
 Computes `ln(x + 1)`.
 This function can be implemented to produce more precise result for `[x]` near zero.
 Special cases: `-ln1p(NaN)` is `NaN`, `-ln1p(x)` is `NaN` where `x < -1.0`, `-ln1p(-1.0)` is `-Inf`, `-ln1p(+Inf)` is `+Inf`.
 @see [ln] function
`@SinceKotlin("1.2") @InlineOnly public actual inline fun ln1p(x: Double): Double = nativeMath.log1p(x)`
 Rounds the given value `[x]` to an integer towards positive infinity.
 @return the smallest double value that is greater than or equal to the given value `[x]` and is a mathematical integer.
 Special cases: `-ceil(x)` is `x` where `x` is `NaN` or `+Inf` or `-Inf` or already a mathematical integer.
`@SinceKotlin("1.2") @InlineOnly public actual inline fun ceil(x: Double): Double = nativeMath.ceil(x)`
 Rounds the given value `[x]` to an integer towards negative infinity.
 @return the largest double value that is smaller than or equal to the given value `[x]` and is a mathematical integer.
 Special cases: `-floor(x)` is `x` where `x` is `NaN` or `+Inf` or `-Inf` or already a mathematical integer.
`@SinceKotlin("1.2") @InlineOnly public actual inline fun floor(x: Double): Double = nativeMath.floor(x)`
 Rounds the given value `[x]` to an integer towards zero.
 @return the value `[x]` having its fractional part truncated.
 Special cases: `-truncate(x)` is `x` where `x` is `NaN` or `+Inf` or `-Inf` or already a mathematical integer.
`@SinceKotlin("1.2") @InlineOnly public actual inline fun truncate(x: Double): Double = nativeMath.trunc(x)`
 Rounds the given value `[x]` towards the closest integer with ties rounded towards even integer.
 Special cases: `-round(x)` is `x` where `x` is `NaN` or `+Inf` or `-Inf` or already a mathematical integer.
`@SinceKotlin("1.2") public actual fun round(x: Double): Double { if (x % 0.5 != 0.0) { return nativeMath.round(x) } val floor = floor(x) return if (floor % 2 == 0.0) floor else ceil(x) }`
 Returns the absolute value of the given value `[x]`.
 Special cases: `-abs(NaN)` is `NaN`.
 @see absoluteValue extension property for [Double]
`@SinceKotlin("1.2") @InlineOnly public actual inline fun abs(x: Double): Double = nativeMath.abs(x)`
 Returns the sign of the given value `[x]`: `-1.0` if the value is negative, `0.0` if the value is zero, `1.0` if the value is positive.
 Special case: `-sign(NaN)` is `NaN`.
`@SinceKotlin("1.2") @InlineOnly public actual inline fun sign(x: Double): Double = nativeMath.sign(x)`
 Returns the smaller of two values.
 If either value is `NaN`, then the result is `NaN`.
`@SinceKotlin("1.2") @InlineOnly public actual inline fun min(a: Double, b: Double): Double = nativeMath.min(a, b)`
 Returns the greater of two values.
 If either value is `NaN`, then the result is `NaN`.
`@SinceKotlin("1.2") @InlineOnly public actual inline fun max(a: Double, b: Double): Double = nativeMath.max(a, b)`
 extensions
 Raises this value to the power `[x]`.
 Special cases: `-b.pow(0.0)` is `1.0`, `-b.pow(1.0)` is `b`, `-b.pow(NaN)` is `NaN`, `-NaN.pow(x)` is `NaN` for `x != 0.0`, `-b.pow(Inf)` is `NaN` for `abs(b) == 1.0`, `-b.pow(x)` is `NaN` for `b < 0` and `x` is finite and not an integer.
`@SinceKotlin("1.2") @InlineOnly public actual inline fun Double.pow(x: Double): Double = nativeMath.pow(this, x)`
 Raises this value to the integer power `[n]`.
 See the other overload of [pow] for details.
`@SinceKotlin("1.2") @InlineOnly public actual inline fun Double.pow(n: Int): Double = nativeMath.pow(this, n.toDouble())`
 Returns the absolute value of this value.
 Special cases: `-NaN.absoluteValue` is `NaN`.
 @see abs function
`@SinceKotlin("1.2") @InlineOnly public actual inline val Double.absoluteValue: Double get() = nativeMath.abs(this)`
 Returns the sign of this value: `-1.0` if the value is negative, `0.0` if the value is zero, `1.0` if the value is positive.
 Special case: `-NaN.sign` is `NaN`.
`@SinceKotlin("1.2") @InlineOnly public actual inline val Double.sign: Double get() = nativeMath.sign(this)`
 Returns this value with the sign bit same as of the

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[sign] value.\n *^@SinceKotlin("1.2")\n@InlineOnly\npublic actual inline fun Double.withSign(sign: Int):
Double = this.withSign(sign.toDouble())\n\n/**\n * Returns the ulp (unit in the last place) of this value.\n *\n * An
ulp is a positive distance between this value and the next nearest [Double] value larger in magnitude.\n *\n * Special
Cases:\n * - `NaN.ulp` is `NaN`\n * - `x.ulp` is `+Inf` when `x` is `+Inf` or `-Inf`\n * - `0.0.ulp` is
`Double.MIN_VALUE`\n *^@SinceKotlin("1.2")\npublic actual val Double.ulp: Double get() = when {\n this
< 0 -> (-this).ulp\n this.isNaN() || this == Double.POSITIVE_INFINITY -> this\n this ==
Double.MAX_VALUE -> this - this.nextDown()\n else -> this.nextUp() - this}\n\n/**\n * Returns the [Double]
value nearest to this value in direction of positive infinity.\n *^@SinceKotlin("1.2")\npublic actual fun
Double.nextUp(): Double = when {\n this.isNaN() || this == Double.POSITIVE_INFINITY -> this\n this == 0.0
-> Double.MIN_VALUE\n else -> Double.fromBits(this.toRawBits() + if (this > 0) 1 else -1)\n}\n\n/**\n *
Returns the [Double] value nearest to this value in direction of negative infinity.\n
*^@SinceKotlin("1.2")\npublic actual fun Double.nextDown(): Double = when {\n this.isNaN() || this ==
Double.NEGATIVE_INFINITY -> this\n this == 0.0 -> -Double.MIN_VALUE\n else ->
Double.fromBits(this.toRawBits() + if (this > 0) -1 else 1)\n}\n\n/**\n * Returns the [Double] value nearest to this
value in direction from this value towards the value [to].\n *\n * Special cases:\n * - `x.nextTowards(y)` is `NaN` if
either `x` or `y` are `NaN`\n * - `x.nextTowards(x) == x`\n *^@SinceKotlin("1.2")\npublic actual fun
Double.nextTowards(to: Double): Double = when {\n this.isNaN() || to.isNaN() -> Double.NaN\n to == this ->
to\n to > this -> this.nextUp()\n else /* to < this */ -> this.nextDown()\n}\n\n/**\n * Rounds this [Double]
value to the nearest integer and converts the result to [Int].\n *\n * Ties are rounded towards positive infinity.\n *\n *
Special cases:\n * - `x.roundToInt() == Int.MAX_VALUE` when `x > Int.MAX_VALUE`\n * - `x.roundToInt()
== Int.MIN_VALUE` when `x < Int.MIN_VALUE`\n *\n * @throws IllegalArgumentException when this value is
`NaN`\n *^@SinceKotlin("1.2")\npublic actual fun Double.roundToInt(): Int = when {\n isNaN() -> throw
IllegalArgumentException("Cannot round NaN value.")\n this > Int.MAX_VALUE -> Int.MAX_VALUE\n this < Int.MIN_VALUE -> Int.MIN_VALUE\n else -> nativeMath.round(this).toInt()\n}\n\n/**\n * Rounds this
[Double] value to the nearest integer and converts the result to [Long].\n *\n * Ties are rounded towards positive
infinity.\n *\n * Special cases:\n * - `x.roundToLong() == Long.MAX_VALUE` when `x >
Long.MAX_VALUE`\n * - `x.roundToLong() == Long.MIN_VALUE` when `x < Long.MIN_VALUE`\n *\n * @throws
IllegalArgumentException when this value is `NaN`\n *^@SinceKotlin("1.2")\npublic actual fun
Double.roundToLong(): Long = when {\n isNaN() -> throw IllegalArgumentException("Cannot round NaN
value.")\n this > Long.MAX_VALUE -> Long.MAX_VALUE\n this < Long.MIN_VALUE ->
Long.MIN_VALUE\n else -> nativeMath.round(this).toLong()\n}\n\n// endregion\n\n// region
===== Float Math =====\n\n/**\n * Computes the
sine of the angle [x] given in radians.\n *\n * Special cases:\n * - `sin(NaN|+Inf|-Inf)` is `NaN`\n
*^@SinceKotlin("1.2")\n@InlineOnly\npublic actual inline fun sin(x: Float): Float =
nativeMath.sin(x.toDouble()).toFloat()\n\n/**\n * Computes the cosine of the angle [x] given in radians.\n *\n *
Special cases:\n * - `cos(NaN|+Inf|-Inf)` is `NaN`\n *^@SinceKotlin("1.2")\n@InlineOnly\npublic actual inline fun
cos(x: Float): Float = nativeMath.cos(x.toDouble()).toFloat()\n\n/**\n * Computes the tangent of the angle [x] given in
radians.\n *\n * Special cases:\n * - `tan(NaN|+Inf|-Inf)` is `NaN`\n
*^@SinceKotlin("1.2")\n@InlineOnly\npublic actual inline fun tan(x: Float): Float =
nativeMath.tan(x.toDouble()).toFloat()\n\n/**\n * Computes the arc sine of the value [x];\n *\n * the returned value is
an angle in the range from `-PI/2` to `PI/2` radians.\n *\n * Special cases:\n * - `asin(x)` is `NaN`, when `abs(x) >
1` or x is `NaN`\n *^@SinceKotlin("1.2")\n@InlineOnly\npublic actual inline fun asin(x: Float): Float =
nativeMath.asin(x.toDouble()).toFloat()\n\n/**\n * Computes the arc cosine of the value [x];\n *\n * the returned value
is an angle in the range from `0.0` to `PI` radians.\n *\n * Special cases:\n * - `acos(x)` is `NaN`, when `abs(x) >
1` or x is `NaN`\n *^@SinceKotlin("1.2")\n@InlineOnly\npublic actual inline fun acos(x: Float): Float =
nativeMath.acos(x.toDouble()).toFloat()\n\n/**\n * Computes the arc tangent of the value [x];\n *\n * the returned value
is an angle in the range from `-PI/2` to `PI/2` radians.\n *\n * Special cases:\n * - `atan(NaN)` is `NaN`\n
*^@SinceKotlin("1.2")\n@InlineOnly\npublic actual inline fun atan(x: Float): Float =

```

`nativeMath.atan(x.toDouble()).toFloat()` Returns the angle θ of the polar coordinates (r, θ) that correspond to the rectangular coordinates (x, y) by computing the arc tangent of the value y / x ; the returned value is an angle in the range from $-\pi$ to π radians. Special cases: $\text{atan2}(0.0, 0.0)$ is 0.0 ; $\text{atan2}(0.0, x)$ is 0.0 for $x > 0$ and π for $x < 0$; $\text{atan2}(-0.0, x)$ is -0.0 for $x > 0$ and $-\pi$ for $x < 0$; $\text{atan2}(y, +\text{Inf})$ is 0.0 for $0 < y < +\text{Inf}$ and -0.0 for $-\text{Inf} < y < 0$; $\text{atan2}(y, -\text{Inf})$ is π for $0 < y < +\text{Inf}$ and $-\pi$ for $-\text{Inf} < y < 0$; $\text{atan2}(y, 0.0)$ is $\pi/2$ for $y > 0$ and $-\pi/2$ for $y < 0$; $\text{atan2}(+\text{Inf}, x)$ is $\pi/2$ for finite x ; $\text{atan2}(-\text{Inf}, x)$ is $-\pi/2$ for finite x ; $\text{atan2}(\text{NaN}, x)$ and $\text{atan2}(y, \text{NaN})$ is NaN .

```

@SinceKotlin("1.2")
@InlineOnly
public actual inline fun atan2(y: Float, x: Float): Float = nativeMath.atan2(y.toDouble(), x.toDouble()).toFloat()
    
```

`nativeMath.atanh(x.toDouble()).toFloat()` Computes the inverse hyperbolic tangent of the value x . Special cases: $\text{atanh}(\text{NaN})$ is NaN ; $\text{atanh}(+1)$ is $+\text{Inf}$; $\text{atanh}(-1)$ is $-\text{Inf}$.

```

@SinceKotlin("1.2")
@InlineOnly
public actual inline fun atanh(x: Float): Float = nativeMath.atanh(x.toDouble()).toFloat()
    
```

`nativeMath.asinh(x.toDouble()).toFloat()` Computes the inverse hyperbolic sine of the value x . Special cases: $\text{asinh}(\text{NaN})$ is NaN ; $\text{asinh}(+\text{Inf})$ is $+\text{Inf}$; $\text{asinh}(-\text{Inf})$ is $-\text{Inf}$.

```

@SinceKotlin("1.2")
@InlineOnly
public actual inline fun asinh(x: Float): Float = nativeMath.asinh(x.toDouble()).toFloat()
    
```

`nativeMath.acosh(x.toDouble()).toFloat()` Computes the inverse hyperbolic cosine of the value x . The returned value is positive y such that $\cosh(y) = x$. Special cases: $\text{acosh}(\text{NaN})$ is NaN ; $\text{acosh}(x)$ is NaN when $x < 1$; $\text{acosh}(+\text{Inf})$ is $+\text{Inf}$.

```

@SinceKotlin("1.2")
@InlineOnly
public actual inline fun acosh(x: Float): Float = nativeMath.acosh(x.toDouble()).toFloat()
    
```

`nativeMath.exp(x.toDouble()).toFloat()` Computes Euler's number e raised to the power of the value x . Special cases: $\text{exp}(\text{NaN})$ is NaN ; $\text{exp}(+\text{Inf})$ is $+\text{Inf}$; $\text{exp}(-\text{Inf})$ is 0.0 .

```

@SinceKotlin("1.2")
@InlineOnly
public actual inline fun exp(x: Float): Float = nativeMath.exp(x.toDouble()).toFloat()
    
```

`nativeMath.exp1(x.toDouble()).toFloat()` Computes $\exp(x) - 1$. This function can be implemented to produce more precise result for x near zero. Special cases: $\text{expm1}(\text{NaN})$ is NaN ; $\text{expm1}(+\text{Inf})$ is $+\text{Inf}$; $\text{expm1}(-\text{Inf})$ is -1.0 .

```

@SinceKotlin("1.2")
@InlineOnly
public actual inline fun expm1(x: Float): Float = nativeMath.expm1(x.toDouble()).toFloat()
    
```

`nativeMath.log(x, base.toDouble()).toFloat()` Computes the logarithm of the value x to the given $base$. Special cases: $\log(x, b)$ is NaN if either x or b are NaN ; $\log(x, b)$ is NaN when $x < 0$ or $b \leq 0$ or $b = 1.0$; $\log(+\text{Inf}, +\text{Inf})$ is NaN ; $\log(+\text{Inf}, b)$ is $+\text{Inf}$ for $b > 1$ and $-\text{Inf}$ for $b < 1$; $\log(0.0, b)$ is $-\text{Inf}$ for $b > 1$ and $+\text{Inf}$ for $b < 1$. See also logarithm functions for common fixed bases: $[\ln]$, $[\log_{10}]$ and $[\log_2]$.

```

@SinceKotlin("1.2")
@InlineOnly
public actual inline fun log(x: Float, base: Float): Float = log(x.toDouble(), base.toDouble()).toFloat()
    
```

`nativeMath.ln(x.toDouble()).toFloat()` Computes the natural logarithm (base E) of the value x . Special cases: $\ln(\text{NaN})$ is NaN ; $\ln(x)$ is NaN when $x < 0$.

`* -`ln(+Inf)` is `+Inf``
`* -`ln(0.0)` is `-Inf``
`*`@SinceKotlin("1.2")`
@InlineOnly`
public actual inline fun ln(x: Float): Float = nativeMath.log(x.toDouble()).toFloat()
* Computes the common logarithm (base 10) of the value [x].
*`@see [ln] function for special cases.
*`@SinceKotlin("1.2")`
@InlineOnly`
public actual inline fun log10(x: Float): Float = nativeMath.log10(x.toDouble()).toFloat()
* Computes the binary logarithm (base 2) of the value [x].
*`@see [ln] function for special cases.
*`@SinceKotlin("1.2")`
@InlineOnly`
public actual inline fun log2(x: Float): Float = nativeMath.log2(x.toDouble()).toFloat()
* Computes `ln(a + 1)`.
* This function can be implemented to produce more precise result for [x] near zero.
* Special cases:
* -`ln1p(NaN)` is `NaN`
* -`ln1p(x)` is `NaN` where `x < -1.0`
* -`ln1p(-1.0)` is `-Inf`
* -`ln1p(+Inf)` is `+Inf`
*`@see [ln] function`
*`@see [expm1] function`
*`@SinceKotlin("1.2")`
@InlineOnly`
public actual inline fun ln1p(x: Float): Float = nativeMath.log1p(x.toDouble()).toFloat()
* Rounds the given value [x] to an integer towards positive infinity.
*`@return the smallest Float value that is greater than or equal to the given value [x] and is a mathematical integer.
* Special cases:
* -`ceil(x)` is `x` where `x` is `NaN` or `+Inf` or `-Inf` or already a mathematical integer.
*`@SinceKotlin("1.2")`
@InlineOnly`
public actual inline fun ceil(x: Float): Float = nativeMath.ceil(x.toDouble()).toFloat()
* Rounds the given value [x] to an integer towards negative infinity.
*`@return the largest Float value that is smaller than or equal to the given value [x] and is a mathematical integer.
* Special cases:
* -`floor(x)` is `x` where `x` is `NaN` or `+Inf` or `-Inf` or already a mathematical integer.
*`@SinceKotlin("1.2")`
@InlineOnly`
public actual inline fun floor(x: Float): Float = nativeMath.floor(x.toDouble()).toFloat()
* Rounds the given value [x] to an integer towards zero.
*`@return the value [x] having its fractional part truncated.
* Special cases:
* -`truncate(x)` is `x` where `x` is `NaN` or `+Inf` or `-Inf` or already a mathematical integer.
*`@SinceKotlin("1.2")`
@InlineOnly`
public actual inline fun truncate(x: Float): Float = truncate(x.toDouble()).toFloat()
* Rounds the given value [x] towards the closest integer with ties rounded towards even integer.
* Special cases:
* -`round(x)` is `x` where `x` is `NaN` or `+Inf` or `-Inf` or already a mathematical integer.
*`@SinceKotlin("1.2")`
@InlineOnly`
public actual inline fun round(x: Float): Float = round(x.toDouble()).toFloat()
* Returns the absolute value of the given value [x].
* Special cases:
* -`abs(NaN)` is `NaN`
*`@see absoluteValue extension property for [Float]
*`@SinceKotlin("1.2")`
@InlineOnly`
public actual inline fun abs(x: Float): Float = nativeMath.abs(x.toDouble()).toFloat()
* Returns the sign of the given value [x]:
* -`-1.0` if the value is negative,
* - zero if the value is zero,
* -`1.0` if the value is positive
* Special case:
* -`sign(NaN)` is `NaN`
*`@SinceKotlin("1.2")`
@InlineOnly`
public actual inline fun sign(x: Float): Float = nativeMath.sign(x.toDouble()).toFloat()
* Returns the smaller of two values.
* If either value is `NaN`, then the result is `NaN`.
*`@SinceKotlin("1.2")`
@InlineOnly`
public actual inline fun min(a: Float, b: Float): Float = nativeMath.min(a, b)
* Returns the greater of two values.
* If either value is `NaN`, then the result is `NaN`.
*`@SinceKotlin("1.2")`
@InlineOnly`
public actual inline fun max(a: Float, b: Float): Float = nativeMath.max(a, b)
// extensions
* Raises this value to the power [x].
* Special cases:
* -`b.pow(0.0)` is `1.0`
* -`b.pow(1.0) == b`
* -`b.pow(NaN)` is `NaN`
* -`NaN.pow(x)` is `NaN` for `x != 0.0`
* -`b.pow(Inf)` is `NaN` for `abs(b) == 1.0`
* -`b.pow(x)` is `NaN` for `b < 0` and `x` is finite and not an integer
*`@SinceKotlin("1.2")`
@InlineOnly`
public actual inline fun Float.pow(x: Float): Float = nativeMath.pow(this.toDouble(), x.toDouble()).toFloat()
* Raises this value to the integer power [n].
* See the other overload of [pow] for details.
*`@SinceKotlin("1.2")`
@InlineOnly`
public actual inline fun Float.pow(n: Int): Float = nativeMath.pow(this.toDouble(), n.toDouble()).toFloat()
* Returns the absolute value of this value.
* Special cases:
* -`NaN.absoluteValue` is `NaN`
*`@see abs function`
*`@SinceKotlin("1.2")`
@InlineOnly`
public actual inline val Float.absoluteValue: Float get() = nativeMath.abs(this.toDouble()).toFloat()
* Returns the sign of this value:
* -`-1.0` if the value is negative,
* - zero if the value is zero,
* -`1.0` if the value is positive
* Special case:
* -`NaN.sign` is `NaN`
*`@SinceKotlin("1.2")`
@InlineOnly`
public actual inline val Float.sign: Float get() = nativeMath.sign(this.toDouble()).toFloat()
* Returns this value with the sign bit same as of the [sign]`


```

Float.NEGATIVE_INFINITY\n\n/**\n * Returns `true` if the argument is a finite floating-point value; returns
`false` otherwise (for `NaN` and infinity arguments).\n */\npublic actual fun Double.isFinite(): Boolean =
!isInfinite() && !isNaN()\n\n/**\n * Returns `true` if the argument is a finite floating-point value; returns `false`
otherwise (for `NaN` and infinity arguments).\n */\npublic actual fun Float.isFinite(): Boolean = !isInfinite() &&
!isNaN()\n\n\n/**\n * Counts the number of set bits in the binary representation of this [Int] number.\n */\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\npublic actual fun
Int.countOneBits(): Int {\n // Hacker's Delight 5-1 algorithm\n var v = this\n v = (v and 0x55555555) +
(v.ushr(1) and 0x55555555)\n v = (v and 0x33333333) + (v.ushr(2) and 0x33333333)\n v = (v and 0x0F0F0F0F)
+ (v.ushr(4) and 0x0F0F0F0F)\n v = (v and 0x00FF00FF) + (v.ushr(8) and 0x00FF00FF)\n v = (v and
0x0000FFFF) + (v.ushr(16))\n return v\n}\n\n/**\n * Counts the number of consecutive most significant bits that
are zero in the binary representation of this [Int] number.\n */\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\n@kotlin.internal.InlineOnly\npublic
actual inline fun Int.countLeadingZeroBits(): Int = JsMath.clz32(this)\n\n/**\n * Counts the number of
consecutive least significant bits that are zero in the binary representation of this [Int] number.\n */\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\npublic actual fun
Int.countTrailingZeroBits(): Int =\n // Hacker's Delight 5-4 algorithm for expressing countTrailingZeroBits with
countLeadingZeroBits\n Int.SIZE_BITS - (this or -this).inv().countLeadingZeroBits()\n\n/**\n * Returns a
number having a single bit set in the position of the most significant set bit of this [Int] number,\n * or zero, if this
number is zero.\n */\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\npublic actual fun
Int.takeHighestOneBit(): Int =\n if (this == 0) 0 else 1.shl(Int.SIZE_BITS - 1 - countLeadingZeroBits())\n\n/**\n * Returns a number having a single bit set in the position of the least significant set bit of this [Int] number,\n * or
zero, if this number is zero.\n */\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\npublic actual fun
Int.takeLowestOneBit(): Int =\n // Hacker's Delight 2-1 algorithm for isolating rightmost 1-bit\n this and -
this\n\n/**\n * Rotates the binary representation of this [Int] number left by the specified [bitCount] number of
bits.\n * The most significant bits pushed out from the left side reenter the number as the least significant bits on the
right side.\n * Rotating the number left by a negative bit count is the same as rotating it right by the negated bit
count:\n * `number.rotateLeft(-n) == number.rotateRight(n)`\n * Rotating by a multiple of [Int.SIZE_BITS] (32)
returns the same number, or more generally\n * `number.rotateLeft(n) == number.rotateLeft(n % 32)`\n */\n@SinceKotlin("1.6")\n@WasExperimental(ExperimentalStdlibApi::class)\npublic actual fun
Int.rotateLeft(bitCount: Int): Int =\n shl(bitCount) or ushr(Int.SIZE_BITS - bitCount)\n\n/**\n * Rotates the
binary representation of this [Int] number right by the specified [bitCount] number of bits.\n * The least significant
bits pushed out from the right side reenter the number as the most significant bits on the left side.\n * Rotating
the number right by a negative bit count is the same as rotating it left by the negated bit count:\n *
`number.rotateRight(-n) == number.rotateLeft(n)`\n * Rotating by a multiple of [Int.SIZE_BITS] (32) returns
the same number, or more generally\n * `number.rotateRight(n) == number.rotateRight(n % 32)`\n */\n@SinceKotlin("1.6")\n@WasExperimental(ExperimentalStdlibApi::class)\npublic actual fun
Int.rotateRight(bitCount: Int): Int =\n shl(Int.SIZE_BITS - bitCount) or ushr(bitCount)\n\n/**\n * Counts the
number of set bits in the binary representation of this [Long] number.\n */\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\npublic actual fun
Long.countOneBits(): Int =\n high.countOneBits() + low.countOneBits()\n\n/**\n * Counts the number of
consecutive most significant bits that are zero in the binary representation of this [Long] number.\n */\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\npublic actual fun
Long.countLeadingZeroBits(): Int =\n when (val high = this.high) {\n 0 -> Int.SIZE_BITS +
low.countLeadingZeroBits()\n else -> high.countLeadingZeroBits()\n }\n\n/**\n * Counts the number of
consecutive least significant bits that are zero in the binary representation of this [Long] number.\n */\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\npublic actual fun
Long.countTrailingZeroBits(): Int =\n when (val low = this.low) {\n 0 -> Int.SIZE_BITS +

```

```

high.countTrailingZeroBits()\n    else -> low.countTrailingZeroBits()\n } \n\n/**\n * Returns a number having a
single bit set in the position of the most significant set bit of this [Long] number,\n * or zero, if this number is
zero.\n */\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\npublic actual fun
Long.takeHighestOneBit(): Long =\n    when (val high = this.high) {\n        0 -> Long(low.takeHighestOneBit(),
0)\n        else -> Long(0, high.takeHighestOneBit())\n    } \n\n/**\n * Returns a number having a single bit set in the
position of the least significant set bit of this [Long] number,\n * or zero, if this number is zero.\n */\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\npublic actual fun
Long.takeLowestOneBit(): Long =\n    when (val low = this.low) {\n        0 -> Long(0, high.takeLowestOneBit())\n        else -> Long(low.takeLowestOneBit(), 0)\n    } \n\n/**\n * Rotates the binary representation of this [Long]
number left by the specified [bitCount] number of bits.\n * The most significant bits pushed out from the left side
reenter the number as the least significant bits on the right side.\n * Rotating the number left by a negative bit
count is the same as rotating it right by the negated bit count:\n * `number.rotateLeft(-n) ==
number.rotateRight(n)`\n * Rotating by a multiple of [Long.SIZE_BITS] (64) returns the same number, or more
generally\n * `number.rotateLeft(n) == number.rotateLeft(n % 64)`\n */\n@SinceKotlin("1.6")\n@WasExperimental(ExperimentalStdlibApi::class)\npublic actual fun
Long.rotateLeft(bitCount: Int): Long {\n    if ((bitCount and 31) != 0) {\n        val low = this.low\n        val high =
this.high\n        val newLow = low.shl(bitCount) or high.ushr(-bitCount)\n        val newHigh = high.shl(bitCount) or
low.ushr(-bitCount)\n        return if ((bitCount and 32) == 0) Long(newLow, newHigh) else Long(newHigh,
newLow)\n    } else {\n        return if ((bitCount and 32) == 0) this else Long(high, low)\n    } \n\n\n\n/**\n * Rotates the binary representation of this [Long] number right by the specified [bitCount] number of bits.\n * The
least significant bits pushed out from the right side reenter the number as the most significant bits on the left side.\n
*\n * Rotating the number right by a negative bit count is the same as rotating it left by the negated bit count:\n *
`number.rotateRight(-n) == number.rotateLeft(n)`\n * Rotating by a multiple of [Long.SIZE_BITS] (64) returns
the same number, or more generally\n * `number.rotateRight(n) == number.rotateRight(n % 64)`\n */\n@SinceKotlin("1.6")\n@WasExperimental(ExperimentalStdlibApi::class)\n@kotlin.internal.InlineOnly\npublic
inline fun Long.rotateRight(bitCount: Int): Long = rotateLeft(-bitCount)\n", "/*\n * Copyright 2010-2018
JetBrains s.r.o. and Kotlin Programming Language contributors.\n * Use of this source code is governed by the
Apache 2.0 license that can be found in the license/LICENSE.txt file.\n */\n\npackage kotlin.js\n\nimport
kotlin.internal.LowPriorityInOverloadResolution\n\n/**\n * Exposes the JavaScript [Promise
object](https://developer.mozilla.org/en/docs/Web/JavaScript/Reference/Global_Objects/Promise) to Kotlin.\n */\n@Suppress("NOT_DOCUMENTED")\npublic open external class Promise<out T>(executor: (resolve: (T) ->
Unit, reject: (Throwable) -> Unit) -> Unit) {\n    @LowPriorityInOverloadResolution\n    public open fun <S>
then(onFulfilled: ((T) -> S)?): Promise<S>\n\n    @LowPriorityInOverloadResolution\n    public open fun <S>
then(onFulfilled: ((T) -> S)?, onRejected: ((Throwable) -> S)?): Promise<S>\n\n    public open fun <S>
catch(onRejected: (Throwable) -> S): Promise<S>\n\n    public open fun finally(onFinally: () -> Unit):
Promise<T>\n\n    companion object {\n        public fun <S> all(promise: Array<out Promise<S>>):
Promise<Array<out S>>\n\n        public fun <S> race(promise: Array<out Promise<S>>): Promise<S>\n\n        public fun reject(e: Throwable): Promise<Nothing>\n\n        public fun <S> resolve(e: S): Promise<S>\n        public
fun <S> resolve(e: Promise<S>): Promise<S>\n    } \n\n\n\n// It's workaround for KT-19672 since we can fix it
properly until KT-11265 isn't fixed.\n\ninline fun <T, S> Promise<Promise<T>>.then(\n    noinline onFulfilled: ((T) -
> S)?\n): Promise<S> {\n    return this.unsafeCast<Promise<T>>().then(onFulfilled)\n} \n\n\ninline fun <T, S>
Promise<Promise<T>>.then(\n    noinline onFulfilled: ((T) -> S)?,\n    noinline onRejected: ((Throwable) -> S)?\n):
Promise<S> {\n    return this.unsafeCast<Promise<T>>().then(onFulfilled, onRejected)\n} \n", "/*\n * Copyright
2010-2018 JetBrains s.r.o. and Kotlin Programming Language contributors.\n * Use of this source code is governed
by the Apache 2.0 license that can be found in the license/LICENSE.txt file.\n */\n\npackage
kotlin.random\n\nimport kotlin.math.pow\n\ninternal actual fun defaultPlatformRandom(): Random =\n    Random(js("Math.random() * Math.pow(2, 32)) | 0").unsafeCast<Int>())\n\nprivate val INV_2_26: Double =
2.0.pow(-26)\nprivate val INV_2_53: Double = 2.0.pow(-53)\n\ninternal actual fun doubleFromParts(hi26: Int, low27:

```



```

isInstance on ErrorKClass`)
override fun equals(other: Any?): Boolean = other === this
override fun
hashCode(): Int = 0
"/**
 * Copyright 2010-2019 JetBrains s.r.o. and Kotlin Programming Language
contributors.
 * Use of this source code is governed by the Apache 2.0 license that can be found in the
license/LICENSE.txt file.
 */
package kotlin.reflect
internal actual inline val
KClass<*>.qualifiedOrSimpleName: String?
get() = simpleName
"/**
 * Copyright 2010-2018 JetBrains s.r.o.
and Kotlin Programming Language contributors.
 * Use of this source code is governed by the Apache 2.0 license
that can be found in the license/LICENSE.txt file.
 */
// a package is omitted to get declarations directly under
the module
// TODO: Remove once JsReflectionAPICallChecker supports more reflection
types
@file:Suppress("Unsupported")
import kotlin.reflect.*
import
kotlin.reflect.js.internal.*
@JsName("createKType")
internal fun createKType(
 classifier: KClassifier,
arguments: Array<KTypeProjection>,
 isMarkedNullable: Boolean
) =
 KTypeImpl(classifier,
arguments.asList(), isMarkedNullable)
@JsName("createDynamicKType")
internal fun
createDynamicKType(): KType = DynamicKType
@JsName("markKTypeNullable")
internal fun
markKTypeNullable(kType: KType) = KTypeImpl(kType.classifier!!, kType.arguments,
true)
@JsName("createKTypeParameter")
internal fun createKTypeParameter(
 name: String,
upperBounds: Array<KType>,
 variance: String
): KTypeParameter {
 val kVariance = when (variance) {
 "in" -> KVariance.IN
 "out" -> KVariance.OUT
 else -> KVariance.INVARIANT
 }
return
KTypeParameterImpl(name, upperBounds.asList(), kVariance,
false)
}
@JsName("getStarKTypeProjection")
internal fun getStarKTypeProjection(): KTypeProjection =
KTypeProjection.STAR
@JsName("createCovariantKTypeProjection")
internal fun
createCovariantKTypeProjection(type: KType): KTypeProjection =
KTypeProjection.covariant(type)
@JsName("createInvariantKTypeProjection")
internal fun
createInvariantKTypeProjection(type: KType): KTypeProjection =
KTypeProjection.invariant(type)
@JsName("createContravariantKTypeProjection")
internal fun
createContravariantKTypeProjection(type: KType): KTypeProjection =
KTypeProjection.contravariant(type)
"/**
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Language contributors.
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license/LICENSE.txt file.
 */
package kotlin.reflect.js.internal
import kotlin.reflect.*
internal class
KTypeImpl(
 override val classifier: KClassifier,
 override val arguments: List<KTypeProjection>,
 override val isMarkedNullable: Boolean
): KType {
 override fun equals(other: Any?): Boolean =
 other
is KTypeImpl &&
 classifier == other.classifier && arguments == other.arguments &&
isMarkedNullable == other.isMarkedNullable
 override fun hashCode(): Int =
 (classifier.hashCode() * 31 + arguments.hashCode()) * 31 + isMarkedNullable.hashCode()
 override fun toString(): String {
 val
kClass = (classifier as? KClass<*>)
 val classifierName = when {
 kClass == null ->
classifier.toString()
 kClass.simpleName != null -> kClass.simpleName
 else -> "(non-denotable
type)"
 }
val args =
 if (arguments.isEmpty()) ""
 else arguments.joinToString(", ",
"<", ">")
val nullable = if (isMarkedNullable) "?"
 else ""
return classifierName + args +
nullable
 }
}
internal object DynamicKType : KType {
 override val classifier: KClassifier? = null
override val arguments: List<KTypeProjection> = emptyList()
 override val isMarkedNullable: Boolean = false
 override fun toString(): String = "dynamic"
}
"/**
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Programming Language contributors.
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found in the license/LICENSE.txt file.
 */
package kotlin.reflect.js.internal
import kotlin.reflect.*
internal data class KTypeParameterImpl(
 override val name: String,
 override val upperBounds: List<KType>,
 override val variance: KVariance,
 override val isReified: Boolean
): KTypeParameter {
 override fun
toString(): String = name
"/**
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license/LICENSE.txt file.
 */
package kotlin.reflect.js.internal
import
kotlin.js.JsClass
@JsName("PrimitiveClasses")
internal object PrimitiveClasses {

```

```

@JsName("anyClass")\n    val anyClass = PrimitiveKClassImpl(js("Object").unsafeCast<JsClass<Any>>(),
"Any", { it is Any })\n\n    @JsName("numberClass")\n    val numberClass =
PrimitiveKClassImpl(js("Number").unsafeCast<JsClass<Number>>(), "Number", { it is Number })\n\n
@JsName("nothingClass")\n    val nothingClass = NothingKClassImpl\n\n    @JsName("booleanClass")\n    val
booleanClass = PrimitiveKClassImpl(js("Boolean").unsafeCast<JsClass<Boolean>>(), "Boolean", { it is Boolean
})\n\n    @JsName("byteClass")\n    val byteClass =
PrimitiveKClassImpl(js("Number").unsafeCast<JsClass<Byte>>(), "Byte", { it is Byte })\n\n
@JsName("shortClass")\n    val shortClass = PrimitiveKClassImpl(js("Number").unsafeCast<JsClass<Short>>(),
"Short", { it is Short })\n\n    @JsName("intClass")\n    val intClass =
PrimitiveKClassImpl(js("Number").unsafeCast<JsClass<Int>>(), "Int", { it is Int })\n\n
@JsName("floatClass")\n    val floatClass = PrimitiveKClassImpl(js("Number").unsafeCast<JsClass<Float>>(),
"Float", { it is Float })\n\n    @JsName("doubleClass")\n    val doubleClass =
PrimitiveKClassImpl(js("Number").unsafeCast<JsClass<Double>>(), "Double", { it is Double })\n\n
@JsName("arrayClass")\n    val arrayClass =
PrimitiveKClassImpl(js("Array").unsafeCast<JsClass<Array<*>>>(), "Array", { it is Array<*> })\n\n
@JsName("stringClass")\n    val stringClass = PrimitiveKClassImpl(js("String").unsafeCast<JsClass<String>>(),
"String", { it is String })\n\n    @JsName("throwableClass")\n    val throwableClass =
PrimitiveKClassImpl(js("Error").unsafeCast<JsClass<Throwable>>(), "Throwable", { it is Throwable })\n\n
@JsName("booleanArrayClass")\n    val booleanArrayClass =
PrimitiveKClassImpl(js("Array").unsafeCast<JsClass<BooleanArray>>(), "BooleanArray", { it is BooleanArray
})\n\n    @JsName("charArrayClass")\n    val charArrayClass =
PrimitiveKClassImpl(js("Uint16Array").unsafeCast<JsClass<CharArray>>(), "CharArray", { it is CharArray
})\n\n    @JsName("byteArrayClass")\n    val byteArrayClass =
PrimitiveKClassImpl(js("Int8Array").unsafeCast<JsClass<ByteArray>>(), "ByteArray", { it is ByteArray })\n\n
@JsName("shortArrayClass")\n    val shortArrayClass =
PrimitiveKClassImpl(js("Int16Array").unsafeCast<JsClass<ShortArray>>(), "ShortArray", { it is ShortArray
})\n\n    @JsName("intArrayClass")\n    val intArrayClass =
PrimitiveKClassImpl(js("Int32Array").unsafeCast<JsClass<IntArray>>(), "IntArray", { it is IntArray })\n\n
@JsName("longArrayClass")\n    val longArrayClass =
PrimitiveKClassImpl(js("Array").unsafeCast<JsClass<LongArray>>(), "LongArray", { it is LongArray })\n\n
@JsName("floatArrayClass")\n    val floatArrayClass =
PrimitiveKClassImpl(js("Float32Array").unsafeCast<JsClass<FloatArray>>(), "FloatArray", { it is FloatArray
})\n\n    @JsName("doubleArrayClass")\n    val doubleArrayClass =
PrimitiveKClassImpl(js("Float64Array").unsafeCast<JsClass<DoubleArray>>(), "DoubleArray", { it is
DoubleArray })\n\n    @JsName("functionClass")\n    fun functionClass(arity: Int): KClassImpl<Any> {\n
return functionClasses.get(arity) ?: run {\n        val result =
PrimitiveKClassImpl(js("Function").unsafeCast<JsClass<Any>>(), "Function$arity",\n        { jsTypeOf(it) === "function" && it.asDynamic().length === arity })\n        functionClasses.asDynamic()[arity]
= result\n        result\n    }\n}\n\nprivate val functionClasses =
arrayOfNulls<KClassImpl<Any>>(0), "/*\n * Copyright 2010-2020 JetBrains s.r.o. and Kotlin Programming
Language contributors.\n * Use of this source code is governed by the Apache 2.0 license that can be found in the
license/LICENSE.txt file.\n */\n\n a package is omitted to get declarations directly under the module\n\nimport
kotlin.reflect.*\nimport kotlin.reflect.js.internal.*\n\n@JsName("getKClass")\ninternal fun <T : Any>
getKClass(jClass: Any /* JsClass<T> | Array<JsClass<T>> */): KClass<T> {\n    return if
(js("Array").isArray(jClass)) {\n        getKClassM(jClass.unsafeCast<Array<JsClass<T>>>())\n    } else {\n
getKClass1(jClass.unsafeCast<JsClass<T>>())\n    }\n}\n\n@JsName("getKClassM")\ninternal fun <T : Any>
getKClassM(jClasses: Array<JsClass<T>>): KClass<T> = when (jClasses.size) {\n    1 ->
getKClass1(jClasses[0])\n    0 -> NothingKClassImpl.unsafeCast<KClass<T>>()\n    else ->

```

```

ErrorKClass().unsafeCast<KClass<T>>()\n\n@JsName("getKClassFromExpression")\ninternal fun <T : Any>
getKClassFromExpression(e: T): KClass<T> =\n    when (jsTypeOf(e)) {\n        "string" ->
PrimitiveClasses.stringClass\n        "number" -> if (jsBitwiseOr(e, 0).asDynamic() === e)
PrimitiveClasses.intClass else PrimitiveClasses.doubleClass\n        "boolean" -> PrimitiveClasses.booleanClass\n        "function" -> PrimitiveClasses.functionClass(e.asDynamic().length)\n        else -> {\n            when {\n                e
is BooleanArray -> PrimitiveClasses.booleanArrayClass\n                e is CharArray ->
PrimitiveClasses.charArrayClass\n                e is ByteArray -> PrimitiveClasses.byteArrayClass\n                e is
ShortArray -> PrimitiveClasses.shortArrayClass\n                e is IntArray -> PrimitiveClasses.intArrayClass\n                e is LongArray -> PrimitiveClasses.longArrayClass\n                e is FloatArray ->
PrimitiveClasses.floatArrayClass\n                e is DoubleArray -> PrimitiveClasses.doubleArrayClass\n                e is
KClass<*> -> KClass::class\n                e is Array<*> -> PrimitiveClasses.arrayClass\n                else -> {\n                    val constructor = js("Object").getPrototypeOf(e).constructor\n                    when {\n                        constructor
=== js("Object") -> PrimitiveClasses.anyClass\n                        constructor === js("Error") ->
PrimitiveClasses.throwableClass\n                        else -> {\n                            val jsClass: JsClass<T> =
constructor\n                            getKClass1(jsClass)\n                            }\n                            }\n                            }\n                            }\n                    }\n                }.unsafeCast<KClass<T>>()\n\n@JsName("getKClass1")\ninternal fun <T : Any> getKClass1(jClass:
JsClass<T>): KClass<T> {\n    if (jClass === js("String")) return
PrimitiveClasses.stringClass\n    unsafeCast<KClass<T>>()\n    val metadata = jClass.asDynamic().`$metadata$\n\nreturn if (metadata != null) {\n    if (metadata.`$kClass$` == null) {\n        val kClass =
SimpleKClassImpl(jClass)\n        metadata.`$kClass$` = kClass\n        kClass\n    } else {\n        metadata.`$kClass$`\n    }\n    } else {\n        SimpleKClassImpl(jClass)\n    }\n    }"/\n\n * Copyright 2010-2018
JetBrains s.r.o. and Kotlin Programming Language contributors.\n * Use of this source code is governed by the
Apache 2.0 license that can be found in the license/LICENSE.txt file.\n\n * Exposes the JavaScript [RegExp
object](https://developer.mozilla.org/en/docs/Web/JavaScript/Reference/Global_Objects/RegExp) to Kotlin.\n\n
*@\n\n@Suppress("NOT_DOCUMENTED")\npublic external class RegExp(pattern: String, flags: String? =
definedExternally) {\n\n    public fun test(str: String): Boolean\n\n    public fun exec(str: String): RegExpMatch?\n\n    public override fun toString(): String\n\n    /**\n     * The lastIndex is a read/write integer property of regular
expressions that specifies the index at which to start the next match.\n     */\n    public var lastIndex: Int\n\n    public
val global: Boolean\n    public val ignoreCase: Boolean\n    public val multiline: Boolean\n}\n\n/**\n * Resets the
regular expression so that subsequent [RegExp.test] and [RegExp.exec] calls will match starting with the beginning
of the input string.\n */\npublic fun RegExp.reset() {\n    lastIndex = 0\n}\n\n// TODO: Inherit from array or
introduce asArray() extension\n/**\n * Represents the return value of [RegExp.exec].\n */\n\n*@\n\n@Suppress("NOT_DOCUMENTED")\npublic external interface RegExpMatch {\n    public val index: Int\n    public val input: String\n    public val length: Int\n}\n\n/**\n * Returns the entire text matched by [RegExp.exec] if
the [index] parameter is 0, or the text matched by the capturing parenthesis\n * at the given index.\n */\n\npublic inline
operator fun RegExpMatch.get(index: Int): String? = asDynamic()[index]\n\n/**\n * Converts the result of
[RegExp.exec] to an array where the first element contains the entire matched text and each subsequent\n * element
is the text matched by each capturing parenthesis.\n */\n\npublic inline fun RegExpMatch.asArray(): Array<out
String?> = unsafeCast<Array<out String?>>()\n\n"/\n\n * Copyright 2010-2018 JetBrains s.r.o. and Kotlin
Programming Language contributors.\n * Use of this source code is governed by the Apache 2.0 license that can be
found in the license/LICENSE.txt file.\n\n */\n\npackage kotlin.sequences\n\ninternal actual class
ConstrainedOnceSequence<T> actual constructor(sequence: Sequence<T>) : Sequence<T> {\n    private var
sequenceRef: Sequence<T>? = sequence\n\n    actual override fun iterator(): Iterator<T> {\n        val sequence =
sequenceRef ?: throw IllegalStateException("This sequence can be consumed only once.")\n        sequenceRef =
null\n        return sequence.iterator()\n    }\n}\n\n"/\n\n * Copyright 2010-2020 JetBrains s.r.o. and Kotlin
Programming Language contributors.\n * Use of this source code is governed by the Apache 2.0 license that can be
found in the license/LICENSE.txt file.\n\n */\n\npackage kotlin.text\n\n@SinceKotlin("1.5")\npublic actual enum

```



```

class CharCategory(internal val value: Int, public actual val code: String) {
    /**
     * General category "Cn" in the Unicode specification.
     */
    UNASSIGNED(0, "Cn"),
    /**
     * General category "Lu" in the Unicode specification.
     */
    UPPER_CASE_LETTER(1, "Lu"),
    /**
     * General category "Ll" in the Unicode specification.
     */
    LOWER_CASE_LETTER(2, "Ll"),
    /**
     * General category "Lt" in the Unicode specification.
     */
    TITLE_CASE_LETTER(3, "Lt"),
    /**
     * General category "Lm" in the Unicode specification.
     */
    MODIFIER_LETTER(4, "Lm"),
    /**
     * General category "Lo" in the Unicode specification.
     */
    OTHER_LETTER(5, "Lo"),
    /**
     * General category "Mn" in the Unicode specification.
     */
    NON_SPACING_MARK(6, "Mn"),
    /**
     * General category "Me" in the Unicode specification.
     */
    ENCLOSING_MARK(7, "Me"),
    /**
     * General category "Mc" in the Unicode specification.
     */
    COMBINING_SPACING_MARK(8, "Mc"),
    /**
     * General category "Nd" in the Unicode specification.
     */
    DECIMAL_DIGIT_NUMBER(9, "Nd"),
    /**
     * General category "Nl" in the Unicode specification.
     */
    LETTER_NUMBER(10, "Nl"),
    /**
     * General category "No" in the Unicode specification.
     */
    OTHER_NUMBER(11, "No"),
    /**
     * General category "Zs" in the Unicode specification.
     */
    SPACE_SEPARATOR(12, "Zs"),
    /**
     * General category "Zl" in the Unicode specification.
     */
    LINE_SEPARATOR(13, "Zl"),
    /**
     * General category "Zp" in the Unicode specification.
     */
    PARAGRAPH_SEPARATOR(14, "Zp"),
    /**
     * General category "Cc" in the Unicode specification.
     */
    CONTROL(15, "Cc"),
    /**
     * General category "Cf" in the Unicode specification.
     */
    FORMAT(16, "Cf"),
    /**
     * General category "Co" in the Unicode specification.
     */
    PRIVATE_USE(18, "Co"),
    /**
     * General category "Cs" in the Unicode specification.
     */
    SURROGATE(19, "Cs"),
    /**
     * General category "Pd" in the Unicode specification.
     */
    DASH_PUNCTUATION(20, "Pd"),
    /**
     * General category "Ps" in the Unicode specification.
     */
    START_PUNCTUATION(21, "Ps"),
    /**
     * General category "Pe" in the Unicode specification.
     */
    END_PUNCTUATION(22, "Pe"),
    /**
     * General category "Pc" in the Unicode specification.
     */
    CONNECTOR_PUNCTUATION(23, "Pc"),
    /**
     * General category "Po" in the Unicode specification.
     */
    OTHER_PUNCTUATION(24, "Po"),
    /**
     * General category "Sm" in the Unicode specification.
     */
    MATH_SYMBOL(25, "Sm"),
    /**
     * General category "Sc" in the Unicode specification.
     */
    CURRENCY_SYMBOL(26, "Sc"),
    /**
     * General category "Sk" in the Unicode specification.
     */
    MODIFIER_SYMBOL(27, "Sk"),
    /**
     * General category "So" in the Unicode specification.
     */
    OTHER_SYMBOL(28, "So"),
    /**
     * General category "Pi" in the Unicode specification.
     */
    INITIAL_QUOTE_PUNCTUATION(29, "Pi"),
    /**
     * General category "Pf" in the Unicode specification.
     */
    FINAL_QUOTE_PUNCTUATION(30, "Pf");
    /**
     * Returns true if [char] character belongs to this category.
     */
    public actual operator fun contains(char: Char): Boolean =
        char.getCategoryValue() == this.value
    companion object {
        internal fun valueOf(category: Int): CharCategory =
            when (category) {
                in 0..16 -> values()[category]
                in 18..30 -> values()[category - 1]
                else -> throw IllegalArgumentException("Category #$category is not defined.")
            }
    }
}
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 */
package kotlin.text
/**
 * The exception thrown when a character encoding or decoding error occurs.
 *
 * @SinceKotlin("1.4")
 * @WasExperimental(ExperimentalStdlibApi::class)
 */
public actual open class CharacterCodingException(message: String?) : Exception(message) {
    actual constructor(): this(null)
}
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 */
package kotlin.text
/**
 * A mutable sequence of characters.
 *
 * String builder can be used to efficiently perform multiple string manipulation operations.
 */
public actual class StringBuilder actual constructor(content: String) : Appendable, CharSequence {
    /**
     * Constructs an empty string builder with the specified initial [capacity].
     *
     * In Kotlin/JS implementation of StringBuilder the initial capacity has no effect on the further performance of operations.
     */
    actual constructor(capacity: Int): this() {
        // Constructs a string builder that
    }
}

```

contains the same characters as the specified [content] char sequence. */

```

actual constructor(content: CharSequence) : this(content.toString()) {}
/** Constructs an empty string builder. */
actual constructor() : this("")
private var string: String = if (content !== undefined) content else ""
actual override val length: Int
get() = string.asDynamic().length
actual override fun get(index: Int): Char = string.getOrNull(index) { throw IndexOutOfBoundsException("index: $index, length: $length")}
actual override fun subSequence(startIndex: Int, endIndex: Int): CharSequence = string.substring(startIndex, endIndex)
actual override fun append(value: Char): String { string += value; return this }
actual override fun append(value: CharSequence?): String { string += value.toString(); return this }
actual override fun append(value: CharSequence?, startIndex: Int, endIndex: Int): String {
    this.appendRange(value ?: "", startIndex, endIndex)
}
/** Reverses the contents of this string builder and returns this instance.
 * Surrogate pairs included in this string builder are treated as single characters.
 * Therefore, the order of the high-low surrogates is never reversed.
 * Note that the reverse operation may produce new surrogate pairs that were unpaired low-surrogates and high-surrogates before the operation.
 * For example, reversing "\uDC00\uD800" produces "\uD800\uDC00" which is a valid surrogate pair.
 */
actual fun reverse(): String {
    var reversed = ""
    var index = string.length - 1
    while (index >= 0) {
        val low = string[index--]
        if (low.isLowSurrogate() && index >= 0) {
            val high = string[index--]
            if (high.isHighSurrogate()) {
                reversed = reversed + high + low
            } else {
                reversed = reversed + low + high
            }
        } else {
            reversed += low
        }
    }
    string = reversed
    return this
}
/** Appends the string representation of the specified object [value] to this string builder and returns this instance.
 * The overall effect is exactly as if the [value] were converted to a string by the `value.toString()` method, and then that string was appended to this string builder.
 */
actual fun append(value: Any?): String {
    string += value.toString()
    return this
}
/** Appends the string representation of the specified boolean [value] to this string builder and returns this instance.
 * The overall effect is exactly as if the [value] were converted to a string by the `value.toString()` method, and then that string was appended to this string builder.
 */
@SinceKotlin("1.3")
actual fun append(value: Boolean): String {
    string += value
    return this
}
/** Appends characters in the specified character array [value] to this string builder and returns this instance.
 * Characters are appended in order, starting at the index 0.
 */
@SinceKotlin("1.4")
@WasExperimental(ExperimentalStdlibApi::class)
actual fun append(value: CharArray): String {
    string += value.concatToString()
    return this
}
@Deprecated("Provided for binary compatibility.", level = DeprecationLevel.HIDDEN)
fun append(value: String): String {
    return append(value)
}
/** Appends the specified string [value] to this string builder and returns this instance.
 * If [value] is `null`, then the four characters `null` are appended.
 */
@SinceKotlin("1.3")
actual fun append(value: String?): String {
    this.string += value ?: "null"
    return this
}
/** Returns the current capacity of this string builder.
 * The capacity is the maximum length this string builder can have before an allocation occurs.
 * In Kotlin/JS implementation of String Builder the value returned from this method may not indicate the actual size of the backing storage.
 */
@SinceKotlin("1.3")
// @ExperimentalStdlibApi
@Deprecated("Obtaining String Builder capacity is not supported in JS and common code.", level = DeprecationLevel.ERROR)
actual fun capacity(): Int {
    return length
}
/** Ensures that the capacity of this string builder is at least equal to the specified [minimumCapacity].
 * If the current capacity is less than the [minimumCapacity], a new backing storage is allocated with greater capacity.
 * Otherwise, this method takes no action and simply returns.
 * In Kotlin/JS implementation of String Builder the size of the backing storage is not extended to comply the given [minimumCapacity], thus calling this method has no effect on the further performance of operations.
 */
@SinceKotlin("1.4")
@WasExperimental(ExperimentalStdlibApi::class)
actual fun ensureCapacity(minimumCapacity: Int) {
}
/** Returns the index within this string builder of the first occurrence of the specified [string].
 * Returns -1 if the specified [string] does not occur in this string builder.
 */
@SinceKotlin("1.4")
@WasExperimental(ExperimentalStdlibApi::class)
actual

```

```

fun indexOf(string: String): Int = this.string.asDynamic().indexOf(string)\n\n /**\n * Returns the index within
this string builder of the first occurrence of the specified [string],\n * starting at the specified [startIndex].\n *\n * Returns -1 if the specified [string] does not occur in this string builder starting at the specified [startIndex].\n
*/\n @SinceKotlin("1.4")\n @WasExperimental(ExperimentalStdlibApi::class)\n actual fun indexOf(string:
String, startIndex: Int): Int = this.string.asDynamic().indexOf(string, startIndex)\n\n /**\n * Returns the index
within this string builder of the last occurrence of the specified [string].\n * The last occurrence of empty string
`""` is considered to be at the index equal to `this.length`.\n *\n * Returns -1 if the specified [string] does not
occur in this string builder.\n *\n @SinceKotlin("1.4")\n
@WasExperimental(ExperimentalStdlibApi::class)\n actual fun lastIndexOf(string: String): Int =
this.string.asDynamic().lastIndexOf(string)\n\n /**\n * Returns the index within this string builder of the last
occurrence of the specified [string],\n * starting from the specified [startIndex] toward the beginning.\n *\n *
Returns -1 if the specified [string] does not occur in this string builder starting at the specified [startIndex].\n
*/\n @SinceKotlin("1.4")\n @WasExperimental(ExperimentalStdlibApi::class)\n actual fun
lastIndexOf(string: String, startIndex: Int): Int {\n    if (string.isEmpty() && startIndex < 0) return -1\n    return
this.string.asDynamic().lastIndexOf(string, startIndex)\n }\n\n /**\n * Inserts the string representation of the
specified boolean [value] into this string builder at the specified [index] and returns this instance.\n *\n * The
overall effect is exactly as if the [value] were converted to a string by the `value.toString()` method,\n * and then
that string was inserted into this string builder at the specified [index].\n *\n * @throws
IndexOutOfBoundsException if [index] is less than zero or greater than the length of this string builder.\n *\n
@SinceKotlin("1.4")\n @WasExperimental(ExperimentalStdlibApi::class)\n actual fun insert(index: Int, value:
Boolean): StringBuilder {\n    AbstractList.checkPositionIndex(index, length)\n\n    string = string.substring(0,
index) + value + string.substring(index)\n    return this\n }\n\n /**\n * Inserts the specified character [value]
into this string builder at the specified [index] and returns this instance.\n *\n * @throws
IndexOutOfBoundsException if [index] is less than zero or greater than the length of this string builder.\n *\n
@SinceKotlin("1.4")\n @WasExperimental(ExperimentalStdlibApi::class)\n actual fun insert(index: Int, value:
Char): StringBuilder {\n    AbstractList.checkPositionIndex(index, length)\n\n    string = string.substring(0,
index) + value + string.substring(index)\n    return this\n }\n\n /**\n * Inserts characters in the specified
character array [value] into this string builder at the specified [index] and returns this instance.\n *\n * The
inserted characters go in same order as in the [value] character array, starting at [index].\n *\n * @throws
IndexOutOfBoundsException if [index] is less than zero or greater than the length of this string builder.\n *\n
@SinceKotlin("1.4")\n @WasExperimental(ExperimentalStdlibApi::class)\n actual fun insert(index: Int, value:
CharArray): StringBuilder {\n    AbstractList.checkPositionIndex(index, length)\n\n    string =
string.substring(0, index) + value.concatToString() + string.substring(index)\n    return this\n }\n\n /**\n *
Inserts characters in the specified character sequence [value] into this string builder at the specified [index] and
returns this instance.\n *\n * The inserted characters go in the same order as in the [value] character sequence,
starting at [index].\n *\n * @param index the position in this string builder to insert at.\n * @param value the
character sequence from which characters are inserted. If [value] is `null`, then the four characters `"\u0026quot;"` are
inserted.\n *\n * @throws IndexOutOfBoundsException if [index] is less than zero or greater than the length of
this string builder.\n *\n @SinceKotlin("1.4")\n @WasExperimental(ExperimentalStdlibApi::class)\n
actual fun insert(index: Int, value: CharSequence?): StringBuilder {\n    AbstractList.checkPositionIndex(index,
length)\n\n    string = string.substring(0, index) + value.toString() + string.substring(index)\n    return this\n
}\n\n /**\n * Inserts the string representation of the specified object [value] into this string builder at the
specified [index] and returns this instance.\n *\n * The overall effect is exactly as if the [value] were converted
to a string by the `value.toString()` method,\n * and then that string was inserted into this string builder at the
specified [index].\n *\n * @throws IndexOutOfBoundsException if [index] is less than zero or greater than the
length of this string builder.\n *\n @SinceKotlin("1.4")\n
@WasExperimental(ExperimentalStdlibApi::class)\n actual fun insert(index: Int, value: Any?): StringBuilder {\n
    AbstractList.checkPositionIndex(index, length)\n\n    string = string.substring(0, index) + value.toString() +

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string.substring(index)\n    return this\n    }\n\n    @Deprecated("Provided for binary compatibility.", level =
DeprecationLevel.HIDDEN)\n    fun insert(index: Int, value: String): StringBuilder = insert(index, value)\n\n    /**\n    * Inserts the string [value] into this string builder at the specified [index] and returns this instance.\n    * \n    * If [value] is `null`, then the four characters `"\n\n\n\n"` are inserted.\n    * \n    * @throws IndexOutOfBoundsException if [index] is less than zero or greater than the length of this string builder.\n    * \n    * @SinceKotlin("1.4")\n    * @WasExperimental(ExperimentalStdlibApi::class)\n    actual fun insert(index: Int, value: String?): StringBuilder {\n    AbstractList.checkPositionIndex(index, length)\n\n    val toInsert = value ?: "\n\n\n\n"\n    this.string = this.string.substring(0, index) + toInsert + this.string.substring(index)\n    return this\n    }\n\n    /**\n    * Sets the length of this string builder to the specified [newLength].\n    * \n    * If the [newLength] is less than the current length, it is changed to the specified [newLength].\n    * \n    * Otherwise, null characters `"\n\n\n\n"` are appended to this string builder until its length is less than the [newLength].\n    * \n    * Note that in Kotlin/JS [set] operator function has non-constant execution time complexity.\n    * \n    * Therefore, increasing length of this string builder and then updating each character by index may slow down your program.\n    * \n    * @throws IndexOutOfBoundsException or [IllegalArgumentException] if [newLength] is less than zero.\n    * \n    * @SinceKotlin("1.4")\n    * @WasExperimental(ExperimentalStdlibApi::class)\n    actual fun setLength(newLength: Int) {\n    if (newLength < 0) {\n        throw IllegalArgumentException("Negative new length: $newLength.")\n    }\n\n    if (newLength <= length) {\n        string = string.substring(0, newLength)\n    } else {\n        for (i in length until newLength) {\n            string += "\n\n\n\n"\n        }\n    }\n\n    }\n\n    /**\n    * Returns a new [String] that contains characters in this string builder at [startIndex] (inclusive) and up to the [length] (exclusive).\n    * \n    * @throws IndexOutOfBoundsException if [startIndex] is less than zero or greater than the length of this string builder.\n    * \n    * @SinceKotlin("1.4")\n    * @WasExperimental(ExperimentalStdlibApi::class)\n    actual fun substring(startIndex: Int): String {\n    AbstractList.checkPositionIndex(startIndex, length)\n\n    return string.substring(startIndex)\n    }\n\n    /**\n    * Returns a new [String] that contains characters in this string builder at [startIndex] (inclusive) and up to the [endIndex] (exclusive).\n    * \n    * @throws IndexOutOfBoundsException or [IllegalArgumentException] when [startIndex] or [endIndex] is out of range of this string builder indices or when `startIndex > endIndex`.\n    * \n    * @SinceKotlin("1.4")\n    * @WasExperimental(ExperimentalStdlibApi::class)\n    actual fun substring(startIndex: Int, endIndex: Int): String {\n    AbstractList.checkBoundsIndexes(startIndex, endIndex, length)\n\n    return string.substring(startIndex, endIndex)\n    }\n\n    /**\n    * Attempts to reduce storage used for this string builder.\n    * \n    * If the backing storage of this string builder is larger than necessary to hold its current contents,\n    * \n    * then it may be resized to become more space efficient.\n    * \n    * Calling this method may, but is not required to, affect the value of the [capacity] property.\n    * \n    * In Kotlin/JS implementation of StringBuilder the size of the backing storage is always equal to the length of the string builder.\n    * \n    * @SinceKotlin("1.4")\n    * @WasExperimental(ExperimentalStdlibApi::class)\n    actual fun trimToSize() {\n    }\n\n    override fun toString(): String = string\n\n    /**\n    * Clears the content of this string builder making it empty and returns this instance.\n    * \n    * @sample samples.text.Strings.clearStringBuilder\n    * \n    * @SinceKotlin("1.3")\n    public fun clear(): String {\n    string = ""\n    return this\n    }\n\n    /**\n    * Sets the character at the specified [index] to the specified [value].\n    * \n    * @throws IndexOutOfBoundsException if [index] is out of bounds of this string builder.\n    * \n    * @SinceKotlin("1.4")\n    * @WasExperimental(ExperimentalStdlibApi::class)\n    public operator fun set(index: Int, value: Char) {\n    AbstractList.checkElementIndex(index, length)\n\n    string = string.substring(0, index) + value + string.substring(index + 1)\n    }\n\n    /**\n    * Replaces characters in the specified range of this string builder with characters in the specified string [value] and returns this instance.\n    * \n    * @param startIndex the beginning (inclusive) of the range to replace.\n    * @param endIndex the end (exclusive) of the range to replace.\n    * @param value the string to replace with.\n    * \n    * @throws IndexOutOfBoundsException or [IllegalArgumentException] if [startIndex] is less than zero, greater than the length of this string builder, or `startIndex > endIndex`.\n    * \n    * @SinceKotlin("1.4")\n    * @WasExperimental(ExperimentalStdlibApi::class)\n    public fun setRange(startIndex: Int, endIndex: Int, value: String): String {\n    checkReplaceRange(startIndex, endIndex, length)\n\n    this.string =

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this.string.substring(0, startIndex) + value + this.string.substring(endIndex)\n    return this\n }\n\n private fun
checkReplaceRange(startIndex: Int, endIndex: Int, length: Int) {\n    if (startIndex < 0 || startIndex > length) {\n
    throw IndexOutOfBoundsException("\startIndex: $startIndex, length: $length")\n    }\n    if (startIndex >
endIndex) {\n        throw IllegalArgumentException("\startIndex($startIndex) > endIndex($endIndex)")\n    }\n
}\n\n /**\n * Removes the character at the specified [index] from this string builder and returns this instance.\n
*\n * If the `Char` at the specified [index] is part of a supplementary code point, this method does not remove
the entire supplementary character.\n *\n * @param index the index of `Char` to remove.\n *\n * @throws
IndexOutOfBoundsException if [index] is out of bounds of this string builder.\n */\n @SinceKotlin("1.4")\n
@WasExperimental(ExperimentalStdlibApi::class)\n public fun deleteAt(index: Int): StringBuilder {\n
AbstractList.checkElementIndex(index, length)\n\n    string = string.substring(0, index) + string.substring(index +
1)\n    return this\n }\n\n /**\n * Removes characters in the specified range from this string builder and
returns this instance.\n *\n * @param startIndex the beginning (inclusive) of the range to remove.\n *
@param endIndex the end (exclusive) of the range to remove.\n *\n * @throws IndexOutOfBoundsException
or [IllegalArgumentException] when [startIndex] is out of range of this string builder indices or when `startIndex >
endIndex`.\n */\n @SinceKotlin("1.4")\n @WasExperimental(ExperimentalStdlibApi::class)\n public fun
deleteRange(startIndex: Int, endIndex: Int): StringBuilder {\n    checkReplaceRange(startIndex, endIndex,
length)\n\n    string = string.substring(0, startIndex) + string.substring(endIndex)\n    return this\n }\n\n
/**\n * Copies characters from this string builder into the [destination] character array.\n *\n * @param
destination the array to copy to.\n * @param destinationOffset the position in the array to copy to, 0 by default.\n
* @param startIndex the beginning (inclusive) of the range to copy, 0 by default.\n * @param endIndex the end
(exclusive) of the range to copy, length of this string builder by default.\n *\n * @throws
IndexOutOfBoundsException or [IllegalArgumentException] when [startIndex] or [endIndex] is out of range of this
string builder indices or when `startIndex > endIndex`.\n * @throws IndexOutOfBoundsException when the
subrange doesn't fit into the [destination] array starting at the specified [destinationOffset],\n * or when that index
is out of the [destination] array indices range.\n */\n @SinceKotlin("1.4")\n
@WasExperimental(ExperimentalStdlibApi::class)\n public fun toCharArray(destination: CharArray,
destinationOffset: Int = 0, startIndex: Int = 0, endIndex: Int = this.length) {\n
AbstractList.checkBoundsIndexes(startIndex, endIndex, length)\n
AbstractList.checkBoundsIndexes(destinationOffset, destinationOffset + endIndex - startIndex, destination.size)\n\n
    var dstIndex = destinationOffset\n    for (index in startIndex until endIndex) {\n        destination[dstIndex++]
= string[index]\n    }\n\n /**\n * Appends characters in a subarray of the specified character array
[value] to this string builder and returns this instance.\n *\n * Characters are appended in order, starting at
specified [startIndex].\n *\n * @param value the array from which characters are appended.\n * @param
startIndex the beginning (inclusive) of the subarray to append.\n * @param endIndex the end (exclusive) of the
subarray to append.\n *\n * @throws IndexOutOfBoundsException or [IllegalArgumentException] when
[startIndex] or [endIndex] is out of range of the [value] array indices or when `startIndex > endIndex`.\n */\n
@SinceKotlin("1.4")\n @WasExperimental(ExperimentalStdlibApi::class)\n public fun appendRange(value:
CharArray, startIndex: Int, endIndex: Int): StringBuilder {\n    string += value.concatToString(startIndex,
endIndex)\n    return this\n }\n\n /**\n * Appends a subsequence of the specified character sequence [value]
to this string builder and returns this instance.\n *\n * @param value the character sequence from which a
subsequence is appended.\n * @param startIndex the beginning (inclusive) of the subsequence to append.\n *
@param endIndex the end (exclusive) of the subsequence to append.\n *\n * @throws
IndexOutOfBoundsException or [IllegalArgumentException] when [startIndex] or [endIndex] is out of range of the
[value] character sequence indices or when `startIndex > endIndex`.\n */\n @SinceKotlin("1.4")\n
@WasExperimental(ExperimentalStdlibApi::class)\n public fun appendRange(value: CharSequence, startIndex:
Int, endIndex: Int): StringBuilder {\n    val stringCsq = value.toString()\n
AbstractList.checkBoundsIndexes(startIndex, endIndex, stringCsq.length)\n\n    string +=
stringCsq.substring(startIndex, endIndex)\n    return this\n }\n\n /**\n * Inserts characters in a subarray of

```

the specified character array [value] into this string builder at the specified [index] and returns this instance.

- * The inserted characters go in same order as in the [value] array, starting at [index].
- * @param index the position in this string builder to insert at.
- * @param value the array from which characters are inserted.
- * @param startIndex the beginning (inclusive) of the subarray to insert.
- * @param endIndex the end (exclusive) of the subarray to insert.
- * @throws IndexOutOfBoundsException or [IllegalArgumentException] when [startIndex] or [endIndex] is out of range of the [value] array indices or when `startIndex > endIndex`.
- * @throws IndexOutOfBoundsException if [index] is less than zero or greater than the length of this string builder.

```

^@SinceKotlin("1.4")
@WasExperimental(ExperimentalStdlibApi::class)
public fun
insertRange(index: Int, value: CharArray, startIndex: Int, endIndex: Int): String Builder {
    AbstractList.checkPositionIndex(index, this.length)
    string = string.substring(0, index) +
    value.concatToString(startIndex, endIndex) + string.substring(index)
    return this
}
/**
 * Inserts
characters in a subsequence of the specified character sequence [value] into this string builder at the specified
[index] and returns this instance.
 * The inserted characters go in the same order as in the [value] character
sequence, starting at [index].
 * @param index the position in this string builder to insert at.
 * @param value the character sequence from which a subsequence is inserted.
 * @param startIndex the beginning
(inclusive) of the subsequence to insert.
 * @param endIndex the end (exclusive) of the subsequence to insert.
 * @throws IndexOutOfBoundsException or [IllegalArgumentException] when [startIndex] or [endIndex] is
out of range of the [value] character sequence indices or when startIndex > endIndex.
 * @throws
IndexOutOfBoundsException if [index] is less than zero or greater than the length of this string builder.
^@SinceKotlin("1.4")
@WasExperimental(ExperimentalStdlibApi::class)
public fun insertRange(index: Int,
value: CharSequence, startIndex: Int, endIndex: Int): String Builder {
    AbstractList.checkPositionIndex(index,
length)
    val stringCsq = value.toString()
    AbstractList.checkBoundsIndexes(startIndex, endIndex,
stringCsq.length)
    string = string.substring(0, index) + stringCsq.substring(startIndex, endIndex) +
string.substring(index)
    return this
}
/**
 * Clears the content of this string builder making it
empty and returns this instance.
 * @sample samples.text.Strings.clearStringBuilder
^@SinceKotlin("1.3")
@Suppress("EXTENSION_SHADOWED_BY_MEMBER",
"NOTHING_TO_INLINE")
public actual inline fun String Builder.clear(): String Builder = this.clear()
/**
 * Sets the character at the specified [index] to the specified [value].
 * @throws IndexOutOfBoundsException if
[index] is out of bounds of this string builder.
^@SinceKotlin("1.4")
@WasExperimental(ExperimentalStdlibApi::class)
@Suppress("EXTENSION_SHA
DOWED_BY_MEMBER", "NOTHING_TO_INLINE")
public actual inline operator fun
String Builder.set(index: Int, value: Char) = this.set(index, value)
/**
 * Replaces characters in the specified
range of this string builder with characters in the specified string [value] and returns this instance.
 * @param
startIndex the beginning (inclusive) of the range to replace.
 * @param endIndex the end (exclusive) of the range to
replace.
 * @param value the string to replace with.
 * @throws IndexOutOfBoundsException or
[IllegalArgumentException] if [startIndex] is less than zero, greater than the length of this string builder, or
startIndex > endIndex.
^@SinceKotlin("1.4")
@WasExperimental(ExperimentalStdlibApi::class)
@Suppress("EXTENSION_SHA
DOWED_BY_MEMBER", "NOTHING_TO_INLINE")
public actual inline fun
String Builder.setRange(startIndex: Int, endIndex: Int, value: String): String Builder =
this.setRange(startIndex,
endIndex, value)
/**
 * Removes the character at the specified [index] from this string builder and returns this
instance.
 * If the `Char` at the specified [index] is part of a supplementary code point, this method does not
remove the entire supplementary character.
 * @param index the index of `Char` to remove.
 * @throws
IndexOutOfBoundsException if [index] is out of bounds of this string builder.
^@SinceKotlin("1.4")
@WasExperimental(ExperimentalStdlibApi::class)
@Suppress("EXTENSION_SHA
DOWED_BY_MEMBER", "NOTHING_TO_INLINE")
public actual inline fun String Builder.deleteAt(index:
Int): String Builder = this.deleteAt(index)
/**
 * Removes characters in the specified range from this string
builder and returns this instance.
 * @param startIndex the beginning (inclusive) of the range to remove.

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@param endIndex the end (exclusive) of the range to remove.\n *\n * @throws IndexOutOfBoundsException or [IllegalArgumentException] when [startIndex] is out of range of this string builder indices or when `startIndex > endIndex`.\n

```

*\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\n@Suppress("EXTENSION_SHA
DOWED_BY_MEMBER", "NOTHING_TO_INLINE")\npublic actual inline fun
StringBuilder.deleteRange(startIndex: Int, endIndex: Int): StringBuilder = this.deleteRange(startIndex,
endIndex)\n\n/**\n * Copies characters from this string builder into the [destination] character array.\n *\n *
@param destination the array to copy to.\n * @param destinationOffset the position in the array to copy to, 0 by
default.\n * @param startIndex the beginning (inclusive) of the range to copy, 0 by default.\n * @param endIndex
the end (exclusive) of the range to copy, length of this string builder by default.\n *\n * @throws
IndexOutOfBoundsException or [IllegalArgumentException] when [startIndex] or [endIndex] is out of range of this
string builder indices or when `startIndex > endIndex`.\n * @throws IndexOutOfBoundsException when the
subrange doesn't fit into the [destination] array starting at the specified [destinationOffset],\n * or when that index is
out of the [destination] array indices range.\n
*\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\n@Suppress("EXTENSION_SHA
DOWED_BY_MEMBER", "NOTHING_TO_INLINE",
"ACTUAL_FUNCTION_WITH_DEFAULT_ARGUMENTS")\npublic actual inline fun
StringBuilder.toCharArray(destination: CharArray, destinationOffset: Int = 0, startIndex: Int = 0, endIndex: Int =
this.length) =\n this.toCharArray(destination, destinationOffset, startIndex, endIndex)\n\n/**\n * Appends
characters in a subarray of the specified character array [value] to this string builder and returns this instance.\n *\n *
Characters are appended in order, starting at specified [startIndex].\n *\n * @param value the array from which
characters are appended.\n * @param startIndex the beginning (inclusive) of the subarray to append.\n * @param
endIndex the end (exclusive) of the subarray to append.\n *\n * @throws IndexOutOfBoundsException or
[IllegalArgumentException] when [startIndex] or [endIndex] is out of range of the [value] array indices or when
`startIndex > endIndex`.\n
*\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\n@Suppress("EXTENSION_SHA
DOWED_BY_MEMBER", "NOTHING_TO_INLINE")\npublic actual inline fun
StringBuilder.appendRange(value: CharArray, startIndex: Int, endIndex: Int): StringBuilder =\n
this.appendRange(value, startIndex, endIndex)\n\n/**\n * Appends a subsequence of the specified character
sequence [value] to this string builder and returns this instance.\n *\n * @param value the character sequence from
which a subsequence is appended.\n * @param startIndex the beginning (inclusive) of the subsequence to append.\n
* @param endIndex the end (exclusive) of the subsequence to append.\n *\n * @throws
IndexOutOfBoundsException or [IllegalArgumentException] when [startIndex] or [endIndex] is out of range of the
[value] character sequence indices or when `startIndex > endIndex`.\n
*\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\n@Suppress("EXTENSION_SHA
DOWED_BY_MEMBER", "NOTHING_TO_INLINE")\npublic actual inline fun
StringBuilder.appendRange(value: CharSequence, startIndex: Int, endIndex: Int): StringBuilder =\n
this.appendRange(value, startIndex, endIndex)\n\n/**\n * Inserts characters in a subarray of the specified character
array [value] into this string builder at the specified [index] and returns this instance.\n *\n * The inserted
characters go in same order as in the [value] array, starting at [index].\n *\n * @param index the position in
this string builder to insert at.\n * @param value the array from which characters are inserted.\n * @param
startIndex the beginning (inclusive) of the subarray to insert.\n * @param endIndex the end (exclusive) of the
subarray to insert.\n *\n * @throws IndexOutOfBoundsException or [IllegalArgumentException] when [startIndex]
or [endIndex] is out of range of the [value] array indices or when `startIndex > endIndex`.\n * @throws
IndexOutOfBoundsException if [index] is less than zero or greater than the length of this string builder.\n
*\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\n@Suppress("EXTENSION_SHA
DOWED_BY_MEMBER", "NOTHING_TO_INLINE")\npublic actual inline fun
StringBuilder.insertRange(index: Int, value: CharArray, startIndex: Int, endIndex: Int): StringBuilder =\n

```

`this.insertRange(index, value, startIndex, endIndex)` Inserts characters in a subsequence of the specified character sequence [value] into this string builder at the specified [index] and returns this instance. The inserted characters go in the same order as in the [value] character sequence, starting at [index]. @param index the position in this string builder to insert at. @param value the character sequence from which a subsequence is inserted. @param startIndex the beginning (inclusive) of the subsequence to insert. @param endIndex the end (exclusive) of the subsequence to insert. @throws IndexOutOfBoundsException or [IllegalArgumentException] when [startIndex] or [endIndex] is out of range of the [value] character sequence indices or when `startIndex > endIndex`. @throws IndexOutOfBoundsException if [index] is less than zero or greater than the length of this string builder.

```

* Since Kotlin("1.4")
* WasExperimental(ExperimentalStdlibApi::class)
* Suppress("EXTENSION_SHA
DOWED_BY_MEMBER", "NOTHING_TO_INLINE")
public actual inline fun
StringBuilder.insertRange(index: Int, value: CharSequence, startIndex: Int, endIndex: Int): StringBuilder =
this.insertRange(index, value, startIndex, endIndex)
"/**
 * Copyright 2010-2018 JetBrains s.r.o. and Kotlin
Programming Language contributors.
 * Use of this source code is governed by the Apache 2.0 license that can be
found in the license/LICENSE.txt file.
 */
package kotlin.text
/**
 * Returns `true` if the content of this
string is equal to the word `true`, ignoring case, and `false` otherwise.
 */
@Deprecated("Use Kotlin compiler
1.4 to avoid deprecation warning.")
@DeprecatedSinceKotlin(hiddenSince =
"1.4")
@kotlin.internal.InlineOnly
public actual inline fun String.toBoolean(): Boolean =
this.toBoolean()
/**
 * Returns `true` if this string is not `null` and its content is equal to the word `true`,
ignoring case, and `false` otherwise.
 */
 * There are also strict versions of the function available on non-nullable
String, [toBooleanStrict] and [toBooleanStrictOrNull].
 */
@SinceKotlin("1.4")
public actual fun
String?.toBoolean(): Boolean = this != null && this.lowercase() == "true"
/**
 * Parses the string as a signed
[Byte] number and returns the result.
 * @throws NumberFormatException if the string is not a valid
representation of a number.
 */
public actual fun String.toByte(): Byte = toByteOrNull() ?:
numberFormatError(this)
/**
 * Parses the string as a signed [Byte] number and returns the result.
 * @throws
NumberFormatException if the string is not a valid representation of a number.
 * @throws
IllegalArgumentException when [radix] is not a valid radix for string to number conversion.
 */
public actual fun
String.toByte(radix: Int): Byte = toByteOrNull(radix) ?: numberFormatError(this)
/**
 * Parses the string as a
[Short] number and returns the result.
 * @throws NumberFormatException if the string is not a valid
representation of a number.
 */
public actual fun String.toShort(): Short = toShortOrNull() ?:
numberFormatError(this)
/**
 * Parses the string as a [Short] number and returns the result.
 * @throws
NumberFormatException if the string is not a valid representation of a number.
 * @throws
IllegalArgumentException when [radix] is not a valid radix for string to number conversion.
 */
public actual fun
String.toShort(radix: Int): Short = toShortOrNull(radix) ?: numberFormatError(this)
/**
 * Parses the string as
an [Int] number and returns the result.
 * @throws NumberFormatException if the string is not a valid
representation of a number.
 */
public actual fun String.toInt(): Int = toIntOrNull() ?:
numberFormatError(this)
/**
 * Parses the string as an [Int] number and returns the result.
 * @throws
NumberFormatException if the string is not a valid representation of a number.
 * @throws
IllegalArgumentException when [radix] is not a valid radix for string to number conversion.
 */
public actual fun
String.toInt(radix: Int): Int = toIntOrNull(radix) ?: numberFormatError(this)
/**
 * Parses the string as a [Long]
number and returns the result.
 * @throws NumberFormatException if the string is not a valid representation of a
number.
 */
public actual fun String.toLong(): Long = toLongOrNull() ?: numberFormatError(this)
/**
 * Parses the string as a [Long] number and returns the result.
 * @throws NumberFormatException if the string is not
a valid representation of a number.
 * @throws IllegalArgumentException when [radix] is not a valid radix for
string to number conversion.
 */
public actual fun
String.toLong(radix: Int): Long = toLongOrNull(radix) ?:
numberFormatError(this)
/**
 * Parses the string as a [Double] number and returns the result.
 * @throws
NumberFormatException if the string is not a valid representation of a number.
 */
public actual fun
String.toDouble(): Double = +(this.asDynamic()).unsafeCast<Double>().also {
    if (it.isNaN() && !this.isNaN())

```



```

RegexOption) : this(pattern, setOf(option))\n\n /** Creates a regular expression from the specified [pattern] string
and the default options. */\n public actual constructor(pattern: String) : this(pattern, emptySet())\n\n /** The
pattern string of this regular expression. */\n public actual val pattern: String = pattern\n\n /** The set of options
that were used to create this regular expression. */\n public actual val options: Set<RegexOption> =
options.toSet()\n private val nativePattern: RegExp = RegExp(pattern, options.toFlags("gu"))\n private var
nativeStickyPattern: RegExp? = null\n private fun initStickyPattern(): RegExp =\n nativeStickyPattern ?:
RegExp(pattern, options.toFlags("yu")).also { nativeStickyPattern = it }\n\n private var
nativeMatchesEntirePattern: RegExp? = null\n private fun initMatchesEntirePattern(): RegExp =\n nativeMatchesEntirePattern ?: run {\n if (pattern.startsWith('^') && pattern.endsWith('$'))\n nativePattern\n else\n return RegExp("^${pattern.trimStart('^').trimEnd('$')}\$"),
options.toFlags("gu"))\n }.also { nativeMatchesEntirePattern = it }\n\n\n /** Indicates whether the regular
expression matches the entire [input]. */\n public actual infix fun matches(input: CharSequence): Boolean {\n
nativePattern.reset()\n val match = nativePattern.exec(input.toString())\n return match != null &&
match.index == 0 && nativePattern.lastIndex == input.length\n }\n\n\n /** Indicates whether the regular
expression can find at least one match in the specified [input]. */\n public actual fun containsMatchIn(input:
CharSequence): Boolean {\n nativePattern.reset()\n return nativePattern.test(input.toString())\n }\n\n
@SinceKotlin("1.5")\n @ExperimentalStdlibApi\n public actual fun matchesAt(input: CharSequence, index:
Int): Boolean {\n if (index < 0 || index > input.length) {\n throw IndexOutOfBoundsException("index
out of bounds: $index, input length: ${input.length}")\n }\n val pattern = initStickyPattern()\n
pattern.lastIndex = index\n return pattern.test(input.toString())\n }\n\n\n /**\n * Returns the first match of a
regular expression in the [input], beginning at the specified [startIndex].\n * @param startIndex An index to
start search with, by default 0. Must be not less than zero and not greater than `input.length()`\n * @return An
instance of [MatchResult] if match was found or `null` otherwise.\n * @throws IndexOutOfBoundsException if
[startIndex] is less than zero or greater than the length of the [input] char sequence.\n * @sample
samples.text.Regexp.find\n */\n
@Suppress("ACTUAL_FUNCTION_WITH_DEFAULT_ARGUMENTS")\n public actual fun find(input:
CharSequence, startIndex: Int = 0): MatchResult? {\n if (startIndex < 0 || startIndex > input.length) {\n
throw IndexOutOfBoundsException("Start index out of bounds: $startIndex, input length: ${input.length}")\n
}\n return nativePattern.findNext(input.toString(), startIndex, nativePattern)\n }\n\n\n /**\n * Returns a
sequence of all occurrences of a regular expression within the [input] string, beginning at the specified
[startIndex].\n * @throws IndexOutOfBoundsException if [startIndex] is less than zero or greater than the
length of the [input] char sequence.\n * @sample samples.text.Regexp.findAll\n */\n
@Suppress("ACTUAL_FUNCTION_WITH_DEFAULT_ARGUMENTS")\n public actual fun findAll(input:
CharSequence, startIndex: Int = 0): Sequence<MatchResult> {\n if (startIndex < 0 || startIndex > input.length)
{\n throw IndexOutOfBoundsException("Start index out of bounds: $startIndex, input length:
${input.length}")\n }\n return generateSequence({ find(input, startIndex) }, { match -> match.next() })\n
}\n\n\n /**\n * Attempts to match the entire [input] CharSequence against the pattern.\n * @return An
instance of [MatchResult] if the entire input matches or `null` otherwise.\n */\n public actual fun
matchEntire(input: CharSequence): MatchResult? =\n initMatchesEntirePattern().findNext(input.toString(), 0,
nativePattern)\n\n @SinceKotlin("1.5")\n @ExperimentalStdlibApi\n public actual fun matchAt(input:
CharSequence, index: Int): MatchResult? {\n if (index < 0 || index > input.length) {\n throw
IndexOutOfBoundsException("index out of bounds: $index, input length: ${input.length}")\n }\n return
initStickyPattern().findNext(input.toString(), index, nativePattern)\n }\n\n\n /**\n * Replaces all occurrences
of this regular expression in the specified [input] string with specified [replacement] expression.\n * @return An
instance of [MatchResult] if the entire input matches or `null` otherwise.\n * The
replacement string may contain references to the captured groups during a match. Occurrences of `\$index` in
the replacement string will be substituted with the subsequences corresponding to the captured groups with the
specified index.\n * The first digit after '$' is always treated as part of group reference. Subsequent digits are
incorporated\n * into `index` only if they would form a valid group reference. Only the digits '0'..'9' are considered

```

as potential components of the group reference. Note that indexes of captured groups start from 1, and the group with index 0 is the whole match.

Backslash character `\"` can be used to include the succeeding character as a literal in the replacement string, e.g. `\"` or `\"`. `[Regex.escapeReplacement]` can be used if [replacement] have to be treated as a literal string.

Note that referring named capturing groups by name is currently not supported in Kotlin/JS. However, you can still refer them by index.

`@param` input the char sequence to find matches of this regular expression in `@param` replacement the expression to replace found matches with `@return` the result of replacing each occurrence of this regular expression in [input] with the result of evaluating the [replacement] expression `@throws` RuntimeException if [replacement] expression is malformed, or capturing group with specified ``name`` or ``index`` does not exist

```

public actual fun
replace(input: CharSequence, replacement: String): String {
    if (!replacement.contains("\\") &&
        !replacement.contains('$')) {
        return input.toString().nativeReplace(nativePattern, replacement)
    }
    return replace(input) { substituteGroupRefs(it, replacement) }
}
/**
 * Replaces all occurrences of this
 * regular expression in the specified [input] string with the result of
 * the given function [transform] that takes
 * [MatchResult] and returns a string to be used as a
 * replacement for that match.
public actual fun
replace(input: CharSequence, transform: (MatchResult) -> CharSequence): String {
    var match = find(input)
    if (match == null) return input.toString()
    var lastStart = 0
    val length = input.length
    val sb =
    StringBuilder(length)
    do {
        val foundMatch = match!!
        sb.append(input, lastStart,
        foundMatch.range.start)
        sb.append(transform(foundMatch))
        lastStart =
        foundMatch.range.endInclusive + 1
        match = foundMatch.next()
    } while (lastStart < length && match
    != null)
    if (lastStart < length) {
        sb.append(input, lastStart, length)
    }
    return
    sb.toString()
}
/**
 * Replaces the first occurrence of this regular expression in the specified [input]
 * string with specified [replacement] expression.
 * The replacement string may contain references to the
 * captured groups during a match. Occurrences of `index` in the replacement string will be substituted with the
 * subsequences corresponding to the captured groups with the specified index.
 * The first digit after `$` is always
 * treated as part of group reference. Subsequent digits are incorporated
 * into `index` only if they would form a
 * valid group reference. Only the digits '0'..'9' are considered as potential components
 * of the group reference.
 * Note that indexes of captured groups start from 1, and the group with index 0 is the whole match.
 * Backslash character \" can be used to include the succeeding character as a literal in the replacement string, e.g. \"
 * or \". [Regex.escapeReplacement] can be used if [replacement] have to be treated as a literal string.
 * Note that referring named capturing groups by name is not supported currently in Kotlin/JS. However, you
 * can still refer them by index.
 * @param input the char sequence to find a match of this regular expression
 * in
 * @param replacement the expression to replace the found match with
 * @return the result of replacing
 * the first occurrence of this regular expression in [input] with the result of evaluating the [replacement] expression
 * @throws RuntimeException if [replacement] expression is malformed, or capturing group with specified `name`
 * or `index` does not exist
public actual fun replaceFirst(input: CharSequence, replacement: String): String {
    if (!replacement.contains("\\") && !replacement.contains('$')) {
        val nonGlobalOptions =
        options.toFlags("u")
        return input.toString().nativeReplace(RegExp(pattern, nonGlobalOptions),
        replacement)
    }
    val match = find(input) ?: return input.toString()
    return buildString {
        append(input.substring(0, match.range.first))
        append(substituteGroupRefs(match, replacement))
        append(input.substring(match.range.last + 1, input.length))
    }
}
/**
 * Splits the [input]
 * CharSequence to a list of strings around matches of this regular expression.
 * @param limit Non-negative
 * value specifying the maximum number of substrings the string can be split to.
 * Zero by default means no limit
 * is set.
public actual fun
split(input: CharSequence, limit: Int = 0): List<String> {
    requireNonNegativeLimit(limit)
    val matches =
    findAll(input).let { if (limit == 0) it else it.take(limit - 1) }
    val result = mutableListOf<String>()
    var
    lastStart = 0
    for (match in matches) {
        result.add(input.subSequence(lastStart,
        match.range.start).toString())
        lastStart = match.range.endInclusive + 1
    }
    result.add(input.subSequence(lastStart, input.length).toString())
    return result
}
/**
 * Splits the

```

```

[input] CharSequence to a sequence of strings around matches of this regular expression.\n
 * @param limit Non-negative value specifying the maximum number of substrings the string can be split to.\n
 * Zero by default means no limit is set.\n
 * @sample samples.text.Regexps.splitToSequence\n
 * @SinceKotlin("1.6")\n
 @WasExperimental(ExperimentalStdlibApi::class)\n
 @Suppress("ACTUAL_FUNCTION_WITH_DEFAULT_ARGUMENTS")\n
 public actual fun splitToSequence(input: CharSequence, limit: Int = 0): Sequence<String> {\n
 requireNonNegativeLimit(limit)\n
 return sequence {\n
 var match = find(input)\n
 if (match == null || limit == 1) {\n
 yield(input.toString())\n
 return@sequence\n
 }\n
 var nextStart = 0\n
 var splitCount = 0\n
 do {\n
 val foundMatch = match!!\n
 yield(input.substring(nextStart, foundMatch.range.first))\n
 nextStart = foundMatch.range.endInclusive + 1\n
 match = foundMatch.next()\n
 } while (++splitCount != limit - 1 && match != null)\n
 yield(input.substring(nextStart, input.length))\n
 }\n
 }\n
 /**\n
 * Returns the string representation of this regular expression, namely the [pattern] of this regular expression.\n
 * Note that another regular expression constructed from the same pattern string may have different [options] and may match strings differently.\n
 * public override fun toString(): String = nativePattern.toString()\n
 actual companion object {\n
 /**\n
 * Returns a regular expression that matches the specified [literal] string literally.\n
 * No characters of that string will have special meaning when searching for an occurrence of the regular expression.\n
 * public actual fun fromLiteral(literal: String): Regex = Regex(escape(literal))\n
 /**\n
 * Returns a regular expression pattern string that matches the specified [literal] string literally.\n
 * No characters of that string will have special meaning when searching for an occurrence of the regular expression.\n
 * public actual fun escape(literal: String): String = literal.nativeReplace(patternEscape, "\\|\\$&\\")\n
 /**\n
 * Returns a literal replacement expression for the specified [literal] string.\n
 * No characters of that string will have special meaning when it is used as a replacement string in [Regex.replace] function.\n
 * public actual fun escapeReplacement(literal: String): String = literal.nativeReplace(replacementEscape, "\\|\\$&\\")\n
 private val patternEscape = Regex("\\|\\$*+?.()|\\|\\{\\}\\|\\|\\|", "g")\n
 private val replacementEscape = Regex("\\|\\$|\\$|\\|", "g")\n
 internal fun nativeEscapeReplacement(literal: String): String = literal.nativeReplace(nativeReplacementEscape, "\\$\\$\\$")\n
 private val nativeReplacementEscape = Regex("\\|\\|\\$|\\|\\|", "g")\n
 } }\n
 private fun Regex.findNext(input: String, from: Int, nextPattern: Regex): MatchResult? {\n
 this.lastIndex = from\n
 val match = exec(input)\n
 if (match == null) return null\n
 val range = match.index..lastIndex - 1\n
 return object : MatchResult {\n
 override val range: IntRange = range\n
 override val value: String\n
 get() = match[0]!\n
 override val groups: MatchGroupCollection = object : MatchGroupCollection, AbstractCollection<MatchGroup?>() {\n
 override val size: Int get() = match.length\n
 override fun iterator(): Iterator<MatchGroup?> = indices.asSequence().map { this[it] }.iterator()\n
 override fun get(index: Int): MatchGroup? = match[index]?.let { MatchGroup(it) }\n
 }\n
 private var groupValues_: List<String?> = null\n
 override val groupValues: List<String>\n
 get() {\n
 if (groupValues_ == null) {\n
 groupValues_ = object : AbstractList<String>() {\n
 override val size: Int get() = match.length\n
 override fun get(index: Int): String = match[index] ?: ""\n
 }\n
 }\n
 return groupValues_!!\n
 }\n
 override fun next(): MatchResult? =\n
 nextPattern.findNext(input, if (range.isEmpty()) advanceToNextCharacter(range.start) else range.endInclusive + 1, nextPattern)\n
 private fun advanceToNextCharacter(index: Int): Int {\n
 if (index < input.lastIndex) {\n
 val code1 = input.asDynamic().charCodeAt(index).unsafeCast<Int>()\n
 if (code1 in 0xD800..0xDBFF) {\n
 val code2 = input.asDynamic().charCodeAt(index + 1).unsafeCast<Int>()\n
 if (code2 in 0xDC00..0xDFFF) {\n
 return index + 2\n
 }\n
 }\n
 }\n
 return index + 1\n
 }\n
 }\n
 }\n
 // The same code from K/N Regex.kt\n
 private fun substituteGroupRefs(match: MatchResult, replacement: String): String {\n
 var index = 0\n
 val result = StringBuilder(replacement.length)\n
 while (index < replacement.length) {\n
 val char = replacement[index++]\n
 if (char == "\\|") {\n
 if (index == replacement.length)\n
 throw IllegalArgumentException("The Char to be escaped is missing")\n
 }

```

```

result.append(replacement[index++])\n    } else if (char == '$') {\n        if (index == replacement.length)\n            throw IllegalArgumentException("Capturing group index is missing")\n        if (replacement[index] == '{')\n            throw IllegalArgumentException("Named capturing group reference currently is not supported")\n        if (replacement[index] !in '0'..'9')\n            throw IllegalArgumentException("Invalid capturing group reference")\n        val endIndex = replacement.readGroupIndex(index, match.groupValues.size)\n        val groupIndex = replacement.substring(index, endIndex).toInt()\n        if (groupIndex >= match.groupValues.size)\n            throw IndexOutOfBoundsException("Group with index $groupIndex does not exist")\n        result.append(match.groupValues[groupIndex])\n        index = endIndex\n    } else {\n        result.append(char)\n    }\n}\nreturn result.toString()\n}\n\nprivate fun String.readGroupIndex(startIndex: Int, groupCount: Int): Int {\n    // at least one digit after '$' is always captured\n    var index = startIndex + 1\n    var groupIndex = this[startIndex] - '0'\n    // capture the largest valid group index\n    while (index < length && this[index] in '0'..'9') {\n        val newGroupIndex = (groupIndex * 10) + (this[index] - '0')\n        if (newGroupIndex in 0 until groupCount) {\n            groupIndex = newGroupIndex\n            index++\n        } else {\n            break\n        }\n    }\n    return index\n}\n\n/*\n * Copyright 2010-2020 JetBrains s.r.o. and Kotlin Programming Language contributors.\n * Use of this source code is governed by the Apache 2.0 license that can be found in the license/LICENSE.txt file.\n */\n\n@file:kotlin.jvm.JvmMultifileClass\n@file:kotlin.jvm.JvmName("StringsKt")\n@file:Suppress("EXTENSION_SHADOWED_BY_MEMBER")\n\npackage kotlin.text\n\nimport kotlin.contracts.*\n\n * A mutable sequence of characters.\n * String builder can be used to efficiently perform multiple string manipulation operations.\n * expect class StringBuilder : Appendable, CharSequence {\n * Constructs an empty string builder.\n * constructor()\n * Constructs an empty string builder with the specified initial [capacity].\n * constructor(capacity: Int)\n * Constructs a string builder that contains the same characters as the specified [content] char sequence.\n * constructor(content: CharSequence)\n * Constructs a string builder that contains the same characters as the specified [content] string.\n * @SinceKotlin("1.3")\n * @ExperimentalStdlibApi\n * constructor(content: String)\n * override val length: Int\n * override operator fun get(index: Int): Char\n * override fun subSequence(startIndex: Int, endIndex: Int): CharSequence\n * override fun append(value: Char): StringBuilder\n * override fun append(value: CharSequence?): StringBuilder\n * override fun append(value: CharSequence?, startIndex: Int, endIndex: Int): StringBuilder\n * Reverses the contents of this string builder and returns this instance.\n * Surrogate pairs included in this string builder are treated as single characters.\n * Therefore, the order of the high-low surrogates is never reversed.\n * Note that the reverse operation may produce new surrogate pairs that were unpaired low-surrogates and high-surrogates before the operation.\n * For example, reversing `"\uDC00\uD800"` produces `"\uD800\uDC00"` which is a valid surrogate pair.\n * fun reverse(): StringBuilder\n * Appends the string representation of the specified object [value] to this string builder and returns this instance.\n * The overall effect is exactly as if the [value] were converted to a string by the `value.toString()` method,\n * and then that string was appended to this string builder.\n * fun append(value: Any?): StringBuilder\n * Appends the string representation of the specified boolean [value] to this string builder and returns this instance.\n * The overall effect is exactly as if the [value] were converted to a string by the `value.toString()` method,\n * and then that string was appended to this string builder.\n * @SinceKotlin("1.3")\n * fun append(value: Boolean): StringBuilder\n * Appends characters in the specified character array [value] to this string builder and returns this instance.\n * Characters are appended in order, starting at the index 0.\n * @SinceKotlin("1.4")\n * @WasExperimental(ExperimentalStdlibApi::class)\n * fun append(value: CharArray): StringBuilder\n * Appends the specified string [value] to this string builder and returns this instance.\n * If [value] is `null`, then the four characters `"\u0000\u0000\u0000\u0000"` are appended.\n * @SinceKotlin("1.3")\n * fun append(value: String?): StringBuilder\n * Returns the current capacity of this string builder.\n * The capacity is the maximum length this string builder can have before an allocation occurs.\n * @SinceKotlin("1.3")\n * @ExperimentalStdlibApi\n * @Deprecated("Obtaining StringBuilder capacity is not supported in JS and common code.", level = DeprecationLevel.ERROR)\n * fun capacity(): Int\n *

```

Ensures that the capacity of this string builder is at least equal to the specified [minimumCapacity].\n * \n * If the current capacity is less than the [minimumCapacity], a new backing storage is allocated with greater capacity.\n * Otherwise, this method takes no action and simply returns.\n * \n @SinceKotlin("1.4")\n @WasExperimental(ExperimentalStdlibApi::class)\n fun ensureCapacity(minimumCapacity: Int)\n /**\n * Returns the index within this string builder of the first occurrence of the specified [string].\n * \n * Returns -1 if the specified [string] does not occur in this string builder.\n * \n @SinceKotlin("1.4")\n @WasExperimental(ExperimentalStdlibApi::class)\n fun indexOf(string: String): Int\n /**\n * Returns the index within this string builder of the first occurrence of the specified [string],\n * starting at the specified [startIndex].\n * \n * Returns -1 if the specified [string] does not occur in this string builder starting at the specified [startIndex].\n * \n @SinceKotlin("1.4")\n @WasExperimental(ExperimentalStdlibApi::class)\n fun indexOf(string: String, startIndex: Int): Int\n /**\n * Returns the index within this string builder of the last occurrence of the specified [string].\n * The last occurrence of empty string ```` is considered to be at the index equal to `this.length`.\n * \n * Returns -1 if the specified [string] does not occur in this string builder.\n * \n @SinceKotlin("1.4")\n @WasExperimental(ExperimentalStdlibApi::class)\n fun lastIndexOf(string: String): Int\n /**\n * Returns the index within this string builder of the last occurrence of the specified [string],\n * starting from the specified [startIndex] toward the beginning.\n * \n * Returns -1 if the specified [string] does not occur in this string builder starting at the specified [startIndex].\n * \n @SinceKotlin("1.4")\n @WasExperimental(ExperimentalStdlibApi::class)\n fun lastIndexOf(string: String, startIndex: Int): Int\n /**\n * Inserts the string representation of the specified boolean [value] into this string builder at the specified [index] and returns this instance.\n * \n * The overall effect is exactly as if the [value] were converted to a string by the `value.toString()` method,\n * and then that string was inserted into this string builder at the specified [index].\n * \n * @throws IndexOutOfBoundsException if [index] is less than zero or greater than the length of this string builder.\n * \n @SinceKotlin("1.4")\n @WasExperimental(ExperimentalStdlibApi::class)\n fun insert(index: Int, value: Boolean): StringBuilder\n /**\n * Inserts the specified character [value] into this string builder at the specified [index] and returns this instance.\n * \n * @throws IndexOutOfBoundsException if [index] is less than zero or greater than the length of this string builder.\n * \n @SinceKotlin("1.4")\n @WasExperimental(ExperimentalStdlibApi::class)\n fun insert(index: Int, value: Char): StringBuilder\n /**\n * Inserts characters in the specified character array [value] into this string builder at the specified [index] and returns this instance.\n * \n * The inserted characters go in same order as in the [value] character array, starting at [index].\n * \n * @throws IndexOutOfBoundsException if [index] is less than zero or greater than the length of this string builder.\n * \n @SinceKotlin("1.4")\n @WasExperimental(ExperimentalStdlibApi::class)\n fun insert(index: Int, value: CharArray): StringBuilder\n /**\n * Inserts characters in the specified character sequence [value] into this string builder at the specified [index] and returns this instance.\n * \n * The inserted characters go in the same order as in the [value] character sequence, starting at [index].\n * \n * @param index the position in this string builder to insert at.\n * @param value the character sequence from which characters are inserted. If [value] is `null`, then the four characters ````null`` are inserted.\n * \n * @throws IndexOutOfBoundsException if [index] is less than zero or greater than the length of this string builder.\n * \n @SinceKotlin("1.4")\n @WasExperimental(ExperimentalStdlibApi::class)\n fun insert(index: Int, value: CharSequence?): StringBuilder\n /**\n * Inserts the string representation of the specified object [value] into this string builder at the specified [index] and returns this instance.\n * \n * The overall effect is exactly as if the [value] were converted to a string by the `value.toString()` method,\n * and then that string was inserted into this string builder at the specified [index].\n * \n * @throws IndexOutOfBoundsException if [index] is less than zero or greater than the length of this string builder.\n * \n @SinceKotlin("1.4")\n @WasExperimental(ExperimentalStdlibApi::class)\n fun insert(index: Int, value: Any?): StringBuilder\n /**\n * Inserts the string [value] into this string builder at the specified [index] and returns this instance.\n * \n * If [value] is `null`, then the four characters ````null`` are inserted.\n * \n * @throws IndexOutOfBoundsException if [index] is less than zero or greater than the length of this string builder.\n * \n @SinceKotlin("1.4")\n @WasExperimental(ExperimentalStdlibApi::class)\n fun insert(index: Int, value: String?): StringBuilder\n

```

/**\n * Sets the length of this string builder to the specified [newLength].\n *\n * If the [newLength] is less
than the current length, it is changed to the specified [newLength].\n * Otherwise, null characters '\u0000' are
appended to this string builder until its length is less than the [newLength].\n *\n * Note that in Kotlin/JS [set]
operator function has non-constant execution time complexity.\n * Therefore, increasing length of this string
builder and then updating each character by index may slow down your program.\n *\n * @throws
IndexOutOfBoundsException or [IllegalArgumentException] if [newLength] is less than zero.\n *\n
@SinceKotlin("1.4")\n @WasExperimental(ExperimentalStdlibApi::class)\n fun setLength(newLength:
Int)\n\n /**\n * Returns a new [String] that contains characters in this string builder at [startIndex] (inclusive)
and up to the [length] (exclusive).\n *\n * @throws IndexOutOfBoundsException if [startIndex] is less than
zero or greater than the length of this string builder.\n *\n @SinceKotlin("1.4")\n
@WasExperimental(ExperimentalStdlibApi::class)\n fun substring(startIndex: Int): String\n\n /**\n * Returns
a new [String] that contains characters in this string builder at [startIndex] (inclusive) and up to the [endIndex]
(exclusive).\n *\n * @throws IndexOutOfBoundsException or [IllegalArgumentException] when [startIndex]
or [endIndex] is out of range of this string builder indices or when `startIndex > endIndex`.\n *\n
@SinceKotlin("1.4")\n @WasExperimental(ExperimentalStdlibApi::class)\n fun substring(startIndex: Int,
endIndex: Int): String\n\n /**\n * Attempts to reduce storage used for this string builder.\n *\n * If the
backing storage of this string builder is larger than necessary to hold its current contents,\n * then it may be
resized to become more space efficient.\n * Calling this method may, but is not required to, affect the value of the
[capacity] property.\n *\n @SinceKotlin("1.4")\n @WasExperimental(ExperimentalStdlibApi::class)\n
fun trimToSize()\n}\n\n/**\n * Clears the content of this string builder making it empty and returns this instance.\n
*\n * @sample samples.text.Strings.clearStringBuilder\n *\n@SinceKotlin("1.3")\npublic expect fun
StringBuilder.clear(): StringBuilder\n\n/**\n * Sets the character at the specified [index] to the specified [value].\n
*\n * @throws IndexOutOfBoundsException if [index] is out of bounds of this string builder.\n
*\n @SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\npublic expect operator fun
StringBuilder.set(index: Int, value: Char)\n\n/**\n * Replaces characters in the specified range of this string builder
with characters in the specified string [value] and returns this instance.\n *\n * @param startIndex the beginning
(inclusive) of the range to replace.\n * @param endIndex the end (exclusive) of the range to replace.\n * @param
value the string to replace with.\n *\n * @throws IndexOutOfBoundsException or [IllegalArgumentException] if
[startIndex] is less than zero, greater than the length of this string builder, or `startIndex > endIndex`.\n
*\n @SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\npublic expect fun
StringBuilder.setRange(startIndex: Int, endIndex: Int, value: String): StringBuilder\n\n/**\n * Removes the
character at the specified [index] from this string builder and returns this instance.\n *\n * If the `Char` at the
specified [index] is part of a supplementary code point, this method does not remove the entire supplementary
character.\n *\n * @param index the index of `Char` to remove.\n *\n * @throws IndexOutOfBoundsException if
[index] is out of bounds of this string builder.\n
*\n @SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\npublic expect fun
StringBuilder.deleteAt(index: Int): StringBuilder\n\n/**\n * Removes characters in the specified range from this
string builder and returns this instance.\n *\n * @param startIndex the beginning (inclusive) of the range to
remove.\n * @param endIndex the end (exclusive) of the range to remove.\n *\n * @throws
IndexOutOfBoundsException or [IllegalArgumentException] when [startIndex] is out of range of this string builder
indices or when `startIndex > endIndex`.\n
*\n @SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\npublic expect fun
StringBuilder.deleteRange(startIndex: Int, endIndex: Int): StringBuilder\n\n/**\n * Copies characters from this
string builder into the [destination] character array.\n *\n * @param destination the array to copy to.\n * @param
destinationOffset the position in the array to copy to, 0 by default.\n * @param startIndex the beginning (inclusive)
of the range to copy, 0 by default.\n * @param endIndex the end (exclusive) of the range to copy, length of this
string builder by default.\n *\n * @throws IndexOutOfBoundsException or [IllegalArgumentException] when
[startIndex] or [endIndex] is out of range of this string builder indices or when `startIndex > endIndex`.\n
*\n @throws

```

IndexOutOfBoundsException when the subrange doesn't fit into the [destination] array starting at the specified [destinationOffset],\n * or when that index is out of the [destination] array indices range.\n

```
*\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\npublic expect fun
StringBuilder.toCharArray(destination: CharArray, destinationOffset: Int = 0, startIndex: Int = 0, endIndex: Int =
this.length)\n\n**\n * Appends characters in a subarray of the specified character array [value] to this string builder
and returns this instance.\n * \n * Characters are appended in order, starting at specified [startIndex].\n * \n * @param
value the array from which characters are appended.\n * @param startIndex the beginning (inclusive) of the
subarray to append.\n * @param endIndex the end (exclusive) of the subarray to append.\n * \n * @throws
IndexOutOfBoundsException or [IllegalArgumentException] when [startIndex] or [endIndex] is out of range of the
[value] array indices or when `startIndex > endIndex`.\n
```

```
*\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\npublic expect fun
StringBuilder.appendRange(value: CharArray, startIndex: Int, endIndex: Int): StringBuilder\n\n**\n * Appends a
subsequence of the specified character sequence [value] to this string builder and returns this instance.\n * \n *
@param value the character sequence from which a subsequence is appended.\n * @param startIndex the beginning
(inclusive) of the subsequence to append.\n * @param endIndex the end (exclusive) of the subsequence to append.\n
*\n * @throws IndexOutOfBoundsException or [IllegalArgumentException] when [startIndex] or [endIndex] is out
of range of the [value] character sequence indices or when `startIndex > endIndex`.\n
```

```
*\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\npublic expect fun
StringBuilder.appendRange(value: CharSequence, startIndex: Int, endIndex: Int): StringBuilder\n\n**\n * Inserts
characters in a subarray of the specified character array [value] into this string builder at the specified [index] and
returns this instance.\n * \n * The inserted characters go in same order as in the [value] array, starting at [index].\n
*\n * @param index the position in this string builder to insert at.\n * @param value the array from which characters
are inserted.\n * @param startIndex the beginning (inclusive) of the subarray to insert.\n * @param endIndex the
end (exclusive) of the subarray to insert.\n * \n * @throws IndexOutOfBoundsException or
[IllegalArgumentException] when [startIndex] or [endIndex] is out of range of the [value] array indices or when
`startIndex > endIndex`.\n * @throws IndexOutOfBoundsException if [index] is less than zero or greater than the
length of this string builder.\n
```

```
*\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\npublic expect fun
StringBuilder.insertRange(index: Int, value: CharArray, startIndex: Int, endIndex: Int): StringBuilder\n\n**\n *
Inserts characters in a subsequence of the specified character sequence [value] into this string builder at the
specified [index] and returns this instance.\n * \n * The inserted characters go in the same order as in the [value]
character sequence, starting at [index].\n * \n * @param index the position in this string builder to insert at.\n
*\n * @param value the character sequence from which a subsequence is inserted.\n * @param startIndex the beginning
(inclusive) of the subsequence to insert.\n * @param endIndex the end (exclusive) of the subsequence to insert.\n
*\n * @throws IndexOutOfBoundsException or [IllegalArgumentException] when [startIndex] or [endIndex] is out of
range of the [value] character sequence indices or when `startIndex > endIndex`.\n * @throws IndexOutOfBoundsException
if [index] is less than zero or greater than the length of this string builder.\n
```

```
*\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\npublic expect fun
StringBuilder.insertRange(index: Int, value: CharSequence, startIndex: Int, endIndex: Int):
StringBuilder\n\n@Suppress("EXTENSION_SHADOWED_BY_MEMBER")\n@Deprecated("Use
append(value: Any?) instead", ReplaceWith("append(value = obj)"),
DeprecationLevel.WARNING)\n@kotlin.internal.InlineOnly\npublic inline fun StringBuilder.append(obj: Any?):
StringBuilder = this.append(obj)\n\n**\n * Builds new string by populating newly created [StringBuilder] using
provided [builderAction]\n * and then converting it to [String].\n *\n@kotlin.internal.InlineOnly\npublic inline fun
buildString(builderAction: StringBuilder.() -> Unit): String {\n    contract { callsInPlace(builderAction,
InvocationKind.EXACTLY_ONCE) }\n    return StringBuilder().apply(builderAction).toString()\n}\n\n**\n *
Builds new string by populating newly created [StringBuilder] initialized with the given [capacity]\n * using
provided [builderAction] and then converting it to [String].\n
```



```

*^@SinceKotlin("1.1")^@kotlin.internal.InlineOnly^public inline fun buildString(capacity: Int, builderAction:
StringBuilder() -> Unit): String {
    contract { callsInPlace(builderAction, InvocationKind.EXACTLY_ONCE) }
    return StringBuilder(capacity).apply(builderAction).toString()
}
* Appends all arguments to the
given StringBuilder.
^public fun StringBuilder.append(vararg value: String?): StringBuilder {
    for (item in value)
        append(item)
    return this
}
* Appends all arguments to the given StringBuilder.
^public fun StringBuilder.append(vararg value: Any?): StringBuilder {
    for (item in value)
        append(item)
    return this
}
* Appends a line feed character ('\n') to this StringBuilder.
*^@SinceKotlin("1.4")^@kotlin.internal.InlineOnly^public inline fun StringBuilder.appendLine():
StringBuilder = append("\n")
* Appends [value] to this [StringBuilder], followed by a line feed character
('\n').
*^@SinceKotlin("1.4")^@kotlin.internal.InlineOnly^public inline fun StringBuilder.appendLine(value:
CharSequence?): StringBuilder = append(value).appendLine()
* Appends [value] to this [StringBuilder],
followed by a line feed character ('\n').
*^@SinceKotlin("1.4")^@kotlin.internal.InlineOnly^public inline fun
StringBuilder.appendLine(value: String?): StringBuilder = append(value).appendLine()
* Appends [value] to
this [StringBuilder], followed by a line feed character ('\n').
*^@SinceKotlin("1.4")^@kotlin.internal.InlineOnly^public inline fun StringBuilder.appendLine(value: Any?):
StringBuilder = append(value).appendLine()
* Appends [value] to this [StringBuilder], followed by a line feed
character ('\n').
*^@SinceKotlin("1.4")^@kotlin.internal.InlineOnly^public inline fun
StringBuilder.appendLine(value: CharArray): StringBuilder = append(value).appendLine()
* Appends [value]
to this [StringBuilder], followed by a line feed character ('\n').
*^@SinceKotlin("1.4")^@kotlin.internal.InlineOnly^public inline fun StringBuilder.appendLine(value: Char):
StringBuilder = append(value).appendLine()
* Appends [value] to this [StringBuilder], followed by a line feed
character ('\n').
*^@SinceKotlin("1.4")^@kotlin.internal.InlineOnly^public inline fun
StringBuilder.appendLine(value: Boolean): StringBuilder = append(value).appendLine()
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2021 JetBrains s.r.o. and Kotlin Programming Language contributors.
* Use of this source code is governed by the
Apache 2.0 license that can be found in the license/LICENSE.txt file.
^package kotlin.text
^import
kotlin.js.RegExp
^internal actual inline fun String.nativeIndexOf(ch: Char,
fromIndex: Int): Int = nativeIndexOf(ch.toString(), fromIndex)
^internal actual
inline fun String.nativeLastIndexOf(ch: Char, fromIndex: Int): Int = nativeLastIndexOf(ch.toString(),
fromIndex)
* Returns `true` if this string starts with the specified prefix.
*^@Suppress("ACTUAL_FUNCTION_WITH_DEFAULT_ARGUMENTS")^public actual fun
String.startsWith(prefix: String, ignoreCase: Boolean = false): Boolean {
    if (!ignoreCase)
        return
        nativeStartsWith(prefix, 0)
    else
        return regionMatches(0, prefix, 0, prefix.length, ignoreCase)
}
* Returns `true` if a substring of this string starting at the specified offset [startIndex] starts with the specified prefix.
*^@Suppress("ACTUAL_FUNCTION_WITH_DEFAULT_ARGUMENTS")^public actual fun
String.startsWith(prefix: String, startIndex: Int, ignoreCase: Boolean = false): Boolean {
    if (!ignoreCase)
        return nativeStartsWith(prefix, startIndex)
    else
        return regionMatches(startIndex, prefix, 0, prefix.length,
        ignoreCase)
}
* Returns `true` if this string ends with the specified suffix.
*^@Suppress("ACTUAL_FUNCTION_WITH_DEFAULT_ARGUMENTS")^public actual fun
String.endsWith(suffix: String, ignoreCase: Boolean = false): Boolean {
    if (!ignoreCase)
        return
        nativeEndsWith(suffix)
    else
        return regionMatches(length - suffix.length, suffix, 0, suffix.length,
        ignoreCase)
}
^@Deprecated("Use Regex.matches() instead",
ReplaceWith("regex.toRegex().matches(this)"))^@DeprecatedSinceKotlin(warningSince = "1.6")^public fun
String.matches(regex: String): Boolean {
    @Suppress("DEPRECATION")
    val result = this.match(regex)
    return result != null && result.size != 0
}
* Returns `true` if this string is empty or consists solely of
whitespace characters.
* @sample samples.text.Strings.stringIsBlank
*^public actual fun
CharSequence.isBlank(): Boolean = length == 0 || indices.all { this[it].isWhitespace() }
* Returns `true` if
this string is equal to [other], optionally ignoring character case.
* @sample samples.text.Strings.stringIsBlank
* Two strings are considered to be equal if
they have the same length and the same character at the same index.
* If [ignoreCase] is true, the result of

```

```

`Char.toUpperCaseChar().toLowerCaseChar()` on each character is compared.\n *\n * @param ignoreCase `true` to ignore
character case when comparing strings. By default `false`.\n
*\n@Suppress("ACTUAL_FUNCTION_WITH_DEFAULT_ARGUMENTS")\npublic actual fun
String?.equals(other: String?, ignoreCase: Boolean = false): Boolean {\n    if (this == null) return other == null\n    if
(other == null) return false\n    if (!ignoreCase) return this == other\n    if (this.length != other.length) return
false\n\n    for (index in 0 until this.length) {\n        val thisChar = this[index]\n        val otherChar = other[index]\n
        if (!thisChar.equals(otherChar, ignoreCase)) {\n            return false\n        }\n    }\n    return
true\n}\n\n\n@Suppress("ACTUAL_FUNCTION_WITH_DEFAULT_ARGUMENTS")\npublic actual fun
CharSequence.regionMatches(thisOffset: Int, other: CharSequence, otherOffset: Int, length: Int, ignoreCase:
Boolean = false): Boolean =\n    regionMatchesImpl(thisOffset, other, otherOffset, length, ignoreCase)\n\n\n/**\n *
Returns a copy of this string having its first letter titlecased using the rules of the default locale,\n * or the original
string if it's empty or already starts with a title case letter.\n * The title case of a character is usually the same as
its upper case with several exceptions.\n * The particular list of characters with the special title case form depends
on the underlying platform.\n *\n * @sample samples.text.Strings.capitalize\n *\n@Deprecated("Use
replaceFirstChar instead.", ReplaceWith("replaceFirstChar { if (it.isLowerCase()) it.titlecase() else it.toString()
}"))\n@DeprecatedSinceKotlin(warningSince = "1.5")\npublic actual fun String.capitalize(): String {\n    return if
(isNotEmpty()) substring(0, 1).uppercase() + substring(1) else this\n}\n\n/**\n * Returns a copy of this string having
its first letter lowercased using the rules of the default locale,\n * or the original string if it's empty or already starts
with a lower case letter.\n *\n * @sample samples.text.Strings.decitalize\n *\n@Deprecated("Use
replaceFirstChar instead.", ReplaceWith("replaceFirstChar { it.lowercase()
}"))\n@DeprecatedSinceKotlin(warningSince = "1.5")\npublic actual fun String.decitalize(): String {\n    return
if (isNotEmpty()) substring(0, 1).lowercase() + substring(1) else this\n}\n\n/**\n * Returns a string containing this
char sequence repeated [n] times.\n * @throws [IllegalArgumentException] when n < 0.\n * @sample
samples.text.Strings.repeat\n *\npublic actual fun CharSequence.repeat(n: Int): String {\n    require(n >= 0) {\n
"Count 'n' must be non-negative, but was $n." }\n    return when (n) {\n        0 -> ""\n        1 -> this.toString()\n
else -> {\n            var result = ""\n            if (!isEmpty()) {\n                var s = this.toString()\n                var count =
n\n                while (true) {\n                    if ((count and 1) == 1) {\n                        result += s\n                    }\n
                    count = count ushr 1\n                    if (count == 0) {\n                        break\n                    }\n
                    s +=
s\n                }\n            }\n            return result\n        }\n    }\n}\n\n/**\n * Returns a new string obtained by
replacing all occurrences of the [oldValue] substring in this string\n * with the specified [newValue] string.\n *\n *
@sample samples.text.Strings.replace\n
*\n@Suppress("ACTUAL_FUNCTION_WITH_DEFAULT_ARGUMENTS")\npublic actual fun
String.replace(oldValue: String, newValue: String, ignoreCase: Boolean = false): String =\n    nativeReplace(Regex(Regex.escape(oldValue), if (ignoreCase) "gui" else "gu"),
Regex.nativeEscapeReplacement(newValue))\n\n\n/**\n * Returns a new string with all occurrences of [oldChar]
replaced with [newChar].\n *\n * @sample samples.text.Strings.replace\n
*\n@Suppress("ACTUAL_FUNCTION_WITH_DEFAULT_ARGUMENTS")\npublic actual fun
String.replace(oldChar: Char, newChar: Char, ignoreCase: Boolean = false): String =\n    nativeReplace(Regex(Regex.escape(oldChar.toString()), if (ignoreCase) "gui" else "gu"),
newChar.toString())\n\n\n@Suppress("ACTUAL_FUNCTION_WITH_DEFAULT_ARGUMENTS")\npublic actual
fun String.replaceFirst(oldValue: String, newValue: String, ignoreCase: Boolean = false): String =\n    nativeReplace(Regex(Regex.escape(oldValue), if (ignoreCase) "ui" else "u"),
Regex.nativeEscapeReplacement(newValue))\n\n\n@Suppress("ACTUAL_FUNCTION_WITH_DEFAULT_ARGU
MENTS")\npublic actual fun String.replaceFirst(oldChar: Char, newChar: Char, ignoreCase: Boolean = false):
String =\n    nativeReplace(Regex(Regex.escape(oldChar.toString()), if (ignoreCase) "ui" else "u"),
newChar.toString())\n", "/*\n * Copyright 2010-2019 JetBrains s.r.o. and Kotlin Programming Language
contributors.\n * Use of this source code is governed by the Apache 2.0 license that can be found in the
license/LICENSE.txt file.\n */\n\npackage kotlin.text\n\n/** Returns the negative [size] if [throwOnMalformed] is

```

```

false, throws [CharacterCodingException] otherwise.
private fun malformed(size: Int, index: Int,
throwOnMalformed: Boolean): Int {
    if (throwOnMalformed) throw CharacterCodingException("Malformed
sequence starting at ${index - 1}")
    return -size
}
Returns code point corresponding to UTF-16
surrogate pair, where the first of the pair is the [high] and the second is in the [string] at the [index].
Returns
zero if the pair is malformed and [throwOnMalformed] is false.
throws CharacterCodingException if the
pair is malformed and [throwOnMalformed] is true.
private fun codePointFromSurrogate(string: String, high:
Int, index: Int, endIndex: Int, throwOnMalformed: Boolean): Int {
    if (high !in 0xD800..0xDBFF || index >=
endIndex) {
        return malformed(0, index, throwOnMalformed)
    }
    val low = string[index].code
    if
(low !in 0xDC00..0xDFFF) {
        return malformed(0, index, throwOnMalformed)
    }
    return 0x10000 +
((high and 0x3FF) shl 10) or (low and 0x3FF)
}
Returns code point corresponding to UTF-8 sequence of
two bytes, where the first byte of the sequence is the [byte1] and the second byte is in the [bytes] array at the
[index].
Returns zero if the sequence is malformed and [throwOnMalformed] is false.
throws
CharacterCodingException if the sequence of two bytes is malformed and [throwOnMalformed] is true.
private fun codePointFrom2(bytes: ByteArray, byte1: Int, index: Int, endIndex: Int, throwOnMalformed:
Boolean): Int {
    if (byte1 and 0x1E == 0 || index >= endIndex) {
        return malformed(0, index,
throwOnMalformed)
    }
    val byte2 = bytes[index].toInt()
    if (byte2 and 0xC0 != 0x80) {
        return
malformed(0, index, throwOnMalformed)
    }
    return (byte1 shl 6) xor byte2 xor 0xF80
}
Returns
code point corresponding to UTF-8 sequence of three bytes, where the first byte of the sequence is the [byte1]
and the others are in the [bytes] array starting from the [index].
Returns a non-positive value indicating number
of bytes from [bytes] included in malformed sequence if the sequence is malformed and [throwOnMalformed] is
false.
throws CharacterCodingException if the sequence of three bytes is malformed and
[throwOnMalformed] is true.
private fun codePointFrom3(bytes: ByteArray, byte1: Int, index: Int, endIndex:
Int, throwOnMalformed: Boolean): Int {
    if (index >= endIndex) {
        return malformed(0, index,
throwOnMalformed)
    }
    val byte2 = bytes[index].toInt()
    if (byte1 and 0xF == 0) {
        if (byte2 and
0xE0 != 0xA0) {
            // Non-shortest form
            return malformed(0, index, throwOnMalformed)
        }
    }
    else if (byte1 and 0xF == 0xD) {
        if (byte2 and 0xE0 != 0x80) {
            // Surrogate code point
            return
malformed(0, index, throwOnMalformed)
        }
    }
    else if (byte2 and 0xC0 != 0x80) {
        return
malformed(0, index, throwOnMalformed)
    }
    if (index + 1 == endIndex) {
        return malformed(1, index,
throwOnMalformed)
    }
    val byte3 = bytes[index + 1].toInt()
    if (byte3 and 0xC0 != 0x80) {
        return
malformed(1, index, throwOnMalformed)
    }
    return (byte1 shl 12) xor (byte2 shl 6) xor byte3 xor -
0x1E080
}
Returns code point corresponding to UTF-8 sequence of four bytes, where the first byte
of the sequence is the [byte1] and the others are in the [bytes] array starting from the [index].
Returns a non-
positive value indicating number of bytes from [bytes] included in malformed sequence if the sequence is
malformed and [throwOnMalformed] is false.
throws CharacterCodingException if the sequence of four
bytes is malformed and [throwOnMalformed] is true.
private fun codePointFrom4(bytes: ByteArray, byte1:
Int, index: Int, endIndex: Int, throwOnMalformed: Boolean): Int {
    if (index >= endIndex) {
        return
malformed(0,
index, throwOnMalformed)
    }
    val byte2 = bytes[index].toInt()
    if (byte1 and 0xF == 0x0) {
        if
(byte2 and 0xF0 <= 0x80) {
            // Non-shortest form
            return malformed(0, index,
throwOnMalformed)
        }
    }
    else if (byte1 and 0xF == 0x4) {
        if (byte2 and 0xF0 != 0x80) {
            //
Out of Unicode code points domain (larger than U+10FFFF)
            return malformed(0, index,
throwOnMalformed)
        }
    }
    else if (byte1 and 0xF > 0x4) {
        return malformed(0, index,
throwOnMalformed)
    }
    else if (byte2 and 0xC0 != 0x80) {
        return malformed(0, index,
throwOnMalformed)
    }
    if (index + 1 == endIndex) {
        return malformed(1, index,
throwOnMalformed)
    }
    val byte3 = bytes[index + 1].toInt()
    if (byte3 and 0xC0 != 0x80) {
        return
malformed(1, index, throwOnMalformed)
    }
    if (index + 2 == endIndex) {
        return malformed(2, index,
throwOnMalformed)
    }
    val byte4 = bytes[index + 2].toInt()
    if (byte4 and 0xC0 != 0x80) {
        return
malformed(2, index, throwOnMalformed)
    }
    return (byte1 shl 18) xor (byte2 shl 12) xor (byte3 shl 6) xor
byte4 xor 0x381F80
}
Maximum number of bytes needed to encode a single char.
Code points in

```



```

== '\n      preLastBreak -= 1\n      // leave 1 common frame to ease matching with the top exception stack\n      return stack.dropLast(preLastBreak) + \"... and ${commonFrames - 1} more common stack frames skipped\"\n    }\n  },\"/>\n * Copyright 2010-2021 JetBrains s.r.o. and Kotlin Programming Language contributors.\n * Use of this source code is governed by the Apache 2.0 license that can be found in the license/LICENSE.txt file.\n\n*/\n\npackage kotlin.time\nimport kotlin.js.json\nimport kotlin.math.*\n\ninternal actual inline val durationAssertionsEnabled: Boolean get() = true\n\ninternal actual fun formatToExactDecimals(value: Double, decimals: Int): String {\n    val rounded = if (decimals == 0) {\n        value\n    } else {\n        val pow = 10.0.pow(decimals)\n        JsMath.round(abs(value) * pow) / pow * sign(value)\n    }\n    return if (abs(rounded) < 1e21) {\n        // toFixed switches to scientific format after 1e21\n        rounded.asDynamic().toFixed(decimals).unsafeCast<String>()\n    } else {\n        // toPrecision outputs the specified number of digits, but only for positive numbers\n        val positive = abs(rounded)\n        val positiveString = positive.asDynamic().toPrecision(ceil(log10(positive)) + decimals).unsafeCast<String>()\n        if (rounded < 0) \"-$positiveString\" else positiveString\n    }\n}\n\ninternal actual fun formatUpToDecimals(value: Double, decimals: Int): String {\n    return value.asDynamic().toLocaleString(\"en-us\", json(\"maximumFractionDigits\" to decimals)).unsafeCast<String>()\n}\n\n*/\n * Copyright 2010-2021 JetBrains s.r.o. and Kotlin Programming Language contributors.\n * Use of this source code is governed by the Apache 2.0 license that can be found in the license/LICENSE.txt file.\n\n*/\n\npackage kotlin.time\n\n@SinceKotlin(\"1.6\")\n@WasExperimental(ExperimentalTime::class)\npublic actual enum class DurationUnit(internal val scale: Double) {\n    /**\n     * Time unit representing one nanosecond, which is 1/1000 of a microsecond.\n     */\n    NANOSECONDS(1e0),\n    /**\n     * Time unit representing one microsecond, which is 1/1000 of a millisecond.\n     */\n    MICROSECONDS(1e3),\n    /**\n     * Time unit representing one millisecond, which is 1/1000 of a second.\n     */\n    MILLISECONDS(1e6),\n    /**\n     * Time unit representing one second.\n     */\n    SECONDS(1e9),\n    /**\n     * Time unit representing one minute.\n     */\n    MINUTES(60e9),\n    /**\n     * Time unit representing one hour.\n     */\n    HOURS(3600e9),\n    /**\n     * Time unit representing one day, which is always equal to 24 hours.\n     */\n    DAYS(86400e9);\n}\n\n@SinceKotlin(\"1.3\")\ninternal actual fun convertDurationUnit(value: Double, sourceUnit: DurationUnit, targetUnit: DurationUnit): Double {\n    val sourceCompareTarget = sourceUnit.scale.compareTo(targetUnit.scale)\n    return when {\n        sourceCompareTarget > 0 -> value * (sourceUnit.scale / targetUnit.scale)\n        sourceCompareTarget < 0 -> value / (targetUnit.scale / sourceUnit.scale)\n        else -> value\n    }\n}\n\n@SinceKotlin(\"1.5\")\ninternal actual fun convertDurationUnitOverflow(value: Long, sourceUnit: DurationUnit, targetUnit: DurationUnit): Long {\n    val sourceCompareTarget = sourceUnit.scale.compareTo(targetUnit.scale)\n    return when {\n        sourceCompareTarget > 0 -> value * (sourceUnit.scale / targetUnit.scale).toLong()\n        sourceCompareTarget < 0 -> value / (targetUnit.scale / sourceUnit.scale).toLong()\n        else -> value\n    }\n}\n\n@SinceKotlin(\"1.5\")\ninternal actual fun convertDurationUnit(value: Long, sourceUnit: DurationUnit, targetUnit: DurationUnit): Long {\n    val sourceCompareTarget = sourceUnit.scale.compareTo(targetUnit.scale)\n    return when {\n        sourceCompareTarget > 0 -> {\n            val scale = (sourceUnit.scale / targetUnit.scale).toLong()\n            val result = value * scale\n            when {\n                result / scale == value -> result\n                value > 0 -> Long.MAX_VALUE\n                else -> Long.MIN_VALUE\n            }\n        }\n        sourceCompareTarget < 0 -> value / (targetUnit.scale / sourceUnit.scale).toLong()\n        else -> value\n    }\n}\n\n*/\n * Copyright 2010-2021 JetBrains s.r.o. and Kotlin Programming Language contributors.\n * Use of this source code is governed by the Apache 2.0 license that can be found in the license/LICENSE.txt file.\n\n*/\n\npackage kotlin.time\nimport org.w3c.performance.GlobalPerformance\nimport org.w3c.performance.Performance\n\n@SinceKotlin(\"1.3\")\n@ExperimentalTime\ninternal actual object MonotonicTimeSource : TimeSource {\n    private val actualSource: TimeSource = run {\n        val isNode: Boolean = js(\"typeof process !== 'undefined' && process.versions && !!process.versions.node\")\n        if (isNode)\n            HrTimeSource(js(\"process\").unsafeCast<Process>())\n        else\n            js(\"self\").unsafeCast<GlobalPerformance?>()?.performance?.let(::PerformanceTimeSource)\n    }\n    ?: DateNowTimeSource\n}\n\noverride fun markNow(): TimeMark = actualSource.markNow()\n}\n\ninternal

```

```

external interface Process {
    fun hrtime(time: Array<Double> = definedExternally):
    Array<Double>
}
@SinceKotlin("1.3")
@ExperimentalTime
internal class HrTimeSource(val process:
    Process) : TimeSource {
    override fun markNow(): TimeMark = object : TimeMark() {
        val startedAt =
        process.hrtime()
        override fun elapsedNow(): Duration =
        process.hrtime(startedAt).let { (seconds,
        nanos) -> seconds.toDuration(DurationUnit.SECONDS) + nanos.toDuration(DurationUnit.NANOSECONDS) }
    }
    override fun toString(): String =
    "\"TimeSource(process.hrtime())\""
}
@SinceKotlin("1.3")
@ExperimentalTime
internal class
PerformanceTimeSource(val performance: Performance) : AbstractDoubleTimeSource(unit =
    DurationUnit.MILLISECONDS) {
    override fun read(): Double = performance.now()
    override fun toString():
    String = "\"TimeSource(self.performance.now())\""
}
@SinceKotlin("1.3")
@ExperimentalTime
internal
object DateNowTimeSource : AbstractDoubleTimeSource(unit = DurationUnit.MILLISECONDS) {
    override
    fun read(): Double = kotlin.js.Date.now()
    override fun toString(): String = "\"TimeSource(Date.now())\"",
}
/* Copyright 2010-2020 JetBrains s.r.o. and Kotlin Programming Language contributors.
Use of this source code
is governed by the Apache 2.0 license that can be found in the license/LICENSE.txt file.
*/
package
kotlinx.dom
import org.w3c.dom.*
import kotlin.contracts.*
/* Creates a new element with the
specified [name].
*/
/* The element is initialized with the specified [init] function.
*/
@SinceKotlin("1.4")
public fun Document.createElement(name: String, init: Element.() -> Unit): Element {
    contract { callsInPlace(init, InvocationKind.EXACTLY_ONCE) }
    return
    createElement(name).apply(init)
}
/* Appends a newly created element with the specified [name] to this
element.
*/
/* The element is initialized with the specified [init] function.
*/
@SinceKotlin("1.4")
public fun
Element.appendChild(name: String, init: Element.() -> Unit): Element {
    contract { callsInPlace(init,
    InvocationKind.EXACTLY_ONCE) }
    return ownerDocument!!.createElement(name, init).also {
    appendChild(it) }
}
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contributors.
Use of this source code is governed by the Apache 2.0 license that can be found in the
license/LICENSE.txt file.
*/
package
kotlinx.dom
import org.w3c.dom.*
/* Returns true if the element
has the given CSS class style in its 'class' attribute
*/
@SinceKotlin("1.4")
fun Element.hasClass(cssClass:
    String): Boolean = className.matches("\\s*(^|\\s+)$cssClass(\\s+.*|\\s*$)".toRegex())
/* Adds CSS class
to element. Has no effect if all specified classes are already in class attribute of the element
*/
/* @return true if at
least one class has been added
*/
@SinceKotlin("1.4")
fun Element.addClass(vararg cssClasses: String):
    Boolean {
    val missingClasses = cssClasses.filterNot { hasClass(it) }
    if (missingClasses.isNotEmpty()) {
        val presentClasses = className.trim()
        className = buildString {
            append(presentClasses)
            if
            (!presentClasses.isEmpty()) {
                append(" ")
            }
            missingClasses.joinTo(this, " ")
        }
        return true
    }
    return false
}
/* Removes all [cssClasses] from element. Has no effect if all
specified classes are missing in class attribute of the element
*/
/* @return true if at least one class has been
removed
*/
@SinceKotlin("1.4")
fun Element.removeClass(vararg cssClasses: String): Boolean {
    if
    (cssClasses.any { hasClass(it) }) {
        val toBeRemoved = cssClasses.toSet()
        className =
        className.trim().split("\\s+".toRegex()).filter { it !in toBeRemoved }.joinToString(" ")
        return true
    }
    return false
}
}
/* Copyright 2010-2018 JetBrains s.r.o. and Kotlin Programming Language
contributors.
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license/LICENSE.txt file.
*/
@file:kotlin.jvm.JvmMultifileClass
@file:kotlin.jvm.JvmName("StringsKt")
package
kotlin.text
/* Converts the string into a regular expression [Regex] with the default options.
*/
@kotlin.internal.InlineOnly
public inline fun String.toRegex(): Regex = Regex(this)
/* Converts the
string into a regular expression [Regex] with the specified single [option].
*/
@kotlin.internal.InlineOnly
public
inline fun String.toRegex(option: RegexOptions): Regex = Regex(this, option)
/* Converts the string into a
regular expression [Regex] with the specified set of [options].
*/
@kotlin.internal.InlineOnly
public inline fun
String.toRegex(options: Set<RegexOption>): Regex = Regex(this, options)
}
/* Copyright 2010-2018
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```

```

Apache 2.0 license that can be found in the license/LICENSE.txt file.\n */\n\npackage kotlin.dom\n\nimport
org.w3c.dom.*\n\n/**\n * Gets a value indicating whether this node is a TEXT_NODE or a
CDATA_SECTION_NODE.\n */\n@SinceKotlin("1.4")\npublic val Node.isText: Boolean\n    get() = nodeType
== Node.TEXT_NODE || nodeType == Node.CDATA_SECTION_NODE\n\n/**\n * Gets a value indicating
whether this node is an [Element].\n */\n@SinceKotlin("1.4")\npublic val Node.isElement: Boolean\n    get() =
nodeType == Node.ELEMENT_NODE\n", /*\n * Copyright 2010-2018 JetBrains s.r.o. and Kotlin Programming
Language contributors.\n * Use of this source code is governed by the Apache 2.0 license that can be found in the
license/LICENSE.txt file.\n */\n\npackage kotlin.dom\n\nimport org.w3c.dom.*\n\n/**\n * Removes all the children
from this node.\n */\n@SinceKotlin("1.4")\npublic fun Node.clear() {\n    while (hasChildNodes()) {\n
removeChild(firstChild!!)\n    }\n}\n\n/**\n * Creates text node and append it to the element.\n */\n@return this
element\n */\n@SinceKotlin("1.4")\nfun Element.appendText(text: String): Element {\n
appendChild(ownerDocument!!.createTextNode(text))\n    return this\n}\n", /*\n * Copyright 2010-2019 JetBrains
s.r.o. and Kotlin Programming Language contributors.\n * Use of this source code is governed by the Apache 2.0
license that can be found in the license/LICENSE.txt file.\n */\n\npackage org.w3c.dom\n\n@Deprecated("Use
UnionMessagePortOrWindowProxy instead.\n", ReplaceWith("UnionMessagePortOrWindowProxy"))\ntypealias
UnionMessagePortOrWindow = UnionMessagePortOrWindowProxy\n\n@Deprecated("Use `as` instead.\n",
ReplaceWith("`as`"))\nvar HTMLLinkElement.as_\n    get() = `as`\n    set(value) {\n        `as` = value\n
}\n\n@Deprecated("Use `is` instead.\n", ReplaceWith("`is`"))\nvar ElementCreationOptions.is_\n    get() = `is`\n
set(value) {\n        `is` = value\n    }\n", /*\n * Copyright 2010-2021 JetBrains s.r.o. and Kotlin Programming
Language contributors.\n * Use of this source code is governed by the Apache 2.0 license that can be found in the
license/LICENSE.txt file.\n */\n\n// NOTE: THIS FILE IS AUTO-GENERATED, DO NOT EDIT!\n// See
github.com/kotlin/dukat for details\n\npackage org.khronos.webgl\n\nimport kotlin.js.*\nimport
org.w3c.dom.*\nimport org.w3c.dom.events.*\n\npublic external interface WebGLContextAttributes {\n    var
alpha: Boolean? /* = true */\n        get() = definedExternally\n        set(value) = definedExternally\n    var
depth: Boolean? /* = true */\n        get() = definedExternally\n        set(value) = definedExternally\n    var
stencil: Boolean? /* = false */\n        get() = definedExternally\n        set(value) = definedExternally\n    var
antialias: Boolean? /* = true */\n        get() = definedExternally\n        set(value) = definedExternally\n    var
premultipliedAlpha: Boolean? /* = true */\n        get() = definedExternally\n        set(value) = definedExternally\n
    var preserveDrawingBuffer: Boolean? /* = false */\n        get() = definedExternally\n        set(value) =
definedExternally\n    var
preferLowPowerToHighPerformance: Boolean? /* = false */\n        get() = definedExternally\n        set(value) =
definedExternally\n    var failIfMajorPerformanceCaveat: Boolean? /* = false */\n        get() = definedExternally\n
set(value) = definedExternally\n}\n\n@Suppress("INVISIBLE_REFERENCE",
"INVISIBLE_MEMBER")\n@kotlin.internal.InlineOnly\npublic inline fun WebGLContextAttributes(alpha:
Boolean? = true, depth: Boolean? = true, stencil: Boolean? = false, antialias: Boolean? = true, premultipliedAlpha:
Boolean? = true, preserveDrawingBuffer: Boolean? = false, preferLowPowerToHighPerformance: Boolean? = false,
failIfMajorPerformanceCaveat: Boolean? = false): WebGLContextAttributes {\n    val o = js("{}")\n
o["alpha"] = alpha\n    o["depth"] = depth\n    o["stencil"] = stencil\n    o["antialias"] = antialias\n
o["premultipliedAlpha"] = premultipliedAlpha\n    o["preserveDrawingBuffer"] = preserveDrawingBuffer\n
o["preferLowPowerToHighPerformance"] = preferLowPowerToHighPerformance\n
o["failIfMajorPerformanceCaveat"] = failIfMajorPerformanceCaveat\n    return o\n}\n\npublic external abstract
class WebGLObject\n\n/**\n * Exposes the JavaScript
[WebGLBuffer](https://developer.mozilla.org/en/docs/Web/API/WebGLBuffer) to Kotlin\n */\n\npublic external
abstract class WebGLBuffer : WebGLObject\n\n/**\n * Exposes the JavaScript
[WebGLFramebuffer](https://developer.mozilla.org/en/docs/Web/API/WebGLFramebuffer) to Kotlin\n */\n\npublic
external abstract class WebGLFramebuffer : WebGLObject\n\n/**\n * Exposes the JavaScript
[WebGLProgram](https://developer.mozilla.org/en/docs/Web/API/WebGLProgram) to Kotlin\n */\n\npublic external
abstract class WebGLProgram : WebGLObject\n\n/**\n * Exposes the JavaScript
[WebGLRenderbuffer](https://developer.mozilla.org/en/docs/Web/API/WebGLRenderbuffer) to Kotlin\n */\n\npublic

```



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external abstract class WebGLRenderbuffer : WebGLObject\n\n**\n * Exposes the JavaScript
[WebGLShader](https://developer.mozilla.org/en/docs/Web/API/WebGLShader) to Kotlin\n *\npublic external
abstract class WebGLShader : WebGLObject\n\n**\n * Exposes the JavaScript
[WebGLTexture](https://developer.mozilla.org/en/docs/Web/API/WebGLTexture) to Kotlin\n *\npublic external
abstract class WebGLTexture : WebGLObject\n\n**\n * Exposes the JavaScript
[WebGLUniformLocation](https://developer.mozilla.org/en/docs/Web/API/WebGLUniformLocation) to Kotlin\n
*\npublic external abstract class WebGLUniformLocation\n\n**\n * Exposes the JavaScript
[WebGLActiveInfo](https://developer.mozilla.org/en/docs/Web/API/WebGLActiveInfo) to Kotlin\n *\npublic
external abstract class WebGLActiveInfo {\n  open val size: Int\n  open val type: Int\n  open val name:
String\n}\n\n**\n * Exposes the JavaScript
[WebGLShaderPrecisionFormat](https://developer.mozilla.org/en/docs/Web/API/WebGLShaderPrecisionFormat) to
Kotlin\n *\npublic external abstract class WebGLShaderPrecisionFormat {\n  open val rangeMin: Int\n  open val
rangeMax: Int\n  open val precision:
Int\n}\n\n@Suppress("NESTED_CLASS_IN_EXTERNAL_INTERFACE")\npublic external interface
WebGLRenderingContextBase {\n  val canvas: HTMLCanvasElement\n  val drawingBufferWidth: Int\n  val
drawingBufferHeight: Int\n  fun getContextAttributes(): WebGLContextAttributes?\n  fun isContextLost():
Boolean\n  fun getSupportedExtensions(): Array<String>?\n  fun getExtension(name: String): dynamic\n  fun
activeTexture(texture: Int)\n  fun attachShader(program: WebGLProgram?, shader: WebGLShader?)\n  fun
bindAttribLocation(program: WebGLProgram?, index: Int, name: String)\n  fun bindBuffer(target: Int, buffer:
WebGLBuffer?)\n  fun bindFramebuffer(target: Int, framebuffer: WebGLFramebuffer?)\n  fun
bindRenderbuffer(target: Int, renderbuffer: WebGLRenderbuffer?)\n  fun bindTexture(target: Int, texture:
WebGLTexture?)\n  fun blendColor(red: Float, green: Float, blue: Float, alpha: Float)\n  fun
blendEquation(mode: Int)\n  fun blendEquationSeparate(modeRGB: Int, modeAlpha: Int)\n  fun
blendFunc(sfactor: Int, dfactor: Int)\n  fun blendFuncSeparate(srcRGB: Int, dstRGB: Int, srcAlpha: Int, dstAlpha:
Int)\n  fun bufferData(target: Int, size: Int, usage: Int)\n  fun bufferData(target: Int, data: BufferDataSource?,
usage: Int)\n  fun bufferSubData(target: Int, offset: Int, data: BufferDataSource?)\n  fun
checkFramebufferStatus(target: Int): Int\n  fun clear(mask: Int)\n  fun clearColor(red: Float, green: Float, blue:
Float, alpha: Float)\n  fun clearDepth(depth: Float)\n  fun clearStencil(s: Int)\n  fun colorMask(red: Boolean,
green: Boolean, blue: Boolean, alpha: Boolean)\n  fun compileShader(shader: WebGLShader?)\n  fun
compressedTexImage2D(target: Int, level: Int, internalformat: Int, width: Int, height: Int, border: Int, data:
ArrayBufferView)\n  fun compressedTexSubImage2D(target: Int, level: Int, xoffset: Int, yoffset: Int, width: Int,
height: Int, format: Int, data: ArrayBufferView)\n  fun copyTexImage2D(target: Int, level: Int, internalformat: Int,
x: Int, y: Int, width: Int, height: Int, border: Int)\n  fun copyTexSubImage2D(target: Int, level: Int, xoffset: Int,
yoffset: Int, x: Int, y: Int, width: Int, height: Int)\n  fun createBuffer(): WebGLBuffer?\n  fun createFramebuffer():
WebGLFramebuffer?\n  fun createProgram(): WebGLProgram?\n  fun createRenderbuffer():
WebGLRenderbuffer?\n  fun createShader(type: Int): WebGLShader?\n  fun createTexture(): WebGLTexture?\n
fun cullFace(mode: Int)\n  fun deleteBuffer(buffer: WebGLBuffer?)\n  fun deleteFramebuffer(framebuffer:
WebGLFramebuffer?)\n  fun deleteProgram(program: WebGLProgram?)\n  fun deleteRenderbuffer(renderbuffer:
WebGLRenderbuffer?)\n  fun deleteShader(shader: WebGLShader?)\n  fun deleteTexture(texture:
WebGLTexture?)\n  fun depthFunc(func: Int)\n  fun depthMask(flag: Boolean)\n  fun depthRange(zNear: Float,
zFar: Float)\n  fun detachShader(program: WebGLProgram?, shader: WebGLShader?)\n  fun disable(cap: Int)\n
fun disableVertexAttribArray(index: Int)\n  fun drawArrays(mode: Int, first: Int, count: Int)\n  fun
drawElements(mode: Int, count: Int, type: Int, offset: Int)\n  fun enable(cap: Int)\n  fun
enableVertexAttribArray(index: Int)\n  fun finish()\n  fun flush()\n  fun framebufferRenderbuffer(target: Int,
attachment: Int, renderbuffertarget: Int, renderbuffer: WebGLRenderbuffer?)\n  fun framebufferTexture2D(target:
Int, attachment: Int, textarget: Int, texture: WebGLTexture?, level: Int)\n  fun frontFace(mode: Int)\n  fun
generateMipmap(target: Int)\n  fun getActiveAttrib(program: WebGLProgram?, index: Int): WebGLActiveInfo?\n
fun getActiveUniform(program: WebGLProgram?, index: Int): WebGLActiveInfo?\n  fun

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getAttachedShaders(program: WebGLProgram?): Array<WebGLShader?>\n fun getAttribLocation(program:
WebGLProgram?, name: String): Int\n fun getBufferParameter(target: Int, pname: Int): Any?\n fun
getParameter(pname: Int): Any?\n fun getError(): Int\n fun getFramebufferAttachmentParameter(target: Int,
attachment: Int, pname: Int): Any?\n fun getProgramParameter(program: WebGLProgram?, pname: Int): Any?\n
fun getProgramInfoLog(program: WebGLProgram?): String?\n fun getRenderbufferParameter(target: Int, pname:
Int): Any?\n fun getShaderParameter(shader: WebGLShader?, pname: Int): Any?\n fun
getShaderPrecisionFormat(shadertype: Int, precisiontype: Int): WebGLShaderPrecisionFormat?\n fun
getShaderInfoLog(shader: WebGLShader?): String?\n fun getShaderSource(shader: WebGLShader?): String?\n
fun getTexParameter(target: Int, pname: Int): Any?\n fun getUniform(program: WebGLProgram?, location:
WebGLUniformLocation?): Any?\n fun getUniformLocation(program: WebGLProgram?, name: String):
WebGLUniformLocation?\n fun getVertexAttrib(index: Int, pname: Int): Any?\n fun
getVertexAttribOffset(index: Int, pname: Int): Int\n fun hint(target: Int, mode: Int)\n fun isBuffer(buffer:
WebGLBuffer?): Boolean\n fun isEnabled(cap: Int): Boolean\n fun isFramebuffer(framebuffer:
WebGLFramebuffer?): Boolean\n fun isProgram(program: WebGLProgram?): Boolean\n fun
isRenderbuffer(renderbuffer: WebGLRenderbuffer?): Boolean\n fun isShader(shader: WebGLShader?): Boolean\n
fun isTexture(texture: WebGLTexture?): Boolean\n fun lineWidth(width: Float)\n fun linkProgram(program:
WebGLProgram?)\n fun pixelStorei(pname: Int, param: Int)\n fun polygonOffset(factor: Float, units: Float)\n
fun readPixels(x: Int, y: Int, width: Int, height: Int, format: Int, type: Int, pixels: ArrayBufferView?)\n fun
renderbufferStorage(target: Int, internalformat: Int, width: Int, height: Int)\n fun sampleCoverage(value: Float,
invert: Boolean)\n fun scissor(x: Int, y: Int, width: Int, height: Int)\n fun shaderSource(shader: WebGLShader?,
source: String)\n fun stencilFunc(func: Int, ref: Int, mask: Int)\n fun stencilFuncSeparate(face: Int, func: Int, ref:
Int, mask: Int)\n fun stencilMask(mask: Int)\n fun stencilMaskSeparate(face: Int, mask: Int)\n fun
stencilOp(fail: Int, zfail: Int, zpass: Int)\n fun stencilOpSeparate(face: Int, fail: Int, zfail: Int, zpass: Int)\n fun
texImage2D(target: Int, level: Int, internalformat: Int, width: Int, height: Int, border: Int, format: Int, type: Int, pixels:
ArrayBufferView?)\n fun texImage2D(target: Int, level: Int, internalformat: Int, format: Int, type: Int, source:
TexImageSource?)\n fun texParameterf(target: Int, pname: Int, param: Float)\n fun texParameteri(target: Int,
pname: Int, param: Int)\n fun texSubImage2D(target: Int, level: Int, xoffset: Int, yoffset: Int, width: Int, height: Int,
format: Int, type: Int, pixels: ArrayBufferView?)\n fun texSubImage2D(target: Int, level: Int, xoffset: Int, yoffset:
Int, format: Int, type: Int, source: TexImageSource?)\n fun uniform1f(location: WebGLUniformLocation?, x:
Float)\n fun uniform1fv(location: WebGLUniformLocation?, v: Float32Array)\n fun uniform1fv(location:
WebGLUniformLocation?, v: Array<Float>)\n fun uniform1i(location: WebGLUniformLocation?, x: Int)\n fun
uniform1iv(location: WebGLUniformLocation?, v: Int32Array)\n fun uniform1iv(location:
WebGLUniformLocation?, v: Array<Int>)\n fun uniform2f(location: WebGLUniformLocation?, x: Float, y:
Float)\n fun uniform2fv(location: WebGLUniformLocation?, v: Float32Array)\n fun uniform2fv(location:
WebGLUniformLocation?, v: Array<Float>)\n fun uniform2i(location: WebGLUniformLocation?, x: Int, y: Int)\n
fun uniform2iv(location: WebGLUniformLocation?, v: Int32Array)\n fun uniform2iv(location:
WebGLUniformLocation?, v: Array<Int>)\n fun uniform3f(location: WebGLUniformLocation?, x: Float, y: Float,
z: Float)\n fun uniform3fv(location: WebGLUniformLocation?, v: Float32Array)\n fun uniform3fv(location:
WebGLUniformLocation?, v: Array<Float>)\n fun uniform3i(location: WebGLUniformLocation?, x: Int, y: Int, z:
Int)\n fun uniform3iv(location: WebGLUniformLocation?, v: Int32Array)\n fun uniform3iv(location:
WebGLUniformLocation?, v: Array<Int>)\n fun uniform4f(location: WebGLUniformLocation?, x: Float, y: Float,
z: Float, w: Float)\n fun uniform4fv(location: WebGLUniformLocation?, v: Float32Array)\n fun
uniform4fv(location: WebGLUniformLocation?, v: Array<Float>)\n fun uniform4i(location:
WebGLUniformLocation?, x: Int, y: Int, z: Int, w: Int)\n fun uniform4iv(location: WebGLUniformLocation?, v:
Int32Array)\n fun uniform4iv(location: WebGLUniformLocation?, v: Array<Int>)\n fun
uniformMatrix2fv(location: WebGLUniformLocation?, transpose: Boolean, value: Float32Array)\n fun
uniformMatrix2fv(location: WebGLUniformLocation?, transpose: Boolean, value: Array<Float>)\n fun
uniformMatrix3fv(location: WebGLUniformLocation?, transpose: Boolean, value: Float32Array)\n fun

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uniformMatrix3fv(location: WebGLUniformLocation?, transpose: Boolean, value: Array<Float>)\n fun
uniformMatrix4fv(location: WebGLUniformLocation?, transpose: Boolean, value: Float32Array)\n fun
uniformMatrix4fv(location: WebGLUniformLocation?, transpose: Boolean, value: Array<Float>)\n fun
useProgram(program: WebGLProgram?)\n fun validateProgram(program: WebGLProgram?)\n fun
vertexAttrib1f(index: Int, x: Float)\n fun vertexAttrib1fv(index: Int, values: dynamic)\n fun
vertexAttrib2f(index: Int, x: Float, y: Float)\n fun vertexAttrib2fv(index: Int, values: dynamic)\n fun
vertexAttrib3f(index: Int, x: Float, y: Float, z: Float)\n fun vertexAttrib3fv(index: Int, values: dynamic)\n fun
vertexAttrib4f(index: Int, x: Float, y: Float, z: Float, w: Float)\n fun vertexAttrib4fv(index: Int, values: dynamic)\n
fun vertexAttribPointer(index: Int, size: Int, type: Int, normalized: Boolean, stride: Int, offset: Int)\n fun
viewport(x: Int, y: Int, width: Int, height: Int)\n\n companion object {\n    val DEPTH_BUFFER_BIT: Int\n
val STENCIL_BUFFER_BIT: Int\n    val COLOR_BUFFER_BIT: Int\n    val POINTS: Int\n    val LINES:
Int\n    val LINE_LOOP: Int\n    val LINE_STRIP: Int\n    val TRIANGLES: Int\n    val
TRIANGLE_STRIP: Int\n    val TRIANGLE_FAN: Int\n    val ZERO: Int\n    val ONE: Int\n    val
SRC_COLOR: Int\n    val ONE_MINUS_SRC_COLOR: Int\n    val SRC_ALPHA: Int\n    val
ONE_MINUS_SRC_ALPHA: Int\n    val DST_ALPHA: Int\n    val ONE_MINUS_DST_ALPHA: Int\n
val DST_COLOR: Int\n    val ONE_MINUS_DST_COLOR: Int\n    val SRC_ALPHA_SATURATE: Int\n
val FUNC_ADD: Int\n    val BLEND_EQUATION: Int\n    val BLEND_EQUATION_RGB: Int\n    val
BLEND_EQUATION_ALPHA: Int\n    val FUNC_SUBTRACT: Int\n    val FUNC_REVERSE_SUBTRACT:
Int\n    val BLEND_DST_RGB: Int\n    val BLEND_SRC_RGB: Int\n    val BLEND_DST_ALPHA: Int\n
val BLEND_SRC_ALPHA: Int\n    val CONSTANT_COLOR: Int\n    val
ONE_MINUS_CONSTANT_COLOR: Int\n    val CONSTANT_ALPHA: Int\n    val
ONE_MINUS_CONSTANT_ALPHA: Int\n    val BLEND_COLOR: Int\n    val ARRAY_BUFFER: Int\n
val ELEMENT_ARRAY_BUFFER: Int\n    val ARRAY_BUFFER_BINDING: Int\n    val
ELEMENT_ARRAY_BUFFER_BINDING: Int\n    val STREAM_DRAW: Int\n    val STATIC_DRAW: Int\n
val DYNAMIC_DRAW: Int\n    val BUFFER_SIZE: Int\n    val BUFFER_USAGE: Int\n    val
CURRENT_VERTEX_ATTRIB: Int\n    val FRONT: Int\n    val BACK: Int\n    val FRONT_AND_BACK:
Int\n    val CULL_FACE: Int\n    val BLEND: Int\n    val DITHER: Int\n    val STENCIL_TEST: Int\n
val DEPTH_TEST: Int\n    val SCISSOR_TEST: Int\n    val POLYGON_OFFSET_FILL: Int\n    val
SAMPLE_ALPHA_TO_COVERAGE: Int\n    val SAMPLE_COVERAGE: Int\n    val NO_ERROR: Int\n
val INVALID_ENUM: Int\n    val INVALID_VALUE: Int\n    val INVALID_OPERATION: Int\n    val
OUT_OF_MEMORY: Int\n    val CW: Int\n    val CCW: Int\n    val LINE_WIDTH: Int\n    val
ALIASED_POINT_SIZE_RANGE: Int\n    val ALIASED_LINE_WIDTH_RANGE: Int\n    val
CULL_FACE_MODE: Int\n    val FRONT_FACE: Int\n    val DEPTH_RANGE: Int\n    val
DEPTH_WRITEMASK: Int\n    val DEPTH_CLEAR_VALUE: Int\n    val DEPTH_FUNC: Int\n    val
STENCIL_CLEAR_VALUE: Int\n    val STENCIL_FUNC: Int\n    val STENCIL_FAIL: Int\n    val
STENCIL_PASS_DEPTH_FAIL: Int\n    val STENCIL_PASS_DEPTH_PASS: Int\n    val STENCIL_REF:
Int\n    val STENCIL_VALUE_MASK: Int\n    val STENCIL_WRITEMASK: Int\n    val
STENCIL_BACK_FUNC: Int\n    val STENCIL_BACK_FAIL: Int\n    val
STENCIL_BACK_PASS_DEPTH_FAIL: Int\n    val STENCIL_BACK_PASS_DEPTH_PASS: Int\n    val
STENCIL_BACK_REF: Int\n    val STENCIL_BACK_VALUE_MASK: Int\n    val
STENCIL_BACK_WRITEMASK: Int\n    val VIEWPORT: Int\n    val SCISSOR_BOX: Int\n    val
COLOR_CLEAR_VALUE: Int\n    val COLOR_WRITEMASK: Int\n    val UNPACK_ALIGNMENT: Int\n
val PACK_ALIGNMENT: Int\n    val MAX_TEXTURE_SIZE: Int\n    val MAX_VIEWPORT_DIMS: Int\n
val SUBPIXEL_BITS: Int\n    val RED_BITS: Int\n    val GREEN_BITS: Int\n    val BLUE_BITS: Int\n
val ALPHA_BITS: Int\n    val DEPTH_BITS: Int\n    val STENCIL_BITS: Int\n    val
POLYGON_OFFSET_UNITS: Int\n    val POLYGON_OFFSET_FACTOR: Int\n    val
TEXTURE_BINDING_2D: Int\n    val SAMPLE_BUFFERS: Int\n    val SAMPLES: Int\n    val
SAMPLE_COVERAGE_VALUE: Int\n    val SAMPLE_COVERAGE_INVERT: Int\n    val

```

COMPRESSED_TEXTURE_FORMATS: Int\n val DONT_CARE: Int\n val FASTEST: Int\n val
 NICEST: Int\n val GENERATE_MIPMAP_HINT: Int\n val BYTE: Int\n val UNSIGNED_BYTE:
 Int\n val SHORT: Int\n val UNSIGNED_SHORT: Int\n val INT: Int\n val UNSIGNED_INT: Int\n
 val FLOAT: Int\n val DEPTH_COMPONENT: Int\n val ALPHA: Int\n val RGB: Int\n val
 RGBA: Int\n val LUMINANCE: Int\n val LUMINANCE_ALPHA: Int\n val
 UNSIGNED_SHORT_4_4_4_4: Int\n val UNSIGNED_SHORT_5_5_5_1: Int\n val
 UNSIGNED_SHORT_5_6_5: Int\n val FRAGMENT_SHADER: Int\n val VERTEX_SHADER: Int\n
 val MAX_VERTEX_ATTRIBS: Int\n val MAX_VERTEX_UNIFORM_VECTORS: Int\n val
 MAX_VARYING_VECTORS: Int\n val MAX_COMBINED_TEXTURE_IMAGE_UNITS: Int\n val
 MAX_VERTEX_TEXTURE_IMAGE_UNITS: Int\n val MAX_TEXTURE_IMAGE_UNITS: Int\n val
 MAX_FRAGMENT_UNIFORM_VECTORS: Int\n val SHADER_TYPE: Int\n val DELETE_STATUS:
 Int\n val LINK_STATUS: Int\n val VALIDATE_STATUS: Int\n val ATTACHED_SHADERS: Int\n
 val ACTIVE_UNIFORMS: Int\n val ACTIVE_ATTRIBUTES: Int\n val
 SHADING_LANGUAGE_VERSION: Int\n val CURRENT_PROGRAM: Int\n val NEVER: Int\n val
 LESS: Int\n val EQUAL: Int\n val LEQUAL: Int\n val GREATER: Int\n val NOTEQUAL: Int\n
 val GEQUAL: Int\n val ALWAYS: Int\n val KEEP: Int\n val REPLACE: Int\n val INCR: Int\n
 val DECR: Int\n val INVERT: Int\n val INCR_WRAP: Int\n val DECR_WRAP: Int\n val
 VENDOR: Int\n val RENDERER: Int\n val VERSION: Int\n val NEAREST: Int\n val LINEAR:
 Int\n val NEAREST_MIPMAP_NEAREST: Int\n val LINEAR_MIPMAP_NEAREST: Int\n val
 NEAREST_MIPMAP_LINEAR: Int\n val LINEAR_MIPMAP_LINEAR: Int\n val
 TEXTURE_MAG_FILTER: Int\n val TEXTURE_MIN_FILTER: Int\n val TEXTURE_WRAP_S: Int\n
 val TEXTURE_WRAP_T: Int\n val TEXTURE_2D: Int\n val TEXTURE: Int\n val
 TEXTURE_CUBE_MAP: Int\n val TEXTURE_BINDING_CUBE_MAP: Int\n val
 TEXTURE_CUBE_MAP_POSITIVE_X: Int\n val TEXTURE_CUBE_MAP_NEGATIVE_X: Int\n val
 TEXTURE_CUBE_MAP_POSITIVE_Y: Int\n val TEXTURE_CUBE_MAP_NEGATIVE_Y: Int\n val
 TEXTURE_CUBE_MAP_POSITIVE_Z: Int\n val TEXTURE_CUBE_MAP_NEGATIVE_Z: Int\n val
 MAX_CUBE_MAP_TEXTURE_SIZE: Int\n val TEXTURE0: Int\n val TEXTURE1: Int\n val
 TEXTURE2: Int\n val TEXTURE3: Int\n val TEXTURE4: Int\n val TEXTURE5: Int\n val
 TEXTURE6: Int\n val TEXTURE7: Int\n val TEXTURE8: Int\n val TEXTURE9: Int\n val
 TEXTURE10: Int\n val TEXTURE11: Int\n val TEXTURE12: Int\n val TEXTURE13: Int\n val
 TEXTURE14: Int\n val TEXTURE15: Int\n val TEXTURE16: Int\n val TEXTURE17: Int\n val
 TEXTURE18: Int\n val TEXTURE19: Int\n val TEXTURE20: Int\n val TEXTURE21: Int\n val
 TEXTURE22: Int\n val TEXTURE23: Int\n val TEXTURE24: Int\n val TEXTURE25: Int\n val
 TEXTURE26: Int\n val TEXTURE27: Int\n val TEXTURE28: Int\n val TEXTURE29: Int\n val
 TEXTURE30: Int\n val TEXTURE31: Int\n val ACTIVE_TEXTURE: Int\n val REPEAT: Int\n
 val CLAMP_TO_EDGE: Int\n val MIRRORED_REPEAT: Int\n val FLOAT_VEC2: Int\n val
 FLOAT_VEC3: Int\n val FLOAT_VEC4: Int\n val INT_VEC2: Int\n val INT_VEC3: Int\n val
 INT_VEC4: Int\n val BOOL: Int\n val BOOL_VEC2: Int\n val BOOL_VEC3: Int\n val
 BOOL_VEC4: Int\n val FLOAT_MAT2: Int\n val FLOAT_MAT3: Int\n val FLOAT_MAT4: Int\n
 val SAMPLER_2D: Int\n val SAMPLER_CUBE: Int\n val VERTEX_ATTRIB_ARRAY_ENABLED:
 Int\n val VERTEX_ATTRIB_ARRAY_SIZE: Int\n val VERTEX_ATTRIB_ARRAY_STRIDE: Int\n
 val VERTEX_ATTRIB_ARRAY_TYPE: Int\n val VERTEX_ATTRIB_ARRAY_NORMALIZED: Int\n
 val VERTEX_ATTRIB_ARRAY_POINTER: Int\n val VERTEX_ATTRIB_ARRAY_BUFFER_BINDING:
 Int\n val IMPLEMENTATION_COLOR_READ_TYPE: Int\n val
 IMPLEMENTATION_COLOR_READ_FORMAT: Int\n val COMPILE_STATUS: Int\n val
 LOW_FLOAT: Int\n val MEDIUM_FLOAT: Int\n val HIGH_FLOAT: Int\n val LOW_INT: Int\n
 val MEDIUM_INT: Int\n val HIGH_INT: Int\n val FRAMEBUFFER: Int\n val RENDERBUFFER:
 Int\n val RGBA4: Int\n val RGB5_A1: Int\n val RGB565: Int\n val DEPTH_COMPONENT16:

```

Int\n    val STENCIL_INDEX: Int\n    val STENCIL_INDEX8: Int\n    val DEPTH_STENCIL: Int\n    val
RENDERBUFFER_WIDTH: Int\n    val RENDERBUFFER_HEIGHT: Int\n    val
RENDERBUFFER_INTERNAL_FORMAT: Int\n    val RENDERBUFFER_RED_SIZE: Int\n    val
RENDERBUFFER_GREEN_SIZE: Int\n    val RENDERBUFFER_BLUE_SIZE: Int\n    val
RENDERBUFFER_ALPHA_SIZE: Int\n    val RENDERBUFFER_DEPTH_SIZE: Int\n    val
RENDERBUFFER_STENCIL_SIZE: Int\n    val FRAMEBUFFER_ATTACHMENT_OBJECT_TYPE: Int\n
val FRAMEBUFFER_ATTACHMENT_OBJECT_NAME: Int\n    val
FRAMEBUFFER_ATTACHMENT_TEXTURE_LEVEL: Int\n    val
FRAMEBUFFER_ATTACHMENT_TEXTURE_CUBE_MAP_FACE: Int\n    val COLOR_ATTACHMENT0:
Int\n    val DEPTH_ATTACHMENT: Int\n    val STENCIL_ATTACHMENT: Int\n    val
DEPTH_STENCIL_ATTACHMENT: Int\n    val NONE: Int\n    val FRAMEBUFFER_COMPLETE: Int\n
val FRAMEBUFFER_INCOMPLETE_ATTACHMENT: Int\n    val
FRAMEBUFFER_INCOMPLETE_MISSING_ATTACHMENT: Int\n    val
FRAMEBUFFER_INCOMPLETE_DIMENSIONS: Int\n    val FRAMEBUFFER_UNSUPPORTED: Int\n
val FRAMEBUFFER_BINDING: Int\n    val RENDERBUFFER_BINDING: Int\n    val
MAX_RENDERBUFFER_SIZE: Int\n    val INVALID_FRAMEBUFFER_OPERATION: Int\n    val
UNPACK_FLIP_Y_WEBGL: Int\n    val UNPACK_PREMULTIPLY_ALPHA_WEBGL: Int\n    val
CONTEXT_LOST_WEBGL: Int\n    val UNPACK_COLORSPACE_CONVERSION_WEBGL: Int\n    val
BROWSER_DEFAULT_WEBGL: Int\n    }\n}\n\n/**\n * Exposes the JavaScript
[WebGLRenderingContext](https://developer.mozilla.org/en/docs/Web/API/WebGLRenderingContext) to Kotlin\n
*\npublic external abstract class WebGLRenderingContext : WebGLRenderingContextBase, RenderingContext {\n
companion object {\n    val DEPTH_BUFFER_BIT: Int\n    val STENCIL_BUFFER_BIT: Int\n    val
COLOR_BUFFER_BIT: Int\n    val POINTS: Int\n    val LINES: Int\n    val LINE_LOOP: Int\n    val
LINE_STRIP: Int\n    val TRIANGLES: Int\n    val TRIANGLE_STRIP: Int\n    val TRIANGLE_FAN:
Int\n    val ZERO: Int\n    val ONE: Int\n    val SRC_COLOR: Int\n    val ONE_MINUS_SRC_COLOR:
Int\n    val SRC_ALPHA: Int\n    val ONE_MINUS_SRC_ALPHA: Int\n    val DST_ALPHA: Int\n    val
ONE_MINUS_DST_ALPHA: Int\n    val DST_COLOR: Int\n    val ONE_MINUS_DST_COLOR: Int\n
val SRC_ALPHA_SATURATE: Int\n    val FUNC_ADD: Int\n    val BLEND_EQUATION: Int\n    val
BLEND_EQUATION_RGB: Int\n    val BLEND_EQUATION_ALPHA: Int\n    val FUNC_SUBTRACT:
Int\n    val FUNC_REVERSE_SUBTRACT: Int\n    val BLEND_DST_RGB: Int\n    val
BLEND_SRC_RGB: Int\n    val BLEND_DST_ALPHA: Int\n    val BLEND_SRC_ALPHA: Int\n    val
CONSTANT_COLOR: Int\n    val ONE_MINUS_CONSTANT_COLOR: Int\n    val CONSTANT_ALPHA:
Int\n    val ONE_MINUS_CONSTANT_ALPHA: Int\n    val BLEND_COLOR: Int\n    val
ARRAY_BUFFER: Int\n    val ELEMENT_ARRAY_BUFFER: Int\n    val ARRAY_BUFFER_BINDING:
Int\n    val ELEMENT_ARRAY_BUFFER_BINDING: Int\n    val STREAM_DRAW: Int\n    val
STATIC_DRAW: Int\n    val DYNAMIC_DRAW: Int\n    val BUFFER_SIZE: Int\n    val
BUFFER_USAGE: Int\n    val CURRENT_VERTEX_ATTRIB: Int\n    val FRONT: Int\n    val BACK:
Int\n    val FRONT_AND_BACK: Int\n    val CULL_FACE: Int\n    val BLEND: Int\n    val DITHER:
Int\n    val STENCIL_TEST: Int\n    val DEPTH_TEST: Int\n    val SCISSOR_TEST: Int\n    val
POLYGON_OFFSET_FILL: Int\n    val SAMPLE_ALPHA_TO_COVERAGE: Int\n    val
SAMPLE_COVERAGE: Int\n    val NO_ERROR: Int\n    val INVALID_ENUM: Int\n    val
INVALID_VALUE: Int\n    val INVALID_OPERATION: Int\n    val OUT_OF_MEMORY: Int\n    val CW:
Int\n    val CCW: Int\n    val LINE_WIDTH: Int\n    val ALIASED_POINT_SIZE_RANGE: Int\n    val
ALIASED_LINE_WIDTH_RANGE: Int\n    val CULL_FACE_MODE: Int\n    val FRONT_FACE: Int\n
val DEPTH_RANGE: Int\n    val DEPTH_WRITEMASK: Int\n    val DEPTH_CLEAR_VALUE: Int\n    val
DEPTH_FUNC: Int\n    val STENCIL_CLEAR_VALUE: Int\n    val STENCIL_FUNC: Int\n    val
STENCIL_FAIL: Int\n    val STENCIL_PASS_DEPTH_FAIL: Int\n    val STENCIL_PASS_DEPTH_PASS:
Int\n    val STENCIL_REF: Int\n    val STENCIL_VALUE_MASK: Int\n    val STENCIL_WRITEMASK:

```

Int\n val STENCIL_BACK_FUNC: Int\n val STENCIL_BACK_FAIL: Int\n val
 STENCIL_BACK_PASS_DEPTH_FAIL: Int\n val STENCIL_BACK_PASS_DEPTH_PASS: Int\n val
 STENCIL_BACK_REF: Int\n val STENCIL_BACK_VALUE_MASK: Int\n val
 STENCIL_BACK_WRITEMASK: Int\n val VIEWPORT: Int\n val SCISSOR_BOX: Int\n val
 COLOR_CLEAR_VALUE: Int\n val COLOR_WRITEMASK: Int\n val UNPACK_ALIGNMENT: Int\n
 val PACK_ALIGNMENT: Int\n val MAX_TEXTURE_SIZE: Int\n val MAX_VIEWPORT_DIMS: Int\n
 val SUBPIXEL_BITS: Int\n val RED_BITS: Int\n val GREEN_BITS: Int\n val BLUE_BITS: Int\n
 val ALPHA_BITS: Int\n val DEPTH_BITS: Int\n val STENCIL_BITS: Int\n val
 POLYGON_OFFSET_UNITS: Int\n val POLYGON_OFFSET_FACTOR: Int\n val
 TEXTURE_BINDING_2D: Int\n val SAMPLE_BUFFERS: Int\n val SAMPLES: Int\n val
 SAMPLE_COVERAGE_VALUE: Int\n val SAMPLE_COVERAGE_INVERT: Int\n val
 COMPRESSED_TEXTURE_FORMATS: Int\n val DONT_CARE: Int\n val FASTEST: Int\n val
 NICEST: Int\n val GENERATE_MIPMAP_HINT: Int\n val BYTE: Int\n val UNSIGNED_BYTE:
 Int\n val SHORT: Int\n val UNSIGNED_SHORT: Int\n val INT: Int\n val UNSIGNED_INT: Int\n
 val FLOAT: Int\n val DEPTH_COMPONENT: Int\n val ALPHA: Int\n val RGB: Int\n val
 RGBA: Int\n val LUMINANCE: Int\n val LUMINANCE_ALPHA: Int\n val
 UNSIGNED_SHORT_4_4_4_4: Int\n val UNSIGNED_SHORT_5_5_5_1: Int\n val
 UNSIGNED_SHORT_5_6_5: Int\n val FRAGMENT_SHADER: Int\n val VERTEX_SHADER: Int\n
 val MAX_VERTEX_ATTRIBS: Int\n val MAX_VERTEX_UNIFORM_VECTORS: Int\n val
 MAX_VARYING_VECTORS: Int\n val MAX_COMBINED_TEXTURE_IMAGE_UNITS: Int\n val
 MAX_VERTEX_TEXTURE_IMAGE_UNITS: Int\n val MAX_TEXTURE_IMAGE_UNITS: Int\n val
 MAX_FRAGMENT_UNIFORM_VECTORS: Int\n val SHADER_TYPE: Int\n val DELETE_STATUS:
 Int\n val LINK_STATUS: Int\n val VALIDATE_STATUS: Int\n val ATTACHED_SHADERS: Int\n
 val ACTIVE_UNIFORMS: Int\n val ACTIVE_ATTRIBUTES: Int\n val
 SHADING_LANGUAGE_VERSION: Int\n val CURRENT_PROGRAM: Int\n val NEVER: Int\n val
 LESS: Int\n val EQUAL: Int\n val LEQUAL: Int\n val GREATER: Int\n val NOTEQUAL: Int\n
 val GEQUAL: Int\n val ALWAYS: Int\n val KEEP: Int\n val REPLACE: Int\n val INCR: Int\n
 val DECR: Int\n val INVERT: Int\n val INCR_WRAP: Int\n val DECR_WRAP: Int\n val
 VENDOR: Int\n val RENDERER: Int\n val VERSION: Int\n val NEAREST: Int\n val LINEAR:
 Int\n val NEAREST_MIPMAP_NEAREST: Int\n val LINEAR_MIPMAP_NEAREST: Int\n val
 NEAREST_MIPMAP_LINEAR: Int\n val LINEAR_MIPMAP_LINEAR: Int\n val
 TEXTURE_MAG_FILTER: Int\n val TEXTURE_MIN_FILTER: Int\n val TEXTURE_WRAP_S: Int\n
 val TEXTURE_WRAP_T: Int\n val TEXTURE_2D: Int\n val TEXTURE: Int\n val
 TEXTURE_CUBE_MAP: Int\n val TEXTURE_BINDING_CUBE_MAP: Int\n val
 TEXTURE_CUBE_MAP_POSITIVE_X: Int\n val TEXTURE_CUBE_MAP_NEGATIVE_X: Int\n val
 TEXTURE_CUBE_MAP_POSITIVE_Y: Int\n val TEXTURE_CUBE_MAP_NEGATIVE_Y: Int\n val
 TEXTURE_CUBE_MAP_POSITIVE_Z: Int\n val TEXTURE_CUBE_MAP_NEGATIVE_Z: Int\n val
 MAX_CUBE_MAP_TEXTURE_SIZE: Int\n val TEXTURE0: Int\n val TEXTURE1: Int\n val
 TEXTURE2: Int\n val TEXTURE3: Int\n val TEXTURE4: Int\n val TEXTURE5: Int\n val
 TEXTURE6: Int\n val TEXTURE7: Int\n val TEXTURE8: Int\n val TEXTURE9: Int\n val
 TEXTURE10: Int\n val TEXTURE11: Int\n val TEXTURE12: Int\n val TEXTURE13: Int\n val
 TEXTURE14: Int\n val TEXTURE15: Int\n val TEXTURE16: Int\n val TEXTURE17: Int\n val
 TEXTURE18: Int\n val TEXTURE19: Int\n val TEXTURE20: Int\n val TEXTURE21: Int\n val
 TEXTURE22: Int\n val TEXTURE23: Int\n val TEXTURE24: Int\n val TEXTURE25: Int\n val
 TEXTURE26: Int\n val TEXTURE27: Int\n val TEXTURE28: Int\n val TEXTURE29: Int\n val
 TEXTURE30: Int\n val TEXTURE31: Int\n val ACTIVE_TEXTURE: Int\n val REPEAT: Int\n
 val CLAMP_TO_EDGE: Int\n val MIRRORED_REPEAT: Int\n val FLOAT_VEC2: Int\n val
 FLOAT_VEC3: Int\n val FLOAT_VEC4: Int\n val INT_VEC2: Int\n val INT_VEC3: Int\n val

```

INT_VEC4: Int\n    val BOOL: Int\n    val BOOL_VEC2: Int\n    val BOOL_VEC3: Int\n    val
BOOL_VEC4: Int\n    val FLOAT_MAT2: Int\n    val FLOAT_MAT3: Int\n    val FLOAT_MAT4: Int\n
val SAMPLER_2D: Int\n    val SAMPLER_CUBE: Int\n    val VERTEX_ATTRIB_ARRAY_ENABLED:
Int\n    val VERTEX_ATTRIB_ARRAY_SIZE: Int\n    val VERTEX_ATTRIB_ARRAY_STRIDE: Int\n
val VERTEX_ATTRIB_ARRAY_TYPE: Int\n    val VERTEX_ATTRIB_ARRAY_NORMALIZED: Int\n
val VERTEX_ATTRIB_ARRAY_POINTER: Int\n    val VERTEX_ATTRIB_ARRAY_BUFFER_BINDING:
Int\n    val IMPLEMENTATION_COLOR_READ_TYPE: Int\n    val
IMPLEMENTATION_COLOR_READ_FORMAT: Int\n    val COMPILE_STATUS: Int\n    val
LOW_FLOAT: Int\n    val MEDIUM_FLOAT: Int\n    val HIGH_FLOAT: Int\n    val LOW_INT: Int\n
val MEDIUM_INT: Int\n    val HIGH_INT: Int\n    val FRAMEBUFFER: Int\n    val RENDERBUFFER:
Int\n    val RGBA4: Int\n    val RGB5_A1: Int\n    val RGB565: Int\n    val DEPTH_COMPONENT16:
Int\n    val STENCIL_INDEX: Int\n    val STENCIL_INDEX8: Int\n    val DEPTH_STENCIL: Int\n    val
RENDERBUFFER_WIDTH: Int\n    val RENDERBUFFER_HEIGHT: Int\n    val
RENDERBUFFER_INTERNAL_FORMAT: Int\n    val RENDERBUFFER_RED_SIZE: Int\n    val
RENDERBUFFER_GREEN_SIZE: Int\n    val RENDERBUFFER_BLUE_SIZE: Int\n    val
RENDERBUFFER_ALPHA_SIZE: Int\n    val RENDERBUFFER_DEPTH_SIZE: Int\n    val
RENDERBUFFER_STENCIL_SIZE: Int\n    val FRAMEBUFFER_ATTACHMENT_OBJECT_TYPE: Int\n
val FRAMEBUFFER_ATTACHMENT_OBJECT_NAME: Int\n    val
FRAMEBUFFER_ATTACHMENT_TEXTURE_LEVEL: Int\n    val
FRAMEBUFFER_ATTACHMENT_TEXTURE_CUBE_MAP_FACE: Int\n    val COLOR_ATTACHMENT0:
Int\n    val DEPTH_ATTACHMENT: Int\n    val STENCIL_ATTACHMENT: Int\n    val
DEPTH_STENCIL_ATTACHMENT: Int\n    val NONE: Int\n    val FRAMEBUFFER_COMPLETE: Int\n
val FRAMEBUFFER_INCOMPLETE_ATTACHMENT: Int\n    val
FRAMEBUFFER_INCOMPLETE_MISSING_ATTACHMENT: Int\n    val
FRAMEBUFFER_INCOMPLETE_DIMENSIONS: Int\n    val FRAMEBUFFER_UNSUPPORTED: Int\n
val FRAMEBUFFER_BINDING: Int\n    val RENDERBUFFER_BINDING: Int\n    val
MAX_RENDERBUFFER_SIZE: Int\n    val INVALID_FRAMEBUFFER_OPERATION: Int\n    val
UNPACK_FLIP_Y_WEBGL: Int\n    val UNPACK_PREMULTIPLY_ALPHA_WEBGL: Int\n    val
CONTEXT_LOST_WEBGL: Int\n    val UNPACK_COLORSPACE_CONVERSION_WEBGL: Int\n    val
BROWSER_DEFAULT_WEBGL: Int\n    }\n}\n\n**\n * Exposes the JavaScript
[WebGLContextEvent](https://developer.mozilla.org/en/docs/Web/API/WebGLContextEvent) to Kotlin\n
*\n\npublic external open class WebGLContextEvent(type: String, eventInit: WebGLContextEventInit =
definedExternally) : Event {\n    open val statusMessage: String\n\n    companion object {\n        val NONE: Short\n        val CAPTURING_PHASE: Short\n        val AT_TARGET: Short\n        val BUBBLING_PHASE: Short\n    }\n}\n\n\npublic external interface WebGLContextEventInit : EventInit {\n    var statusMessage: String? /* = \"\" */\n    get() = definedExternally\n    set(value) = definedExternally\n}\n\n\n@Suppress(\"INVISIBLE_REFERENCE\",
\"INVISIBLE_MEMBER\")\n@kotlin.internal.InlineOnly\n\npublic inline fun
WebGLContextEventInit(statusMessage: String? = \"\", bubbles: Boolean? = false, cancelable: Boolean? = false,
composed: Boolean? = false): WebGLContextEventInit {\n    val o = js(\"({})\")\n    o[\"statusMessage\"] =
statusMessage\n    o[\"bubbles\"] = bubbles\n    o[\"cancelable\"] = cancelable\n    o[\"composed\"] = composed\n
return o\n}\n\n**\n * Exposes the JavaScript
[ArrayBuffer](https://developer.mozilla.org/en/docs/Web/API/ArrayBuffer) to Kotlin\n
*\n\npublic external open
class ArrayBuffer(length: Int) : BufferDataSource {\n    open val byteLength: Int\n    fun slice(begin: Int, end: Int =
definedExternally): ArrayBuffer\n\n    companion object {\n        fun isView(value: Any?): Boolean\n    }\n}\n\n**\n * Exposes the JavaScript
[ArrayBufferView](https://developer.mozilla.org/en/docs/Web/API/ArrayBufferView) to Kotlin\n
*\n\npublic
external interface ArrayBufferView : BufferDataSource {\n    val buffer: ArrayBuffer\n    val byteOffset: Int\n    val
byteLength: Int\n}\n\n**\n * Exposes the JavaScript

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```

[Int8Array](https://developer.mozilla.org/en/docs/Web/API/Int8Array) to Kotlin\n */\npublic external open class
Int8Array : ArrayBufferView {\n  constructor(length: Int)\n  constructor(array: Int8Array)\n  constructor(array:
Array<Byte>)\n  constructor(buffer: ArrayBuffer, byteOffset: Int = definedExternally, length: Int =
definedExternally)\n  open val length: Int\n  override val buffer: ArrayBuffer\n  override val byteOffset: Int\n
override val byteLength: Int\n  fun set(array: Int8Array, offset: Int = definedExternally)\n  fun set(array:
Array<Byte>, offset: Int = definedExternally)\n  fun subarray(start: Int, end: Int): Int8Array\n\n  companion
object {\n    val BYTES_PER_ELEMENT: Int\n  }\n}\n\n@Suppress(\"INVISIBLE_REFERENCE\",
\"INVISIBLE_MEMBER\")\n@kotlin.internal.InlineOnly\npublic inline operator fun Int8Array.get(index: Int):
Byte = asDynamic()[index]\n\n@Suppress(\"INVISIBLE_REFERENCE\",
\"INVISIBLE_MEMBER\")\n@kotlin.internal.InlineOnly\npublic inline operator fun Int8Array.set(index: Int,
value: Byte) { asDynamic()[index] = value }\n\n/**\n * Exposes the JavaScript
[Uint8Array](https://developer.mozilla.org/en/docs/Web/API/Uint8Array) to Kotlin\n */\npublic external open class
Uint8Array : ArrayBufferView {\n  constructor(length: Int)\n  constructor(array: Uint8Array)\n
constructor(array: Array<Byte>)\n  constructor(buffer: ArrayBuffer, byteOffset: Int = definedExternally, length:
Int = definedExternally)\n  open val length: Int\n  override val buffer: ArrayBuffer\n  override val byteOffset:
Int\n  override val byteLength: Int\n  fun set(array: Uint8Array, offset: Int = definedExternally)\n  fun set(array:
Array<Byte>, offset: Int = definedExternally)\n  fun subarray(start: Int, end: Int): Uint8Array\n\n  companion
object {\n    val BYTES_PER_ELEMENT: Int\n  }\n}\n\n@Suppress(\"INVISIBLE_REFERENCE\",
\"INVISIBLE_MEMBER\")\n@kotlin.internal.InlineOnly\npublic inline operator fun Uint8Array.get(index: Int):
Byte = asDynamic()[index]\n\n@Suppress(\"INVISIBLE_REFERENCE\",
\"INVISIBLE_MEMBER\")\n@kotlin.internal.InlineOnly\npublic inline operator fun Uint8Array.set(index: Int,
value: Byte) { asDynamic()[index] = value }\n\n/**\n * Exposes the JavaScript
[Uint8ClampedArray](https://developer.mozilla.org/en/docs/Web/API/Uint8ClampedArray) to Kotlin\n */\npublic
external open class Uint8ClampedArray : ArrayBufferView {\n  constructor(length: Int)\n  constructor(array:
Uint8ClampedArray)\n  constructor(array: Array<Byte>)\n  constructor(buffer: ArrayBuffer, byteOffset: Int =
definedExternally, length: Int = definedExternally)\n  open val length: Int\n  override val buffer: ArrayBuffer\n
override val byteOffset: Int\n  override val byteLength: Int\n  fun set(array: Uint8ClampedArray, offset: Int =
definedExternally)\n  fun set(array: Array<Byte>, offset: Int = definedExternally)\n  fun subarray(start: Int, end:
Int): Uint8ClampedArray\n\n  companion object {\n    val BYTES_PER_ELEMENT: Int\n  }\n}\n\n@Suppress(\"INVISIBLE_REFERENCE\",
\"INVISIBLE_MEMBER\")\n@kotlin.internal.InlineOnly\npublic inline operator fun
Uint8ClampedArray.get(index: Int): Byte = asDynamic()[index]\n\n@Suppress(\"INVISIBLE_REFERENCE\",
\"INVISIBLE_MEMBER\")\n@kotlin.internal.InlineOnly\npublic inline operator fun
Uint8ClampedArray.set(index: Int, value: Byte) { asDynamic()[index] = value }\n\n/**\n * Exposes the JavaScript
[Int16Array](https://developer.mozilla.org/en/docs/Web/API/Int16Array) to Kotlin\n */\npublic external open class
Int16Array : ArrayBufferView {\n  constructor(length: Int)\n  constructor(array: Int16Array)\n
constructor(array: Array<Short>)\n  constructor(buffer: ArrayBuffer, byteOffset: Int = definedExternally, length:
Int = definedExternally)\n  open val length: Int\n  override val buffer: ArrayBuffer\n  override val byteOffset:
Int\n  override val byteLength: Int\n  fun set(array: Int16Array, offset: Int = definedExternally)\n  fun set(array:
Array<Short>, offset: Int = definedExternally)\n  fun subarray(start: Int, end: Int): Int16Array\n\n  companion
object {\n    val BYTES_PER_ELEMENT: Int\n  }\n}\n\n@Suppress(\"INVISIBLE_REFERENCE\",
\"INVISIBLE_MEMBER\")\n@kotlin.internal.InlineOnly\npublic inline operator fun Int16Array.get(index: Int):
Short = asDynamic()[index]\n\n@Suppress(\"INVISIBLE_REFERENCE\",
\"INVISIBLE_MEMBER\")\n@kotlin.internal.InlineOnly\npublic inline operator fun Int16Array.set(index: Int,
value: Short) { asDynamic()[index] = value }\n\n/**\n * Exposes the JavaScript
[Uint16Array](https://developer.mozilla.org/en/docs/Web/API/Uint16Array) to Kotlin\n */\npublic external open
class Uint16Array : ArrayBufferView {\n  constructor(length: Int)\n  constructor(array: Uint16Array)\n
constructor(array: Array<Short>)\n  constructor(buffer: ArrayBuffer, byteOffset: Int = definedExternally, length:
Int = definedExternally)\n  open val length: Int\n  override val buffer: ArrayBuffer\n  override val byteOffset:
Int\n  override val byteLength: Int\n  fun set(array: Uint16Array, offset: Int = definedExternally)\n  fun set(array:
Array<Short>, offset: Int = definedExternally)\n  fun subarray(start: Int, end: Int): Uint16Array\n\n  companion
object {\n    val BYTES_PER_ELEMENT: Int\n  }\n}\n\n@Suppress(\"INVISIBLE_REFERENCE\",
\"INVISIBLE_MEMBER\")\n@kotlin.internal.InlineOnly\npublic inline operator fun Uint16Array.get(index: Int):
Short = asDynamic()[index]\n\n@Suppress(\"INVISIBLE_REFERENCE\",
\"INVISIBLE_MEMBER\")\n@kotlin.internal.InlineOnly\npublic inline operator fun Uint16Array.set(index: Int,
value: Short) { asDynamic()[index] = value }\n\n/**\n * Exposes the JavaScript

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Int = definedExternally)\n  open val length: Int\n  override val buffer: ArrayBuffer\n  override val byteOffset:
Int\n  override val byteLength: Int\n  fun set(array: Uint16Array, offset: Int = definedExternally)\n  fun set(array:
Array<Short>, offset: Int = definedExternally)\n  fun subarray(start: Int, end: Int): Uint16Array\n\n  companion
object {\n    val BYTES_PER_ELEMENT: Int\n  }\n}\n\n@Suppress(\"INVISIBLE_REFERENCE\",
\"INVISIBLE_MEMBER\")\n@kotlin.internal.InlineOnly\npublic inline operator fun Uint16Array.get(index: Int):
Short = asDynamic()[index]\n\n@Suppress(\"INVISIBLE_REFERENCE\",
\"INVISIBLE_MEMBER\")\n@kotlin.internal.InlineOnly\npublic inline operator fun Uint16Array.set(index: Int,
value: Short) { asDynamic()[index] = value }\n\n/**\n * Exposes the JavaScript
[Int32Array](https://developer.mozilla.org/en/docs/Web/API/Int32Array) to Kotlin\n */\npublic external open class
Int32Array : ArrayBufferView {\n  constructor(length: Int)\n  constructor(array: Int32Array)\n
constructor(array: Array<Int>)\n  constructor(buffer: ArrayBuffer, byteOffset: Int = definedExternally, length: Int
= definedExternally)\n  open val length: Int\n  override val buffer: ArrayBuffer\n  override val byteOffset: Int\n
override val byteLength: Int\n  fun set(array: Int32Array, offset: Int = definedExternally)\n  fun set(array:
Array<Int>, offset: Int = definedExternally)\n  fun subarray(start: Int, end: Int): Int32Array\n\n  companion object
{\n    val BYTES_PER_ELEMENT: Int\n  }\n}\n\n@Suppress(\"INVISIBLE_REFERENCE\",
\"INVISIBLE_MEMBER\")\n@kotlin.internal.InlineOnly\npublic inline operator fun Int32Array.get(index: Int): Int
= asDynamic()[index]\n\n@Suppress(\"INVISIBLE_REFERENCE\",
\"INVISIBLE_MEMBER\")\n@kotlin.internal.InlineOnly\npublic inline operator fun Int32Array.set(index: Int,
value: Int) { asDynamic()[index] = value }\n\n/**\n * Exposes the JavaScript
[Uint32Array](https://developer.mozilla.org/en/docs/Web/API/Uint32Array) to Kotlin\n */\npublic external open
class Uint32Array : ArrayBufferView {\n  constructor(length: Int)\n  constructor(array: Uint32Array)\n
constructor(array: Array<Int>)\n  constructor(buffer: ArrayBuffer, byteOffset: Int = definedExternally, length: Int
= definedExternally)\n  open val length: Int\n  override val buffer: ArrayBuffer\n  override val byteOffset: Int\n
override val byteLength: Int\n  fun set(array: Uint32Array, offset: Int = definedExternally)\n  fun set(array:
Array<Int>, offset: Int = definedExternally)\n  fun subarray(start: Int, end: Int): Uint32Array\n\n  companion
object {\n    val BYTES_PER_ELEMENT: Int\n  }\n}\n\n@Suppress(\"INVISIBLE_REFERENCE\",
\"INVISIBLE_MEMBER\")\n@kotlin.internal.InlineOnly\npublic inline operator fun Uint32Array.get(index: Int):
Int = asDynamic()[index]\n\n@Suppress(\"INVISIBLE_REFERENCE\",
\"INVISIBLE_MEMBER\")\n@kotlin.internal.InlineOnly\npublic inline operator fun Uint32Array.set(index: Int,
value: Int) { asDynamic()[index] = value }\n\n/**\n * Exposes the JavaScript
[Float32Array](https://developer.mozilla.org/en/docs/Web/API/Float32Array) to Kotlin\n */\npublic external open
class Float32Array : ArrayBufferView {\n  constructor(length: Int)\n  constructor(array: Float32Array)\n
constructor(array: Array<Float>)\n  constructor(buffer: ArrayBuffer, byteOffset: Int = definedExternally, length:
Int = definedExternally)\n  open val length: Int\n  override val buffer: ArrayBuffer\n  override val byteOffset:
Int\n  override val byteLength: Int\n  fun set(array: Float32Array, offset: Int = definedExternally)\n  fun
set(array: Array<Float>, offset: Int = definedExternally)\n  fun subarray(start: Int, end: Int): Float32Array\n\n
companion object {\n    val BYTES_PER_ELEMENT: Int\n  }\n}\n\n@Suppress(\"INVISIBLE_REFERENCE\",
\"INVISIBLE_MEMBER\")\n@kotlin.internal.InlineOnly\npublic inline operator fun Float32Array.get(index: Int):
Float = asDynamic()[index]\n\n@Suppress(\"INVISIBLE_REFERENCE\",
\"INVISIBLE_MEMBER\")\n@kotlin.internal.InlineOnly\npublic inline operator fun Float32Array.set(index: Int,
value: Float) { asDynamic()[index] = value }\n\n/**\n * Exposes the JavaScript
[Float64Array](https://developer.mozilla.org/en/docs/Web/API/Float64Array) to Kotlin\n */\npublic external open
class Float64Array : ArrayBufferView {\n  constructor(length: Int)\n  constructor(array: Float64Array)\n
constructor(array: Array<Double>)\n  constructor(buffer: ArrayBuffer, byteOffset: Int = definedExternally, length:
Int = definedExternally)\n  open val length: Int\n  override val buffer: ArrayBuffer\n  override val byteOffset:
Int\n  override val byteLength: Int\n  fun set(array: Float64Array, offset: Int = definedExternally)\n  fun
set(array: Array<Double>, offset: Int = definedExternally)\n  fun subarray(start: Int, end: Int): Float64Array\n\n

```



```

kotlin.js.*\nimport org.khronos.webgl.*\nimport org.w3c.dom.*\n\npublic external abstract class MediaList :
ItemArrayLike<String> {\n    open var mediaText: String\n    fun appendMedium(medium: String)\n    fun
deleteMedium(medium: String)\n    override fun item(index: Int):
String?\n}\n\n@Suppress("INVISIBLE_REFERENCE",
"INVISIBLE_MEMBER")\n\n@kotlin.internal.InlineOnly\n\npublic inline operator fun MediaList.get(index: Int):
String? = asDynamic()[index]\n\n/**\n * Exposes the JavaScript
[StyleSheet](https://developer.mozilla.org/en/docs/Web/API/StyleSheet) to Kotlin\n */\n\npublic external abstract
class StyleSheet {\n    open val type: String\n    open val href: String?\n    open val ownerNode:
UnionElementOrProcessingInstruction?\n    open val parentStyleSheet: StyleSheet?\n    open val title: String?\n
open val media: MediaList\n    open var disabled: Boolean\n}\n\n/**\n * Exposes the JavaScript
[CSSStyleSheet](https://developer.mozilla.org/en/docs/Web/API/CSSStyleSheet) to Kotlin\n */\n\npublic external
abstract class CSSStyleSheet : StyleSheet {\n    open val ownerRule: CSSRule?\n    open val cssRules:
CSSRuleList\n    fun insertRule(rule: String, index: Int): Int\n    fun deleteRule(index: Int)\n}\n\n/**\n * Exposes the
JavaScript [StyleSheetList](https://developer.mozilla.org/en/docs/Web/API/StyleSheetList) to Kotlin\n */\n\npublic
external abstract class StyleSheetList : ItemArrayLike<StyleSheet> {\n    override fun item(index: Int):
StyleSheet?\n}\n\n@Suppress("INVISIBLE_REFERENCE",
"INVISIBLE_MEMBER")\n\n@kotlin.internal.InlineOnly\n\npublic inline operator fun StyleSheetList.get(index: Int):
StyleSheet? = asDynamic()[index]\n\n/**\n * Exposes the JavaScript
[LinkStyle](https://developer.mozilla.org/en/docs/Web/API/LinkStyle) to Kotlin\n */\n\npublic external interface
LinkStyle {\n    val sheet: StyleSheet?\n    get() = definedExternally\n}\n\n/**\n * Exposes the JavaScript
[CSSRuleList](https://developer.mozilla.org/en/docs/Web/API/CSSRuleList) to Kotlin\n */\n\npublic external abstract
class CSSRuleList : ItemArrayLike<CSSRule> {\n    override fun item(index: Int):
CSSRule?\n}\n\n@Suppress("INVISIBLE_REFERENCE",
"INVISIBLE_MEMBER")\n\n@kotlin.internal.InlineOnly\n\npublic inline operator fun CSSRuleList.get(index: Int):
CSSRule? = asDynamic()[index]\n\n/**\n * Exposes the JavaScript
[CSSRule](https://developer.mozilla.org/en/docs/Web/API/CSSRule) to Kotlin\n */\n\npublic external abstract class
CSSRule {\n    open val type: Short\n    open var cssText: String\n    open val parentRule: CSSRule?\n    open val
parentStyleSheet: CSSStyleSheet?\n\n    companion object {\n        val STYLE_RULE: Short\n        val
CHARSET_RULE: Short\n        val IMPORT_RULE: Short\n        val MEDIA_RULE: Short\n        val
FONT_FACE_RULE: Short\n        val PAGE_RULE: Short\n        val MARGIN_RULE: Short\n        val
NAMESPACE_RULE: Short\n    }\n}\n\n/**\n * Exposes the JavaScript
[CSSStyleRule](https://developer.mozilla.org/en/docs/Web/API/CSSStyleRule) to Kotlin\n */\n\npublic external
abstract class CSSStyleRule : CSSRule {\n    open var selectorText: String\n    open val style:
CSSStyleDeclaration\n\n    companion object {\n        val STYLE_RULE: Short\n        val CHARSET_RULE:
Short\n        val IMPORT_RULE: Short\n        val MEDIA_RULE: Short\n        val FONT_FACE_RULE: Short\n
        val PAGE_RULE: Short\n        val MARGIN_RULE: Short\n        val NAMESPACE_RULE: Short\n    }\n}\n\npublic external abstract class CSSImportRule : CSSRule {\n    open val href: String\n    open val media:
MediaList\n    open val styleSheet: CSSStyleSheet\n\n    companion object {\n        val STYLE_RULE: Short\n
        val CHARSET_RULE: Short\n        val IMPORT_RULE: Short\n        val MEDIA_RULE: Short\n        val
FONT_FACE_RULE: Short\n        val PAGE_RULE: Short\n        val MARGIN_RULE: Short\n        val
NAMESPACE_RULE: Short\n    }\n}\n\n/**\n * Exposes the JavaScript
[CSSGroupingRule](https://developer.mozilla.org/en/docs/Web/API/CSSGroupingRule) to Kotlin\n */\n\npublic
external abstract class CSSGroupingRule : CSSRule {\n    open val cssRules: CSSRuleList\n    fun insertRule(rule:
String, index: Int): Int\n    fun deleteRule(index: Int)\n\n    companion object {\n        val STYLE_RULE: Short\n
        val CHARSET_RULE: Short\n        val IMPORT_RULE: Short\n        val MEDIA_RULE: Short\n        val
FONT_FACE_RULE: Short\n        val PAGE_RULE: Short\n        val MARGIN_RULE: Short\n        val
NAMESPACE_RULE: Short\n    }\n}\n\n/**\n * Exposes the JavaScript
[CSSMediaRule](https://developer.mozilla.org/en/docs/Web/API/CSSMediaRule) to Kotlin\n */\n\npublic external

```

```

abstract class CSSMediaRule : CSSGroupingRule {\n  open val media: MediaList\n\n  companion object {\n    val STYLE_RULE: Short\n    val CHARSET_RULE: Short\n    val IMPORT_RULE: Short\n    val MEDIA_RULE: Short\n    val FONT_FACE_RULE: Short\n    val PAGE_RULE: Short\n    val MARGIN_RULE: Short\n    val NAMESPACE_RULE: Short\n  }\n}\n\n/**\n * Exposes the JavaScript [CSSPageRule](https://developer.mozilla.org/en/docs/Web/API/CSSPageRule) to Kotlin\n */\n\npublic external abstract class CSSPageRule : CSSGroupingRule {\n  open var selectorText: String\n  open val style: CSSStyleDeclaration\n\n  companion object {\n    val STYLE_RULE: Short\n    val CHARSET_RULE: Short\n    val IMPORT_RULE: Short\n    val MEDIA_RULE: Short\n    val FONT_FACE_RULE: Short\n    val PAGE_RULE: Short\n    val MARGIN_RULE: Short\n    val NAMESPACE_RULE: Short\n  }\n}\n\npublic external abstract class CSSMarginRule : CSSRule {\n  open val name: String\n  open val style: CSSStyleDeclaration\n\n  companion object {\n    val STYLE_RULE: Short\n    val CHARSET_RULE: Short\n    val IMPORT_RULE: Short\n    val MEDIA_RULE: Short\n    val FONT_FACE_RULE: Short\n    val PAGE_RULE: Short\n    val MARGIN_RULE: Short\n    val NAMESPACE_RULE: Short\n  }\n}\n\n/**\n * Exposes the JavaScript [CSSNamespaceRule](https://developer.mozilla.org/en/docs/Web/API/CSSNamespaceRule) to Kotlin\n */\n\npublic external abstract class CSSNamespaceRule : CSSRule {\n  open val namespaceURI: String\n  open val prefix: String\n\n  companion object {\n    val STYLE_RULE: Short\n    val CHARSET_RULE: Short\n    val IMPORT_RULE: Short\n    val MEDIA_RULE: Short\n    val FONT_FACE_RULE: Short\n    val PAGE_RULE: Short\n    val MARGIN_RULE: Short\n    val NAMESPACE_RULE: Short\n  }\n}\n\n/**\n * Exposes the JavaScript [CSSStyleDeclaration](https://developer.mozilla.org/en/docs/Web/API/CSSStyleDeclaration) to Kotlin\n */\n\npublic external abstract class CSSStyleDeclaration : ItemArrayLike<String> {\n  open var cssText: String\n  open val parentRule: CSSRule?\n  open var cssFloat: String\n  open var alignContent: String\n  open var alignItems: String\n  open var alignSelf: String\n  open var animation: String\n  open var animationDelay: String\n  open var animationDirection: String\n  open var animationDuration: String\n  open var animationFillMode: String\n  open var animationIterationCount: String\n  open var animationName: String\n  open var animationPlayState: String\n  open var animationTimingFunction: String\n  open var backfaceVisibility: String\n  open var background: String\n  open var backgroundAttachment: String\n  open var backgroundClip: String\n  open var backgroundColor: String\n  open var backgroundImage: String\n  open var backgroundOrigin: String\n  open var backgroundPosition: String\n  open var backgroundRepeat: String\n  open var backgroundSize: String\n  open var border: String\n  open var borderBottom: String\n  open var borderBottomColor: String\n  open var borderBottomLeftRadius: String\n  open var borderBottomRightRadius: String\n  open var borderBottomStyle: String\n  open var borderBottomWidth: String\n  open var borderCollapse: String\n  open var borderColor: String\n  open var borderImage: String\n  open var borderImageOutset: String\n  open var borderImageRepeat: String\n  open var borderImageSlice: String\n  open var borderImageSource: String\n  open var borderImageWidth: String\n  open var borderLeft: String\n  open var borderLeftColor: String\n  open var borderLeftStyle: String\n  open var borderLeftWidth: String\n  open var borderRadius: String\n  open var borderRight: String\n  open var borderRightColor: String\n  open var borderRightStyle: String\n  open var borderRightWidth: String\n  open var borderSpacing: String\n  open var borderStyle: String\n  open var borderTop: String\n  open var borderTopColor: String\n  open var borderTopLeftRadius: String\n  open var borderTopRightRadius: String\n  open var borderTopStyle: String\n  open var borderTopWidth: String\n  open var borderWidth: String\n  open var bottom: String\n  open var boxDecorationBreak: String\n  open var boxShadow: String\n  open var boxSizing: String\n  open var breakAfter: String\n  open var breakBefore: String\n  open var breakInside: String\n  open var captionSide: String\n  open var clear: String\n  open var clip: String\n  open var color: String\n  open var columnCount: String\n  open var columnFill: String\n  open var columnGap: String\n  open var columnRule: String\n  open var columnRuleColor: String\n  open var columnRuleStyle: String\n  open var columnRuleWidth: String\n  open var columnSpan: String\n  open var columnWidth: String\n  open var columns: String\n  open var content: String\n  open var counterIncrement:

```

String\n open var counterReset: String\n open var cursor: String\n open var direction: String\n open var display: String\n open var emptyCells: String\n open var filter: String\n open var flex: String\n open var flexBasis: String\n open var flexDirection: String\n open var flexFlow: String\n open var flexGrow: String\n open var flexShrink: String\n open var flexWrap: String\n open var font: String\n open var fontFamily: String\n open var fontFeatureSettings: String\n open var fontKerning: String\n open var fontLanguageOverride: String\n open var fontSize: String\n open var fontSizeAdjust: String\n open var fontStretch: String\n open var fontStyle: String\n open var fontSynthesis: String\n open var fontVariant: String\n open var fontVariantAlternates: String\n open var fontVariantCaps: String\n open var fontVariantEastAsian: String\n open var fontVariantLigatures: String\n open var fontVariantNumeric: String\n open var fontVariantPosition: String\n open var fontWeight: String\n open var hangingPunctuation: String\n open var height: String\n open var hyphens: String\n open var imageOrientation: String\n open var imageRendering: String\n open var imageResolution: String\n open var imeMode: String\n open var justifyContent: String\n open var left: String\n open var letterSpacing: String\n open var lineBreak: String\n open var lineHeight: String\n open var listStyle: String\n open var listStyleImage: String\n open var listStylePosition: String\n open var listStyleType: String\n open var margin: String\n open var marginBottom: String\n open var marginLeft: String\n open var marginRight: String\n open var marginTop: String\n open var mark: String\n open var markAfter: String\n open var markBefore: String\n open var marks: String\n open var marqueeDirection: String\n open var marqueePlayCount: String\n open var marqueeSpeed: String\n open var marqueeStyle: String\n open var mask: String\n open var maskType: String\n open var maxHeight: String\n open var maxWidth: String\n open var minHeight: String\n open var minWidth: String\n open var navDown: String\n open var navIndex: String\n open var navLeft: String\n open var navRight: String\n open var navUp: String\n open var objectFit: String\n open var objectPosition: String\n open var opacity: String\n open var order: String\n open var orphans: String\n open var outline: String\n open var outlineColor: String\n open var outlineOffset: String\n open var outlineStyle: String\n open var outlineWidth: String\n open var overflowWrap: String\n open var overflowX: String\n open var overflowY: String\n open var padding: String\n open var paddingBottom: String\n open var paddingLeft: String\n open var paddingRight: String\n open var paddingTop: String\n open var pageBreakAfter: String\n open var pageBreakBefore: String\n open var pageBreakInside: String\n open var perspective: String\n open var perspectiveOrigin: String\n open var phonemes: String\n open var position: String\n open var quotes: String\n open var resize: String\n open var rest: String\n open var restAfter: String\n open var restBefore: String\n open var right: String\n open var tabSize: String\n open var tableLayout: String\n open var textAlign: String\n open var textAlignLast: String\n open var textCombineUpright: String\n open var textDecoration: String\n open var textDecorationColor: String\n open var textDecorationLine: String\n open var textDecorationStyle: String\n open var textIndent: String\n open var textJustify: String\n open var textOrientation: String\n open var textOverflow: String\n open var textShadow: String\n open var textTransform: String\n open var textUnderlinePosition: String\n open var top: String\n open var transform: String\n open var transformOrigin: String\n open var transformStyle: String\n open var transition: String\n open var transitionDelay: String\n open var transitionDuration: String\n open var transitionProperty: String\n open var transitionTimingFunction: String\n open var unicodeBidi: String\n open var verticalAlign: String\n open var visibility: String\n open var voiceBalance: String\n open var voiceDuration: String\n open var voicePitch: String\n open var voicePitchRange: String\n open var voiceRate: String\n open var voiceStress: String\n open var voiceVolume: String\n open var whiteSpace: String\n open var widows: String\n open var width: String\n open var wordBreak: String\n open var wordSpacing: String\n open var wordWrap: String\n open var writingMode: String\n open var zIndex: String\n open var _dashed_attribute: String\n open var _camel_cased_attribute: String\n open var _webkit_cased_attribute: String\n fun getProperty(property: String): String\n fun getPropertyPriority(property: String): String\n fun setProperty(property: String, value: String, priority: String = definedExternally)\n fun setPropertyValue(property: String, value: String)\n fun setPropertyPriority(property: String, priority: String)\n fun removeProperty(property: String): String\n override fun item(index: Int):

```

String\n}\n\n@Suppress(\"INVISIBLE_REFERENCE\",
\"INVISIBLE_MEMBER\")\n@kotlin.internal.InlineOnly\npublic inline operator fun
CSSStyleDeclaration.get(index: Int): String? = asDynamic()[index]\n\npublic external interface
ElementCSSInlineStyle {\n    val style: CSSStyleDeclaration\n}\n\n/**\n * Exposes the JavaScript
[CSS](https://developer.mozilla.org/en/docs/Web/API/CSS) to Kotlin\n *\n\npublic external abstract class CSS {\n
companion object {\n    fun escape(ident: String): String\n    }\n}\n\npublic external interface
UnionElementOrProcessingInstruction\", \"/*\n * Copyright 2010-2021 JetBrains s.r.o. and Kotlin Programming
Language contributors.\n * Use of this source code is governed by the Apache 2.0 license that can be found in the
license/LICENSE.txt file.\n *\n\n// NOTE: THIS FILE IS AUTO-GENERATED, DO NOT EDIT!\n\n// See
github.com/kotlin/dukat for details\n\npackage org.w3c.dom.encryptedmedia\n\nimport kotlin.js.*\nimport
org.khronos.webgl.*\nimport org.w3c.dom.*\nimport org.w3c.dom.events.*\n\n/**\n * Exposes the JavaScript
[MediaKeySystemConfiguration](https://developer.mozilla.org/en/docs/Web/API/MediaKeySystemConfiguration)
to Kotlin\n *\n\npublic external interface MediaKeySystemConfiguration {\n    var label: String? /* = \"\" *\n
get() = definedExternally\n    set(value) = definedExternally\n    var initDataTypes: Array<String>? /* = arrayOf()
*\n
get() = definedExternally\n    set(value) = definedExternally\n    var audioCapabilities:
Array<MediaKeySystemMediaCapability>? /* = arrayOf() *\n
get() = definedExternally\n    set(value) =
definedExternally\n    var videoCapabilities: Array<MediaKeySystemMediaCapability>? /* = arrayOf() *\n
get() = definedExternally\n    set(value) = definedExternally\n    var distinctiveIdentifier:
MediaKeysRequirement? /* = MediaKeysRequirement.OPTIONAL *\n
get() = definedExternally\n
set(value) = definedExternally\n    var persistentState: MediaKeysRequirement? /* =
MediaKeysRequirement.OPTIONAL *\n
get() = definedExternally\n    set(value) = definedExternally\n
var sessionTypes: Array<String>?\n
get() = definedExternally\n    set(value) =
definedExternally\n}\n\n@Suppress(\"INVISIBLE_REFERENCE\",
\"INVISIBLE_MEMBER\")\n@kotlin.internal.InlineOnly\npublic inline fun MediaKeySystemConfiguration(label:
String? = \"\", initDataTypes: Array<String>? = arrayOf(), audioCapabilities:
Array<MediaKeySystemMediaCapability>? = arrayOf(), videoCapabilities:
Array<MediaKeySystemMediaCapability>? = arrayOf(), distinctiveIdentifier: MediaKeysRequirement? =
MediaKeysRequirement.OPTIONAL, persistentState: MediaKeysRequirement? =
MediaKeysRequirement.OPTIONAL, sessionTypes: Array<String>? = undefined): MediaKeySystemConfiguration
{\n    val o = js(\"({})\")\n    o[\"label\"] = label\n    o[\"initDataTypes\"] = initDataTypes\n
o[\"audioCapabilities\"] = audioCapabilities\n    o[\"videoCapabilities\"] = videoCapabilities\n
o[\"distinctiveIdentifier\"] = distinctiveIdentifier\n    o[\"persistentState\"] = persistentState\n    o[\"sessionTypes\"]
= sessionTypes\n    return o\n}\n\npublic external interface MediaKeySystemMediaCapability {\n    var
contentType: String? /* = \"\" *\n
get() = definedExternally\n    set(value) = definedExternally\n    var
robustness: String? /* = \"\" *\n
get() = definedExternally\n    set(value) =
definedExternally\n}\n\n@Suppress(\"INVISIBLE_REFERENCE\",
\"INVISIBLE_MEMBER\")\n@kotlin.internal.InlineOnly\npublic inline fun
MediaKeySystemMediaCapability(contentType: String? = \"\", robustness: String? = \"\"):
MediaKeySystemMediaCapability {\n    val o = js(\"({})\")\n    o[\"contentType\"] = contentType\n
o[\"robustness\"] = robustness\n    return o\n}\n\n/**\n * Exposes the JavaScript
[MediaKeySystemAccess](https://developer.mozilla.org/en/docs/Web/API/MediaKeySystemAccess) to Kotlin\n
*\n\npublic external abstract class MediaKeySystemAccess {\n    open val keySystem: String\n    fun
getConfiguration(): MediaKeySystemConfiguration\n    fun createMediaKeys(): Promise<MediaKeys>\n}\n\n/**\n * Exposes the JavaScript [MediaKeys](https://developer.mozilla.org/en/docs/Web/API/MediaKeys) to Kotlin\n
*\n\npublic external abstract class MediaKeys {\n    fun createSession(sessionType: MediaKeySessionType =
definedExternally): MediaKeySession\n    fun setServerCertificate(serverCertificate: dynamic):
Promise<Boolean>\n}\n\n/**\n * Exposes the JavaScript
[MediaKeySession](https://developer.mozilla.org/en/docs/Web/API/MediaKeySession) to Kotlin\n *\n\npublic

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```

external abstract class MediaKeySession : EventTarget {
    open val sessionId: String
    open val expiration: Double
    open val closed: Promise<Unit>
    open val keyStatuses: MediaKeyStatusMap
    open var onkeystatuseschange: ((Event) -> dynamic)?
    open var onmessage: ((MessageEvent) -> dynamic)?
    fun generateRequest(initDataType: String, initData: dynamic): Promise<Unit>
    fun load(sessionId: String): Promise<Boolean>
    fun update(response: dynamic): Promise<Unit>
    fun close(): Promise<Unit>
    fun remove(): Promise<Unit>
}

/** Exposes the JavaScript
[MediaKeyStatusMap](https://developer.mozilla.org/en/docs/Web/API/MediaKeyStatusMap) to Kotlin */
@public external abstract class MediaKeyStatusMap {
    open val size: Int
    fun has(keyId: dynamic): Boolean
    fun get(keyId: dynamic): Any?
}

/** Exposes the JavaScript
[MediaKeyMessageEvent](https://developer.mozilla.org/en/docs/Web/API/MediaKeyMessageEvent) to Kotlin */
@public external open class MediaKeyMessageEvent(type: String, eventInitDict: MediaKeyMessageEventInit) :
    Event {
    open val messageType: MediaKeyMessageType
    open val message: ArrayBuffer

    companion object {
        val NONE: Short
        val CAPTURING_PHASE: Short
        val AT_TARGET: Short
        val BUBBLING_PHASE: Short
    }
}

@public external interface MediaKeyMessageEventInit : EventInit {
    var messageType: MediaKeyMessageType?
    var message: ArrayBuffer?
}

@Suppress("INVISIBLE_REFERENCE", "INVISIBLE_MEMBER")
@kotlin.internal.InlineOnly
@public inline fun
MediaKeyMessageEventInit(messageType: MediaKeyMessageType?, message: ArrayBuffer?, bubbles: Boolean? =
    false, cancelable: Boolean? = false, composed: Boolean? = false): MediaKeyMessageEventInit {
    val o = js("{}")
    o["messageType"] = messageType
    o["message"] = message
    o["bubbles"] = bubbles
    o["cancelable"] = cancelable
    o["composed"] = composed
    return o
}

@public external open class
MediaEncryptedEvent(type: String, eventInitDict: MediaEncryptedEventInit = definedExternally) : Event {
    open val initDataType: String
    open val initData: ArrayBuffer?

    companion object {
        val NONE: Short
        val CAPTURING_PHASE: Short
        val AT_TARGET: Short
        val BUBBLING_PHASE: Short
    }
}

@public external interface MediaEncryptedEventInit : EventInit {
    var initDataType: String? /* =
    "" */
    get() = definedExternally
    set(value) = definedExternally
    var initData: ArrayBuffer? /* = null
    */
    get() = definedExternally
    set(value) =
    definedExternally
}

@Suppress("INVISIBLE_REFERENCE", "INVISIBLE_MEMBER")
@kotlin.internal.InlineOnly
@public inline fun
MediaEncryptedEventInit(initDataType: String? = "", initData: ArrayBuffer? = null, bubbles: Boolean? = false,
    cancelable: Boolean? = false, composed: Boolean? = false): MediaEncryptedEventInit {
    val o = js("{}")
    o["initDataType"] = initDataType
    o["initData"] = initData
    o["bubbles"] = bubbles
    o["cancelable"] =
    cancelable
    o["composed"] = composed
    return o
}

/* please, don't implement this interface!
*/
@JsName("null")
@Suppress("NESTED_CLASS_IN_EXTERNAL_INTERFACE")
@public external
interface MediaKeysRequirement {
    companion object {
        @public inline val
        MediaKeysRequirement.Companion.REQUIRED: MediaKeysRequirement get() =
        "required".asDynamic().unsafeCast<MediaKeysRequirement>()
        @public inline val
        MediaKeysRequirement.Companion.OPTIONAL: MediaKeysRequirement get() =
        "optional".asDynamic().unsafeCast<MediaKeysRequirement>()
        @public inline val
        MediaKeysRequirement.Companion.NOT_ALLOWED: MediaKeysRequirement get() = "not-
        allowed".asDynamic().unsafeCast<MediaKeysRequirement>()
    }

    /* please, don't implement this interface!
    */
    @JsName("null")
    @Suppress("NESTED_CLASS_IN_EXTERNAL_INTERFACE")
    @public external
    interface MediaKeySessionType {
        companion object {
            @public inline val
            MediaKeySessionType.Companion.TEMPORARY: MediaKeySessionType get() =
            "temporary".asDynamic().unsafeCast<MediaKeySessionType>()
            @public inline val
            MediaKeySessionType.Companion.PERSISTENT_LICENSE: MediaKeySessionType get() = "persistent-
            license".asDynamic().unsafeCast<MediaKeySessionType>()
        }

        /* please, don't implement this interface!
        */
        @JsName("null")
        @Suppress("NESTED_CLASS_IN_EXTERNAL_INTERFACE")
        @public external

```

```

interface MediaKeyStatus {\n  companion object\n}\n\npublic inline val MediaKeyStatus.Companion.USABLE:
MediaKeyStatus get() = \"usable\".asDynamic().unsafeCast<MediaKeyStatus>()\n\npublic inline val
MediaKeyStatus.Companion.EXPIRED: MediaKeyStatus get() =
\"expired\".asDynamic().unsafeCast<MediaKeyStatus>()\n\npublic inline val
MediaKeyStatus.Companion.RELEASED: MediaKeyStatus get() =
\"released\".asDynamic().unsafeCast<MediaKeyStatus>()\n\npublic inline val
MediaKeyStatus.Companion.OUTPUT_RESTRICTED: MediaKeyStatus get() = \"output-
restricted\".asDynamic().unsafeCast<MediaKeyStatus>()\n\npublic inline val
MediaKeyStatus.Companion.OUTPUT_DOWNSCALED: MediaKeyStatus get() = \"output-
downscaled\".asDynamic().unsafeCast<MediaKeyStatus>()\n\npublic inline val
MediaKeyStatus.Companion.STATUS_PENDING: MediaKeyStatus get() = \"status-
pending\".asDynamic().unsafeCast<MediaKeyStatus>()\n\npublic inline val
MediaKeyStatus.Companion.INTERNAL_ERROR: MediaKeyStatus get() = \"internal-
error\".asDynamic().unsafeCast<MediaKeyStatus>()\n\n/* please, don't implement this interface!
*/\n\n@JsName(\"null\")\n\n@Suppress(\"NESTED_CLASS_IN_EXTERNAL_INTERFACE\")\n\npublic external
interface MediaKeyMessageType {\n  companion object\n}\n\npublic inline val
MediaKeyMessageType.Companion.LICENSE_REQUEST: MediaKeyMessageType get() = \"license-
request\".asDynamic().unsafeCast<MediaKeyMessageType>()\n\npublic inline val
MediaKeyMessageType.Companion.LICENSE_RENEWAL: MediaKeyMessageType get() = \"license-
renewal\".asDynamic().unsafeCast<MediaKeyMessageType>()\n\npublic inline val
MediaKeyMessageType.Companion.LICENSE_RELEASE: MediaKeyMessageType get() = \"license-
release\".asDynamic().unsafeCast<MediaKeyMessageType>()\n\npublic inline val
MediaKeyMessageType.Companion.INDIVIDUALIZATION_REQUEST: MediaKeyMessageType get() =
\"individualization-request\".asDynamic().unsafeCast<MediaKeyMessageType>()\n\n/*\n * Copyright 2010-2021
JetBrains s.r.o. and Kotlin Programming Language contributors.\n * Use of this source code is governed by the
Apache 2.0 license that can be found in the license/LICENSE.txt file.\n *\n\n// NOTE: THIS FILE IS AUTO-
GENERATED, DO NOT EDIT!\n\n// See github.com/kotlin/dukat for details\n\npackage
org.w3c.dom.events\n\nimport kotlin.js.*\nimport org.khronos.webgl.*\nimport org.w3c.dom.*\n\n/**\n * Exposes
the JavaScript [UIEvent](https://developer.mozilla.org/en/docs/Web/API/UIEvent) to Kotlin\n *\n\npublic external
open class UIEvent(type: String, eventInitDict: UIEventInit = definedExternally) : Event {\n  open val view:
Window?\n  open val detail: Int\n\n  companion object {\n    val NONE: Short\n    val
CAPTURING_PHASE: Short\n    val AT_TARGET: Short\n    val BUBBLING_PHASE: Short\n
}\n}\n\npublic external interface UIEventInit : EventInit {\n  var view: Window? /* = null */\n  get() =
definedExternally\n  set(value) = definedExternally\n  var detail: Int? /* = 0 */\n  get() =
definedExternally\n  set(value) = definedExternally\n}\n\n@Suppress(\"INVISIBLE_REFERENCE\",
\"INVISIBLE_MEMBER\")\n\n@kotlin.internal.InlineOnly\n\npublic inline fun UIEventInit(view: Window? = null,
detail: Int? = 0, bubbles: Boolean? = false, cancelable: Boolean? = false, composed: Boolean? = false): UIEventInit
{\n  val o = js(\"({})\")\n  o[\"view\"] = view\n  o[\"detail\"] = detail\n  o[\"bubbles\"] = bubbles\n
o[\"cancelable\"] = cancelable\n  o[\"composed\"] = composed\n  return o\n}\n\n/**\n * Exposes the JavaScript
[FocusEvent](https://developer.mozilla.org/en/docs/Web/API/FocusEvent) to Kotlin\n *\n\npublic external open class
FocusEvent(type: String, eventInitDict: FocusEventInit = definedExternally) : UIEvent {\n  open val relatedTarget:
EventTarget?\n\n  companion object {\n    val NONE: Short\n    val CAPTURING_PHASE: Short\n    val
AT_TARGET: Short\n    val BUBBLING_PHASE: Short\n  }\n}\n\npublic external interface FocusEventInit :
UIEventInit {\n  var relatedTarget: EventTarget? /* = null */\n  get() = definedExternally\n  set(value) =
definedExternally\n}\n\n@Suppress(\"INVISIBLE_REFERENCE\",
\"INVISIBLE_MEMBER\")\n\n@kotlin.internal.InlineOnly\n\npublic inline fun FocusEventInit(relatedTarget:
EventTarget? = null, view: Window? = null, detail: Int? = 0, bubbles: Boolean? = false, cancelable: Boolean? =
false, composed: Boolean? = false): FocusEventInit {\n  val o = js(\"({})\")\n  o[\"relatedTarget\"] =

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relatedTarget\n o["view"] = view\n o["detail"] = detail\n o["bubbles"] = bubbles\n o["cancelable"] =
cancelable\n o["composed"] = composed\n return o\n}\n\n**\n * Exposes the JavaScript
[MouseEvent](https://developer.mozilla.org/en/docs/Web/API/MouseEvent) to Kotlin\n *\npublic external open
class MouseEvent(type: String, eventInitDict: MouseEventInit = definedExternally) : UIEvent,
UnionElementOrMouseEvent {\n open val screenX: Int\n open val screenY: Int\n open val clientX: Int\n
open val clientY: Int\n open val ctrlKey: Boolean\n open val shiftKey: Boolean\n open val altKey: Boolean\n
open val metaKey: Boolean\n open val button: Short\n open val buttons: Short\n open val relatedTarget:
EventTarget?\n open val region: String?\n open val pageX: Double\n open val pageY: Double\n open val x:
Double\n open val y: Double\n open val offsetX: Double\n open val offsetY: Double\n fun
getModifierState(keyArg: String): Boolean\n\n companion object {\n val NONE: Short\n val
CAPTURING_PHASE: Short\n val AT_TARGET: Short\n val BUBBLING_PHASE: Short\n
}\n}\n\npublic external interface MouseEventInit : EventModifierInit {\n var screenX: Int? /* = 0 */\n get() =
definedExternally\n set(value) = definedExternally\n var screenY: Int? /* = 0 */\n get() =
definedExternally\n set(value) = definedExternally\n var clientX: Int? /* = 0 */\n get() =
definedExternally\n set(value) = definedExternally\n var clientY: Int? /* = 0 */\n get() =
definedExternally\n set(value) = definedExternally\n var button: Short? /* = 0 */\n get() =
definedExternally\n set(value) = definedExternally\n var buttons: Short? /* = 0 */\n get() =
definedExternally\n set(value) = definedExternally\n var relatedTarget: EventTarget? /* = null */\n get()
= definedExternally\n set(value) = definedExternally\n var region: String? /* = null */\n get() =
definedExternally\n set(value) = definedExternally\n}\n\n@Suppress("INVISIBLE_REFERENCE",
"INVISIBLE_MEMBER")\n@kotlin.internal.InlineOnly\npublic inline fun MouseEventInit(screenX: Int? = 0,
screenY: Int? = 0, clientX: Int? = 0, clientY: Int? = 0, button: Short? = 0, buttons: Short? = 0, relatedTarget:
EventTarget? = null, region: String? = null, ctrlKey: Boolean? = false, shiftKey: Boolean? = false, altKey: Boolean?
= false, metaKey: Boolean? = false, modifierAltGraph: Boolean? = false, modifierCapsLock: Boolean? = false,
modifierFn: Boolean? = false, modifierFnLock: Boolean? = false, modifierHyper: Boolean? = false,
modifierNumLock: Boolean? = false, modifierScrollLock: Boolean? = false, modifierSuper: Boolean? = false,
modifierSymbol: Boolean? = false, modifierSymbolLock: Boolean? = false, view: Window? = null, detail: Int? = 0,
bubbles: Boolean? = false, cancelable: Boolean? = false, composed: Boolean? = false): MouseEventInit {\n val o =
js("{}")\n o["screenX"] = screenX\n o["screenY"] = screenY\n o["clientX"] = clientX\n o["clientY"]
= clientY\n o["button"] = button\n o["buttons"] = buttons\n o["relatedTarget"] = relatedTarget\n
o["region"] = region\n o["ctrlKey"] = ctrlKey\n o["shiftKey"] = shiftKey\n o["altKey"] = altKey\n
o["metaKey"] = metaKey\n o["modifierAltGraph"] = modifierAltGraph\n o["modifierCapsLock"] =
modifierCapsLock\n o["modifierFn"] = modifierFn\n o["modifierFnLock"] = modifierFnLock\n
o["modifierHyper"] = modifierHyper\n o["modifierNumLock"] = modifierNumLock\n
o["modifierScrollLock"] = modifierScrollLock\n o["modifierSuper"] = modifierSuper\n
o["modifierSymbol"] = modifierSymbol\n o["modifierSymbolLock"] = modifierSymbolLock\n o["view"] =
view\n o["detail"] = detail\n o["bubbles"] = bubbles\n o["cancelable"] = cancelable\n o["composed"] =
composed\n return o\n}\n\npublic external interface EventModifierInit : UIEventInit {\n var ctrlKey: Boolean?
/* = false */\n get() = definedExternally\n set(value) = definedExternally\n var shiftKey: Boolean? /* =
false */\n get() = definedExternally\n set(value) = definedExternally\n var altKey: Boolean? /* = false
*/\n get() = definedExternally\n set(value) = definedExternally\n var metaKey: Boolean? /* = false */\n
get() = definedExternally\n set(value) = definedExternally\n var modifierAltGraph: Boolean? /* = false */\n
get() = definedExternally\n set(value) = definedExternally\n var modifierCapsLock: Boolean? /* = false
*/\n get() = definedExternally\n set(value) = definedExternally\n var modifierFn: Boolean? /* = false */\n
get() = definedExternally\n set(value) = definedExternally\n var modifierFnLock: Boolean? /* = false */\n
get() = definedExternally\n set(value) = definedExternally\n var modifierHyper: Boolean? /* = false */\n
get() = definedExternally\n set(value) = definedExternally\n var modifierNumLock: Boolean? /* = false */\n
get() = definedExternally\n set(value) = definedExternally\n var modifierScrollLock: Boolean? /* = false

```

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*^n    get() = definedExternally\n    set(value) = definedExternally\n    var modifierSuper: Boolean? /* = false
*^n    get() = definedExternally\n    set(value) = definedExternally\n    var modifierSymbol: Boolean? /* = false
*^n    get() = definedExternally\n    set(value) = definedExternally\n    var modifierSymbolLock: Boolean? /* =
false *^n    get() = definedExternally\n    set(value) =
definedExternally\n}\n\n@Suppress(\"INVISIBLE_REFERENCE\",
\"INVISIBLE_MEMBER\")\n@kotlin.internal.InlineOnly\npublic inline fun EventModifierInit(ctrlKey: Boolean? =
false, shiftKey: Boolean? = false, altKey: Boolean? = false, metaKey: Boolean? = false, modifierAltGraph:
Boolean? = false, modifierCapsLock: Boolean? = false, modifierFn: Boolean? = false, modifierFnLock: Boolean? =
false, modifierHyper: Boolean? = false, modifierNumLock: Boolean? = false, modifierScrollLock: Boolean? = false,
modifierSuper: Boolean? = false, modifierSymbol: Boolean? = false, modifierSymbolLock: Boolean? = false, view:
Window? = null, detail: Int? = 0, bubbles: Boolean? = false, cancelable: Boolean? = false, composed: Boolean? =
false): EventModifierInit {\n    val o = js(\"({})\")\n    o[\"ctrlKey\"] = ctrlKey\n    o[\"shiftKey\"] = shiftKey\n
o[\"altKey\"] = altKey\n    o[\"metaKey\"] = metaKey\n    o[\"modifierAltGraph\"] = modifierAltGraph\n
o[\"modifierCapsLock\"] = modifierCapsLock\n    o[\"modifierFn\"] = modifierFn\n    o[\"modifierFnLock\"] =
modifierFnLock\n    o[\"modifierHyper\"] = modifierHyper\n    o[\"modifierNumLock\"] = modifierNumLock\n
o[\"modifierScrollLock\"] = modifierScrollLock\n    o[\"modifierSuper\"] = modifierSuper\n
o[\"modifierSymbol\"] = modifierSymbol\n    o[\"modifierSymbolLock\"] = modifierSymbolLock\n    o[\"view\"] =
view\n    o[\"detail\"] = detail\n    o[\"bubbles\"] = bubbles\n    o[\"cancelable\"] = cancelable\n    o[\"composed\"] =
composed\n    return o\n}\n\n/*\n * Exposes the JavaScript
[WheelEvent](https://developer.mozilla.org/en/docs/Web/API/WheelEvent) to Kotlin\n *^n\npublic external open
class WheelEvent(type: String, eventInitDict: WheelEventInit = definedExternally) : MouseEvent {\n    open val
deltaX: Double\n    open val deltaY: Double\n    open val deltaZ: Double\n    open val deltaMode: Int\n\n    companion object {\n        val DOM_DELTA_PIXEL: Int\n        val DOM_DELTA_LINE: Int\n        val
DOM_DELTA_PAGE: Int\n        val NONE: Short\n        val CAPTURING_PHASE: Short\n        val
AT_TARGET: Short\n        val BUBBLING_PHASE: Short\n    }\n\n    public external interface WheelEventInit :
MouseEventInit {\n        var deltaX: Double? /* = 0.0 *^n        get() = definedExternally\n        set(value) =
definedExternally\n        var deltaY: Double? /* = 0.0 *^n        get() = definedExternally\n        set(value) =
definedExternally\n        var deltaZ: Double? /* = 0.0 *^n        get() = definedExternally\n        set(value) =
definedExternally\n        var deltaMode: Int? /* = 0 *^n        get() = definedExternally\n        set(value) =
definedExternally\n    }\n\n    @Suppress(\"INVISIBLE_REFERENCE\",
\"INVISIBLE_MEMBER\")\n    @kotlin.internal.InlineOnly\n    public inline fun WheelEventInit(deltaX: Double? = 0.0,
deltaY: Double? = 0.0, deltaZ: Double? = 0.0, deltaMode: Int? = 0, screenX: Int? = 0, screenY: Int? = 0, clientX:
Int? = 0, clientY: Int? = 0, button: Short? = 0, buttons: Short? = 0, relatedTarget: EventTarget? = null, region:
String? = null, ctrlKey: Boolean? = false, shiftKey: Boolean? = false, altKey: Boolean? = false, metaKey: Boolean?
= false, modifierAltGraph: Boolean? = false, modifierCapsLock: Boolean? = false, modifierFn: Boolean? = false,
modifierFnLock: Boolean? = false, modifierHyper: Boolean? = false, modifierNumLock: Boolean? = false,
modifierScrollLock: Boolean? = false, modifierSuper: Boolean? = false, modifierSymbol: Boolean? = false,
modifierSymbolLock: Boolean? = false, view: Window? = null, detail: Int? = 0, bubbles: Boolean? = false,
cancelable: Boolean? = false, composed: Boolean? = false): WheelEventInit {\n        val o = js(\"({})\")\n
o[\"deltaX\"] = deltaX\n    o[\"deltaY\"] = deltaY\n    o[\"deltaZ\"] = deltaZ\n    o[\"deltaMode\"] = deltaMode\n
o[\"screenX\"] = screenX\n    o[\"screenY\"] = screenY\n    o[\"clientX\"] = clientX\n    o[\"clientY\"] = clientY\n
o[\"button\"] = button\n    o[\"buttons\"] = buttons\n    o[\"relatedTarget\"] = relatedTarget\n    o[\"region\"] =
region\n    o[\"ctrlKey\"] = ctrlKey\n    o[\"shiftKey\"] = shiftKey\n    o[\"altKey\"] = altKey\n    o[\"metaKey\"] =
metaKey\n    o[\"modifierAltGraph\"] = modifierAltGraph\n    o[\"modifierCapsLock\"] = modifierCapsLock\n
o[\"modifierFn\"] = modifierFn\n    o[\"modifierFnLock\"] = modifierFnLock\n    o[\"modifierHyper\"] =
modifierHyper\n    o[\"modifierNumLock\"] = modifierNumLock\n    o[\"modifierScrollLock\"] =
modifierScrollLock\n    o[\"modifierSuper\"] = modifierSuper\n    o[\"modifierSymbol\"] = modifierSymbol\n
o[\"modifierSymbolLock\"] = modifierSymbolLock\n    o[\"view\"] = view\n    o[\"detail\"] = detail\n

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o["bubbles"] = bubbles\n  o["cancelable"] = cancelable\n  o["composed"] = composed\n  return
o\n}\n\n/**\n * Exposes the JavaScript [InputEvent](https://developer.mozilla.org/en/docs/Web/API/InputEvent) to
Kotlin\n */\npublic external open class InputEvent(type: String, eventInitDict: InputEventInit = definedExternally) :
UIEvent {\n  open val data: String\n  open val isComposing: Boolean\n\n  companion object {\n    val NONE:
Short\n    val CAPTURING_PHASE: Short\n    val AT_TARGET: Short\n    val BUBBLING_PHASE:
Short\n  }\n}\n\npublic external interface InputEventInit : UIEventInit {\n  var data: String? /* = "" */\n
get() = definedExternally\n  set(value) = definedExternally\n  var isComposing: Boolean? /* = false */\n
get() = definedExternally\n  set(value) = definedExternally\n}\n\n@Suppress("INVISIBLE_REFERENCE",
"INVISIBLE_MEMBER")\n@kotlin.internal.InlineOnly\npublic inline fun InputEventInit(data: String? = "",
isComposing: Boolean? = false, view: Window? = null, detail: Int? = 0, bubbles: Boolean? = false, cancelable:
Boolean? = false, composed: Boolean? = false): InputEventInit {\n  val o = js("{}")\n  o["data"] = data\n
o["isComposing"] = isComposing\n  o["view"] = view\n  o["detail"] = detail\n  o["bubbles"] = bubbles\n
o["cancelable"] = cancelable\n  o["composed"] = composed\n  return o\n}\n\n/**\n * Exposes the JavaScript
[KeyboardEvent](https://developer.mozilla.org/en/docs/Web/API/KeyboardEvent) to Kotlin\n */\npublic external
open class KeyboardEvent(type: String, eventInitDict: KeyboardEventInit = definedExternally) : UIEvent {\n
  open val key: String\n  open val code: String\n  open val location: Int\n  open val ctrlKey: Boolean\n  open val
  shiftKey: Boolean\n  open val altKey: Boolean\n  open val metaKey: Boolean\n  open val repeat: Boolean\n
  open val isComposing: Boolean\n  open val charCode: Int\n  open val keyCode: Int\n  open val which: Int\n
  fun getModifierState(keyArg: String): Boolean\n\n  companion object {\n    val
  DOM_KEY_LOCATION_STANDARD: Int\n    val DOM_KEY_LOCATION_LEFT: Int\n    val
  DOM_KEY_LOCATION_RIGHT: Int\n    val DOM_KEY_LOCATION_NUMPAD: Int\n    val NONE:
Short\n    val CAPTURING_PHASE: Short\n    val AT_TARGET: Short\n    val BUBBLING_PHASE:
Short\n  }\n}\n\npublic external interface KeyboardEventInit : EventModifierInit {\n  var key: String? /* = "" */\n
get() = definedExternally\n  set(value) = definedExternally\n  var code: String? /* = "" */\n  get()
= definedExternally\n  set(value) = definedExternally\n  var location: Int? /* = 0 */\n  get() =
definedExternally\n  set(value) = definedExternally\n  var repeat: Boolean? /* = false */\n  get() =
definedExternally\n  set(value) = definedExternally\n  var isComposing: Boolean? /* = false */\n  get() =
definedExternally\n  set(value) = definedExternally\n}\n\n@Suppress("INVISIBLE_REFERENCE",
"INVISIBLE_MEMBER")\n@kotlin.internal.InlineOnly\npublic inline fun KeyboardEventInit(key: String? = "",
code: String? = "", location: Int? = 0, repeat: Boolean? = false, isComposing: Boolean? = false, ctrlKey: Boolean?
= false, shiftKey: Boolean? = false, altKey: Boolean? = false, metaKey: Boolean? = false, modifierAltGraph:
Boolean? = false, modifierCapsLock: Boolean? = false, modifierFn: Boolean? = false, modifierFnLock: Boolean? =
false, modifierHyper: Boolean? = false, modifierNumLock: Boolean? = false, modifierScrollLock: Boolean? = false,
modifierSuper: Boolean? = false, modifierSymbol: Boolean? = false, modifierSymbolLock: Boolean? = false, view:
Window? = null, detail: Int? = 0, bubbles: Boolean? = false, cancelable: Boolean? = false, composed: Boolean? =
false): KeyboardEventInit {\n  val o = js("{}")\n  o["key"] = key\n  o["code"] = code\n  o["location"] =
location\n  o["repeat"] = repeat\n  o["isComposing"] = isComposing\n  o["ctrlKey"] = ctrlKey\n
o["shiftKey"] = shiftKey\n  o["altKey"] = altKey\n  o["metaKey"] = metaKey\n  o["modifierAltGraph"] =
modifierAltGraph\n  o["modifierCapsLock"] = modifierCapsLock\n  o["modifierFn"] = modifierFn\n
o["modifierFnLock"] = modifierFnLock\n  o["modifierHyper"] = modifierHyper\n  o["modifierNumLock"] =
modifierNumLock\n  o["modifierScrollLock"] = modifierScrollLock\n  o["modifierSuper"] = modifierSuper\n
o["modifierSymbol"] = modifierSymbol\n  o["modifierSymbolLock"] = modifierSymbolLock\n  o["view"] =
view\n  o["detail"] = detail\n  o["bubbles"] = bubbles\n  o["cancelable"] = cancelable\n  o["composed"] =
composed\n  return o\n}\n\n/**\n * Exposes the JavaScript
[CompositionEvent](https://developer.mozilla.org/en/docs/Web/API/CompositionEvent) to Kotlin\n */\npublic
external open class CompositionEvent(type: String, eventInitDict: CompositionEventInit = definedExternally) :
UIEvent {\n  open val data: String\n\n  companion object {\n    val NONE: Short\n    val
  CAPTURING_PHASE: Short\n    val AT_TARGET: Short\n    val BUBBLING_PHASE: Short\n

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}\n\npublic external interface CompositionEventInit : UIEventInit {\n  var data: String? /* = \"\" */\n  get() = definedExternally\n  set(value) = definedExternally\n}\n\n@Suppress(\"INVISIBLE_REFERENCE\", \"INVISIBLE_MEMBER\")\n@kotlin.internal.InlineOnly\npublic inline fun CompositionEventInit(data: String? = \"\", view: Window? = null, detail: Int? = 0, bubbles: Boolean? = false, cancelable: Boolean? = false, composed: Boolean? = false): CompositionEventInit {\n  val o = js(\"({})\")\n  o[\"data\"] = data\n  o[\"view\"] = view\n  o[\"detail\"] = detail\n  o[\"bubbles\"] = bubbles\n  o[\"cancelable\"] = cancelable\n  o[\"composed\"] = composed\n  return o\n}\n\n/**\n * Exposes the JavaScript [Event](https://developer.mozilla.org/en/docs/Web/API/Event) to Kotlin\n */\npublic external open class Event(type: String, eventInitDict: EventInit = definedExternally) {\n  open val type: String\n  open val target: EventTarget?\n  open val currentTarget: EventTarget?\n  open val eventPhase: Short\n  open val bubbles: Boolean\n  open val cancelable: Boolean\n  open val defaultPrevented: Boolean\n  open val composed: Boolean\n  open val isTrusted: Boolean\n  open val timeStamp: Number\n  fun composedPath(): Array<EventTarget>\n  fun stopPropagation()\n  fun stopImmediatePropagation()\n  fun preventDefault()\n  fun initEvent(type: String, bubbles: Boolean, cancelable: Boolean)\n\n  companion object {\n    val NONE: Short\n    val CAPTURING_PHASE: Short\n    val AT_TARGET: Short\n    val BUBBLING_PHASE: Short\n  }\n}\n\n/**\n * Exposes the JavaScript [EventTarget](https://developer.mozilla.org/en/docs/Web/API/EventTarget) to Kotlin\n */\npublic external abstract class EventTarget {\n  fun addEventListener(type: String, callback: EventListener?, options: dynamic = definedExternally)\n  fun addEventListener(type: String, callback: ((Event) -> Unit)?, options: dynamic = definedExternally)\n  fun removeEventListener(type: String, callback: EventListener?, options: dynamic = definedExternally)\n  fun removeEventListener(type: String, callback: ((Event) -> Unit)?, options: dynamic = definedExternally)\n  fun dispatchEvent(event: Event): Boolean\n}\n\n/**\n * Exposes the JavaScript [EventListener](https://developer.mozilla.org/en/docs/Web/API/EventListener) to Kotlin\n */\npublic external interface EventListener {\n  fun handleEvent(event: Event)\n}\n\n\"/*\n * Copyright 2010-2021 JetBrains s.r.o. and Kotlin Programming Language contributors.\n * Use of this source code is governed by the Apache 2.0 license that can be found in the license/LICENSE.txt file.\n */\n\n// NOTE: THIS FILE IS AUTO-GENERATED, DO NOT EDIT!\n\n See github.com/kotlin/dukat for details\n\npackage org.w3c.dom\n\nimport kotlin.js.*\nimport org.khronos.webgl.*\nimport org.w3c.dom.clipboard.*\nimport org.w3c.dom.css.*\nimport org.w3c.dom.encryptedmedia.*\nimport org.w3c.dom.events.*\nimport org.w3c.dom.mediacapture.*\nimport org.w3c.dom.mediasource.*\nimport org.w3c.dom.pointerevents.*\nimport org.w3c.dom.svg.*\nimport org.w3c.fetch.*\nimport org.w3c.files.*\nimport org.w3c.performance.*\nimport org.w3c.workers.*\nimport org.w3c.xhr.*\n\npublic external abstract class HTMLAllCollection {\n  open val length: Int\n  fun item(nameOrIndex: String = definedExternally): UnionElementOrHTMLCollection?\n  fun namedItem(name: String): UnionElementOrHTMLCollection?\n}\n\n@Suppress(\"INVISIBLE_REFERENCE\", \"INVISIBLE_MEMBER\")\n@kotlin.internal.InlineOnly\npublic inline operator fun HTMLAllCollection.get(index: Int): Element? = asDynamic()[index]\n\n@Suppress(\"INVISIBLE_REFERENCE\", \"INVISIBLE_MEMBER\")\n@kotlin.internal.InlineOnly\npublic inline operator fun HTMLAllCollection.get(name: String): UnionElementOrHTMLCollection? = asDynamic()[name]\n\n/**\n * Exposes the JavaScript [HTMLFormControlsCollection](https://developer.mozilla.org/en/docs/Web/API/HTMLFormControlsCollection) to Kotlin\n */\npublic external abstract class HTMLFormControlsCollection : HTMLCollection\n\n/**\n * Exposes the JavaScript [RadioNodeList](https://developer.mozilla.org/en/docs/Web/API/RadioNodeList) to Kotlin\n */\npublic external abstract class RadioNodeList : NodeList, UnionElementOrRadioNodeList {\n  open var value: String\n}\n\n/**\n * Exposes the JavaScript [HTMLOptionsCollection](https://developer.mozilla.org/en/docs/Web/API/HTMLOptionsCollection) to Kotlin\n */\npublic external abstract class HTMLOptionsCollection : HTMLCollection {\n  override var length: Int\n  open var selectedIndex: Int\n  fun add(element: UnionHTMLOptGroupElementOrHTMLOptionElement, before:

```


DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n }\n}\n\n/**\n * Exposes the JavaScript [HTMLHeadElement](https://developer.mozilla.org/en/docs/Web/API/HTMLHeadElement) to Kotlin\n *\npublic external abstract class HTMLHeadElement : HTMLElement {\n companion object {\n val ELEMENT_NODE: Short\n val ATTRIBUTE_NODE: Short\n val TEXT_NODE: Short\n val CDATA_SECTION_NODE: Short\n val ENTITY_REFERENCE_NODE: Short\n val ENTITY_NODE: Short\n val PROCESSING_INSTRUCTION_NODE: Short\n val COMMENT_NODE: Short\n val DOCUMENT_NODE: Short\n val DOCUMENT_TYPE_NODE: Short\n val DOCUMENT_FRAGMENT_NODE: Short\n val NOTATION_NODE: Short\n val DOCUMENT_POSITION_DISCONNECTED: Short\n val DOCUMENT_POSITION_PRECEDING: Short\n val DOCUMENT_POSITION_FOLLOWING: Short\n val DOCUMENT_POSITION_CONTAINS: Short\n val DOCUMENT_POSITION_CONTAINED_BY: Short\n val

DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n }\n}\n\n/**\n * Exposes the JavaScript [HTMLTitleElement](https://developer.mozilla.org/en/docs/Web/API/HTMLTitleElement) to Kotlin\n *\npublic external abstract class HTMLTitleElement : HTMLElement {\n open var text: String\n\n companion object {\n val ELEMENT_NODE: Short\n val ATTRIBUTE_NODE: Short\n val TEXT_NODE: Short\n val CDATA_SECTION_NODE: Short\n val ENTITY_REFERENCE_NODE: Short\n val ENTITY_NODE: Short\n val PROCESSING_INSTRUCTION_NODE: Short\n val COMMENT_NODE: Short\n val DOCUMENT_NODE: Short\n val DOCUMENT_TYPE_NODE: Short\n val DOCUMENT_FRAGMENT_NODE: Short\n val NOTATION_NODE: Short\n val DOCUMENT_POSITION_DISCONNECTED: Short\n val DOCUMENT_POSITION_PRECEDING: Short\n val DOCUMENT_POSITION_FOLLOWING: Short\n val DOCUMENT_POSITION_CONTAINS: Short\n val DOCUMENT_POSITION_CONTAINED_BY: Short\n val

DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n }\n}\n\n/**\n * Exposes the JavaScript [HTMLBaseElement](https://developer.mozilla.org/en/docs/Web/API/HTMLBaseElement) to Kotlin\n *\npublic external abstract class HTMLBaseElement : HTMLElement {\n open var href: String\n open var target: String\n\n companion object {\n val ELEMENT_NODE: Short\n val ATTRIBUTE_NODE: Short\n val TEXT_NODE: Short\n val CDATA_SECTION_NODE: Short\n val ENTITY_REFERENCE_NODE: Short\n val ENTITY_NODE: Short\n val PROCESSING_INSTRUCTION_NODE: Short\n val COMMENT_NODE: Short\n val DOCUMENT_NODE: Short\n val DOCUMENT_TYPE_NODE: Short\n val DOCUMENT_FRAGMENT_NODE: Short\n val NOTATION_NODE: Short\n val DOCUMENT_POSITION_DISCONNECTED: Short\n val DOCUMENT_POSITION_PRECEDING: Short\n val DOCUMENT_POSITION_FOLLOWING: Short\n val DOCUMENT_POSITION_CONTAINS: Short\n val DOCUMENT_POSITION_CONTAINED_BY: Short\n val

DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n }\n}\n\n/**\n * Exposes the JavaScript [HTMLLinkElement](https://developer.mozilla.org/en/docs/Web/API/HTMLLinkElement) to Kotlin\n *\npublic external abstract class HTMLLinkElement : HTMLElement, LinkStyle {\n open var href: String\n open var crossOrigin: String?\n open var rel: String\n open var `as`: RequestDestination\n open val relList: DOMTokenList\n open var media: String\n open var nonce: String\n open var hreflang: String\n open var type: String\n open val sizes: DOMTokenList\n open var referrerPolicy: String\n open var charset: String\n open var rev: String\n open var target: String\n open var scope: String\n open var workerType: WorkerType\n\n companion object {\n val ELEMENT_NODE: Short\n val ATTRIBUTE_NODE: Short\n val TEXT_NODE: Short\n val CDATA_SECTION_NODE: Short\n val ENTITY_REFERENCE_NODE: Short\n val ENTITY_NODE: Short\n val PROCESSING_INSTRUCTION_NODE: Short\n val COMMENT_NODE: Short\n val DOCUMENT_NODE: Short\n val DOCUMENT_TYPE_NODE: Short\n val DOCUMENT_FRAGMENT_NODE: Short\n val NOTATION_NODE: Short\n val DOCUMENT_POSITION_DISCONNECTED: Short\n val DOCUMENT_POSITION_PRECEDING: Short\n val DOCUMENT_POSITION_FOLLOWING: Short\n val DOCUMENT_POSITION_CONTAINS: Short\n

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    val DOCUMENT_POSITION_CONTAINED_BY: Short\n    val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n    }\n}\n\n/**\n * Exposes the JavaScript
[HTMLMetaElement](https://developer.mozilla.org/en/docs/Web/API/HTMLMetaElement) to Kotlin\n *\npublic
external abstract class HTMLMetaElement : HTMLElement {\n    open var name: String\n    open var httpEquiv:
String\n    open var content: String\n    open var scheme: String\n\n    companion object {\n        val
ELEMENT_NODE: Short\n        val ATTRIBUTE_NODE: Short\n        val TEXT_NODE: Short\n        val
CDATA_SECTION_NODE: Short\n        val ENTITY_REFERENCE_NODE: Short\n        val ENTITY_NODE:
Short\n        val PROCESSING_INSTRUCTION_NODE: Short\n        val COMMENT_NODE: Short\n        val
DOCUMENT_NODE: Short\n        val DOCUMENT_TYPE_NODE: Short\n        val
DOCUMENT_FRAGMENT_NODE: Short\n        val NOTATION_NODE: Short\n        val
DOCUMENT_POSITION_DISCONNECTED: Short\n        val DOCUMENT_POSITION_PRECEDING: Short\n
        val DOCUMENT_POSITION_FOLLOWING: Short\n        val DOCUMENT_POSITION_CONTAINS: Short\n
        val DOCUMENT_POSITION_CONTAINED_BY: Short\n        val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n    }\n}\n\n/**\n * Exposes the JavaScript
[HTMLStyleElement](https://developer.mozilla.org/en/docs/Web/API/HTMLStyleElement) to Kotlin\n *\npublic
external abstract class HTMLStyleElement : HTMLElement, LinkStyle {\n    open var media: String\n    open var
nonce: String\n    open var type: String\n\n    companion object {\n        val ELEMENT_NODE: Short\n        val
ATTRIBUTE_NODE: Short\n        val TEXT_NODE: Short\n        val CDATA_SECTION_NODE: Short\n        val
ENTITY_REFERENCE_NODE: Short\n        val ENTITY_NODE: Short\n        val
PROCESSING_INSTRUCTION_NODE: Short\n        val COMMENT_NODE: Short\n        val
DOCUMENT_NODE: Short\n        val DOCUMENT_TYPE_NODE: Short\n        val
DOCUMENT_FRAGMENT_NODE: Short\n        val NOTATION_NODE: Short\n        val
DOCUMENT_POSITION_DISCONNECTED: Short\n        val DOCUMENT_POSITION_PRECEDING: Short\n
        val DOCUMENT_POSITION_FOLLOWING: Short\n        val DOCUMENT_POSITION_CONTAINS: Short\n
        val DOCUMENT_POSITION_CONTAINED_BY: Short\n        val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n    }\n}\n\n/**\n * Exposes the JavaScript
[HTMLBodyElement](https://developer.mozilla.org/en/docs/Web/API/HTMLBodyElement) to Kotlin\n *\npublic
external abstract class HTMLBodyElement : HTMLElement, WindowEventHandlers {\n    open var text: String\n
open var link: String\n    open var vLink: String\n    open var aLink: String\n    open var bgColor: String\n
open var background: String\n\n    companion object {\n        val ELEMENT_NODE: Short\n        val
ATTRIBUTE_NODE: Short\n        val TEXT_NODE: Short\n        val CDATA_SECTION_NODE: Short\n        val
ENTITY_REFERENCE_NODE: Short\n        val ENTITY_NODE: Short\n        val
PROCESSING_INSTRUCTION_NODE: Short\n        val COMMENT_NODE: Short\n        val
DOCUMENT_NODE: Short\n        val DOCUMENT_TYPE_NODE: Short\n        val
DOCUMENT_FRAGMENT_NODE: Short\n        val NOTATION_NODE: Short\n        val
DOCUMENT_POSITION_DISCONNECTED: Short\n        val DOCUMENT_POSITION_PRECEDING: Short\n
        val DOCUMENT_POSITION_FOLLOWING: Short\n        val DOCUMENT_POSITION_CONTAINS: Short\n
        val DOCUMENT_POSITION_CONTAINED_BY: Short\n        val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n    }\n}\n\n/**\n * Exposes the JavaScript
[HTMLHeadingElement](https://developer.mozilla.org/en/docs/Web/API/HTMLHeadingElement) to Kotlin\n *\npublic
external abstract class HTMLHeadingElement : HTMLElement {\n    open var align: String\n\n    companion object {\n        val ELEMENT_NODE: Short\n        val ATTRIBUTE_NODE: Short\n        val
TEXT_NODE: Short\n        val CDATA_SECTION_NODE: Short\n        val ENTITY_REFERENCE_NODE:
Short\n        val ENTITY_NODE: Short\n        val PROCESSING_INSTRUCTION_NODE: Short\n        val
COMMENT_NODE: Short\n        val DOCUMENT_NODE: Short\n        val DOCUMENT_TYPE_NODE: Short\n
        val DOCUMENT_FRAGMENT_NODE: Short\n        val NOTATION_NODE: Short\n        val
DOCUMENT_POSITION_DISCONNECTED: Short\n        val DOCUMENT_POSITION_PRECEDING: Short\n
        val DOCUMENT_POSITION_FOLLOWING: Short\n        val DOCUMENT_POSITION_CONTAINS: Short\n

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    val DOCUMENT_POSITION_CONTAINED_BY: Short\n    val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n    }\n}\n\n/**\n * Exposes the JavaScript
[HTMLParagraphElement](https://developer.mozilla.org/en/docs/Web/API/HTMLParagraphElement) to Kotlin\n
*\npublic external abstract class HTMLParagraphElement : HTMLInputElement {\n    open var align: String\n\n
companion object {\n        val ELEMENT_NODE: Short\n        val ATTRIBUTE_NODE: Short\n        val
TEXT_NODE: Short\n        val CDATA_SECTION_NODE: Short\n        val ENTITY_REFERENCE_NODE:
Short\n        val ENTITY_NODE: Short\n        val PROCESSING_INSTRUCTION_NODE: Short\n        val
COMMENT_NODE: Short\n        val DOCUMENT_NODE: Short\n        val DOCUMENT_TYPE_NODE: Short\n
        val DOCUMENT_FRAGMENT_NODE: Short\n        val NOTATION_NODE: Short\n        val
DOCUMENT_POSITION_DISCONNECTED: Short\n        val DOCUMENT_POSITION_PRECEDING: Short\n
        val DOCUMENT_POSITION_FOLLOWING: Short\n        val DOCUMENT_POSITION_CONTAINS: Short\n
        val DOCUMENT_POSITION_CONTAINED_BY: Short\n        val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n    }\n}\n\n/**\n * Exposes the JavaScript
[HTMLHRElement](https://developer.mozilla.org/en/docs/Web/API/HTMLHRElement) to Kotlin\n
*\npublic external abstract class HTMLHRElement : HTMLInputElement {\n    open var align: String\n
    open var color: String\n
    open var noShade: Boolean\n
    open var size: String\n
    open var width: String\n\n    companion object {\n        val
ELEMENT_NODE: Short\n        val ATTRIBUTE_NODE: Short\n        val TEXT_NODE: Short\n        val
CDATA_SECTION_NODE: Short\n        val ENTITY_REFERENCE_NODE: Short\n        val ENTITY_NODE:
Short\n        val PROCESSING_INSTRUCTION_NODE: Short\n        val COMMENT_NODE: Short\n        val
DOCUMENT_NODE: Short\n        val DOCUMENT_TYPE_NODE: Short\n        val
DOCUMENT_FRAGMENT_NODE: Short\n        val NOTATION_NODE: Short\n        val
DOCUMENT_POSITION_DISCONNECTED: Short\n        val DOCUMENT_POSITION_PRECEDING: Short\n
        val DOCUMENT_POSITION_FOLLOWING: Short\n        val DOCUMENT_POSITION_CONTAINS: Short\n
        val DOCUMENT_POSITION_CONTAINED_BY: Short\n        val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n    }\n}\n\n/**\n * Exposes the JavaScript
[HTMLPreElement](https://developer.mozilla.org/en/docs/Web/API/HTMLPreElement) to Kotlin\n
*\npublic external abstract class HTMLPreElement : HTMLInputElement {\n    open var width: Int\n\n
    companion object {\n        val
ELEMENT_NODE: Short\n        val ATTRIBUTE_NODE: Short\n        val TEXT_NODE: Short\n        val
CDATA_SECTION_NODE: Short\n        val ENTITY_REFERENCE_NODE: Short\n        val ENTITY_NODE:
Short\n        val PROCESSING_INSTRUCTION_NODE: Short\n        val COMMENT_NODE: Short\n        val
DOCUMENT_NODE: Short\n        val DOCUMENT_TYPE_NODE: Short\n        val
DOCUMENT_FRAGMENT_NODE: Short\n        val NOTATION_NODE: Short\n        val
DOCUMENT_POSITION_DISCONNECTED: Short\n        val DOCUMENT_POSITION_PRECEDING: Short\n
        val DOCUMENT_POSITION_FOLLOWING: Short\n        val DOCUMENT_POSITION_CONTAINS: Short\n
        val DOCUMENT_POSITION_CONTAINED_BY: Short\n        val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n    }\n}\n\n/**\n * Exposes the JavaScript
[HTMLQuoteElement](https://developer.mozilla.org/en/docs/Web/API/HTMLQuoteElement) to Kotlin\n
*\npublic external abstract class HTMLQuoteElement : HTMLInputElement {\n    open var cite: String\n\n
    companion object {\n        val
ELEMENT_NODE: Short\n        val ATTRIBUTE_NODE: Short\n        val TEXT_NODE: Short\n        val
CDATA_SECTION_NODE: Short\n        val ENTITY_REFERENCE_NODE: Short\n        val ENTITY_NODE:
Short\n        val PROCESSING_INSTRUCTION_NODE: Short\n        val COMMENT_NODE: Short\n        val
DOCUMENT_NODE: Short\n        val DOCUMENT_TYPE_NODE: Short\n        val
DOCUMENT_FRAGMENT_NODE: Short\n        val NOTATION_NODE: Short\n        val
DOCUMENT_POSITION_DISCONNECTED: Short\n        val DOCUMENT_POSITION_PRECEDING: Short\n
        val DOCUMENT_POSITION_FOLLOWING: Short\n        val DOCUMENT_POSITION_CONTAINS: Short\n
        val DOCUMENT_POSITION_CONTAINED_BY: Short\n        val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n    }\n}\n\n/**\n * Exposes the JavaScript
[HTMLLOListElement](https://developer.mozilla.org/en/docs/Web/API/HTMLLOListElement) to Kotlin\n
*\npublic

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external abstract class HTMLLOListElement : HTMLInputElement {
    open var reversed: Boolean
    open var start: Int
    open var type: String
    open var compact: Boolean
    companion object {
        val ELEMENT_NODE: Short
        val ATTRIBUTE_NODE: Short
        val TEXT_NODE: Short
        val CDATA_SECTION_NODE: Short
        val ENTITY_REFERENCE_NODE: Short
        val ENTITY_NODE: Short
        val PROCESSING_INSTRUCTION_NODE: Short
        val COMMENT_NODE: Short
        val DOCUMENT_NODE: Short
        val DOCUMENT_TYPE_NODE: Short
        val DOCUMENT_FRAGMENT_NODE: Short
        val NOTATION_NODE: Short
        val DOCUMENT_POSITION_DISCONNECTED: Short
        val DOCUMENT_POSITION_PRECEDING: Short
        val DOCUMENT_POSITION_FOLLOWING: Short
        val DOCUMENT_POSITION_CONTAINS: Short
        val DOCUMENT_POSITION_CONTAINED_BY: Short
    }
}

DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short }
}

Exposes the JavaScript [HTMLUListElement](https://developer.mozilla.org/en/docs/Web/API/HTMLUListElement) to Kotlin
public external abstract class HTMLUListElement : HTMLInputElement {
    open var compact: Boolean
    open var type: String
    companion object {
        val ELEMENT_NODE: Short
        val ATTRIBUTE_NODE: Short
        val TEXT_NODE: Short
        val CDATA_SECTION_NODE: Short
        val ENTITY_REFERENCE_NODE: Short
        val ENTITY_NODE: Short
        val PROCESSING_INSTRUCTION_NODE: Short
        val COMMENT_NODE: Short
        val DOCUMENT_NODE: Short
        val DOCUMENT_TYPE_NODE: Short
        val DOCUMENT_FRAGMENT_NODE: Short
        val NOTATION_NODE: Short
        val DOCUMENT_POSITION_DISCONNECTED: Short
        val DOCUMENT_POSITION_PRECEDING: Short
        val DOCUMENT_POSITION_FOLLOWING: Short
        val DOCUMENT_POSITION_CONTAINS: Short
        val DOCUMENT_POSITION_CONTAINED_BY: Short
    }
}

DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short }
}

Exposes the JavaScript [HTMLLIElement](https://developer.mozilla.org/en/docs/Web/API/HTMLLIElement) to Kotlin
public external abstract class HTMLLIElement : HTMLInputElement {
    open var value: Int
    open var type: String
    companion object {
        val ELEMENT_NODE: Short
        val ATTRIBUTE_NODE: Short
        val TEXT_NODE: Short
        val CDATA_SECTION_NODE: Short
        val ENTITY_REFERENCE_NODE: Short
        val ENTITY_NODE: Short
        val PROCESSING_INSTRUCTION_NODE: Short
        val COMMENT_NODE: Short
        val DOCUMENT_NODE: Short
        val DOCUMENT_TYPE_NODE: Short
        val DOCUMENT_FRAGMENT_NODE: Short
        val NOTATION_NODE: Short
        val DOCUMENT_POSITION_DISCONNECTED: Short
        val DOCUMENT_POSITION_PRECEDING: Short
        val DOCUMENT_POSITION_FOLLOWING: Short
        val DOCUMENT_POSITION_CONTAINS: Short
        val DOCUMENT_POSITION_CONTAINED_BY: Short
    }
}

DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short }
}

Exposes the JavaScript [HTMLDListElement](https://developer.mozilla.org/en/docs/Web/API/HTMLDListElement) to Kotlin
public external abstract class HTMLDListElement : HTMLInputElement {
    open var compact: Boolean
    companion object {
        val ELEMENT_NODE: Short
        val ATTRIBUTE_NODE: Short
        val TEXT_NODE: Short
        val CDATA_SECTION_NODE: Short
        val ENTITY_REFERENCE_NODE: Short
        val ENTITY_NODE: Short
        val PROCESSING_INSTRUCTION_NODE: Short
        val COMMENT_NODE: Short
        val DOCUMENT_NODE: Short
        val DOCUMENT_TYPE_NODE: Short
        val DOCUMENT_FRAGMENT_NODE: Short
        val NOTATION_NODE: Short
        val DOCUMENT_POSITION_DISCONNECTED: Short
        val DOCUMENT_POSITION_PRECEDING: Short
        val DOCUMENT_POSITION_FOLLOWING: Short
        val DOCUMENT_POSITION_CONTAINS: Short
        val DOCUMENT_POSITION_CONTAINED_BY: Short
    }
}

DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short }
}

Exposes the JavaScript [HTMLDivElement](https://developer.mozilla.org/en/docs/Web/API/HTMLDivElement) to Kotlin
public external abstract class HTMLDivElement : HTMLInputElement {
    open var align: String
    companion object {
        val ELEMENT_NODE: Short
        val ATTRIBUTE_NODE: Short
        val TEXT_NODE: Short
        val CDATA_SECTION_NODE: Short
        val ENTITY_REFERENCE_NODE: Short
        val ENTITY_NODE: Short
    }
}

```

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Short\n    val PROCESSING_INSTRUCTION_NODE: Short\n    val COMMENT_NODE: Short\n    val
DOCUMENT_NODE: Short\n    val DOCUMENT_TYPE_NODE: Short\n    val
DOCUMENT_FRAGMENT_NODE: Short\n    val NOTATION_NODE: Short\n    val
DOCUMENT_POSITION_DISCONNECTED: Short\n    val DOCUMENT_POSITION_PRECEDING: Short\n
    val DOCUMENT_POSITION_FOLLOWING: Short\n    val DOCUMENT_POSITION_CONTAINS: Short\n
    val DOCUMENT_POSITION_CONTAINED_BY: Short\n    val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n    }\n}\n\n/**\n * Exposes the JavaScript
[HTMLAnchorElement](https://developer.mozilla.org/en/docs/Web/API/HTMLAnchorElement) to Kotlin\n
*/\npublic external abstract class HTMLAnchorElement : HTMLElement, HTMLHyperlinkElementUtils {\n    open
var target: String\n    open var download: String\n    open var ping: String\n    open var rel: String\n    open val
relList: DOMTokenList\n    open var hreflang: String\n    open var type: String\n    open var text: String\n    open
var referrerPolicy: String\n    open var coords: String\n    open var charset: String\n    open var name: String\n
open var rev: String\n    open var shape: String\n\n    companion object {\n        val ELEMENT_NODE: Short\n
        val ATTRIBUTE_NODE: Short\n        val TEXT_NODE: Short\n        val CDATA_SECTION_NODE: Short\n
        val ENTITY_REFERENCE_NODE: Short\n        val ENTITY_NODE: Short\n        val
PROCESSING_INSTRUCTION_NODE: Short\n        val COMMENT_NODE: Short\n        val
DOCUMENT_NODE: Short\n        val DOCUMENT_TYPE_NODE: Short\n        val
DOCUMENT_FRAGMENT_NODE: Short\n        val NOTATION_NODE: Short\n        val
DOCUMENT_POSITION_DISCONNECTED: Short\n        val DOCUMENT_POSITION_PRECEDING: Short\n
        val DOCUMENT_POSITION_FOLLOWING: Short\n        val DOCUMENT_POSITION_CONTAINS: Short\n
        val DOCUMENT_POSITION_CONTAINED_BY: Short\n        val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n    }\n}\n\n/**\n * Exposes the JavaScript
[HTMLDataElement](https://developer.mozilla.org/en/docs/Web/API/HTMLDataElement) to Kotlin\n
*/\npublic external abstract class HTMLDataElement : HTMLElement {\n    open var value: String\n\n    companion object {\n
        val ELEMENT_NODE: Short\n        val ATTRIBUTE_NODE: Short\n        val TEXT_NODE: Short\n        val
CDATA_SECTION_NODE: Short\n        val ENTITY_REFERENCE_NODE: Short\n        val ENTITY_NODE:
Short\n        val PROCESSING_INSTRUCTION_NODE: Short\n        val COMMENT_NODE: Short\n        val
DOCUMENT_NODE: Short\n        val DOCUMENT_TYPE_NODE: Short\n        val
DOCUMENT_FRAGMENT_NODE: Short\n        val NOTATION_NODE: Short\n        val
DOCUMENT_POSITION_DISCONNECTED: Short\n        val DOCUMENT_POSITION_PRECEDING: Short\n
        val DOCUMENT_POSITION_FOLLOWING: Short\n        val DOCUMENT_POSITION_CONTAINS: Short\n
        val DOCUMENT_POSITION_CONTAINED_BY: Short\n        val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n    }\n}\n\n/**\n * Exposes the JavaScript
[HTMLTimeElement](https://developer.mozilla.org/en/docs/Web/API/HTMLTimeElement) to Kotlin\n
*/\npublic external abstract class HTMLTimeElement : HTMLElement {\n    open var dateTime: String\n\n    companion
object {\n        val ELEMENT_NODE: Short\n        val ATTRIBUTE_NODE: Short\n        val TEXT_NODE:
Short\n        val CDATA_SECTION_NODE: Short\n        val ENTITY_REFERENCE_NODE: Short\n        val
ENTITY_NODE: Short\n        val PROCESSING_INSTRUCTION_NODE: Short\n        val COMMENT_NODE:
Short\n        val DOCUMENT_NODE: Short\n        val DOCUMENT_TYPE_NODE: Short\n        val
DOCUMENT_FRAGMENT_NODE: Short\n        val NOTATION_NODE: Short\n        val
DOCUMENT_POSITION_DISCONNECTED: Short\n        val DOCUMENT_POSITION_PRECEDING: Short\n
        val DOCUMENT_POSITION_FOLLOWING: Short\n        val DOCUMENT_POSITION_CONTAINS: Short\n
        val DOCUMENT_POSITION_CONTAINED_BY: Short\n        val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n    }\n}\n\n/**\n * Exposes the JavaScript
[HTMLSpanElement](https://developer.mozilla.org/en/docs/Web/API/HTMLSpanElement) to Kotlin\n
*/\npublic external abstract class HTMLSpanElement : HTMLElement {\n    companion object {\n        val
ELEMENT_NODE: Short\n        val ATTRIBUTE_NODE: Short\n        val TEXT_NODE: Short\n        val
CDATA_SECTION_NODE: Short\n        val ENTITY_REFERENCE_NODE: Short\n        val ENTITY_NODE:

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Short\n    val PROCESSING_INSTRUCTION_NODE: Short\n    val COMMENT_NODE: Short\n    val
DOCUMENT_NODE: Short\n    val DOCUMENT_TYPE_NODE: Short\n    val
DOCUMENT_FRAGMENT_NODE: Short\n    val NOTATION_NODE: Short\n    val
DOCUMENT_POSITION_DISCONNECTED: Short\n    val DOCUMENT_POSITION_PRECEDING: Short\n
    val DOCUMENT_POSITION_FOLLOWING: Short\n    val DOCUMENT_POSITION_CONTAINS: Short\n
    val DOCUMENT_POSITION_CONTAINED_BY: Short\n    val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n    }\n}\n\n/**\n * Exposes the JavaScript
[HTMLBRElement](https://developer.mozilla.org/en/docs/Web/API/HTMLBRElement) to Kotlin\n
*\npublic external abstract class HTMLBRElement : HTMLElement {\n    open var clear: String\n\n    companion object {\n
    val ELEMENT_NODE: Short\n    val ATTRIBUTE_NODE: Short\n    val TEXT_NODE: Short\n    val
CDATA_SECTION_NODE: Short\n    val ENTITY_REFERENCE_NODE: Short\n    val ENTITY_NODE:
Short\n    val PROCESSING_INSTRUCTION_NODE: Short\n    val COMMENT_NODE: Short\n    val
DOCUMENT_NODE: Short\n    val DOCUMENT_TYPE_NODE: Short\n    val
DOCUMENT_FRAGMENT_NODE: Short\n    val NOTATION_NODE: Short\n    val
DOCUMENT_POSITION_DISCONNECTED: Short\n    val DOCUMENT_POSITION_PRECEDING: Short\n
    val DOCUMENT_POSITION_FOLLOWING: Short\n    val DOCUMENT_POSITION_CONTAINS: Short\n
    val DOCUMENT_POSITION_CONTAINED_BY: Short\n    val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n    }\n}\n\n/**\n * Exposes the JavaScript
[HTMLHyperlinkElementUtils](https://developer.mozilla.org/en/docs/Web/API/HTMLHyperlinkElementUtils) to
Kotlin\n
*\npublic external interface HTMLHyperlinkElementUtils {\n    var href: String\n    val origin: String\n
var protocol: String\n    var username: String\n    var password: String\n    var host: String\n    var hostname:
String\n    var port: String\n    var pathname: String\n    var search: String\n    var hash: String\n}\n\n/**\n * Exposes
the JavaScript [HTMLModElement](https://developer.mozilla.org/en/docs/Web/API/HTMLModElement) to
Kotlin\n
*\npublic external abstract class HTMLModElement : HTMLElement {\n    open var cite: String\n    open
var dateTime: String\n\n    companion object {\n    val ELEMENT_NODE: Short\n    val
ATTRIBUTE_NODE: Short\n    val TEXT_NODE: Short\n    val CDATA_SECTION_NODE: Short\n    val
ENTITY_REFERENCE_NODE: Short\n    val ENTITY_NODE: Short\n    val
PROCESSING_INSTRUCTION_NODE: Short\n    val COMMENT_NODE: Short\n    val
DOCUMENT_NODE: Short\n    val DOCUMENT_TYPE_NODE: Short\n    val
DOCUMENT_FRAGMENT_NODE: Short\n    val NOTATION_NODE: Short\n    val
DOCUMENT_POSITION_DISCONNECTED: Short\n    val DOCUMENT_POSITION_PRECEDING: Short\n
    val DOCUMENT_POSITION_FOLLOWING: Short\n    val DOCUMENT_POSITION_CONTAINS: Short\n
    val DOCUMENT_POSITION_CONTAINED_BY: Short\n    val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n    }\n}\n\n/**\n * Exposes the JavaScript
[HTMLPictureElement](https://developer.mozilla.org/en/docs/Web/API/HTMLPictureElement) to Kotlin\n
*\npublic external abstract class HTMLPictureElement : HTMLElement {\n    companion object {\n    val
ELEMENT_NODE: Short\n    val ATTRIBUTE_NODE: Short\n    val TEXT_NODE: Short\n    val
CDATA_SECTION_NODE: Short\n    val ENTITY_REFERENCE_NODE: Short\n    val ENTITY_NODE:
Short\n    val PROCESSING_INSTRUCTION_NODE: Short\n    val COMMENT_NODE: Short\n    val
DOCUMENT_NODE: Short\n    val DOCUMENT_TYPE_NODE: Short\n    val
DOCUMENT_FRAGMENT_NODE: Short\n    val NOTATION_NODE: Short\n    val
DOCUMENT_POSITION_DISCONNECTED: Short\n    val DOCUMENT_POSITION_PRECEDING: Short\n
    val DOCUMENT_POSITION_FOLLOWING: Short\n    val DOCUMENT_POSITION_CONTAINS: Short\n
    val DOCUMENT_POSITION_CONTAINED_BY: Short\n    val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n    }\n}\n\n/**\n * Exposes the JavaScript
[HTMLSourceElement](https://developer.mozilla.org/en/docs/Web/API/HTMLSourceElement) to Kotlin\n
*\npublic external abstract class HTMLSourceElement : HTMLElement {\n    open var src: String\n    open var
type: String\n    open var srcset: String\n    open var sizes: String\n    open var media: String\n\n    companion object

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PROCESSING_INSTRUCTION_NODE: Short\n    val COMMENT_NODE: Short\n    val
DOCUMENT_NODE: Short\n    val DOCUMENT_TYPE_NODE: Short\n    val
DOCUMENT_FRAGMENT_NODE: Short\n    val NOTATION_NODE: Short\n    val
DOCUMENT_POSITION_DISCONNECTED: Short\n    val DOCUMENT_POSITION_PRECEDING: Short\n
    val DOCUMENT_POSITION_FOLLOWING: Short\n    val DOCUMENT_POSITION_CONTAINS: Short\n
    val DOCUMENT_POSITION_CONTAINED_BY: Short\n    val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n    } \n } \n \n /** \n * Exposes the JavaScript
[HTMLElement](https://developer.mozilla.org/en/docs/Web/API/HTMLElement) to Kotlin \n
*\npublic external abstract class HTMLElement : HTMLInputElement { \n    open var data: String \n    open var
type: String \n    open var typeMustMatch: Boolean \n    open var name: String \n    open var useMap: String \n    open
val form: HTMLFormElement? \n    open var width: String \n    open var height: String \n    open val
contentDocument: Document? \n    open val contentWindow: Window? \n    open val willValidate: Boolean \n    open
val validity: ValidityState \n    open val validationMessage: String \n    open var align: String \n    open var archive:
String \n    open var code: String \n    open var declare: Boolean \n    open var hspace: Int \n    open var standby:
String \n    open var vspace: Int \n    open var codeBase: String \n    open var codeType: String \n    open var border:
String \n    fun getSVGDocument(): Document? \n    fun checkValidity(): Boolean \n    fun reportValidity():
Boolean \n    fun setCustomValidity(error: String) \n \n    companion object { \n        val ELEMENT_NODE: Short \n
        val ATTRIBUTE_NODE: Short \n        val TEXT_NODE: Short \n        val CDATA_SECTION_NODE: Short \n
        val ENTITY_REFERENCE_NODE: Short \n        val ENTITY_NODE: Short \n        val
PROCESSING_INSTRUCTION_NODE: Short \n        val COMMENT_NODE: Short \n        val
DOCUMENT_NODE: Short \n        val DOCUMENT_TYPE_NODE: Short \n        val
DOCUMENT_FRAGMENT_NODE: Short \n        val NOTATION_NODE: Short \n        val
DOCUMENT_POSITION_DISCONNECTED: Short \n        val DOCUMENT_POSITION_PRECEDING: Short \n
        val DOCUMENT_POSITION_FOLLOWING: Short \n        val DOCUMENT_POSITION_CONTAINS: Short \n
        val DOCUMENT_POSITION_CONTAINED_BY: Short \n        val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short \n    } \n } \n \n /** \n * Exposes the JavaScript
[HTMLParamElement](https://developer.mozilla.org/en/docs/Web/API/HTMLParamElement) to Kotlin \n
*\npublic external abstract class HTMLParamElement : HTMLInputElement { \n    open var name: String \n    open var
value: String \n    open var type: String \n    open var valueType: String \n \n    companion object { \n        val
ELEMENT_NODE: Short \n        val ATTRIBUTE_NODE: Short \n        val TEXT_NODE: Short \n        val
CDATA_SECTION_NODE: Short \n        val ENTITY_REFERENCE_NODE: Short \n        val ENTITY_NODE:
Short \n        val PROCESSING_INSTRUCTION_NODE: Short \n        val COMMENT_NODE: Short \n        val
DOCUMENT_NODE: Short \n        val DOCUMENT_TYPE_NODE: Short \n        val
DOCUMENT_FRAGMENT_NODE: Short \n        val NOTATION_NODE: Short \n        val
DOCUMENT_POSITION_DISCONNECTED: Short \n        val DOCUMENT_POSITION_PRECEDING: Short \n
        val DOCUMENT_POSITION_FOLLOWING: Short \n        val DOCUMENT_POSITION_CONTAINS: Short \n
        val DOCUMENT_POSITION_CONTAINED_BY: Short \n        val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short \n    } \n } \n \n /** \n * Exposes the JavaScript
[HTMLVideoElement](https://developer.mozilla.org/en/docs/Web/API/HTMLVideoElement) to Kotlin \n
*\npublic external abstract class HTMLVideoElement : HTMLMediaElement, CanvasImageSource, TexImageSource { \n
    open var width: Int \n    open var height: Int \n    open val videoWidth: Int \n    open val videoHeight: Int \n    open var
poster: String \n    open var playsInline: Boolean \n \n    companion object { \n        val NETWORK_EMPTY: Short \n
        val NETWORK_IDLE: Short \n        val NETWORK_LOADING: Short \n        val NETWORK_NO_SOURCE:
Short \n        val HAVE_NOTHING: Short \n        val HAVE_METADATA: Short \n        val
HAVE_CURRENT_DATA: Short \n        val HAVE_FUTURE_DATA: Short \n        val HAVE_ENOUGH_DATA:
Short \n        val ELEMENT_NODE: Short \n        val ATTRIBUTE_NODE: Short \n        val TEXT_NODE: Short \n
        val CDATA_SECTION_NODE: Short \n        val ENTITY_REFERENCE_NODE: Short \n        val
ENTITY_NODE: Short \n        val PROCESSING_INSTRUCTION_NODE: Short \n        val COMMENT_NODE:

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Short\n    val DOCUMENT_NODE: Short\n    val DOCUMENT_TYPE_NODE: Short\n    val
DOCUMENT_FRAGMENT_NODE: Short\n    val NOTATION_NODE: Short\n    val
DOCUMENT_POSITION_DISCONNECTED: Short\n    val DOCUMENT_POSITION_PRECEDING: Short\n
    val DOCUMENT_POSITION_FOLLOWING: Short\n    val DOCUMENT_POSITION_CONTAINS: Short\n
    val DOCUMENT_POSITION_CONTAINED_BY: Short\n    val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n    }\n}\n\n/**\n * Exposes the JavaScript
[HTMLAudioElement](https://developer.mozilla.org/en/docs/Web/API/HTMLAudioElement) to Kotlin\n
*/\npublic external abstract class HTMLAudioElement : HTMLMediaElement {\n    companion object {\n        val
NETWORK_EMPTY: Short\n        val NETWORK_IDLE: Short\n        val NETWORK_LOADING: Short\n
        val NETWORK_NO_SOURCE: Short\n        val HAVE_NOTHING: Short\n        val HAVE_METADATA:
Short\n        val HAVE_CURRENT_DATA: Short\n        val HAVE_FUTURE_DATA: Short\n        val
HAVE_ENOUGH_DATA: Short\n        val ELEMENT_NODE: Short\n        val ATTRIBUTE_NODE: Short\n
        val TEXT_NODE: Short\n        val CDATA_SECTION_NODE: Short\n        val ENTITY_REFERENCE_NODE:
Short\n        val ENTITY_NODE: Short\n        val PROCESSING_INSTRUCTION_NODE: Short\n        val
COMMENT_NODE: Short\n        val DOCUMENT_NODE: Short\n        val DOCUMENT_TYPE_NODE: Short\n
        val DOCUMENT_FRAGMENT_NODE: Short\n        val NOTATION_NODE: Short\n        val
DOCUMENT_POSITION_DISCONNECTED: Short\n        val DOCUMENT_POSITION_PRECEDING: Short\n
        val DOCUMENT_POSITION_FOLLOWING: Short\n        val DOCUMENT_POSITION_CONTAINS: Short\n
        val DOCUMENT_POSITION_CONTAINED_BY: Short\n        val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n    }\n}\n\n/**\n * Exposes the JavaScript
[HTMLTrackElement](https://developer.mozilla.org/en/docs/Web/API/HTMLTrackElement) to Kotlin\n
*/\npublic external abstract class HTMLTrackElement : HTMLMediaElement {\n    open var kind: String\n    open var src: String\n
    open var srclang: String\n    open var label: String\n    open var default: Boolean\n    open val readyState: Short\n
    open val track: TextTrack\n\n    companion object {\n        val NONE: Short\n        val LOADING: Short\n        val
LOADED: Short\n        val ERROR: Short\n        val ELEMENT_NODE: Short\n        val ATTRIBUTE_NODE:
Short\n        val TEXT_NODE: Short\n        val CDATA_SECTION_NODE: Short\n        val
ENTITY_REFERENCE_NODE: Short\n        val ENTITY_NODE: Short\n        val
PROCESSING_INSTRUCTION_NODE: Short\n        val COMMENT_NODE: Short\n        val
DOCUMENT_NODE: Short\n        val DOCUMENT_TYPE_NODE: Short\n        val
DOCUMENT_FRAGMENT_NODE: Short\n        val NOTATION_NODE: Short\n        val
DOCUMENT_POSITION_DISCONNECTED: Short\n        val DOCUMENT_POSITION_PRECEDING: Short\n
        val DOCUMENT_POSITION_FOLLOWING: Short\n        val DOCUMENT_POSITION_CONTAINS: Short\n
        val DOCUMENT_POSITION_CONTAINED_BY: Short\n        val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n    }\n}\n\n/**\n * Exposes the JavaScript
[HTMLMediaElement](https://developer.mozilla.org/en/docs/Web/API/HTMLMediaElement) to Kotlin\n
*/\npublic external abstract class HTMLMediaElement : HTMLMediaElement {\n    open val error: MediaError?\n    open
var src: String\n    open var srcObject: MediaProvider?\n    open val currentSrc: String\n    open var crossOrigin:
String?\n    open val networkState: Short\n    open var preload: String\n    open val buffered: TimeRanges\n    open
val readyState: Short\n    open val seeking: Boolean\n    open var currentTime: Double\n    open val duration:
Double\n    open val paused: Boolean\n    open var defaultPlaybackRate: Double\n    open var playbackRate:
Double\n    open val played: TimeRanges\n    open val seekable: TimeRanges\n    open val ended: Boolean\n    open
var autoplay: Boolean\n    open var loop: Boolean\n    open var controls: Boolean\n    open var volume: Double\n
    open var muted: Boolean\n    open var defaultMuted: Boolean\n    open val audioTracks: AudioTrackList\n    open
val videoTracks: VideoTrackList\n    open val textTracks: TextTrackList\n    open val mediaKeys: MediaKeys?\n
    open var onencrypted: ((Event) -> dynamic)?\n    open var onwaitingforkey: ((Event) -> dynamic)?\n    fun load()\n
    fun canPlayType(type: String): CanPlayTypeResult\n    fun fastSeek(time: Double)\n    fun getStartDate():
dynamic\n    fun play(): Promise<Unit>\n    fun pause()\n    fun addTextTrack(kind: TextTrackKind, label: String =
definedExternally, language: String = definedExternally): TextTrack\n    fun setMediaKeys(mediaKeys:

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MediaKeys?): Promise<Unit>\n\n companion object {\n    val NETWORK_EMPTY: Short\n    val NETWORK_IDLE: Short\n    val NETWORK_LOADING: Short\n    val NETWORK_NO_SOURCE: Short\n    val HAVE_NOTHING: Short\n    val HAVE_METADATA: Short\n    val HAVE_CURRENT_DATA: Short\n    val HAVE_FUTURE_DATA: Short\n    val HAVE_ENOUGH_DATA: Short\n    val ELEMENT_NODE: Short\n    val ATTRIBUTE_NODE: Short\n    val TEXT_NODE: Short\n    val CDATA_SECTION_NODE: Short\n    val ENTITY_REFERENCE_NODE: Short\n    val ENTITY_NODE: Short\n    val PROCESSING_INSTRUCTION_NODE: Short\n    val COMMENT_NODE: Short\n    val DOCUMENT_NODE: Short\n    val DOCUMENT_TYPE_NODE: Short\n    val DOCUMENT_FRAGMENT_NODE: Short\n    val NOTATION_NODE: Short\n    val DOCUMENT_POSITION_DISCONNECTED: Short\n    val DOCUMENT_POSITION_PRECEDING: Short\n    val DOCUMENT_POSITION_FOLLOWING: Short\n    val DOCUMENT_POSITION_CONTAINS: Short\n    val DOCUMENT_POSITION_CONTAINED_BY: Short\n    val DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n }
}\n\n/**\n * Exposes the JavaScript [MediaError](https://developer.mozilla.org/en/docs/Web/API/MediaError) to Kotlin\n */\npublic external abstract class MediaError {\n    open val code: Short\n\n    companion object {\n        val MEDIA_ERR_ABORTED: Short\n        val MEDIA_ERR_NETWORK: Short\n        val MEDIA_ERR_DECODE: Short\n        val MEDIA_ERR_SRC_NOT_SUPPORTED: Short\n    }
}\n\n/**\n * Exposes the JavaScript [AudioTrackList](https://developer.mozilla.org/en/docs/Web/API/AudioTrackList) to Kotlin\n */\npublic external abstract class AudioTrackList : EventTarget {\n    open val length: Int\n    open var onchange: ((Event) -> dynamic)?\n    open var onaddtrack: ((TrackEvent) -> dynamic)?\n    open var onremovetrack: ((TrackEvent) -> dynamic)?\n    fun getTrackById(id: String): AudioTrack?\n}\n\n@Suppress("INVISIBLE_REFERENCE", "INVISIBLE_MEMBER")\n@kotlin.internal.InlineOnly\npublic inline operator fun AudioTrackList.get(index: Int): AudioTrack? = asDynamic()[index]\n\n/**\n * Exposes the JavaScript [AudioTrack](https://developer.mozilla.org/en/docs/Web/API/AudioTrack) to Kotlin\n */\npublic external abstract class AudioTrack : UnionAudioTrackOrTextTrackOrVideoTrack {\n    open val id: String\n    open val kind: String\n    open val label: String\n    open val language: String\n    open var enabled: Boolean\n    open val sourceBuffer: SourceBuffer?\n}\n\n/**\n * Exposes the JavaScript [VideoTrackList](https://developer.mozilla.org/en/docs/Web/API/VideoTrackList) to Kotlin\n */\npublic external abstract class VideoTrackList : EventTarget {\n    open val length: Int\n    open val selectedIndex: Int\n    open var onchange: ((Event) -> dynamic)?\n    open var onaddtrack: ((TrackEvent) -> dynamic)?\n    open var onremovetrack: ((TrackEvent) -> dynamic)?\n    fun getTrackById(id: String): VideoTrack?\n}\n\n@Suppress("INVISIBLE_REFERENCE", "INVISIBLE_MEMBER")\n@kotlin.internal.InlineOnly\npublic inline operator fun VideoTrackList.get(index: Int): VideoTrack? = asDynamic()[index]\n\n/**\n * Exposes the JavaScript [VideoTrack](https://developer.mozilla.org/en/docs/Web/API/VideoTrack) to Kotlin\n */\npublic external abstract class VideoTrack : UnionAudioTrackOrTextTrackOrVideoTrack {\n    open val id: String\n    open val kind: String\n    open val label: String\n    open val language: String\n    open var selected: Boolean\n    open val sourceBuffer: SourceBuffer?\n}\n\npublic external abstract class TextTrackList : EventTarget {\n    open val length: Int\n    open var onchange: ((Event) -> dynamic)?\n    open var onaddtrack: ((TrackEvent) -> dynamic)?\n    open var onremovetrack: ((TrackEvent) -> dynamic)?\n    fun getTrackById(id: String): TextTrack?\n}\n\n@Suppress("INVISIBLE_REFERENCE", "INVISIBLE_MEMBER")\n@kotlin.internal.InlineOnly\npublic inline operator fun TextTrackList.get(index: Int): TextTrack? = asDynamic()[index]\n\n/**\n * Exposes the JavaScript [TextTrack](https://developer.mozilla.org/en/docs/Web/API/TextTrack) to Kotlin\n */\npublic external abstract class TextTrack : EventTarget, UnionAudioTrackOrTextTrackOrVideoTrack {\n    open val kind: TextTrackKind\n    open val label: String\n    open val language: String\n    open val id: String\n    open val inBandMetadataTrackDispatchType: String\n    open var mode: TextTrackMode\n    open val cues: TextTrackCueList?\n    open val activeCues: TextTrackCueList?\n    open var oncuechange: ((Event) ->

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dynamic)?\n  open val sourceBuffer: SourceBuffer?\n  fun addCue(cue: TextTrackCue)\n  fun removeCue(cue:
TextTrackCue)\n}\n\npublic external abstract class TextTrackCueList {\n  open val length: Int\n  fun
getCueById(id: String): TextTrackCue?\n}\n\n@Suppress("INVISIBLE_REFERENCE",
"INVISIBLE_MEMBER")\n@kotlin.internal.InlineOnly\npublic inline operator fun TextTrackCueList.get(index:
Int): TextTrackCue? = asDynamic()[index]\n\n/**\n * Exposes the JavaScript
[TextTrackCue](https://developer.mozilla.org/en/docs/Web/API/TextTrackCue) to Kotlin\n */\npublic external
abstract class TextTrackCue : EventTarget {\n  open val track: TextTrack?\n  open var id: String\n  open var
startTime: Double\n  open var endTime: Double\n  open var pauseOnExit: Boolean\n  open var onenter: ((Event)
-> dynamic)?\n  open var onexit: ((Event) -> dynamic)?\n}\n\n/**\n * Exposes the JavaScript
[TimeRanges](https://developer.mozilla.org/en/docs/Web/API/TimeRanges) to Kotlin\n */\npublic external abstract
class TimeRanges {\n  open val length: Int\n  fun start(index: Int): Double\n  fun end(index: Int):
Double\n}\n\n/**\n * Exposes the JavaScript
[TrackEvent](https://developer.mozilla.org/en/docs/Web/API/TrackEvent) to Kotlin\n */\npublic external open class
TrackEvent(type: String, eventInitDict: TrackEventInit = definedExternally) : Event {\n  open val track:
UnionAudioTrackOrTextTrackOrVideoTrack?\n\n  companion object {\n    val NONE: Short\n    val
CAPTURING_PHASE: Short\n    val AT_TARGET: Short\n    val BUBBLING_PHASE: Short\n
}\n}\n\npublic external interface TrackEventInit : EventInit {\n  var track:
UnionAudioTrackOrTextTrackOrVideoTrack? /* = null */\n  get() = definedExternally\n  set(value) =
definedExternally\n}\n\n@Suppress("INVISIBLE_REFERENCE",
"INVISIBLE_MEMBER")\n@kotlin.internal.InlineOnly\npublic inline fun TrackEventInit(track:
UnionAudioTrackOrTextTrackOrVideoTrack? = null, bubbles: Boolean? = false, cancelable: Boolean? = false,
composed: Boolean? = false): TrackEventInit {\n  val o = js("{}")\n  o["track"] = track\n  o["bubbles"] =
bubbles\n  o["cancelable"] = cancelable\n  o["composed"] = composed\n  return o\n}\n\n/**\n * Exposes the
JavaScript [HTMLMapElement](https://developer.mozilla.org/en/docs/Web/API/HTMLMapElement) to Kotlin\n
*/\npublic external abstract class HTMLMapElement : HTMLElement {\n  open var name: String\n  open val
areas: HTMLCollection\n\n  companion object {\n    val ELEMENT_NODE: Short\n    val
ATTRIBUTE_NODE: Short\n    val TEXT_NODE: Short\n    val CDATA_SECTION_NODE: Short\n    val
ENTITY_REFERENCE_NODE: Short\n    val ENTITY_NODE: Short\n    val
PROCESSING_INSTRUCTION_NODE: Short\n    val COMMENT_NODE: Short\n    val
DOCUMENT_NODE: Short\n    val DOCUMENT_TYPE_NODE: Short\n    val
DOCUMENT_FRAGMENT_NODE: Short\n    val NOTATION_NODE: Short\n    val
DOCUMENT_POSITION_DISCONNECTED: Short\n    val DOCUMENT_POSITION_PRECEDING: Short\n
val DOCUMENT_POSITION_FOLLOWING: Short\n    val DOCUMENT_POSITION_CONTAINS: Short\n
val DOCUMENT_POSITION_CONTAINED_BY: Short\n    val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n  }\n}\n\n/**\n * Exposes the JavaScript
[HTMLAreaElement](https://developer.mozilla.org/en/docs/Web/API/HTMLAreaElement) to Kotlin\n */\npublic
external abstract class HTMLAreaElement : HTMLElement, HTMLHyperlinkElementUtils {\n  open var alt:
String\n  open var coords: String\n  open var shape: String\n  open var target: String\n  open var download:
String\n  open var ping: String\n  open var rel: String\n  open val relList: DOMTokenList\n  open var
referrerPolicy: String\n  open var noHref: Boolean\n\n  companion object {\n    val ELEMENT_NODE:
Short\n    val ATTRIBUTE_NODE: Short\n    val TEXT_NODE: Short\n    val CDATA_SECTION_NODE:
Short\n    val ENTITY_REFERENCE_NODE: Short\n    val ENTITY_NODE: Short\n    val
PROCESSING_INSTRUCTION_NODE: Short\n    val COMMENT_NODE: Short\n    val
DOCUMENT_NODE: Short\n    val DOCUMENT_TYPE_NODE: Short\n    val
DOCUMENT_FRAGMENT_NODE: Short\n    val NOTATION_NODE: Short\n    val
DOCUMENT_POSITION_DISCONNECTED: Short\n    val DOCUMENT_POSITION_PRECEDING: Short\n
val DOCUMENT_POSITION_FOLLOWING: Short\n    val DOCUMENT_POSITION_CONTAINS: Short\n
val DOCUMENT_POSITION_CONTAINED_BY: Short\n    val

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TEXT_NODE: Short\n    val CDATA_SECTION_NODE: Short\n    val ENTITY_REFERENCE_NODE:
Short\n    val ENTITY_NODE: Short\n    val PROCESSING_INSTRUCTION_NODE: Short\n    val
COMMENT_NODE: Short\n    val DOCUMENT_NODE: Short\n    val DOCUMENT_TYPE_NODE: Short\n
    val DOCUMENT_FRAGMENT_NODE: Short\n    val NOTATION_NODE: Short\n    val
DOCUMENT_POSITION_DISCONNECTED: Short\n    val DOCUMENT_POSITION_PRECEDING: Short\n
    val DOCUMENT_POSITION_FOLLOWING: Short\n    val DOCUMENT_POSITION_CONTAINS: Short\n
    val DOCUMENT_POSITION_CONTAINED_BY: Short\n    val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n    } \n} \n \n /** \n * Exposes the JavaScript
[HTMLTableRowElement](https://developer.mozilla.org/en/docs/Web/API/HTMLTableRowElement) to Kotlin \n
*\npublic external abstract class HTMLTableRowElement : HTMLElement { \n    open val rowIndex: Int \n    open
val sectionRowIndex: Int \n    open val cells: HTMLCollection \n    open var align: String \n    open var ch: String \n
open var chOff: String \n    open var vAlign: String \n    open var bgColor: String \n    fun insertCell(index: Int =
definedExternally): HTMLElement \n    fun deleteCell(index: Int) \n \n    companion object { \n        val
ELEMENT_NODE: Short\n        val ATTRIBUTE_NODE: Short\n        val TEXT_NODE: Short\n        val
CDATA_SECTION_NODE: Short\n        val ENTITY_REFERENCE_NODE: Short\n        val ENTITY_NODE:
Short\n        val PROCESSING_INSTRUCTION_NODE: Short\n        val COMMENT_NODE: Short\n        val
DOCUMENT_NODE: Short\n        val DOCUMENT_TYPE_NODE: Short\n        val
DOCUMENT_FRAGMENT_NODE: Short\n        val NOTATION_NODE: Short\n        val
DOCUMENT_POSITION_DISCONNECTED: Short\n        val DOCUMENT_POSITION_PRECEDING: Short\n
        val DOCUMENT_POSITION_FOLLOWING: Short\n        val DOCUMENT_POSITION_CONTAINS: Short\n
        val DOCUMENT_POSITION_CONTAINED_BY: Short\n        val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n    } \n} \n \n /** \n * Exposes the JavaScript
[HTMLTableCellElement](https://developer.mozilla.org/en/docs/Web/API/HTMLTableCellElement) to Kotlin \n
*\npublic external abstract class HTMLTableCellElement : HTMLElement { \n    open var colSpan: Int \n    open var
rowSpan: Int \n    open var headers: String \n    open val cellIndex: Int \n    open var scope: String \n    open var abbr:
String \n    open var align: String \n    open var axis: String \n    open var height: String \n    open var width: String \n
open var ch: String \n    open var chOff: String \n    open var noWrap: Boolean \n    open var vAlign: String \n    open
var bgColor: String \n \n    companion object { \n        val ELEMENT_NODE: Short\n        val ATTRIBUTE_NODE:
Short\n        val TEXT_NODE: Short\n        val CDATA_SECTION_NODE: Short\n        val
ENTITY_REFERENCE_NODE: Short\n        val ENTITY_NODE: Short\n        val
PROCESSING_INSTRUCTION_NODE: Short\n        val COMMENT_NODE: Short\n        val
DOCUMENT_NODE: Short\n        val DOCUMENT_TYPE_NODE: Short\n        val
DOCUMENT_FRAGMENT_NODE: Short\n        val NOTATION_NODE: Short\n        val
DOCUMENT_POSITION_DISCONNECTED: Short\n        val DOCUMENT_POSITION_PRECEDING: Short\n
        val DOCUMENT_POSITION_FOLLOWING: Short\n        val DOCUMENT_POSITION_CONTAINS: Short\n
        val DOCUMENT_POSITION_CONTAINED_BY: Short\n        val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n    } \n} \n \n /** \n * Exposes the JavaScript
[HTMLFormElement](https://developer.mozilla.org/en/docs/Web/API/HTMLFormElement) to Kotlin \n
*\npublic external abstract class HTMLFormElement : HTMLElement { \n    open var acceptCharset: String \n    open var
action: String \n    open var autocomplete: String \n    open var enctype: String \n    open var encoding: String \n    open
var method: String \n    open var name: String \n    open var noValidate: Boolean \n    open var target: String \n    open
val elements: HTMLFormControlsCollection \n    open val length: Int \n    fun submit() \n    fun reset() \n    fun
checkValidity(): Boolean \n    fun reportValidity(): Boolean \n \n    companion object { \n        val ELEMENT_NODE:
Short\n        val ATTRIBUTE_NODE: Short\n        val TEXT_NODE: Short\n        val CDATA_SECTION_NODE:
Short\n        val ENTITY_REFERENCE_NODE: Short\n        val ENTITY_NODE: Short\n        val
PROCESSING_INSTRUCTION_NODE: Short\n        val COMMENT_NODE: Short\n        val
DOCUMENT_NODE: Short\n        val DOCUMENT_TYPE_NODE: Short\n        val
DOCUMENT_FRAGMENT_NODE: Short\n        val NOTATION_NODE: Short\n        val

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DOCUMENT_POSITION_DISCONNECTED: Short\n    val DOCUMENT_POSITION_PRECEDING: Short\n
    val DOCUMENT_POSITION_FOLLOWING: Short\n    val DOCUMENT_POSITION_CONTAINS: Short\n
    val DOCUMENT_POSITION_CONTAINED_BY: Short\n    val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n
}\n}\n\n@Suppress(\\"INVISIBLE_REFERENCE\",
\\"INVISIBLE_MEMBER\")\n@kotlin.internal.InlineOnly\npublic inline operator fun
HTMLFormElement.get(index: Int): Element? =
asDynamic()[index]\n\n@Suppress(\\"INVISIBLE_REFERENCE\",
\\"INVISIBLE_MEMBER\")\n@kotlin.internal.InlineOnly\npublic inline operator fun
HTMLFormElement.get(name: String): UnionElementOrRadioNodeList? = asDynamic()[name]\n\n/**\n * Exposes
the JavaScript [HTMLLabelElement](https://developer.mozilla.org/en/docs/Web/API/HTMLLabelElement) to
Kotlin\n */\npublic external abstract class HTMLLabelElement : HTMLElement {\n    open val form:
HTMLFormElement?\n    open var htmlFor: String\n    open val control: HTMLFormElement?\n\n    companion object
{\n        val ELEMENT_NODE: Short\n        val ATTRIBUTE_NODE: Short\n        val TEXT_NODE: Short\n
val CDATA_SECTION_NODE: Short\n        val ENTITY_REFERENCE_NODE: Short\n        val
ENTITY_NODE: Short\n        val PROCESSING_INSTRUCTION_NODE: Short\n        val COMMENT_NODE:
Short\n        val DOCUMENT_NODE: Short\n        val DOCUMENT_TYPE_NODE: Short\n        val
DOCUMENT_FRAGMENT_NODE: Short\n        val NOTATION_NODE: Short\n        val
DOCUMENT_POSITION_DISCONNECTED: Short\n        val DOCUMENT_POSITION_PRECEDING: Short\n
        val DOCUMENT_POSITION_FOLLOWING: Short\n        val DOCUMENT_POSITION_CONTAINS: Short\n
        val DOCUMENT_POSITION_CONTAINED_BY: Short\n        val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n    }\n\n    /**\n     * Exposes the JavaScript
[HTMLInputElement](https://developer.mozilla.org/en/docs/Web/API/HTMLInputElement) to Kotlin\n     */\n    public
external abstract class HTMLInputElement : HTMLFormElement {\n        open var accept: String\n        open var alt: String\n
open var autocomplete: String\n        open var autofocus: Boolean\n        open var defaultChecked: Boolean\n        open var
checked: Boolean\n        open var dirName: String\n        open var disabled: Boolean\n        open val form:
HTMLFormElement?\n        open val files: FileList?\n        open var formAction: String\n        open var formEnctype:
String\n        open var formMethod: String\n        open var formNoValidate: Boolean\n        open var formTarget: String\n
open var height: Int\n        open var indeterminate: Boolean\n        open var inputMode: String\n        open val list:
HTMLFormElement?\n        open var max: String\n        open var maxLength: Int\n        open var min: String\n        open var
minLength: Int\n        open var multiple: Boolean\n        open var name: String\n        open var pattern: String\n        open var
placeholder: String\n        open var readOnly: Boolean\n        open var required: Boolean\n        open var size: Int\n        open
var src: String\n        open var step: String\n        open var type: String\n        open var defaultValue: String\n        open var
value: String\n        open var valueAsDate: dynamic\n        open var valueAsNumber: Double\n        open var width: Int\n
open val willValidate: Boolean\n        open val validity: ValidityState\n        open val validationMessage: String\n        open
val labels: NodeList\n        open var selectionStart: Int?\n        open var selectionEnd: Int?\n        open var
selectionDirection: String?\n        open var align: String\n        open var useMap: String\n        fun stepUp(n: Int =
definedExternally)\n        fun stepDown(n: Int = definedExternally)\n        fun checkValidity(): Boolean\n        fun
reportValidity(): Boolean\n        fun setCustomValidity(error: String)\n        fun select()\n        fun
setRangeText(replacement: String)\n        fun setRangeText(replacement: String, start: Int, end: Int, selectionMode:
SelectionMode = definedExternally)\n        fun setSelectionRange(start: Int, end: Int, direction: String =
definedExternally)\n\n        companion object {\n            val ELEMENT_NODE: Short\n            val ATTRIBUTE_NODE:
Short\n            val TEXT_NODE: Short\n            val CDATA_SECTION_NODE: Short\n            val
ENTITY_REFERENCE_NODE: Short\n            val ENTITY_NODE: Short\n            val
PROCESSING_INSTRUCTION_NODE: Short\n            val COMMENT_NODE: Short\n            val
DOCUMENT_NODE: Short\n            val DOCUMENT_TYPE_NODE: Short\n            val
DOCUMENT_FRAGMENT_NODE: Short\n            val NOTATION_NODE: Short\n            val
DOCUMENT_POSITION_DISCONNECTED: Short\n            val DOCUMENT_POSITION_PRECEDING: Short\n

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    val DOCUMENT_POSITION_FOLLOWING: Short\n    val DOCUMENT_POSITION_CONTAINS: Short\n
    val DOCUMENT_POSITION_CONTAINED_BY: Short\n    val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n    } \n} \n \n /** \n * Exposes the JavaScript
[HTMLButtonElement](https://developer.mozilla.org/en/docs/Web/API/HTMLButtonElement) to Kotlin \n
*\npublic external abstract class HTMLButtonElement : HTMLElement { \n    open var autofocus: Boolean\n
open var disabled: Boolean\n    open val form: HTMLFormElement?\n    open var formAction: String\n    open var
formEnctype: String\n    open var formMethod: String\n    open var formNoValidate: Boolean\n    open var
formTarget: String\n    open var name: String\n    open var type: String\n    open var value: String\n    open var
menu: HTMLMenuElement?\n    open val willValidate: Boolean\n    open val validity: ValidityState\n    open val
validationMessage: String\n    open val labels: NodeList\n    fun checkValidity(): Boolean\n    fun reportValidity():
Boolean\n    fun setCustomValidity(error: String)\n\n    companion object { \n        val ELEMENT_NODE: Short\n
        val ATTRIBUTE_NODE: Short\n        val TEXT_NODE: Short\n        val CDATA_SECTION_NODE: Short\n
        val ENTITY_REFERENCE_NODE: Short\n        val ENTITY_NODE: Short\n        val
PROCESSING_INSTRUCTION_NODE: Short\n        val COMMENT_NODE: Short\n        val
DOCUMENT_NODE: Short\n        val DOCUMENT_TYPE_NODE: Short\n        val
DOCUMENT_FRAGMENT_NODE: Short\n        val NOTATION_NODE: Short\n        val
DOCUMENT_POSITION_DISCONNECTED: Short\n        val DOCUMENT_POSITION_PRECEDING: Short\n
        val DOCUMENT_POSITION_FOLLOWING: Short\n        val DOCUMENT_POSITION_CONTAINS: Short\n
        val DOCUMENT_POSITION_CONTAINED_BY: Short\n        val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n    } \n} \n \n /** \n * Exposes the JavaScript
[HTMLSelectElement](https://developer.mozilla.org/en/docs/Web/API/HTMLSelectElement) to Kotlin \n
*\npublic external abstract class HTMLSelectElement : HTMLElement, ItemArrayLike<Element> { \n    open var
autocomplete: String\n    open var autofocus: Boolean\n    open var disabled: Boolean\n    open val form:
HTMLFormElement?\n    open var multiple: Boolean\n    open var name: String\n    open var required: Boolean\n
open var size: Int\n    open val type: String\n    open val options: HTMLOptionsCollection\n    override var length:
Int\n    open val selectedOptions: HTMLCollection\n    open var selectedIndex: Int\n    open var value: String\n
open val willValidate: Boolean\n    open val validity: ValidityState\n    open val validationMessage: String\n    open
val labels: NodeList\n    fun namedItem(name: String): HTMLOptionElement?\n    fun add(element:
UnionHTMLOptGroupElementOrHTMLOptionElement, before: dynamic = definedExternally)\n    fun
remove(index: Int)\n    fun checkValidity(): Boolean\n    fun reportValidity(): Boolean\n    fun
setCustomValidity(error: String)\n    override fun item(index: Int): Element?\n\n    companion object { \n        val
ELEMENT_NODE: Short\n        val ATTRIBUTE_NODE: Short\n        val TEXT_NODE: Short\n        val
CDATA_SECTION_NODE: Short\n        val ENTITY_REFERENCE_NODE: Short\n        val ENTITY_NODE:
Short\n        val PROCESSING_INSTRUCTION_NODE: Short\n        val COMMENT_NODE: Short\n        val
DOCUMENT_NODE: Short\n        val DOCUMENT_TYPE_NODE: Short\n        val
DOCUMENT_FRAGMENT_NODE: Short\n        val NOTATION_NODE: Short\n        val
DOCUMENT_POSITION_DISCONNECTED: Short\n        val DOCUMENT_POSITION_PRECEDING: Short\n
        val DOCUMENT_POSITION_FOLLOWING: Short\n        val DOCUMENT_POSITION_CONTAINS: Short\n
        val DOCUMENT_POSITION_CONTAINED_BY: Short\n        val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n    } \n} \n \n @Suppress(\n    "INVISIBLE_REFERENCE",
    "INVISIBLE_MEMBER") \n @kotlin.internal.InlineOnly \n public inline operator fun
HTMLSelectElement.get(index: Int): Element? =
asDynamic()[index] \n \n @Suppress(\n    "INVISIBLE_REFERENCE",
    "INVISIBLE_MEMBER") \n @kotlin.internal.InlineOnly \n public inline operator fun
HTMLSelectElement.set(index: Int, option: HTMLOptionElement?) { asDynamic()[index] = option } \n \n /** \n *
Exposes the JavaScript
[HTMLDataListElement](https://developer.mozilla.org/en/docs/Web/API/HTMLDataListElement) to Kotlin \n

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*\npublic external abstract class HTMLDataListElement : HTMLInputElement {\n  open val options:
HTMLCollection\n\n  companion object {\n    val ELEMENT_NODE: Short\n    val ATTRIBUTE_NODE:
Short\n    val TEXT_NODE: Short\n    val CDATA_SECTION_NODE: Short\n    val
ENTITY_REFERENCE_NODE: Short\n    val ENTITY_NODE: Short\n    val
PROCESSING_INSTRUCTION_NODE: Short\n    val COMMENT_NODE: Short\n    val
DOCUMENT_NODE: Short\n    val DOCUMENT_TYPE_NODE: Short\n    val
DOCUMENT_FRAGMENT_NODE: Short\n    val NOTATION_NODE: Short\n    val
DOCUMENT_POSITION_DISCONNECTED: Short\n    val DOCUMENT_POSITION_PRECEDING: Short\n
    val DOCUMENT_POSITION_FOLLOWING: Short\n    val DOCUMENT_POSITION_CONTAINS: Short\n
    val DOCUMENT_POSITION_CONTAINED_BY: Short\n    val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n  }\n}\n\n/**\n * Exposes the JavaScript
[HTMLOptGroupElement](https://developer.mozilla.org/en/docs/Web/API/HTMLOptGroupElement) to Kotlin\n
*\npublic external abstract class HTMLOptGroupElement : HTMLInputElement,
UnionHTMLOptGroupElementOrHTMLOptionElement {\n  open var disabled: Boolean\n  open var label:
String\n\n  companion object {\n    val ELEMENT_NODE: Short\n    val ATTRIBUTE_NODE: Short\n
val TEXT_NODE: Short\n    val CDATA_SECTION_NODE: Short\n    val ENTITY_REFERENCE_NODE:
Short\n    val ENTITY_NODE: Short\n    val PROCESSING_INSTRUCTION_NODE: Short\n    val
COMMENT_NODE: Short\n    val DOCUMENT_NODE: Short\n    val DOCUMENT_TYPE_NODE: Short\n
val DOCUMENT_FRAGMENT_NODE: Short\n    val NOTATION_NODE: Short\n    val
DOCUMENT_POSITION_DISCONNECTED: Short\n    val DOCUMENT_POSITION_PRECEDING: Short\n
val DOCUMENT_POSITION_FOLLOWING: Short\n    val DOCUMENT_POSITION_CONTAINS: Short\n
val DOCUMENT_POSITION_CONTAINED_BY: Short\n    val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n  }\n}\n\n/**\n * Exposes the JavaScript
[HTMLOptionElement](https://developer.mozilla.org/en/docs/Web/API/HTMLOptionElement) to Kotlin\n
*\npublic external abstract class HTMLOptionElement : HTMLInputElement,
UnionHTMLOptGroupElementOrHTMLOptionElement {\n  open var disabled: Boolean\n  open val form:
HTMLFormElement?\n  open var label: String\n  open var defaultSelected: Boolean\n  open var selected:
Boolean\n  open var value: String\n  open var text: String\n  open val index: Int\n\n  companion object {\n
val ELEMENT_NODE: Short\n    val ATTRIBUTE_NODE: Short\n    val TEXT_NODE: Short\n    val
CDATA_SECTION_NODE: Short\n    val ENTITY_REFERENCE_NODE: Short\n    val ENTITY_NODE:
Short\n    val PROCESSING_INSTRUCTION_NODE: Short\n    val COMMENT_NODE: Short\n    val
DOCUMENT_NODE: Short\n    val DOCUMENT_TYPE_NODE: Short\n    val
DOCUMENT_FRAGMENT_NODE: Short\n    val NOTATION_NODE: Short\n    val
DOCUMENT_POSITION_DISCONNECTED: Short\n    val DOCUMENT_POSITION_PRECEDING: Short\n
val DOCUMENT_POSITION_FOLLOWING: Short\n    val DOCUMENT_POSITION_CONTAINS: Short\n
val DOCUMENT_POSITION_CONTAINED_BY: Short\n    val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n  }\n}\n\n/**\n * Exposes the JavaScript
[HTMLTextAreaElement](https://developer.mozilla.org/en/docs/Web/API/HTMLTextAreaElement) to Kotlin\n
*\npublic external abstract class HTMLTextAreaElement : HTMLInputElement {\n  open var autocomplete: String\n
open var autofocus: Boolean\n  open var cols: Int\n  open var dirName: String\n  open var disabled: Boolean\n
open val form: HTMLFormElement?\n  open var inputMode: String\n  open var maxLength: Int\n  open var
minLength: Int\n  open var name: String\n  open var placeholder: String\n  open var readOnly: Boolean\n  open
var required: Boolean\n  open var rows: Int\n  open var wrap: String\n  open val type: String\n  open var
defaultValue: String\n  open var value: String\n  open val textLength: Int\n  open val willValidate: Boolean\n
open val validity: ValidityState\n  open val validationMessage: String\n  open val labels: NodeList\n  open var
selectionStart: Int?\n  open var selectionEnd: Int?\n  open var selectionDirection: String?\n  fun checkValidity():
Boolean\n  fun reportValidity(): Boolean\n  fun setCustomValidity(error: String)\n  fun select()\n  fun
setRangeText(replacement: String)\n  fun setRangeText(replacement: String, start: Int, end: Int, selectionMode:

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SelectionMode = definedExternally)\n fun setSelectionRange(start: Int, end: Int, direction: String =
definedExternally)\n\n companion object {\n val ELEMENT_NODE: Short\n val ATTRIBUTE_NODE:
Short\n val TEXT_NODE: Short\n val CDATA_SECTION_NODE: Short\n val
ENTITY_REFERENCE_NODE: Short\n val ENTITY_NODE: Short\n val
PROCESSING_INSTRUCTION_NODE: Short\n val COMMENT_NODE: Short\n val
DOCUMENT_NODE: Short\n val DOCUMENT_TYPE_NODE: Short\n val
DOCUMENT_FRAGMENT_NODE: Short\n val NOTATION_NODE: Short\n val
DOCUMENT_POSITION_DISCONNECTED: Short\n val DOCUMENT_POSITION_PRECEDING: Short\n
val DOCUMENT_POSITION_FOLLOWING: Short\n val DOCUMENT_POSITION_CONTAINS: Short\n
val DOCUMENT_POSITION_CONTAINED_BY: Short\n val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n }\n}\n\n/**\n * Exposes the JavaScript
[HTMLKeygenElement](https://developer.mozilla.org/en/docs/Web/API/HTMLKeygenElement) to Kotlin\n
*\n\npublic external abstract class HTMLKeygenElement : HTMLInputElement {\n open var autofocus: Boolean\n
open var challenge: String\n open var disabled: Boolean\n open val form: HTMLFormElement?\n open var
keytype: String\n open var name: String\n open val type: String\n open val willValidate: Boolean\n open val
validity: ValidityState\n open val validationMessage: String\n open val labels: NodeList\n fun checkValidity():
Boolean\n fun reportValidity(): Boolean\n fun setCustomValidity(error: String)\n\n companion object {\n
val ELEMENT_NODE: Short\n val ATTRIBUTE_NODE: Short\n val TEXT_NODE: Short\n val
CDATA_SECTION_NODE: Short\n val ENTITY_REFERENCE_NODE: Short\n val ENTITY_NODE:
Short\n val PROCESSING_INSTRUCTION_NODE: Short\n val COMMENT_NODE: Short\n val
DOCUMENT_NODE: Short\n val DOCUMENT_TYPE_NODE: Short\n val
DOCUMENT_FRAGMENT_NODE: Short\n val NOTATION_NODE: Short\n val
DOCUMENT_POSITION_DISCONNECTED: Short\n val DOCUMENT_POSITION_PRECEDING: Short\n
val DOCUMENT_POSITION_FOLLOWING: Short\n val DOCUMENT_POSITION_CONTAINS: Short\n
val DOCUMENT_POSITION_CONTAINED_BY: Short\n val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n }\n}\n\n/**\n * Exposes the JavaScript
[HTMLOutputElement](https://developer.mozilla.org/en/docs/Web/API/HTMLOutputElement) to Kotlin\n
*\n\npublic external abstract class HTMLOutputElement : HTMLInputElement {\n open val htmlFor: DOMTokenList\n
open val form: HTMLFormElement?\n open var name: String\n open val type: String\n open var
defaultValue: String\n open var value: String\n open val willValidate: Boolean\n open val validity:
ValidityState\n open val validationMessage: String\n open val labels: NodeList\n fun checkValidity():
Boolean\n fun reportValidity(): Boolean\n fun setCustomValidity(error: String)\n\n companion object {\n
val ELEMENT_NODE: Short\n val ATTRIBUTE_NODE: Short\n val TEXT_NODE: Short\n val
CDATA_SECTION_NODE: Short\n val ENTITY_REFERENCE_NODE: Short\n val ENTITY_NODE:
Short\n val PROCESSING_INSTRUCTION_NODE: Short\n val COMMENT_NODE: Short\n val
DOCUMENT_NODE: Short\n val DOCUMENT_TYPE_NODE: Short\n val
DOCUMENT_FRAGMENT_NODE: Short\n val NOTATION_NODE: Short\n val
DOCUMENT_POSITION_DISCONNECTED: Short\n val DOCUMENT_POSITION_PRECEDING: Short\n
val DOCUMENT_POSITION_FOLLOWING: Short\n val DOCUMENT_POSITION_CONTAINS: Short\n
val DOCUMENT_POSITION_CONTAINED_BY: Short\n val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n }\n}\n\n/**\n * Exposes the JavaScript
[HTMLProgressElement](https://developer.mozilla.org/en/docs/Web/API/HTMLProgressElement) to Kotlin\n
*\n\npublic external abstract class HTMLProgressElement : HTMLInputElement {\n open var value: Double\n open
var max: Double\n open val position: Double\n open val labels: NodeList\n\n companion object {\n val
ELEMENT_NODE: Short\n val ATTRIBUTE_NODE: Short\n val TEXT_NODE: Short\n val
CDATA_SECTION_NODE: Short\n val ENTITY_REFERENCE_NODE: Short\n val ENTITY_NODE:
Short\n val PROCESSING_INSTRUCTION_NODE: Short\n val COMMENT_NODE: Short\n val
DOCUMENT_NODE: Short\n val DOCUMENT_TYPE_NODE: Short\n val

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DOCUMENT_FRAGMENT_NODE: Short\n val NOTATION_NODE: Short\n val

DOCUMENT_POSITION_DISCONNECTED: Short\n val DOCUMENT_POSITION_PRECEDING: Short\n val DOCUMENT_POSITION_FOLLOWING: Short\n val DOCUMENT_POSITION_CONTAINS: Short\n val DOCUMENT_POSITION_CONTAINED_BY: Short\n val

DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n }n}\n/n/**\n * Exposes the JavaScript [HTMLMeterElement](https://developer.mozilla.org/en/docs/Web/API/HTMLMeterElement) to Kotlin\n */\npublic external abstract class HTMLMeterElement : HTMLInputElement {\n open var value: Double\n open var min: Double\n open var max: Double\n open var low: Double\n open var high: Double\n open var optimum: Double\n open val labels: NodeList\n\n companion object {\n val ELEMENT_NODE: Short\n val ATTRIBUTE_NODE: Short\n val TEXT_NODE: Short\n val CDATA_SECTION_NODE: Short\n val ENTITY_REFERENCE_NODE: Short\n val ENTITY_NODE: Short\n val PROCESSING_INSTRUCTION_NODE: Short\n val COMMENT_NODE: Short\n val DOCUMENT_NODE: Short\n val DOCUMENT_TYPE_NODE: Short\n val DOCUMENT_FRAGMENT_NODE: Short\n val NOTATION_NODE: Short\n val DOCUMENT_POSITION_DISCONNECTED: Short\n val DOCUMENT_POSITION_PRECEDING: Short\n val DOCUMENT_POSITION_FOLLOWING: Short\n val DOCUMENT_POSITION_CONTAINS: Short\n val DOCUMENT_POSITION_CONTAINED_BY: Short\n val DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n }n}\n/n/**\n * Exposes the JavaScript [HTMLFieldSetElement](https://developer.mozilla.org/en/docs/Web/API/HTMLFieldSetElement) to Kotlin\n */\npublic external abstract class HTMLFieldSetElement : HTMLInputElement {\n open var disabled: Boolean\n open val form: HTMLFormElement?\n open var name: String\n open val type: String\n open val elements: HTMLCollection\n open val willValidate: Boolean\n open val validity: ValidityState\n open val validationMessage: String\n fun checkValidity(): Boolean\n fun reportValidity(): Boolean\n fun setCustomValidity(error: String)\n\n companion object {\n val ELEMENT_NODE: Short\n val ATTRIBUTE_NODE: Short\n val TEXT_NODE: Short\n val CDATA_SECTION_NODE: Short\n val ENTITY_REFERENCE_NODE: Short\n val ENTITY_NODE: Short\n val PROCESSING_INSTRUCTION_NODE: Short\n val COMMENT_NODE: Short\n val DOCUMENT_NODE: Short\n val DOCUMENT_TYPE_NODE: Short\n val DOCUMENT_FRAGMENT_NODE: Short\n val NOTATION_NODE: Short\n val DOCUMENT_POSITION_DISCONNECTED: Short\n val DOCUMENT_POSITION_PRECEDING: Short\n val DOCUMENT_POSITION_FOLLOWING: Short\n val DOCUMENT_POSITION_CONTAINS: Short\n val DOCUMENT_POSITION_CONTAINED_BY: Short\n val DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n }n}\n/n/**\n * Exposes the JavaScript [HTMLLegendElement](https://developer.mozilla.org/en/docs/Web/API/HTMLLegendElement) to Kotlin\n */\npublic external abstract class HTMLLegendElement : HTMLInputElement {\n open val form: HTMLFormElement?\n open var align: String\n\n companion object {\n val ELEMENT_NODE: Short\n val ATTRIBUTE_NODE: Short\n val TEXT_NODE: Short\n val CDATA_SECTION_NODE: Short\n val ENTITY_REFERENCE_NODE: Short\n val ENTITY_NODE: Short\n val PROCESSING_INSTRUCTION_NODE: Short\n val COMMENT_NODE: Short\n val DOCUMENT_NODE: Short\n val DOCUMENT_TYPE_NODE: Short\n val DOCUMENT_FRAGMENT_NODE: Short\n val NOTATION_NODE: Short\n val DOCUMENT_POSITION_DISCONNECTED: Short\n val DOCUMENT_POSITION_PRECEDING: Short\n val DOCUMENT_POSITION_FOLLOWING: Short\n val DOCUMENT_POSITION_CONTAINS: Short\n val DOCUMENT_POSITION_CONTAINED_BY: Short\n val DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n }n}\n/n/**\n * Exposes the JavaScript [ValidityState](https://developer.mozilla.org/en/docs/Web/API/ValidityState) to Kotlin\n */\npublic external abstract class ValidityState {\n open val valueMissing: Boolean\n open val typeMismatch: Boolean\n open val patternMismatch: Boolean\n open val tooLong: Boolean\n open val tooShort: Boolean\n open val

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rangeUnderflow: Boolean\n open val rangeOverflow: Boolean\n open val stepMismatch: Boolean\n open val
badInput: Boolean\n open val customError: Boolean\n open val valid: Boolean\n}\n\n/**\n * Exposes the
JavaScript [HTMLDetailsElement](https://developer.mozilla.org/en/docs/Web/API/HTMLDetailsElement) to
Kotlin\n */\npublic external abstract class HTMLDetailsElement : HTMLElement {\n open var open: Boolean\n\n
companion object {\n val ELEMENT_NODE: Short\n val ATTRIBUTE_NODE: Short\n val
TEXT_NODE: Short\n val CDATA_SECTION_NODE: Short\n val ENTITY_REFERENCE_NODE:
Short\n val ENTITY_NODE: Short\n val PROCESSING_INSTRUCTION_NODE: Short\n val
COMMENT_NODE: Short\n val DOCUMENT_NODE: Short\n val DOCUMENT_TYPE_NODE: Short\n
val DOCUMENT_FRAGMENT_NODE: Short\n val NOTATION_NODE: Short\n val
DOCUMENT_POSITION_DISCONNECTED: Short\n val DOCUMENT_POSITION_PRECEDING: Short\n
val DOCUMENT_POSITION_FOLLOWING: Short\n val DOCUMENT_POSITION_CONTAINS: Short\n
val DOCUMENT_POSITION_CONTAINED_BY: Short\n val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n }\n}\n\npublic external abstract class
HTMLMenuElement : HTMLElement {\n open var type: String\n open var label: String\n open var compact:
Boolean\n\n companion object {\n val ELEMENT_NODE: Short\n val ATTRIBUTE_NODE: Short\n
val TEXT_NODE: Short\n val CDATA_SECTION_NODE: Short\n val ENTITY_REFERENCE_NODE:
Short\n val ENTITY_NODE: Short\n val PROCESSING_INSTRUCTION_NODE: Short\n val
COMMENT_NODE: Short\n val DOCUMENT_NODE: Short\n val DOCUMENT_TYPE_NODE: Short\n
val DOCUMENT_FRAGMENT_NODE: Short\n val NOTATION_NODE: Short\n val
DOCUMENT_POSITION_DISCONNECTED: Short\n val DOCUMENT_POSITION_PRECEDING: Short\n
val DOCUMENT_POSITION_FOLLOWING: Short\n val DOCUMENT_POSITION_CONTAINS: Short\n
val DOCUMENT_POSITION_CONTAINED_BY: Short\n val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n }\n}\n\npublic external abstract class
HTMLMenuItemElement : HTMLElement {\n open var type: String\n open var label: String\n open var icon:
String\n open var disabled: Boolean\n open var checked: Boolean\n open var radiogroup: String\n open var
default: Boolean\n\n companion object {\n val ELEMENT_NODE: Short\n val ATTRIBUTE_NODE:
Short\n val TEXT_NODE: Short\n val CDATA_SECTION_NODE: Short\n val
ENTITY_REFERENCE_NODE: Short\n val ENTITY_NODE: Short\n val
PROCESSING_INSTRUCTION_NODE: Short\n val COMMENT_NODE: Short\n val
DOCUMENT_NODE: Short\n val DOCUMENT_TYPE_NODE: Short\n val
DOCUMENT_FRAGMENT_NODE: Short\n val NOTATION_NODE: Short\n val
DOCUMENT_POSITION_DISCONNECTED: Short\n val DOCUMENT_POSITION_PRECEDING: Short\n
val DOCUMENT_POSITION_FOLLOWING: Short\n val DOCUMENT_POSITION_CONTAINS: Short\n
val DOCUMENT_POSITION_CONTAINED_BY: Short\n val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n }\n}\n\npublic external open class
RelatedEvent(type: String, eventInitDict: RelatedEventInit = definedExternally) : Event {\n open val
relatedTarget: EventTarget?\n\n companion object {\n val NONE: Short\n val CAPTURING_PHASE:
Short\n val AT_TARGET: Short\n val BUBBLING_PHASE: Short\n }\n}\n\npublic external interface
RelatedEventInit : EventInit {\n var relatedTarget: EventTarget? /* = null */\n get() = definedExternally\n
set(value) = definedExternally\n}\n\n@Suppress("INVISIBLE_REFERENCE",
"INVISIBLE_MEMBER")\n@kotlin.internal.InlineOnly\npublic inline fun RelatedEventInit(relatedTarget:
EventTarget? = null, bubbles: Boolean? = false, cancelable: Boolean? = false, composed: Boolean? = false):
RelatedEventInit {\n val o = js("{}")\n o["relatedTarget"] = relatedTarget\n o["bubbles"] = bubbles\n
o["cancelable"] = cancelable\n o["composed"] = composed\n return o\n}\n\n/**\n * Exposes the JavaScript
[HTMLDialogElement](https://developer.mozilla.org/en/docs/Web/API/HTMLDialogElement) to Kotlin\n
*/\npublic external abstract class HTMLDialogElement : HTMLElement {\n open var open: Boolean\n open var
returnValue: String\n fun show(anchor: UnionElementOrMouseEvent = definedExternally)\n fun
showModal(anchor: UnionElementOrMouseEvent = definedExternally)\n fun close(returnValue: String =

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definedExternally))\n\n companion object {\n    val ELEMENT_NODE: Short\n    val ATTRIBUTE_NODE: Short\n    val TEXT_NODE: Short\n    val CDATA_SECTION_NODE: Short\n    val ENTITY_REFERENCE_NODE: Short\n    val ENTITY_NODE: Short\n    val PROCESSING_INSTRUCTION_NODE: Short\n    val COMMENT_NODE: Short\n    val DOCUMENT_NODE: Short\n    val DOCUMENT_TYPE_NODE: Short\n    val DOCUMENT_FRAGMENT_NODE: Short\n    val NOTATION_NODE: Short\n    val DOCUMENT_POSITION_DISCONNECTED: Short\n    val DOCUMENT_POSITION_PRECEDING: Short\n    val DOCUMENT_POSITION_FOLLOWING: Short\n    val DOCUMENT_POSITION_CONTAINS: Short\n    val DOCUMENT_POSITION_CONTAINED_BY: Short\n    val DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n }
}\n\n/**\n * Exposes the JavaScript [HTMLScriptElement](https://developer.mozilla.org/en/docs/Web/API/HTMLScriptElement) to Kotlin\n *\npublic external abstract class HTMLScriptElement : HTMLElement, HTMLOrSVGScriptElement {\n    open var src: String\n    open var type: String\n    open var charset: String\n    open var async: Boolean\n    open var defer: Boolean\n    open var crossOrigin: String?\n    open var text: String\n    open var nonce: String\n    open var event: String\n    open var htmlFor: String\n\n    companion object {\n        val ELEMENT_NODE: Short\n        val ATTRIBUTE_NODE: Short\n        val TEXT_NODE: Short\n        val CDATA_SECTION_NODE: Short\n        val ENTITY_REFERENCE_NODE: Short\n        val ENTITY_NODE: Short\n        val PROCESSING_INSTRUCTION_NODE: Short\n        val COMMENT_NODE: Short\n        val DOCUMENT_NODE: Short\n        val DOCUMENT_TYPE_NODE: Short\n        val DOCUMENT_FRAGMENT_NODE: Short\n        val NOTATION_NODE: Short\n        val DOCUMENT_POSITION_DISCONNECTED: Short\n        val DOCUMENT_POSITION_PRECEDING: Short\n        val DOCUMENT_POSITION_FOLLOWING: Short\n        val DOCUMENT_POSITION_CONTAINS: Short\n        val DOCUMENT_POSITION_CONTAINED_BY: Short\n        val DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n    }
}\n\n/**\n * Exposes the JavaScript [HTMLTemplateElement](https://developer.mozilla.org/en/docs/Web/API/HTMLTemplateElement) to Kotlin\n *\npublic external abstract class HTMLTemplateElement : HTMLElement {\n    open val content: DocumentFragment\n\n    companion object {\n        val ELEMENT_NODE: Short\n        val ATTRIBUTE_NODE: Short\n        val TEXT_NODE: Short\n        val CDATA_SECTION_NODE: Short\n        val ENTITY_REFERENCE_NODE: Short\n        val ENTITY_NODE: Short\n        val PROCESSING_INSTRUCTION_NODE: Short\n        val COMMENT_NODE: Short\n        val DOCUMENT_NODE: Short\n        val DOCUMENT_TYPE_NODE: Short\n        val DOCUMENT_FRAGMENT_NODE: Short\n        val NOTATION_NODE: Short\n        val DOCUMENT_POSITION_DISCONNECTED: Short\n        val DOCUMENT_POSITION_PRECEDING: Short\n        val DOCUMENT_POSITION_FOLLOWING: Short\n        val DOCUMENT_POSITION_CONTAINS: Short\n        val DOCUMENT_POSITION_CONTAINED_BY: Short\n        val DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n    }
}\n\n/**\n * Exposes the JavaScript [HTMLSlotElement](https://developer.mozilla.org/en/docs/Web/API/HTMLSlotElement) to Kotlin\n *\npublic external abstract class HTMLSlotElement : HTMLElement {\n    open var name: String\n    fun assignedNodes(options: AssignedNodesOptions = definedExternally): Array<Node>\n\n    companion object {\n        val ELEMENT_NODE: Short\n        val ATTRIBUTE_NODE: Short\n        val TEXT_NODE: Short\n        val CDATA_SECTION_NODE: Short\n        val ENTITY_REFERENCE_NODE: Short\n        val ENTITY_NODE: Short\n        val PROCESSING_INSTRUCTION_NODE: Short\n        val COMMENT_NODE: Short\n        val DOCUMENT_NODE: Short\n        val DOCUMENT_TYPE_NODE: Short\n        val DOCUMENT_FRAGMENT_NODE: Short\n        val NOTATION_NODE: Short\n        val DOCUMENT_POSITION_DISCONNECTED: Short\n        val DOCUMENT_POSITION_PRECEDING: Short\n        val DOCUMENT_POSITION_FOLLOWING: Short\n        val DOCUMENT_POSITION_CONTAINS: Short\n        val DOCUMENT_POSITION_CONTAINED_BY: Short\n        val DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n    }
}\n\npublic external interface

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AssignedNodesOptions {\n  var flatten: Boolean? /* = false */\n    get() = definedExternally\n    set(value) =
definedExternally\n}\n\n@Suppress(\"INVISIBLE_REFERENCE\",
\"INVISIBLE_MEMBER\")\n@kotlin.internal.InlineOnly\npublic inline fun AssignedNodesOptions(flatten:
Boolean? = false): AssignedNodesOptions {\n  val o = js(\"({})\")\n  o[\"flatten\"] = flatten\n  return
o\n}\n\n/**\n * Exposes the JavaScript
[HTMLCanvasElement](https://developer.mozilla.org/en/docs/Web/API/HTMLCanvasElement) to Kotlin\n
*\npublic external abstract class HTMLCanvasElement : HTMLElement, CanvasImageSource, TexImageSource
{\n  open var width: Int\n  open var height: Int\n  fun getContext(contextId: String, vararg arguments: Any?):
RenderingContext?\n  fun toDataURL(type: String = definedExternally, quality: Any? = definedExternally):
String\n  fun toBlob(_callback: (Blob?) -> Unit, type: String = definedExternally, quality: Any? =
definedExternally)\n\n  companion object {\n    val ELEMENT_NODE: Short\n    val ATTRIBUTE_NODE:
Short\n    val TEXT_NODE: Short\n    val CDATA_SECTION_NODE: Short\n    val
ENTITY_REFERENCE_NODE: Short\n    val ENTITY_NODE: Short\n    val
PROCESSING_INSTRUCTION_NODE: Short\n    val COMMENT_NODE: Short\n    val
DOCUMENT_NODE: Short\n    val DOCUMENT_TYPE_NODE: Short\n    val
DOCUMENT_FRAGMENT_NODE: Short\n    val NOTATION_NODE: Short\n    val
DOCUMENT_POSITION_DISCONNECTED: Short\n    val DOCUMENT_POSITION_PRECEDING: Short\n
val DOCUMENT_POSITION_FOLLOWING: Short\n    val DOCUMENT_POSITION_CONTAINS: Short\n
val DOCUMENT_POSITION_CONTAINED_BY: Short\n    val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n  }\n}\n\npublic external interface
CanvasRenderingContext2DSettings {\n  var alpha: Boolean? /* = true */\n    get() = definedExternally\n
set(value) = definedExternally\n}\n\n@Suppress(\"INVISIBLE_REFERENCE\",
\"INVISIBLE_MEMBER\")\n@kotlin.internal.InlineOnly\npublic inline fun
CanvasRenderingContext2DSettings(alpha: Boolean? = true): CanvasRenderingContext2DSettings {\n  val o =
js(\"({})\")\n  o[\"alpha\"] = alpha\n  return o\n}\n\n/**\n * Exposes the JavaScript
[CanvasRenderingContext2D](https://developer.mozilla.org/en/docs/Web/API/CanvasRenderingContext2D) to
Kotlin\n
*\npublic external abstract class CanvasRenderingContext2D : CanvasState, CanvasTransform,
CanvasCompositing, CanvasImageSmoothing, CanvasFillStrokeStyles, CanvasShadowStyles, CanvasFilters,
CanvasRect, CanvasDrawPath, CanvasUserInterface, CanvasText, CanvasDrawImage, CanvasHitRegion,
CanvasImageData, CanvasPathDrawingStyles, CanvasTextDrawingStyles, CanvasPath, RenderingContext {\n
open val canvas: HTMLCanvasElement\n}\n\npublic external interface CanvasState {\n  fun save()\n  fun
restore()\n}\n\npublic external interface CanvasTransform {\n  fun scale(x: Double, y: Double)\n  fun
rotate(angle: Double)\n  fun translate(x: Double, y: Double)\n  fun transform(a: Double, b: Double, c: Double, d:
Double, e: Double, f: Double)\n  fun getTransform(): DOMMatrix\n  fun setTransform(a: Double, b: Double, c:
Double, d: Double, e: Double, f: Double)\n  fun setTransform(transform: dynamic = definedExternally)\n  fun
resetTransform()\n}\n\npublic external interface CanvasCompositing {\n  var globalAlpha: Double\n  var
globalCompositeOperation: String\n}\n\npublic external interface CanvasImageSmoothing {\n  var
imageSmoothingEnabled: Boolean\n  var imageSmoothingQuality: ImageSmoothingQuality\n}\n\npublic external
interface CanvasFillStrokeStyles {\n  var strokeStyle: dynamic\n    get() = definedExternally\n    set(value) =
definedExternally\n  var fillStyle: dynamic\n    get() = definedExternally\n    set(value) = definedExternally\n
fun createLinearGradient(x0: Double, y0: Double, x1: Double, y1: Double): CanvasGradient\n  fun
createRadialGradient(x0: Double, y0: Double, r0: Double, x1: Double, y1: Double, r1: Double): CanvasGradient\n
fun createPattern(image: CanvasImageSource, repetition: String): CanvasPattern?\n}\n\npublic external interface
CanvasShadowStyles {\n  var shadowOffsetX: Double\n  var shadowOffsetY: Double\n  var shadowBlur:
Double\n  var shadowColor: String\n}\n\npublic external interface CanvasFilters {\n  var filter:
String\n}\n\npublic external interface CanvasRect {\n  fun clearRect(x: Double, y: Double, w: Double, h:
Double)\n  fun fillRect(x: Double, y: Double, w: Double, h: Double)\n  fun strokeRect(x: Double, y: Double, w:
Double, h: Double)\n}\n\npublic external interface CanvasDrawPath {\n  fun beginPath()\n  fun fill(fillRule:

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CanvasFillRule = definedExternally)\n fun fill(path: Path2D, fillRule: CanvasFillRule = definedExternally)\n
fun stroke()\n fun stroke(path: Path2D)\n fun clip(fillRule: CanvasFillRule = definedExternally)\n fun
clip(path: Path2D, fillRule: CanvasFillRule = definedExternally)\n fun resetClip()\n fun isPointInPath(x:
Double, y: Double, fillRule: CanvasFillRule = definedExternally): Boolean\n fun isPointInPath(path: Path2D, x:
Double, y: Double, fillRule: CanvasFillRule = definedExternally): Boolean\n fun isPointInStroke(x: Double, y:
Double): Boolean\n fun isPointInStroke(path: Path2D, x: Double, y: Double): Boolean\n}\n\npublic external
interface CanvasUserInterface {\n fun drawFocusIfNeeded(element: Element)\n fun drawFocusIfNeeded(path:
Path2D, element: Element)\n fun scrollPathIntoView()\n fun scrollPathIntoView(path: Path2D)\n}\n\npublic
external interface CanvasText {\n fun fillText(text: String, x: Double, y: Double, maxWidth: Double =
definedExternally)\n fun strokeText(text: String, x: Double, y: Double, maxWidth: Double = definedExternally)\n
fun measureText(text: String): TextMetrics\n}\n\npublic external interface CanvasDrawImage {\n fun
drawImage(image: CanvasImageSource, dx: Double, dy: Double)\n fun drawImage(image: CanvasImageSource,
dx: Double, dy: Double, dw: Double, dh: Double)\n fun drawImage(image: CanvasImageSource, sx: Double, sy:
Double, sw: Double, sh: Double, dx: Double, dy: Double, dw: Double, dh: Double)\n}\n\npublic external interface
CanvasHitRegion {\n fun addHitRegion(options: HitRegionOptions = definedExternally)\n fun
removeHitRegion(id: String)\n fun clearHitRegions()\n}\n\npublic external interface CanvasImageData {\n fun
createImageData(sw: Double, sh: Double): ImageData\n fun createImageData(imagedata: ImageData):
ImageData\n fun getImageData(sx: Double, sy: Double, sw: Double, sh: Double): ImageData\n fun
putImageData(imagedata: ImageData, dx: Double, dy: Double)\n fun putImageData(imagedata: ImageData, dx:
Double, dy: Double, dirtyX: Double, dirtyY: Double, dirtyWidth: Double, dirtyHeight: Double)\n}\n\npublic
external interface CanvasPathDrawingStyles {\n var lineWidth: Double\n var lineCap: CanvasLineCap\n var
lineJoin: CanvasLineJoin\n var miterLimit: Double\n var lineDashOffset: Double\n fun setLineDash(segments:
Array<Double>)\n fun getLineDash(): Array<Double>\n}\n\npublic external interface CanvasTextDrawingStyles
{\n var font: String\n var textAlign: CanvasTextAlign\n var textBaseline: CanvasTextBaseline\n var
direction: CanvasDirection\n}\n\npublic external interface CanvasPath {\n fun closePath()\n fun moveTo(x:
Double, y: Double)\n fun lineTo(x: Double, y: Double)\n fun quadraticCurveTo(cpx: Double, cpy: Double, x:
Double, y: Double)\n fun bezierCurveTo(cp1x: Double, cp1y: Double, cp2x: Double, cp2y: Double, x: Double, y:
Double)\n fun arcTo(x1: Double, y1: Double, x2: Double, y2: Double, radius: Double)\n fun arcTo(x1: Double,
y1: Double, x2: Double, y2: Double, radiusX: Double, radiusY: Double, rotation: Double)\n fun rect(x: Double, y:
Double, w: Double, h: Double)\n fun arc(x: Double, y: Double, radius: Double, startAngle: Double, endAngle:
Double, anticlockwise: Boolean = definedExternally)\n fun ellipse(x: Double, y: Double, radiusX: Double,
radiusY: Double, rotation: Double, startAngle: Double, endAngle: Double, anticlockwise: Boolean =
definedExternally)\n}\n\n/**\n * Exposes the JavaScript
[CanvasGradient](https://developer.mozilla.org/en/docs/Web/API/CanvasGradient) to Kotlin\n */\n\npublic external
abstract class CanvasGradient {\n fun addColorStop(offset: Double, color: String)\n}\n\n/**\n * Exposes the
JavaScript [CanvasPattern](https://developer.mozilla.org/en/docs/Web/API/CanvasPattern) to Kotlin\n */\n\npublic
external abstract class CanvasPattern {\n fun setTransform(transform: dynamic = definedExternally)\n}\n\n/**\n *
Exposes the JavaScript [TextMetrics](https://developer.mozilla.org/en/docs/Web/API/TextMetrics) to Kotlin\n */\n\npublic external abstract class TextMetrics {\n open val width: Double\n open val actualBoundingBoxLeft:
Double\n open val actualBoundingBoxRight: Double\n open val fontBoundingBoxAscent: Double\n open val
fontBoundingBoxDescent: Double\n open val actualBoundingBoxAscent: Double\n open val
actualBoundingBoxDescent: Double\n open val emHeightAscent: Double\n open val emHeightDescent:
Double\n open val hangingBaseline: Double\n open val alphabeticBaseline: Double\n open val
ideographicBaseline: Double\n}\n\npublic external interface HitRegionOptions {\n var path: Path2D? /* = null
*/\n fun get() = definedExternally\n fun set(value) = definedExternally\n var fillRule: CanvasFillRule? /* =
CanvasFillRule.NONZERO */\n fun get() = definedExternally\n fun set(value) = definedExternally\n var id:
String? /* = \"\" */\n fun get() = definedExternally\n fun set(value) = definedExternally\n var parentID: String? /*
= null */\n fun get() = definedExternally\n fun set(value) = definedExternally\n var cursor: String? /* = \"inherit\"

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*/\n    get() = definedExternally\n    set(value) = definedExternally\n    var control: Element? /* = null */\n    get() = definedExternally\n    set(value) = definedExternally\n    var label: String? /* = null */\n    get() = definedExternally\n    set(value) = definedExternally\n    var role: String? /* = null */\n    get() = definedExternally\n    set(value) = definedExternally\n}\n\n@Suppress("INVISIBLE_REFERENCE",  
"INVISIBLE_MEMBER")\n@kotlin.internal.InlineOnly\npublic inline fun HitRegionOptions(path: Path2D? = null, fillRule: CanvasFillRule? = CanvasFillRule.NONZERO, id: String? = "", parentID: String? = null, cursor: String? = "inherit", control: Element? = null, label: String? = null, role: String? = null): HitRegionOptions {\n    val o = js("{}")\n    o["path"] = path\n    o["fillRule"] = fillRule\n    o["id"] = id\n    o["parentID"] = parentID\n    o["cursor"] = cursor\n    o["control"] = control\n    o["label"] = label\n    o["role"] = role\n    return o\n}\n\n/**\n * Exposes the JavaScript [ImageData](https://developer.mozilla.org/en/docs/Web/API/ImageData) to Kotlin\n */\npublic external open class ImageData : ImageBitmapSource, TexImageSource {\n    constructor(sw: Int, sh: Int)\n    constructor(data: Uint8ClampedArray, sw: Int, sh: Int = definedExternally)\n    open val width: Int\n    open val height: Int\n    open val data: Uint8ClampedArray\n}\n\n/**\n * Exposes the JavaScript [Path2D](https://developer.mozilla.org/en/docs/Web/API/Path2D) to Kotlin\n */\npublic external open class Path2D() : CanvasPath {\n    constructor(path: Path2D)\n    constructor(paths: Array<Path2D>, fillRule: CanvasFillRule = definedExternally)\n    constructor(d: String)\n    fun addPath(path: Path2D, transform: dynamic = definedExternally)\n    override fun closePath()\n    override fun moveTo(x: Double, y: Double)\n    override fun.lineTo(x: Double, y: Double)\n    override fun.quadraticCurveTo(cpx: Double, cpy: Double, x: Double, y: Double)\n    override fun.bezierCurveTo(cp1x: Double, cp1y: Double, cp2x: Double, cp2y: Double, x: Double, y: Double)\n    override fun.arcTo(x1: Double, y1: Double, x2: Double, y2: Double, radius: Double)\n    override fun.arcTo(x1: Double, y1: Double, x2: Double, y2: Double, radiusX: Double, radiusY: Double, rotation: Double)\n    override fun.rect(x: Double, y: Double, w: Double, h: Double)\n    override fun.arc(x: Double, y: Double, radius: Double, startAngle: Double, endAngle: Double, anticlockwise: Boolean /* = definedExternally */) \n    override fun.ellipse(x: Double, y: Double, radiusX: Double, radiusY: Double, rotation: Double, startAngle: Double, endAngle: Double, anticlockwise: Boolean /* = definedExternally */) \n}\n\n/**\n * Exposes the JavaScript [ImageBitmapRenderingContext](https://developer.mozilla.org/en/docs/Web/API/ImageBitmapRenderingContext) to Kotlin\n */\npublic external abstract class ImageBitmapRenderingContext {\n    open val canvas: HTMLCanvasElement\n    fun transferFromImageBitmap(bitmap: ImageBitmap?)\n}\n\npublic external interface ImageBitmapRenderingContextSettings {\n    var alpha: Boolean? /* = true */\n    get() = definedExternally\n    set(value) = definedExternally\n}\n\n@Suppress("INVISIBLE_REFERENCE", "INVISIBLE_MEMBER")\n@kotlin.internal.InlineOnly\npublic inline fun ImageBitmapRenderingContextSettings(alpha: Boolean? = true): ImageBitmapRenderingContextSettings {\n    val o = js("{}")\n    o["alpha"] = alpha\n    return o\n}\n\n/**\n * Exposes the JavaScript [CustomElementRegistry](https://developer.mozilla.org/en/docs/Web/API/CustomElementRegistry) to Kotlin\n */\npublic external abstract class CustomElementRegistry {\n    fun define(name: String, constructor: () -> dynamic, options: ElementDefinitionOptions = definedExternally)\n    fun get(name: String): Any?\n    fun whenDefined(name: String): Promise<Unit>\n}\n\npublic external interface ElementDefinitionOptions {\n    var extends: String?\n    get() = definedExternally\n    set(value) = definedExternally\n}\n\n@Suppress("INVISIBLE_REFERENCE", "INVISIBLE_MEMBER")\n@kotlin.internal.InlineOnly\npublic inline fun ElementDefinitionOptions(extends: String? = undefined): ElementDefinitionOptions {\n    val o = js("{}")\n    o["extends"] = extends\n    return o\n}\n\npublic external interface ElementContentEditable {\n    var contentEditable: String\n    val isContentEditable: Boolean\n}\n\n/**\n * Exposes the JavaScript [DataTransfer](https://developer.mozilla.org/en/docs/Web/API/DataTransfer) to Kotlin\n */\npublic external abstract class DataTransfer {\n    open var dropEffect: String\n    open var effectAllowed: String\n    open val items: DataTransferItemList\n    open val types: Array<out String>\n    open val files: FileList\n    fun setDragImage(image: Element, x: Int, y: Int)\n    fun getData(format: String): String\n    fun setData(format: String, data: String)\n    fun clearData(format: String = definedExternally)\n}\n\n/**\n * Exposes the JavaScript

```

```

[DataTransferItemList](https://developer.mozilla.org/en/docs/Web/API/DataTransferItemList) to Kotlin\n *\npublic
external abstract class DataTransferItemList {\n  open val length: Int\n  fun add(data: String, type: String):
DataTransferItem?\n  fun add(data: File): DataTransferItem?\n  fun remove(index: Int)\n  fun
clear()\n}\n\n@Suppress("INVISIBLE_REFERENCE",
"INVISIBLE_MEMBER")\n@kotlin.internal.InlineOnly\npublic inline operator fun
DataTransferItemList.get(index: Int): DataTransferItem? = asDynamic()[index]\n\n/**\n * Exposes the JavaScript
[DataTransferItem](https://developer.mozilla.org/en/docs/Web/API/DataTransferItem) to Kotlin\n *\npublic
external abstract class DataTransferItem {\n  open val kind: String\n  open val type: String\n  fun
getAsString(_callback: ((String) -> Unit)?)\n  fun getAsFile(): File?\n}\n\n/**\n * Exposes the JavaScript
[DragEvent](https://developer.mozilla.org/en/docs/Web/API/TouchEvent) to Kotlin\n *\npublic external open class
DragEvent(type: String, eventInitDict: DragEventInit = definedExternally) : MouseEvent {\n  open val
dataTransfer: DataTransfer?\n\n  companion object {\n    val NONE: Short\n    val CAPTURING_PHASE:
Short\n    val AT_TARGET: Short\n    val BUBBLING_PHASE: Short\n  }\n}\n\npublic external interface
DragEventInit : MouseEventInit {\n  var dataTransfer: DataTransfer? /* = null */\n  get() = definedExternally\n
  set(value) = definedExternally\n}\n\n@Suppress("INVISIBLE_REFERENCE",
"INVISIBLE_MEMBER")\n@kotlin.internal.InlineOnly\npublic inline fun DragEventInit(dataTransfer:
DataTransfer? = null, screenX: Int? = 0, screenY: Int? = 0, clientX: Int? = 0, clientY: Int? = 0, button: Short? = 0,
buttons: Short? = 0, relatedTarget: EventTarget? = null, region: String? = null, ctrlKey: Boolean? = false, shiftKey:
Boolean? = false, altKey: Boolean? = false, metaKey: Boolean? = false, modifierAltGraph: Boolean? = false,
modifierCapsLock: Boolean? = false, modifierFn: Boolean? = false, modifierFnLock: Boolean? = false,
modifierHyper: Boolean? = false, modifierNumLock: Boolean? = false, modifierScrollLock: Boolean? = false,
modifierSuper: Boolean? = false, modifierSymbol: Boolean? = false, modifierSymbolLock: Boolean? = false, view:
Window? = null, detail: Int? = 0, bubbles: Boolean? = false, cancelable: Boolean? = false, composed: Boolean? =
false): DragEventInit {\n  val o = js("{}")\n  o["dataTransfer"] = dataTransfer\n  o["screenX"] = screenX\n
o["screenY"] = screenY\n  o["clientX"] = clientX\n  o["clientY"] = clientY\n  o["button"] = button\n
o["buttons"] = buttons\n  o["relatedTarget"] = relatedTarget\n  o["region"] = region\n  o["ctrlKey"] =
ctrlKey\n  o["shiftKey"] = shiftKey\n  o["altKey"] = altKey\n  o["metaKey"] = metaKey\n
o["modifierAltGraph"] = modifierAltGraph\n  o["modifierCapsLock"] = modifierCapsLock\n
o["modifierFn"] = modifierFn\n  o["modifierFnLock"] = modifierFnLock\n  o["modifierHyper"] =
modifierHyper\n  o["modifierNumLock"] = modifierNumLock\n  o["modifierScrollLock"] =
modifierScrollLock\n  o["modifierSuper"] = modifierSuper\n  o["modifierSymbol"] = modifierSymbol\n
o["modifierSymbolLock"] = modifierSymbolLock\n  o["view"] = view\n  o["detail"] = detail\n
o["bubbles"] = bubbles\n  o["cancelable"] = cancelable\n  o["composed"] = composed\n  return
o\n}\n\n/**\n * Exposes the JavaScript [Window](https://developer.mozilla.org/en/docs/Web/API/Window) to
Kotlin\n *\npublic external abstract class Window : EventTarget, GlobalEventHandlers, WindowEventHandlers,
WindowOrWorkerGlobalScope, WindowSessionStorage, WindowLocalStorage, GlobalPerformance,
UnionMessagePortOrWindowProxy {\n  open val window: Window\n  open val self: Window\n  open val
document: Document\n  open var name: String\n  open val location: Location\n  open val history: History\n
open val customElements: CustomElementRegistry\n  open val locationbar: BarProp\n  open val menubar:
BarProp\n  open val personalbar: BarProp\n  open val scrollbars: BarProp\n  open val statusbar: BarProp\n
open val toolbar: BarProp\n  open var status: String\n  open val closed: Boolean\n  open val frames: Window\n
open val length: Int\n  open val top: Window\n  open var opener: Any?\n  open val parent: Window\n  open val
frameElement: Element?\n  open val navigator: Navigator\n  open val applicationCache: ApplicationCache\n
open val external: External\n  open val screen: Screen\n  open val innerWidth: Int\n  open val innerHeight: Int\n
open val scrollX: Double\n  open val pageXOffset: Double\n  open val scrollY: Double\n  open val
pageYOffset: Double\n  open val screenX: Int\n  open val screenY: Int\n  open val outerWidth: Int\n  open val
outerHeight: Int\n  open val devicePixelRatio: Double\n  fun close()\n  fun stop()\n  fun focus()\n  fun blur()\n
fun open(url: String = definedExternally, target: String = definedExternally, features: String = definedExternally):

```



```

CAPTURING_PHASE: Short\n    val AT_TARGET: Short\n    val BUBBLING_PHASE: Short\n
}\n}\n\npublic external interface PageTransitionEventInit : EventInit {\n    var persisted: Boolean? /* = false */\n
get() = definedExternally\n    set(value) = definedExternally\n}\n\n@Suppress(\"INVISIBLE_REFERENCE\",
\"INVISIBLE_MEMBER\")\n@kotlin.internal.InlineOnly\npublic inline fun PageTransitionEventInit(persisted:
Boolean? = false, bubbles: Boolean? = false, cancelable: Boolean? = false, composed: Boolean? = false):
PageTransitionEventInit {\n    val o = js(\"({})\")\n    o[\"persisted\"] = persisted\n    o[\"bubbles\"] = bubbles\n
o[\"cancelable\"] = cancelable\n    o[\"composed\"] = composed\n    return o\n}\n\n/**\n * Exposes the JavaScript
[BeforeUnloadEvent](https://developer.mozilla.org/en/docs/Web/API/BeforeUnloadEvent) to Kotlin\n */\npublic
external open class BeforeUnloadEvent : Event {\n    var returnValue: String\n\n    companion object {\n        val
NONE: Short\n        val CAPTURING_PHASE: Short\n        val AT_TARGET: Short\n        val
BUBBLING_PHASE: Short\n    }\n}\n\npublic external abstract class ApplicationCache : EventTarget {\n    open
val status: Short\n    open var onchecking: ((Event) -> dynamic)?\n    open var onerror: ((Event) -> dynamic)?\n
open var onnoupdate: ((Event) -> dynamic)?\n    open var ondownloading: ((Event) -> dynamic)?\n    open var
onprogress: ((ProgressEvent) -> dynamic)?\n    open var onupdateready: ((Event) -> dynamic)?\n    open var
oncached: ((Event) -> dynamic)?\n    open var onobsolete: ((Event) -> dynamic)?\n    fun update()\n    fun abort()\n
fun swapCache()\n\n    companion object {\n        val UNCACHED: Short\n        val IDLE: Short\n        val
CHECKING: Short\n        val DOWNLOADING: Short\n        val UPDATEREADY: Short\n        val OBSOLETE:
Short\n    }\n}\n\n/**\n * Exposes the JavaScript
[NavigatorOnLine](https://developer.mozilla.org/en/docs/Web/API/NavigatorOnLine) to Kotlin\n */\npublic
external interface NavigatorOnLine {\n    val onLine: Boolean\n}\n\n/**\n * Exposes the JavaScript
[ErrorEvent](https://developer.mozilla.org/en/docs/Web/API/ErrorEvent) to Kotlin\n */\npublic external open class
ErrorEvent(type: String, eventInitDict: ErrorEventInit = definedExternally) : Event {\n    open val message: String\n
open val filename: String\n    open val lineno: Int\n    open val colno: Int\n    open val error: Any?\n\n    companion
object {\n        val NONE: Short\n        val CAPTURING_PHASE: Short\n        val AT_TARGET: Short\n        val
BUBBLING_PHASE: Short\n    }\n}\n\npublic external interface ErrorEventInit : EventInit {\n    var message:
String? /* = \"\" */\n    get() = definedExternally\n    set(value) = definedExternally\n    var filename: String? /*
= \"\" */\n    get() = definedExternally\n    set(value) = definedExternally\n    var lineno: Int? /* = 0 */\n
get() = definedExternally\n    set(value) = definedExternally\n    var colno: Int? /* = 0 */\n    get() =
definedExternally\n    set(value) = definedExternally\n    var error: Any? /* = null */\n    get() =
definedExternally\n    set(value) = definedExternally\n}\n\n@Suppress(\"INVISIBLE_REFERENCE\",
\"INVISIBLE_MEMBER\")\n@kotlin.internal.InlineOnly\npublic inline fun ErrorEventInit(message: String? = \"\",
filename: String? = \"\", lineno: Int? = 0, colno: Int? = 0, error: Any? = null, bubbles: Boolean? = false, cancelable:
Boolean? = false, composed: Boolean? = false): ErrorEventInit {\n    val o = js(\"({})\")\n    o[\"message\"] =
message\n    o[\"filename\"] = filename\n    o[\"lineno\"] = lineno\n    o[\"colno\"] = colno\n    o[\"error\"] = error\n
o[\"bubbles\"] = bubbles\n    o[\"cancelable\"] = cancelable\n    o[\"composed\"] = composed\n    return
o\n}\n\n/**\n * Exposes the JavaScript
[PromiseRejectionEvent](https://developer.mozilla.org/en/docs/Web/API/PromiseRejectionEvent) to Kotlin\n
*/\npublic external open class PromiseRejectionEvent(type: String, eventInitDict: PromiseRejectionEventInit) :
Event {\n    open val promise: Promise<Any?>\n    open val reason: Any?\n\n    companion object {\n        val
NONE: Short\n        val CAPTURING_PHASE: Short\n        val AT_TARGET: Short\n        val
BUBBLING_PHASE: Short\n    }\n}\n\npublic external interface PromiseRejectionEventInit : EventInit {\n    var
promise: Promise<Any?>\n    var reason: Any?\n    get() = definedExternally\n    set(value) =
definedExternally\n}\n\n@Suppress(\"INVISIBLE_REFERENCE\",
\"INVISIBLE_MEMBER\")\n@kotlin.internal.InlineOnly\npublic inline fun PromiseRejectionEventInit(promise:
Promise<Any?>?, reason: Any? = undefined, bubbles: Boolean? = false, cancelable: Boolean? = false, composed:
Boolean? = false): PromiseRejectionEventInit {\n    val o = js(\"({})\")\n    o[\"promise\"] = promise\n
o[\"reason\"] = reason\n    o[\"bubbles\"] = bubbles\n    o[\"cancelable\"] = cancelable\n    o[\"composed\"] =
composed\n    return o\n}\n\n/**\n * Exposes the JavaScript

```

[GlobalEventHandlers](https://developer.mozilla.org/en/docs/Web/API/GlobalEventHandlers) to Kotlin

```

*public external interface GlobalEventHandlers {
    var onabort: ((Event) -> dynamic)?
    get() = definedExternally
    set(value) = definedExternally
    var onblur: ((FocusEvent) -> dynamic)?
    get() = definedExternally
    set(value) = definedExternally
    var oncancel: ((Event) -> dynamic)?
    get() = definedExternally
    set(value) = definedExternally
    var oncanplay: ((Event) -> dynamic)?
    get() = definedExternally
    set(value) = definedExternally
    var oncanplaythrough: ((Event) -> dynamic)?
    get() = definedExternally
    set(value) = definedExternally
    var onchange: ((Event) -> dynamic)?
    get() = definedExternally
    set(value) = definedExternally
    var onclick: ((MouseEvent) -> dynamic)?
    get() = definedExternally
    set(value) = definedExternally
    var onclose: ((Event) -> dynamic)?
    get() = definedExternally
    set(value) = definedExternally
    var oncontextmenu: ((MouseEvent) -> dynamic)?
    get() = definedExternally
    set(value) = definedExternally
    var oncuechange: ((Event) -> dynamic)?
    get() = definedExternally
    set(value) = definedExternally
    var ondblclick: ((MouseEvent) -> dynamic)?
    get() = definedExternally
    set(value) = definedExternally
    var ondrag: ((DragEvent) -> dynamic)?
    get() = definedExternally
    set(value) = definedExternally
    var ondragend: ((DragEvent) -> dynamic)?
    get() = definedExternally
    set(value) = definedExternally
    var ondragenter: ((DragEvent) -> dynamic)?
    get() = definedExternally
    set(value) = definedExternally
    var ondragexit: ((DragEvent) -> dynamic)?
    get() = definedExternally
    set(value) = definedExternally
    var ondragleave: ((DragEvent) -> dynamic)?
    get() = definedExternally
    set(value) = definedExternally
    var ondragover: ((DragEvent) -> dynamic)?
    get() = definedExternally
    set(value) = definedExternally
    var ondragstart: ((DragEvent) -> dynamic)?
    get() = definedExternally
    set(value) = definedExternally
    var ondrop: ((DragEvent) -> dynamic)?
    get() = definedExternally
    set(value) = definedExternally
    var ondurationchange: ((Event) -> dynamic)?
    get() = definedExternally
    set(value) = definedExternally
    var onemptied: ((Event) -> dynamic)?
    get() = definedExternally
    set(value) = definedExternally
    var onended: ((Event) -> dynamic)?
    get() = definedExternally
    set(value) = definedExternally
    var onerror: ((dynamic, String, Int, Int, Any?) -> dynamic)?
    get() = definedExternally
    set(value) = definedExternally
    var onfocus: ((FocusEvent) -> dynamic)?
    get() = definedExternally
    set(value) = definedExternally
    var oninput: ((InputEvent) -> dynamic)?
    get() = definedExternally
    set(value) = definedExternally
    var oninvalid: ((Event) -> dynamic)?
    get() = definedExternally
    set(value) = definedExternally
    var onkeydown: ((KeyboardEvent) -> dynamic)?
    get() = definedExternally
    set(value) = definedExternally
    var onkeypress: ((KeyboardEvent) -> dynamic)?
    get() = definedExternally
    set(value) = definedExternally
    var onkeyup: ((KeyboardEvent) -> dynamic)?
    get() = definedExternally
    set(value) = definedExternally
    var onload: ((Event) -> dynamic)?
    get() = definedExternally
    set(value) = definedExternally
    var onloadeddata: ((Event) -> dynamic)?
    get() = definedExternally
    set(value) = definedExternally
    var onloadedmetadata: ((Event) -> dynamic)?
    get() = definedExternally
    set(value) = definedExternally
    var onloadend: ((Event) -> dynamic)?
    get() = definedExternally
    set(value) = definedExternally
    var onloadstart: ((ProgressEvent) -> dynamic)?
    get() = definedExternally
    set(value) = definedExternally
    var onmousedown: ((MouseEvent) -> dynamic)?
    get() = definedExternally
    set(value) = definedExternally
    var onmouseenter: ((MouseEvent) -> dynamic)?
    get() = definedExternally
    set(value) = definedExternally
    var onmouseleave: ((MouseEvent) -> dynamic)?
    get() = definedExternally
    set(value) = definedExternally
    var onmousemove: ((MouseEvent) -> dynamic)?
    get() = definedExternally
    set(value) = definedExternally
    var onmouseout: ((MouseEvent) -> dynamic)?
    get() = definedExternally
    set(value) = definedExternally
    var onmouseover: ((MouseEvent) -> dynamic)?
    get() = definedExternally
    set(value) = definedExternally
    var onmouseup: ((MouseEvent) -> dynamic)?
    get() = definedExternally
    set(value) = definedExternally
    var onwheel: ((WheelEvent) -> dynamic)?
    get() = definedExternally
    set(value) = definedExternally
    var onpause: ((Event) -> dynamic)?
    get() = definedExternally
    set(value) = definedExternally
    var onplay: ((Event) -> dynamic)?
    get() = definedExternally
    set(value) = definedExternally
    var onplaying: ((Event) -> dynamic)?
    get() = definedExternally

```



```

set(value) = definedExternally\n    var onprogress: ((ProgressEvent) -> dynamic)?\n    get() = definedExternally\n
    set(value) = definedExternally\n    var onratechange: ((Event) -> dynamic)?\n    get() = definedExternally\n
set(value) = definedExternally\n    var onreset: ((Event) -> dynamic)?\n    get() = definedExternally\n
set(value) = definedExternally\n    var onresize: ((Event) -> dynamic)?\n    get() = definedExternally\n
set(value) = definedExternally\n    var onscroll: ((Event) -> dynamic)?\n    get() = definedExternally\n
set(value) = definedExternally\n    var onseeked: ((Event) -> dynamic)?\n    get() = definedExternally\n
set(value) = definedExternally\n    var onseeking: ((Event) -> dynamic)?\n    get() = definedExternally\n
set(value) = definedExternally\n    var onselect: ((Event) -> dynamic)?\n    get() = definedExternally\n
set(value) = definedExternally\n    var onshow: ((Event) -> dynamic)?\n    get() = definedExternally\n
set(value) = definedExternally\n    var onstalled: ((Event) -> dynamic)?\n    get() = definedExternally\n
set(value) = definedExternally\n    var onsubmit: ((Event) -> dynamic)?\n    get() = definedExternally\n
set(value) = definedExternally\n    var onsuspend: ((Event) -> dynamic)?\n    get() = definedExternally\n
set(value) = definedExternally\n    var ontimeupdate: ((Event) -> dynamic)?\n    get() = definedExternally\n
set(value) = definedExternally\n    var ontoggle: ((Event) -> dynamic)?\n    get() = definedExternally\n
set(value) = definedExternally\n    var onvolumechange: ((Event) -> dynamic)?\n    get() = definedExternally\n
    set(value) = definedExternally\n    var onwaiting: ((Event) -> dynamic)?\n    get() = definedExternally\n
set(value) = definedExternally\n    var ongotpointercapture: ((PointerEvent) -> dynamic)?\n    get() =
definedExternally\n    set(value) = definedExternally\n    var onlostpointercapture: ((PointerEvent) -> dynamic)?\n
    get() = definedExternally\n    set(value) = definedExternally\n    var onpointerdown: ((PointerEvent) ->
dynamic)?\n    get() = definedExternally\n    set(value) = definedExternally\n    var onpointermove:
((PointerEvent) -> dynamic)?\n    get() = definedExternally\n    set(value) = definedExternally\n    var
onpointerup: ((PointerEvent) -> dynamic)?\n    get() = definedExternally\n    set(value) = definedExternally\n
var onpointercancel: ((PointerEvent) -> dynamic)?\n    get() = definedExternally\n    set(value) =
definedExternally\n    var onpointerover: ((PointerEvent) -> dynamic)?\n    get() = definedExternally\n
set(value) = definedExternally\n    var onpointerout: ((PointerEvent) -> dynamic)?\n    get() = definedExternally\n
    set(value) = definedExternally\n    var onpointerenter: ((PointerEvent) -> dynamic)?\n    get() =
definedExternally\n    set(value) = definedExternally\n    var onpointerleave: ((PointerEvent) -> dynamic)?\n
get() = definedExternally\n    set(value) = definedExternally\n}\n\n**\n * Exposes the JavaScript
[WindowEventHandlers](https://developer.mozilla.org/en/docs/Web/API/WindowEventHandlers) to Kotlin\n
*\npublic external interface WindowEventHandlers {\n    var onafterprint: ((Event) -> dynamic)?\n    get() =
definedExternally\n    set(value) = definedExternally\n    var onbeforeprint: ((Event) -> dynamic)?\n    get() =
definedExternally\n    set(value) = definedExternally\n    var onbeforeunload: ((BeforeUnloadEvent) ->
String)?\n    get() = definedExternally\n    set(value) = definedExternally\n    var onhashchange:
((HashChangeEvent) -> dynamic)?\n    get() = definedExternally\n    set(value) = definedExternally\n    var
onlanguagechange: ((Event) -> dynamic)?\n    get() = definedExternally\n    set(value) = definedExternally\n
var onmessage: ((MessageEvent) -> dynamic)?\n    get() = definedExternally\n    set(value) =
definedExternally\n    var onoffline: ((Event) -> dynamic)?\n    get() = definedExternally\n    set(value) =
definedExternally\n    var ononline: ((Event) -> dynamic)?\n    get() = definedExternally\n    set(value) =
definedExternally\n    var onpagehide: ((PageTransitionEvent) -> dynamic)?\n    get() = definedExternally\n
set(value) = definedExternally\n    var onpageshow: ((PageTransitionEvent) -> dynamic)?\n    get() =
definedExternally\n    set(value) = definedExternally\n    var onpopstate: ((PopStateEvent) -> dynamic)?\n
get() = definedExternally\n    set(value) = definedExternally\n    var onrejectionhandled: ((Event) -> dynamic)?\n
    get() = definedExternally\n    set(value) = definedExternally\n    var onstorage: ((StorageEvent) -> dynamic)?\n
    get() = definedExternally\n    set(value) = definedExternally\n    var onunhandledrejection:
((PromiseRejectionEvent) -> dynamic)?\n    get() = definedExternally\n    set(value) = definedExternally\n
var onunload: ((Event) -> dynamic)?\n    get() = definedExternally\n    set(value) =
definedExternally\n}\n\npublic external interface DocumentAndElementEventHandlers {\n    var oncopy:
((ClipboardEvent) -> dynamic)?\n    get() = definedExternally\n    set(value) = definedExternally\n    var oncut:

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((ClipboardEvent) -> dynamic)?\n    get() = definedExternally\n    set(value) = definedExternally\n    var
onpaste: ((ClipboardEvent) -> dynamic)?\n    get() = definedExternally\n    set(value) =
definedExternally\n}\n\n/**\n * Exposes the JavaScript
[WindowOrWorkerGlobalScope](https://developer.mozilla.org/en/docs/Web/API/WindowOrWorkerGlobalScope)
to Kotlin\n */\npublic external interface WindowOrWorkerGlobalScope {\n    val origin: String\n    val caches:
CacheStorage\n    fun btoa(data: String): String\n    fun atob(data: String): String\n    fun setTimeout(handler:
dynamic, timeout: Int = definedExternally, vararg arguments: Any?): Int\n    fun clearTimeout(handle: Int =
definedExternally)\n    fun setInterval(handler: dynamic, timeout: Int = definedExternally, vararg arguments: Any?):
Int\n    fun clearInterval(handle: Int = definedExternally)\n    fun createImageBitmap(image: ImageBitmapSource,
options: ImageBitmapOptions = definedExternally): Promise<ImageBitmap>\n    fun createImageBitmap(image:
ImageBitmapSource, sx: Int, sy: Int, sw: Int, sh: Int, options: ImageBitmapOptions = definedExternally):
Promise<ImageBitmap>\n    fun fetch(input: dynamic, init: RequestInit = definedExternally):
Promise<Response>\n}\n\n/**\n * Exposes the JavaScript
[Navigator](https://developer.mozilla.org/en/docs/Web/API/Navigator) to Kotlin\n */\npublic external abstract class
Navigator : NavigatorID, NavigatorLanguage, NavigatorOnLine, NavigatorContentUtils, NavigatorCookies,
NavigatorPlugins, NavigatorConcurrentHardware {\n    open val clipboard: Clipboard\n    open val mediaDevices:
MediaDevices\n    open val maxTouchPoints: Int\n    open val serviceWorker: ServiceWorkerContainer\n    fun
requestMediaKeySystemAccess(keySystem: String, supportedConfigurations:
Array<MediaKeySystemConfiguration>): Promise<MediaKeySystemAccess>\n    fun getUserMedia(constraints:
MediaStreamConstraints, successCallback: (MediaStream) -> Unit, errorCallback: (dynamic) -> Unit)\n    fun
vibrate(pattern: dynamic): Boolean\n}\n\n/**\n * Exposes the JavaScript
[NavigatorID](https://developer.mozilla.org/en/docs/Web/API/NavigatorID) to Kotlin\n */\npublic external interface
NavigatorID {\n    val appCodeName: String\n    val appName: String\n    val appVersion: String\n    val platform:
String\n    val product: String\n    val productSub: String\n    val userAgent: String\n    val vendor: String\n    val
vendorSub: String\n    val oscpu: String\n    fun taintEnabled(): Boolean\n}\n\n/**\n * Exposes the JavaScript
[NavigatorLanguage](https://developer.mozilla.org/en/docs/Web/API/NavigatorLanguage) to Kotlin\n */\npublic
external interface NavigatorLanguage {\n    val language: String\n    val languages: Array<out String>\n}\n\npublic
external interface NavigatorContentUtils {\n    fun registerProtocolHandler(scheme: String, url: String, title:
String)\n    fun registerContentHandler(mimeType: String, url: String, title: String)\n    fun
isProtocolHandlerRegistered(scheme: String, url: String): String\n    fun isContentHandlerRegistered(mimeType:
String, url: String): String\n    fun unregisterProtocolHandler(scheme: String, url: String)\n    fun
unregisterContentHandler(mimeType: String, url: String)\n}\n\npublic external interface NavigatorCookies {\n    val
cookieEnabled: Boolean\n}\n\n/**\n * Exposes the JavaScript
[NavigatorPlugins](https://developer.mozilla.org/en/docs/Web/API/NavigatorPlugins) to Kotlin\n */\npublic
external interface NavigatorPlugins {\n    val plugins: PluginArray\n    val mimeTypes: MimeTypeErrorArray\n    fun
javaEnabled(): Boolean\n}\n\n/**\n * Exposes the JavaScript
[PluginArray](https://developer.mozilla.org/en/docs/Web/API/PluginArray) to Kotlin\n */\npublic external abstract
class PluginArray : ItemArrayLike<Plugin> {\n    fun refresh(reload: Boolean = definedExternally)\n    override fun
item(index: Int): Plugin?\n    fun namedItem(name: String):
Plugin?\n}\n\n@Suppress(\"INVISIBLE_REFERENCE\",
\"INVISIBLE_MEMBER\")\n@kotlin.internal.InlineOnly\npublic inline operator fun PluginArray.get(index: Int):
Plugin? = asDynamic()[index]\n\n@Suppress(\"INVISIBLE_REFERENCE\",
\"INVISIBLE_MEMBER\")\n@kotlin.internal.InlineOnly\npublic inline operator fun PluginArray.get(name:
String): Plugin? = asDynamic()[name]\n\n/**\n * Exposes the JavaScript
[MimeTypeArray](https://developer.mozilla.org/en/docs/Web/API/MimeTypeArray) to Kotlin\n */\npublic external
abstract class MimeTypeArray : ItemArrayLike<MimeType> {\n    override fun item(index: Int): MimeType?\n    fun
namedItem(name: String): MimeType?\n}\n\n@Suppress(\"INVISIBLE_REFERENCE\",
\"INVISIBLE_MEMBER\")\n@kotlin.internal.InlineOnly\npublic inline operator fun MimeTypeArray.get(index:

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Int): MimeType? = asDynamic()[index]\n\n@Suppress(\\"INVISIBLE_REFERENCE\",
\\"INVISIBLE_MEMBER\")\n\n@kotlin.internal.InlineOnly\n\npublic inline operator fun MimeTypeArray.get(name:
String): MimeType? = asDynamic()[name]\n\n/**\n * Exposes the JavaScript
[Plugin](https://developer.mozilla.org/en/docs/Web/API/Plugin) to Kotlin\n *^\n\npublic external abstract class Plugin
: ItemArrayLike<MimeType> {\n  open val name: String\n  open val description: String\n  open val filename:
String\n  override fun item(index: Int): MimeType?\n  fun namedItem(name: String):
MimeType?\n}\n\n@Suppress(\\"INVISIBLE_REFERENCE\",
\\"INVISIBLE_MEMBER\")\n\n@kotlin.internal.InlineOnly\n\npublic inline operator fun Plugin.get(index: Int):
MimeType? = asDynamic()[index]\n\n@Suppress(\\"INVISIBLE_REFERENCE\",
\\"INVISIBLE_MEMBER\")\n\n@kotlin.internal.InlineOnly\n\npublic inline operator fun Plugin.get(name: String):
MimeType? = asDynamic()[name]\n\n/**\n * Exposes the JavaScript
[MimeType](https://developer.mozilla.org/en/docs/Web/API/MimeType) to Kotlin\n *^\n\npublic external abstract
class MimeType {\n  open val type: String\n  open val description: String\n  open val suffixes: String\n  open
val enabledPlugin: Plugin\n}\n\n/**\n * Exposes the JavaScript
[ImageBitmap](https://developer.mozilla.org/en/docs/Web/API/ImageBitmap) to Kotlin\n *^\n\npublic external
abstract class ImageBitmap : CanvasImageSource, TexImageSource {\n  open val width: Int\n  open val height:
Int\n  fun close()\n}\n\npublic external interface ImageBitmapOptions {\n  var imageOrientation:
ImageOrientation? /* = ImageOrientation.NONE */\n  get() = definedExternally\n  set(value) =
definedExternally\n  var premultiplyAlpha: PremultiplyAlpha? /* = PremultiplyAlpha.DEFAULT */\n  get() =
definedExternally\n  set(value) = definedExternally\n  var colorSpaceConversion: ColorSpaceConversion? /* =
ColorSpaceConversion.DEFAULT */\n  get() = definedExternally\n  set(value) = definedExternally\n  var
resizeWidth: Int?\n  get() = definedExternally\n  set(value) = definedExternally\n  var resizeHeight: Int?\n
  get() = definedExternally\n  set(value) = definedExternally\n  var resizeQuality: ResizeQuality? /* =
ResizeQuality.LOW */\n  get() = definedExternally\n  set(value) =
definedExternally\n}\n\n@Suppress(\\"INVISIBLE_REFERENCE\",
\\"INVISIBLE_MEMBER\")\n\n@kotlin.internal.InlineOnly\n\npublic inline fun
ImageBitmapOptions(imageOrientation: ImageOrientation? = ImageOrientation.NONE, premultiplyAlpha:
PremultiplyAlpha? = PremultiplyAlpha.DEFAULT, colorSpaceConversion: ColorSpaceConversion? =
ColorSpaceConversion.DEFAULT, resizeWidth: Int? = undefined, resizeHeight: Int? = undefined, resizeQuality:
ResizeQuality? = ResizeQuality.LOW): ImageBitmapOptions {\n  val o = js(\\"{\})\n  o[\"imageOrientation\"]
= imageOrientation\n  o[\"premultiplyAlpha\"] = premultiplyAlpha\n  o[\"colorSpaceConversion\"] =
colorSpaceConversion\n  o[\"resizeWidth\"] = resizeWidth\n  o[\"resizeHeight\"] = resizeHeight\n
o[\"resizeQuality\"] = resizeQuality\n  return o\n}\n\n/**\n * Exposes the JavaScript
[MessageEvent](https://developer.mozilla.org/en/docs/Web/API/MessageEvent) to Kotlin\n *^\n\npublic external open
class MessageEvent(type: String, eventInitDict: MessageEventInit = definedExternally) : Event {\n  open val data:
Any?\n  open val origin: String\n  open val lastEventId: String\n  open val source:
UnionMessagePortOrWindowProxy?\n  open val ports: Array<out MessagePort>\n  fun initMessageEvent(type:
String, bubbles: Boolean, cancelable: Boolean, data: Any?, origin: String, lastEventId: String, source:
UnionMessagePortOrWindowProxy?, ports: Array<MessagePort>)\n\n  companion object {\n    val NONE:
Short\n    val CAPTURING_PHASE: Short\n    val AT_TARGET: Short\n    val BUBBLING_PHASE:
Short\n  }\n}\n\npublic external interface MessageEventInit : EventInit {\n  var data: Any? /* = null */\n  get()
= definedExternally\n  set(value) = definedExternally\n  var origin: String? /* = \\"\" */\n  get() =
definedExternally\n  set(value) = definedExternally\n  var lastEventId: String? /* = \\"\" */\n  get() =
definedExternally\n  set(value) = definedExternally\n  var source: UnionMessagePortOrWindowProxy? /* =
null */\n  get() = definedExternally\n  set(value) = definedExternally\n  var ports: Array<MessagePort>? /*
= arrayOf() */\n  get() = definedExternally\n  set(value) =
definedExternally\n}\n\n@Suppress(\\"INVISIBLE_REFERENCE\",
\\"INVISIBLE_MEMBER\")\n\n@kotlin.internal.InlineOnly\n\npublic inline fun MessageEventInit(data: Any? = null,

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origin: String? = "", lastEventId: String? = "", source: UnionMessagePortOrWindowProxy? = null, ports:
Array<MessagePort>? = arrayOf(), bubbles: Boolean? = false, cancelable: Boolean? = false, composed: Boolean? =
false): MessageEventInit {\n  val o = js("{}")\n  o["data"] = data\n  o["origin"] = origin\n
o["lastEventId"] = lastEventId\n  o["source"] = source\n  o["ports"] = ports\n  o["bubbles"] = bubbles\n
o["cancelable"] = cancelable\n  o["composed"] = composed\n  return o\n}\n\n/**\n * Exposes the JavaScript
[EventSource](https://developer.mozilla.org/en/docs/Web/API/EventSource) to Kotlin\n *\npublic external open
class EventSource(url: String, eventSourceInitDict: EventSourceInit = definedExternally) : EventTarget {\n  open
val url: String\n  open val withCredentials: Boolean\n  open val readyState: Short\n  var onopen: ((Event) ->
dynamic)?\n  var onmessage: ((MessageEvent) -> dynamic)?\n  var onerror: ((Event) -> dynamic)?\n  fun
close()\n\n  companion object {\n    val CONNECTING: Short\n    val OPEN: Short\n    val CLOSED:
Short\n  }\n}\n\npublic external interface EventSourceInit {\n  var withCredentials: Boolean? /* = false *\n
get() = definedExternally\n  set(value) = definedExternally\n}\n\n@Suppress("INVISIBLE_REFERENCE",
"INVISIBLE_MEMBER")\n@kotlin.internal.InlineOnly\npublic inline fun EventSourceInit(withCredentials:
Boolean? = false): EventSourceInit {\n  val o = js("{}")\n  o["withCredentials"] = withCredentials\n  return
o\n}\n\n/**\n * Exposes the JavaScript [WebSocket](https://developer.mozilla.org/en/docs/Web/API/WebSocket) to
Kotlin\n *\npublic external open class WebSocket(url: String, protocols: dynamic = definedExternally) :
EventTarget {\n  open val url: String\n  open val readyState: Short\n  open val bufferedAmount: Number\n  var
onopen: ((Event) -> dynamic)?\n  var onerror: ((Event) -> dynamic)?\n  var onclose: ((Event) -> dynamic)?\n
open val extensions: String\n  open val protocol: String\n  var onmessage: ((MessageEvent) -> dynamic)?\n  var
binaryType: BinaryType\n  fun close(code: Short = definedExternally, reason: String = definedExternally)\n  fun
send(data: String)\n  fun send(data: Blob)\n  fun send(data: ArrayBuffer)\n  fun send(data:
ArrayBufferView)\n\n  companion object {\n    val CONNECTING: Short\n    val OPEN: Short\n    val
CLOSING: Short\n    val CLOSED: Short\n  }\n}\n\n/**\n * Exposes the JavaScript
[CloseEvent](https://developer.mozilla.org/en/docs/Web/API/CloseEvent) to Kotlin\n *\npublic external open class
CloseEvent(type: String, eventInitDict: CloseEventInit = definedExternally) : Event {\n  open val wasClean:
Boolean\n  open val code: Short\n  open val reason: String\n\n  companion object {\n    val NONE: Short\n    val
CAPTURING_PHASE: Short\n    val AT_TARGET: Short\n    val BUBBLING_PHASE: Short\n  }\n}\n\npublic external interface CloseEventInit : EventInit {\n  var wasClean: Boolean? /* = false *\n
get() =
definedExternally\n  set(value) = definedExternally\n  var code: Short? /* = 0 *\n  get() =
definedExternally\n  set(value) = definedExternally\n  var reason: String? /* = "" *\n  get() =
definedExternally\n  set(value) = definedExternally\n}\n\n@Suppress("INVISIBLE_REFERENCE",
"INVISIBLE_MEMBER")\n@kotlin.internal.InlineOnly\npublic inline fun CloseEventInit(wasClean: Boolean? =
false, code: Short? = 0, reason: String? = "", bubbles: Boolean? = false, cancelable: Boolean? = false, composed:
Boolean? = false): CloseEventInit {\n  val o = js("{}")\n  o["wasClean"] = wasClean\n  o["code"] = code\n
o["reason"] = reason\n  o["bubbles"] = bubbles\n  o["cancelable"] = cancelable\n  o["composed"] =
composed\n  return o\n}\n\n/**\n * Exposes the JavaScript
[MessageChannel](https://developer.mozilla.org/en/docs/Web/API/MessageChannel) to Kotlin\n *\npublic external
open class MessageChannel {\n  open val port1: MessagePort\n  open val port2: MessagePort\n}\n\n/**\n *
Exposes the JavaScript [MessagePort](https://developer.mozilla.org/en/docs/Web/API/MessagePort) to Kotlin\n
*\npublic external abstract class MessagePort : EventTarget, UnionMessagePortOrWindowProxy,
UnionMessagePortOrServiceWorker, UnionClientOrMessagePortOrServiceWorker {\n  open val onmessage:
((MessageEvent) -> dynamic)?\n  fun postMessage(message: Any?, transfer: Array<dynamic> =
definedExternally)\n  fun start()\n  fun close()\n}\n\n/**\n * Exposes the JavaScript
[BroadcastChannel](https://developer.mozilla.org/en/docs/Web/API/BroadcastChannel) to Kotlin\n *\npublic
external open class BroadcastChannel(name: String) : EventTarget {\n  open val name: String\n  var onmessage:
((MessageEvent) -> dynamic)?\n  fun postMessage(message: Any?)\n  fun close()\n}\n\n/**\n * Exposes the
JavaScript [WorkerGlobalScope](https://developer.mozilla.org/en/docs/Web/API/WorkerGlobalScope) to Kotlin\n
*\npublic external abstract class WorkerGlobalScope : EventTarget, WindowOrWorkerGlobalScope,

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GlobalPerformance {\n open val self: WorkerGlobalScope\n open val location: WorkerLocation\n open val navigator: WorkerNavigator\n open var onerror: ((dynamic, String, Int, Int, Any?) -> dynamic)?\n open var onlanguagechange: ((Event) -> dynamic)?\n open var onoffline: ((Event) -> dynamic)?\n open var ononline: ((Event) -> dynamic)?\n open var onrejectionhandled: ((Event) -> dynamic)?\n open var onunhandledrejection: ((PromiseRejectionEvent) -> dynamic)?\n fun importScripts(vararg urls: String)\n}\n\n/**\n * Exposes the JavaScript

[DedicatedWorkerGlobalScope](https://developer.mozilla.org/en/docs/Web/API/DedicatedWorkerGlobalScope) to Kotlin\n */\npublic external abstract class DedicatedWorkerGlobalScope : WorkerGlobalScope {\n open var onmessage: ((MessageEvent) -> dynamic)?\n fun postMessage(message: Any?, transfer: Array<dynamic> = definedExternally)\n fun close()\n}\n\n/**\n * Exposes the JavaScript

[SharedWorkerGlobalScope](https://developer.mozilla.org/en/docs/Web/API/SharedWorkerGlobalScope) to Kotlin\n */\npublic external abstract class SharedWorkerGlobalScope : WorkerGlobalScope {\n open val name: String\n open val applicationCache: ApplicationCache\n open var onconnect: ((Event) -> dynamic)?\n fun close()\n}\n\n/**\n * Exposes the JavaScript

[AbstractWorker](https://developer.mozilla.org/en/docs/Web/API/AbstractWorker) to Kotlin\n */\npublic external interface AbstractWorker {\n var onerror: ((Event) -> dynamic)?\n get() = definedExternally\n set(value) = definedExternally\n}\n\n/**\n * Exposes the JavaScript

[Worker](https://developer.mozilla.org/en/docs/Web/API/Worker) to Kotlin\n */\npublic external open class Worker(scriptURL: String, options: WorkerOptions = definedExternally) : EventTarget, AbstractWorker {\n var onmessage: ((MessageEvent) -> dynamic)?\n override var onerror: ((Event) -> dynamic)?\n fun terminate()\n fun postMessage(message: Any?, transfer: Array<dynamic> = definedExternally)\n}\n\npublic external interface WorkerOptions {\n var type: WorkerType? /* = WorkerType.CLASSIC */\n get() = definedExternally\n set(value) = definedExternally\n var credentials: RequestCredentials? /* = RequestCredentials.OMIT */\n get() = definedExternally\n set(value) = definedExternally\n}\n\n@Suppress(\"INVISIBLE_REFERENCE\", \"INVISIBLE_MEMBER\")\n@kotlin.internal.InlineOnly\npublic inline fun WorkerOptions(type: WorkerType? = WorkerType.CLASSIC, credentials: RequestCredentials? = RequestCredentials.OMIT): WorkerOptions {\n val o = js(\"({})\")\n o[\"type\"] = type\n o[\"credentials\"] = credentials\n return o\n}\n\n/**\n * Exposes the JavaScript

[SharedWorker](https://developer.mozilla.org/en/docs/Web/API/SharedWorker) to Kotlin\n */\npublic external open class SharedWorker(scriptURL: String, name: String = definedExternally, options: WorkerOptions = definedExternally) : EventTarget, AbstractWorker {\n open val port: MessagePort\n override var onerror: ((Event) -> dynamic)?\n}\n\n/**\n * Exposes the JavaScript

[NavigatorConcurrentHardware](https://developer.mozilla.org/en/docs/Web/API/NavigatorConcurrentHardware) to Kotlin\n */\npublic external interface NavigatorConcurrentHardware {\n val hardwareConcurrency: Number\n}\n\n/**\n * Exposes the JavaScript

[WorkerNavigator](https://developer.mozilla.org/en/docs/Web/API/WorkerNavigator) to Kotlin\n */\npublic external abstract class WorkerNavigator : NavigatorID, NavigatorLanguage, NavigatorOnLine, NavigatorConcurrentHardware {\n open val serviceWorker: ServiceWorkerContainer\n}\n\n/**\n * Exposes the JavaScript

[WorkerLocation](https://developer.mozilla.org/en/docs/Web/API/WorkerLocation) to Kotlin\n */\npublic external abstract class WorkerLocation {\n open val href: String\n open val origin: String\n open val protocol: String\n open val host: String\n open val hostname: String\n open val port: String\n open val pathname: String\n open val search: String\n open val hash: String\n}\n\n/**\n * Exposes the JavaScript

[Storage](https://developer.mozilla.org/en/docs/Web/API/Storage) to Kotlin\n */\npublic external abstract class Storage {\n open val length: Int\n fun key(index: Int): String?\n fun removeItem(key: String)\n fun clear()\n fun getItem(key: String): String?\n fun setItem(key: String, value: String)\n}\n\n@Suppress(\"INVISIBLE_REFERENCE\", \"INVISIBLE_MEMBER\")\n@kotlin.internal.InlineOnly\npublic inline operator fun Storage.get(key: String): String? = asDynamic()[key]\n\n@Suppress(\"INVISIBLE_REFERENCE\", \"INVISIBLE_MEMBER\")\n@kotlin.internal.InlineOnly\npublic inline operator fun Storage.set(key: String, value:

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String) { asDynamic()[key] = value }\n\n/**\n * Exposes the JavaScript
[WindowSessionStorage](https://developer.mozilla.org/en/docs/Web/API/WindowSessionStorage) to Kotlin\n
*\npublic external interface WindowSessionStorage {\n  val sessionStorage: Storage\n}\n\n/**\n * Exposes the
JavaScript [WindowLocalStorage](https://developer.mozilla.org/en/docs/Web/API/WindowLocalStorage) to
Kotlin\n*\npublic external interface WindowLocalStorage {\n  val localStorage: Storage\n}\n\n/**\n * Exposes
the JavaScript [StorageEvent](https://developer.mozilla.org/en/docs/Web/API/StorageEvent) to Kotlin\n*\npublic
external open class StorageEvent(type: String, eventInitDict: StorageEventInit = definedExternally) : Event {\n
open val key: String?\n  open val oldValue: String?\n  open val newValue: String?\n  open val url: String\n
open val storageArea: Storage?\n\n  companion object {\n    val NONE: Short\n    val CAPTURING_PHASE:
Short\n    val AT_TARGET: Short\n    val BUBBLING_PHASE: Short\n  }\n}\n\npublic external interface
StorageEventInit : EventInit {\n  var key: String? /* = null */\n    get() = definedExternally\n    set(value) =
definedExternally\n  var oldValue: String? /* = null */\n    get() = definedExternally\n    set(value) =
definedExternally\n  var newValue: String? /* = null */\n    get() = definedExternally\n    set(value) =
definedExternally\n  var url: String? /* = \"\" */\n    get() = definedExternally\n    set(value) =
definedExternally\n  var storageArea: Storage? /* = null */\n    get() = definedExternally\n    set(value) =
definedExternally\n}\n\n@Suppress(\"INVISIBLE_REFERENCE\",
\"INVISIBLE_MEMBER\")\n\n@kotlin.internal.InlineOnly\n\npublic inline fun StorageEventInit(key: String? = null,
oldValue: String? = null, newValue: String? = null, url: String? = \"\", storageArea: Storage? = null, bubbles:
Boolean? = false, cancelable: Boolean? = false, composed: Boolean? = false): StorageEventInit {\n  val o =
js(\"({})\")\n  o[\"key\"] = key\n  o[\"oldValue\"] = oldValue\n  o[\"newValue\"] = newValue\n  o[\"url\"] =
url\n  o[\"storageArea\"] = storageArea\n  o[\"bubbles\"] = bubbles\n  o[\"cancelable\"] = cancelable\n
o[\"composed\"] = composed\n  return o\n}\n\npublic external abstract class HTMLAppletElement :
HTMLInputElement {\n  open var align: String\n  open var alt: String\n  open var archive: String\n  open var code:
String\n  open var codeBase: String\n  open var height: String\n  open var hspace: Int\n  open var name:
String\n  open var _object: String\n  open var vspace: Int\n  open var width: String\n\n  companion object {\n
val ELEMENT_NODE: Short\n    val ATTRIBUTE_NODE: Short\n    val TEXT_NODE: Short\n    val
CDATA_SECTION_NODE: Short\n    val ENTITY_REFERENCE_NODE: Short\n    val ENTITY_NODE:
Short\n    val PROCESSING_INSTRUCTION_NODE: Short\n    val COMMENT_NODE: Short\n    val
DOCUMENT_NODE: Short\n    val DOCUMENT_TYPE_NODE: Short\n    val
DOCUMENT_FRAGMENT_NODE: Short\n    val NOTATION_NODE: Short\n    val
DOCUMENT_POSITION_DISCONNECTED: Short\n    val DOCUMENT_POSITION_PRECEDING: Short\n
val DOCUMENT_POSITION_FOLLOWING: Short\n    val DOCUMENT_POSITION_CONTAINS: Short\n
val DOCUMENT_POSITION_CONTAINED_BY: Short\n    val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n  }\n}\n\n/**\n * Exposes the JavaScript
[HTMLMarqueeElement](https://developer.mozilla.org/en/docs/Web/API/HTMLMarqueeElement) to Kotlin\n
*\npublic external abstract class HTMLMarqueeElement : HTMLInputElement {\n  open var behavior: String\n  open
var bgColor: String\n  open var direction: String\n  open var height: String\n  open var hspace: Int\n  open var
loop: Int\n  open var scrollAmount: Int\n  open var scrollDelay: Int\n  open var trueSpeed: Boolean\n  open var
vspace: Int\n  open var width: String\n  open var onbounce: ((Event) -> dynamic)?\n  open var onfinish: ((Event)
-> dynamic)?\n  open var onstart: ((Event) -> dynamic)?\n  fun start()\n  fun stop()\n\n  companion object {\n
val ELEMENT_NODE: Short\n    val ATTRIBUTE_NODE: Short\n    val TEXT_NODE: Short\n    val
CDATA_SECTION_NODE: Short\n    val ENTITY_REFERENCE_NODE: Short\n    val ENTITY_NODE:
Short\n    val PROCESSING_INSTRUCTION_NODE: Short\n    val COMMENT_NODE: Short\n    val
DOCUMENT_NODE: Short\n    val DOCUMENT_TYPE_NODE: Short\n    val
DOCUMENT_FRAGMENT_NODE: Short\n    val NOTATION_NODE: Short\n    val
DOCUMENT_POSITION_DISCONNECTED: Short\n    val DOCUMENT_POSITION_PRECEDING: Short\n
val DOCUMENT_POSITION_FOLLOWING: Short\n    val DOCUMENT_POSITION_CONTAINS: Short\n
val DOCUMENT_POSITION_CONTAINED_BY: Short\n    val

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{\n fun AddSearchProvider()\n fun IsSearchProviderInstalled()\n}\n\npublic external interface EventInit {\n
var bubbles: Boolean? /* = false */\n    get() = definedExternally\n    set(value) = definedExternally\n var
cancelable: Boolean? /* = false */\n    get() = definedExternally\n    set(value) = definedExternally\n var
composed: Boolean? /* = false */\n    get() = definedExternally\n    set(value) =
definedExternally\n}\n\n@Suppress(\"INVISIBLE_REFERENCE\",
\"INVISIBLE_MEMBER\")\n@kotlin.internal.InlineOnly\npublic inline fun EventInit(bubbles: Boolean? = false,
cancelable: Boolean? = false, composed: Boolean? = false): EventInit {\n val o = js(\"({})\")\n o[\"bubbles\"] =
bubbles\n o[\"cancelable\"] = cancelable\n o[\"composed\"] = composed\n return o\n}\n\n/**\n * Exposes the
JavaScript [CustomEvent](https://developer.mozilla.org/en/docs/Web/API/CustomEvent) to Kotlin\n */\n\npublic
external open class CustomEvent(type: String, eventInitDict: CustomEventInit = definedExternally) : Event {\n
open val detail: Any?\n fun initCustomEvent(type: String, bubbles: Boolean, cancelable: Boolean, detail:
Any?)\n\n companion object {\n val NONE: Short\n val CAPTURING_PHASE: Short\n val
AT_TARGET: Short\n val BUBBLING_PHASE: Short\n }\n}\n\npublic external interface CustomEventInit :
EventInit {\n var detail: Any? /* = null */\n    get() = definedExternally\n    set(value) =
definedExternally\n}\n\n@Suppress(\"INVISIBLE_REFERENCE\",
\"INVISIBLE_MEMBER\")\n@kotlin.internal.InlineOnly\npublic inline fun CustomEventInit(detail: Any? = null,
bubbles: Boolean? = false, cancelable: Boolean? = false, composed: Boolean? = false): CustomEventInit {\n val o
= js(\"({})\")\n o[\"detail\"] = detail\n o[\"bubbles\"] = bubbles\n o[\"cancelable\"] = cancelable\n
o[\"composed\"] = composed\n return o\n}\n\npublic external interface EventListenerOptions {\n var capture:
Boolean? /* = false */\n    get() = definedExternally\n    set(value) =
definedExternally\n}\n\n@Suppress(\"INVISIBLE_REFERENCE\",
\"INVISIBLE_MEMBER\")\n@kotlin.internal.InlineOnly\npublic inline fun EventListenerOptions(capture:
Boolean? = false): EventListenerOptions {\n val o = js(\"({})\")\n o[\"capture\"] = capture\n return
o\n}\n\npublic external interface AddEventListenerOptions : EventListenerOptions {\n var passive: Boolean? /* =
false */\n    get() = definedExternally\n    set(value) = definedExternally\n var once: Boolean? /* = false */\n
get() = definedExternally\n    set(value) = definedExternally\n}\n\n@Suppress(\"INVISIBLE_REFERENCE\",
\"INVISIBLE_MEMBER\")\n@kotlin.internal.InlineOnly\npublic inline fun AddEventListenerOptions(passive:
Boolean? = false, once: Boolean? = false, capture: Boolean? = false): AddEventListenerOptions {\n val o =
js(\"({})\")\n o[\"passive\"] = passive\n o[\"once\"] = once\n o[\"capture\"] = capture\n return o\n}\n\npublic
external interface NonElementParentNode {\n fun getElementById(elementId: String): Element?\n}\n\n/**\n *
Exposes the JavaScript
[DocumentOrShadowRoot](https://developer.mozilla.org/en/docs/Web/API/DocumentOrShadowRoot) to Kotlin\n */\n\npublic
external interface DocumentOrShadowRoot {\n val fullscreenElement: Element?\n    get() =
definedExternally\n}\n\n/**\n * Exposes the JavaScript
[ParentNode](https://developer.mozilla.org/en/docs/Web/API/ParentNode) to Kotlin\n */\n\npublic external interface
ParentNode {\n val children: HTMLCollection\n val firstElementChild: Element?\n    get() =
definedExternally\n val lastElementChild: Element?\n    get() = definedExternally\n val childElementCount:
Int\n fun prepend(vararg nodes: dynamic)\n fun append(vararg nodes: dynamic)\n fun querySelector(selectors:
String): Element?\n fun querySelectorAll(selectors: String): NodeList\n}\n\n/**\n * Exposes the JavaScript
[NonDocumentTypeChildNode](https://developer.mozilla.org/en/docs/Web/API/NonDocumentTypeChildNode) to
Kotlin\n */\n\npublic external interface NonDocumentTypeChildNode {\n val previousElementSibling: Element?\n
get() = definedExternally\n val nextElementSibling: Element?\n    get() = definedExternally\n}\n\n/**\n *
Exposes the JavaScript [ChildNode](https://developer.mozilla.org/en/docs/Web/API/ChildNode) to Kotlin\n */\n\npublic
external interface ChildNode {\n fun before(vararg nodes: dynamic)\n fun after(vararg nodes:
dynamic)\n fun replaceWith(vararg nodes: dynamic)\n fun remove()\n}\n\n/**\n * Exposes the JavaScript
[Slotable](https://developer.mozilla.org/en/docs/Web/API/Slotable) to Kotlin\n */\n\npublic external interface Slotable
{\n val assignedSlot: HTMLSlotElement?\n    get() = definedExternally\n}\n\n/**\n * Exposes the JavaScript
[NodeList](https://developer.mozilla.org/en/docs/Web/API/NodeList) to Kotlin\n */\n\npublic external abstract class

```



```

NodeList : ItemArrayLike<Node> {
    override fun item(index: Int):
Node?
}
@Suppress("INVISIBLE_REFERENCE",
"INVISIBLE_MEMBER")
@kotlin.internal.InlineOnly
public inline operator fun NodeList.get(index: Int):
Node? = asDynamic()[index]
/**
 * Exposes the JavaScript
[HTMLCollection](https://developer.mozilla.org/en/docs/Web/API/HTMLCollection) to Kotlin
*/
public
external abstract class HTMLCollection : ItemArrayLike<Element>, UnionElementOrHTMLCollection {
    override fun item(index: Int): Element?
    fun namedItem(name: String):
Element?
}
@Suppress("INVISIBLE_REFERENCE",
"INVISIBLE_MEMBER")
@kotlin.internal.InlineOnly
public inline operator fun HTMLCollection.get(index:
Int): Element? = asDynamic()[index]
@Suppress("INVISIBLE_REFERENCE",
"INVISIBLE_MEMBER")
@kotlin.internal.InlineOnly
public inline operator fun HTMLCollection.get(name:
String): Element? = asDynamic()[name]
/**
 * Exposes the JavaScript
[MutationObserver](https://developer.mozilla.org/en/docs/Web/API/MutationObserver) to Kotlin
*/
public
external open class MutationObserver(callback: (Array<MutationRecord>, MutationObserver) -> Unit) {
    fun
observe(target: Node, options: MutationObserverInit = definedExternally)
    fun disconnect()
    fun
takeRecords(): Array<MutationRecord>
}
/**
 * Exposes the JavaScript
[MutationObserverInit](https://developer.mozilla.org/en/docs/Web/API/MutationObserverInit) to Kotlin
*/
public
external interface MutationObserverInit {
    var childList: Boolean? /* = false */
    get() =
definedExternally
    set(value) = definedExternally
    var attributes: Boolean?
    get() =
definedExternally
    set(value) = definedExternally
    var characterData: Boolean?
    get() =
definedExternally
    set(value) = definedExternally
    var subtree: Boolean? /* = false */
    get() =
definedExternally
    set(value) = definedExternally
    var attributeOldValue: Boolean?
    get() =
definedExternally
    set(value) = definedExternally
    var characterDataOldValue: Boolean?
    get() =
definedExternally
    set(value) = definedExternally
    var attributeFilter: Array<String>?
    get() =
definedExternally
    set(value) = definedExternally
}
@Suppress("INVISIBLE_REFERENCE",
"INVISIBLE_MEMBER")
@kotlin.internal.InlineOnly
public inline fun MutationObserverInit(childList:
Boolean? = false, attributes: Boolean? = undefined, characterData: Boolean? = undefined, subtree: Boolean? = false,
attributeOldValue: Boolean? = undefined, characterDataOldValue: Boolean? = undefined, attributeFilter:
Array<String>? = undefined): MutationObserverInit {
    val o = js("{}")
    o["childList"] = childList
    o["attributes"] = attributes
    o["characterData"] = characterData
    o["subtree"] = subtree
    o["attributeOldValue"] = attributeOldValue
    o["characterDataOldValue"] = characterDataOldValue
    o["attributeFilter"] = attributeFilter
    return o
}
/**
 * Exposes the JavaScript
[MutationRecord](https://developer.mozilla.org/en/docs/Web/API/MutationRecord) to Kotlin
*/
public
external
abstract class MutationRecord {
    open val type: String
    open val target: Node
    open val addedNodes:
NodeList
    open val removedNodes: NodeList
    open val previousSibling: Node?
    open val nextSibling:
Node?
    open val attributeName: String?
    open val attributeNamespace: String?
    open val oldValue:
String?
}
/**
 * Exposes the JavaScript
[Node](https://developer.mozilla.org/en/docs/Web/API/Node) to
Kotlin
*/
public
external abstract class Node : EventTarget {
    open val nodeType: Short
    open val
nodeName: String
    open val baseURI: String
    open val isConnected: Boolean
    open val ownerDocument:
Document?
    open val parentNode: Node?
    open val parentElement: Element?
    open val childNodes:
NodeList
    open val firstChild: Node?
    open val lastChild: Node?
    open val previousSibling: Node?
    open val nextSibling: Node?
    open var nodeValue: String?
    open var textContent: String?
    fun
getRootNode(options: GetRootNodeOptions = definedExternally): Node
    fun hasChildNodes(): Boolean
    fun
normalize()
    fun cloneNode(deep: Boolean = definedExternally): Node
    fun isEqualNode(otherNode: Node?):
Boolean
    fun isSameNode(otherNode: Node?): Boolean
    fun compareDocumentPosition(other: Node): Short
    fun
contains(other: Node?): Boolean
    fun lookupPrefix(namespace: String?): String?
    fun
lookupNamespaceURI(prefix: String?): String?
    fun isDefaultNamespace(namespace: String?): Boolean
    fun
insertBefore(node: Node, child: Node?): Node
    fun appendChild(node: Node): Node
    fun replaceChild(node:

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Node, child: Node): Node\n fun removeChild(child: Node): Node\n\n companion object {\n val
ELEMENT_NODE: Short\n val ATTRIBUTE_NODE: Short\n val TEXT_NODE: Short\n val
CDATA_SECTION_NODE: Short\n val ENTITY_REFERENCE_NODE: Short\n val ENTITY_NODE:
Short\n val PROCESSING_INSTRUCTION_NODE: Short\n val COMMENT_NODE: Short\n val
DOCUMENT_NODE: Short\n val DOCUMENT_TYPE_NODE: Short\n val
DOCUMENT_FRAGMENT_NODE: Short\n val NOTATION_NODE: Short\n val
DOCUMENT_POSITION_DISCONNECTED: Short\n val DOCUMENT_POSITION_PRECEDING: Short\n
val DOCUMENT_POSITION_FOLLOWING: Short\n val DOCUMENT_POSITION_CONTAINS: Short\n
val DOCUMENT_POSITION_CONTAINED_BY: Short\n val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n }\n\npublic external interface
GetRootNodeOptions {\n var composed: Boolean? /* = false */\n get() = definedExternally\n set(value) =
definedExternally\n}\n\n@Suppress(\"INVISIBLE_REFERENCE\",
\"INVISIBLE_MEMBER\")\n@kotlin.internal.InlineOnly\npublic inline fun GetRootNodeOptions(composed:
Boolean? = false): GetRootNodeOptions {\n val o = js(\"({})\")\n o[\"composed\"] = composed\n return
o\n}\n\n/**\n * Exposes the JavaScript [Document](https://developer.mozilla.org/en/docs/Web/API/Document) to
Kotlin\n */\npublic external open class Document : Node, GlobalEventHandlers,
DocumentAndElementEventHandlers, NonElementParentNode, DocumentOrShadowRoot, ParentNode,
GeometryUtils {\n open val implementation: DOMImplementation\n open val URL: String\n open val
documentURI: String\n open val origin: String\n open val compatMode: String\n open val characterSet:
String\n open val charset: String\n open val inputEncoding: String\n open val contentType: String\n open val
doctype: DocumentType?\n open val documentElement: Element?\n open val location: Location?\n var
domain: String\n open val referrer: String\n var cookie: String\n open val lastModified: String\n open val
readyState: DocumentReadyState\n var title: String\n var dir: String\n var body: HTMLElement?\n open val
head: HTMLHeadElement?\n open val images: HTMLCollection\n open val embeds: HTMLCollection\n open
val plugins: HTMLCollection\n open val links: HTMLCollection\n open val forms: HTMLCollection\n open
val scripts: HTMLCollection\n open val currentScript: HTMLScriptElement?\n open val defaultView:
Window?\n open val activeElement: Element?\n var designMode: String\n var onreadystatechange: ((Event) ->
dynamic)?\n var fgColor: String\n var linkColor: String\n var vlinkColor: String\n var alinkColor: String\n
var bgColor: String\n open val anchors: HTMLCollection\n open val applets: HTMLCollection\n open val all:
HTMLAllCollection\n open val scrollingElement: Element?\n open val styleSheets: StyleSheetList\n open val
rootElement: SVGElement?\n open val fullscreenEnabled: Boolean\n open val fullscreen: Boolean\n var
onfullscreenchange: ((Event) -> dynamic)?\n var onfullscreenerror: ((Event) -> dynamic)?\n override var
onabort: ((Event) -> dynamic)?\n override var onblur: ((FocusEvent) -> dynamic)?\n override var oncancel:
((Event) -> dynamic)?\n override var oncanplay: ((Event) -> dynamic)?\n override var oncanplaythrough:
((Event) -> dynamic)?\n override var onchange: ((Event) -> dynamic)?\n override var onclick: ((MouseEvent) ->
dynamic)?\n override var onclose: ((Event) -> dynamic)?\n override var oncontextmenu: ((MouseEvent) ->
dynamic)?\n override var oncuechange: ((Event) -> dynamic)?\n override var ondblclick: ((MouseEvent) ->
dynamic)?\n override var ondrag: ((DragEvent) -> dynamic)?\n override var ondragend: ((DragEvent) ->
dynamic)?\n override var ondragenter: ((DragEvent) -> dynamic)?\n override var ondragexit: ((DragEvent) ->
dynamic)?\n override var ondragleave: ((DragEvent) -> dynamic)?\n override var ondragover: ((DragEvent) ->
dynamic)?\n override var ondragstart: ((DragEvent) -> dynamic)?\n override var ondrop: ((DragEvent) ->
dynamic)?\n override var ondurationchange: ((Event) -> dynamic)?\n override var onemptied: ((Event) ->
dynamic)?\n override var onended: ((Event) -> dynamic)?\n override var onerror: ((dynamic, String, Int, Int,
Any?) -> dynamic)?\n override var onfocus: ((FocusEvent) -> dynamic)?\n override var oninput: ((InputEvent) ->
dynamic)?\n override var oninvalid: ((Event) -> dynamic)?\n override var onkeydown: ((KeyboardEvent) ->
dynamic)?\n override var onkeypress: ((KeyboardEvent) -> dynamic)?\n override var onkeyup:
((KeyboardEvent) -> dynamic)?\n override var onload: ((Event) -> dynamic)?\n override var onloadeddata:
((Event) -> dynamic)?\n override var onloadedmetadata: ((Event) -> dynamic)?\n override var onloadend:

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((Event) -> dynamic)?\n  override var onloadstart: ((ProgressEvent) -> dynamic)?\n  override var onmousedown:
((MouseEvent) -> dynamic)?\n  override var onmouseenter: ((MouseEvent) -> dynamic)?\n  override var
onmouseleave: ((MouseEvent) -> dynamic)?\n  override var onmousemove: ((MouseEvent) -> dynamic)?\n
override var onmouseout: ((MouseEvent) -> dynamic)?\n  override var onmouseover: ((MouseEvent) ->
dynamic)?\n  override var onmouseup: ((MouseEvent) -> dynamic)?\n  override var onwheel: ((WheelEvent) ->
dynamic)?\n  override var onpause: ((Event) -> dynamic)?\n  override var onplay: ((Event) -> dynamic)?\n
override var onplaying: ((Event) -> dynamic)?\n  override var onprogress: ((ProgressEvent) -> dynamic)?\n
override var onratechange: ((Event) -> dynamic)?\n  override var onreset: ((Event) -> dynamic)?\n  override var
onresize: ((Event) -> dynamic)?\n  override var onscroll: ((Event) -> dynamic)?\n  override var onseeked:
((Event) -> dynamic)?\n  override var onseeking: ((Event) -> dynamic)?\n  override var onselect: ((Event) ->
dynamic)?\n  override var onshow: ((Event) -> dynamic)?\n  override var onstalled: ((Event) -> dynamic)?\n
override var onsubmit: ((Event) -> dynamic)?\n  override var onsuspend: ((Event) -> dynamic)?\n  override var
ontimeupdate: ((Event) -> dynamic)?\n  override var ontoggle: ((Event) -> dynamic)?\n  override var
onvolumechange: ((Event) -> dynamic)?\n  override var onwaiting: ((Event) -> dynamic)?\n  override var
ongotpointercapture: ((PointerEvent) -> dynamic)?\n  override var onlostpointercapture: ((PointerEvent) ->
dynamic)?\n  override var onpointerdown: ((PointerEvent) -> dynamic)?\n  override var onpointermove:
((PointerEvent) -> dynamic)?\n  override var onpointerup: ((PointerEvent) -> dynamic)?\n  override var
onpointercancel: ((PointerEvent) -> dynamic)?\n  override var onpointerover: ((PointerEvent) -> dynamic)?\n
override var onpointerout: ((PointerEvent) -> dynamic)?\n  override var onpointerenter: ((PointerEvent) ->
dynamic)?\n  override var onpointerleave: ((PointerEvent) -> dynamic)?\n  override var oncopy:
((ClipboardEvent) -> dynamic)?\n  override var oncut: ((ClipboardEvent) -> dynamic)?\n  override var onpaste:
((ClipboardEvent) -> dynamic)?\n  override val fullscreenElement: Element?\n  override val children:
HTMLCollection\n  override val firstElementChild: Element?\n  override val lastElementChild: Element?\n
override val childElementCount: Int\n  fun getElementsByTagName(qualifiedName: String): HTMLCollection\n
fun getElementsByTagNameNS(namespace: String?, localName: String): HTMLCollection\n  fun
getElementsByTagName(className: String): HTMLCollection\n  fun createElement(localName: String,
options: ElementCreationOptions = definedExternally): Element\n  fun createElementNS(namespace: String?,
qualifiedName: String, options: ElementCreationOptions = definedExternally): Element\n  fun
createDocumentFragment(): DocumentFragment\n  fun createTextNode(data: String): Text\n  fun
createCDATASection(data: String): CDATASection\n  fun createComment(data: String): Comment\n  fun
createProcessingInstruction(target: String, data: String): ProcessingInstruction\n  fun importNode(node: Node,
deep: Boolean = definedExternally): Node\n  fun adoptNode(node: Node): Node\n  fun
createAttribute(localName: String): Attr\n  fun createAttributeNS(namespace: String?, qualifiedName: String):
Attr\n  fun createEvent(`interface`: String): Event\n  fun createRange(): Range\n  fun createNodeIterator(root:
Node, whatToShow: Int = definedExternally, filter: NodeFilter? = definedExternally): NodeIterator\n  fun
createNodeIterator(root: Node, whatToShow: Int = definedExternally, filter: ((Node) -> Short)? =
definedExternally): NodeIterator\n  fun createTreeWalker(root: Node, whatToShow: Int = definedExternally, filter:
NodeFilter? = definedExternally): TreeWalker\n  fun createTreeWalker(root: Node, whatToShow: Int =
definedExternally, filter: ((Node) -> Short)? = definedExternally): TreeWalker\n  fun
getElementsByTagName(elementName: String): NodeList\n  fun open(type: String = definedExternally, replace:
String = definedExternally): Document\n  fun open(url: String, name: String, features: String): Window\n  fun
close()\n  fun write(vararg text: String)\n  fun writeln(vararg text: String)\n  fun hasFocus(): Boolean\n  fun
execCommand(commandId: String, showUI: Boolean = definedExternally, value: String = definedExternally):
Boolean\n  fun queryCommandEnabled(commandId: String): Boolean\n  fun
queryCommandIndeterm(commandId: String): Boolean\n  fun queryCommandState(commandId: String):
Boolean\n  fun queryCommandSupported(commandId: String): Boolean\n  fun
queryCommandValue(commandId: String): String\n  fun clear()\n  fun captureEvents()\n  fun releaseEvents()\n
fun elementFromPoint(x: Double, y: Double): Element?\n  fun elementsFromPoint(x: Double, y: Double):

```

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Array<Element>\n fun caretPositionFromPoint(x: Double, y: Double): CaretPosition?\n fun createTouch(view:
Window, target: EventTarget, identifier: Int, pageX: Int, pageY: Int, screenX: Int, screenY: Int): Touch\n fun
createTouchList(vararg touches: Touch): TouchList\n fun exitFullscreen(): Promise<Unit>\n override fun
getElementById(elementId: String): Element?\n override fun prepend(vararg nodes: dynamic)\n override fun
append(vararg nodes: dynamic)\n override fun querySelector(selectors: String): Element?\n override fun
querySelectorAll(selectors: String): NodeList\n override fun getBoxQuads(options: BoxQuadOptions /* =
definedExternally */): Array<DOMQuad>\n override fun convertQuadFromNode(quad: dynamic, from: dynamic,
options: ConvertCoordinateOptions /* = definedExternally */): DOMQuad\n override fun
convertRectFromNode(rect: DOMRectReadOnly, from: dynamic, options: ConvertCoordinateOptions /* =
definedExternally */): DOMQuad\n override fun convertPointFromNode(point: DOMPointInit, from: dynamic,
options: ConvertCoordinateOptions /* = definedExternally */): DOMPoint\n\n companion object {\n val
ELEMENT_NODE: Short\n val ATTRIBUTE_NODE: Short\n val TEXT_NODE: Short\n val
CDATA_SECTION_NODE: Short\n val ENTITY_REFERENCE_NODE: Short\n val ENTITY_NODE:
Short\n val PROCESSING_INSTRUCTION_NODE: Short\n val COMMENT_NODE: Short\n val
DOCUMENT_NODE: Short\n val DOCUMENT_TYPE_NODE: Short\n val
DOCUMENT_FRAGMENT_NODE: Short\n val NOTATION_NODE: Short\n val
DOCUMENT_POSITION_DISCONNECTED: Short\n val DOCUMENT_POSITION_PRECEDING: Short\n
val DOCUMENT_POSITION_FOLLOWING: Short\n val DOCUMENT_POSITION_CONTAINS: Short\n
val DOCUMENT_POSITION_CONTAINED_BY: Short\n val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n
}\n}\n\n@Suppress(\"INVISIBLE_REFERENCE\",
\"INVISIBLE_MEMBER\")\n@kotlin.internal.InlineOnly\npublic inline operator fun Document.get(name: String):
dynamic = asDynamic()[name]\n\n/**\n * Exposes the JavaScript
[XMLDocument](https://developer.mozilla.org/en/docs/Web/API/XMLDocument) to Kotlin\n */\npublic external
open class XMLDocument : Document {\n companion object {\n val ELEMENT_NODE: Short\n val
ATTRIBUTE_NODE: Short\n val TEXT_NODE: Short\n val CDATA_SECTION_NODE: Short\n val
ENTITY_REFERENCE_NODE: Short\n val ENTITY_NODE: Short\n val
PROCESSING_INSTRUCTION_NODE: Short\n val COMMENT_NODE: Short\n val
DOCUMENT_NODE: Short\n val DOCUMENT_TYPE_NODE: Short\n val
DOCUMENT_FRAGMENT_NODE: Short\n val NOTATION_NODE: Short\n val
DOCUMENT_POSITION_DISCONNECTED: Short\n val DOCUMENT_POSITION_PRECEDING: Short\n
val DOCUMENT_POSITION_FOLLOWING: Short\n val DOCUMENT_POSITION_CONTAINS: Short\n
val DOCUMENT_POSITION_CONTAINED_BY: Short\n val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n }\n}\n\npublic external interface
ElementCreationOptions {\n var `is`: String?\n get() = definedExternally\n set(value) =
definedExternally\n}\n\n@Suppress(\"INVISIBLE_REFERENCE\",
\"INVISIBLE_MEMBER\")\n@kotlin.internal.InlineOnly\npublic inline fun ElementCreationOptions(`is`: String?
= undefined): ElementCreationOptions {\n val o = js(\"({})\")\n o[\"is\"] = `is`\n return o\n}\n\n/**\n *
Exposes the JavaScript
[DOMImplementation](https://developer.mozilla.org/en/docs/Web/API/DOMImplementation) to Kotlin\n */\n
public external abstract class DOMImplementation {\n fun createDocumentType(qualifiedName: String,
publicId: String, systemId: String): DocumentType\n fun createDocument(namespace: String?, qualifiedName:
String, doctype: DocumentType? = definedExternally): XMLDocument\n fun createHTMLDocument(title: String
= definedExternally): Document\n fun hasFeature(): Boolean\n}\n\n/**\n * Exposes the JavaScript
[DocumentType](https://developer.mozilla.org/en/docs/Web/API/DocumentType) to Kotlin\n */\npublic external
abstract class DocumentType : Node, ChildNode {\n open val name: String\n open val publicId: String\n open
val systemId: String\n\n companion object {\n val ELEMENT_NODE: Short\n val ATTRIBUTE_NODE:
Short\n val TEXT_NODE: Short\n val CDATA_SECTION_NODE: Short\n val

```

```

ENTITY_REFERENCE_NODE: Short\n    val ENTITY_NODE: Short\n    val
PROCESSING_INSTRUCTION_NODE: Short\n    val COMMENT_NODE: Short\n    val
DOCUMENT_NODE: Short\n    val DOCUMENT_TYPE_NODE: Short\n    val
DOCUMENT_FRAGMENT_NODE: Short\n    val NOTATION_NODE: Short\n    val
DOCUMENT_POSITION_DISCONNECTED: Short\n    val DOCUMENT_POSITION_PRECEDING: Short\n
    val DOCUMENT_POSITION_FOLLOWING: Short\n    val DOCUMENT_POSITION_CONTAINS: Short\n
    val DOCUMENT_POSITION_CONTAINED_BY: Short\n    val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n    }n}\n\n/**\n * Exposes the JavaScript
[DocumentFragment](https://developer.mozilla.org/en/docs/Web/API/DocumentFragment) to Kotlin\n *^\npublic
external open class DocumentFragment : Node, NonElementParentNode, ParentNode {\n    override val children:
HTMLCollection\n    override val firstElementChild: Element?\n    override val lastElementChild: Element?\n
    override val childElementCount: Int\n    override fun getElementById(elementId: String): Element?\n    override fun
prepend(vararg nodes: dynamic)\n    override fun append(vararg nodes: dynamic)\n    override fun
querySelector(selectors: String): Element?\n    override fun querySelectorAll(selectors: String): NodeList\n\n
companion object {\n    val ELEMENT_NODE: Short\n    val ATTRIBUTE_NODE: Short\n    val
TEXT_NODE: Short\n    val CDATA_SECTION_NODE: Short\n    val ENTITY_REFERENCE_NODE:
Short\n    val ENTITY_NODE: Short\n    val PROCESSING_INSTRUCTION_NODE: Short\n    val
COMMENT_NODE: Short\n    val DOCUMENT_NODE: Short\n    val DOCUMENT_TYPE_NODE: Short\n
    val DOCUMENT_FRAGMENT_NODE: Short\n    val NOTATION_NODE: Short\n    val
DOCUMENT_POSITION_DISCONNECTED: Short\n    val DOCUMENT_POSITION_PRECEDING: Short\n
    val DOCUMENT_POSITION_FOLLOWING: Short\n    val DOCUMENT_POSITION_CONTAINS: Short\n
    val DOCUMENT_POSITION_CONTAINED_BY: Short\n    val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n    }n}\n\n/**\n * Exposes the JavaScript
[ShadowRoot](https://developer.mozilla.org/en/docs/Web/API/ShadowRoot) to Kotlin\n *^\npublic external open
class ShadowRoot : DocumentFragment, DocumentOrShadowRoot {\n    open val mode: ShadowRootMode\n
    open val host: Element\n    override val fullscreenElement: Element?\n\n    companion object {\n    val
ELEMENT_NODE: Short\n    val ATTRIBUTE_NODE: Short\n    val TEXT_NODE: Short\n    val
CDATA_SECTION_NODE: Short\n    val ENTITY_REFERENCE_NODE: Short\n    val ENTITY_NODE:
Short\n    val PROCESSING_INSTRUCTION_NODE: Short\n    val COMMENT_NODE: Short\n    val
DOCUMENT_NODE: Short\n    val DOCUMENT_TYPE_NODE: Short\n    val
DOCUMENT_FRAGMENT_NODE: Short\n    val NOTATION_NODE: Short\n    val
DOCUMENT_POSITION_DISCONNECTED: Short\n    val DOCUMENT_POSITION_PRECEDING: Short\n
    val DOCUMENT_POSITION_FOLLOWING: Short\n    val DOCUMENT_POSITION_CONTAINS: Short\n
    val DOCUMENT_POSITION_CONTAINED_BY: Short\n    val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n    }n}\n\n/**\n * Exposes the JavaScript
[Element](https://developer.mozilla.org/en/docs/Web/API/Element) to Kotlin\n *^\npublic external abstract class
Element : Node, ParentNode, NonDocumentTypeChildNode, ChildNode, Slotable, GeometryUtils,
UnionElementOrHTMLCollection, UnionElementOrRadioNodeList, UnionElementOrMouseEvent,
UnionElementOrProcessingInstruction {\n    open val namespaceURI: String?\n    open val prefix: String?\n    open
val localName: String\n    open val tagName: String\n    open var id: String\n    open var className: String\n    open
val classList: DOMTokenList\n    open var slot: String\n    open val attributes: NamedNodeMap\n    open val
shadowRoot: ShadowRoot?\n    open var scrollTop: Double\n    open var scrollLeft: Double\n    open val
scrollWidth: Int\n    open val scrollHeight: Int\n    open val clientTop: Int\n    open val clientLeft: Int\n    open val
clientWidth: Int\n    open val clientHeight: Int\n    open var innerHTML: String\n    open var outerHTML: String\n
    fun hasAttributes(): Boolean\n    fun getAttributeNames(): Array<String>\n    fun getAttribute(qualifiedName:
String): String?\n    fun getAttributeNS(namespace: String?, localName: String): String?\n    fun
setAttribute(qualifiedName: String, value: String)\n    fun setAttributeNS(namespace: String?, qualifiedName:
String, value: String)\n    fun removeAttribute(qualifiedName: String)\n    fun removeAttributeNS(namespace:

```

```

String?, localName: String)\n fun hasAttribute(qualifiedName: String): Boolean\n fun
hasAttributeNS(namespace: String?, localName: String): Boolean\n fun getAttributeNode(qualifiedName: String):
Attr?\n fun getAttributeNodeNS(namespace: String?, localName: String): Attr?\n fun setAttributeNode(attr:
Attr): Attr?\n fun setAttributeNodeNS(attr: Attr): Attr?\n fun removeAttributeNode(attr: Attr): Attr\n fun
attachShadow(init: ShadowRootInit): ShadowRoot\n fun closest(selectors: String): Element?\n fun
matches(selectors: String): Boolean\n fun webkitMatchesSelector(selectors: String): Boolean\n fun
getElementsByTagName(qualifiedName: String): HTMLCollection\n fun
getElementsByTagNameNS(namespace: String?, localName: String): HTMLCollection\n fun
getElementsByClassName(classNames: String): HTMLCollection\n fun insertAdjacentElement(where: String,
element: Element): Element?\n fun insertAdjacentText(where: String, data: String)\n fun getClientRects():
Array<DOMRect>\n fun getBoundingClientRect(): DOMRect\n fun scrollIntoView()\n fun
scrollIntoView(arg: dynamic)\n fun scroll(options: ScrollToOptions = definedExternally)\n fun scroll(x: Double,
y: Double)\n fun scrollTo(options: ScrollToOptions = definedExternally)\n fun scrollTo(x: Double, y: Double)\n
fun scrollBy(options: ScrollToOptions = definedExternally)\n fun scrollBy(x: Double, y: Double)\n fun
insertAdjacentHTML(position: String, text: String)\n fun setPointerCapture(pointerId: Int)\n fun
releasePointerCapture(pointerId: Int)\n fun hasPointerCapture(pointerId: Int): Boolean\n fun requestFullscreen():
Promise<Unit>\n\n companion object {\n    val ELEMENT_NODE: Short\n    val ATTRIBUTE_NODE:
Short\n    val TEXT_NODE: Short\n    val CDATA_SECTION_NODE: Short\n    val
ENTITY_REFERENCE_NODE: Short\n    val ENTITY_NODE: Short\n    val
PROCESSING_INSTRUCTION_NODE: Short\n    val COMMENT_NODE: Short\n    val
DOCUMENT_NODE: Short\n    val DOCUMENT_TYPE_NODE: Short\n    val
DOCUMENT_FRAGMENT_NODE: Short\n    val NOTATION_NODE: Short\n    val
DOCUMENT_POSITION_DISCONNECTED: Short\n    val DOCUMENT_POSITION_PRECEDING: Short\n
    val DOCUMENT_POSITION_FOLLOWING: Short\n    val DOCUMENT_POSITION_CONTAINS: Short\n
    val DOCUMENT_POSITION_CONTAINED_BY: Short\n    val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n } }\n\npublic external interface
ShadowRootInit {\n    var mode: ShadowRootMode?\n}\n\n@Suppress("INVISIBLE_REFERENCE",
"INVISIBLE_MEMBER")\n@kotlin.internal.InlineOnly\npublic inline fun ShadowRootInit(mode:
ShadowRootMode?): ShadowRootInit {\n    val o = js("{}")\n    o["mode"] = mode\n    return o\n}\n\n/**\n *
Exposes the JavaScript [NamedNodeMap](https://developer.mozilla.org/en/docs/Web/API/NamedNodeMap) to
Kotlin\n */\npublic external abstract class NamedNodeMap : ItemArrayLike<Attr> {\n    fun
getNamedItemNS(namespace: String?, localName: String): Attr?\n    fun setNamedItem(attr: Attr): Attr?\n    fun
setNamedItemNS(attr: Attr): Attr?\n    fun removeNamedItem(qualifiedName: String): Attr\n    fun
removeNamedItemNS(namespace: String?, localName: String): Attr\n    override fun item(index: Int): Attr?\n    fun
getNamedItem(qualifiedName: String): Attr?\n}\n\n@Suppress("INVISIBLE_REFERENCE",
"INVISIBLE_MEMBER")\n@kotlin.internal.InlineOnly\npublic inline operator fun NamedNodeMap.get(index:
Int): Attr? = asDynamic()[index]\n\n@Suppress("INVISIBLE_REFERENCE",
"INVISIBLE_MEMBER")\n@kotlin.internal.InlineOnly\npublic inline operator fun
NamedNodeMap.get(qualifiedName: String): Attr? = asDynamic()[qualifiedName]\n\n/**\n * Exposes the
JavaScript [Attr](https://developer.mozilla.org/en/docs/Web/API/Attr) to Kotlin\n */\npublic external abstract class
Attr : Node {\n    open val namespaceURI: String?\n    open val prefix: String?\n    open val localName: String\n
open val name: String\n    open var value: String\n    open val ownerElement: Element?\n    open val specified:
Boolean\n\n    companion object {\n        val ELEMENT_NODE: Short\n        val ATTRIBUTE_NODE: Short\n
        val TEXT_NODE: Short\n        val CDATA_SECTION_NODE: Short\n        val ENTITY_REFERENCE_NODE:
Short\n        val ENTITY_NODE: Short\n        val PROCESSING_INSTRUCTION_NODE: Short\n        val
COMMENT_NODE: Short\n        val DOCUMENT_NODE: Short\n        val DOCUMENT_TYPE_NODE: Short\n
        val DOCUMENT_FRAGMENT_NODE: Short\n        val NOTATION_NODE: Short\n        val
DOCUMENT_POSITION_DISCONNECTED: Short\n        val DOCUMENT_POSITION_PRECEDING: Short\n

```

```

    val DOCUMENT_POSITION_FOLLOWING: Short\n    val DOCUMENT_POSITION_CONTAINS: Short\n
    val DOCUMENT_POSITION_CONTAINED_BY: Short\n    val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n    }\n}\n\n/**\n * Exposes the JavaScript
[CharacterData](https://developer.mozilla.org/en/docs/Web/API/CharacterData) to Kotlin\n *\npublic external
abstract class CharacterData : Node, NonDocumentTypeChildNode, ChildNode {\n    open var data: String\n    open
val length: Int\n    fun substringData(offset: Int, count: Int): String\n    fun appendData(data: String)\n    fun
insertData(offset: Int, data: String)\n    fun deleteData(offset: Int, count: Int)\n    fun replaceData(offset: Int, count:
Int, data: String)\n\n    companion object {\n        val ELEMENT_NODE: Short\n        val ATTRIBUTE_NODE:
Short\n        val TEXT_NODE: Short\n        val CDATA_SECTION_NODE: Short\n        val
ENTITY_REFERENCE_NODE: Short\n        val ENTITY_NODE: Short\n        val
PROCESSING_INSTRUCTION_NODE: Short\n        val COMMENT_NODE: Short\n        val
DOCUMENT_NODE: Short\n        val DOCUMENT_TYPE_NODE: Short\n        val
DOCUMENT_FRAGMENT_NODE: Short\n        val NOTATION_NODE: Short\n        val
DOCUMENT_POSITION_DISCONNECTED: Short\n        val DOCUMENT_POSITION_PRECEDING: Short\n
        val DOCUMENT_POSITION_FOLLOWING: Short\n        val DOCUMENT_POSITION_CONTAINS: Short\n
        val DOCUMENT_POSITION_CONTAINED_BY: Short\n        val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n    }\n}\n\n/**\n * Exposes the JavaScript
[Text](https://developer.mozilla.org/en/docs/Web/API/Text) to Kotlin\n *\npublic external open class Text(data:
String = definedExternally) : CharacterData, Slotable, GeometryUtils {\n    open val wholeText: String\n    override
val assignedSlot: HTMLSlotElement?\n    override val previousElementSibling: Element?\n    override val
nextElementSibling: Element?\n    fun splitText(offset: Int): Text\n    override fun getBoxQuads(options:
BoxQuadOptions /* = definedExternally */): Array<DOMQuad>\n    override fun convertQuadFromNode(quad:
dynamic, from: dynamic, options: ConvertCoordinateOptions /* = definedExternally */): DOMQuad\n    override
fun convertRectFromNode(rect: DOMRectReadOnly, from: dynamic, options: ConvertCoordinateOptions /* =
definedExternally */): DOMQuad\n    override fun convertPointFromNode(point: DOMPointInit, from: dynamic,
options: ConvertCoordinateOptions /* = definedExternally */): DOMPoint\n    override fun before(vararg nodes:
dynamic)\n    override fun after(vararg nodes: dynamic)\n    override fun replaceWith(vararg nodes: dynamic)\n
    override fun remove()\n\n    companion object {\n        val ELEMENT_NODE: Short\n        val
ATTRIBUTE_NODE: Short\n        val TEXT_NODE: Short\n        val CDATA_SECTION_NODE: Short\n        val
ENTITY_REFERENCE_NODE: Short\n        val ENTITY_NODE: Short\n        val
PROCESSING_INSTRUCTION_NODE: Short\n        val COMMENT_NODE: Short\n        val
DOCUMENT_NODE: Short\n        val DOCUMENT_TYPE_NODE: Short\n        val
DOCUMENT_FRAGMENT_NODE: Short\n        val NOTATION_NODE: Short\n        val
DOCUMENT_POSITION_DISCONNECTED: Short\n        val DOCUMENT_POSITION_PRECEDING: Short\n
        val DOCUMENT_POSITION_FOLLOWING: Short\n        val DOCUMENT_POSITION_CONTAINS: Short\n
        val DOCUMENT_POSITION_CONTAINED_BY: Short\n        val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n    }\n}\n\n/**\n * Exposes the JavaScript
[CDATASection](https://developer.mozilla.org/en/docs/Web/API/CDATASection) to Kotlin\n *\npublic external
open class CDATASection : Text {\n    companion object {\n        val ELEMENT_NODE: Short\n        val
ATTRIBUTE_NODE: Short\n        val TEXT_NODE: Short\n        val CDATA_SECTION_NODE: Short\n        val
ENTITY_REFERENCE_NODE: Short\n        val ENTITY_NODE: Short\n        val
PROCESSING_INSTRUCTION_NODE: Short\n        val COMMENT_NODE: Short\n        val
DOCUMENT_NODE: Short\n        val DOCUMENT_TYPE_NODE: Short\n        val
DOCUMENT_FRAGMENT_NODE: Short\n        val NOTATION_NODE: Short\n        val
DOCUMENT_POSITION_DISCONNECTED: Short\n        val DOCUMENT_POSITION_PRECEDING: Short\n
        val DOCUMENT_POSITION_FOLLOWING: Short\n        val DOCUMENT_POSITION_CONTAINS: Short\n
        val DOCUMENT_POSITION_CONTAINED_BY: Short\n        val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n    }\n}\n}\n\n/**\n * Exposes the JavaScript

```

[ProcessingInstruction](https://developer.mozilla.org/en/docs/Web/API/ProcessingInstruction) to Kotlin\n

```

*public external abstract class ProcessingInstruction : CharacterData, LinkStyle,
UnionElementOrProcessingInstruction {
    open val target: String
    companion object {
        val ELEMENT_NODE: Short
        val ATTRIBUTE_NODE: Short
        val TEXT_NODE: Short
        val CDATA_SECTION_NODE: Short
        val ENTITY_REFERENCE_NODE: Short
        val ENTITY_NODE: Short
        val PROCESSING_INSTRUCTION_NODE: Short
        val COMMENT_NODE: Short
        val DOCUMENT_NODE: Short
        val DOCUMENT_TYPE_NODE: Short
        val DOCUMENT_FRAGMENT_NODE: Short
        val NOTATION_NODE: Short
        val DOCUMENT_POSITION_DISCONNECTED: Short
        val DOCUMENT_POSITION_PRECEDING: Short
        val DOCUMENT_POSITION_FOLLOWING: Short
        val DOCUMENT_POSITION_CONTAINS: Short
        val DOCUMENT_POSITION_CONTAINED_BY: Short
        val DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short
    }
}

```

* Exposes the JavaScript [Comment](https://developer.mozilla.org/en/docs/Web/API/Comment) to Kotlin\n

```

*public external open class Comment(data: String = definedExternally) : CharacterData {
    override val previousElementSibling: Element?
    override val nextElementSibling: Element?
    override fun before(vararg nodes: dynamic)
    override fun after(vararg nodes: dynamic)
    override fun replaceWith(vararg nodes: dynamic)
    override fun remove()
    companion object {
        val ELEMENT_NODE: Short
        val ATTRIBUTE_NODE: Short
        val TEXT_NODE: Short
        val CDATA_SECTION_NODE: Short
        val ENTITY_REFERENCE_NODE: Short
        val ENTITY_NODE: Short
        val PROCESSING_INSTRUCTION_NODE: Short
        val COMMENT_NODE: Short
        val DOCUMENT_NODE: Short
        val DOCUMENT_TYPE_NODE: Short
        val DOCUMENT_FRAGMENT_NODE: Short
        val NOTATION_NODE: Short
        val DOCUMENT_POSITION_DISCONNECTED: Short
        val DOCUMENT_POSITION_PRECEDING: Short
        val DOCUMENT_POSITION_FOLLOWING: Short
        val DOCUMENT_POSITION_CONTAINS: Short
        val DOCUMENT_POSITION_CONTAINED_BY: Short
        val DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short
    }
}

```

* Exposes the JavaScript [Range](https://developer.mozilla.org/en/docs/Web/API/Range) to Kotlin\n

```

*public external open class Range {
    open val startContainer: Node
    open val startOffset: Int
    open val endContainer: Node
    open val endOffset: Int
    open val collapsed: Boolean
    open val commonAncestorContainer: Node
    fun setStart(node: Node, offset: Int)
    fun setEnd(node: Node, offset: Int)
    fun setStartBefore(node: Node)
    fun setStartAfter(node: Node)
    fun setEndBefore(node: Node)
    fun setEndAfter(node: Node)
    fun collapse(toStart: Boolean = definedExternally)
    fun selectNode(node: Node)
    fun selectNodeContents(node: Node)
    fun compareBoundaryPoints(how: Short, sourceRange: Range): Short
    fun deleteContents()
    fun extractContents(): DocumentFragment
    fun cloneContents(): DocumentFragment
    fun insertNode(node: Node)
    fun surroundContents(newParent: Node)
    fun cloneRange(): Range
    fun detach()
    fun isPointInRange(node: Node, offset: Int): Boolean
    fun comparePoint(node: Node, offset: Int): Short
    fun intersectsNode(node: Node): Boolean
    fun getClientRects(): Array<DOMRect>
    fun getBoundingClientRect(): DOMRect
    fun createContextualFragment(fragment: String): DocumentFragment
    companion object {
        val START_TO_START: Short
        val START_TO_END: Short
        val END_TO_END: Short
        val END_TO_START: Short
    }
}

```

* Exposes the JavaScript [NodeIterator](https://developer.mozilla.org/en/docs/Web/API/NodeIterator) to Kotlin\n

```

*public external abstract class NodeIterator {
    open val root: Node
    open val referenceNode: Node
    open val pointerBeforeReferenceNode: Boolean
    open val whatToShow: Int
    open val filter: NodeFilter?
    fun nextNode(): Node?
    fun previousNode(): Node?
    fun detach()
}

```

* Exposes the JavaScript [TreeWalker](https://developer.mozilla.org/en/docs/Web/API/TreeWalker) to Kotlin\n

```

*public external abstract class TreeWalker {
    open val root: Node
    open val whatToShow: Int
    open val filter: NodeFilter?
    open var currentNode: Node
    fun parentNode(): Node?
    fun firstChild(): Node?
    fun lastChild(): Node?
    fun previousSibling(): Node?
    fun nextSibling(): Node?
    fun previousNode(): Node?
    fun nextNode(): Node?
}

```

* Exposes the JavaScript

[NodeFilter](https://developer.mozilla.org/en/docs/Web/API/NodeFilter) to Kotlin\n

```
*\n@Suppress("NESTED_CLASS_IN_EXTERNAL_INTERFACE")\npublic external interface NodeFilter {\n
fun acceptNode(node: Node): Short\n\n companion object {\n    val FILTER_ACCEPT: Short\n    val FILTER_REJECT: Short\n    val FILTER_SKIP: Short\n    val SHOW_ALL: Int\n    val SHOW_ELEMENT: Int\n    val SHOW_ATTRIBUTE: Int\n    val SHOW_TEXT: Int\n    val SHOW_CDATA_SECTION: Int\n    val SHOW_ENTITY_REFERENCE: Int\n    val SHOW_ENTITY: Int\n    val SHOW_PROCESSING_INSTRUCTION: Int\n    val SHOW_COMMENT: Int\n    val SHOW_DOCUMENT: Int\n    val SHOW_DOCUMENT_TYPE: Int\n    val SHOW_DOCUMENT_FRAGMENT: Int\n    val SHOW_NOTATION: Int\n } }\n\n/**\n * Exposes the JavaScript [DOMTokenList](https://developer.mozilla.org/en/docs/Web/API/DOMTokenList) to Kotlin\n */\npublic external abstract class DOMTokenList : ItemArrayLike<String> {\n    open var value: String\n    fun contains(token: String): Boolean\n    fun add(vararg tokens: String)\n    fun remove(vararg tokens: String)\n    fun toggle(token: String, force: Boolean = definedExternally): Boolean\n    fun replace(token: String, newToken: String)\n    fun supports(token: String): Boolean\n    override fun item(index: Int): String?\n }\n\n@Suppress("INVISIBLE_REFERENCE", "INVISIBLE_MEMBER")\n@kotlin.internal.InlineOnly\npublic inline operator fun DOMTokenList.get(index: Int): String? = asDynamic()[index]\n\n/**\n * Exposes the JavaScript [DOMPointReadOnly](https://developer.mozilla.org/en/docs/Web/API/DOMPointReadOnly) to Kotlin\n */\npublic external open class DOMPointReadOnly(x: Double, y: Double, z: Double, w: Double) {\n    open val x: Double\n    open val y: Double\n    open val z: Double\n    open val w: Double\n    fun matrixTransform(matrix: DOMMatrixReadOnly): DOMPoint\n }\n\n/**\n * Exposes the JavaScript [DOMPoint](https://developer.mozilla.org/en/docs/Web/API/DOMPoint) to Kotlin\n */\npublic external open class DOMPoint : DOMPointReadOnly {\n    constructor(point: DOMPointInit)\n    constructor(x: Double = definedExternally, y: Double = definedExternally, z: Double = definedExternally, w: Double = definedExternally)\n    override var x: Double\n    override var y: Double\n    override var z: Double\n    override var w: Double\n }\n\n/**\n * Exposes the JavaScript [DOMPointInit](https://developer.mozilla.org/en/docs/Web/API/DOMPointInit) to Kotlin\n */\npublic external interface DOMPointInit {\n    var x: Double? /* = 0.0 */\n    get() = definedExternally\n    set(value) = definedExternally\n    var y: Double? /* = 0.0 */\n    get() = definedExternally\n    set(value) = definedExternally\n    var z: Double? /* = 0.0 */\n    get() = definedExternally\n    set(value) = definedExternally\n    var w: Double? /* = 1.0 */\n    get() = definedExternally\n    set(value) = definedExternally\n }\n\n@Suppress("INVISIBLE_REFERENCE", "INVISIBLE_MEMBER")\n@kotlin.internal.InlineOnly\npublic inline fun DOMPointInit(x: Double? = 0.0, y: Double? = 0.0, z: Double? = 0.0, w: Double? = 1.0): DOMPointInit {\n    val o = js("{}")\n    o["x"] = x\n    o["y"] = y\n    o["z"] = z\n    o["w"] = w\n    return o\n }\n\n/**\n * Exposes the JavaScript [DOMRect](https://developer.mozilla.org/en/docs/Web/API/DOMRect) to Kotlin\n */\npublic external open class DOMRect(x: Double = definedExternally, y: Double = definedExternally, width: Double = definedExternally, height: Double = definedExternally) : DOMRectReadOnly {\n    override var x: Double\n    override var y: Double\n    override var width: Double\n    override var height: Double\n }\n\n/**\n * Exposes the JavaScript [DOMRectReadOnly](https://developer.mozilla.org/en/docs/Web/API/DOMRectReadOnly) to Kotlin\n */\npublic external open class DOMRectReadOnly(x: Double, y: Double, width: Double, height: Double) {\n    open val x: Double\n    open val y: Double\n    open val width: Double\n    open val height: Double\n    open val top: Double\n    open val right: Double\n    open val bottom: Double\n    open val left: Double\n }\n\npublic external interface DOMRectInit {\n    var x: Double? /* = 0.0 */\n    get() = definedExternally\n    set(value) = definedExternally\n    var y: Double? /* = 0.0 */\n    get() = definedExternally\n    set(value) = definedExternally\n    var width: Double? /* = 0.0 */\n    get() = definedExternally\n    set(value) = definedExternally\n    var height: Double? /* = 0.0 */\n    get() = definedExternally\n    set(value) = definedExternally\n }\n\n@Suppress("INVISIBLE_REFERENCE",
```

```

\@kotlin.internal.InlineOnly\npublic inline fun DOMRectInit(x: Double? = 0.0, y:
Double? = 0.0, width: Double? = 0.0, height: Double? = 0.0): DOMRectInit {\n  val o = js("{}")\n  o["x"] =
x\n  o["y"] = y\n  o["width"] = width\n  o["height"] = height\n  return o\n}\n\npublic external interface
DOMRectList : ItemArrayLike<DOMRect> {\n  override fun item(index: Int):
DOMRect?\n}\n\n@Suppress("INVISIBLE_REFERENCE",
"INVISIBLE_MEMBER")\n@kotlin.internal.InlineOnly\npublic inline operator fun DOMRectList.get(index: Int):
DOMRect? = asDynamic()[index]\n\n/**\n * Exposes the JavaScript
[DOMQuad](https://developer.mozilla.org/en/docs/Web/API/DOMQuad) to Kotlin\n */\npublic external open class
DOMQuad {\n  constructor(p1: DOMPointInit = definedExternally, p2: DOMPointInit = definedExternally, p3:
DOMPointInit = definedExternally, p4: DOMPointInit = definedExternally)\n  constructor(rect: DOMRectInit)\n
open val p1: DOMPoint\n  open val p2: DOMPoint\n  open val p3: DOMPoint\n  open val p4: DOMPoint\n
open val bounds: DOMRectReadOnly\n}\n\n/**\n * Exposes the JavaScript
[DOMMatrixReadOnly](https://developer.mozilla.org/en/docs/Web/API/DOMMatrixReadOnly) to Kotlin\n
*/\npublic external open class DOMMatrixReadOnly(numberSequence: Array<Double>) {\n  open val a: Double\n
open val b: Double\n  open val c: Double\n  open val d: Double\n  open val e: Double\n  open val f: Double\n
open val m11: Double\n  open val m12: Double\n  open val m13: Double\n  open val m14: Double\n  open val
m21: Double\n  open val m22: Double\n  open val m23: Double\n  open val m24: Double\n  open val m31:
Double\n  open val m32: Double\n  open val m33: Double\n  open val m34: Double\n  open val m41: Double\n
open val m42: Double\n  open val m43: Double\n  open val m44: Double\n  open val is2D: Boolean\n  open
val isIdentity: Boolean\n  fun translate(tx: Double, ty: Double, tz: Double = definedExternally): DOMMatrix\n
fun scale(scale: Double, originX: Double = definedExternally, originY: Double = definedExternally): DOMMatrix\n
fun scale3d(scale: Double, originX: Double = definedExternally, originY: Double = definedExternally, originZ:
Double = definedExternally): DOMMatrix\n  fun scaleNonUniform(scaleX: Double, scaleY: Double =
definedExternally, scaleZ: Double = definedExternally, originX: Double = definedExternally, originY: Double =
definedExternally, originZ: Double = definedExternally): DOMMatrix\n  fun rotate(angle: Double, originX:
Double = definedExternally, originY: Double = definedExternally): DOMMatrix\n  fun rotateFromVector(x:
Double, y: Double): DOMMatrix\n  fun rotateAxisAngle(x: Double, y: Double, z: Double, angle: Double):
DOMMatrix\n  fun skewX(sx: Double): DOMMatrix\n  fun skewY(sy: Double): DOMMatrix\n  fun
multiply(other: DOMMatrix): DOMMatrix\n  fun flipX(): DOMMatrix\n  fun flipY(): DOMMatrix\n  fun
inverse(): DOMMatrix\n  fun transformPoint(point: DOMPointInit = definedExternally): DOMPoint\n  fun
toFloat32Array(): Float32Array\n  fun toFloat64Array(): Float64Array\n}\n\n/**\n * Exposes the JavaScript
[DOMMatrix](https://developer.mozilla.org/en/docs/Web/API/DOMMatrix) to Kotlin\n */\npublic external open
class DOMMatrix() : DOMMatrixReadOnly {\n  constructor(transformList: String)\n  constructor(other:
DOMMatrixReadOnly)\n  constructor(array32: Float32Array)\n  constructor(array64: Float64Array)\n
constructor(numberSequence: Array<Double>)\n  override var a: Double\n  override var b: Double\n  override
var c: Double\n  override var d: Double\n  override var e: Double\n  override var f: Double\n  override var m11:
Double\n  override var m12: Double\n  override var m13: Double\n  override var m14: Double\n  override var
m21: Double\n  override var m22: Double\n  override var m23: Double\n  override var m24: Double\n  override
var m31: Double\n  override var m32: Double\n  override var m33: Double\n  override var m34: Double\n
override var m41: Double\n  override var m42: Double\n  override var m43: Double\n  override var m44:
Double\n  fun multiplySelf(other: DOMMatrix): DOMMatrix\n  fun preMultiplySelf(other: DOMMatrix):
DOMMatrix\n  fun translateSelf(tx: Double, ty: Double, tz: Double = definedExternally): DOMMatrix\n  fun
scaleSelf(scale: Double, originX: Double = definedExternally, originY: Double = definedExternally): DOMMatrix\n
fun scale3dSelf(scale: Double, originX: Double = definedExternally, originY: Double = definedExternally,
originZ: Double = definedExternally): DOMMatrix\n  fun scaleNonUniformSelf(scaleX: Double, scaleY: Double =
definedExternally, scaleZ: Double = definedExternally, originX: Double = definedExternally, originY: Double =
definedExternally, originZ: Double = definedExternally): DOMMatrix\n  fun rotateSelf(angle: Double, originX:
Double = definedExternally, originY: Double = definedExternally): DOMMatrix\n  fun rotateFromVectorSelf(x:

```

```

Double, y: Double): DOMMatrix\n fun rotateAxisAngleSelf(x: Double, y: Double, z: Double, angle: Double):
DOMMatrix\n fun skewXSelf(sx: Double): DOMMatrix\n fun skewYSelf(sy: Double): DOMMatrix\n fun
invertSelf(): DOMMatrix\n fun setMatrixValue(transformList: String): DOMMatrix\n\n\npublic external
interface ScrollOptions {\n var behavior: ScrollBehavior? /* = ScrollBehavior.AUTO */\n get() =
definedExternally\n set(value) = definedExternally\n}\n\n@Suppress(\"INVISIBLE_REFERENCE\",
\"INVISIBLE_MEMBER\")\n@kotlin.internal.InlineOnly\npublic inline fun ScrollOptions(behavior:
ScrollBehavior? = ScrollBehavior.AUTO): ScrollOptions {\n val o = js(\"({})\")\n o[\"behavior\"] = behavior\n
return o}\n\n/**\n * Exposes the JavaScript
[ScrollToOptions](https://developer.mozilla.org/en/docs/Web/API/ScrollToOptions) to Kotlin\n */\npublic external
interface ScrollToOptions : ScrollOptions {\n var left: Double?\n get() = definedExternally\n set(value) =
definedExternally\n var top: Double?\n get() = definedExternally\n set(value) =
definedExternally\n}\n\n@Suppress(\"INVISIBLE_REFERENCE\",
\"INVISIBLE_MEMBER\")\n@kotlin.internal.InlineOnly\npublic inline fun ScrollToOptions(left: Double? =
undefined, top: Double? = undefined, behavior: ScrollBehavior? = ScrollBehavior.AUTO): ScrollToOptions {\n
val o = js(\"({})\")\n o[\"left\"] = left\n o[\"top\"] = top\n o[\"behavior\"] = behavior\n return o}\n\n/**\n *
Exposes the JavaScript [MediaQueryList](https://developer.mozilla.org/en/docs/Web/API/MediaQueryList) to
Kotlin\n */\npublic external abstract class MediaQueryList : EventTarget {\n open val media: String\n open val
matches: Boolean\n open var onchange: ((Event) -> dynamic)?\n fun addListener(listener: EventListener?)\n
fun addListener(listener: ((Event) -> Unit)?)\n fun removeListener(listener: EventListener?)\n fun
removeListener(listener: ((Event) -> Unit)?)\n}\n\n/**\n * Exposes the JavaScript
[MediaQueryListEvent](https://developer.mozilla.org/en/docs/Web/API/MediaQueryListEvent) to Kotlin\n
*/\npublic external open class MediaQueryListEvent(type: String, eventInitDict: MediaQueryListEventInit =
definedExternally) : Event {\n open val media: String\n open val matches: Boolean\n\n companion object {\n
val NONE: Short\n val CAPTURING_PHASE: Short\n val AT_TARGET: Short\n val
BUBBLING_PHASE: Short\n }\n}\n\npublic external interface MediaQueryListEventInit : EventInit {\n var
media: String? /* = \"\" */\n get() = definedExternally\n set(value) = definedExternally\n var matches:
Boolean? /* = false */\n get() = definedExternally\n set(value) =
definedExternally\n}\n\n@Suppress(\"INVISIBLE_REFERENCE\",
\"INVISIBLE_MEMBER\")\n@kotlin.internal.InlineOnly\npublic inline fun MediaQueryListEventInit(media:
String? = \"\", matches: Boolean? = false, bubbles: Boolean? = false, cancelable: Boolean? = false, composed:
Boolean? = false): MediaQueryListEventInit {\n val o = js(\"({})\")\n o[\"media\"] = media\n o[\"matches\"] =
matches\n o[\"bubbles\"] = bubbles\n o[\"cancelable\"] = cancelable\n o[\"composed\"] = composed\n return
o}\n\n/**\n * Exposes the JavaScript [Screen](https://developer.mozilla.org/en/docs/Web/API/Screen) to Kotlin\n
*/\npublic external abstract class Screen {\n open val availWidth: Int\n open val availHeight: Int\n open val
width: Int\n open val height: Int\n open val colorDepth: Int\n open val pixelDepth: Int\n}\n\n/**\n * Exposes
the JavaScript [CaretPosition](https://developer.mozilla.org/en/docs/Web/API/CaretPosition) to Kotlin\n */\npublic
external abstract class CaretPosition {\n open val offsetNode: Node\n open val offset: Int\n fun
getClientRect(): DOMRect?\n}\n\npublic external interface ScrollIntoViewOptions : ScrollOptions {\n var block:
ScrollLogicalPosition? /* = ScrollLogicalPosition.CENTER */\n get() = definedExternally\n set(value) =
definedExternally\n var inline: ScrollLogicalPosition? /* = ScrollLogicalPosition.CENTER */\n get() =
definedExternally\n set(value) = definedExternally\n}\n\n@Suppress(\"INVISIBLE_REFERENCE\",
\"INVISIBLE_MEMBER\")\n@kotlin.internal.InlineOnly\npublic inline fun ScrollIntoViewOptions(block:
ScrollLogicalPosition? = ScrollLogicalPosition.CENTER, inline: ScrollLogicalPosition? =
ScrollLogicalPosition.CENTER, behavior: ScrollBehavior? = ScrollBehavior.AUTO): ScrollIntoViewOptions {\n
val o = js(\"({})\")\n o[\"block\"] = block\n o[\"inline\"] = inline\n o[\"behavior\"] = behavior\n return
o}\n\n\npublic external interface BoxQuadOptions {\n var box: CSSBoxType? /* = CSSBoxType.BORDER */\n
get() = definedExternally\n set(value) = definedExternally\n var relativeTo: dynamic\n get() =
definedExternally\n set(value) = definedExternally\n}\n\n@Suppress(\"INVISIBLE_REFERENCE\",

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\ "INVISIBLE_MEMBER" ) \n @kotlin.internal.InlineOnly \n public inline fun BoxQuadOptions(box: CSSBoxType?
= CSSBoxType.BORDER, relativeTo: dynamic = undefined): BoxQuadOptions { \n val o = js(("{})") \n
o["box"] = box \n o["relativeTo"] = relativeTo \n return o \n } \n \n public external interface
ConvertCoordinateOptions { \n var fromBox: CSSBoxType? /* = CSSBoxType.BORDER */ \n get() =
definedExternally \n set(value) = definedExternally \n var toBox: CSSBoxType? /* = CSSBoxType.BORDER
*/ \n get() = definedExternally \n set(value) =
definedExternally \n } \n \n @Suppress( "INVISIBLE_REFERENCE" ,
\ "INVISIBLE_MEMBER" ) \n @kotlin.internal.InlineOnly \n public inline fun ConvertCoordinateOptions(fromBox:
CSSBoxType? = CSSBoxType.BORDER, toBox: CSSBoxType? = CSSBoxType.BORDER):
ConvertCoordinateOptions { \n val o = js(("{})") \n o["fromBox"] = fromBox \n o["toBox"] = toBox \n
return o \n } \n \n /** \n * Exposes the JavaScript
[GeometryUtils](https://developer.mozilla.org/en/docs/Web/API/GeometryUtils) to Kotlin \n */ \n public external
interface GeometryUtils { \n fun getBoxQuads(options: BoxQuadOptions = definedExternally):
Array<DOMQuad> \n fun convertQuadFromNode(quad: dynamic, from: dynamic, options:
ConvertCoordinateOptions = definedExternally): DOMQuad \n fun convertRectFromNode(rect:
DOMRectReadOnly, from: dynamic, options: ConvertCoordinateOptions = definedExternally): DOMQuad \n fun
convertPointFromNode(point: DOMPointInit, from: dynamic, options: ConvertCoordinateOptions =
definedExternally): DOMPoint \n } \n \n /** \n * Exposes the JavaScript
[Touch](https://developer.mozilla.org/en/docs/Web/API/Touch) to Kotlin \n */ \n public external abstract class Touch
{ \n open val identifier: Int \n open val target: EventTarget \n open val screenX: Int \n open val screenY: Int \n
open val clientX: Int \n open val clientY: Int \n open val pageX: Int \n open val pageY: Int \n open val region:
String? \n } \n \n public external abstract class TouchList : ItemArrayLike<Touch> { \n override fun item(index: Int):
Touch? \n } \n \n @Suppress( "INVISIBLE_REFERENCE" ,
\ "INVISIBLE_MEMBER" ) \n @kotlin.internal.InlineOnly \n public inline operator fun TouchList.get(index: Int):
Touch? = asDynamic()[index] \n \n public external open class TouchEvent : UIEvent { \n open val touches:
TouchList \n open val targetTouches: TouchList \n open val changedTouches: TouchList \n open val altKey:
Boolean \n open val metaKey: Boolean \n open val ctrlKey: Boolean \n open val shiftKey: Boolean \n \n companion object { \n val NONE: Short \n val CAPTURING_PHASE: Short \n val AT_TARGET:
Short \n val BUBBLING_PHASE: Short \n } \n } \n \n /** \n * Exposes the JavaScript
[Image](https://developer.mozilla.org/en/docs/Web/API/Image) to Kotlin \n */ \n public external open class
Image(width: Int = definedExternally, height: Int = definedExternally) : HTMLElement { \n override var
onabort: ((Event) -> dynamic)? \n override var onblur: ((FocusEvent) -> dynamic)? \n override var oncancel:
((Event) -> dynamic)? \n override var oncanplay: ((Event) -> dynamic)? \n override var oncanplaythrough:
((Event) -> dynamic)? \n override var onchange: ((Event) -> dynamic)? \n override var onclick: ((MouseEvent) ->
dynamic)? \n override var onclose: ((Event) -> dynamic)? \n override var oncontextmenu: ((MouseEvent) ->
dynamic)? \n override var oncuechange: ((Event) -> dynamic)? \n override var ondblclick: ((MouseEvent) ->
dynamic)? \n override var ondrag: ((DragEvent) -> dynamic)? \n override var ondragend: ((DragEvent) ->
dynamic)? \n override var ondragenter: ((DragEvent) -> dynamic)? \n override var ondragexit: ((DragEvent) ->
dynamic)? \n override var ondragleave: ((DragEvent) -> dynamic)? \n override var ondragover: ((DragEvent) ->
dynamic)? \n override var ondragstart: ((DragEvent) -> dynamic)? \n override var ondrop: ((DragEvent) ->
dynamic)? \n override var ondurationchange: ((Event) -> dynamic)? \n override var onemptied: ((Event) ->
dynamic)? \n override var onended: ((Event) -> dynamic)? \n override var onerror: ((dynamic, String, Int, Int,
Any?) -> dynamic)? \n override var onfocus: ((FocusEvent) -> dynamic)? \n override var oninput: ((InputEvent) ->
dynamic)? \n override var oninvalid: ((Event) -> dynamic)? \n override var onkeydown: ((KeyboardEvent) ->
dynamic)? \n override var onkeypress: ((KeyboardEvent) -> dynamic)? \n override var onkeyup:
((KeyboardEvent) -> dynamic)? \n override var onload: ((Event) -> dynamic)? \n override var onloadeddata:
((Event) -> dynamic)? \n override var onloadedmetadata: ((Event) -> dynamic)? \n override var onloadend:
((Event) -> dynamic)? \n override var onloadstart: ((ProgressEvent) -> dynamic)? \n override var onmousedown:

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((MouseEvent) -> dynamic)?\n  override var onmouseenter: ((MouseEvent) -> dynamic)?\n  override var
onmouseleave: ((MouseEvent) -> dynamic)?\n  override var onmousemove: ((MouseEvent) -> dynamic)?\n
override var onmouseout: ((MouseEvent) -> dynamic)?\n  override var onmouseover: ((MouseEvent) ->
dynamic)?\n  override var onmouseup: ((MouseEvent) -> dynamic)?\n  override var onwheel: ((WheelEvent) ->
dynamic)?\n  override var onpause: ((Event) -> dynamic)?\n  override var onplay: ((Event) -> dynamic)?\n
override var onplaying: ((Event) -> dynamic)?\n  override var onprogress: ((ProgressEvent) -> dynamic)?\n
override var onratechange: ((Event) -> dynamic)?\n  override var onreset: ((Event) -> dynamic)?\n  override var
onresize: ((Event) -> dynamic)?\n  override var onscroll: ((Event) -> dynamic)?\n  override var onseeked:
((Event) -> dynamic)?\n  override var onseeking: ((Event) -> dynamic)?\n  override var onselect: ((Event) ->
dynamic)?\n  override var onshow: ((Event) -> dynamic)?\n  override var onstalled: ((Event) -> dynamic)?\n
override var onsubmit: ((Event) -> dynamic)?\n  override var onsuspend: ((Event) -> dynamic)?\n  override var
ontimeupdate: ((Event) -> dynamic)?\n  override var ontoggle: ((Event) -> dynamic)?\n  override var
onvolumechange: ((Event) -> dynamic)?\n  override var onwaiting: ((Event) -> dynamic)?\n  override var
ongotpointercapture: ((PointerEvent) -> dynamic)?\n  override var onlostpointercapture: ((PointerEvent) ->
dynamic)?\n  override var onpointerdown: ((PointerEvent) -> dynamic)?\n  override var onpointermove:
((PointerEvent) -> dynamic)?\n  override var onpointerup: ((PointerEvent) -> dynamic)?\n  override var
onpointercancel: ((PointerEvent) -> dynamic)?\n  override var onpointerover: ((PointerEvent) -> dynamic)?\n
override var onpointerout: ((PointerEvent) -> dynamic)?\n  override var onpointerenter: ((PointerEvent) ->
dynamic)?\n  override var onpointerleave: ((PointerEvent) -> dynamic)?\n  override var oncopy:
((ClipboardEvent) -> dynamic)?\n  override var oncut: ((ClipboardEvent) -> dynamic)?\n  override var onpaste:
((ClipboardEvent) -> dynamic)?\n  override var contentEditable: String\n  override val isContentEditable:
Boolean\n  override val style: CSSStyleDeclaration\n  override val children: HTMLCollection\n  override val
firstElementChild: Element?\n  override val lastElementChild: Element?\n  override val childElementCount: Int\n
  override val previousElementSibling: Element?\n  override val nextElementSibling: Element?\n  override val
assignedSlot: HTMLSlotElement?\n  override fun prepend(vararg nodes: dynamic)\n  override fun append(vararg
nodes: dynamic)\n  override fun querySelector(selectors: String): Element?\n  override fun
querySelectorAll(selectors: String): NodeList\n  override fun before(vararg nodes: dynamic)\n  override fun
after(vararg nodes: dynamic)\n  override fun replaceWith(vararg nodes: dynamic)\n  override fun remove()\n
  override fun getBoxQuads(options: BoxQuadOptions /* = definedExternally */): Array<DOMQuad>\n  override
fun convertQuadFromNode(quad: dynamic, from: dynamic, options: ConvertCoordinateOptions /* =
definedExternally */): DOMQuad\n  override fun convertRectFromNode(rect: DOMRectReadOnly, from:
dynamic, options: ConvertCoordinateOptions /* = definedExternally */): DOMQuad\n  override fun
convertPointFromNode(point: DOMPointInit, from: dynamic, options: ConvertCoordinateOptions /* =
definedExternally */): DOMPoint\n\n  companion object {\n    val ELEMENT_NODE: Short\n    val
ATTRIBUTE_NODE: Short\n    val TEXT_NODE: Short\n    val CDATA_SECTION_NODE: Short\n    val
ENTITY_REFERENCE_NODE: Short\n    val ENTITY_NODE: Short\n    val
PROCESSING_INSTRUCTION_NODE: Short\n    val COMMENT_NODE: Short\n    val
DOCUMENT_NODE: Short\n    val DOCUMENT_TYPE_NODE: Short\n    val
DOCUMENT_FRAGMENT_NODE: Short\n    val NOTATION_NODE: Short\n    val
DOCUMENT_POSITION_DISCONNECTED: Short\n    val DOCUMENT_POSITION_PRECEDING: Short\n
    val DOCUMENT_POSITION_FOLLOWING: Short\n    val DOCUMENT_POSITION_CONTAINS: Short\n
    val DOCUMENT_POSITION_CONTAINED_BY: Short\n    val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n  }\n\n  public external open class
Audio(src: String = definedExternally) : HTMLAudioElement {\n    override var onabort: ((Event) -> dynamic)?\n
  override var onblur: ((FocusEvent) -> dynamic)?\n  override var oncancel: ((Event) -> dynamic)?\n
  override var oncanplay: ((Event) -> dynamic)?\n  override var oncanplaythrough: ((Event) -> dynamic)?\n
  override var onchange: ((Event) -> dynamic)?\n  override var onclick: ((MouseEvent) -> dynamic)?\n
  override var onclose: ((Event) -> dynamic)?\n  override var oncontextmenu: ((MouseEvent) -> dynamic)?\n
  override var oncuechange:

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((Event) -> dynamic)?\n  override var ondblclick: ((MouseEvent) -> dynamic)?\n  override var ondrag:
((DragEvent) -> dynamic)?\n  override var ondragend: ((DragEvent) -> dynamic)?\n  override var ondragenter:
((DragEvent) -> dynamic)?\n  override var ondragexit: ((DragEvent) -> dynamic)?\n  override var ondragleave:
((DragEvent) -> dynamic)?\n  override var ondragover: ((DragEvent) -> dynamic)?\n  override var ondragstart:
((DragEvent) -> dynamic)?\n  override var ondrop: ((DragEvent) -> dynamic)?\n  override var ondurationchange:
((Event) -> dynamic)?\n  override var onemptied: ((Event) -> dynamic)?\n  override var onended: ((Event) ->
dynamic)?\n  override var onerror: ((dynamic, String, Int, Int, Any?) -> dynamic)?\n  override var onfocus:
((FocusEvent) -> dynamic)?\n  override var oninput: ((InputEvent) -> dynamic)?\n  override var oninvalid:
((Event) -> dynamic)?\n  override var onkeydown: ((KeyboardEvent) -> dynamic)?\n  override var onkeypress:
((KeyboardEvent) -> dynamic)?\n  override var onkeyup: ((KeyboardEvent) -> dynamic)?\n  override var onload:
((Event) -> dynamic)?\n  override var onloadeddata: ((Event) -> dynamic)?\n  override var onloadedmetadata:
((Event) -> dynamic)?\n  override var onloadend: ((Event) -> dynamic)?\n  override var onloadstart:
((ProgressEvent) -> dynamic)?\n  override var onmousedown: ((MouseEvent) -> dynamic)?\n  override var
onmouseenter: ((MouseEvent) -> dynamic)?\n  override var onmouseleave: ((MouseEvent) -> dynamic)?\n
override var onmousemove: ((MouseEvent) -> dynamic)?\n  override var onmouseout: ((MouseEvent) ->
dynamic)?\n  override var onmouseover: ((MouseEvent) -> dynamic)?\n  override var onmouseup: ((MouseEvent)
-> dynamic)?\n  override var onwheel: ((WheelEvent) -> dynamic)?\n  override var onpause: ((Event) ->
dynamic)?\n  override var onplay: ((Event) -> dynamic)?\n  override var onplaying: ((Event) -> dynamic)?\n
override var onprogress: ((ProgressEvent) -> dynamic)?\n  override var onratechange: ((Event) -> dynamic)?\n
override var onreset: ((Event) -> dynamic)?\n  override var onresize: ((Event) -> dynamic)?\n  override var
onscroll: ((Event) -> dynamic)?\n  override var onseeked: ((Event) -> dynamic)?\n  override var onseeking:
((Event) -> dynamic)?\n  override var onselect: ((Event) -> dynamic)?\n  override var onshow: ((Event) ->
dynamic)?\n  override var onstalled: ((Event) -> dynamic)?\n  override var onsubmit: ((Event) -> dynamic)?\n
override var onsuspend: ((Event) -> dynamic)?\n  override var ontimeupdate: ((Event) -> dynamic)?\n  override
var ontoggle: ((Event) -> dynamic)?\n  override var onvolumechange: ((Event) -> dynamic)?\n  override var
onwaiting: ((Event) -> dynamic)?\n  override var ongotpointercapture: ((PointerEvent) -> dynamic)?\n  override
var onlostpointercapture: ((PointerEvent) -> dynamic)?\n  override var onpointerdown: ((PointerEvent) ->
dynamic)?\n  override var onpointermove: ((PointerEvent) -> dynamic)?\n  override var onpointerup:
((PointerEvent) -> dynamic)?\n  override var onpointercancel: ((PointerEvent) -> dynamic)?\n  override var
onpointerover: ((PointerEvent) -> dynamic)?\n  override var onpointerout: ((PointerEvent) -> dynamic)?\n
override var onpointerenter: ((PointerEvent) -> dynamic)?\n  override var onpointerleave: ((PointerEvent) ->
dynamic)?\n  override var oncopy: ((ClipboardEvent) -> dynamic)?\n  override var oncut: ((ClipboardEvent) ->
dynamic)?\n  override var onpaste: ((ClipboardEvent) -> dynamic)?\n  override var contentEditable: String\n
override val isContentEditable: Boolean\n  override val style: CSSStyleDeclaration\n  override val children:
HTMLCollection\n  override val firstElementChild: Element?\n  override val lastElementChild: Element?\n
override val childElementCount: Int\n  override val previousElementSibling: Element?\n  override val
nextElementSibling: Element?\n  override val assignedSlot: HTMLSlotElement?\n  override fun prepend(vararg
nodes: dynamic)\n  override fun append(vararg nodes: dynamic)\n  override fun querySelector(selectors: String):
Element?\n  override fun querySelectorAll(selectors: String): NodeList\n  override fun before(vararg nodes:
dynamic)\n  override fun after(vararg nodes: dynamic)\n  override fun replaceWith(vararg nodes: dynamic)\n
override fun remove()\n  override fun getBoxQuads(options: BoxQuadOptions /* = definedExternally */):
Array<DOMQuad>\n  override fun convertQuadFromNode(quad: dynamic, from: dynamic, options:
ConvertCoordinateOptions /* = definedExternally */): DOMQuad\n  override fun convertRectFromNode(rect:
DOMRectReadOnly, from: dynamic, options: ConvertCoordinateOptions /* = definedExternally */): DOMQuad\n
override fun convertPointFromNode(point: DOMPointInit, from: dynamic, options: ConvertCoordinateOptions /* =
definedExternally */): DOMPoint\n\n  companion object {\n    val NETWORK_EMPTY: Short\n    val
NETWORK_IDLE: Short\n    val NETWORK_LOADING: Short\n    val NETWORK_NO_SOURCE: Short\n
    val HAVE_NOTHING: Short\n    val HAVE_METADATA: Short\n    val HAVE_CURRENT_DATA:

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Short\n val HAVE_FUTURE_DATA: Short\n val HAVE_ENOUGH_DATA: Short\n val ELEMENT_NODE: Short\n val ATTRIBUTE_NODE: Short\n val TEXT_NODE: Short\n val CDATA_SECTION_NODE: Short\n val ENTITY_REFERENCE_NODE: Short\n val ENTITY_NODE: Short\n val PROCESSING_INSTRUCTION_NODE: Short\n val COMMENT_NODE: Short\n val DOCUMENT_NODE: Short\n val DOCUMENT_TYPE_NODE: Short\n val DOCUMENT_FRAGMENT_NODE: Short\n val NOTATION_NODE: Short\n val DOCUMENT_POSITION_DISCONNECTED: Short\n val DOCUMENT_POSITION_PRECEDING: Short\n val DOCUMENT_POSITION_FOLLOWING: Short\n val DOCUMENT_POSITION_CONTAINS: Short\n val DOCUMENT_POSITION_CONTAINED_BY: Short\n val DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n }

} \n\n\n/**\n * Exposes the JavaScript [Option](https://developer.mozilla.org/en/docs/Web/API/Option) to Kotlin\n */\npublic external open class Option(text: String = definedExternally, value: String = definedExternally, defaultSelected: Boolean = definedExternally, selected: Boolean = definedExternally) : HTMLInputElement {\n override var onabort: ((Event) -> dynamic)?\n override var onblur: ((FocusEvent) -> dynamic)?\n override var onCancel: ((Event) -> dynamic)?\n override var oncanplay: ((Event) -> dynamic)?\n override var oncanplaythrough: ((Event) -> dynamic)?\n override var onChange: ((Event) -> dynamic)?\n override var onclick: ((MouseEvent) -> dynamic)?\n override var onclose: ((Event) -> dynamic)?\n override var oncontextmenu: ((MouseEvent) -> dynamic)?\n override var oncuechange: ((Event) -> dynamic)?\n override var ondblclick: ((MouseEvent) -> dynamic)?\n override var ondrag: ((DragEvent) -> dynamic)?\n override var ondragend: ((DragEvent) -> dynamic)?\n override var ondragenter: ((DragEvent) -> dynamic)?\n override var ondragexit: ((DragEvent) -> dynamic)?\n override var ondragleave: ((DragEvent) -> dynamic)?\n override var ondragover: ((DragEvent) -> dynamic)?\n override var ondragstart: ((DragEvent) -> dynamic)?\n override var ondrop: ((DragEvent) -> dynamic)?\n override var ondurationchange: ((Event) -> dynamic)?\n override var onemptied: ((Event) -> dynamic)?\n override var onended: ((Event) -> dynamic)?\n override var onerror: ((dynamic, String, Int, Int, Any?) -> dynamic)?\n override var onfocus: ((FocusEvent) -> dynamic)?\n override var oninput: ((InputEvent) -> dynamic)?\n override var oninvalid: ((Event) -> dynamic)?\n override var onkeydown: ((KeyboardEvent) -> dynamic)?\n override var onkeypress: ((KeyboardEvent) -> dynamic)?\n override var onkeyup: ((KeyboardEvent) -> dynamic)?\n override var onload: ((Event) -> dynamic)?\n override var onloadeddata: ((Event) -> dynamic)?\n override var onloadedmetadata: ((Event) -> dynamic)?\n override var onloadend: ((Event) -> dynamic)?\n override var onloadstart: ((ProgressEvent) -> dynamic)?\n override var onmousedown: ((MouseEvent) -> dynamic)?\n override var onmouseenter: ((MouseEvent) -> dynamic)?\n override var onmouseleave: ((MouseEvent) -> dynamic)?\n override var onmousemove: ((MouseEvent) -> dynamic)?\n override var onmouseout: ((MouseEvent) -> dynamic)?\n override var onmouseover: ((MouseEvent) -> dynamic)?\n override var onmouseup: ((MouseEvent) -> dynamic)?\n override var onwheel: ((WheelEvent) -> dynamic)?\n override var onpause: ((Event) -> dynamic)?\n override var onplay: ((Event) -> dynamic)?\n override var onplaying: ((Event) -> dynamic)?\n override var onprogress: ((ProgressEvent) -> dynamic)?\n override var onratechange: ((Event) -> dynamic)?\n override var onreset: ((Event) -> dynamic)?\n override var onresize: ((Event) -> dynamic)?\n override var onscroll: ((Event) -> dynamic)?\n override var onseeked: ((Event) -> dynamic)?\n override var onseeking: ((Event) -> dynamic)?\n override var onselect: ((Event) -> dynamic)?\n override var onshow: ((Event) -> dynamic)?\n override var onstalled: ((Event) -> dynamic)?\n override var onsubmit: ((Event) -> dynamic)?\n override var onsuspend: ((Event) -> dynamic)?\n override var ontimeupdate: ((Event) -> dynamic)?\n override var ontoggle: ((Event) -> dynamic)?\n override var onvolumechange: ((Event) -> dynamic)?\n override var onwaiting: ((Event) -> dynamic)?\n override var ongotpointercapture: ((PointerEvent) -> dynamic)?\n override var onlostpointercapture: ((PointerEvent) -> dynamic)?\n override var onpointerdown: ((PointerEvent) -> dynamic)?\n override var onpointermove: ((PointerEvent) -> dynamic)?\n override var onpointerup: ((PointerEvent) -> dynamic)?\n override var onpointercancel: ((PointerEvent) -> dynamic)?\n override var onpointerover: ((PointerEvent) -> dynamic)?\n override var onpointerout: ((PointerEvent) -> dynamic)?\n override var onpointerenter: ((PointerEvent) ->

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dynamic)?\n  override var onpointerleave: ((PointerEvent) -> dynamic)?\n  override var oncopy:
((ClipboardEvent) -> dynamic)?\n  override var oncut: ((ClipboardEvent) -> dynamic)?\n  override var onpaste:
((ClipboardEvent) -> dynamic)?\n  override var contentEditable: String\n  override val isContentEditable:
Boolean\n  override val style: CSSStyleDeclaration\n  override val children: HTMLCollection\n  override val
firstElementChild: Element?\n  override val lastElementChild: Element?\n  override val childElementCount: Int\n
  override val previousElementSibling: Element?\n  override val nextElementSibling: Element?\n  override val
assignedSlot: HTMLSlotElement?\n  override fun prepend(vararg nodes: dynamic)\n  override fun append(vararg
nodes: dynamic)\n  override fun querySelector(selectors: String): Element?\n  override fun
querySelectorAll(selectors: String): NodeList\n  override fun before(vararg nodes: dynamic)\n  override fun
after(vararg nodes: dynamic)\n  override fun replaceWith(vararg nodes: dynamic)\n  override fun remove()\n
  override fun getBoxQuads(options: BoxQuadOptions /* = definedExternally */): Array<DOMQuad>\n  override
fun convertQuadFromNode(quad: dynamic, from: dynamic, options: ConvertCoordinateOptions /* =
definedExternally */): DOMQuad\n  override fun convertRectFromNode(rect: DOMRectReadOnly, from:
dynamic, options: ConvertCoordinateOptions /* = definedExternally */): DOMQuad\n  override fun
convertPointFromNode(point: DOMPointInit, from: dynamic, options: ConvertCoordinateOptions /* =
definedExternally */): DOMPoint\n\n  companion object {\n    val ELEMENT_NODE: Short\n    val
ATTRIBUTE_NODE: Short\n    val TEXT_NODE: Short\n    val CDATA_SECTION_NODE: Short\n    val
ENTITY_REFERENCE_NODE: Short\n    val ENTITY_NODE: Short\n    val
PROCESSING_INSTRUCTION_NODE: Short\n    val COMMENT_NODE: Short\n    val
DOCUMENT_NODE: Short\n    val DOCUMENT_TYPE_NODE: Short\n    val
DOCUMENT_FRAGMENT_NODE: Short\n    val NOTATION_NODE: Short\n    val
DOCUMENT_POSITION_DISCONNECTED: Short\n    val DOCUMENT_POSITION_PRECEDING: Short\n
    val DOCUMENT_POSITION_FOLLOWING: Short\n    val DOCUMENT_POSITION_CONTAINS: Short\n
    val DOCUMENT_POSITION_CONTAINED_BY: Short\n    val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n  }\n\n  public external interface
UnionElementOrHTMLCollection\n  public external interface UnionElementOrRadioNodeList\n  public external
interface UnionHTMLOptGroupElementOrHTMLOptionElement\n  public external interface
UnionAudioTrackOrTextTrackOrVideoTrack\n  public external interface UnionElementOrMouseEvent\n  public
external interface UnionMessagePortOrWindowProxy\n  public external interface MediaProvider\n  public
external interface RenderingContext\n  public external interface HTMLOrSVGImageElement :
CanvasImageSource\n  public external interface CanvasImageSource : ImageBitmapSource\n  public external
interface ImageBitmapSource\n  public external interface HTMLOrSVGScriptElement\n\n/* please, don't
implement this interface!
*\n@JsName("null")\n@Suppress("NESTED_CLASS_IN_EXTERNAL_INTERFACE")\n  public external
interface DocumentReadyState {\n    companion object\n  }\n  public inline val
DocumentReadyState.Companion.LOADING: DocumentReadyState get() =
"loading".asDynamic().unsafeCast<DocumentReadyState>()\n  public inline val
DocumentReadyState.Companion.INTERACTIVE: DocumentReadyState get() =
"interactive".asDynamic().unsafeCast<DocumentReadyState>()\n  public inline val
DocumentReadyState.Companion.COMPLETE: DocumentReadyState get() =
"complete".asDynamic().unsafeCast<DocumentReadyState>()\n\n/* please, don't implement this interface!
*\n@JsName("null")\n@Suppress("NESTED_CLASS_IN_EXTERNAL_INTERFACE")\n  public external
interface CanPlayTypeResult {\n    companion object\n  }\n  public inline val
CanPlayTypeResult.Companion.EMPTY: CanPlayTypeResult get() =
""\n  public inline val CanPlayTypeResult.Companion.MAYBE:
CanPlayTypeResult get() = "maybe".asDynamic().unsafeCast<CanPlayTypeResult>()\n  public inline val
CanPlayTypeResult.Companion.PROBABLY: CanPlayTypeResult get() =
"probably".asDynamic().unsafeCast<CanPlayTypeResult>()\n\n/* please, don't implement this interface!

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*\n@JsName("null")\n@Suppress("NESTED_CLASS_IN_EXTERNAL_INTERFACE")\npublic external
interface TextTrackMode {\n    companion object\n}\n\npublic inline val TextTrackMode.Companion.DISABLED:
TextTrackMode get() = "disabled".asDynamic().unsafeCast<TextTrackMode>()\n\npublic inline val
TextTrackMode.Companion.HIDDEN: TextTrackMode get() =
"hidden".asDynamic().unsafeCast<TextTrackMode>()\n\npublic inline val
TextTrackMode.Companion.SHOWING: TextTrackMode get() =
"showing".asDynamic().unsafeCast<TextTrackMode>()\n\n/* please, don't implement this interface!
*\n@JsName("null")\n@Suppress("NESTED_CLASS_IN_EXTERNAL_INTERFACE")\npublic external
interface TextTrackKind {\n    companion object\n}\n\npublic inline val TextTrackKind.Companion.SUBTITLES:
TextTrackKind get() = "subtitles".asDynamic().unsafeCast<TextTrackKind>()\n\npublic inline val
TextTrackKind.Companion.CAPTIONS: TextTrackKind get() =
"captions".asDynamic().unsafeCast<TextTrackKind>()\n\npublic inline val
TextTrackKind.Companion.DESCRPTIONS: TextTrackKind get() =
"descriptions".asDynamic().unsafeCast<TextTrackKind>()\n\npublic inline val
TextTrackKind.Companion.CHAPTERS: TextTrackKind get() =
"chapters".asDynamic().unsafeCast<TextTrackKind>()\n\npublic inline val
TextTrackKind.Companion.METADATA: TextTrackKind get() =
"metadata".asDynamic().unsafeCast<TextTrackKind>()\n\n/* please, don't implement this interface!
*\n@JsName("null")\n@Suppress("NESTED_CLASS_IN_EXTERNAL_INTERFACE")\npublic external
interface SelectionMode {\n    companion object\n}\n\npublic inline val SelectionMode.Companion.SELECT:
SelectionMode get() = "select".asDynamic().unsafeCast<SelectionMode>()\n\npublic inline val
SelectionMode.Companion.START: SelectionMode get() =
"start".asDynamic().unsafeCast<SelectionMode>()\n\npublic inline val SelectionMode.Companion.END:
SelectionMode get() = "end".asDynamic().unsafeCast<SelectionMode>()\n\npublic inline val
SelectionMode.Companion.PRESERVE: SelectionMode get() =
"preserve".asDynamic().unsafeCast<SelectionMode>()\n\n/* please, don't implement this interface!
*\n@JsName("null")\n@Suppress("NESTED_CLASS_IN_EXTERNAL_INTERFACE")\npublic external
interface CanvasFillRule {\n    companion object\n}\n\npublic inline val CanvasFillRule.Companion.NONZERO:
CanvasFillRule get() = "nonzero".asDynamic().unsafeCast<CanvasFillRule>()\n\npublic inline val
CanvasFillRule.Companion.EVENODD: CanvasFillRule get() =
"evenodd".asDynamic().unsafeCast<CanvasFillRule>()\n\n/* please, don't implement this interface!
*\n@JsName("null")\n@Suppress("NESTED_CLASS_IN_EXTERNAL_INTERFACE")\npublic external
interface ImageSmoothingQuality {\n    companion object\n}\n\npublic inline val
ImageSmoothingQuality.Companion.LOW: ImageSmoothingQuality get() =
"low".asDynamic().unsafeCast<ImageSmoothingQuality>()\n\npublic inline val
ImageSmoothingQuality.Companion.MEDIUM: ImageSmoothingQuality get() =
"medium".asDynamic().unsafeCast<ImageSmoothingQuality>()\n\npublic inline val
ImageSmoothingQuality.Companion.HIGH: ImageSmoothingQuality get() =
"high".asDynamic().unsafeCast<ImageSmoothingQuality>()\n\n/* please, don't implement this interface!
*\n@JsName("null")\n@Suppress("NESTED_CLASS_IN_EXTERNAL_INTERFACE")\npublic external
interface CanvasLineCap {\n    companion object\n}\n\npublic inline val CanvasLineCap.Companion.BUTT:
CanvasLineCap get() = "butt".asDynamic().unsafeCast<CanvasLineCap>()\n\npublic inline val
CanvasLineCap.Companion.ROUND: CanvasLineCap get() =
"round".asDynamic().unsafeCast<CanvasLineCap>()\n\npublic inline val CanvasLineCap.Companion.SQUARE:
CanvasLineCap get() = "square".asDynamic().unsafeCast<CanvasLineCap>()\n\n/* please, don't implement this
interface! *\n@JsName("null")\n@Suppress("NESTED_CLASS_IN_EXTERNAL_INTERFACE")\npublic
external interface CanvasLineJoin {\n    companion object\n}\n\npublic inline val
CanvasLineJoin.Companion.ROUND: CanvasLineJoin get() =

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\"round\".asDynamic().unsafeCast<CanvasLineJoin>()\n\npublic inline val CanvasLineJoin.Companion.BEVEL:
CanvasLineJoin get() = \"bevel\".asDynamic().unsafeCast<CanvasLineJoin>()\n\npublic inline val
CanvasLineJoin.Companion.MITER: CanvasLineJoin get() =
\"miter\".asDynamic().unsafeCast<CanvasLineJoin>()\n\n/* please, don't implement this interface!
*\n@JsName(\"null\")\n@Suppress(\"NESTED_CLASS_IN_EXTERNAL_INTERFACE\")\n\npublic external
interface CanvasTextAlign {\n  companion object\n}\n\npublic inline val CanvasTextAlign.Companion.START:
CanvasTextAlign get() = \"start\".asDynamic().unsafeCast<CanvasTextAlign>()\n\npublic inline val
CanvasTextAlign.Companion.END: CanvasTextAlign get() =
\"end\".asDynamic().unsafeCast<CanvasTextAlign>()\n\npublic inline val CanvasTextAlign.Companion.LEFT:
CanvasTextAlign get() = \"left\".asDynamic().unsafeCast<CanvasTextAlign>()\n\npublic inline val
CanvasTextAlign.Companion.RIGHT: CanvasTextAlign get() =
\"right\".asDynamic().unsafeCast<CanvasTextAlign>()\n\npublic inline val
CanvasTextAlign.Companion.CENTER: CanvasTextAlign get() =
\"center\".asDynamic().unsafeCast<CanvasTextAlign>()\n\n/* please, don't implement this interface!
*\n@JsName(\"null\")\n@Suppress(\"NESTED_CLASS_IN_EXTERNAL_INTERFACE\")\n\npublic external
interface CanvasTextBaseline {\n  companion object\n}\n\npublic inline val CanvasTextBaseline.Companion.TOP:
CanvasTextBaseline get() = \"top\".asDynamic().unsafeCast<CanvasTextBaseline>()\n\npublic inline val
CanvasTextBaseline.Companion.HANGING: CanvasTextBaseline get() =
\"hanging\".asDynamic().unsafeCast<CanvasTextBaseline>()\n\npublic inline val
CanvasTextBaseline.Companion.MIDDLE: CanvasTextBaseline get() =
\"middle\".asDynamic().unsafeCast<CanvasTextBaseline>()\n\npublic inline val
CanvasTextBaseline.Companion.ALPHABETIC: CanvasTextBaseline get() =
\"alphabetic\".asDynamic().unsafeCast<CanvasTextBaseline>()\n\npublic inline val
CanvasTextBaseline.Companion.IDEOGRAPHIC: CanvasTextBaseline get() =
\"ideographic\".asDynamic().unsafeCast<CanvasTextBaseline>()\n\npublic inline val
CanvasTextBaseline.Companion.BOTTOM: CanvasTextBaseline get() =
\"bottom\".asDynamic().unsafeCast<CanvasTextBaseline>()\n\n/* please, don't implement this interface!
*\n@JsName(\"null\")\n@Suppress(\"NESTED_CLASS_IN_EXTERNAL_INTERFACE\")\n\npublic external
interface CanvasDirection {\n  companion object\n}\n\npublic inline val CanvasDirection.Companion.LTR:
CanvasDirection get() = \"ltr\".asDynamic().unsafeCast<CanvasDirection>()\n\npublic inline val
CanvasDirection.Companion.RTL: CanvasDirection get() =
\"rtl\".asDynamic().unsafeCast<CanvasDirection>()\n\npublic inline val CanvasDirection.Companion.INHERIT:
CanvasDirection get() = \"inherit\".asDynamic().unsafeCast<CanvasDirection>()\n\n/* please, don't implement this
interface! *\n@JsName(\"null\")\n@Suppress(\"NESTED_CLASS_IN_EXTERNAL_INTERFACE\")\n\npublic
external interface ScrollRestoration {\n  companion object\n}\n\npublic inline val
ScrollRestoration.Companion.AUTO: ScrollRestoration get() =
\"auto\".asDynamic().unsafeCast<ScrollRestoration>()\n\npublic inline val
ScrollRestoration.Companion.MANUAL: ScrollRestoration get() =
\"manual\".asDynamic().unsafeCast<ScrollRestoration>()\n\n/* please, don't implement this interface!
*\n@JsName(\"null\")\n@Suppress(\"NESTED_CLASS_IN_EXTERNAL_INTERFACE\")\n\npublic external
interface ImageOrientation {\n  companion object\n}\n\npublic inline val ImageOrientation.Companion.NONE:
ImageOrientation get() = \"none\".asDynamic().unsafeCast<ImageOrientation>()\n\npublic inline val
ImageOrientation.Companion.FLIPY: ImageOrientation get() =
\"flipY\".asDynamic().unsafeCast<ImageOrientation>()\n\n/* please, don't implement this interface!
*\n@JsName(\"null\")\n@Suppress(\"NESTED_CLASS_IN_EXTERNAL_INTERFACE\")\n\npublic external
interface PremultiplyAlpha {\n  companion object\n}\n\npublic inline val PremultiplyAlpha.Companion.NONE:
PremultiplyAlpha get() = \"none\".asDynamic().unsafeCast<PremultiplyAlpha>()\n\npublic inline val
PremultiplyAlpha.Companion.PREMULTIPLY: PremultiplyAlpha get() =

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\"premultiply\".asDynamic().unsafeCast<PremultiplyAlpha>()\n\npublic inline val
PremultiplyAlpha.Companion.DEFAULT: PremultiplyAlpha get() =
\"default\".asDynamic().unsafeCast<PremultiplyAlpha>()\n\n/* please, don't implement this interface!
*\n\n@JsName(\"null\")\n\n@Suppress(\"NESTED_CLASS_IN_EXTERNAL_INTERFACE\")\n\npublic external
interface ColorSpaceConversion {\n\n\ncompanion object\n\n}\n\npublic inline val
ColorSpaceConversion.Companion.NONE: ColorSpaceConversion get() =
\"none\".asDynamic().unsafeCast<ColorSpaceConversion>()\n\npublic inline val
ColorSpaceConversion.Companion.DEFAULT: ColorSpaceConversion get() =
\"default\".asDynamic().unsafeCast<ColorSpaceConversion>()\n\n/* please, don't implement this interface!
*\n\n@JsName(\"null\")\n\n@Suppress(\"NESTED_CLASS_IN_EXTERNAL_INTERFACE\")\n\npublic external
interface ResizeQuality {\n\n\ncompanion object\n\n}\n\npublic inline val ResizeQuality.Companion.PIXELATED:
ResizeQuality get() = \"pixelated\".asDynamic().unsafeCast<ResizeQuality>()\n\npublic inline val
ResizeQuality.Companion.LOW: ResizeQuality get() =
\"low\".asDynamic().unsafeCast<ResizeQuality>()\n\npublic inline val ResizeQuality.Companion.MEDIUM:
ResizeQuality get() = \"medium\".asDynamic().unsafeCast<ResizeQuality>()\n\npublic inline val
ResizeQuality.Companion.HIGH: ResizeQuality get() = \"high\".asDynamic().unsafeCast<ResizeQuality>()\n\n/*
please, don't implement this interface!
*\n\n@JsName(\"null\")\n\n@Suppress(\"NESTED_CLASS_IN_EXTERNAL_INTERFACE\")\n\npublic external
interface BinaryType {\n\n\ncompanion object\n\n}\n\npublic inline val BinaryType.Companion.BLOB: BinaryType
get() = \"blob\".asDynamic().unsafeCast<BinaryType>()\n\npublic inline val
BinaryType.Companion.ARRAYBUFFER: BinaryType get() =
\"arraybuffer\".asDynamic().unsafeCast<BinaryType>()\n\n/* please, don't implement this interface!
*\n\n@JsName(\"null\")\n\n@Suppress(\"NESTED_CLASS_IN_EXTERNAL_INTERFACE\")\n\npublic external
interface WorkerType {\n\n\ncompanion object\n\n}\n\npublic inline val WorkerType.Companion.CLASSIC:
WorkerType get() = \"classic\".asDynamic().unsafeCast<WorkerType>()\n\npublic inline val
WorkerType.Companion.MODULE: WorkerType get() =
\"module\".asDynamic().unsafeCast<WorkerType>()\n\n/* please, don't implement this interface!
*\n\n@JsName(\"null\")\n\n@Suppress(\"NESTED_CLASS_IN_EXTERNAL_INTERFACE\")\n\npublic external
interface ShadowRootMode {\n\n\ncompanion object\n\n}\n\npublic inline val ShadowRootMode.Companion.OPEN:
ShadowRootMode get() = \"open\".asDynamic().unsafeCast<ShadowRootMode>()\n\npublic inline val
ShadowRootMode.Companion.CLOSED: ShadowRootMode get() =
\"closed\".asDynamic().unsafeCast<ShadowRootMode>()\n\n/* please, don't implement this interface!
*\n\n@JsName(\"null\")\n\n@Suppress(\"NESTED_CLASS_IN_EXTERNAL_INTERFACE\")\n\npublic external
interface ScrollBehavior {\n\n\ncompanion object\n\n}\n\npublic inline val ScrollBehavior.Companion.AUTO:
ScrollBehavior get() = \"auto\".asDynamic().unsafeCast<ScrollBehavior>()\n\npublic inline val
ScrollBehavior.Companion.INSTANT: ScrollBehavior get() =
\"instant\".asDynamic().unsafeCast<ScrollBehavior>()\n\npublic inline val ScrollBehavior.Companion.SMOOTH:
ScrollBehavior get() = \"smooth\".asDynamic().unsafeCast<ScrollBehavior>()\n\n/* please, don't implement this
interface! *\n\n@JsName(\"null\")\n\n@Suppress(\"NESTED_CLASS_IN_EXTERNAL_INTERFACE\")\n\npublic
external interface ScrollLogicalPosition {\n\n\ncompanion object\n\n}\n\npublic inline val
ScrollLogicalPosition.Companion.START: ScrollLogicalPosition get() =
\"start\".asDynamic().unsafeCast<ScrollLogicalPosition>()\n\npublic inline val
ScrollLogicalPosition.Companion.CENTER: ScrollLogicalPosition get() =
\"center\".asDynamic().unsafeCast<ScrollLogicalPosition>()\n\npublic inline val
ScrollLogicalPosition.Companion.END: ScrollLogicalPosition get() =
\"end\".asDynamic().unsafeCast<ScrollLogicalPosition>()\n\npublic inline val
ScrollLogicalPosition.Companion.NEAREST: ScrollLogicalPosition get() =
\"nearest\".asDynamic().unsafeCast<ScrollLogicalPosition>()\n\n/* please, don't implement this interface!

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*\n@jsName("null")\n@Suppress("NESTED_CLASS_IN_EXTERNAL_INTERFACE")\npublic external
interface CSSBoxType {\n  companion object\n}\n\npublic inline val CSSBoxType.Companion.MARGIN:
CSSBoxType get() = "margin".asDynamic().unsafeCast<CSSBoxType>()\n\npublic inline val
CSSBoxType.Companion.BORDER: CSSBoxType get() =
"border".asDynamic().unsafeCast<CSSBoxType>()\n\npublic inline val CSSBoxType.Companion.PADDING:
CSSBoxType get() = "padding".asDynamic().unsafeCast<CSSBoxType>()\n\npublic inline val
CSSBoxType.Companion.CONTENT: CSSBoxType get() =
"content".asDynamic().unsafeCast<CSSBoxType>()"/**\n * Copyright 2010-2021 JetBrains s.r.o. and Kotlin
Programming Language contributors.\n * Use of this source code is governed by the Apache 2.0 license that can be
found in the license/LICENSE.txt file.\n *\n// NOTE: THIS FILE IS AUTO-GENERATED, DO NOT EDIT!\n//
See github.com/kotlin/dukat for details\n\npackage org.w3c.fetch\n\nimport kotlin.js.*\nimport
org.khronos.webgl.*\nimport org.w3c.files.*\nimport org.w3c.xhr.*\n\n/**\n * Exposes the JavaScript
[Headers](https://developer.mozilla.org/en/docs/Web/API/Headers) to Kotlin\n *\npublic external open class
Headers(init: dynamic = definedExternally) {\n  fun append(name: String, value: String)\n  fun delete(name:
String)\n  fun get(name: String): String?\n  fun has(name: String): Boolean\n  fun set(name: String, value:
String)\n}\n\n/**\n * Exposes the JavaScript [Body](https://developer.mozilla.org/en/docs/Web/API/Body) to
Kotlin\n *\npublic external interface Body {\n  val bodyUsed: Boolean\n  fun ArrayBuffer():
Promise<ArrayBuffer>\n  fun blob(): Promise<Blob>\n  fun formData(): Promise<FormData>\n  fun json():
Promise<Any?>\n  fun text(): Promise<String>\n}\n\n/**\n * Exposes the JavaScript
[Request](https://developer.mozilla.org/en/docs/Web/API/Request) to Kotlin\n *\npublic external open class
Request(input: dynamic, init: RequestInit = definedExternally) : Body {\n  open val method: String\n  open val
url: String\n  open val headers: Headers\n  open val type: RequestType\n  open val destination:
RequestDestination\n  open val referrer: String\n  open val referrerPolicy: dynamic\n  open val mode:
RequestMode\n  open val credentials: RequestCredentials\n  open val cache: RequestCache\n  open val redirect:
RequestRedirect\n  open val integrity: String\n  open val keepalive: Boolean\n  override val bodyUsed:
Boolean\n  fun clone(): Request\n  override fun ArrayBuffer(): Promise<ArrayBuffer>\n  override fun blob():
Promise<Blob>\n  override fun formData(): Promise<FormData>\n  override fun json(): Promise<Any?>\n  override
fun text(): Promise<String>\n}\n\npublic external interface RequestInit {\n  var method: String?\n
get() = definedExternally\n  set(value) = definedExternally\n  var headers: dynamic\n  get() =
definedExternally\n  set(value) = definedExternally\n  var body: dynamic\n  get() = definedExternally\n
set(value) = definedExternally\n  var referrer: String?\n  get() = definedExternally\n  set(value) =
definedExternally\n  var referrerPolicy: dynamic\n  get() = definedExternally\n  set(value) =
definedExternally\n  var mode: RequestMode?\n  get() = definedExternally\n  set(value) =
definedExternally\n  var credentials: RequestCredentials?\n  get() = definedExternally\n  set(value) =
definedExternally\n  var cache: RequestCache?\n  get() = definedExternally\n  set(value) =
definedExternally\n  var redirect: RequestRedirect?\n  get() = definedExternally\n  set(value) =
definedExternally\n  var integrity: String?\n  get() = definedExternally\n  set(value) = definedExternally\n
var keepalive: Boolean?\n  get() = definedExternally\n  set(value) = definedExternally\n  var window:
Any?\n  get() = definedExternally\n  set(value) =
definedExternally\n}\n\n@Suppress("INVISIBLE_REFERENCE",
"INVISIBLE_MEMBER")\n\n@kotlin.internal.InlineOnly\npublic inline fun RequestInit(method: String? =
undefined, headers: dynamic = undefined, body: dynamic = undefined, referrer: String? = undefined, referrerPolicy:
dynamic = undefined, mode: RequestMode? = undefined, credentials: RequestCredentials? = undefined, cache:
RequestCache? = undefined, redirect: RequestRedirect? = undefined, integrity: String? = undefined, keepalive:
Boolean? = undefined, window: Any? = undefined): RequestInit {\n  val o = js("{}")\n  o["method"] =
method\n  o["headers"] = headers\n  o["body"] = body\n  o["referrer"] = referrer\n  o["referrerPolicy"] =
referrerPolicy\n  o["mode"] = mode\n  o["credentials"] = credentials\n  o["cache"] = cache\n  o["redirect"]
= redirect\n  o["integrity"] = integrity\n  o["keepalive"] = keepalive\n  o["window"] = window\n  return

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o\n}\n\n/**\n * Exposes the JavaScript [Response](https://developer.mozilla.org/en/docs/Web/API/Response) to
Kotlin\n *\npublic external open class Response(body: dynamic = definedExternally, init: ResponseInit =
definedExternally) : Body {\n  open val type: ResponseType\n  open val url: String\n  open val redirected:
Boolean\n  open val status: Short\n  open val ok: Boolean\n  open val statusText: String\n  open val headers:
Headers\n  open val body: dynamic\n  open val trailer: Promise<Headers>\n  override val bodyUsed: Boolean\n
fun clone(): Response\n  override fun arrayBuffer(): Promise<ArrayBuffer>\n  override fun blob():
Promise<Blob>\n  override fun formData(): Promise<FormData>\n  override fun json(): Promise<Any?>\n
override fun text(): Promise<String>\n\n  companion object {\n    fun error(): Response\n    fun redirect(url:
String, status: Short = definedExternally): Response\n  }\n}\n\npublic external interface ResponseInit {\n  var
status: Short? /* = 200 */\n    get() = definedExternally\n    set(value) = definedExternally\n  var statusText:
String? /* = \"OK\" */\n    get() = definedExternally\n    set(value) = definedExternally\n  var headers:
dynamic\n    get() = definedExternally\n    set(value) =
definedExternally\n}\n\n@Suppress(\"INVISIBLE_REFERENCE\",
\"INVISIBLE_MEMBER\")\n@kotlin.internal.InlineOnly\npublic inline fun ResponseInit(status: Short? = 200,
statusText: String? = \"OK\", headers: dynamic = undefined): ResponseInit {\n  val o = js(\"({})\")\n  o[\"status\"]
= status\n  o[\"statusText\"] = statusText\n  o[\"headers\"] = headers\n  return o\n}\n\n/* please, don't implement
this interface! */\n@JsName(\"null\")\n@Suppress(\"NESTED_CLASS_IN_EXTERNAL_INTERFACE\")\npublic
external interface RequestType {\n  companion object\n}\n\npublic inline val RequestType.Companion.EMPTY:
RequestType get() = \"\".asDynamic().unsafeCast<RequestType>()\n\npublic inline val
RequestType.Companion.AUDIO: RequestType get() =
\"audio\".asDynamic().unsafeCast<RequestType>()\n\npublic inline val RequestType.Companion.FONT:
RequestType get() = \"font\".asDynamic().unsafeCast<RequestType>()\n\npublic inline val
RequestType.Companion.IMAGE: RequestType get() =
\"image\".asDynamic().unsafeCast<RequestType>()\n\npublic inline val RequestType.Companion.SCRIPT:
RequestType get() = \"script\".asDynamic().unsafeCast<RequestType>()\n\npublic inline val
RequestType.Companion.STYLE: RequestType get() =
\"style\".asDynamic().unsafeCast<RequestType>()\n\npublic inline val RequestType.Companion.TRACK:
RequestType get() = \"track\".asDynamic().unsafeCast<RequestType>()\n\npublic inline val
RequestType.Companion.VIDEO: RequestType get() = \"video\".asDynamic().unsafeCast<RequestType>()\n\n/*
please, don't implement this interface!
*/\n@JsName(\"null\")\n@Suppress(\"NESTED_CLASS_IN_EXTERNAL_INTERFACE\")\npublic external
interface RequestDestination {\n  companion object\n}\n\npublic inline val
RequestDestination.Companion.EMPTY: RequestDestination get() =
\"\".asDynamic().unsafeCast<RequestDestination>()\n\npublic inline val
RequestDestination.Companion.DOCUMENT: RequestDestination get() =
\"document\".asDynamic().unsafeCast<RequestDestination>()\n\npublic inline val
RequestDestination.Companion.EMBED: RequestDestination get() =
\"embed\".asDynamic().unsafeCast<RequestDestination>()\n\npublic inline val
RequestDestination.Companion.FONT: RequestDestination get() =
\"font\".asDynamic().unsafeCast<RequestDestination>()\n\npublic inline val
RequestDestination.Companion.IMAGE: RequestDestination get() =
\"image\".asDynamic().unsafeCast<RequestDestination>()\n\npublic inline val
RequestDestination.Companion.MANIFEST: RequestDestination get() =
\"manifest\".asDynamic().unsafeCast<RequestDestination>()\n\npublic inline val
RequestDestination.Companion.MEDIA: RequestDestination get() =
\"media\".asDynamic().unsafeCast<RequestDestination>()\n\npublic inline val
RequestDestination.Companion.OBJECT: RequestDestination get() =
\"object\".asDynamic().unsafeCast<RequestDestination>()\n\npublic inline val

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RequestDestination.Companion.REPORT: RequestDestination get() =
    \"report\".asDynamic().unsafeCast<RequestDestination>()\n\npublic inline val
RequestDestination.Companion.SCRIPT: RequestDestination get() =
    \"script\".asDynamic().unsafeCast<RequestDestination>()\n\npublic inline val
RequestDestination.Companion.SERVICWORKER: RequestDestination get() =
    \"serviceworker\".asDynamic().unsafeCast<RequestDestination>()\n\npublic inline val
RequestDestination.Companion.SHAREDWORKER: RequestDestination get() =
    \"sharedworker\".asDynamic().unsafeCast<RequestDestination>()\n\npublic inline val
RequestDestination.Companion.STYLE: RequestDestination get() =
    \"style\".asDynamic().unsafeCast<RequestDestination>()\n\npublic inline val
RequestDestination.Companion.WORKER: RequestDestination get() =
    \"worker\".asDynamic().unsafeCast<RequestDestination>()\n\npublic inline val
RequestDestination.Companion.XSLT: RequestDestination get() =
    \"xslt\".asDynamic().unsafeCast<RequestDestination>()\n\n/* please, don't implement this interface!
*\n\n@JsName(\"null\")\n\n@Suppress(\"NESTED_CLASS_IN_EXTERNAL_INTERFACE\")\n\npublic external
interface RequestMode {\n    companion object\n}\n\npublic inline val RequestMode.Companion.NAVIGATE:
RequestMode get() = \"navigate\".asDynamic().unsafeCast<RequestMode>()\n\npublic inline val
RequestMode.Companion.SAME_ORIGIN: RequestMode get() = \"same-
origin\".asDynamic().unsafeCast<RequestMode>()\n\npublic inline val RequestMode.Companion.NO_CORS:
RequestMode get() = \"no-cors\".asDynamic().unsafeCast<RequestMode>()\n\npublic inline val
RequestMode.Companion.CORS: RequestMode get() = \"cors\".asDynamic().unsafeCast<RequestMode>()\n\n/*
please, don't implement this interface!
*\n\n@JsName(\"null\")\n\n@Suppress(\"NESTED_CLASS_IN_EXTERNAL_INTERFACE\")\n\npublic external
interface RequestCredentials {\n    companion object\n}\n\npublic inline val RequestCredentials.Companion.OMIT:
RequestCredentials get() = \"omit\".asDynamic().unsafeCast<RequestCredentials>()\n\npublic inline val
RequestCredentials.Companion.SAME_ORIGIN: RequestCredentials get() = \"same-
origin\".asDynamic().unsafeCast<RequestCredentials>()\n\npublic inline val
RequestCredentials.Companion.INCLUDE: RequestCredentials get() =
    \"include\".asDynamic().unsafeCast<RequestCredentials>()\n\n/* please, don't implement this interface!
*\n\n@JsName(\"null\")\n\n@Suppress(\"NESTED_CLASS_IN_EXTERNAL_INTERFACE\")\n\npublic external
interface RequestCache {\n    companion object\n}\n\npublic inline val RequestCache.Companion.DEFAULT:
RequestCache get() = \"default\".asDynamic().unsafeCast<RequestCache>()\n\npublic inline val
RequestCache.Companion.NO_STORE: RequestCache get() = \"no-
store\".asDynamic().unsafeCast<RequestCache>()\n\npublic inline val RequestCache.Companion.RELOAD:
RequestCache get() = \"reload\".asDynamic().unsafeCast<RequestCache>()\n\npublic inline val
RequestCache.Companion.NO_CACHE: RequestCache get() = \"no-
cache\".asDynamic().unsafeCast<RequestCache>()\n\npublic inline val
RequestCache.Companion.FORCE_CACHE: RequestCache get() = \"force-
cache\".asDynamic().unsafeCast<RequestCache>()\n\npublic inline val
RequestCache.Companion.ONLY_IF_CACHED: RequestCache get() = \"only-if-
cached\".asDynamic().unsafeCast<RequestCache>()\n\n/* please, don't implement this interface!
*\n\n@JsName(\"null\")\n\n@Suppress(\"NESTED_CLASS_IN_EXTERNAL_INTERFACE\")\n\npublic external
interface RequestRedirect {\n    companion object\n}\n\npublic inline val RequestRedirect.Companion.FOLLOW:
RequestRedirect get() = \"follow\".asDynamic().unsafeCast<RequestRedirect>()\n\npublic inline val
RequestRedirect.Companion.ERROR: RequestRedirect get() =
    \"error\".asDynamic().unsafeCast<RequestRedirect>()\n\npublic inline val RequestRedirect.Companion.MANUAL:
RequestRedirect get() = \"manual\".asDynamic().unsafeCast<RequestRedirect>()\n\n/* please, don't implement this
interface! *\n\n@JsName(\"null\")\n\n@Suppress(\"NESTED_CLASS_IN_EXTERNAL_INTERFACE\")\n\npublic

```

```

external interface ResponseType {
    companion object {}
    public inline val Companion.BASIC: ResponseType get() = "basic".asDynamic().unsafeCast<ResponseType>()
    public inline val Companion.CORS: ResponseType get() = "cors".asDynamic().unsafeCast<ResponseType>()
    public inline val Companion.DEFAULT: ResponseType get() = "default".asDynamic().unsafeCast<ResponseType>()
    public inline val Companion.ERROR: ResponseType get() = "error".asDynamic().unsafeCast<ResponseType>()
    public inline val Companion.OPAQUE: ResponseType get() = "opaque".asDynamic().unsafeCast<ResponseType>()
    public inline val Companion.OPAQUEREDIRECT: ResponseType get() = "opaqueredirect".asDynamic().unsafeCast<ResponseType>()
}

/*
 * Copyright 2010-2021 JetBrains s.r.o. and Kotlin Programming Language contributors.
 * Use of this source code is governed by the Apache 2.0 license that can be found in the license/LICENSE.txt file.
 */
NOTE: THIS FILE IS AUTO-GENERATED, DO NOT EDIT!
See github.com/kotlin/dukat for details

package org.w3c.dom.mediacapture

import kotlin.js.*
import org.khronos.webgl.*
import org.w3c.dom.*
import org.w3c.dom.events.*

/* Exposes the JavaScript [MediaStream](https://developer.mozilla.org/en/docs/Web/API/MediaStream) to Kotlin */
public external open class MediaStream() : EventTarget, MediaProvider {
    constructor(stream: MediaStream)
    constructor(tracks: Array<MediaStreamTrack>)
    open val id: String
    open val active: Boolean
    var onaddtrack: ((MediaStreamTrackEvent) -> dynamic)?
    var onremovetrack: ((MediaStreamTrackEvent) -> dynamic)?
    fun getAudioTracks(): Array<MediaStreamTrack>
    fun getVideoTracks(): Array<MediaStreamTrack>
    fun getTracks(): Array<MediaStreamTrack>
    fun getTrackById(trackId: String): MediaStreamTrack?
    fun addTrack(track: MediaStreamTrack)
    fun removeTrack(track: MediaStreamTrack)
    fun clone(): MediaStream

    /* Exposes the JavaScript [MediaStreamTrack](https://developer.mozilla.org/en/docs/Web/API/MediaStreamTrack) to Kotlin */
    public external abstract class MediaStreamTrack : EventTarget {
        open val kind: String
        open val id: String
        open val label: String
        open var enabled: Boolean
        open val muted: Boolean
        open var onmute: ((Event) -> dynamic)?
        open var onunmute: ((Event) -> dynamic)?
        open val readyState: MediaStreamTrackState
        open var onended: ((Event) -> dynamic)?
        open var onoverconstrained: ((Event) -> dynamic)?
        fun clone(): MediaStreamTrack
        fun stop()
        fun getCapabilities(): MediaTrackCapabilities
        fun getConstraints(): MediaTrackConstraints
        fun getSettings(): MediaTrackSettings
        fun applyConstraints(constraints: MediaTrackConstraints = definedExternally): Promise<Unit>
    }

    /* Exposes the JavaScript [MediaTrackSupportedConstraints](https://developer.mozilla.org/en/docs/Web/API/MediaTrackSupportedConstraints) to Kotlin */
    public external interface MediaTrackSupportedConstraints {
        var width: Boolean? /* = true */
        var height: Boolean? /* = true */
        var aspectRatio: Boolean? /* = true */
        var frameRate: Boolean? /* = true */
        var facingMode: Boolean? /* = true */
        var resizeMode: Boolean? /* = true */
        var volume: Boolean? /* = true */
        var sampleRate: Boolean? /* = true */
        var sampleSize: Boolean? /* = true */
        var echoCancellation: Boolean? /* = true */
        var autoGainControl: Boolean? /* = true */
        var noiseSuppression: Boolean? /* = true */
        var latency: Boolean? /* = true */
        var channelCount: Boolean? /* = true */
        var deviceId: Boolean? /* = true */
        var groupId: Boolean? /* = true */
    }
}
@Suppress("INVISIBLE_REFERENCE",

```

```

\INVISIBLE_MEMBER\)\n@kotlin.internal.InlineOnly\npublic inline fun
MediaTrackSupportedConstraints(width: Boolean? = true, height: Boolean? = true, aspectRatio: Boolean? = true,
frameRate: Boolean? = true, facingMode: Boolean? = true, resizeMode: Boolean? = true, volume: Boolean? = true,
sampleRate: Boolean? = true, sampleSize: Boolean? = true, echoCancellation: Boolean? = true, autoGainControl:
Boolean? = true, noiseSuppression: Boolean? = true, latency: Boolean? = true, channelCount: Boolean? = true,
deviceId: Boolean? = true, groupId: Boolean? = true): MediaTrackSupportedConstraints {\n  val o = js("{}")\n
o["width"] = width\n  o["height"] = height\n  o["aspectRatio"] = aspectRatio\n  o["frameRate"] =
frameRate\n  o["facingMode"] = facingMode\n  o["resizeMode"] = resizeMode\n  o["volume"] = volume\n
o["sampleRate"] = sampleRate\n  o["sampleSize"] = sampleSize\n  o["echoCancellation"] =
echoCancellation\n  o["autoGainControl"] = autoGainControl\n  o["noiseSuppression"] = noiseSuppression\n
o["latency"] = latency\n  o["channelCount"] = channelCount\n  o["deviceId"] = deviceId\n  o["groupId"] =
groupId\n  return o\n}\n\npublic external interface MediaTrackCapabilities {\n  var width: ULongRange?\n
get() = definedExternally\n  set(value) = definedExternally\n  var height: ULongRange?\n  get() =
definedExternally\n  set(value) = definedExternally\n  var aspectRatio: DoubleRange?\n  get() =
definedExternally\n  set(value) = definedExternally\n  var frameRate: DoubleRange?\n  get() =
definedExternally\n  set(value) = definedExternally\n  var facingMode: Array<String>?\n  get() =
definedExternally\n  set(value) = definedExternally\n  var resizeMode: Array<String>?\n  get() =
definedExternally\n  set(value) = definedExternally\n  var volume: DoubleRange?\n  get() =
definedExternally\n  set(value) = definedExternally\n  var sampleRate: ULongRange?\n  get() =
definedExternally\n  set(value) = definedExternally\n  var sampleSize: ULongRange?\n  get() =
definedExternally\n  set(value) = definedExternally\n  var echoCancellation: Array<Boolean>?\n  get() =
definedExternally\n  set(value) = definedExternally\n  var autoGainControl: Array<Boolean>?\n  get() =
definedExternally\n  set(value) = definedExternally\n  var noiseSuppression: Array<Boolean>?\n  get() =
definedExternally\n  set(value) = definedExternally\n  var latency: DoubleRange?\n  get() =
definedExternally\n  set(value) = definedExternally\n  var channelCount: ULongRange?\n  get() =
definedExternally\n  set(value) = definedExternally\n  var deviceId: String?\n  get() = definedExternally\n
set(value) = definedExternally\n  var groupId: String?\n  get() = definedExternally\n  set(value) =
definedExternally\n}\n\n@Suppress(\INVISIBLE_REFERENCE"),
\INVISIBLE_MEMBER\)\n@kotlin.internal.InlineOnly\npublic inline fun MediaTrackCapabilities(width:
ULongRange? = undefined, height: ULongRange? = undefined, aspectRatio: DoubleRange? = undefined,
frameRate: DoubleRange? = undefined, facingMode: Array<String>? = undefined, resizeMode: Array<String>? =
undefined, volume: DoubleRange? = undefined, sampleRate: ULongRange? = undefined, sampleSize:
ULongRange? = undefined, echoCancellation: Array<Boolean>? = undefined, autoGainControl: Array<Boolean>?
= undefined, noiseSuppression: Array<Boolean>? = undefined, latency: DoubleRange? = undefined, channelCount:
ULongRange? = undefined, deviceId: String? = undefined, groupId: String? = undefined): MediaTrackCapabilities
{\n  val o = js("{}")\n  o["width"] = width\n  o["height"] = height\n  o["aspectRatio"] = aspectRatio\n
o["frameRate"] = frameRate\n  o["facingMode"] = facingMode\n  o["resizeMode"] = resizeMode\n
o["volume"] = volume\n  o["sampleRate"] = sampleRate\n  o["sampleSize"] = sampleSize\n
o["echoCancellation"] = echoCancellation\n  o["autoGainControl"] = autoGainControl\n
o["noiseSuppression"] = noiseSuppression\n  o["latency"] = latency\n  o["channelCount"] = channelCount\n
o["deviceId"] = deviceId\n  o["groupId"] = groupId\n  return o\n}\n\n**\n * Exposes the JavaScript
[MediaTrackConstraints](https://developer.mozilla.org/en/docs/Web/API/MediaTrackConstraints) to Kotlin\n
*\n\npublic external interface MediaTrackConstraints : MediaTrackConstraintSet {\n  var advanced:
Array<MediaTrackConstraintSet>?\n  get() = definedExternally\n  set(value) =
definedExternally\n}\n\n@Suppress(\INVISIBLE_REFERENCE"),
\INVISIBLE_MEMBER\)\n@kotlin.internal.InlineOnly\npublic inline fun MediaTrackConstraints(advanced:
Array<MediaTrackConstraintSet>? = undefined, width: dynamic = undefined, height: dynamic = undefined,
aspectRatio: dynamic = undefined, frameRate: dynamic = undefined, facingMode: dynamic = undefined,

```



```

resizeMode: dynamic = undefined, volume: dynamic = undefined, sampleRate: dynamic = undefined, sampleSize:
dynamic = undefined, echoCancellation: dynamic = undefined, autoGainControl: dynamic = undefined,
noiseSuppression: dynamic = undefined, latency: dynamic = undefined, channelCount: dynamic = undefined,
deviceId: dynamic = undefined, groupId: dynamic = undefined): MediaTrackConstraints {\n  val o = js("{}")\n
o["advanced"] = advanced\n  o["width"] = width\n  o["height"] = height\n  o["aspectRatio"] =
aspectRatio\n  o["frameRate"] = frameRate\n  o["facingMode"] = facingMode\n  o["resizeMode"] =
resizeMode\n  o["volume"] = volume\n  o["sampleRate"] = sampleRate\n  o["sampleSize"] = sampleSize\n
o["echoCancellation"] = echoCancellation\n  o["autoGainControl"] = autoGainControl\n
o["noiseSuppression"] = noiseSuppression\n  o["latency"] = latency\n  o["channelCount"] = channelCount\n
o["deviceId"] = deviceId\n  o["groupId"] = groupId\n  return o\n}\n\npublic external interface
MediaTrackConstraintSet {\n  var width: dynamic\n    get() = definedExternally\n    set(value) =
definedExternally\n  var height: dynamic\n    get() = definedExternally\n    set(value) = definedExternally\n
var aspectRatio: dynamic\n    get() = definedExternally\n    set(value) = definedExternally\n  var frameRate:
dynamic\n    get() = definedExternally\n    set(value) = definedExternally\n  var facingMode: dynamic\n
get() = definedExternally\n    set(value) = definedExternally\n  var resizeMode: dynamic\n    get() =
definedExternally\n    set(value) = definedExternally\n  var volume: dynamic\n    get() = definedExternally\n
set(value) = definedExternally\n  var sampleRate: dynamic\n    get() = definedExternally\n    set(value) =
definedExternally\n  var sampleSize: dynamic\n    get() = definedExternally\n    set(value) =
definedExternally\n  var echoCancellation: dynamic\n    get() = definedExternally\n    set(value) =
definedExternally\n  var autoGainControl: dynamic\n    get() = definedExternally\n    set(value) =
definedExternally\n  var noiseSuppression: dynamic\n    get() = definedExternally\n    set(value) =
definedExternally\n  var latency: dynamic\n    get() = definedExternally\n    set(value) = definedExternally\n
var channelCount: dynamic\n    get() = definedExternally\n    set(value) = definedExternally\n  var deviceId:
dynamic\n    get() = definedExternally\n    set(value) = definedExternally\n  var groupId: dynamic\n    get()
= definedExternally\n    set(value) = definedExternally\n}\n\n@Suppress("INVISIBLE_REFERENCE",
"INVISIBLE_MEMBER")\n@kotlin.internal.InlineOnly\npublic inline fun MediaTrackConstraintSet(width:
dynamic = undefined, height: dynamic = undefined, aspectRatio: dynamic = undefined, frameRate: dynamic =
undefined, facingMode: dynamic = undefined, resizeMode: dynamic = undefined, volume: dynamic = undefined,
sampleRate: dynamic = undefined, sampleSize: dynamic = undefined, echoCancellation: dynamic = undefined,
autoGainControl: dynamic = undefined, noiseSuppression: dynamic = undefined, latency: dynamic = undefined,
channelCount: dynamic = undefined, deviceId: dynamic = undefined, groupId: dynamic = undefined):
MediaTrackConstraintSet {\n  val o = js("{}")\n  o["width"] = width\n  o["height"] = height\n
o["aspectRatio"] = aspectRatio\n  o["frameRate"] = frameRate\n  o["facingMode"] = facingMode\n
o["resizeMode"] = resizeMode\n  o["volume"] = volume\n  o["sampleRate"] = sampleRate\n
o["sampleSize"] = sampleSize\n  o["echoCancellation"] = echoCancellation\n  o["autoGainControl"] =
autoGainControl\n  o["noiseSuppression"] = noiseSuppression\n  o["latency"] = latency\n
o["channelCount"] = channelCount\n  o["deviceId"] = deviceId\n  o["groupId"] = groupId\n  return
o\n}\n\n/**\n * Exposes the JavaScript
[MediaTrackSettings](https://developer.mozilla.org/en/docs/Web/API/MediaTrackSettings) to Kotlin\n *\n\npublic
external interface MediaTrackSettings {\n  var width: Int?\n    get() = definedExternally\n    set(value) =
definedExternally\n  var height: Int?\n    get() = definedExternally\n    set(value) = definedExternally\n  var
aspectRatio: Double?\n    get() = definedExternally\n    set(value) = definedExternally\n  var frameRate:
Double?\n    get() = definedExternally\n    set(value) = definedExternally\n  var facingMode: String?\n
get() = definedExternally\n    set(value) = definedExternally\n  var resizeMode: String?\n    get() =
definedExternally\n    set(value) = definedExternally\n  var volume: Double?\n    get() = definedExternally\n
set(value) = definedExternally\n  var sampleRate: Int?\n    get() = definedExternally\n    set(value) =
definedExternally\n  var sampleSize: Int?\n    get() = definedExternally\n    set(value) = definedExternally\n
var echoCancellation: Boolean?\n    get() = definedExternally\n    set(value) = definedExternally\n  var

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autoGainControl: Boolean? \n      get() = definedExternally \n      set(value) = definedExternally \n      var
noiseSuppression: Boolean? \n      get() = definedExternally \n      set(value) = definedExternally \n      var latency:
Double? \n      get() = definedExternally \n      set(value) = definedExternally \n      var channelCount: Int? \n
get() = definedExternally \n      set(value) = definedExternally \n      var deviceId: String? \n      get() =
definedExternally \n      set(value) = definedExternally \n      var groupId: String? \n      get() = definedExternally \n
set(value) = definedExternally \n} \n \n @Suppress("INVISIBLE_REFERENCE",
"INVISIBLE_MEMBER") \n \n @kotlin.internal.InlineOnly \n \n public inline fun MediaTrackSettings(width: Int? =
undefined, height: Int? = undefined, aspectRatio: Double? = undefined, frameRate: Double? = undefined,
facingMode: String? = undefined, resizeMode: String? = undefined, volume: Double? = undefined, sampleRate: Int?
= undefined, sampleSize: Int? = undefined, echoCancellation: Boolean? = undefined, autoGainControl: Boolean? =
undefined, noiseSuppression: Boolean? = undefined, latency: Double? = undefined, channelCount: Int? = undefined,
deviceId: String? = undefined, groupId: String? = undefined): MediaTrackSettings { \n      val o = js("{}") \n
o["width"] = width \n      o["height"] = height \n      o["aspectRatio"] = aspectRatio \n      o["frameRate"] =
frameRate \n      o["facingMode"] = facingMode \n      o["resizeMode"] = resizeMode \n      o["volume"] = volume \n
o["sampleRate"] = sampleRate \n      o["sampleSize"] = sampleSize \n      o["echoCancellation"] =
echoCancellation \n      o["autoGainControl"] = autoGainControl \n      o["noiseSuppression"] = noiseSuppression \n
o["latency"] = latency \n      o["channelCount"] = channelCount \n      o["deviceId"] = deviceId \n      o["groupId"] =
groupId \n      return o \n} \n \n /** \n * Exposes the JavaScript
[MediaStreamTrackEvent](https://developer.mozilla.org/en/docs/Web/API/MediaStreamTrackEvent) to Kotlin \n
*/ \n \n public external open class MediaStreamTrackEvent(type: String, eventInitDict: MediaStreamTrackEventInit) :
Event { \n      open val track: MediaStreamTrack \n      companion object { \n          val NONE: Short \n          val
CAPTURING_PHASE: Short \n          val AT_TARGET: Short \n          val BUBBLING_PHASE: Short \n      } \n} \n \n \n public external interface MediaStreamTrackEventInit : EventInit { \n      var track:
MediaStreamTrack? \n} \n \n @Suppress("INVISIBLE_REFERENCE",
"INVISIBLE_MEMBER") \n \n @kotlin.internal.InlineOnly \n \n public inline fun MediaStreamTrackEventInit(track:
MediaStreamTrack?, bubbles: Boolean? = false, cancelable: Boolean? = false, composed: Boolean? = false):
MediaStreamTrackEventInit { \n      val o = js("{}") \n      o["track"] = track \n      o["bubbles"] = bubbles \n
o["cancelable"] = cancelable \n      o["composed"] = composed \n      return o \n} \n \n \n public external open class
OverconstrainedErrorEvent(type: String, eventInitDict: OverconstrainedErrorEventInit) : Event { \n      open val error:
dynamic \n      companion object { \n          val NONE: Short \n          val CAPTURING_PHASE: Short \n          val
AT_TARGET: Short \n          val BUBBLING_PHASE: Short \n      } \n} \n \n \n public external interface
OverconstrainedErrorEventInit : EventInit { \n      var error: dynamic /* = null */ \n      get() = definedExternally \n
set(value) = definedExternally \n} \n \n @Suppress("INVISIBLE_REFERENCE",
"INVISIBLE_MEMBER") \n \n @kotlin.internal.InlineOnly \n \n public inline fun OverconstrainedErrorEventInit(error:
dynamic = null, bubbles: Boolean? = false, cancelable: Boolean? = false, composed: Boolean? = false):
OverconstrainedErrorEventInit { \n      val o = js("{}") \n      o["error"] = error \n      o["bubbles"] = bubbles \n
o["cancelable"] = cancelable \n      o["composed"] = composed \n      return o \n} \n \n \n /** \n * Exposes the JavaScript
[MediaDevices](https://developer.mozilla.org/en/docs/Web/API/MediaDevices) to Kotlin \n
*/ \n \n public external
abstract class MediaDevices : EventTarget { \n      open var ondevicechange: ((Event) -> dynamic)? \n      fun
enumerateDevices(): Promise<Array<MediaDeviceInfo>> \n      fun getSupportedConstraints():
MediaTrackSupportedConstraints \n      fun getUserMedia(constraints: MediaStreamConstraints = definedExternally):
Promise<MediaStream> \n} \n \n /** \n * Exposes the JavaScript
[MediaDeviceInfo](https://developer.mozilla.org/en/docs/Web/API/MediaDeviceInfo) to Kotlin \n
*/ \n \n public
external abstract class MediaDeviceInfo { \n      open val deviceId: String \n      open val kind: MediaDeviceKind \n
open val label: String \n      open val groupId: String \n      fun toJSON(): dynamic \n} \n \n \n public external abstract class
InputDeviceInfo : MediaDeviceInfo { \n      fun getCapabilities(): MediaTrackCapabilities \n} \n \n \n /** \n * Exposes the
JavaScript [MediaStreamConstraints](https://developer.mozilla.org/en/docs/Web/API/MediaStreamConstraints) to
Kotlin \n
*/ \n \n public external interface MediaStreamConstraints { \n      var video: dynamic /* = false */ \n      get() =

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definedExternally\n    set(value) = definedExternally\n    var audio: dynamic /* = false */\n    get() =
definedExternally\n    set(value) = definedExternally\n}\n\n@Suppress(\"INVISIBLE_REFERENCE\",
\"INVISIBLE_MEMBER\")\n@kotlin.internal.InlineOnly\npublic inline fun MediaStreamConstraints(video:
dynamic = false, audio: dynamic = false): MediaStreamConstraints {\n    val o = js(\"({})\")\n    o[\"video\"] =
video\n    o[\"audio\"] = audio\n    return o\n}\n\npublic external interface ConstrainingPattern {\n    var
onoverconstrained: ((Event) -> dynamic)?\n    get() = definedExternally\n    set(value) = definedExternally\n
fun getCapabilities(): Capabilities\n    fun getConstraints(): Constraints\n    fun getSettings(): Settings\n    fun
applyConstraints(constraints: Constraints = definedExternally): Promise<Unit>\n}\n\n/**\n * Exposes the
JavaScript [DoubleRange](https://developer.mozilla.org/en/docs/Web/API/DoubleRange) to Kotlin\n */\npublic
external interface DoubleRange {\n    var max: Double?\n    get() = definedExternally\n    set(value) =
definedExternally\n    var min: Double?\n    get() = definedExternally\n    set(value) =
definedExternally\n}\n\n@Suppress(\"INVISIBLE_REFERENCE\",
\"INVISIBLE_MEMBER\")\n@kotlin.internal.InlineOnly\npublic inline fun DoubleRange(max: Double? =
undefined, min: Double? = undefined): DoubleRange {\n    val o = js(\"({})\")\n    o[\"max\"] = max\n    o[\"min\"] =
min\n    return o\n}\n\npublic external interface ConstrainDoubleRange : DoubleRange {\n    var exact: Double?\n
get() = definedExternally\n    set(value) = definedExternally\n    var ideal: Double?\n    get() =
definedExternally\n    set(value) = definedExternally\n}\n\n@Suppress(\"INVISIBLE_REFERENCE\",
\"INVISIBLE_MEMBER\")\n@kotlin.internal.InlineOnly\npublic inline fun ConstrainDoubleRange(exact: Double?
= undefined, ideal: Double? = undefined, max: Double? = undefined, min: Double? = undefined):
ConstrainDoubleRange {\n    val o = js(\"({})\")\n    o[\"exact\"] = exact\n    o[\"ideal\"] = ideal\n    o[\"max\"] =
max\n    o[\"min\"] = min\n    return o\n}\n\npublic external interface ULongRange {\n    var max: Int?\n    get() =
definedExternally\n    set(value) = definedExternally\n    var min: Int?\n    get() = definedExternally\n
set(value) = definedExternally\n}\n\n@Suppress(\"INVISIBLE_REFERENCE\",
\"INVISIBLE_MEMBER\")\n@kotlin.internal.InlineOnly\npublic inline fun ULongRange(max: Int? = undefined,
min: Int? = undefined): ULongRange {\n    val o = js(\"({})\")\n    o[\"max\"] = max\n    o[\"min\"] = min\n    return
o\n}\n\npublic external interface ConstrainULongRange : ULongRange {\n    var exact: Int?\n    get() =
definedExternally\n    set(value) = definedExternally\n    var ideal: Int?\n    get() = definedExternally\n
set(value) = definedExternally\n}\n\n@Suppress(\"INVISIBLE_REFERENCE\",
\"INVISIBLE_MEMBER\")\n@kotlin.internal.InlineOnly\npublic inline fun ConstrainULongRange(exact: Int? =
undefined, ideal: Int? = undefined, max: Int? = undefined, min: Int? = undefined): ConstrainULongRange {\n    val o
= js(\"({})\")\n    o[\"exact\"] = exact\n    o[\"ideal\"] = ideal\n    o[\"max\"] = max\n    o[\"min\"] = min\n    return
o\n}\n\n/**\n * Exposes the JavaScript
[ConstrainBooleanParameters](https://developer.mozilla.org/en/docs/Web/API/ConstrainBooleanParameters) to
Kotlin\n */\npublic external interface ConstrainBooleanParameters {\n    var exact: Boolean?\n    get() =
definedExternally\n    set(value) = definedExternally\n    var ideal: Boolean?\n    get() = definedExternally\n
set(value) = definedExternally\n}\n\n@Suppress(\"INVISIBLE_REFERENCE\",
\"INVISIBLE_MEMBER\")\n@kotlin.internal.InlineOnly\npublic inline fun ConstrainBooleanParameters(exact:
Boolean? = undefined, ideal: Boolean? = undefined): ConstrainBooleanParameters {\n    val o = js(\"({})\")\n
o[\"exact\"] = exact\n    o[\"ideal\"] = ideal\n    return o\n}\n\n/**\n * Exposes the JavaScript
[ConstrainDOMStringParameters](https://developer.mozilla.org/en/docs/Web/API/ConstrainDOMStringParameters)
to Kotlin\n */\npublic external interface ConstrainDOMStringParameters {\n    var exact: dynamic\n    get() =
definedExternally\n    set(value) = definedExternally\n    var ideal: dynamic\n    get() = definedExternally\n
set(value) = definedExternally\n}\n\n@Suppress(\"INVISIBLE_REFERENCE\",
\"INVISIBLE_MEMBER\")\n@kotlin.internal.InlineOnly\npublic inline fun
ConstrainDOMStringParameters(exact: dynamic = undefined, ideal: dynamic = undefined):
ConstrainDOMStringParameters {\n    val o = js(\"({})\")\n    o[\"exact\"] = exact\n    o[\"ideal\"] = ideal\n    return
o\n}\n\npublic external interface Capabilities\n@Suppress(\"INVISIBLE_REFERENCE\",
\"INVISIBLE_MEMBER\")\n@kotlin.internal.InlineOnly\npublic inline fun Capabilities(): Capabilities {\n    val o

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```

= js("{}")\n    return o\n}\n\npublic external interface Settings\n\n@Suppress("INVISIBLE_REFERENCE",
"INVISIBLE_MEMBER")\n@kotlin.internal.InlineOnly\npublic inline fun Settings(): Settings {\n    val o =
js("{}")\n    return o\n}\n\npublic external interface ConstraintSet\n\n@Suppress("INVISIBLE_REFERENCE",
"INVISIBLE_MEMBER")\n@kotlin.internal.InlineOnly\npublic inline fun ConstraintSet(): ConstraintSet {\n
val o = js("{}")\n    return o\n}\n\npublic external interface Constraints : ConstraintSet {\n    var advanced:
Array<ConstraintSet>?\n    get() = definedExternally\n    set(value) =
definedExternally\n}\n\n@Suppress("INVISIBLE_REFERENCE",
"INVISIBLE_MEMBER")\n@kotlin.internal.InlineOnly\npublic inline fun Constraints(advanced:
Array<ConstraintSet>? = undefined): Constraints {\n    val o = js("{}")\n    o["advanced"] = advanced\n
return o\n}\n\n/* please, don't implement this interface!
*\n\n@JsName("null")\n@Suppress("NESTED_CLASS_IN_EXTERNAL_INTERFACE")\npublic external
interface MediaStreamTrackState {\n    companion object\n}\n\npublic inline val
MediaStreamTrackState.Companion.LIVE: MediaStreamTrackState get() =
"live".asDynamic().unsafeCast<MediaStreamTrackState>()\n\npublic inline val
MediaStreamTrackState.Companion.ENDED: MediaStreamTrackState get() =
"ended".asDynamic().unsafeCast<MediaStreamTrackState>()\n\n/* please, don't implement this interface!
*\n\n@JsName("null")\n@Suppress("NESTED_CLASS_IN_EXTERNAL_INTERFACE")\npublic external
interface VideoFacingModeEnum {\n    companion object\n}\n\npublic inline val
VideoFacingModeEnum.Companion.USER: VideoFacingModeEnum get() =
"user".asDynamic().unsafeCast<VideoFacingModeEnum>()\n\npublic inline val
VideoFacingModeEnum.Companion.ENVIRONMENT: VideoFacingModeEnum get() =
"environment".asDynamic().unsafeCast<VideoFacingModeEnum>()\n\npublic inline val
VideoFacingModeEnum.Companion.LEFT: VideoFacingModeEnum get() =
"left".asDynamic().unsafeCast<VideoFacingModeEnum>()\n\npublic inline val
VideoFacingModeEnum.Companion.RIGHT: VideoFacingModeEnum get() =
"right".asDynamic().unsafeCast<VideoFacingModeEnum>()\n\n/* please, don't implement this interface!
*\n\n@JsName("null")\n@Suppress("NESTED_CLASS_IN_EXTERNAL_INTERFACE")\npublic external
interface VideoResizeModeEnum {\n    companion object\n}\n\npublic inline val
VideoResizeModeEnum.Companion.NONE: VideoResizeModeEnum get() =
"none".asDynamic().unsafeCast<VideoResizeModeEnum>()\n\npublic inline val
VideoResizeModeEnum.Companion.CROP_AND_SCALE: VideoResizeModeEnum get() = "crop-and-
scale".asDynamic().unsafeCast<VideoResizeModeEnum>()\n\n/* please, don't implement this interface!
*\n\n@JsName("null")\n@Suppress("NESTED_CLASS_IN_EXTERNAL_INTERFACE")\npublic external
interface MediaDeviceKind {\n    companion object\n}\n\npublic inline val
MediaDeviceKind.Companion.AUDIOINPUT: MediaDeviceKind get() =
"audioinput".asDynamic().unsafeCast<MediaDeviceKind>()\n\npublic inline val
MediaDeviceKind.Companion.AUDIOOUTPUT: MediaDeviceKind get() =
"audiooutput".asDynamic().unsafeCast<MediaDeviceKind>()\n\npublic inline val
MediaDeviceKind.Companion.VIDEOINPUT: MediaDeviceKind get() =
"videoinput".asDynamic().unsafeCast<MediaDeviceKind>()
}

/*\n * Copyright 2010-2021 JetBrains s.r.o. and
Kotlin Programming Language contributors.\n * Use of this source code is governed by the Apache 2.0 license that
can be found in the license/LICENSE.txt file.\n */\n\n// NOTE: THIS FILE IS AUTO-GENERATED, DO NOT
EDIT!\n\n// See github.com/kotlin/dukat for details\n\npackage org.w3c.dom.mediasource\n\nimport
kotlin.js.*\nimport org.khronos.webgl.*\nimport org.w3c.dom.*\nimport org.w3c.dom.events.*\n\n/**\n * Exposes
the JavaScript [MediaSource](https://developer.mozilla.org/en/docs/Web/API/MediaSource) to Kotlin\n */\n\npublic
external open class MediaSource : EventTarget, MediaProvider {\n    open val sourceBuffers: SourceBufferList\n
open val activeSourceBuffers: SourceBufferList\n    open val readyState: ReadyState\n    var duration: Double\n
var onsourceopen: ((Event) -> dynamic)?\n    var onsourceended: ((Event) -> dynamic)?\n    var onsourceclose:

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((Event) -> dynamic)?\n fun addSourceBuffer(type: String): SourceBuffer\n fun
removeSourceBuffer(sourceBuffer: SourceBuffer)\n fun endOfStream(error: EndOfStreamError =
definedExternally)\n fun setLiveSeekableRange(start: Double, end: Double)\n fun clearLiveSeekableRange()\n\n
companion object {\n fun isTypeSupported(type: String): Boolean\n }\n}\n\n/**\n * Exposes the JavaScript
[SourceBuffer](https://developer.mozilla.org/en/docs/Web/API/SourceBuffer) to Kotlin\n *\n\npublic external
abstract class SourceBuffer : EventTarget {\n open var mode: AppendMode\n open val updating: Boolean\n
open val buffered: TimeRanges\n open var timestampOffset: Double\n open val audioTracks: AudioTrackList\n
open val videoTracks: VideoTrackList\n open val textTracks: TextTrackList\n open var appendWindowStart:
Double\n open var appendWindowEnd: Double\n open var onupdatestart: ((Event) -> dynamic)?\n open var
onupdate: ((Event) -> dynamic)?\n open var onupdateend: ((Event) -> dynamic)?\n open var onerror: ((Event) ->
dynamic)?\n open var onabort: ((Event) -> dynamic)?\n fun appendBuffer(data: dynamic)\n fun abort()\n fun
remove(start: Double, end: Double)\n}\n\n\n/**\n * Exposes the JavaScript
[SourceBufferList](https://developer.mozilla.org/en/docs/Web/API/SourceBufferList) to Kotlin\n *\n\npublic
external abstract class SourceBufferList : EventTarget {\n open val length: Int\n open var onaddsourcebuffer:
((Event) -> dynamic)?\n open var onremovesourcebuffer: ((Event) ->
dynamic)?\n}\n\n@Suppress("INVISIBLE_REFERENCE",
"INVISIBLE_MEMBER")\n@kotlin.internal.InlineOnly\npublic inline operator fun SourceBufferList.get(index:
Int): SourceBuffer? = asDynamic()[index]\n\n/* please, don't implement this interface!
*\n\n@JsName("null")\n@Suppress("NESTED_CLASS_IN_EXTERNAL_INTERFACE")\n\npublic external
interface ReadyState {\n companion object\n}\n\n\npublic inline val ReadyState.Companion.CLOSED: ReadyState
get() = "closed".asDynamic().unsafeCast<ReadyState>()\n\n\npublic inline val ReadyState.Companion.OPEN:
ReadyState get() = "open".asDynamic().unsafeCast<ReadyState>()\n\n\npublic inline val
ReadyState.Companion.ENDED: ReadyState get() = "ended".asDynamic().unsafeCast<ReadyState>()\n\n\n/*
please, don't implement this interface!
*\n\n@JsName("null")\n@Suppress("NESTED_CLASS_IN_EXTERNAL_INTERFACE")\n\npublic external
interface EndOfStreamError {\n companion object\n}\n\n\npublic inline val
EndOfStreamError.Companion.NETWORK: EndOfStreamError get() =
"network".asDynamic().unsafeCast<EndOfStreamError>()\n\n\npublic inline val
EndOfStreamError.Companion.DECODE: EndOfStreamError get() =
"decode".asDynamic().unsafeCast<EndOfStreamError>()\n\n\n/* please, don't implement this interface!
*\n\n@JsName("null")\n@Suppress("NESTED_CLASS_IN_EXTERNAL_INTERFACE")\n\npublic external
interface AppendMode {\n companion object\n}\n\n\npublic inline val AppendMode.Companion.SEGMENTS:
AppendMode get() = "segments".asDynamic().unsafeCast<AppendMode>()\n\n\npublic inline val
AppendMode.Companion.SEQUENCE: AppendMode get() =
"sequence".asDynamic().unsafeCast<AppendMode>()\n\n\n\n/*\n * Copyright 2010-2021 JetBrains s.r.o. and Kotlin
Programming Language contributors.\n * Use of this source code is governed by the Apache 2.0 license that can be
found in the license/LICENSE.txt file.\n *\n\n\n// NOTE: THIS FILE IS AUTO-GENERATED, DO NOT EDIT!\n\n//
See github.com/kotlin/dukat for details\n\n\npackage org.w3c.dom.pointerevents\n\n\nimport kotlin.js.*\n\nimport
org.khronos.webgl.*\n\nimport org.w3c.dom.*\n\nimport org.w3c.dom.events.*\n\n\n\npublic external interface
PointerEventInit : MouseEventInit {\n var pointerId: Int? /* = 0 */\n get() = definedExternally\n
set(value) = definedExternally\n var width: Double? /* = 1.0 */\n get() = definedExternally\n set(value) =
definedExternally\n var height: Double? /* = 1.0 */\n get() = definedExternally\n set(value) =
definedExternally\n var pressure: Float? /* = 0f */\n get() = definedExternally\n set(value) =
definedExternally\n var tangentialPressure: Float? /* = 0f */\n get() = definedExternally\n set(value) =
definedExternally\n var tiltX: Int? /* = 0 */\n get() = definedExternally\n set(value) = definedExternally\n
var tiltY: Int? /* = 0 */\n get() = definedExternally\n set(value) = definedExternally\n var twist: Int? /* =
0 */\n get() = definedExternally\n set(value) = definedExternally\n var pointerType: String? /* = "" */\n
get() = definedExternally\n set(value) = definedExternally\n var isPrimary: Boolean? /* = false */\n

```

```

get() = definedExternally\n    set(value) = definedExternally\n}\n\n@Suppress(\"INVISIBLE_REFERENCE\",
\"INVISIBLE_MEMBER\")\n@kotlin.internal.InlineOnly\npublic inline fun PointerEventInit(pointerId: Int? = 0,
width: Double? = 1.0, height: Double? = 1.0, pressure: Float? = 0f, tangentialPressure: Float? = 0f, tiltX: Int? = 0,
tiltY: Int? = 0, twist: Int? = 0, pointerType: String? = \"\", isPrimary: Boolean? = false, screenX: Int? = 0, screenY:
Int? = 0, clientX: Int? = 0, clientY: Int? = 0, button: Short? = 0, buttons: Short? = 0, relatedTarget: EventTarget? =
null, region: String? = null, ctrlKey: Boolean? = false, shiftKey: Boolean? = false, altKey: Boolean? = false,
metaKey: Boolean? = false, modifierAltGraph: Boolean? = false, modifierCapsLock: Boolean? = false, modifierFn:
Boolean? = false, modifierFnLock: Boolean? = false, modifierHyper: Boolean? = false, modifierNumLock:
Boolean? = false, modifierScrollLock: Boolean? = false, modifierSuper: Boolean? = false, modifierSymbol:
Boolean? = false, modifierSymbolLock: Boolean? = false, view: Window? = null, detail: Int? = 0, bubbles:
Boolean? = false, cancelable: Boolean? = false, composed: Boolean? = false): PointerEventInit {\n    val o =
js(\"({})\")\n    o[\"pointerId\"] = pointerId\n    o[\"width\"] = width\n    o[\"height\"] = height\n    o[\"pressure\"] =
pressure\n    o[\"tangentialPressure\"] = tangentialPressure\n    o[\"tiltX\"] = tiltX\n    o[\"tiltY\"] = tiltY\n
o[\"twist\"] = twist\n    o[\"pointerType\"] = pointerType\n    o[\"isPrimary\"] = isPrimary\n    o[\"screenX\"] =
screenX\n    o[\"screenY\"] = screenY\n    o[\"clientX\"] = clientX\n    o[\"clientY\"] = clientY\n    o[\"button\"] =
button\n    o[\"buttons\"] = buttons\n    o[\"relatedTarget\"] = relatedTarget\n    o[\"region\"] = region\n
o[\"ctrlKey\"] = ctrlKey\n    o[\"shiftKey\"] = shiftKey\n    o[\"altKey\"] = altKey\n    o[\"metaKey\"] = metaKey\n
o[\"modifierAltGraph\"] = modifierAltGraph\n    o[\"modifierCapsLock\"] = modifierCapsLock\n
o[\"modifierFn\"] = modifierFn\n    o[\"modifierFnLock\"] = modifierFnLock\n    o[\"modifierHyper\"] =
modifierHyper\n    o[\"modifierNumLock\"] = modifierNumLock\n    o[\"modifierScrollLock\"] =
modifierScrollLock\n    o[\"modifierSuper\"] = modifierSuper\n    o[\"modifierSymbol\"] = modifierSymbol\n
o[\"modifierSymbolLock\"] = modifierSymbolLock\n    o[\"view\"] = view\n    o[\"detail\"] = detail\n
o[\"bubbles\"] = bubbles\n    o[\"cancelable\"] = cancelable\n    o[\"composed\"] = composed\n    return
o\n}\n\n/**\n * Exposes the JavaScript

```

```

[PointerEvent](https://developer.mozilla.org/en/docs/Web/API/PointerEvent) to Kotlin\n\npublic external open
class PointerEvent(type: String, eventInitDict: PointerEventInit = definedExternally) : MouseEvent {\n    open val
pointerId: Int\n    open val width: Double\n    open val height: Double\n    open val pressure: Float\n    open val
tangentialPressure: Float\n    open val tiltX: Int\n    open val tiltY: Int\n    open val twist: Int\n    open val
pointerType: String\n    open val isPrimary: Boolean\n\n    companion object {\n        val NONE: Short\n        val
CAPTURING_PHASE: Short\n        val AT_TARGET: Short\n        val BUBBLING_PHASE: Short\n    }\n}\n\n/**\n * Copyright 2010-2021 JetBrains s.r.o. and Kotlin Programming Language contributors.\n * Use of this source code
is governed by the Apache 2.0 license that can be found in the license/LICENSE.txt file.\n\n// NOTE: THIS
FILE IS AUTO-GENERATED, DO NOT EDIT!\n\n// See github.com/kotlin/dukat for details\n\npackage
org.w3c.dom.svg\n\nimport kotlin.js.*\nimport org.khronos.webgl.*\nimport org.w3c.dom.*\nimport
org.w3c.dom.css.*\n\n/**\n * Exposes the JavaScript

```

```

[SVGElement](https://developer.mozilla.org/en/docs/Web/API/SVGElement) to Kotlin\n\npublic external
abstract class SVGElement : Element, ElementCSSInlineStyle, GlobalEventHandlers, SVGElementInstance {\n
open val dataset: DOMStringMap\n    open val ownerSVGElement: SVGSVGElement?\n    open val
viewportElement: SVGElement?\n    open var tabIndex: Int\n    fun focus()\n    fun blur()\n\n    companion object
{\n        val ELEMENT_NODE: Short\n        val ATTRIBUTE_NODE: Short\n        val TEXT_NODE: Short\n
val CDATA_SECTION_NODE: Short\n        val ENTITY_REFERENCE_NODE: Short\n        val
ENTITY_NODE: Short\n        val PROCESSING_INSTRUCTION_NODE: Short\n        val COMMENT_NODE:
Short\n        val DOCUMENT_NODE: Short\n        val DOCUMENT_TYPE_NODE: Short\n        val
DOCUMENT_FRAGMENT_NODE: Short\n        val NOTATION_NODE: Short\n        val
DOCUMENT_POSITION_DISCONNECTED: Short\n        val DOCUMENT_POSITION_PRECEDING: Short\n
val DOCUMENT_POSITION_FOLLOWING: Short\n        val DOCUMENT_POSITION_CONTAINS: Short\n
val DOCUMENT_POSITION_CONTAINED_BY: Short\n        val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n    }\n}\n\npublic external interface

```

```

SVGBoundingBoxOptions {
    var fill: Boolean? /* = true */
    get() = definedExternally
    set(value) = definedExternally
    var stroke: Boolean? /* = false */
    get() = definedExternally
    set(value) = definedExternally
    var markers: Boolean? /* = false */
    get() = definedExternally
    set(value) = definedExternally
    var clipped: Boolean? /* = false */
    get() = definedExternally
    set(value) = definedExternally
}
@Suppress("INVISIBLE_REFERENCE", "INVISIBLE_MEMBER")
@kotlin.internal.InlineOnly
public inline fun SVGBoundingBoxOptions(fill: Boolean? = true, stroke: Boolean? = false, markers: Boolean? = false, clipped: Boolean? = false): SVGBoundingBoxOptions {
    val o = js("{}")
    o["fill"] = fill
    o["stroke"] = stroke
    o["markers"] = markers
    o["clipped"] = clipped
    return o
}
/**
 * Exposes the JavaScript [SVGGraphicsElement](https://developer.mozilla.org/en/docs/Web/API/SVGGraphicsElement) to Kotlin
 */
public external abstract class SVGGraphicsElement : SVGElement, SVGTests {
    open val transform: SVGAnimatedTransformList
    fun getBBox(options: SVGBoundingBoxOptions = definedExternally): DOMRect
    fun getCTM(): DOMMatrix?
    fun getScreenCTM(): DOMMatrix?
    companion object {
        val ELEMENT_NODE: Short
        val ATTRIBUTE_NODE: Short
        val TEXT_NODE: Short
        val CDATA_SECTION_NODE: Short
        val ENTITY_REFERENCE_NODE: Short
        val ENTITY_NODE: Short
        val PROCESSING_INSTRUCTION_NODE: Short
        val COMMENT_NODE: Short
        val DOCUMENT_NODE: Short
        val DOCUMENT_TYPE_NODE: Short
        val DOCUMENT_FRAGMENT_NODE: Short
        val NOTATION_NODE: Short
        val DOCUMENT_POSITION_DISCONNECTED: Short
        val DOCUMENT_POSITION_PRECEDING: Short
        val DOCUMENT_POSITION_FOLLOWING: Short
        val DOCUMENT_POSITION_CONTAINS: Short
        val DOCUMENT_POSITION_CONTAINED_BY: Short
        val DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short
    }
}
/**
 * Exposes the JavaScript [SVGGeometryElement](https://developer.mozilla.org/en/docs/Web/API/SVGGeometryElement) to Kotlin
 */
public external abstract class SVGGeometryElement : SVGGraphicsElement {
    open val pathLength: SVGAnimatedNumber
    fun isPointInFill(point: DOMPoint): Boolean
    fun isPointInStroke(point: DOMPoint): Boolean
    fun getTotalLength(): Float
    fun getPointAtLength(distance: Float): DOMPoint
    companion object {
        val ELEMENT_NODE: Short
        val ATTRIBUTE_NODE: Short
        val TEXT_NODE: Short
        val CDATA_SECTION_NODE: Short
        val ENTITY_REFERENCE_NODE: Short
        val ENTITY_NODE: Short
        val PROCESSING_INSTRUCTION_NODE: Short
        val COMMENT_NODE: Short
        val DOCUMENT_NODE: Short
        val DOCUMENT_TYPE_NODE: Short
        val DOCUMENT_FRAGMENT_NODE: Short
        val NOTATION_NODE: Short
        val DOCUMENT_POSITION_DISCONNECTED: Short
        val DOCUMENT_POSITION_PRECEDING: Short
        val DOCUMENT_POSITION_FOLLOWING: Short
        val DOCUMENT_POSITION_CONTAINS: Short
        val DOCUMENT_POSITION_CONTAINED_BY: Short
        val DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short
    }
}
/**
 * Exposes the JavaScript [SVGNumber](https://developer.mozilla.org/en/docs/Web/API/SVGNumber) to Kotlin
 */
public external abstract class SVGNumber {
    open var value: Float
}
/**
 * Exposes the JavaScript [SVGLength](https://developer.mozilla.org/en/docs/Web/API/SVGLength) to Kotlin
 */
public external abstract class SVGLength {
    open val unitType: Short
    open var value: Float
    open var valueInSpecifiedUnits: Float
    open var valueAsString: String
    fun newValueSpecifiedUnits(unitType: Short, valueInSpecifiedUnits: Float)
    fun convertToSpecifiedUnits(unitType: Short)
    companion object {
        val SVG_LENGTHTYPE_UNKNOWN: Short
        val SVG_LENGTHTYPE_NUMBER: Short
        val SVG_LENGTHTYPE_PERCENTAGE: Short
        val SVG_LENGTHTYPE_EMS: Short
        val SVG_LENGTHTYPE_EXS: Short
        val SVG_LENGTHTYPE_PX: Short
        val SVG_LENGTHTYPE_CM: Short
        val SVG_LENGTHTYPE_MM: Short
        val SVG_LENGTHTYPE_IN: Short
        val SVG_LENGTHTYPE_PT: Short
        val SVG_LENGTHTYPE_PC: Short
    }
}
/**
 * Exposes the JavaScript [SVGAngle](https://developer.mozilla.org/en/docs/Web/API/SVGAngle) to Kotlin
 */
public external abstract

```

```

class SVGAngle {\n  open val unitType: Short\n  open var value: Float\n  open var valueInSpecifiedUnits:
Float\n  open var valueAsString: String\n  fun newValueSpecifiedUnits(unitType: Short, valueInSpecifiedUnits:
Float)\n  fun convertToSpecifiedUnits(unitType: Short)\n\n  companion object {\n    val
SVG_ANGLETYPE_UNKNOWN: Short\n    val SVG_ANGLETYPE_UNSPECIFIED: Short\n    val
SVG_ANGLETYPE_DEG: Short\n    val SVG_ANGLETYPE_RAD: Short\n    val
SVG_ANGLETYPE_GRAD: Short\n  }\n\n  public external abstract class SVGNameList {\n  open val length:
Int\n  open val numberOfItems: Int\n  fun clear()\n  fun initialize(newItem: dynamic): dynamic\n  fun
insertItemBefore(newItem: dynamic, index: Int): dynamic\n  fun replaceItem(newItem: dynamic, index: Int):
dynamic\n  fun removeItem(index: Int): dynamic\n  fun appendItem(newItem: dynamic): dynamic\n  fun
getItem(index: Int): dynamic\n}\n\n  @Suppress("INVISIBLE_REFERENCE",
"INVISIBLE_MEMBER")\n  @kotlin.internal.InlineOnly\n  public inline operator fun SVGNameList.get(index: Int):
dynamic = asDynamic()[index]\n\n  @Suppress("INVISIBLE_REFERENCE",
"INVISIBLE_MEMBER")\n  @kotlin.internal.InlineOnly\n  public inline operator fun SVGNameList.set(index: Int,
newItem: dynamic) { asDynamic()[index] = newItem }\n\n  /**\n   * Exposes the JavaScript
[SVGNumberList](https://developer.mozilla.org/en/docs/Web/API/SVGNumberList) to Kotlin\n   */\n  public external
abstract class SVGNumberList {\n  open val length: Int\n  open val numberOfItems: Int\n  fun clear()\n  fun
initialize(newItem: SVGNumber): SVGNumber\n  fun insertItemBefore(newItem: SVGNumber, index: Int):
SVGNumber\n  fun replaceItem(newItem: SVGNumber, index: Int): SVGNumber\n  fun removeItem(index: Int):
SVGNumber\n  fun appendItem(newItem: SVGNumber): SVGNumber\n  fun getItem(index: Int):
SVGNumber\n}\n\n  @Suppress("INVISIBLE_REFERENCE",
"INVISIBLE_MEMBER")\n  @kotlin.internal.InlineOnly\n  public inline operator fun SVGNumberList.get(index:
Int): SVGNumber? = asDynamic()[index]\n\n  @Suppress("INVISIBLE_REFERENCE",
"INVISIBLE_MEMBER")\n  @kotlin.internal.InlineOnly\n  public inline operator fun SVGNumberList.set(index:
Int, newItem: SVGNumber) { asDynamic()[index] = newItem }\n\n  /**\n   * Exposes the JavaScript
[SVGLengthList](https://developer.mozilla.org/en/docs/Web/API/SVGLengthList) to Kotlin\n   */\n  public external
abstract class SVGLengthList {\n  open val length: Int\n  open val numberOfItems: Int\n  fun clear()\n  fun
initialize(newItem: SVGLength): SVGLength\n  fun insertItemBefore(newItem: SVGLength, index: Int):
SVGLength\n  fun replaceItem(newItem: SVGLength, index: Int): SVGLength\n  fun removeItem(index: Int):
SVGLength\n  fun appendItem(newItem: SVGLength): SVGLength\n  fun getItem(index: Int):
SVGLength\n}\n\n  @Suppress("INVISIBLE_REFERENCE",
"INVISIBLE_MEMBER")\n  @kotlin.internal.InlineOnly\n  public inline operator fun SVGLengthList.get(index:
Int): SVGLength? = asDynamic()[index]\n\n  @Suppress("INVISIBLE_REFERENCE",
"INVISIBLE_MEMBER")\n  @kotlin.internal.InlineOnly\n  public inline operator fun SVGLengthList.set(index: Int,
newItem: SVGLength) { asDynamic()[index] = newItem }\n\n  /**\n   * Exposes the JavaScript
[SVGAnimatedBoolean](https://developer.mozilla.org/en/docs/Web/API/SVGAnimatedBoolean) to Kotlin\n   */\n  public external
abstract class SVGAnimatedBoolean {\n  open var baseVal: Boolean\n  open val animVal:
Boolean\n}\n\n  /**\n   * Exposes the JavaScript
[SVGAnimatedEnumeration](https://developer.mozilla.org/en/docs/Web/API/SVGAnimatedEnumeration) to
Kotlin\n   */\n  public external abstract class SVGAnimatedEnumeration {\n  open var baseVal: Short\n  open val
animVal: Short\n}\n\n  /**\n   * Exposes the JavaScript
[SVGAnimatedInteger](https://developer.mozilla.org/en/docs/Web/API/SVGAnimatedInteger) to Kotlin\n   */\n  public external
abstract class SVGAnimatedInteger {\n  open var baseVal: Int\n  open val animVal:
Int\n}\n\n  /**\n   * Exposes the JavaScript
[SVGAnimatedNumber](https://developer.mozilla.org/en/docs/Web/API/SVGAnimatedNumber) to Kotlin\n   */\n  public external
abstract class SVGAnimatedNumber {\n  open var baseVal: Float\n  open val animVal:
Float\n}\n\n  /**\n   * Exposes the JavaScript
[SVGAnimatedLength](https://developer.mozilla.org/en/docs/Web/API/SVGAnimatedLength) to Kotlin\n   */\n  public external
abstract class SVGAnimatedLength {\n  open val baseVal: SVGLength\n  open val animVal:
SVGLength\n}

```


SVGLength}\n\n/**\n * Exposes the JavaScript [SVGAnimatedAngle](https://developer.mozilla.org/en/docs/Web/API/SVGAnimatedAngle) to Kotlin\n *\npublic external abstract class SVGAnimatedAngle {\n open val baseVal: SVGAngle\n open val animVal: SVGAngle\n}\n\n/**\n * Exposes the JavaScript [SVGAnimatedString](https://developer.mozilla.org/en/docs/Web/API/SVGAnimatedString) to Kotlin\n *\npublic external abstract class SVGAnimatedString {\n open var baseVal: String\n open val animVal: String\n}\n\n/**\n * Exposes the JavaScript [SVGAnimatedRect](https://developer.mozilla.org/en/docs/Web/API/SVGAnimatedRect) to Kotlin\n *\npublic external abstract class SVGAnimatedRect {\n open val baseVal: DOMRect\n open val animVal: DOMRectReadOnly\n}\n\n/**\n * Exposes the JavaScript [SVGAnimatedNumberList](https://developer.mozilla.org/en/docs/Web/API/SVGAnimatedNumberList) to Kotlin\n *\npublic external abstract class SVGAnimatedNumberList {\n open val baseVal: SVGNumberList\n open val animVal: SVGNumberList\n}\n\n/**\n * Exposes the JavaScript [SVGAnimatedLengthList](https://developer.mozilla.org/en/docs/Web/API/SVGAnimatedLengthList) to Kotlin\n *\npublic external abstract class SVGAnimatedLengthList {\n open val baseVal: SVGLengthList\n open val animVal: SVGLengthList\n}\n\n/**\n * Exposes the JavaScript [SVGStringList](https://developer.mozilla.org/en/docs/Web/API/SVGStringList) to Kotlin\n *\npublic external abstract class SVGStringList {\n open val length: Int\n open val numberOfItems: Int\n fun clear()\n fun initialize(newItem: String): String\n fun insertItemBefore(newItem: String, index: Int): String\n fun replaceItem(newItem: String, index: Int): String\n fun removeItem(index: Int): String\n fun appendItem(newItem: String): String\n fun getItem(index: Int): String\n}\n\n@Suppress(\"INVISIBLE_REFERENCE\", \"INVISIBLE_MEMBER\")\n@kotlin.internal.InlineOnly\npublic inline operator fun SVGStringList.get(index: Int): String? = asDynamic()[index]\n\n@Suppress(\"INVISIBLE_REFERENCE\", \"INVISIBLE_MEMBER\")\n@kotlin.internal.InlineOnly\npublic inline operator fun SVGStringList.set(index: Int, newItem: String) { asDynamic()[index] = newItem }\n\n/**\n * Exposes the JavaScript [SVGUnitTypes](https://developer.mozilla.org/en/docs/Web/API/SVGUnitTypes) to Kotlin\n *\n@Suppress(\"NESTED_CLASS_IN_EXTERNAL_INTERFACE\")\npublic external interface SVGUnitTypes {\n companion object {\n val SVG_UNIT_TYPE_UNKNOWN: Short\n val SVG_UNIT_TYPE_USERSPACEONUSE: Short\n val SVG_UNIT_TYPE_OBJECTBOUNDINGBOX: Short\n }\n}\n\n/**\n * Exposes the JavaScript [SVGTTests](https://developer.mozilla.org/en/docs/Web/API/SVGTTests) to Kotlin\n *\npublic external interface SVGTTests {\n val requiredExtensions: SVGStringList\n val systemLanguage: SVGStringList\n}\n\npublic external interface SVGFitToViewBox {\n val viewBox: SVGAnimatedRect\n val preserveAspectRatio: SVGAnimatedPreserveAspectRatio\n}\n\n/**\n * Exposes the JavaScript [SVGZoomAndPan](https://developer.mozilla.org/en/docs/Web/API/SVGZoomAndPan) to Kotlin\n *\n@Suppress(\"NESTED_CLASS_IN_EXTERNAL_INTERFACE\")\npublic external interface SVGZoomAndPan {\n var zoomAndPan: Short\n\n companion object {\n val SVG_ZOOMANDPAN_UNKNOWN: Short\n val SVG_ZOOMANDPAN_DISABLE: Short\n val SVG_ZOOMANDPAN_MAGNIFY: Short\n }\n}\n\n/**\n * Exposes the JavaScript [SVGURIReference](https://developer.mozilla.org/en/docs/Web/API/SVGURIReference) to Kotlin\n *\npublic external interface SVGURIReference {\n val href: SVGAnimatedString\n}\n\n/**\n * Exposes the JavaScript [SVGSVGElement](https://developer.mozilla.org/en/docs/Web/API/SVGSVGElement) to Kotlin\n *\npublic external abstract class SVGSVGElement : SVGGraphicsElement, SVGFitToViewBox, SVGZoomAndPan, WindowEventHandlers {\n open val x: SVGAnimatedLength\n open val y: SVGAnimatedLength\n open val width: SVGAnimatedLength\n open val height: SVGAnimatedLength\n open var currentScale: Float\n open val currentTranslate: DOMPointReadOnly\n fun getIntersectionList(rect: DOMRectReadOnly, referenceElement: SVGElement?): NodeList\n fun getEnclosureList(rect: DOMRectReadOnly, referenceElement: SVGElement?): NodeList\n fun checkIntersection(element: SVGElement, rect: DOMRectReadOnly): Boolean\n fun


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    val DOCUMENT_POSITION_CONTAINED_BY: Short\n    val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n    }\n}\n\n/**\n * Exposes the JavaScript
[SVGDescElement](https://developer.mozilla.org/en/docs/Web/API/SVGDescElement) to Kotlin\n *\npublic
external abstract class SVGDescElement : SVGElement {\n    companion object {\n        val ELEMENT_NODE:
Short\n        val ATTRIBUTE_NODE: Short\n        val TEXT_NODE: Short\n        val CDATA_SECTION_NODE:
Short\n        val ENTITY_REFERENCE_NODE: Short\n        val ENTITY_NODE: Short\n        val
PROCESSING_INSTRUCTION_NODE: Short\n        val COMMENT_NODE: Short\n        val
DOCUMENT_NODE: Short\n        val DOCUMENT_TYPE_NODE: Short\n        val
DOCUMENT_FRAGMENT_NODE: Short\n        val NOTATION_NODE: Short\n        val
DOCUMENT_POSITION_DISCONNECTED: Short\n        val DOCUMENT_POSITION_PRECEDING: Short\n
        val DOCUMENT_POSITION_FOLLOWING: Short\n        val DOCUMENT_POSITION_CONTAINS: Short\n
        val DOCUMENT_POSITION_CONTAINED_BY: Short\n        val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n    }\n}\n\n/**\n * Exposes the JavaScript
[SVGMetadataElement](https://developer.mozilla.org/en/docs/Web/API/SVGMetadataElement) to Kotlin\n *\npublic
external abstract class SVGMetadataElement : SVGElement {\n    companion object {\n        val
ELEMENT_NODE: Short\n        val ATTRIBUTE_NODE: Short\n        val TEXT_NODE: Short\n        val
CDATA_SECTION_NODE: Short\n        val ENTITY_REFERENCE_NODE: Short\n        val ENTITY_NODE:
Short\n        val PROCESSING_INSTRUCTION_NODE: Short\n        val COMMENT_NODE: Short\n        val
DOCUMENT_NODE: Short\n        val DOCUMENT_TYPE_NODE: Short\n        val
DOCUMENT_FRAGMENT_NODE: Short\n        val NOTATION_NODE: Short\n        val
DOCUMENT_POSITION_DISCONNECTED: Short\n        val DOCUMENT_POSITION_PRECEDING: Short\n
        val DOCUMENT_POSITION_FOLLOWING: Short\n        val DOCUMENT_POSITION_CONTAINS: Short\n
        val DOCUMENT_POSITION_CONTAINED_BY: Short\n        val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n    }\n}\n\n/**\n * Exposes the JavaScript
[SVGTitleElement](https://developer.mozilla.org/en/docs/Web/API/SVGTitleElement) to Kotlin\n *\npublic
external abstract class SVGTitleElement : SVGElement {\n    companion object {\n        val ELEMENT_NODE:
Short\n        val ATTRIBUTE_NODE: Short\n        val TEXT_NODE: Short\n        val CDATA_SECTION_NODE:
Short\n        val ENTITY_REFERENCE_NODE: Short\n        val ENTITY_NODE: Short\n        val
PROCESSING_INSTRUCTION_NODE: Short\n        val COMMENT_NODE: Short\n        val
DOCUMENT_NODE: Short\n        val DOCUMENT_TYPE_NODE: Short\n        val
DOCUMENT_FRAGMENT_NODE: Short\n        val NOTATION_NODE: Short\n        val
DOCUMENT_POSITION_DISCONNECTED: Short\n        val DOCUMENT_POSITION_PRECEDING: Short\n
        val DOCUMENT_POSITION_FOLLOWING: Short\n        val DOCUMENT_POSITION_CONTAINS: Short\n
        val DOCUMENT_POSITION_CONTAINED_BY: Short\n        val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n    }\n}\n\n/**\n * Exposes the JavaScript
[SVGSymbolElement](https://developer.mozilla.org/en/docs/Web/API/SVGSymbolElement) to Kotlin\n *\npublic
external abstract class SVGSymbolElement : SVGGraphicsElement, SVGFitToViewBox {\n    companion object
{\n        val ELEMENT_NODE: Short\n        val ATTRIBUTE_NODE: Short\n        val TEXT_NODE: Short\n
        val CDATA_SECTION_NODE: Short\n        val ENTITY_REFERENCE_NODE: Short\n        val
ENTITY_NODE: Short\n        val PROCESSING_INSTRUCTION_NODE: Short\n        val COMMENT_NODE:
Short\n        val DOCUMENT_NODE: Short\n        val DOCUMENT_TYPE_NODE: Short\n        val
DOCUMENT_FRAGMENT_NODE: Short\n        val NOTATION_NODE: Short\n        val
DOCUMENT_POSITION_DISCONNECTED: Short\n        val DOCUMENT_POSITION_PRECEDING: Short\n
        val DOCUMENT_POSITION_FOLLOWING: Short\n        val DOCUMENT_POSITION_CONTAINS: Short\n
        val DOCUMENT_POSITION_CONTAINED_BY: Short\n        val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n    }\n}\n\n/**\n * Exposes the JavaScript
[SVGUseElement](https://developer.mozilla.org/en/docs/Web/API/SVGUseElement) to Kotlin\n *\npublic external
abstract class SVGUseElement : SVGGraphicsElement, SVGURIReference {\n    open val x:

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SVGAnimatedLength\n open val y: SVGAnimatedLength\n open val width: SVGAnimatedLength\n open val
height: SVGAnimatedLength\n open val instanceRoot: SVGElement?\n open val animatedInstanceRoot:
SVGElement?\n\n companion object {\n val ELEMENT_NODE: Short\n val ATTRIBUTE_NODE:
Short\n val TEXT_NODE: Short\n val CDATA_SECTION_NODE: Short\n val
ENTITY_REFERENCE_NODE: Short\n val ENTITY_NODE: Short\n val
PROCESSING_INSTRUCTION_NODE: Short\n val COMMENT_NODE: Short\n val
DOCUMENT_NODE: Short\n val DOCUMENT_TYPE_NODE: Short\n val
DOCUMENT_FRAGMENT_NODE: Short\n val NOTATION_NODE: Short\n val
DOCUMENT_POSITION_DISCONNECTED: Short\n val DOCUMENT_POSITION_PRECEDING: Short\n
val DOCUMENT_POSITION_FOLLOWING: Short\n val DOCUMENT_POSITION_CONTAINS: Short\n
val DOCUMENT_POSITION_CONTAINED_BY: Short\n val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n }\n}\n\npublic external open class
SVGUseElementShadowRoot : ShadowRoot {\n companion object {\n val ELEMENT_NODE: Short\n
val ATTRIBUTE_NODE: Short\n val TEXT_NODE: Short\n val CDATA_SECTION_NODE: Short\n
val ENTITY_REFERENCE_NODE: Short\n val ENTITY_NODE: Short\n val
PROCESSING_INSTRUCTION_NODE: Short\n val COMMENT_NODE: Short\n val
DOCUMENT_NODE: Short\n val DOCUMENT_TYPE_NODE: Short\n val
DOCUMENT_FRAGMENT_NODE: Short\n val NOTATION_NODE: Short\n val
DOCUMENT_POSITION_DISCONNECTED: Short\n val DOCUMENT_POSITION_PRECEDING: Short\n
val DOCUMENT_POSITION_FOLLOWING: Short\n val DOCUMENT_POSITION_CONTAINS: Short\n
val DOCUMENT_POSITION_CONTAINED_BY: Short\n val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n }\n}\n\npublic external interface
SVGElementInstance {\n val correspondingElement: SVGElement?\n get() = definedExternally\n val
correspondingUseElement: SVGUseElement?\n get() = definedExternally\n}\n\npublic external open class
ShadowAnimation(source: dynamic, newTarget: dynamic) {\n open val sourceAnimation: dynamic\n}\n\n/**\n *
Exposes the JavaScript [SVGSwitchElement](https://developer.mozilla.org/en/docs/Web/API/SVGSwitchElement)
to Kotlin\n */\n\npublic external abstract class SVGSwitchElement : SVGGraphicsElement {\n companion object
{\n val ELEMENT_NODE: Short\n val ATTRIBUTE_NODE: Short\n val TEXT_NODE: Short\n
val CDATA_SECTION_NODE: Short\n val ENTITY_REFERENCE_NODE: Short\n val
ENTITY_NODE: Short\n val PROCESSING_INSTRUCTION_NODE: Short\n val COMMENT_NODE:
Short\n val DOCUMENT_NODE: Short\n val DOCUMENT_TYPE_NODE: Short\n val
DOCUMENT_FRAGMENT_NODE: Short\n val NOTATION_NODE: Short\n val
DOCUMENT_POSITION_DISCONNECTED: Short\n val DOCUMENT_POSITION_PRECEDING: Short\n
val DOCUMENT_POSITION_FOLLOWING: Short\n val DOCUMENT_POSITION_CONTAINS: Short\n
val DOCUMENT_POSITION_CONTAINED_BY: Short\n val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n }\n}\n\npublic external interface
GetSVGDocument {\n fun getSVGDocument(): Document\n}\n\n/**\n * Exposes the JavaScript
[SVGStyleElement](https://developer.mozilla.org/en/docs/Web/API/SVGStyleElement) to Kotlin\n */\n\npublic
external abstract class SVGStyleElement : SVGElement, LinkStyle {\n open var type: String\n open var media:
String\n open var title: String\n\n companion object {\n val ELEMENT_NODE: Short\n val
ATTRIBUTE_NODE: Short\n val TEXT_NODE: Short\n val CDATA_SECTION_NODE: Short\n val
ENTITY_REFERENCE_NODE: Short\n val ENTITY_NODE: Short\n val
PROCESSING_INSTRUCTION_NODE: Short\n val COMMENT_NODE: Short\n val
DOCUMENT_NODE: Short\n val DOCUMENT_TYPE_NODE: Short\n val
DOCUMENT_FRAGMENT_NODE: Short\n val NOTATION_NODE: Short\n val
DOCUMENT_POSITION_DISCONNECTED: Short\n val DOCUMENT_POSITION_PRECEDING: Short\n
val DOCUMENT_POSITION_FOLLOWING: Short\n val DOCUMENT_POSITION_CONTAINS: Short\n
val DOCUMENT_POSITION_CONTAINED_BY: Short\n val

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DOCUMENT_POSITION_DISCONNECTED: Short\n    val DOCUMENT_POSITION_PRECEDING: Short\n
    val DOCUMENT_POSITION_FOLLOWING: Short\n    val DOCUMENT_POSITION_CONTAINS: Short\n
    val DOCUMENT_POSITION_CONTAINED_BY: Short\n    val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n    } \n} \n \n /** \n * Exposes the JavaScript
[SVGRectElement](https://developer.mozilla.org/en/docs/Web/API/SVGRectElement) to Kotlin \n * \n public
external abstract class SVGRectElement : SVGGeometryElement { \n    open val x: SVGAnimatedLength \n    open
val y: SVGAnimatedLength \n    open val width: SVGAnimatedLength \n    open val height: SVGAnimatedLength \n
    open val rx: SVGAnimatedLength \n    open val ry: SVGAnimatedLength \n \n    companion object { \n    val
ELEMENT_NODE: Short\n    val ATTRIBUTE_NODE: Short\n    val TEXT_NODE: Short\n    val
CDATA_SECTION_NODE: Short\n    val ENTITY_REFERENCE_NODE: Short\n    val ENTITY_NODE:
Short\n    val PROCESSING_INSTRUCTION_NODE: Short\n    val COMMENT_NODE: Short\n    val
DOCUMENT_NODE: Short\n    val DOCUMENT_TYPE_NODE: Short\n    val
DOCUMENT_FRAGMENT_NODE: Short\n    val NOTATION_NODE: Short\n    val
DOCUMENT_POSITION_DISCONNECTED: Short\n    val DOCUMENT_POSITION_PRECEDING: Short\n
    val DOCUMENT_POSITION_FOLLOWING: Short\n    val DOCUMENT_POSITION_CONTAINS: Short\n
    val DOCUMENT_POSITION_CONTAINED_BY: Short\n    val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n    } \n} \n \n /** \n * Exposes the JavaScript
[SVGCircleElement](https://developer.mozilla.org/en/docs/Web/API/SVGCircleElement) to Kotlin \n * \n public
external abstract class SVGCircleElement : SVGGeometryElement { \n    open val cx: SVGAnimatedLength \n
    open val cy: SVGAnimatedLength \n    open val r: SVGAnimatedLength \n \n    companion object { \n    val
ELEMENT_NODE: Short\n    val ATTRIBUTE_NODE: Short\n    val TEXT_NODE: Short\n    val
CDATA_SECTION_NODE: Short\n    val ENTITY_REFERENCE_NODE: Short\n    val ENTITY_NODE:
Short\n    val PROCESSING_INSTRUCTION_NODE: Short\n    val COMMENT_NODE: Short\n    val
DOCUMENT_NODE: Short\n    val DOCUMENT_TYPE_NODE: Short\n    val
DOCUMENT_FRAGMENT_NODE: Short\n    val NOTATION_NODE: Short\n    val
DOCUMENT_POSITION_DISCONNECTED: Short\n    val DOCUMENT_POSITION_PRECEDING: Short\n
    val DOCUMENT_POSITION_FOLLOWING: Short\n    val DOCUMENT_POSITION_CONTAINS: Short\n
    val DOCUMENT_POSITION_CONTAINED_BY: Short\n    val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n    } \n} \n \n /** \n * Exposes the JavaScript
[SVGEllipseElement](https://developer.mozilla.org/en/docs/Web/API/SVGEllipseElement) to Kotlin \n * \n public
external abstract class SVGEllipseElement : SVGGeometryElement { \n    open val cx: SVGAnimatedLength \n
    open val cy: SVGAnimatedLength \n    open val rx: SVGAnimatedLength \n    open val ry: SVGAnimatedLength \n
    companion object { \n    val ELEMENT_NODE: Short\n    val ATTRIBUTE_NODE: Short\n    val
TEXT_NODE: Short\n    val CDATA_SECTION_NODE: Short\n    val ENTITY_REFERENCE_NODE:
Short\n    val ENTITY_NODE: Short\n    val PROCESSING_INSTRUCTION_NODE: Short\n    val
COMMENT_NODE: Short\n    val DOCUMENT_NODE: Short\n    val DOCUMENT_TYPE_NODE: Short\n
    val DOCUMENT_FRAGMENT_NODE: Short\n    val NOTATION_NODE: Short\n    val
DOCUMENT_POSITION_DISCONNECTED: Short\n    val DOCUMENT_POSITION_PRECEDING: Short\n
    val DOCUMENT_POSITION_FOLLOWING: Short\n    val DOCUMENT_POSITION_CONTAINS: Short\n
    val DOCUMENT_POSITION_CONTAINED_BY: Short\n    val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n    } \n} \n \n /** \n * Exposes the JavaScript
[SVGLineElement](https://developer.mozilla.org/en/docs/Web/API/SVGLineElement) to Kotlin \n * \n public
external abstract class SVGLineElement : SVGGeometryElement { \n    open val x1: SVGAnimatedLength \n    open
val y1: SVGAnimatedLength \n    open val x2: SVGAnimatedLength \n    open val y2: SVGAnimatedLength \n \n
    companion object { \n    val ELEMENT_NODE: Short\n    val ATTRIBUTE_NODE: Short\n    val
TEXT_NODE: Short\n    val CDATA_SECTION_NODE: Short\n    val ENTITY_REFERENCE_NODE:
Short\n    val ENTITY_NODE: Short\n    val PROCESSING_INSTRUCTION_NODE: Short\n    val
COMMENT_NODE: Short\n    val DOCUMENT_NODE: Short\n    val DOCUMENT_TYPE_NODE: Short\n

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    val DOCUMENT_FRAGMENT_NODE: Short\n    val NOTATION_NODE: Short\n    val
DOCUMENT_POSITION_DISCONNECTED: Short\n    val DOCUMENT_POSITION_PRECEDING: Short\n
    val DOCUMENT_POSITION_FOLLOWING: Short\n    val DOCUMENT_POSITION_CONTAINS: Short\n
    val DOCUMENT_POSITION_CONTAINED_BY: Short\n    val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n    } \n} \n \n /** \n * Exposes the JavaScript
[SVGMeshElement](https://developer.mozilla.org/en/docs/Web/API/SVGMeshElement) to Kotlin \n * \n public
external abstract class SVGMeshElement : SVGGeometryElement, SVGURIReference { \n    companion object { \n
    val ELEMENT_NODE: Short\n    val ATTRIBUTE_NODE: Short\n    val TEXT_NODE: Short\n    val
CDATA_SECTION_NODE: Short\n    val ENTITY_REFERENCE_NODE: Short\n    val ENTITY_NODE:
Short\n    val PROCESSING_INSTRUCTION_NODE: Short\n    val COMMENT_NODE: Short\n    val
DOCUMENT_NODE: Short\n    val DOCUMENT_TYPE_NODE: Short\n    val
DOCUMENT_FRAGMENT_NODE: Short\n    val NOTATION_NODE: Short\n    val
DOCUMENT_POSITION_DISCONNECTED: Short\n    val DOCUMENT_POSITION_PRECEDING: Short\n
    val DOCUMENT_POSITION_FOLLOWING: Short\n    val DOCUMENT_POSITION_CONTAINS: Short\n
    val DOCUMENT_POSITION_CONTAINED_BY: Short\n    val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n    } \n} \n \n /** \n * Exposes the JavaScript
[SVGAnimatedPoints](https://developer.mozilla.org/en/docs/Web/API/SVGAnimatedPoints) to Kotlin \n * \n public
external interface SVGAnimatedPoints { \n    val points: SVGPointList \n    val animatedPoints:
SVGPointList \n} \n \n public external abstract class SVGPointList { \n    open val length: Int \n    open val
numberOfItems: Int \n    fun clear() \n    fun initialize(newItem: DOMPoint): DOMPoint \n    fun
insertItemBefore(newItem: DOMPoint, index: Int): DOMPoint \n    fun replaceItem(newItem: DOMPoint, index:
Int): DOMPoint \n    fun removeItem(index: Int): DOMPoint \n    fun appendItem(newItem: DOMPoint):
DOMPoint \n    fun getItem(index: Int): DOMPoint \n} \n \n @Suppress("INVISIBLE_REFERENCE",
"INVISIBLE_MEMBER") \n @kotlin.internal.InlineOnly \n public inline operator fun SVGPointList.get(index: Int):
DOMPoint? = asDynamic()[index] \n \n @Suppress("INVISIBLE_REFERENCE",
"INVISIBLE_MEMBER") \n @kotlin.internal.InlineOnly \n public inline operator fun SVGPointList.set(index: Int,
newItem: DOMPoint) { asDynamic()[index] = newItem } \n \n /** \n * Exposes the JavaScript
[SVGPolylineElement](https://developer.mozilla.org/en/docs/Web/API/SVGPolylineElement) to Kotlin \n
* \n public external abstract class SVGPolylineElement : SVGGeometryElement, SVGAnimatedPoints { \n
companion object { \n    val ELEMENT_NODE: Short\n    val ATTRIBUTE_NODE: Short\n    val
TEXT_NODE: Short\n    val CDATA_SECTION_NODE: Short\n    val ENTITY_REFERENCE_NODE:
Short\n    val ENTITY_NODE: Short\n    val PROCESSING_INSTRUCTION_NODE: Short\n    val
COMMENT_NODE: Short\n    val DOCUMENT_NODE: Short\n    val DOCUMENT_TYPE_NODE: Short\n
    val DOCUMENT_FRAGMENT_NODE: Short\n    val NOTATION_NODE: Short\n    val
DOCUMENT_POSITION_DISCONNECTED: Short\n    val DOCUMENT_POSITION_PRECEDING: Short\n
    val DOCUMENT_POSITION_FOLLOWING: Short\n    val DOCUMENT_POSITION_CONTAINS: Short\n
    val DOCUMENT_POSITION_CONTAINED_BY: Short\n    val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n    } \n} \n \n /** \n * Exposes the JavaScript
[SVGPolygonElement](https://developer.mozilla.org/en/docs/Web/API/SVGPolygonElement) to Kotlin \n
* \n public external abstract class SVGPolygonElement : SVGGeometryElement, SVGAnimatedPoints { \n
companion object { \n    val ELEMENT_NODE: Short\n    val ATTRIBUTE_NODE: Short\n    val
TEXT_NODE: Short\n    val CDATA_SECTION_NODE: Short\n    val ENTITY_REFERENCE_NODE:
Short\n    val ENTITY_NODE: Short\n    val PROCESSING_INSTRUCTION_NODE: Short\n    val
COMMENT_NODE: Short\n    val DOCUMENT_NODE: Short\n    val DOCUMENT_TYPE_NODE: Short\n
    val DOCUMENT_FRAGMENT_NODE: Short\n    val NOTATION_NODE: Short\n    val
DOCUMENT_POSITION_DISCONNECTED: Short\n    val DOCUMENT_POSITION_PRECEDING: Short\n
    val DOCUMENT_POSITION_FOLLOWING: Short\n    val DOCUMENT_POSITION_CONTAINS: Short\n
    val DOCUMENT_POSITION_CONTAINED_BY: Short\n    val

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ATTRIBUTE_NODE: Short\n    val TEXT_NODE: Short\n    val CDATA_SECTION_NODE: Short\n    val
ENTITY_REFERENCE_NODE: Short\n    val ENTITY_NODE: Short\n    val
PROCESSING_INSTRUCTION_NODE: Short\n    val COMMENT_NODE: Short\n    val
DOCUMENT_NODE: Short\n    val DOCUMENT_TYPE_NODE: Short\n    val
DOCUMENT_FRAGMENT_NODE: Short\n    val NOTATION_NODE: Short\n    val
DOCUMENT_POSITION_DISCONNECTED: Short\n    val DOCUMENT_POSITION_PRECEDING: Short\n
    val DOCUMENT_POSITION_FOLLOWING: Short\n    val DOCUMENT_POSITION_CONTAINS: Short\n
    val DOCUMENT_POSITION_CONTAINED_BY: Short\n    val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n    }\n}\n\npublic external abstract class
SVGMarkerElement : SVGElement, SVGFitToViewBox {\n    open val refX: SVGAnimatedLength\n    open val
refY: SVGAnimatedLength\n    open val markerUnits: SVGAnimatedEnumeration\n    open val markerWidth:
SVGAnimatedLength\n    open val markerHeight: SVGAnimatedLength\n    open val orientType:
SVGAnimatedEnumeration\n    open val orientAngle: SVGAnimatedAngle\n    open var orient: String\n    fun
setOrientToAuto()\n    fun setOrientToAngle(angle: SVGAngle)\n\n    companion object {\n        val
SVG_MARKERUNITS_UNKNOWN: Short\n        val SVG_MARKERUNITS_USERSPACEONUSE: Short\n
        val SVG_MARKERUNITS_STROKEWIDTH: Short\n        val SVG_MARKER_ORIENT_UNKNOWN: Short\n
        val SVG_MARKER_ORIENT_AUTO: Short\n        val SVG_MARKER_ORIENT_ANGLE: Short\n        val
ELEMENT_NODE: Short\n        val ATTRIBUTE_NODE: Short\n        val TEXT_NODE: Short\n        val
CDATA_SECTION_NODE: Short\n        val ENTITY_REFERENCE_NODE: Short\n        val ENTITY_NODE:
Short\n        val PROCESSING_INSTRUCTION_NODE: Short\n        val COMMENT_NODE: Short\n        val
DOCUMENT_NODE: Short\n        val DOCUMENT_TYPE_NODE: Short\n        val
DOCUMENT_FRAGMENT_NODE: Short\n        val NOTATION_NODE: Short\n        val
DOCUMENT_POSITION_DISCONNECTED: Short\n        val DOCUMENT_POSITION_PRECEDING: Short\n
        val DOCUMENT_POSITION_FOLLOWING: Short\n        val DOCUMENT_POSITION_CONTAINS: Short\n
        val DOCUMENT_POSITION_CONTAINED_BY: Short\n        val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n    }\n}\n\n/**\n * Exposes the JavaScript
[SVGSolidcolorElement](https://developer.mozilla.org/en/docs/Web/API/SVGSolidcolorElement) to Kotlin\n
*/\n\npublic external abstract class SVGSolidcolorElement : SVGElement {\n    companion object {\n        val
ELEMENT_NODE: Short\n        val ATTRIBUTE_NODE: Short\n        val TEXT_NODE: Short\n        val
CDATA_SECTION_NODE: Short\n        val ENTITY_REFERENCE_NODE: Short\n        val ENTITY_NODE:
Short\n        val PROCESSING_INSTRUCTION_NODE: Short\n        val COMMENT_NODE: Short\n        val
DOCUMENT_NODE: Short\n        val DOCUMENT_TYPE_NODE: Short\n        val
DOCUMENT_FRAGMENT_NODE: Short\n        val NOTATION_NODE: Short\n        val
DOCUMENT_POSITION_DISCONNECTED: Short\n        val DOCUMENT_POSITION_PRECEDING: Short\n
        val DOCUMENT_POSITION_FOLLOWING: Short\n        val DOCUMENT_POSITION_CONTAINS: Short\n
        val DOCUMENT_POSITION_CONTAINED_BY: Short\n        val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n    }\n}\n\n/**\n * Exposes the JavaScript
[SVGGradientElement](https://developer.mozilla.org/en/docs/Web/API/SVGGradientElement) to Kotlin\n
*/\n\npublic external abstract class SVGGradientElement : SVGElement, SVGURIReference, SVGUnitTypes {\n
    open val gradientUnits: SVGAnimatedEnumeration\n    open val gradientTransform: SVGAnimatedTransformList\n
    open val spreadMethod: SVGAnimatedEnumeration\n\n    companion object {\n        val
SVG_SPREADMETHOD_UNKNOWN: Short\n        val SVG_SPREADMETHOD_PAD: Short\n        val
SVG_SPREADMETHOD_REFLECT: Short\n        val SVG_SPREADMETHOD_REPEAT: Short\n        val
SVG_UNIT_TYPE_UNKNOWN: Short\n        val SVG_UNIT_TYPE_USERSPACEONUSE: Short\n        val
SVG_UNIT_TYPE_OBJECTBOUNDINGBOX: Short\n        val ELEMENT_NODE: Short\n        val
ATTRIBUTE_NODE: Short\n        val TEXT_NODE: Short\n        val CDATA_SECTION_NODE: Short\n        val
ENTITY_REFERENCE_NODE: Short\n        val ENTITY_NODE: Short\n        val
PROCESSING_INSTRUCTION_NODE: Short\n        val COMMENT_NODE: Short\n        val

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DOCUMENT_NODE: Short\n val DOCUMENT_TYPE_NODE: Short\n val
DOCUMENT_FRAGMENT_NODE: Short\n val NOTATION_NODE: Short\n val
DOCUMENT_POSITION_DISCONNECTED: Short\n val DOCUMENT_POSITION_PRECEDING: Short\n
val DOCUMENT_POSITION_FOLLOWING: Short\n val DOCUMENT_POSITION_CONTAINS: Short\n
val DOCUMENT_POSITION_CONTAINED_BY: Short\n val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n } \n} \n \n /** \n * Exposes the JavaScript
[SVGLinearGradientElement](https://developer.mozilla.org/en/docs/Web/API/SVGLinearGradientElement) to
Kotlin \n * \n public external abstract class SVGLinearGradientElement : SVGGradientElement { \n open val x1:
SVGAnimatedLength \n open val y1: SVGAnimatedLength \n open val x2: SVGAnimatedLength \n open val
y2: SVGAnimatedLength \n \n companion object { \n val SVG_SPREADMETHOD_UNKNOWN: Short \n
val SVG_SPREADMETHOD_PAD: Short \n val SVG_SPREADMETHOD_REFLECT: Short \n val
SVG_SPREADMETHOD_REPEAT: Short \n val SVG_UNIT_TYPE_UNKNOWN: Short \n val
SVG_UNIT_TYPE_USERSPACEONUSE: Short \n val SVG_UNIT_TYPE_OBJECTBOUNDINGBOX:
Short \n val ELEMENT_NODE: Short \n val ATTRIBUTE_NODE: Short \n val TEXT_NODE: Short \n
val CDATA_SECTION_NODE: Short \n val ENTITY_REFERENCE_NODE: Short \n val
ENTITY_NODE: Short \n val PROCESSING_INSTRUCTION_NODE: Short \n val COMMENT_NODE:
Short \n val DOCUMENT_NODE: Short \n val DOCUMENT_TYPE_NODE: Short \n val
DOCUMENT_FRAGMENT_NODE: Short \n val NOTATION_NODE: Short \n val
DOCUMENT_POSITION_DISCONNECTED: Short \n val DOCUMENT_POSITION_PRECEDING: Short \n
val DOCUMENT_POSITION_FOLLOWING: Short \n val DOCUMENT_POSITION_CONTAINS: Short \n
val DOCUMENT_POSITION_CONTAINED_BY: Short \n val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n } \n} \n \n /** \n * Exposes the JavaScript
[SVGRadialGradientElement](https://developer.mozilla.org/en/docs/Web/API/SVGRadialGradientElement) to
Kotlin \n * \n public external abstract class SVGRadialGradientElement : SVGGradientElement { \n open val cx:
SVGAnimatedLength \n open val cy: SVGAnimatedLength \n open val r: SVGAnimatedLength \n open val fx:
SVGAnimatedLength \n open val fy: SVGAnimatedLength \n open val fr: SVGAnimatedLength \n \n companion
object { \n val SVG_SPREADMETHOD_UNKNOWN: Short \n val SVG_SPREADMETHOD_PAD:
Short \n val SVG_SPREADMETHOD_REFLECT: Short \n val SVG_SPREADMETHOD_REPEAT:
Short \n val SVG_UNIT_TYPE_UNKNOWN: Short \n val SVG_UNIT_TYPE_USERSPACEONUSE:
Short \n val SVG_UNIT_TYPE_OBJECTBOUNDINGBOX: Short \n val ELEMENT_NODE: Short \n
val ATTRIBUTE_NODE: Short \n val TEXT_NODE: Short \n val CDATA_SECTION_NODE: Short \n
val ENTITY_REFERENCE_NODE: Short \n val ENTITY_NODE: Short \n val
PROCESSING_INSTRUCTION_NODE: Short \n val COMMENT_NODE: Short \n val
DOCUMENT_NODE: Short \n val DOCUMENT_TYPE_NODE: Short \n val
DOCUMENT_FRAGMENT_NODE: Short \n val NOTATION_NODE: Short \n val
DOCUMENT_POSITION_DISCONNECTED: Short \n val DOCUMENT_POSITION_PRECEDING: Short \n
val DOCUMENT_POSITION_FOLLOWING: Short \n val DOCUMENT_POSITION_CONTAINS: Short \n
val DOCUMENT_POSITION_CONTAINED_BY: Short \n val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n } \n} \n \n public external abstract class
SVGMeshGradientElement : SVGGradientElement { \n companion object { \n val
SVG_SPREADMETHOD_UNKNOWN: Short \n val SVG_SPREADMETHOD_PAD: Short \n val
SVG_SPREADMETHOD_REFLECT: Short \n val SVG_SPREADMETHOD_REPEAT: Short \n val
SVG_UNIT_TYPE_UNKNOWN: Short \n val SVG_UNIT_TYPE_USERSPACEONUSE: Short \n val
SVG_UNIT_TYPE_OBJECTBOUNDINGBOX: Short \n val ELEMENT_NODE: Short \n val
ATTRIBUTE_NODE: Short \n val TEXT_NODE: Short \n val CDATA_SECTION_NODE: Short \n val
ENTITY_REFERENCE_NODE: Short \n val ENTITY_NODE: Short \n val
PROCESSING_INSTRUCTION_NODE: Short \n val COMMENT_NODE: Short \n val
DOCUMENT_NODE: Short \n val DOCUMENT_TYPE_NODE: Short \n val

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DOCUMENT_FRAGMENT_NODE: Short\n    val NOTATION_NODE: Short\n    val
DOCUMENT_POSITION_DISCONNECTED: Short\n    val DOCUMENT_POSITION_PRECEDING: Short\n
    val DOCUMENT_POSITION_FOLLOWING: Short\n    val DOCUMENT_POSITION_CONTAINS: Short\n
    val DOCUMENT_POSITION_CONTAINED_BY: Short\n    val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n    }\n}\n\npublic external abstract class
SVGMeshrowElement : SVGElement {\n    companion object {\n        val ELEMENT_NODE: Short\n        val
ATTRIBUTE_NODE: Short\n        val TEXT_NODE: Short\n        val CDATA_SECTION_NODE: Short\n        val
ENTITY_REFERENCE_NODE: Short\n        val ENTITY_NODE: Short\n        val
PROCESSING_INSTRUCTION_NODE: Short\n        val COMMENT_NODE: Short\n        val
DOCUMENT_NODE: Short\n        val DOCUMENT_TYPE_NODE: Short\n        val
DOCUMENT_FRAGMENT_NODE: Short\n        val NOTATION_NODE: Short\n        val
DOCUMENT_POSITION_DISCONNECTED: Short\n        val DOCUMENT_POSITION_PRECEDING: Short\n
        val DOCUMENT_POSITION_FOLLOWING: Short\n        val DOCUMENT_POSITION_CONTAINS: Short\n
        val DOCUMENT_POSITION_CONTAINED_BY: Short\n        val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n    }\n}\n\npublic external abstract class
SVGMeshpatchElement : SVGElement {\n    companion object {\n        val ELEMENT_NODE: Short\n        val
ATTRIBUTE_NODE: Short\n        val TEXT_NODE: Short\n        val CDATA_SECTION_NODE: Short\n        val
ENTITY_REFERENCE_NODE: Short\n        val ENTITY_NODE: Short\n        val
PROCESSING_INSTRUCTION_NODE: Short\n        val COMMENT_NODE: Short\n        val
DOCUMENT_NODE: Short\n        val DOCUMENT_TYPE_NODE: Short\n        val
DOCUMENT_FRAGMENT_NODE: Short\n        val NOTATION_NODE: Short\n        val
DOCUMENT_POSITION_DISCONNECTED: Short\n        val DOCUMENT_POSITION_PRECEDING: Short\n
        val DOCUMENT_POSITION_FOLLOWING: Short\n        val DOCUMENT_POSITION_CONTAINS: Short\n
        val DOCUMENT_POSITION_CONTAINED_BY: Short\n        val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n    }\n}\n\n/**\n * Exposes the JavaScript
[SVGStopElement](https://developer.mozilla.org/en/docs/Web/API/SVGStopElement) to Kotlin\n */\n\npublic
external abstract class SVGStopElement : SVGElement {\n    open val offset: SVGAnimatedNumber\n\n    companion object {\n        val ELEMENT_NODE: Short\n        val ATTRIBUTE_NODE: Short\n        val
TEXT_NODE: Short\n        val CDATA_SECTION_NODE: Short\n        val ENTITY_REFERENCE_NODE:
Short\n        val ENTITY_NODE: Short\n        val PROCESSING_INSTRUCTION_NODE: Short\n        val
COMMENT_NODE: Short\n        val DOCUMENT_NODE: Short\n        val DOCUMENT_TYPE_NODE: Short\n
        val DOCUMENT_FRAGMENT_NODE: Short\n        val NOTATION_NODE: Short\n        val
DOCUMENT_POSITION_DISCONNECTED: Short\n        val DOCUMENT_POSITION_PRECEDING: Short\n
        val DOCUMENT_POSITION_FOLLOWING: Short\n        val DOCUMENT_POSITION_CONTAINS: Short\n
        val DOCUMENT_POSITION_CONTAINED_BY: Short\n        val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n    }\n}\n\n/**\n * Exposes the JavaScript
[SVGPatternElement](https://developer.mozilla.org/en/docs/Web/API/SVGPatternElement) to Kotlin\n */\n\npublic
external abstract class SVGPatternElement : SVGElement, SVGFitToViewBox, SVGURIReference,
SVGUnitTypes {\n    open val patternUnits: SVGAnimatedEnumeration\n    open val patternContentUnits:
SVGAnimatedEnumeration\n    open val patternTransform: SVGAnimatedTransformList\n    open val x:
SVGAnimatedLength\n    open val y: SVGAnimatedLength\n    open val width: SVGAnimatedLength\n    open val
height: SVGAnimatedLength\n\n    companion object {\n        val SVG_UNIT_TYPE_UNKNOWN: Short\n
        val SVG_UNIT_TYPE_USERSPACEONUSE: Short\n        val SVG_UNIT_TYPE_OBJECTBOUNDINGBOX:
Short\n        val ELEMENT_NODE: Short\n        val ATTRIBUTE_NODE: Short\n        val TEXT_NODE: Short\n
        val CDATA_SECTION_NODE: Short\n        val ENTITY_REFERENCE_NODE: Short\n        val
ENTITY_NODE: Short\n        val PROCESSING_INSTRUCTION_NODE: Short\n        val COMMENT_NODE:
Short\n        val DOCUMENT_NODE: Short\n        val DOCUMENT_TYPE_NODE: Short\n        val
DOCUMENT_FRAGMENT_NODE: Short\n        val NOTATION_NODE: Short\n        val

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DOCUMENT_POSITION_DISCONNECTED: Short\n    val DOCUMENT_POSITION_PRECEDING: Short\n
    val DOCUMENT_POSITION_FOLLOWING: Short\n    val DOCUMENT_POSITION_CONTAINS: Short\n
    val DOCUMENT_POSITION_CONTAINED_BY: Short\n    val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n    }\n}\n\npublic external abstract class
SVGHatchElement : SVGElement {\n    companion object {\n    val ELEMENT_NODE: Short\n    val
ATTRIBUTE_NODE: Short\n    val TEXT_NODE: Short\n    val CDATA_SECTION_NODE: Short\n    val
ENTITY_REFERENCE_NODE: Short\n    val ENTITY_NODE: Short\n    val
PROCESSING_INSTRUCTION_NODE: Short\n    val COMMENT_NODE: Short\n    val
DOCUMENT_NODE: Short\n    val DOCUMENT_TYPE_NODE: Short\n    val
DOCUMENT_FRAGMENT_NODE: Short\n    val NOTATION_NODE: Short\n    val
DOCUMENT_POSITION_DISCONNECTED: Short\n    val DOCUMENT_POSITION_PRECEDING: Short\n
    val DOCUMENT_POSITION_FOLLOWING: Short\n    val DOCUMENT_POSITION_CONTAINS: Short\n
    val DOCUMENT_POSITION_CONTAINED_BY: Short\n    val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n    }\n}\n\npublic external abstract class
SVGHatchpathElement : SVGElement {\n    companion object {\n    val ELEMENT_NODE: Short\n    val
ATTRIBUTE_NODE: Short\n    val TEXT_NODE: Short\n    val CDATA_SECTION_NODE: Short\n    val
ENTITY_REFERENCE_NODE: Short\n    val ENTITY_NODE: Short\n    val
PROCESSING_INSTRUCTION_NODE: Short\n    val COMMENT_NODE: Short\n    val
DOCUMENT_NODE: Short\n    val DOCUMENT_TYPE_NODE: Short\n    val
DOCUMENT_FRAGMENT_NODE: Short\n    val NOTATION_NODE: Short\n    val
DOCUMENT_POSITION_DISCONNECTED: Short\n    val DOCUMENT_POSITION_PRECEDING: Short\n
    val DOCUMENT_POSITION_FOLLOWING: Short\n    val DOCUMENT_POSITION_CONTAINS: Short\n
    val DOCUMENT_POSITION_CONTAINED_BY: Short\n    val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n    }\n}\n\n/**\n * Exposes the JavaScript
[SVGCursorElement](https://developer.mozilla.org/en/docs/Web/API/SVGCursorElement) to Kotlin\n *\npublic
external abstract class SVGCursorElement : SVGElement, SVGURIReference {\n    open val x:
SVGAnimatedLength\n    open val y: SVGAnimatedLength\n\n    companion object {\n    val
ELEMENT_NODE: Short\n    val ATTRIBUTE_NODE: Short\n    val TEXT_NODE: Short\n    val
CDATA_SECTION_NODE: Short\n    val ENTITY_REFERENCE_NODE: Short\n    val ENTITY_NODE:
Short\n    val PROCESSING_INSTRUCTION_NODE: Short\n    val COMMENT_NODE: Short\n    val
DOCUMENT_NODE: Short\n    val DOCUMENT_TYPE_NODE: Short\n    val
DOCUMENT_FRAGMENT_NODE: Short\n    val NOTATION_NODE: Short\n    val
DOCUMENT_POSITION_DISCONNECTED: Short\n    val DOCUMENT_POSITION_PRECEDING: Short\n
    val DOCUMENT_POSITION_FOLLOWING: Short\n    val DOCUMENT_POSITION_CONTAINS: Short\n
    val DOCUMENT_POSITION_CONTAINED_BY: Short\n    val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n    }\n}\n\n/**\n * Exposes the JavaScript
[SVGScriptElement](https://developer.mozilla.org/en/docs/Web/API/SVGScriptElement) to Kotlin\n *\npublic
external abstract class SVGScriptElement : SVGElement, SVGURIReference, HTMLOrSVGScriptElement {\n
open var type: String\n    open var crossOrigin: String?\n\n    companion object {\n    val ELEMENT_NODE:
Short\n    val ATTRIBUTE_NODE: Short\n    val TEXT_NODE: Short\n    val CDATA_SECTION_NODE:
Short\n    val ENTITY_REFERENCE_NODE: Short\n    val ENTITY_NODE: Short\n    val
PROCESSING_INSTRUCTION_NODE: Short\n    val COMMENT_NODE: Short\n    val
DOCUMENT_NODE: Short\n    val DOCUMENT_TYPE_NODE: Short\n    val
DOCUMENT_FRAGMENT_NODE: Short\n    val NOTATION_NODE: Short\n    val
DOCUMENT_POSITION_DISCONNECTED: Short\n    val DOCUMENT_POSITION_PRECEDING: Short\n
    val DOCUMENT_POSITION_FOLLOWING: Short\n    val DOCUMENT_POSITION_CONTAINS: Short\n
    val DOCUMENT_POSITION_CONTAINED_BY: Short\n    val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n    }\n}\n\n/**\n * Exposes the JavaScript

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[SVGElement](https://developer.mozilla.org/en/docs/Web/API/SVGElement) to Kotlin\n *\npublic external
abstract class SVGElement : SVGGraphicsElement, SVGURIReference {\n  open val target:
SVGAnimatedString\n  open val download: SVGAnimatedString\n  open val rel: SVGAnimatedString\n  open
val relList: SVGAnimatedString\n  open val hreflang: SVGAnimatedString\n  open val type:
SVGAnimatedString\n\n  companion object {\n    val ELEMENT_NODE: Short\n    val
ATTRIBUTE_NODE: Short\n    val TEXT_NODE: Short\n    val CDATA_SECTION_NODE: Short\n    val
ENTITY_REFERENCE_NODE: Short\n    val ENTITY_NODE: Short\n    val
PROCESSING_INSTRUCTION_NODE: Short\n    val COMMENT_NODE: Short\n    val
DOCUMENT_NODE: Short\n    val DOCUMENT_TYPE_NODE: Short\n    val
DOCUMENT_FRAGMENT_NODE: Short\n    val NOTATION_NODE: Short\n    val
DOCUMENT_POSITION_DISCONNECTED: Short\n    val DOCUMENT_POSITION_PRECEDING: Short\n
    val DOCUMENT_POSITION_FOLLOWING: Short\n    val DOCUMENT_POSITION_CONTAINS: Short\n
    val DOCUMENT_POSITION_CONTAINED_BY: Short\n    val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n  }\n}\n\n/**\n * Exposes the JavaScript
[SVGViewElement](https://developer.mozilla.org/en/docs/Web/API/SVGViewElement) to Kotlin\n *\npublic
external abstract class SVGViewElement : SVGElement, SVGFitToViewBox, SVGZoomAndPan {\n  companion
object {\n    val SVG_ZOOMANDPAN_UNKNOWN: Short\n    val SVG_ZOOMANDPAN_DISABLE:
Short\n    val SVG_ZOOMANDPAN_MAGNIFY: Short\n    val ELEMENT_NODE: Short\n    val
ATTRIBUTE_NODE: Short\n    val TEXT_NODE: Short\n    val CDATA_SECTION_NODE: Short\n    val
ENTITY_REFERENCE_NODE: Short\n    val ENTITY_NODE: Short\n    val
PROCESSING_INSTRUCTION_NODE: Short\n    val COMMENT_NODE: Short\n    val
DOCUMENT_NODE: Short\n    val DOCUMENT_TYPE_NODE: Short\n    val
DOCUMENT_FRAGMENT_NODE: Short\n    val NOTATION_NODE: Short\n    val
DOCUMENT_POSITION_DISCONNECTED: Short\n    val DOCUMENT_POSITION_PRECEDING: Short\n
    val DOCUMENT_POSITION_FOLLOWING: Short\n    val DOCUMENT_POSITION_CONTAINS: Short\n
    val DOCUMENT_POSITION_CONTAINED_BY: Short\n    val
DOCUMENT_POSITION_IMPLEMENTATION_SPECIFIC: Short\n  }\n}\n\n"/*\n * Copyright 2010-2021
JetBrains s.r.o. and Kotlin Programming Language contributors.\n * Use of this source code is governed by the
Apache 2.0 license that can be found in the license/LICENSE.txt file.\n *\n\n// NOTE: THIS FILE IS AUTO-
GENERATED, DO NOT EDIT!\n// See github.com/kotlin/dukat for details\n\npackage org.w3c.files\n\nimport
kotlin.js.*\nimport org.khronos.webgl.*\nimport org.w3c.dom.*\nimport org.w3c.dom.events.*\nimport
org.w3c.xhr.*\n\n/**\n * Exposes the JavaScript [Blob](https://developer.mozilla.org/en/docs/Web/API/Blob) to
Kotlin\n *\npublic external open class Blob(blobParts: Array<dynamic> = definedExternally, options:
BlobPropertyBag = definedExternally) : MediaProvider, ImageBitmapSource {\n  open val size: Number\n  open
val type: String\n  open val isClosed: Boolean\n  fun slice(start: Int = definedExternally, end: Int =
definedExternally, contentType: String = definedExternally): Blob\n  fun close()\n}\n\npublic external interface
BlobPropertyBag {\n  var type: String? /* = "" */\n  get() = definedExternally\n  set(value) =
definedExternally\n}\n\n@Suppress(\"INVISIBLE_REFERENCE\",
\"INVISIBLE_MEMBER\")\n@kotlin.internal.InlineOnly\npublic inline fun BlobPropertyBag(type: String? = \"\"):
BlobPropertyBag {\n  val o = js(\"({})\")\n  o[\"type\"] = type\n  return o\n}\n\n/**\n * Exposes the JavaScript
[File](https://developer.mozilla.org/en/docs/Web/API/File) to Kotlin\n *\npublic external open class File(fileBits:
Array<dynamic>, fileName: String, options: FilePropertyBag = definedExternally) : Blob {\n  open val name:
String\n  open val lastModified: Int\n}\n\npublic external interface FilePropertyBag : BlobPropertyBag {\n  var
lastModified: Int?\n  get() = definedExternally\n  set(value) =
definedExternally\n}\n\n@Suppress(\"INVISIBLE_REFERENCE\",
\"INVISIBLE_MEMBER\")\n@kotlin.internal.InlineOnly\npublic inline fun FilePropertyBag(lastModified: Int? =
undefined, type: String? = \"\"): FilePropertyBag {\n  val o = js(\"({})\")\n  o[\"lastModified\"] = lastModified\n
o[\"type\"] = type\n  return o\n}\n\n/**\n * Exposes the JavaScript

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[FileList](https://developer.mozilla.org/en/docs/Web/API/FileList) to Kotlin\n *\npublic external abstract class
FileList : ItemArrayLike<File> {\n  override fun item(index: Int):
File?\n}\n\n@Suppress(\"INVISIBLE_REFERENCE\",
\"INVISIBLE_MEMBER\")\n@kotlin.internal.InlineOnly\npublic inline operator fun FileList.get(index: Int): File?
= asDynamic()[index]\n\n/**\n * Exposes the JavaScript
[FileReader](https://developer.mozilla.org/en/docs/Web/API/FileReader) to Kotlin\n *\npublic external open class
FileReader : EventTarget {\n  open val readyState: Short\n  open val result: dynamic\n  open val error:
dynamic\n  var onloadstart: ((ProgressEvent) -> dynamic)?\n  var onprogress: ((ProgressEvent) -> dynamic)?\n
var onload: ((Event) -> dynamic)?\n  var onabort: ((Event) -> dynamic)?\n  var onerror: ((Event) -> dynamic)?\n
var onloadend: ((Event) -> dynamic)?\n  fun readAsArrayBuffer(blob: Blob)\n  fun readAsBinaryString(blob:
Blob)\n  fun readAsText(blob: Blob, label: String = definedExternally)\n  fun readAsDataURL(blob: Blob)\n
fun abort()\n\n  companion object {\n    val EMPTY: Short\n    val LOADING: Short\n    val DONE:
Short\n  }\n}\n\n/**\n * Exposes the JavaScript
[FileReaderSync](https://developer.mozilla.org/en/docs/Web/API/FileReaderSync) to Kotlin\n *\npublic external
open class FileReaderSync {\n  fun readAsArrayBuffer(blob: Blob): ArrayBuffer\n  fun readAsBinaryString(blob:
Blob): String\n  fun readAsText(blob: Blob, label: String = definedExternally): String\n  fun
readAsDataURL(blob: Blob): String\n}\n\n/**\n * Copyright 2010-2021 JetBrains s.r.o. and Kotlin Programming
Language contributors.\n * Use of this source code is governed by the Apache 2.0 license that can be found in the
license/LICENSE.txt file.\n *\n// NOTE: THIS FILE IS AUTO-GENERATED, DO NOT EDIT!\n// See
github.com/kotlin/dukat for details\n\npackage org.w3c.notifications\n\nimport kotlin.js.*\nimport
org.khronos.webgl.*\nimport org.w3c.dom.events.*\nimport org.w3c.workers.*\n\n/**\n * Exposes the JavaScript
[Notification](https://developer.mozilla.org/en/docs/Web/API/Notification) to Kotlin\n *\npublic external open
class Notification(title: String, options: NotificationOptions = definedExternally) : EventTarget {\n  var onclick:
((MouseEvent) -> dynamic)?\n  var onerror: ((Event) -> dynamic)?\n  open val title: String\n  open val dir:
NotificationDirection\n  open val lang: String\n  open val body: String\n  open val tag: String\n  open val
image: String\n  open val icon: String\n  open val badge: String\n  open val sound: String\n  open val vibrate:
Array<out Int>\n  open val timestamp: Number\n  open val renotify: Boolean\n  open val silent: Boolean\n
open val noscreen: Boolean\n  open val requireInteraction: Boolean\n  open val sticky: Boolean\n  open val data:
Any?\n  open val actions: Array<out NotificationAction>\n  fun close()\n\n  companion object {\n    val
permission: NotificationPermission\n    val maxActions: Int\n    fun requestPermission(deprecatedCallback:
(NotificationPermission) -> Unit = definedExternally): Promise<NotificationPermission>\n  }\n}\n\npublic
external interface NotificationOptions {\n  var dir: NotificationDirection? /* = NotificationDirection.AUTO */\n
get() = definedExternally\n  set(value) = definedExternally\n  var lang: String? /* = \"\" */\n  get() =
definedExternally\n  set(value) = definedExternally\n  var body: String? /* = \"\" */\n  get() =
definedExternally\n  set(value) = definedExternally\n  var tag: String? /* = \"\" */\n  get() =
definedExternally\n  set(value) = definedExternally\n  var image: String?\n  get() = definedExternally\n
set(value) = definedExternally\n  var icon: String?\n  get() = definedExternally\n  set(value) =
definedExternally\n  var badge: String?\n  get() = definedExternally\n  set(value) = definedExternally\n
var sound: String?\n  get() = definedExternally\n  set(value) = definedExternally\n  var vibrate: dynamic\n
get() = definedExternally\n  set(value) = definedExternally\n  var timestamp: Number?\n  get() =
definedExternally\n  set(value) = definedExternally\n  var renotify: Boolean? /* = false */\n  get() =
definedExternally\n  set(value) = definedExternally\n  var silent: Boolean? /* = false */\n  get() =
definedExternally\n  set(value) = definedExternally\n  var noscreen: Boolean? /* = false */\n  get() =
definedExternally\n  set(value) = definedExternally\n  var requireInteraction: Boolean? /* = false */\n  get()
= definedExternally\n  set(value) = definedExternally\n  var sticky: Boolean? /* = false */\n  get() =
definedExternally\n  set(value) = definedExternally\n  var data: Any? /* = null */\n  get() =
definedExternally\n  set(value) = definedExternally\n  var actions: Array<NotificationAction>? /* = arrayOf()
*/\n  get() = definedExternally\n  set(value) =

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definedExternally\n}\n\n@Suppress(\\"INVISIBLE_REFERENCE\",
\\"INVISIBLE_MEMBER\")\n@kotlin.internal.InlineOnly\npublic inline fun NotificationOptions(dir:
NotificationDirection? = NotificationDirection.AUTO, lang: String? = \\", body: String? = \\", tag: String? = \\",
image: String? = undefined, icon: String? = undefined, badge: String? = undefined, sound: String? = undefined,
vibrate: dynamic = undefined, timestamp: Number? = undefined, renotify: Boolean? = false, silent: Boolean? =
false, noscreen: Boolean? = false, requireInteraction: Boolean? = false, sticky: Boolean? = false, data: Any? = null,
actions: Array<NotificationAction>? = arrayOf()): NotificationOptions {\n    val o = js(\\"({})\")\n    o[\"dir\"] = dir\n
o[\"lang\"] = lang\n    o[\"body\"] = body\n    o[\"tag\"] = tag\n    o[\"image\"] = image\n    o[\"icon\"] = icon\n
o[\"badge\"] = badge\n    o[\"sound\"] = sound\n    o[\"vibrate\"] = vibrate\n    o[\"timestamp\"] = timestamp\n
o[\"renotify\"] = renotify\n    o[\"silent\"] = silent\n    o[\"noscreen\"] = noscreen\n    o[\"requireInteraction\"] =
requireInteraction\n    o[\"sticky\"] = sticky\n    o[\"data\"] = data\n    o[\"actions\"] = actions\n    return
o\n}\n\npublic external interface NotificationAction {\n    var action: String?\n    var title: String?\n    var icon:
String?\n    get() = definedExternally\n    set(value) =
definedExternally\n}\n\n@Suppress(\\"INVISIBLE_REFERENCE\",
\\"INVISIBLE_MEMBER\")\n@kotlin.internal.InlineOnly\npublic inline fun NotificationAction(action: String?,
title: String?, icon: String? = undefined): NotificationAction {\n    val o = js(\\"({})\")\n    o[\"action\"] = action\n
o[\"title\"] = title\n    o[\"icon\"] = icon\n    return o\n}\n\npublic external interface GetNotificationOptions {\n    var
tag: String? /* = \\" *\/\n    get() = definedExternally\n    set(value) =
definedExternally\n}\n\n@Suppress(\\"INVISIBLE_REFERENCE\",
\\"INVISIBLE_MEMBER\")\n@kotlin.internal.InlineOnly\npublic inline fun GetNotificationOptions(tag: String? =
\\"): GetNotificationOptions {\n    val o = js(\\"({})\")\n    o[\"tag\"] = tag\n    return o\n}\n\n/**\n * Exposes the
JavaScript [NotificationEvent](https://developer.mozilla.org/en/docs/Web/API/NotificationEvent) to Kotlin\n
*/\npublic external open class NotificationEvent(type: String, eventInitDict: NotificationEventInit) :
ExtendableEvent {\n    open val notification: Notification\n    open val action: String\n\n    companion object {\n
val NONE: Short\n    val CAPTURING_PHASE: Short\n    val AT_TARGET: Short\n    val
BUBBLING_PHASE: Short\n    }\n}\n\npublic external interface NotificationEventInit : ExtendableEventInit {\n
var notification: Notification?\n    var action: String? /* = \\" *\/\n    get() = definedExternally\n    set(value) =
definedExternally\n}\n\n@Suppress(\\"INVISIBLE_REFERENCE\",
\\"INVISIBLE_MEMBER\")\n@kotlin.internal.InlineOnly\npublic inline fun NotificationEventInit(notification:
Notification?, action: String? = \\", bubbles: Boolean? = false, cancelable: Boolean? = false, composed: Boolean? =
false): NotificationEventInit {\n    val o = js(\\"({})\")\n    o[\"notification\"] = notification\n    o[\"action\"] =
action\n    o[\"bubbles\"] = bubbles\n    o[\"cancelable\"] = cancelable\n    o[\"composed\"] = composed\n    return
o\n}\n\n/* please, don't implement this interface!\n
*/\n@JsName(\\"null\")\n@Suppress(\\"NESTED_CLASS_IN_EXTERNAL_INTERFACE\")\npublic external
interface NotificationPermission {\n    companion object\n}\n\npublic inline val
NotificationPermission.Companion.DEFAULT: NotificationPermission get() =
\\\"default\\\".asDynamic().unsafeCast<NotificationPermission>()\n\npublic inline val
NotificationPermission.Companion.DENIED: NotificationPermission get() =
\\\"denied\\\".asDynamic().unsafeCast<NotificationPermission>()\n\npublic inline val
NotificationPermission.Companion.GRANTED: NotificationPermission get() =
\\\"granted\\\".asDynamic().unsafeCast<NotificationPermission>()\n\n/* please, don't implement this interface!\n
*/\n@JsName(\\"null\")\n@Suppress(\\"NESTED_CLASS_IN_EXTERNAL_INTERFACE\")\npublic external
interface NotificationDirection {\n    companion object\n}\n\npublic inline val
NotificationDirection.Companion.AUTO: NotificationDirection get() =
\\\"auto\\\".asDynamic().unsafeCast<NotificationDirection>()\n\npublic inline val
NotificationDirection.Companion.LTR: NotificationDirection get() =
\\\"ltr\\\".asDynamic().unsafeCast<NotificationDirection>()\n\npublic inline val
NotificationDirection.Companion.RTL: NotificationDirection get() =

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\"rtl\".asDynamic().unsafeCast<NotificationDirection>()", /*\n * Copyright 2010-2021 JetBrains s.r.o. and Kotlin
Programming Language contributors.\n * Use of this source code is governed by the Apache 2.0 license that can be
found in the license/LICENSE.txt file.\n *^\n\n// NOTE: THIS FILE IS AUTO-GENERATED, DO NOT EDIT!\n\n//
See github.com/kotlin/dukat for details\n\npackage org.w3c.workers\n\nimport kotlin.js.*\nimport
org.khronos.webgl.*\nimport org.w3c.dom.*\nimport org.w3c.dom.events.*\nimport org.w3c.fetch.*\nimport
org.w3c.notifications.*\n\n/**\n * Exposes the JavaScript
[ServiceWorker](https://developer.mozilla.org/en/docs/Web/API/ServiceWorker) to Kotlin\n *^\n\npublic external
abstract class ServiceWorker : EventTarget, AbstractWorker, UnionMessagePortOrServiceWorker,
UnionClientOrMessagePortOrServiceWorker {\n    open val scriptURL: String\n    open val state:
ServiceWorkerState\n    open var onstatechange: ((Event) -> dynamic)?\n    fun postMessage(message: Any?,
transfer: Array<dynamic> = definedExternally)\n}\n\n/**\n * Exposes the JavaScript
[ServiceWorkerRegistration](https://developer.mozilla.org/en/docs/Web/API/ServiceWorkerRegistration) to
Kotlin\n *^\n\npublic external abstract class ServiceWorkerRegistration : EventTarget {\n    open val installing:
ServiceWorker?\n    open val waiting: ServiceWorker?\n    open val active: ServiceWorker?\n    open val scope:
String\n    open var onupdatefound: ((Event) -> dynamic)?\n    open val APISpace: dynamic\n    fun update():
Promise<Unit>\n    fun unregister(): Promise<Boolean>\n    fun showNotification(title: String, options:
NotificationOptions = definedExternally): Promise<Unit>\n    fun getNotifications(filter: GetNotificationOptions =
definedExternally): Promise<Array<Notification>>\n    fun methodName(): Promise<dynamic>\n}\n\n/**\n *
Exposes the JavaScript
[ServiceWorkerContainer](https://developer.mozilla.org/en/docs/Web/API/ServiceWorkerContainer) to Kotlin\n
*^\n\npublic external abstract class ServiceWorkerContainer : EventTarget {\n    open val controller:
ServiceWorker?\n    open val ready: Promise<ServiceWorkerRegistration>\n    open var oncontrollerchange:
((Event) -> dynamic)?\n    open var onmessage: ((MessageEvent) -> dynamic)?\n    fun register(scriptURL: String,
options: RegistrationOptions = definedExternally): Promise<ServiceWorkerRegistration>\n    fun
getRegistration(clientURL: String = definedExternally): Promise<Any?>\n    fun getRegistrations():
Promise<Array<ServiceWorkerRegistration>>\n    fun startMessages()\n}\n\npublic external interface
RegistrationOptions {\n    var scope: String?\n    get() = definedExternally\n    set(value) = definedExternally\n
    var type: WorkerType? /* = WorkerType.CLASSIC */\n    get() = definedExternally\n    set(value) =
definedExternally\n}\n\n@Suppress(\"INVISIBLE_REFERENCE\",
\"INVISIBLE_MEMBER\")\n@kotlin.internal.InlineOnly\npublic inline fun RegistrationOptions(scope: String? =
undefined, type: WorkerType? = WorkerType.CLASSIC): RegistrationOptions {\n    val o = js(\"{\}\")\n    o[\"scope\"] = scope\n    o[\"type\"] = type\n    return o\n}\n\n/**\n * Exposes the JavaScript
[ServiceWorkerMessageEvent](https://developer.mozilla.org/en/docs/Web/API/ServiceWorkerMessageEvent) to
Kotlin\n *^\n\npublic external open class ServiceWorkerMessageEvent(type: String, eventInitDict:
ServiceWorkerMessageEventInit = definedExternally) : Event {\n    open val data: Any?\n    open val origin:
String\n    open val lastEventId: String\n    open val source: UnionMessagePortOrServiceWorker?\n    open val
ports: Array<out MessagePort>?\n\n    companion object {\n        val NONE: Short\n        val
CAPTURING_PHASE: Short\n        val AT_TARGET: Short\n        val BUBBLING_PHASE: Short\n    }\n}\n\npublic external interface ServiceWorkerMessageEventInit : EventInit {\n    var data: Any?\n    get() =
definedExternally\n    set(value) = definedExternally\n    var origin: String?\n    get() = definedExternally\n
set(value) = definedExternally\n    var lastEventId: String?\n    get() = definedExternally\n    set(value) =
definedExternally\n    var source: UnionMessagePortOrServiceWorker?\n    get() = definedExternally\n
set(value) = definedExternally\n    var ports: Array<MessagePort>?\n    get() = definedExternally\n    set(value)
= definedExternally\n}\n\n@Suppress(\"INVISIBLE_REFERENCE\",
\"INVISIBLE_MEMBER\")\n@kotlin.internal.InlineOnly\npublic inline fun ServiceWorkerMessageEventInit(data:
Any? = undefined, origin: String? = undefined, lastEventId: String? = undefined, source:
UnionMessagePortOrServiceWorker? = undefined, ports: Array<MessagePort>? = undefined, bubbles: Boolean? =
false, cancelable: Boolean? = false, composed: Boolean? = false): ServiceWorkerMessageEventInit {\n    val o =

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js("{}")\n o["data"] = data\n o["origin"] = origin\n o["lastEventId"] = lastEventId\n o["source"] =
source\n o["ports"] = ports\n o["bubbles"] = bubbles\n o["cancelable"] = cancelable\n o["composed"] =
composed\n return o\n}\n\n/**\n * Exposes the JavaScript
[ServiceWorkerGlobalScope](https://developer.mozilla.org/en/docs/Web/API/ServiceWorkerGlobalScope) to
Kotlin\n *\npublic external abstract class ServiceWorkerGlobalScope : WorkerGlobalScope {\n open val clients:
Clients\n open val registration: ServiceWorkerRegistration\n open var oninstall: ((Event) -> dynamic)?\n open
var onactivate: ((Event) -> dynamic)?\n open var onfetch: ((FetchEvent) -> dynamic)?\n open var
onforeignfetch: ((Event) -> dynamic)?\n open var onmessage: ((MessageEvent) -> dynamic)?\n open var
onnotificationclick: ((NotificationEvent) -> dynamic)?\n open var onnotificationclose: ((NotificationEvent) ->
dynamic)?\n open var onfunctionalevent: ((Event) -> dynamic)?\n fun skipWaiting():
Promise<Unit>\n}\n\n/**\n * Exposes the JavaScript
[Client](https://developer.mozilla.org/en/docs/Web/API/Client) to Kotlin\n *\npublic external abstract class Client :
UnionClientOrMessagePortOrServiceWorker {\n open val url: String\n open val frameType: FrameType\n
open val id: String\n fun postMessage(message: Any?, transfer: Array<dynamic> = definedExternally)\n}\n\n/**\n
* Exposes the JavaScript [WindowClient](https://developer.mozilla.org/en/docs/Web/API/WindowClient) to
Kotlin\n *\npublic external abstract class WindowClient : Client {\n open val visibilityState: dynamic\n open
val focused: Boolean\n fun focus(): Promise<WindowClient>\n fun navigate(url: String):
Promise<WindowClient>\n}\n\n/**\n * Exposes the JavaScript
[Clients](https://developer.mozilla.org/en/docs/Web/API/Clients) to Kotlin\n *\npublic external abstract class
Clients {\n fun get(id: String): Promise<Any?>\n fun matchAll(options: ClientQueryOptions =
definedExternally): Promise<Array<Client>>\n fun openWindow(url: String): Promise<WindowClient?>\n fun
claim(): Promise<Unit>\n}\n\npublic external interface ClientQueryOptions {\n var includeUncontrolled:
Boolean? /* = false *\n get() = definedExternally\n set(value) = definedExternally\n var type:
ClientType? /* = ClientType.WINDOW *\n get() = definedExternally\n set(value) =
definedExternally\n}\n\n@Suppress("INVISIBLE_REFERENCE",
"INVISIBLE_MEMBER")\n@kotlin.internal.InlineOnly\npublic inline fun
ClientQueryOptions(includeUncontrolled: Boolean? = false, type: ClientType? = ClientType.WINDOW):
ClientQueryOptions {\n val o = js("{}")\n o["includeUncontrolled"] = includeUncontrolled\n o["type"] =
type\n return o\n}\n\n/**\n * Exposes the JavaScript
[ExtendableEvent](https://developer.mozilla.org/en/docs/Web/API/ExtendableEvent) to Kotlin\n *\npublic external
open class ExtendableEvent(type: String, eventInitDict: ExtendableEventInit = definedExternally) : Event {\n fun
waitUntil(f: Promise<Any?>)\n\n companion object {\n val NONE: Short\n val CAPTURING_PHASE:
Short\n val AT_TARGET: Short\n val BUBBLING_PHASE: Short\n }\n}\n\npublic external interface
ExtendableEventInit : EventInit\n\n@Suppress("INVISIBLE_REFERENCE",
"INVISIBLE_MEMBER")\n@kotlin.internal.InlineOnly\npublic inline fun ExtendableEventInit(bubbles:
Boolean? = false, cancelable: Boolean? = false, composed: Boolean? = false): ExtendableEventInit {\n val o =
js("{}")\n o["bubbles"] = bubbles\n o["cancelable"] = cancelable\n o["composed"] = composed\n
return o\n}\n\n/**\n * Exposes the JavaScript
[InstallEvent](https://developer.mozilla.org/en/docs/Web/API/InstallEvent) to Kotlin\n *\npublic external open
class InstallEvent(type: String, eventInitDict: ExtendableEventInit = definedExternally) : ExtendableEvent {\n fun
registerForeignFetch(options: ForeignFetchOptions)\n\n companion object {\n val NONE: Short\n val
CAPTURING_PHASE: Short\n val AT_TARGET: Short\n val BUBBLING_PHASE: Short\n
}\n}\n\npublic external interface ForeignFetchOptions {\n var scopes: Array<String>?\n var origins:
Array<String>?\n}\n\n@Suppress("INVISIBLE_REFERENCE",
"INVISIBLE_MEMBER")\n@kotlin.internal.InlineOnly\npublic inline fun ForeignFetchOptions(scopes:
Array<String>?, origins: Array<String>?): ForeignFetchOptions {\n val o = js("{}")\n o["scopes"] =
scopes\n o["origins"] = origins\n return o\n}\n\n/**\n * Exposes the JavaScript
[FetchEvent](https://developer.mozilla.org/en/docs/Web/API/FetchEvent) to Kotlin\n *\npublic external open class

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[Cache](https://developer.mozilla.org/en/docs/Web/API/Cache) to Kotlin\n *^\\npublic external abstract class Cache
{\\n fun match(request: dynamic, options: CacheQueryOptions = definedExternally): Promise<Any?>\\n fun
matchAll(request: dynamic = definedExternally, options: CacheQueryOptions = definedExternally):
Promise<Array<Response>>\\n fun add(request: dynamic): Promise<Unit>\\n fun addAll(requests:
Array<dynamic>): Promise<Unit>\\n fun put(request: dynamic, response: Response): Promise<Unit>\\n fun
delete(request: dynamic, options: CacheQueryOptions = definedExternally): Promise<Boolean>\\n fun
keys(request: dynamic = definedExternally, options: CacheQueryOptions = definedExternally):
Promise<Array<Request>>\\n}\\n\\npublic external interface CacheQueryOptions {\\n var ignoreSearch: Boolean? /*
= false */^\\n get() = definedExternally\\n set(value) = definedExternally\\n var ignoreMethod: Boolean? /*
= false */^\\n get() = definedExternally\\n set(value) = definedExternally\\n var ignoreVary: Boolean? /*
= false */^\\n get() = definedExternally\\n set(value) = definedExternally\\n var cacheName: String?\\n
get() = definedExternally\\n set(value) = definedExternally\\n}\\n\\n@Suppress("\\INVISIBLE_REFERENCE",
\\INVISIBLE_MEMBER")\\n@kotlin.internal.InlineOnly\\npublic inline fun CacheQueryOptions(ignoreSearch:
Boolean? = false, ignoreMethod: Boolean? = false, ignoreVary: Boolean? = false, cacheName: String? = undefined):
CacheQueryOptions {\\n val o = js("\\{\\}")\\n o["ignoreSearch"] = ignoreSearch\\n o["ignoreMethod"] =
ignoreMethod\\n o["ignoreVary"] = ignoreVary\\n o["cacheName"] = cacheName\\n return o\\n}\\n\\npublic
external interface CacheBatchOperation {\\n var type: String?\\n get() = definedExternally\\n set(value) =
definedExternally\\n var request: Request?\\n get() = definedExternally\\n set(value) = definedExternally\\n
var response: Response?\\n get() = definedExternally\\n set(value) = definedExternally\\n var options:
CacheQueryOptions?\\n get() = definedExternally\\n set(value) =
definedExternally\\n}\\n\\n@Suppress("\\INVISIBLE_REFERENCE",
\\INVISIBLE_MEMBER")\\n@kotlin.internal.InlineOnly\\npublic inline fun CacheBatchOperation(type: String? =
undefined, request: Request? = undefined, response: Response? = undefined, options: CacheQueryOptions? =
undefined): CacheBatchOperation {\\n val o = js("\\{\\}")\\n o["type"] = type\\n o["request"] = request\\n
o["response"] = response\\n o["options"] = options\\n return o\\n}\\n\\n/**\\n * Exposes the JavaScript
[CacheStorage](https://developer.mozilla.org/en/docs/Web/API/CacheStorage) to Kotlin\\n *^\\npublic external
abstract class CacheStorage {\\n fun match(request: dynamic, options: CacheQueryOptions = definedExternally):
Promise<Any?>\\n fun has(cacheName: String): Promise<Boolean>\\n fun open(cacheName: String):
Promise<Cache>\\n fun delete(cacheName: String): Promise<Boolean>\\n fun keys():
Promise<Array<String>>\\n}\\n\\npublic external open class FunctionalEvent : ExtendableEvent {\\n companion
object {\\n val NONE: Short\\n val CAPTURING_PHASE: Short\\n val AT_TARGET: Short\\n val
BUBBLING_PHASE: Short\\n }\\n}\\n\\npublic external interface UnionMessagePortOrServiceWorker\\n\\npublic
external interface UnionClientOrMessagePortOrServiceWorker\\n\\n/* please, don't implement this interface!
*/^\\n@JsName("\\null")\\n@Suppress("\\NESTED_CLASS_IN_EXTERNAL_INTERFACE")\\npublic external
interface ServiceWorkerState {\\n companion object\\n}\\n\\npublic inline val
ServiceWorkerState.Companion.INSTALLING: ServiceWorkerState get() =
\\installing\\n.asDynamic().unsafeCast<ServiceWorkerState>()\\n\\npublic inline val
ServiceWorkerState.Companion.INSTALLED: ServiceWorkerState get() =
\\installed\\n.asDynamic().unsafeCast<ServiceWorkerState>()\\n\\npublic inline val
ServiceWorkerState.Companion.ACTIVATING: ServiceWorkerState get() =
\\activating\\n.asDynamic().unsafeCast<ServiceWorkerState>()\\n\\npublic inline val
ServiceWorkerState.Companion.ACTIVATED: ServiceWorkerState get() =
\\activated\\n.asDynamic().unsafeCast<ServiceWorkerState>()\\n\\npublic inline val
ServiceWorkerState.Companion.REDUNDANT: ServiceWorkerState get() =
\\redundant\\n.asDynamic().unsafeCast<ServiceWorkerState>()\\n\\n/* please, don't implement this interface!
*/^\\n@JsName("\\null")\\n@Suppress("\\NESTED_CLASS_IN_EXTERNAL_INTERFACE")\\npublic external
interface FrameType {\\n companion object\\n}\\n\\npublic inline val FrameType.Companion.AUXILIARY:
FrameType get() = \\auxiliary\\n.asDynamic().unsafeCast<FrameType>()\\n\\npublic inline val

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FrameType.Companion.TOP_LEVEL: FrameType get() = `top-
level`.asDynamic().unsafeCast<FrameType>()\n\npublic inline val FrameType.Companion.NESTED: FrameType
get() = `nested`.asDynamic().unsafeCast<FrameType>()\n\npublic inline val FrameType.Companion.NONE:
FrameType get() = `none`.asDynamic().unsafeCast<FrameType>()\n\n/* please, don't implement this interface!
*\n@JsName(`null`)\n@Suppress(`NESTED_CLASS_IN_EXTERNAL_INTERFACE`)\n\npublic external
interface ClientType {\n  companion object\n}\n\npublic inline val ClientType.Companion.WINDOW: ClientType
get() = `window`.asDynamic().unsafeCast<ClientType>()\n\npublic inline val ClientType.Companion.WORKER:
ClientType get() = `worker`.asDynamic().unsafeCast<ClientType>()\n\npublic inline val
ClientType.Companion.SHAREDWORKER: ClientType get() =
`sharedworker`.asDynamic().unsafeCast<ClientType>()\n\npublic inline val ClientType.Companion.ALL:
ClientType get() = `all`.asDynamic().unsafeCast<ClientType>()`,`/*\n * Copyright 2010-2021 JetBrains s.r.o. and
Kotlin Programming Language contributors.\n * Use of this source code is governed by the Apache 2.0 license that
can be found in the license/LICENSE.txt file.\n */\n\n// NOTE: THIS FILE IS AUTO-GENERATED, DO NOT
EDIT!\n\n See github.com/kotlin/dukat for details\n\npackage org.w3c.xhr\n\nimport kotlin.js.*\nimport
org.khronos.webgl.*\nimport org.w3c.dom.*\nimport org.w3c.dom.events.*\nimport org.w3c.files.*\n\n/**\n *
Exposes the JavaScript
[XMLHttpRequestEventTarget](https://developer.mozilla.org/en/docs/Web/API/XMLHttpRequestEventTarget) to Kotlin\n
*\n\npublic external abstract class XMLHttpRequestEventTarget : EventTarget {\n  open var onloadstart:
((ProgressEvent) -> dynamic)?\n  open var onprogress: ((ProgressEvent) -> dynamic)?\n  open var onabort:
((Event) -> dynamic)?\n  open var onerror: ((Event) -> dynamic)?\n  open var onload: ((Event) -> dynamic)?\n
open var ontimeout: ((Event) -> dynamic)?\n  open var onloadend: ((Event) -> dynamic)?\n}\n\n\npublic external
abstract class XMLHttpRequestUpload : XMLHttpRequestEventTarget\n\n/**\n * Exposes the JavaScript
[XMLHttpRequest](https://developer.mozilla.org/en/docs/Web/API/XMLHttpRequest) to Kotlin\n
*\n\npublic
external open class XMLHttpRequest : XMLHttpRequestEventTarget {\n  var onreadystatechange: ((Event) ->
dynamic)?\n  open val readyState: Short\n  var timeout: Int\n  var withCredentials: Boolean\n  open val upload:
XMLHttpRequestUpload\n  open val responseURL: String\n  open val status: Short\n  open val statusText:
String\n  var responseType: XMLHttpRequestResponseType\n  open val response: Any?\n  open val
responseText: String\n  open val responseXML: Document?\n  fun open(method: String, url: String)\n  fun
open(method: String, url: String, async: Boolean, username: String? = definedExternally, password: String? =
definedExternally)\n  fun setRequestHeader(name: String, value: String)\n  fun send(body: dynamic =
definedExternally)\n  fun abort()\n  fun getResponseHeader(name: String): String?\n  fun
getAllResponseHeaders(): String\n  fun overrideMimeType(mime: String)\n}\n\n  companion object {\n    val
UNSENT: Short\n    val OPENED: Short\n    val HEADERS_RECEIVED: Short\n    val LOADING:
Short\n    val DONE: Short\n  }\n}\n\n\n/**\n * Exposes the JavaScript
[FormData](https://developer.mozilla.org/en/docs/Web/API/FormData) to Kotlin\n
*\n\npublic external open class
FormData(form: HTMLFormElement = definedExternally) {\n  fun append(name: String, value: String)\n  fun
append(name: String, value: Blob, filename: String = definedExternally)\n  fun delete(name: String)\n  fun
get(name: String): dynamic\n  fun getAll(name: String): Array<dynamic>\n  fun has(name: String): Boolean\n
fun set(name: String, value: String)\n  fun set(name: String, value: Blob, filename: String =
definedExternally)\n}\n\n\n/**\n * Exposes the JavaScript
[ProgressEvent](https://developer.mozilla.org/en/docs/Web/API/ProgressEvent) to Kotlin\n
*\n\npublic external open
class ProgressEvent(type: String, eventInitDict: ProgressEventInit = definedExternally) : Event {\n  open val
lengthComputable: Boolean\n  open val loaded: Number\n  open val total: Number\n}\n\n  companion object {\n
val NONE: Short\n    val CAPTURING_PHASE: Short\n    val AT_TARGET: Short\n    val
BUBBLING_PHASE: Short\n  }\n}\n\n\npublic external interface ProgressEventInit : EventInit {\n  var
lengthComputable: Boolean? /* = false */\n  get() = definedExternally\n  set(value) = definedExternally\n
var loaded: Number? /* = 0 */\n  get() = definedExternally\n  set(value) = definedExternally\n  var total:
Number? /* = 0 */\n  get() = definedExternally\n  set(value) =

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definedExternally\n}\n\n@Suppress(\"INVISIBLE_REFERENCE\",
\"INVISIBLE_MEMBER\")\n\n@kotlin.internal.InlineOnly\n\npublic inline fun ProgressEventInit(lengthComputable:
Boolean? = false, loaded: Number? = 0, total: Number? = 0, bubbles: Boolean? = false, cancelable: Boolean? =
false, composed: Boolean? = false): ProgressEventInit {\n    val o = js(\"({})\")\n    o[\"lengthComputable\"] =
lengthComputable\n    o[\"loaded\"] = loaded\n    o[\"total\"] = total\n    o[\"bubbles\"] = bubbles\n
o[\"cancelable\"] = cancelable\n    o[\"composed\"] = composed\n    return o\n}\n\n/* please, don't implement this
interface! */\n\n@JsName(\"null\")\n\n@Suppress(\"NESTED_CLASS_IN_EXTERNAL_INTERFACE\")\n\npublic
external interface XMLHttpRequestResponseType {\n    companion object\n}\n\n\npublic inline val
XMLHttpRequestResponseType.Companion.EMPTY: XMLHttpRequestResponseType get() =
\"\".asDynamic().unsafeCast<XMLHttpRequestResponseType>()\n\n\npublic inline val
XMLHttpRequestResponseType.Companion.ARRAYBUFFER: XMLHttpRequestResponseType get() =
\"arraybuffer\".asDynamic().unsafeCast<XMLHttpRequestResponseType>()\n\n\npublic inline val
XMLHttpRequestResponseType.Companion.BLOB: XMLHttpRequestResponseType get() =
\"blob\".asDynamic().unsafeCast<XMLHttpRequestResponseType>()\n\n\npublic inline val
XMLHttpRequestResponseType.Companion.DOCUMENT: XMLHttpRequestResponseType get() =
\"document\".asDynamic().unsafeCast<XMLHttpRequestResponseType>()\n\n\npublic inline val
XMLHttpRequestResponseType.Companion.JSON: XMLHttpRequestResponseType get() =
\"json\".asDynamic().unsafeCast<XMLHttpRequestResponseType>()\n\n\npublic inline val
XMLHttpRequestResponseType.Companion.TEXT: XMLHttpRequestResponseType get() =
\"text\".asDynamic().unsafeCast<XMLHttpRequestResponseType>()\n\n\n/*\n * Copyright 2010-2018 JetBrains s.r.o.
and Kotlin Programming Language contributors.\n * Use of this source code is governed by the Apache 2.0 license
that can be found in the license/LICENSE.txt file.\n */\n\n\npackage kotlin\n\n\nimport
kotlin.annotation.AnnotationRetention.BINARY\n\nimport kotlin.annotation.AnnotationRetention.SOURCE\n\nimport
kotlin.annotation.AnnotationTarget.*\n\nimport kotlin.internal.RequireKotlin\n\nimport
kotlin.internal.RequireKotlinVersionKind\n\nimport kotlin.reflect.KClass\n\n\n/**\n * Signals that the annotated
annotation class is a marker of an experimental API.\n * Any declaration annotated with that marker is
considered an experimental declaration\n * and its call sites should accept the experimental aspect of it either by
using [UseExperimental],\n * or by being annotated with that marker themselves, effectively causing further
propagation of that experimental aspect.\n * This class is deprecated in favor of a more general approach
provided by [RequiresOptIn]/[OptIn].\n */\n\n\n@Target(ANNOTATION_CLASS)\n\n@Retention(BINARY)\n\n@SinceKotlin(\"1.2\")\n\n@RequireKotlin(\"1.2.50\",
versionKind = RequireKotlinVersionKind.COMPILER_VERSION)\n\n@DeprecatedSinceKotlin(warningSince =
\"1.4\", errorSince = \"1.6\")\n\n@Deprecated(\"Please use RequiresOptIn instead.\")\n\npublic annotation class
Experimental(val level: Level = Level.ERROR) {\n    /**\n     * Severity of the diagnostic that should be reported on
usages of experimental API which did not explicitly accept the experimental aspect\n     * of that API either by using
[UseExperimental] or by being annotated with the corresponding marker annotation.\n     */\n\n    public enum class
Level {\n        /** Specifies that a warning should be reported on incorrect usages of this experimental API. */\n
WARNING,\n        /** Specifies that an error should be reported on incorrect usages of this experimental API. */\n
ERROR,\n        }\n}\n\n\n/**\n * Allows to use experimental API denoted by the given markers in the annotated file,
declaration, or expression.\n * If a declaration is annotated with [UseExperimental], its usages are **not**
required to opt-in to that experimental API.\n * This class is deprecated in favor of a more general approach
provided by [RequiresOptIn]/[OptIn].\n */\n\n\n@Target(\n    CLASS, PROPERTY, LOCAL_VARIABLE,
VALUE_PARAMETER, CONSTRUCTOR, FUNCTION, PROPERTY_GETTER, PROPERTY_SETTER,
EXPRESSION, FILE,
TYPEALIAS)\n\n@Retention(SOURCE)\n\n@SinceKotlin(\"1.2\")\n\n@RequireKotlin(\"1.2.50\", versionKind =
RequireKotlinVersionKind.COMPILER_VERSION)\n\n@DeprecatedSinceKotlin(warningSince = \"1.4\", errorSince =
\"1.6\")\n\n@Deprecated(\"Please use OptIn instead.\", ReplaceWith(\"OptIn(*markerClass)\",
\"kotlin.OptIn\"))\n\npublic annotation class UseExperimental(\n    vararg val markerClass: KClass<out

```

```

Annotation>\n)\n\n@Target(CLASS, PROPERTY, CONSTRUCTOR, FUNCTION,
TYPEALIAS)\n@Retention(BINARY)\ninternal annotation class WasExperimental(\n    vararg val markerClass:
KClass<out Annotation>\n)\n", "package kotlin\n\nimport kotlin.annotation.AnnotationTarget.*\n\n/*\n * This
annotation marks the standard library API that is considered experimental and is not subject to the\n * [general
compatibility guarantees](https://kotlinlang.org/docs/reference/evolution/components-stability.html) given for the
standard library:\n * the behavior of such API may be changed or the API may be removed completely in any
further release.\n * \n * > Beware using the annotated API especially if you're developing a library, since your library
might become binary incompatible\n * with the future versions of the standard library.\n * \n * Any usage of a
declaration annotated with `@ExperimentalStdlibApi` must be accepted either by\n * annotating that usage with the
[OptIn] annotation, e.g. `@OptIn(ExperimentalStdlibApi::class)`,\n * or by using the compiler argument `-opt-
in=kotlin.ExperimentalStdlibApi`.\n * \n * \n * @RequiresOptIn(level =
RequiresOptIn.Level.ERROR)\n@Retention(AnnotationRetention.BINARY)\n@Target(\n    CLASS,\n    ANNOTATION_CLASS,\n    PROPERTY,\n    FIELD,\n    LOCAL_VARIABLE,\n    VALUE_PARAMETER,\n    CONSTRUCTOR,\n    FUNCTION,\n    PROPERTY_GETTER,\n    PROPERTY_SETTER,\n    TYPEALIAS)\n)\n@MustBeDocumented\n@SinceKotlin("1.3")\npublic annotation class
ExperimentalStdlibApi\n", "/*\n * Copyright 2010-2020 JetBrains s.r.o. and Kotlin Programming Language
contributors.\n * Use of this source code is governed by the Apache 2.0 license that can be found in the
license/LICENSE.txt file.\n * \n * \n * package kotlin\n\nimport kotlin.annotation.AnnotationTarget.*\n\nimport
kotlin.experimental.ExperimentalTypeInference\n\n/*\n * Allows to infer generic type arguments of a function
from the calls in the annotated function parameter of that function.\n * \n * When this annotation is placed on a
generic function parameter of a function,\n * it enables to infer the type arguments of that generic function from the
lambda body passed to that parameter.\n * \n * The calls that affect inference are either members of the receiver type
of an annotated function parameter or\n * extensions for that type. The extensions must be themselves annotated
with `@BuilderInference`.\n * \n * Example: we declare\n * ```\n * fun <T> sequence(@BuilderInference block:
suspend SequenceScope<T>().() -> Unit): Sequence<T>\n * ```\n * and use it like\n * ```\n * val result = sequence {
yield("result") }\n * ```\n * Here the type argument of the resulting sequence is inferred to `String` from\n * the
argument of the [SequenceScope.yield] function, that is called inside the lambda passed to [sequence].\n * \n * Note:
this annotation is experimental, see [ExperimentalTypeInference] on how to opt-in for it.\n
*\n * \n * @Target(VALUE_PARAMETER, FUNCTION,
PROPERTY)\n@Retention(AnnotationRetention.BINARY)\n@SinceKotlin("1.3")\n@ExperimentalTypeInferenc
e\npublic annotation class BuilderInference\n\n/*\n * Enables overload selection based on the type of the value
returned from lambda argument.\n * \n * When two or more function overloads have otherwise the same parameter
lists that differ only in the return type\n * of a functional parameter, this annotation enables overload selection by the
type of the value returned from\n * the lambda function passed to this functional parameter.\n * \n * Example:\n *
```
\n * @OverloadResolutionByLambdaReturnType\n * fun create(intProducer: () -> Int): Int\n * \n * fun
create(doubleProducer: () -> Double): Double\n * \n * val newValue = create { 3.14 }\n * ```\n * \n * The annotation
being applied to one of overloads allows to resolve this ambiguity by analyzing what value is returned\n * from the
lambda function.\n * \n * This annotation is also used to discriminate the annotated overloads in case if overload
selection still cannot\n * choose one of them even taking in account the result of lambda parameter analysis. In that
case a warning is reported.\n * \n * Note: this annotation is experimental, see [ExperimentalTypeInference] on how
to opt-in for it.\n
*\n * \n * @Target(FUNCTION)\n@Retention(AnnotationRetention.BINARY)\n@SinceKotlin("1.4")\n@Experimental
TypeInference\npublic annotation class OverloadResolutionByLambdaReturnType", "/*\n * Copyright 2010-2018
JetBrains s.r.o. and Kotlin Programming Language contributors.\n * Use of this source code is governed by the
Apache 2.0 license that can be found in the license/LICENSE.txt file.\n * \n * \n * package kotlin\n\nimport
kotlin.annotation.AnnotationTarget.*\n\nimport kotlin.internal.RequireKotlin\n\nimport
kotlin.internal.RequireKotlinVersionKind\n\n/*\n * The experimental multiplatform support API marker.\n * \n *
Any usage of a declaration annotated with `@ExperimentalMultiplatform` must be accepted either by\n * annotating

```

that usage with the [OptIn] annotation, e.g. `@OptIn(ExperimentalMultiplatform::class)`,  
or by using the compiler argument `-opt-in=kotlin.ExperimentalMultiplatform`.

```
*\n@RequiresOptIn\n@MustBeDocumented\n@Target(\n CLASS,\n ANNOTATION_CLASS,\n PROPERTY,\n FIELD,\n LOCAL_VARIABLE,\n VALUE_PARAMETER,\n CONSTRUCTOR,\n FUNCTION,\n PROPERTY_GETTER,\n PROPERTY_SETTER,\n TYPEALIAS)\n\n@Retention(AnnotationRetention.BINARY)\n@RequireKotlin("1.2.50", versionKind =\n RequireKotlinVersionKind.COMPILER_VERSION)\n\npublic annotation class ExperimentalMultiplatform\n\n/**\n * Marks an expected annotation class that it isn't required to have actual counterparts in all platforms.\n * This annotation is only applicable to `expect` annotation classes in multi-platform projects and marks that class as\n * "optional".\n * Optional expected class is allowed to have no corresponding actual class on the platform. Optional\n * annotations can only be used to annotate something, not as types in signatures. If an optional annotation has no\n * corresponding actual class on a platform, the annotation entries where it's used are simply erased when\n * compiling code on that platform.\n * Note: this annotation is experimental, see [ExperimentalMultiplatform] on how to opt-in for it.
```

```
\n@Target(ANNOTATION_CLASS)\n@Retention(AnnotationRetention.BINARY)\n@ExperimentalMultiplatform\n@RequireKotlin("1.2.50", versionKind = RequireKotlinVersionKind.COMPILER_VERSION)\n\npublic annotation class OptionalExpectation\n\n"/\n * Copyright 2010-2018 JetBrains s.r.o. and Kotlin Programming Language contributors.\n * Use of this source code is governed by the Apache 2.0 license that can be found in the\n * license/LICENSE.txt file.\n */\n\npackage kotlin\n\nimport\n kotlin.annotation.AnnotationRetention.BINARY\nimport\n kotlin.annotation.AnnotationRetention.SOURCE\nimport\n kotlin.annotation.AnnotationTarget\nimport\n kotlin.internal.RequireKotlin\nimport\n kotlin.internal.RequireKotlinVersionKind\nimport\n kotlin.reflect.KClass\n\n/**\n * Signals that the annotated annotation class is a marker of an API that requires an explicit opt-in.\n * Call sites of any declaration annotated with that marker should opt in to the API either by using [OptIn],\n * or by being annotated with that marker themselves, effectively causing further propagation of the opt-in requirement.\n * This class requires opt-in itself and can only be used with the compiler argument -opt-in=kotlin.RequiresOptIn.
@property message message to be reported on usages of API without an explicit opt-in, or empty string for the default message.
```

The default message is: `"This declaration is experimental and its usage should be marked with 'Marker' or '@OptIn(Marker::class)'"`, where `Marker` is the opt-in requirement marker.  
@property level specifies how usages of API without an explicit opt-in are reported in code.

```
*\n@Target(ANNOTATION_CLASS)\n@Retention(BINARY)\n@SinceKotlin("1.3")\n@RequireKotlin("1.3.70", versionKind = RequireKotlinVersionKind.COMPILER_VERSION)\n\npublic annotation class RequiresOptIn(\n val message: String = "",\n val level: Level = Level.ERROR) {\n /**\n * Severity of the diagnostic that should be reported on usages which did not explicitly opt into the API either by using [OptIn] or by being annotated with the corresponding marker annotation.\n */\n public enum class Level {\n /** Specifies that a warning should be reported on incorrect usages of this API.\n WARNING,\n /** Specifies that an error should be reported on incorrect usages of this API.\n ERROR,\n }\n\n/**\n * Allows to use the API denoted by the given markers in the annotated file, declaration, or expression.\n * If a declaration is annotated with [OptIn], its usages are not required to opt in to that API.\n * This class requires opt-in itself and can only be used with the compiler argument -opt-in=kotlin.RequiresOptIn.
@Target(\n CLASS, PROPERTY, LOCAL_VARIABLE, VALUE_PARAMETER, CONSTRUCTOR, FUNCTION, PROPERTY_GETTER, PROPERTY_SETTER, EXPRESSION, FILE,
```

```
TYPEALIAS)\n\n@Retention(SOURCE)\n@SinceKotlin("1.3")\n@RequireKotlin("1.3.70", versionKind = RequireKotlinVersionKind.COMPILER_VERSION)\n\npublic annotation class OptIn(\n vararg val markerClass: KClass<out Annotation>)\n\n"/*\n * Copyright 2010-2020 JetBrains s.r.o. and Kotlin Programming Language contributors.\n * Use of this source code is governed by the Apache 2.0 license that can be found in the\n * license/LICENSE.txt file.\n */\n\npackage kotlin.collections\n\nimport\n kotlin.js.JsName\n\n/**\n * Provides a skeletal implementation of the read-only [Collection] interface.\n * @param E the type of elements contained in the
```



```

collection. The collection is covariant in its element type.
*/@SinceKotlin("1.1")
public abstract class
AbstractCollection<out E> protected constructor() : Collection<E> {
 abstract override val size: Int
 abstract
 override fun iterator(): Iterator<E>
 override fun contains(element: @UnsafeVariance E): Boolean = any { it
 == element }
 override fun containsAll(elements: Collection<@UnsafeVariance E>): Boolean =
elements.all { contains(it) } // use when js will support bound refs: elements.all(this::contains)
 override fun
isEmpty(): Boolean = size == 0
 override fun toString(): String = joinToString(", ", "[", "]")
 if (it
 === this) "(this Collection)" else it.toString()
}
/**
 * Returns new array of type `Array<Any?>` with
the elements of this collection.
*/@JsName("toArray")
protected open fun toArray(): Array<Any?> =
copyToArrayImpl(this)
/**
 * Fills the provided [array] or creates new array of the same type
 * and
fills it with the elements of this collection.
*/@protected open fun <T> toArray(array: Array<T>): Array<T>
= copyToArrayImpl(this, array)
}
n", "/*
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Language contributors.
 * Use of this source code is governed by the Apache 2.0 license that can be found in the
license/LICENSE.txt file.
*/
package kotlin.collections
private enum class State { Ready,
NotReady,
Done,
Failed }
/**
 * A base class to simplify implementing iterators so that
implementations only have to implement [computeNext]
 * to implement the iterator, calling [done] when the
iteration is complete.
*/public abstract class AbstractIterator<T> : Iterator<T> {
 private var state =
State.NotReady
 private var nextValue: T? = null
 override fun hasNext(): Boolean {
 require(state !=
State.Failed)
 return when (state) {
 State.Done -> false
 State.Ready -> true
 else ->
tryToComputeNext()
 }
 }
 override fun next(): T {
 if (!hasNext()) throw
NoSuchElementException()
 state = State.NotReady
 @Suppress("UNCHECKED_CAST")
return nextValue as T
 }
 private fun tryToComputeNext(): Boolean {
 state = State.Failed
 computeNext()
 return state == State.Ready
 }
 /**
 * Computes the next item in the iterator.
 *
 * This callback method should call one of these two methods:
 *
 * * [setNext] with the next value of
the iteration
 *
 * * [done] to indicate there are no more elements
 *
 * Failure to call either method will
result in the iteration terminating with a failed state
*/
abstract protected fun computeNext(): Unit
/**
 * Sets the next value in the iteration, called from the [computeNext] function
*/
protected fun
setNext(value: T): Unit {
 nextValue = value
 state = State.Ready
}
/**
 * Sets the state to
done so that the iteration terminates.
*/
protected fun done() {
 state = State.Done
}
}
n", "/*
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is governed by the Apache 2.0 license that can be found in the license/LICENSE.txt file.
*/
Based on
GWT AbstractList
 * Copyright 2007 Google Inc.
*/
package kotlin.collections
/**
 * Provides a skeletal
implementation of the read-only [List] interface.
 *
 * This class is intended to help implementing read-only lists
so it doesn't support concurrent modification tracking.
 *
 * @param E the type of elements contained in the list.
The list is covariant in its element type.
*/@SinceKotlin("1.1")
public abstract class AbstractList<out E>
protected constructor() : AbstractCollection<E>(), List<E> {
 abstract override val size: Int
 abstract override
fun get(index: Int): E
 override fun iterator(): Iterator<E> = IteratorImpl()
 override fun indexOf(element:
@UnsafeVariance E): Int = indexOfFirst { it == element }
 override fun lastIndexOf(element:
@UnsafeVariance E): Int = indexOfLast { it == element }
 override fun listIterator(): ListIterator<E> =
ListIteratorImpl(0)
 override fun listIterator(index: Int): ListIterator<E> = ListIteratorImpl(index)
 override fun subList(fromIndex: Int, toIndex: Int): List<E> = SubList(this, fromIndex, toIndex)
 private class
SubList<out E>(private val list: AbstractList<E>, private val fromIndex: Int, toIndex: Int) : AbstractList<E>(),
RandomAccess {
 private var _size: Int = 0
 init {
 checkRangeIndexes(fromIndex, toIndex,
list.size)
 this._size = toIndex - fromIndex
 }
 override fun get(index: Int): E {
 checkElementIndex(index, _size)
 return list[fromIndex + index]
 }
 override val size: Int
get() = _size
 }
 /**
 * Compares this list with other list instance with the ordered structural equality.
 *
 * @return true, if [other] instance is a [List] of the same size, which contains the same elements in the same
order.
*/
override fun equals(other: Any?): Boolean {
 if (other === this) return true
 if (other !is
List<*>) return false
 return orderedEquals(this, other)
 }
 /**
 * Returns the hash code value for

```

```

this list.\n */\n override fun hashCode(): Int = orderedHashCode(this)\n\n private open inner class IteratorImpl
: Iterator<E> {\n /** the index of the item that will be returned on the next call to [next]`() */\n protected
var index = 0\n\n override fun hasNext(): Boolean = index < size\n\n override fun next(): E {\n if
(!hasNext()) throw NoSuchElementException()\n return get(index++)\n }\n }\n\n /**\n *
Implementation of [ListIterator] for abstract lists.\n */\n private open inner class ListIteratorImpl(index: Int) :
IteratorImpl(), ListIterator<E> {\n\n init {\n checkPositionIndex(index, this@AbstractList.size)\n
this.index = index\n }\n\n override fun hasPrevious(): Boolean = index > 0\n\n override fun
nextIndex(): Int = index\n\n override fun previous(): E {\n if (!hasPrevious()) throw
NoSuchElementException()\n return get(--index)\n }\n\n override fun previousIndex(): Int = index -
1\n }\n\n internal companion object {\n internal fun checkElementIndex(index: Int, size: Int) {\n if
(index < 0 || index >= size) {\n throw IndexOutOfBoundsException("index: $index, size: $size")\n }\n }\n\n internal fun checkPositionIndex(index: Int, size: Int) {\n if (index < 0 || index > size) {\n
 throw IndexOutOfBoundsException("index: $index, size: $size")\n }\n }\n\n internal fun
checkRangeIndexes(fromIndex: Int, toIndex: Int, size: Int) {\n if (fromIndex < 0 || toIndex > size) {\n
 throw IndexOutOfBoundsException("fromIndex: $fromIndex, toIndex: $toIndex, size: $size")\n }\n
 if (fromIndex > toIndex) {\n throw IllegalArgumentException("fromIndex: $fromIndex > toIndex:
$toIndex")\n }\n }\n\n internal fun checkBoundsIndexes(startIndex: Int, endIndex: Int, size: Int) {\n
 if (startIndex < 0 || endIndex > size) {\n throw IndexOutOfBoundsException("startIndex:
$startIndex, endIndex: $endIndex, size: $size")\n }\n if (startIndex > endIndex) {\n throw
IllegalArgumentException("startIndex: $startIndex > endIndex: $endIndex")\n }\n }\n\n internal
fun orderedHashCode(c: Collection<*>): Int {\n var hashCode = 1\n for (e in c) {\n
 hashCode = 31 * hashCode + (e?.hashCode() ?: 0)\n }\n return hashCode\n }\n\n internal fun
orderedEquals(c: Collection<*>, other: Collection<*>): Boolean {\n if (c.size != other.size) return false\n\n
 val otherIterator = other.iterator()\n for (elem in c) {\n val elemOther = otherIterator.next()\n
 if (elem != elemOther) {\n return false\n }\n }\n return true\n }\n }\n\n /*\n * Copyright 2010-2020 JetBrains s.r.o. and Kotlin Programming Language contributors.\n * Use of this
source code is governed by the Apache 2.0 license that can be found in the license/LICENSE.txt file.\n */\n\n *
Based on GWT AbstractMap\n * Copyright 2007 Google Inc.\n */\n\n package kotlin.collections\n\n /**\n * Provides
a skeletal implementation of the read-only [Map] interface.\n * The implementor is required to implement
[entries] property, which should return read-only set of map entries.\n * @param K the type of map keys. The
map is invariant in its key type.\n * @param V the type of map values. The map is covariant in its value type.\n
 */\n\n @SinceKotlin("1.1")\n public abstract class AbstractMap<K, out V> protected constructor() : Map<K, V>
{\n\n override fun containsKey(key: K): Boolean {\n return implFindEntry(key) != null\n }\n\n override
fun containsValue(value: @UnsafeVariance V): Boolean = entries.any { it.value == value }\n\n internal fun
containsEntry(entry: Map.Entry<*, *>): Boolean {\n // since entry comes from @UnsafeVariance parameters it
can be virtually anything\n if (entry !is Map.Entry<*, *>) return false\n val key = entry.key\n val value
= entry.value\n val ourValue = get(key)\n\n if (value != ourValue) {\n return false\n }\n\n //
Perhaps it was null and we don't contain the key?\n if (ourValue == null && !containsKey(key)) {\n return false\n }\n return true\n }\n\n /**\n * Compares this map with other instance with the
ordered structural equality.\n * @return true, if [other] instance is a [Map] of the same size, all entries of
which are contained in the [entries] set of this map.\n */\n\n override fun equals(other: Any?): Boolean {\n if
(other === this) return true\n if (other !is Map<*, *>) return false\n if (size != other.size) return false\n\n
 return other.entries.all { containsEntry(it) }\n }\n\n override operator fun get(key: K): V? =
implFindEntry(key)?.value\n\n /**\n * Returns the hash code value for this map.\n * It is the same as
the hashCode of [entries] set.\n */\n\n override fun hashCode(): Int = entries.hashCode()\n\n override fun
isEmpty(): Boolean = size == 0\n\n override val size: Int get() = entries.size\n\n /**\n * Returns a read-only
[Set] of all keys in this map.\n * Accessing this property first time creates a keys view from [entries].\n *
All subsequent accesses just return the created instance.\n */\n\n override val keys: Set<K>\n get() {\n

```

```

if (_keys == null) {\n _keys = object : AbstractSet<K>() {\n override operator fun
contains(element: K): Boolean = containsKey(element)\n override operator fun iterator(): Iterator<K>
{\n val entryIterator = entries.iterator()\n return object : Iterator<K> {\n override fun hasNext(): Boolean = entryIterator.hasNext()\n override fun next(): K =
entryIterator.next().key\n }\n }\n override val size: Int get() =
this@AbstractMap.size\n }\n } return _keys!!\n }\n @kotlin.jvm.Volatile\nprivate var _keys: Set<K>? = null\n override fun toString(): String = entries.joinToString(", ", "\n", "\n") {\n toString(it) }\n private fun toString(entry: Map.Entry<K, V>): String = toString(entry.key) + "=" +
toString(entry.value)\n private fun toString(o: Any?): String = if (o === this) "(this Map)" else o.toString()\n /**\n * Returns a read-only [Collection] of all values in this map.\n *\n * Accessing this property first time
creates a values view from [entries].\n *\n * All subsequent accesses just return the created instance.\n *\n override val values: Collection<V>\n get() {\n if (_values == null) {\n _values = object :
AbstractCollection<V>() {\n override operator fun contains(element: @UnsafeVariance V): Boolean =
containsValue(element)\n override operator fun iterator(): Iterator<V> {\n val
entryIterator = entries.iterator()\n return object : Iterator<V> {\n override fun
hasNext(): Boolean = entryIterator.hasNext()\n override fun next(): V = entryIterator.next().value\n }\n }\n override val size: Int get() = this@AbstractMap.size\n }\n }\n return _values!!\n }\n @kotlin.jvm.Volatile\nprivate var _values: Collection<V>? = null\n private fun implFindEntry(key: K): Map.Entry<K, V>? = entries.firstOrNull { it.key == key }\n internal
companion object {\n internal fun entryHashCode(e: Map.Entry<*, *>): Int = with(e) { (key?.hashCode() ?:
0) xor (value?.hashCode() ?: 0) }\n internal fun entryToString(e: Map.Entry<*, *>): String = with(e) {\n "$key=$value" }\n internal fun entryEquals(e: Map.Entry<*, *>, other: Any?): Boolean {\n if (other !is
Map.Entry<*, *>) return false\n return e.key == other.key && e.value == other.value\n }\n }\n }"/*\n * Copyright 2010-2020 JetBrains s.r.o. and Kotlin Programming Language contributors.\n * Use of
this source code is governed by the Apache 2.0 license that can be found in the license/LICENSE.txt file.\n */\n package kotlin.collections\n /**\n * Provides a skeletal implementation of the read-only [Set] interface.\n *\n * This class is intended to help implementing read-only sets so it doesn't support concurrent modification tracking.\n *\n * @param E the type of elements contained in the set. The set is covariant in its element type.\n */\n @SinceKotlin("1.1")\n public abstract class AbstractSet<out E> protected constructor() :
AbstractCollection<E>(), Set<E> {\n /**\n * Compares this set with other set instance with the unordered
structural equality.\n *\n * @return true, if [other] instance is a [Set] of the same size, all elements of which are
contained in this set.\n */\n override fun equals(other: Any?): Boolean {\n if (other === this) return true\n if (other !is Set<*>) return false\n return setEquals(this, other)\n }\n /**\n * Returns the hash code
value for this set.\n */\n override fun hashCode(): Int = unorderedHashCode(this)\n internal companion
object {\n internal fun unorderedHashCode(c: Collection<*>): Int {\n var hashCode = 0\n for
(element in c) {\n hashCode += (element?.hashCode() ?: 0)\n }\n return hashCode\n }\n internal fun setEquals(c: Set<*>, other: Set<*>): Boolean {\n if (c.size != other.size) return false\n return c.containsAll(other)\n }\n }\n }"/*\n * Copyright 2010-2019 JetBrains s.r.o. and Kotlin
Programming Language contributors.\n * Use of this source code is governed by the Apache 2.0 license that can be
found in the license/LICENSE.txt file.\n */\n package kotlin.collections\n /**\n * Resizable-array implementation
of the deque data structure.\n *\n * The name deque is short for "double ended queue" and is usually pronounced
"deck".\n *\n * The collection provide methods for convenient access to the both ends.\n * It also implements
[MutableList] interface and supports efficient get/set operations by index.\n */\n @SinceKotlin("1.4")\n @WasExperimental(ExperimentalStdlibApi::class)\n public class ArrayDeque<E> :
AbstractMutableList<E> {\n private var head: Int = 0\n private var elementData: Array<Any?>\n override
var size: Int = 0\n private set\n /**\n * Constructs an empty deque with specified [initialCapacity], or
throws [IllegalArgumentException] if [initialCapacity] is negative.\n */\n public constructor(initialCapacity:
Int) {\n elementData = when {\n initialCapacity == 0 -> emptyElementData\n initialCapacity > 0 -

```

```

> arrayOfNulls(initialCapacity)\n else -> throw IllegalArgumentException("Illegal Capacity:
$initialCapacity")\n }\n }\n\n /**\n * Constructs an empty deque.\n */\n public constructor() {\n
elementData = emptyElementData\n }\n\n /**\n * Constructs a deque that contains the same elements as the
specified [elements] collection in the same order.\n */\n public constructor(elements: Collection<E>) {\n
elementData = elements.toArray()\n size = elementData.size\n if (elementData.isEmpty())\n
elementData = emptyElementData\n }\n\n /**\n * Ensures that the capacity of this deque is at least equal to
the specified [minCapacity].\n * If the current capacity is less than the [minCapacity], a new backing
storage is allocated with greater capacity.\n * Otherwise, this method takes no action and simply returns.\n */\n
private fun ensureCapacity(minCapacity: Int) {\n if (minCapacity < 0) throw IllegalStateException("Deque is
too big.") // overflow\n if (minCapacity <= elementData.size) return\n if (elementData ===
emptyElementData) {\n elementData = arrayOfNulls(minCapacity.coerceAtLeast(defaultMinCapacity))\n
 return\n }\n val newCapacity = newCapacity(elementData.size, minCapacity)\n
copyElements(newCapacity)\n }\n\n /**\n * Creates a new array with the specified [newCapacity] size and
copies elements in the [elementData] array to it.\n */\n private fun copyElements(newCapacity: Int) {\n val
newElements = arrayOfNulls<Any?>(newCapacity)\n elementData.copyInto(newElements, 0, head,
elementData.size)\n elementData.copyInto(newElements, elementData.size - head, 0, head)\n head = 0\n
elementData = newElements\n }\n\n @kotlin.internal.InlineOnly\n private inline fun
internalGet(internalIndex: Int): E {\n @Suppress("UNCHECKED_CAST")\n return
elementData[internalIndex] as E\n }\n\n private fun positiveMod(index: Int): Int = if (index >=
elementData.size) index - elementData.size else index\n\n private fun negativeMod(index: Int): Int = if (index < 0)
index + elementData.size else index\n\n @kotlin.internal.InlineOnly\n private inline fun
internalIndex(index: Int): Int = positiveMod(head + index)\n\n private fun incremented(index: Int): Int = if (index ==
elementData.lastIndex) 0 else index + 1\n\n private fun decremented(index: Int): Int = if (index == 0)
elementData.lastIndex else index - 1\n\n override fun isEmpty(): Boolean = size == 0\n\n /**\n * Returns the
first element, or throws [NoSuchElementException] if this deque is empty.\n */\n public fun first(): E = if
(isEmpty()) throw NoSuchElementException("ArrayDeque is empty.") else internalGet(head)\n\n /**\n *
Returns the first element, or `null` if this deque is empty.\n */\n public fun firstOrNull(): E? = if (isEmpty()) null
else internalGet(head)\n\n /**\n * Returns the last element, or throws [NoSuchElementException] if this deque
is empty.\n */\n public fun last(): E = if (isEmpty()) throw NoSuchElementException("ArrayDeque is empty.")
else internalGet(internalIndex(lastIndex))\n\n /**\n * Returns the last element, or `null` if this deque is empty.\n
*/\n public fun lastOrNull(): E? = if (isEmpty()) null else internalGet(internalIndex(lastIndex))\n\n /**\n *
Prepends the specified [element] to this deque.\n */\n public fun addFirst(element: E) {\n
ensureCapacity(size + 1)\n head = decremented(head)\n elementData[head] = element\n size += 1\n
}\n\n /**\n * Appends the specified [element] to this deque.\n */\n public fun addLast(element: E) {\n
ensureCapacity(size + 1)\n elementData[internalIndex(size)] = element\n size += 1\n }\n\n /**\n *
Removes the first element from this deque and returns that removed element, or throws [NoSuchElementException]
if this deque is empty.\n */\n public fun removeFirst(): E {\n if (isEmpty()) throw
NoSuchElementException("ArrayDeque is empty.")\n val element = internalGet(head)\n
elementData[head] = null\n head = incremented(head)\n size -= 1\n return element\n }\n\n /**\n *
Removes the first element from this deque and returns that removed element, or returns `null` if this deque is
empty.\n */\n public fun removeFirstOrNull(): E? = if (isEmpty()) null else removeFirst()\n\n /**\n *
Removes the last element from this deque and returns that removed element, or throws [NoSuchElementException]
if this deque is empty.\n */\n public fun removeLast(): E {\n if (isEmpty()) throw
NoSuchElementException("ArrayDeque is empty.")\n val internalLastIndex = internalIndex(lastIndex)\n
val element = internalGet(internalLastIndex)\n elementData[internalLastIndex] = null\n size -= 1\n
return element\n }\n\n /**\n * Removes the last element from this deque and returns that removed element, or
returns `null` if this deque is empty.\n */\n public fun removeLastOrNull(): E? = if (isEmpty()) null else
removeLast()\n\n // MutableList, MutableCollection\n public override fun add(element: E): Boolean {\n

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addLast(element)\n return true\n }\n\n public override fun add(index: Int, element: E) {\n
AbstractList.checkPositionIndex(index, size)\n if (index == size) {\n addLast(element)\n
return\n } else if (index == 0) {\n addFirst(element)\n return\n }\n\n ensureCapacity(size
+ 1)\n\n // Elements in circular array lay in 2 ways:\n // 1. `head` is less than `tail`: [#, #, e1, e2, e3,
#]\n // 2. `head` is greater than `tail`: [e3, #, #, #, e1, e2]\n // where head is the index of the first element
in the circular array,\n // and tail is the index following the last element.\n //\n // At this point the
insertion index is not equal to head or tail.\n // Also the circular array can store at least one more element.\n
//\n // Depending on where the given element must be inserted the preceding or the succeeding\n // elements
will be shifted to make room for the element to be inserted.\n //\n // In case the preceding elements are
shifted:\n // * if the insertion index is greater than the head (regardless of circular array form)\n // ->
shift the preceding elements\n // * otherwise, the circular array has (2) form and the insertion index is less than
tail\n // -> shift all elements in the back of the array\n // -> shift preceding elements in the front of the
array\n // In case the succeeding elements are shifted:\n // * if the insertion index is less than the tail
(regardless of circular array form)\n // -> shift the succeeding elements\n // * otherwise, the circular
array has (2) form and the insertion index is greater than head\n // -> shift all elements in the front of the
array\n // -> shift succeeding elements in the back of the array\n\n val internalIndex =
internalIndex(index)\n\n if (index < (size + 1) shr 1) {\n // closer to the first element -> shift preceding
elements\n val decrementedInternalIndex = decremented(internalIndex)\n val decrementedHead =
decremented(head)\n\n if (decrementedInternalIndex >= head) {\n elementData[decrementedHead]
= elementData[head] // head can be zero\n elementData.copyInto(elementData, head, head + 1,
decrementedInternalIndex + 1)\n } else { // head > tail\n elementData.copyInto(elementData, head -
1, head, elementData.size) // head can't be zero\n elementData[elementData.size - 1] = elementData[0]\n
 elementData.copyInto(elementData, 0, 1, decrementedInternalIndex + 1)\n }\n\n elementData[decrementedInternalIndex] = element\n head = decrementedHead\n } else {\n //
closer to the last element -> shift succeeding elements\n val tail = internalIndex(size)\n\n if
(internalIndex < tail) {\n elementData.copyInto(elementData, internalIndex + 1, internalIndex, tail)\n
 } else { // head > tail\n elementData.copyInto(elementData, 1, 0, tail)\n elementData[0] =
elementData[elementData.size - 1]\n elementData.copyInto(elementData, internalIndex + 1, internalIndex,
elementData.size - 1)\n }\n\n elementData[internalIndex] = element\n }\n\n size += 1\n }\n\n
private fun copyCollectionElements(internalIndex: Int, elements: Collection<E>) {\n val iterator =
elements.iterator()\n\n for (index in internalIndex until elementData.size) {\n if (!iterator.hasNext())
break\n elementData[index] = iterator.next()\n }\n\n for (index in 0 until head) {\n if
(!iterator.hasNext()) break\n elementData[index] = iterator.next()\n }\n\n size += elements.size\n
}\n\n public override fun addAll(elements: Collection<E>): Boolean {\n if (elements.isEmpty()) return false\n
 ensureCapacity(this.size + elements.size)\n copyCollectionElements(internalIndex(size), elements)\n
return true\n }\n\n public override fun addAll(index: Int, elements: Collection<E>): Boolean {\n
AbstractList.checkPositionIndex(index, size)\n\n if (elements.isEmpty()) {\n return false\n } else if
(index == size) {\n return addAll(elements)\n }\n\n ensureCapacity(this.size + elements.size)\n
val tail = internalIndex(size)\n val internalIndex = internalIndex(index)\n val elementsSize =
elements.size\n\n if (index < (size + 1) shr 1) {\n // closer to the first element -> shift preceding
elements\n\n var shiftedHead = head - elementsSize\n\n if (internalIndex >= head) {\n if
(shiftedHead >= 0) {\n elementData.copyInto(elementData, shiftedHead, head, internalIndex)\n
 } else { // head < tail, insertion leads to head >= tail\n shiftedHead += elementData.size\n val
elementsToShift = internalIndex - head\n val shiftToBack = elementData.size - shiftedHead\n\n if (shiftToBack >= elementsToShift) {\n elementData.copyInto(elementData, shiftedHead, head,
internalIndex)\n } else {\n elementData.copyInto(elementData, shiftedHead, head, head +
shiftToBack)\n }\n elementData.copyInto(elementData, 0, head + shiftToBack, internalIndex)\n
 }\n }\n\n } else { // head > tail, internalIndex < tail\n elementData.copyInto(elementData,

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shiftedHead, head, elementData.size)\n if (elementsSize >= internalIndex) {\n
elementData.copyInto(elementData, elementData.size - elementsSize, 0, internalIndex)\n } else {\n
 elementData.copyInto(elementData, elementData.size - elementsSize, 0, elementsSize)\n
elementData.copyInto(elementData, 0, elementsSize, internalIndex)\n }\n }\n head =
shiftedHead\n copyCollectionElements(negativeMod(internalIndex - elementsSize), elements)\n } else
{\n // closer to the last element -> shift succeeding elements\n val shiftedInternalIndex =
internalIndex + elementsSize\n if (internalIndex < tail) {\n if (tail + elementsSize <=
elementData.size) {\n elementData.copyInto(elementData, shiftedInternalIndex, internalIndex, tail)\n
 } else { // head < tail, insertion leads to head >= tail\n if (shiftedInternalIndex >= elementData.size)
{\n elementData.copyInto(elementData, shiftedInternalIndex - elementData.size, internalIndex, tail)\n
 } else {\n val shiftToFront = tail + elementsSize - elementData.size\n
elementData.copyInto(elementData, 0, tail - shiftToFront, tail)\n elementData.copyInto(elementData,
shiftedInternalIndex, internalIndex, tail - shiftToFront)\n }\n } else { // head > tail,
internalIndex > head\n elementData.copyInto(elementData, elementsSize, 0, tail)\n if
(shiftedInternalIndex >= elementData.size) {\n elementData.copyInto(elementData, shiftedInternalIndex
- elementData.size, internalIndex, elementData.size)\n } else {\n
elementData.copyInto(elementData, 0, elementData.size - elementsSize, elementData.size)\n
elementData.copyInto(elementData, shiftedInternalIndex, internalIndex, elementData.size - elementsSize)\n
}\n }\n copyCollectionElements(internalIndex, elements)\n }\n }\n return true\n }\n\n public
override fun get(index: Int): E {\n AbstractList.checkElementIndex(index, size)\n return
internalGet(internalIndex(index))\n }\n\n public override fun set(index: Int, element: E): E {\n
AbstractList.checkElementIndex(index, size)\n val internalIndex = internalIndex(index)\n val oldElement
= internalGet(internalIndex)\n elementData[internalIndex] = element\n return oldElement\n }\n\n
public override fun contains(element: E): Boolean = indexOf(element) != -1\n\n public override fun
indexOf(element: E): Int {\n val tail = internalIndex(size)\n if (head < tail) {\n for (index in head
until tail) {\n if (element == elementData[index]) return index - head\n }\n } else if (head >=
tail) {\n for (index in head until elementData.size) {\n if (element == elementData[index]) return
index - head\n }\n }\n for (index in 0 until tail) {\n if (element == elementData[index]) return
index + elementData.size - head\n }\n }\n return -1\n }\n\n public override fun
lastIndexOf(element: E): Int {\n val tail = internalIndex(size)\n if (head < tail) {\n for (index in tail
- 1 downTo head) {\n if (element == elementData[index]) return index - head\n }\n } else if
(head > tail) {\n for (index in tail - 1 downTo 0) {\n if (element == elementData[index]) return
index + elementData.size - head\n }\n }\n for (index in elementData.lastIndex downTo head) {\n
if (element == elementData[index]) return index - head\n }\n }\n return -1\n }\n\n public
override fun remove(element: E): Boolean {\n val index = indexOf(element)\n if (index == -1) return
false\n removeAt(index)\n return true\n }\n\n public override fun removeAt(index: Int): E {\n
AbstractList.checkElementIndex(index, size)\n if (index == lastIndex) {\n return removeLast()\n }
else if (index == 0) {\n return removeFirst()\n }\n }\n val internalIndex = internalIndex(index)\n
val element = internalGet(internalIndex)\n if (index < size shr 1) {\n // closer to the first element ->
shift preceding elements\n if (internalIndex >= head) {\n elementData.copyInto(elementData, head
+ 1, head, internalIndex)\n } else { // head > tail, internalIndex < head\n
elementData.copyInto(elementData, 1, 0, internalIndex)\n elementData[0] = elementData[elementData.size
- 1]\n elementData.copyInto(elementData, head + 1, head, elementData.size - 1)\n }\n }\n
elementData[head] = null\n head = incremented(head)\n } else {\n // closer to the last element ->
shift succeeding elements\n val internalLastIndex = internalIndex(lastIndex)\n if (internalIndex <=
internalLastIndex) {\n elementData.copyInto(elementData, internalIndex, internalIndex + 1,
internalLastIndex + 1)\n } else { // head > tail, internalIndex > head\n
elementData.copyInto(elementData, internalIndex, internalIndex + 1, elementData.size)\n

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elementData[elementData.size - 1] = elementData[0]\n elementData.copyInto(elementData, 0, 1,
internalLastIndex + 1)\n }\n elementData[internalLastIndex] = null\n }\n size -= 1\n\nreturn element\n }\n\n public override fun removeAll(elements: Collection<E>): Boolean = filterInPlace {
!elements.contains(it) }\n\n public override fun retainAll(elements: Collection<E>): Boolean = filterInPlace {
elements.contains(it) }\n\n private inline fun filterInPlace(predicate: (E) -> Boolean): Boolean {\n if
(this.isEmpty() || elementData.isEmpty())\n return false\n\n val tail = internalIndex(size)\n var
newTail = head\n var modified = false\n if (head < tail) {\n for (index in head until tail) {\n
 val element = elementData[index]\n @Suppress(\"UNCHECKED_CAST\")\n if
(predicate(element as E))\n elementData[newTail++] = element\n else\n modified =
true\n }\n elementData.fill(null, newTail, tail)\n } else {\n for (index in head until
elementData.size) {\n val element = elementData[index]\n elementData[index] = null\n\n @Suppress(\"UNCHECKED_CAST\")\n if (predicate(element as E))\n elementData[newTail++] = element\n else\n modified = true\n }\n newTail =
positiveMod(newTail)\n for (index in 0 until tail) {\n val element = elementData[index]\n
 elementData[index] = null\n @Suppress(\"UNCHECKED_CAST\")\n if (predicate(element as
E)) {\n elementData[newTail] = element\n newTail = incremented(newTail)\n }
else {\n modified = true\n }\n }\n if (modified)\n size =
negativeMod(newTail - head)\n return modified\n }\n\n public override fun clear() {\n val tail =
internalIndex(size)\n if (head < tail) {\n elementData.fill(null, head, tail)\n } else if (isEmpty())
{\n elementData.fill(null, head, elementData.size)\n elementData.fill(null, 0, tail)\n }\n head =
0\n size = 0\n }\n\n @Suppress(\"NOTHING_TO_OVERRIDE\")\n override fun <T> toArray(array:
Array<T>): Array<T> {\n @Suppress(\"UNCHECKED_CAST\")\n val dest = (if (array.size >= size) array
else arrayOfNulls(array, size)) as Array<Any?>\n val tail = internalIndex(size)\n if (head < tail) {\n
 elementData.copyInto(dest, startIndex = head, endIndex = tail)\n } else if (isEmpty()) {\n
 elementData.copyInto(dest, destinationOffset = 0, startIndex = head, endIndex = elementData.size)\n
 elementData.copyInto(dest, destinationOffset = elementData.size - head, startIndex = 0, endIndex = tail)\n }\n
 if (dest.size > size) {\n dest[size] = null // null-terminate\n }\n\n @Suppress(\"UNCHECKED_CAST\")\n return dest as Array<T>\n }\n\n @Suppress(\"NOTHING_TO_OVERRIDE\")\n override fun toArray(): Array<Any?> {\n return
toArray(arrayOfNulls<Any?>(size))\n }\n\n // for testing\n internal fun <T> testToArray(array: Array<T>):
Array<T> = toArray(array)\n internal fun testToArray(): Array<Any?> = toArray()\n\n internal companion
object {\n private val emptyElementData = emptyArray<Any?>()\n private const val maxArraySize =
Int.MAX_VALUE - 8\n private const val defaultMinCapacity = 10\n internal fun
newCapacity(oldCapacity: Int, minCapacity: Int): Int {\n // overflow-conscious\n var newCapacity =
oldCapacity + (oldCapacity shr 1)\n if (newCapacity - minCapacity < 0)\n newCapacity =
minCapacity\n if (newCapacity - maxArraySize > 0)\n newCapacity = if (minCapacity >
maxArraySize) Int.MAX_VALUE else maxArraySize\n return newCapacity\n }\n }\n\n // For testing
only\n internal fun internalStructure(structure: (head: Int, elements: Array<Any?>) -> Unit) {\n val tail =
internalIndex(size)\n val head = if (isEmpty() || head < tail) head else head - elementData.size\n
 structure(head, toArray())\n }\n }
}
/*\n * Copyright 2010-2018 JetBrains s.r.o. and Kotlin Programming Language
contributors.\n * Use of this source code is governed by the Apache 2.0 license that can be found in the
license/LICENSE.txt file.\n
*/\n\n@file:kotlin.jvm.JvmMultifileClass\n@file:kotlin.jvm.JvmName(\"ArraysKt\")\n\npackage
kotlin.collections\n\nimport kotlin.contracts.*\n\n/**\n * Returns a single list of all elements from all arrays in the
given array.\n * @sample samples.collections.Arrays.Transformations.flattenArray\n */\npublic fun <T> Array<out
Array<out T>>.flatten(): List<T> {\n val result = ArrayList<T>(sumOf { it.size })\n for (element in this) {\n
 result.addAll(element)\n }\n return result\n}\n\n/**\n * Returns a pair of lists, where\n * *first* list is built from
the first values of each pair from this array,\n * *second* list is built from the second values of each pair from this

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array.\n * @sample samples.collections.Arrays.Transformations.unzipArray\n */\npublic fun <T, R> Array<out\n
Pair<T, R>>.unzip(): Pair<List<T>, List<R>> {\n val listT = ArrayList<T>(size)\n val listR =\n
ArrayList<R>(size)\n for (pair in this) {\n listT.add(pair.first)\n listR.add(pair.second)\n }\n return\n
listT to listR\n}\n\n/**\n * Returns `true` if this nullable array is either null or empty.\n * @sample\n
samples.collections.Arrays.Usage.arrayIsNullOrEmpty\n\n*/\n@SinceKotlin("1.3")\n@kotlin.internal.InlineOnly\npublic inline fun Array<*>?.isNullOrEmpty(): Boolean\n
{\n contract {\n returns(false) implies (this@isNullOrEmpty != null)\n }\n return this == null ||\n
this.isEmpty()\n}\n\n/**\n * Returns this array if it's not empty\n * or the result of calling [defaultValue] function if\n
the array is empty.\n * @sample samples.collections.Arrays.Usage.arrayIfEmpty\n\n*/\n@SinceKotlin("1.3")\n@kotlin.internal.InlineOnly\n@Suppress("UPPER_BOUND_CANNOT_BE_ARRAY")\npublic inline fun <C, R> C.ifEmpty(defaultValue: () -> R): R where C : Array<*>, C : R =\n if (isEmpty())\n defaultValue() else\n
this\n}\n\n@OptIn(ExperimentalUnsignedTypes::class)\n@SinceKotlin("1.3")\n@PublishedApi\n@kotlin.jvm.Jvm\n
Name("contentDeepEquals")\n@kotlin.js.JsName("contentDeepEqualsImpl")\ninternal fun <T> Array<out\n
T>?.contentDeepEqualsImpl(other: Array<out T>?): Boolean {\n if (this === other) return true\n if (this == null\n
|| other == null || this.size != other.size) return false\n for (i in indices) {\n val v1 = this[i]\n val v2 =\n
other[i]\n if (v1 === v2) {\n continue\n } else if (v1 == null || v2 == null) {\n return false\n
 }\n when {\n v1 is Array<*> && v2 is Array<*> -> if (!v1.contentDeepEquals(v2)) return\n
false\n v1 is ByteArray && v2 is ByteArray -> if (!v1.contentEquals(v2)) return false\n v1 is\n
ShortArray && v2 is ShortArray -> if (!v1.contentEquals(v2)) return false\n v1 is IntArray && v2 is\n
IntArray -> if (!v1.contentEquals(v2)) return false\n v1 is LongArray && v2 is LongArray -> if\n
(!v1.contentEquals(v2)) return false\n v1 is FloatArray && v2 is FloatArray -> if (!v1.contentEquals(v2))\n
return false\n v1 is DoubleArray && v2 is DoubleArray -> if (!v1.contentEquals(v2)) return false\n\n
v1 is CharArray && v2 is CharArray -> if (!v1.contentEquals(v2)) return false\n v1 is BooleanArray &&\n
v2 is BooleanArray -> if (!v1.contentEquals(v2)) return false\n v1 is UByteArray && v2 is UByteArray\n
-> if (!v1.contentEquals(v2)) return false\n v1 is UShortArray && v2 is UShortArray -> if\n
(!v1.contentEquals(v2)) return false\n v1 is UIntArray && v2 is UIntArray -> if (!v1.contentEquals(v2))\n
return false\n v1 is ULongArray && v2 is ULongArray -> if (!v1.contentEquals(v2)) return false\n\n\n
 else -> if (v1 != v2) return false\n }\n }\n return\n
true\n}\n\n@SinceKotlin("1.3")\n@PublishedApi\n@kotlin.jvm.JvmName("contentDeepToString")\n@kotlin.js.\n
JsName("contentDeepToStringImpl")\ninternal fun <T> Array<out T>?.contentDeepToStringImpl(): String {\n if (this == null)\n
return "null"\n val length = size.coerceAtMost((Int.MAX_VALUE - 2) / 5) * 5 + 2 // in order not\n
to overflow Int.MAX_VALUE\n return buildString(length) {\n contentDeepToStringInternal(this,\n
mutableListOf())\n }\n}\n\n@OptIn(ExperimentalUnsignedTypes::class)\nprivate fun <T> Array<out\n
T>.contentDeepToStringInternal(result: StringBuilder, processed: MutableList<Array<*>>) {\n if (this in\n
processed) {\n result.append("[...]")\n return\n }\n processed.add(this)\n result.append("[")\n for (i\n
in indices) {\n if (i != 0) {\n result.append(", ")\n }\n val element = this[i]\n when\n
(element) {\n null -> result.append("null")\n is Array<*> ->\n
element.contentDeepToStringInternal(result, processed)\n is ByteArray ->\n
result.append(element.contentToString())\n is ShortArray -> result.append(element.contentToString())\n\n
 is IntArray -> result.append(element.contentToString())\n is LongArray ->\n
result.append(element.contentToString())\n is FloatArray -> result.append(element.contentToString())\n\n
 is DoubleArray -> result.append(element.contentToString())\n is CharArray ->\n
result.append(element.contentToString())\n is BooleanArray -> result.append(element.contentToString())\n\n
 is UByteArray -> result.append(element.contentToString())\n is UShortArray ->\n
result.append(element.contentToString())\n is UIntArray -> result.append(element.contentToString())\n\n
 is ULongArray -> result.append(element.contentToString())\n else ->\n
result.append(element.toString())\n }\n }\n result.append("]")\n
}

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processed.removeAt(processed.lastIndex)\n}"/*\n * Copyright 2010-2021 JetBrains s.r.o. and Kotlin Programming
Language contributors.\n * Use of this source code is governed by the Apache 2.0 license that can be found in the
license/LICENSE.txt file.\n */\n\npackage kotlin.collections\n\n/** Returns true if the brittle contains optimization
is enabled. See KT-45438. */\n\ninternal expect fun brittleContainsOptimizationEnabled(): Boolean\n\n/**\n * Returns true if [brittleContainsOptimizationEnabled] is true\n * and it's safe to convert this collection to a set
without changing contains method behavior.\n */\n\nprivate fun <T> Collection<T>.safeToConvertToSet() =
brittleContainsOptimizationEnabled() && size > 2 && this is ArrayList\n\n/**\n * When
[brittleContainsOptimizationEnabled] is true:\n * - Converts this [Iterable] to a set if it is not a [Collection].\n * -
Converts this [Collection] to a set, when it's worth so and it doesn't change contains method behavior.\n * -
Otherwise returns this.\n * When [brittleContainsOptimizationEnabled] is false:\n * - Converts this [Iterable] to a
list if it is not a [Collection].\n * - Otherwise returns this.\n */\n\ninternal fun <T>
Iterable<T>.convertToSetForSetOperationWith(source: Iterable<T>): Collection<T> =\n when (this) {\n is
Set -> this\n is Collection -> when {\n source is Collection && source.size < 2 -> this\n else -> if (this.safeToConvertToSet()) toHashSet() else this\n }\n else -> if
(brittleContainsOptimizationEnabled()) toHashSet() else toList()\n }\n\n/**\n * When
[brittleContainsOptimizationEnabled] is true:\n * - Converts this [Iterable] to a set if it is not a [Collection].\n * -
Converts this [Collection] to a set, when it's worth so and it doesn't change contains method behavior.\n * -
Otherwise returns this.\n * When [brittleContainsOptimizationEnabled] is false:\n * - Converts this [Iterable] to a
list if it is not a [Collection].\n * - Otherwise returns this.\n */\n\ninternal fun <T>
Iterable<T>.convertToSetForSetOperation(): Collection<T> =\n when (this) {\n is Set -> this\n is
Collection -> if (this.safeToConvertToSet()) toHashSet() else this\n else -> if
(brittleContainsOptimizationEnabled()) toHashSet() else toList()\n }\n\n/**\n * Converts this sequence to a set if
[brittleContainsOptimizationEnabled] is true,\n * otherwise converts it to a list.\n */\n\ninternal fun <T>
Sequence<T>.convertToSetForSetOperation(): Collection<T> =\n if (brittleContainsOptimizationEnabled())
toHashSet() else toList()\n\n/**\n * Converts this array to a set if [brittleContainsOptimizationEnabled] is true,\n *
otherwise converts it to a list.\n */\n\ninternal fun <T> Array<T>.convertToSetForSetOperation(): Collection<T> =\n if (brittleContainsOptimizationEnabled()) toHashSet() else asList()"/*\n * Copyright 2010-2018 JetBrains s.r.o.
and Kotlin Programming Language contributors.\n * Use of this source code is governed by the Apache 2.0 license
that can be found in the license/LICENSE.txt file.\n */\n\npackage kotlin.collections\n\n/**\n * Data class
representing a value from a collection or sequence, along with its index in that collection or sequence.\n */\n\n@property value the underlying value.\n * @property index the index of the value in the collection or sequence.\n */\n\npublic data class IndexedValue<out T>(public val index: Int, public val value: T)\n"/*\n * Copyright 2010-2020 JetBrains s.r.o. and Kotlin Programming Language contributors.\n * Use of this source code is governed by the
Apache 2.0 license that can be found in the license/LICENSE.txt file.\n */\n\n@file:kotlin.jvm.JvmName("MapAccessorsKt")\n\npackage kotlin.collections\n\nimport
kotlin.reflect.KProperty\n\nimport kotlin.internal.Exact\n\n/**\n * Returns the value of the property for the given
object from this read-only map.\n * @param thisRef the object for which the value is requested (not used).\n *
@param property the metadata for the property, used to get the name of property and lookup the value
corresponding to this name in the map.\n * @return the property value.\n */\n\n * @throws NoSuchElementException
when the map doesn't contain value for the property name and doesn't provide an implicit default (see
[withDefault]).\n */\n\n@kotlin.internal.InlineOnly\n\npublic inline operator fun <V, V1 : V> Map<in String, @Exact
V>.getValue(thisRef: Any?, property: KProperty<*>): V1 =\n @Suppress("UNCHECKED_CAST")
(getOrNullImplicitDefault(property.name) as V1)\n\n/**\n * Returns the value of the property for the given object from
this mutable map.\n * @param thisRef the object for which the value is requested (not used).\n * @param property
the metadata for the property, used to get the name of property and lookup the value corresponding to this name in
the map.\n * @return the property value.\n */\n\n * @throws NoSuchElementException when the map doesn't contain
value for the property name and doesn't provide an implicit default (see [withDefault]).\n */\n\n@kotlin.jvm.JvmName("getVar")\n\n@kotlin.internal.InlineOnly\n\npublic inline operator fun <V, V1 : V>

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MutableMap<in String, out @Exact V>.getValue(thisRef: Any?, property: KProperty<*>): V1 =\n
@Suppress(\\"UNCHECKED_CAST\") (getOrImplicitDefault(property.name) as V1)\n\n/**\n * Stores the value of
the property for the given object in this mutable map.\n * @param thisRef the object for which the value is
requested (not used).\n * @param property the metadata for the property, used to get the name of property and store
the value associated with that name in the map.\n * @param value the value to set.\n
*/\n\n@kotlin.internal.InlineOnly\npublic inline operator fun <V> MutableMap<in String, in V>.setValue(thisRef:
Any?, property: KProperty<*>, value: V) {\n this.put(property.name, value)\n}\n\n"/*\n * Copyright 2010-2018
JetBrains s.r.o. and Kotlin Programming Language contributors.\n * Use of this source code is governed by the
Apache 2.0 license that can be found in the license/LICENSE.txt file.\n
*/\n\n@file:kotlin.jvm.JvmMultifileClass\n@file:kotlin.jvm.JvmName(\\"MapsKt\")\n\npackage
kotlin.collections\n\n/**\n * Returns the value for the given key, or the implicit default value for this map.\n * By
default no implicit value is provided for maps and a [NoSuchElementException] is thrown.\n * To create a map with
implicit default value use [withDefault] method.\n * @throws NoSuchElementException when the map doesn't
contain a value for the specified key and no implicit default was provided for that map.\n
*/\n\n@kotlin.jvm.JvmName(\\"getOrImplicitDefaultNullable\")\n@PublishedApi\ninternal fun <K, V> Map<K,
V>.getOrImplicitDefault(key: K): V {\n if (this is MapWithDefault)\n return
this.getOrImplicitDefault(key)\n return getOrElseNullable(key, { throw NoSuchElementException(\\"Key $key
is missing in the map.\") })\n}\n\n/**\n * Returns a wrapper of this read-only map, having the implicit default value
provided with the specified function [defaultValue].\n * @n * This implicit default value is used when the original
map doesn't contain a value for the key specified\n * and a value is obtained with [Map.getValue] function, for
example when properties are delegated to the map.\n * @n * When this map already has an implicit default value
provided with a former call to [withDefault], it is being replaced by this call.\n */\n\npublic fun <K, V> Map<K,
V>.withDefault(defaultValue: (key: K) -> V): Map<K, V> =\n when (this) {\n is MapWithDefault ->
this.map.withDefault(defaultValue)\n else -> MapWithDefaultImpl(this, defaultValue)\n }\n\n/**\n * Returns
a wrapper of this mutable map, having the implicit default value provided with the specified function
[defaultValue].\n * @n * This implicit default value is used when the original map doesn't contain a value for the key
specified\n * and a value is obtained with [Map.getValue] function, for example when properties are delegated to the
map.\n * @n * When this map already has an implicit default value provided with a former call to [withDefault], it is
being replaced by this call.\n */\n\n@kotlin.jvm.JvmName(\\"withDefaultMutable\")\npublic fun <K, V>
MutableMap<K, V>.withDefault(defaultValue: (key: K) -> V): MutableMap<K, V> =\n when (this) {\n is
MutableMapWithDefault -> this.map.withDefault(defaultValue)\n else -> MutableMapWithDefaultImpl(this,
defaultValue)\n }\n\nprivate interface MapWithDefault<K, out V> : Map<K, V> {\n public val map: Map<K,
V>\n public fun getOrImplicitDefault(key: K): V\n}\n\nprivate interface MutableMapWithDefault<K, V> :
MutableMap<K, V>, MapWithDefault<K, V> {\n public override val map: MutableMap<K, V>\n}\n\nprivate
class MapWithDefaultImpl<K, out V>(public override val map: Map<K, V>, private val default: (key: K) -> V) :
MapWithDefault<K, V> {\n override fun equals(other: Any?): Boolean = map.equals(other)\n override fun
hashCode(): Int = map.hashCode()\n override fun toString(): String = map.toString()\n override val size: Int get()
= map.size\n override fun isEmpty(): Boolean = map.isEmpty()\n override fun containsKey(key: K): Boolean =
map.containsKey(key)\n override fun containsValue(value: @UnsafeVariance V): Boolean =
map.containsValue(value)\n override fun get(key: K): V? = map.get(key)\n override val keys: Set<K> get() =
map.keys\n override val values: Collection<V> get() = map.values\n override val entries: Set<Map.Entry<K,
V>> get() = map.entries\n override fun getOrImplicitDefault(key: K): V = map.getOrElseNullable(key, {
default(key) })\n}\n\nprivate class MutableMapWithDefaultImpl<K, V>(public override val map: MutableMap<K,
V>, private val default: (key: K) -> V) : MutableMapWithDefault<K, V> {\n override fun equals(other: Any?):
Boolean = map.equals(other)\n override fun hashCode(): Int = map.hashCode()\n override fun toString(): String
= map.toString()\n override val size: Int get() = map.size\n override fun isEmpty(): Boolean = map.isEmpty()\n
override fun containsKey(key: K): Boolean = map.containsKey(key)\n override fun containsValue(value:
@UnsafeVariance V): Boolean = map.containsValue(value)\n override fun get(key: K): V? = map.get(key)\n
}

```

```

override val keys: MutableSet<K> get() = map.keys\n override val values: MutableCollection<V> get() =
map.values\n override val entries: MutableSet<MutableMap.MutableEntry<K, V>> get() = map.entries\n\n
override fun put(key: K, value: V): V? = map.put(key, value)\n override fun remove(key: K): V? =
map.remove(key)\n override fun putAll(from: Map<out K, V>) = map.putAll(from)\n override fun clear() =
map.clear()\n\n override fun getOrDefault(key: K): V = map.getOrNull(key, { default(key)
})\n}\n\n", "/*\n * Copyright 2010-2020 JetBrains s.r.o. and Kotlin Programming Language contributors.\n * Use of
this source code is governed by the Apache 2.0 license that can be found in the license/LICENSE.txt file.\n
*/\n\n@file:kotlin.jvm.JvmMultifileClass\n@file:kotlin.jvm.JvmName("CollectionsKt")\n\npackage
kotlin.collections\n\nimport kotlin.random.Random\n\n/**\n * Removes a single instance of the specified element
from this\n * collection, if it is present.\n * Allows to overcome type-safety restriction of `remove` that requires
to pass an element of type `E`.\n * @return `true` if the element has been successfully removed; `false` if it was
not present in the collection.\n */\n@kotlin.internal.InlineOnly\npublic inline fun <@kotlin.internal.OnlyInputTypes
T> MutableCollection<out T>.remove(element: T): Boolean =\n @Suppress("UNCHECKED_CAST") (this as
MutableCollection<T>).remove(element)\n\n/**\n * Removes all of this collection's elements that are also
contained in the specified collection.\n * Allows to overcome type-safety restriction of `removeAll` that requires
to pass a collection of type `Collection<E>`.\n * @return `true` if any of the specified elements was removed
from the collection, `false` if the collection was not modified.\n */\n@kotlin.internal.InlineOnly\npublic inline fun
<@kotlin.internal.OnlyInputTypes T> MutableCollection<out T>.removeAll(elements: Collection<T>): Boolean
=\n @Suppress("UNCHECKED_CAST") (this as MutableCollection<T>).removeAll(elements)\n\n/**\n * Retains only the
elements in this collection that are contained in the specified collection.\n * Allows to overcome type-safety
restriction of `retainAll` that requires to pass a collection of type `Collection<E>`.\n * @return `true` if any
element was removed from the collection, `false` if the collection was not modified.\n */\n@kotlin.internal.InlineOnly\npublic inline fun <@kotlin.internal.OnlyInputTypes T> MutableCollection<out
T>.retainAll(elements: Collection<T>): Boolean =\n @Suppress("UNCHECKED_CAST") (this as
MutableCollection<T>).retainAll(elements)\n\n/**\n * Adds the specified [element] to this mutable collection.\n
*/\n@kotlin.internal.InlineOnly\npublic inline operator fun <T> MutableCollection<in T>.plusAssign(element: T)
{\n this.add(element)\n}\n\n/**\n * Adds all elements of the given [elements] collection to this mutable
collection.\n */\n@kotlin.internal.InlineOnly\npublic inline operator fun <T> MutableCollection<in
T>.plusAssign(elements: Iterable<T>) {\n this.addAll(elements)\n}\n\n/**\n * Adds all elements of the given
[elements] array to this mutable collection.\n */\n@kotlin.internal.InlineOnly\npublic inline operator fun <T>
MutableCollection<in T>.plusAssign(elements: Array<T>) {\n this.addAll(elements)\n}\n\n/**\n * Adds all
elements of the given [elements] sequence to this mutable collection.\n */\n@kotlin.internal.InlineOnly\npublic
inline operator fun <T> MutableCollection<in T>.plusAssign(elements: Sequence<T>) {\n
 this.addAll(elements)\n}\n\n/**\n * Removes a single instance of the specified [element] from this mutable
collection.\n */\n@kotlin.internal.InlineOnly\npublic inline operator fun <T> MutableCollection<in
T>.minusAssign(element: T) {\n this.remove(element)\n}\n\n/**\n * Removes all elements contained in the given
[elements] collection from this mutable collection.\n */\n@kotlin.internal.InlineOnly\npublic inline operator fun
<T> MutableCollection<in T>.minusAssign(elements: Iterable<T>) {\n this.removeAll(elements)\n}\n\n/**\n *
Removes all elements contained in the given [elements] array from this mutable collection.\n */\n@kotlin.internal.InlineOnly\npublic inline operator fun <T> MutableCollection<in T>.minusAssign(elements:
Array<T>) {\n this.removeAll(elements)\n}\n\n/**\n * Removes all elements contained in the given [elements]
sequence from this mutable collection.\n */\n@kotlin.internal.InlineOnly\npublic inline operator fun <T>
MutableCollection<in T>.minusAssign(elements: Sequence<T>) {\n this.removeAll(elements)\n}\n\n/**\n * Adds
all elements of the given [elements] collection to this [MutableCollection].\n */\npublic fun <T>
MutableCollection<in T>.addAll(elements: Iterable<T>): Boolean {\n when (elements) {\n is Collection ->
return addAll(elements)\n else -> {\n var result: Boolean = false\n for (item in elements)\n
if (add(item)) result = true\n return result\n }\n }\n}\n\n/**\n * Adds all elements of the given
[elements] sequence to this [MutableCollection].\n */\npublic fun <T> MutableCollection<in T>.addAll(elements:

```

```

Sequence<T>): Boolean {
 var result: Boolean = false
 for (item in elements) {
 if (add(item)) result = true
 }
 return result
}

* Adds all elements of the given [elements] array to this [MutableCollection].
public fun <T> MutableCollection<in T>.addAll(elements: Array<out T>): Boolean {
 return addAll(elements.asList())
}

* Removes all elements from this [MutableCollection] that are also contained in the given [elements] collection.
public fun <T> MutableCollection<in T>.removeAll(elements: Iterable<T>): Boolean {
 return removeAll(elements.convertToSetForSetOperationWith(this))
}

* Removes all elements from this [MutableCollection] that are also contained in the given [elements] sequence.
public fun <T> MutableCollection<in T>.removeAll(elements: Sequence<T>): Boolean {
 val set = elements.convertToSetForSetOperation()
 return set.isNotEmpty() && removeAll(set)
}

* Removes all elements from this [MutableCollection] that are also contained in the given [elements] array.
public fun <T> MutableCollection<in T>.removeAll(elements: Array<out T>): Boolean {
 return elements.isNotEmpty() && removeAll(elements.convertToSetForSetOperation())
}

* Retains only elements of this [MutableCollection] that are contained in the given [elements] collection.
public fun <T> MutableCollection<in T>.retainAll(elements: Iterable<T>): Boolean {
 return retainAll(elements.convertToSetForSetOperationWith(this))
}

* Retains only elements of this [MutableCollection] that are contained in the given [elements] array.
public fun <T> MutableCollection<in T>.retainAll(elements: Array<out T>): Boolean {
 if (elements.isNotEmpty())
 return retainAll(elements.convertToSetForSetOperation())
 else
 return retainNothing()
}

* Retains only elements of this [MutableCollection] that are contained in the given [elements] sequence.
public fun <T> MutableCollection<in T>.retainAll(elements: Sequence<T>): Boolean {
 val set = elements.convertToSetForSetOperation()
 if (set.isNotEmpty())
 return retainAll(set)
 else
 return retainNothing()
}

private fun MutableCollection<*>.retainNothing(): Boolean {
 val result = isEmpty()
 clear()
 return result
}

* Removes all elements from this [MutableIterable] that match the given [predicate].
* @return `true` if any element was removed from this collection, or `false` when no elements were removed and collection was not modified.
public fun <T> MutableIterable<T>.removeAll(predicate: (T) -> Boolean): Boolean = filterInPlace(predicate, true)

* Retains only elements of this [MutableIterable] that match the given [predicate].
* @return `true` if any element was removed from this collection, or `false` when all elements were retained and collection was not modified.
public fun <T> MutableIterable<T>.retainAll(predicate: (T) -> Boolean): Boolean = filterInPlace(predicate, false)

private fun <T> MutableIterable<T>.filterInPlace(predicate: (T) -> Boolean, predicateResultToRemove: Boolean): Boolean {
 var result = false
 with(iterator()) {
 while (hasNext())
 if (predicate(next()) == predicateResultToRemove)
 remove()
 result = true
 }
 return result
}

* Removes the element at the specified [index] from this list.
* In Kotlin one should use the [MutableList.removeAt] function instead.
@Deprecated("Use removeAt(index) instead.", level = DeprecationLevel.ERROR)
@kotlin.internal.InlineOnly
public inline fun <T> MutableList<T>.remove(index: Int): T = removeAt(index)

* Removes the first element from this mutable list and returns that removed element, or throws [NoSuchElementException] if this list is empty.
@SinceKotlin("1.4")
@WasExperimental(ExperimentalStdlibApi::class)
public fun <T> MutableList<T>.removeFirst(): T = if (isEmpty()) throw NoSuchElementException("List is empty.") else removeAt(0)

* Removes the first element from this mutable list and returns that removed element, or returns `null` if this list is empty.
@SinceKotlin("1.4")
@WasExperimental(ExperimentalStdlibApi::class)
public fun <T> MutableList<T>.removeFirstOrNull(): T? = if (isEmpty()) null else removeAt(0)

* Removes the last element from this mutable list and returns that removed element, or throws [NoSuchElementException] if this list is empty.
@SinceKotlin("1.4")
@WasExperimental(ExperimentalStdlibApi::class)
public fun <T> MutableList<T>.removeLast(): T = if (isEmpty()) throw NoSuchElementException("List is empty.") else removeAt(lastIndex)

* Removes the last element from this mutable list and returns that removed element, or returns `null` if this list is empty.

```

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*\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\npublic fun <T>
MutableList<T>.removeLastOrNull(): T? = if (isEmpty()) null else removeAt(lastIndex)\n\n/**\n * Removes all
elements from this [MutableList] that match the given [predicate].\n *\n * @return `true` if any element was
removed from this collection, or `false` when no elements were removed and collection was not modified.\n
*\npublic fun <T> MutableList<T>.removeAll(predicate: (T) -> Boolean): Boolean = filterInPlace(predicate,
true)\n\n/**\n * Retains only elements of this [MutableList] that match the given [predicate].\n *\n * @return `true`
if any element was removed from this collection, or `false` when all elements were retained and collection was not
modified.\n *\npublic fun <T> MutableList<T>.retainAll(predicate: (T) -> Boolean): Boolean =
filterInPlace(predicate, false)\n\nprivate fun <T> MutableList<T>.filterInPlace(predicate: (T) -> Boolean,
predicateResultToRemove: Boolean): Boolean {\n if (this !is RandomAccess)\n return (this as
MutableIterable<T>).filterInPlace(predicate, predicateResultToRemove)\n\n var writeIndex: Int = 0\n for
(readIndex in 0..lastIndex) {\n val element = this[readIndex]\n if (predicate(element) ==
predicateResultToRemove)\n continue\n\n if (writeIndex != readIndex)\n this[writeIndex] =
element\n\n writeIndex++\n }\n if (writeIndex < size) {\n for (removeIndex in lastIndex downTo
writeIndex)\n removeAt(removeIndex)\n\n return true\n } else {\n return false\n }\n}\n\n"/*\n *
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governed by the Apache 2.0 license that can be found in the license/LICENSE.txt file.\n
*\n\n@file:kotlin.jvm.JvmMultifileClass\n@file:kotlin.jvm.JvmName("CollectionsKt")\n\npackage
kotlin.collections\n\nprivate open class ReversedListReadOnly<out T>(private val delegate: List<T>) :
AbstractList<T>() {\n override val size: Int get() = delegate.size\n override fun get(index: Int): T =
delegate[reverseElementIndex(index)]\n}\n\nprivate class ReversedList<T>(private val delegate: MutableList<T>) :
AbstractMutableList<T>() {\n override val size: Int get() = delegate.size\n override fun get(index: Int): T =
delegate[reverseElementIndex(index)]\n\n override fun clear() = delegate.clear()\n override fun removeAt(index:
Int): T = delegate.removeAt(reverseElementIndex(index))\n\n override fun set(index: Int, element: T): T =
delegate.set(reverseElementIndex(index), element)\n\n override fun add(index: Int, element: T) {\n delegate.add(reversePositionIndex(index), element)\n }\n}\n\nprivate fun List<*>.reverseElementIndex(index:
Int) =\n if (index in 0..lastIndex) lastIndex - index else throw IndexOutOfBoundsException("Element index
$index must be in range [0..lastIndex].")\n\nprivate fun List<*>.reversePositionIndex(index: Int) =\n if (index
in 0..size) size - index else throw IndexOutOfBoundsException("Position index $index must be in range
[0..size].")\n\n\n/**\n * Returns a reversed read-only view of the original List.\n * All changes made in the
original list will be reflected in the reversed one.\n * @sample samples.collections.ReversedViews.asReversedList\n
*\npublic fun <T> List<T>.asReversed(): List<T> = ReversedListReadOnly(this)\n\n/**\n * Returns a reversed
mutable view of the original mutable List.\n * All changes made in the original list will be reflected in the reversed
one and vice versa.\n * @sample samples.collections.ReversedViews.asReversedMutableList\n
*\n@kotlin.jvm.JvmName("asReversedMutable")\npublic fun <T> MutableList<T>.asReversed():
MutableList<T> = ReversedList(this)\n\n"/*\n * Copyright 2010-2018 JetBrains s.r.o. and Kotlin Programming
Language contributors.\n * Use of this source code is governed by the Apache 2.0 license that can be found in the
license/LICENSE.txt file.\n
*\n\n@file:kotlin.jvm.JvmMultifileClass\n@file:kotlin.jvm.JvmName("SequencesKt")\n@file:OptIn(Experimenta
lTypeInference::class)\n\npackage kotlin.sequences\n\nimport kotlin.coroutines.*\nimport
kotlin.coroutines.intrinsics.*\nimport kotlin.experimental.ExperimentalTypeInference\n\n/**\n * Builds a
[Sequence] lazily yielding values one by one.\n *\n * @see kotlin.sequences.generateSequence\n *\n * @sample
samples.collections.Sequences.Building.buildSequenceYieldAll\n * @sample
samples.collections.Sequences.Building.buildFibonacciSequence\n *\n@SinceKotlin("1.3")\npublic fun <T>
sequence(@BuilderInference block: suspend SequenceScope<T>().() -> Unit): Sequence<T> = Sequence {
iterator(block) }\n\n@SinceKotlin("1.3")\n@Deprecated("Use 'sequence { }' function instead.",
ReplaceWith("sequence(builderAction)"), level =
DeprecationLevel.ERROR)\n@kotlin.internal.InlineOnly\npublic inline fun <T> buildSequence(@BuilderInference

```



```

-> IllegalStateException("\Iterator has failed.\")\n else -> IllegalStateException("\Unexpected state of the
iterator: $state")\n } \n \n \n override suspend fun yield(value: T) {\n nextValue = value\n state =
State_Ready\n return suspendCoroutineUninterceptedOrReturn { c ->\n nextStep = c\n COROUTINE_SUSPENDED\n } \n } \n \n override suspend fun yieldAll(iterator: Iterator<T>) {\n if
(!iterator.hasNext()) return\n nextIterator = iterator\n state = State_ManyReady\n return
suspendCoroutineUninterceptedOrReturn { c ->\n nextStep = c\n COROUTINE_SUSPENDED\n } \n } \n \n // Completion continuation implementation\n override fun resumeWith(result: Result<Unit>) {\n
result.getOrThrow() // just rethrow exception if it is there\n state = State_Done\n } \n \n override val context:
CoroutineContext\n get() = EmptyCoroutineContext\n } \n \n /*\n * Copyright 2010-2018 JetBrains s.r.o. and
Kotlin Programming Language contributors.\n * Use of this source code is governed by the Apache 2.0 license that
can be found in the license/LICENSE.txt file.\n */\n\npackage kotlin.collections\n\ninternal fun
checkWindowSizeStep(size: Int, step: Int) {\n require(size > 0 && step > 0) {\n if (size != step)\n "\Both size $size and step $step must be greater than zero.\n" else\n "\size $size must be greater than
zero.\n" } \n } \n \n internal fun <T> Sequence<T>.windowedSequence(size: Int, step: Int, partialWindows: Boolean,
reuseBuffer: Boolean): Sequence<List<T>> {\n checkWindowSizeStep(size, step)\n return Sequence {
windowedIterator(iterator(), size, step, partialWindows, reuseBuffer) } \n } \n \n internal fun <T>
windowedIterator(iterator: Iterator<T>, size: Int, step: Int, partialWindows: Boolean, reuseBuffer: Boolean):
Iterator<List<T>> {\n if (!iterator.hasNext()) return EmptyIterator\n return iterator<List<T>> {\n val
bufferInitialCapacity = size.coerceAtMost(1024)\n val gap = step - size\n if (gap >= 0) {\n var buffer
= ArrayList<T>(bufferInitialCapacity)\n var skip = 0\n for (e in iterator) {\n if (skip > 0) {\
skip -= 1; continue } \n buffer.add(e)\n if (buffer.size == size) {\n yield(buffer)\n
 if (reuseBuffer) buffer.clear() else buffer = ArrayList(size)\n skip = gap\n } \n } \n
 if (buffer.isNotEmpty()) {\n if (partialWindows || buffer.size == size) yield(buffer)\n } \n
 } else {\n var buffer = RingBuffer<T>(bufferInitialCapacity)\n for (e in iterator) {\n
buffer.add(e)\n if (buffer.isFull()) {\n if (buffer.size < size) { buffer =
buffer.expanded(maxCapacity = size); continue } \n yield(if (reuseBuffer) buffer else
ArrayList(buffer))\n buffer.removeFirst(step)\n } \n } \n if (partialWindows) {\n
while (buffer.size > step) {\n yield(if (reuseBuffer) buffer else ArrayList(buffer))\n
buffer.removeFirst(step)\n } \n if (buffer.isNotEmpty()) yield(buffer)\n } \n } \n } \n \n internal class MovingSubList<out E>(private val list: List<E>) : AbstractList<E>(), RandomAccess {\n
private var fromIndex: Int = 0\n private var _size: Int = 0\n fun move(fromIndex: Int, toIndex: Int) {\n
checkRangeIndexes(fromIndex, toIndex, list.size)\n this.fromIndex = fromIndex\n this._size = toIndex -
fromIndex\n } \n \n override fun get(index: Int): E {\n checkElementIndex(index, _size)\n return
list[fromIndex + index]\n } \n \n override val size: Int get() = _size\n } \n \n /**\n * Provides ring buffer
implementation.\n * \n * Buffer overflow is not allowed so [add] doesn't overwrite tail but raises an exception.\n
*/\n\nprivate class RingBuffer<T>(private val buffer: Array<Any?>, filledSize: Int) : AbstractList<T>(),
RandomAccess {\n init {\n require(filledSize >= 0) { "\ring buffer filled size should not be negative but it is
$filledSize" }\n require(filledSize <= buffer.size) { "\ring buffer filled size: $filledSize cannot be larger than
the buffer size: ${buffer.size}" }\n } \n \n constructor(capacity: Int) : this(arrayOfNulls<Any?>(capacity), 0)\n private val capacity = buffer.size\n private var startIndex: Int = 0\n override var size: Int = filledSize\n
private set\n \n override fun get(index: Int): T {\n checkElementIndex(index, size)\n
@Suppress("\UNCHECKED_CAST")\n return buffer[startIndex.forward(index)] as T\n } \n \n fun isFull() =
size == capacity\n \n override fun iterator(): Iterator<T> = object : AbstractIterator<T>() {\n private var count
= size\n private var index = startIndex\n override fun computeNext() {\n if (count == 0) {\n
done()\n } else {\n @Suppress("\UNCHECKED_CAST")\n setNext(buffer[index] as
T)\n index = index.forward(1)\n count--\n } \n } \n } \n \n @Suppress("\UNCHECKED_CAST")\n override fun <T> toArray(array: Array<T>): Array<T> {\n val
result: Array<T?> =\n if (array.size < this.size) array.copyOf(this.size) else array as Array<T?>\n val

```

```

size = this.size\n\n var widx = 0\n var idx = startIndex\n\n while (widx < size && idx < capacity) {\n
 result[widx] = buffer[idx] as T\n widx++\n idx++\n }\n\n idx = 0\n while (widx <
size) {\n result[widx] = buffer[idx] as T\n widx++\n idx++\n }\n if (result.size >
this.size) result[this.size] = null\n\n return result as Array<T>\n }\n\n override fun toArray(): Array<Any?>
{\n return toArray(arrayOfNulls(size))\n }\n\n /**\n * Creates a new ring buffer with the capacity equal to
the minimum of [maxCapacity] and 1.5 * [capacity].\n * The returned ring buffer contains the same elements as
this ring buffer.\n */\n fun expanded(maxCapacity: Int): RingBuffer<T> {\n val newCapacity = (capacity +
(capacity shr 1) + 1).coerceAtMost(maxCapacity)\n val newBuffer = if (startIndex == 0)
buffer.copyOf(newCapacity) else toArray(arrayOfNulls(newCapacity))\n return RingBuffer(newBuffer, size)\n
}\n\n /**\n * Add [element] to the buffer or fail with [IllegalStateException] if no free space available in the
buffer\n */\n fun add(element: T) {\n if (isFull()) {\n throw IllegalStateException("ring buffer is
full")\n }\n\n buffer[startIndex.forward(size)] = element\n size++\n }\n\n /**\n * Removes [n]
first elements from the buffer or fails with [IllegalArgumentException] if not enough elements in the buffer to
remove\n */\n fun removeFirst(n: Int) {\n require(n >= 0) { "\"n shouldn't be negative but it is $n" }\n
require(n <= size) { "\"n shouldn't be greater than the buffer size: n = $n, size = $size" }\n\n if (n > 0) {\n
val start = startIndex\n val end = start.forward(n)\n\n if (start > end) {\n buffer.fill(null, start,
capacity)\n buffer.fill(null, 0, end)\n } else {\n buffer.fill(null, start, end)\n }\n\n startIndex = end\n size -= n\n }\n }\n\n @Suppress("NOTHING_TO_INLINE")\n private
inline fun Int.forward(n: Int): Int = (this + n) % capacity\n }\n\n /**\n * Copyright 2010-2019 JetBrains s.r.o. and
Kotlin Programming Language contributors.\n * Use of this source code is governed by the Apache 2.0 license that
can be found in the license/LICENSE.txt file.\n */\n\npackage kotlin.collections\n\n// UByteArray
=====
\n@Exp
erimentalUnsignedTypes\nprivate fun partition(\n array: UByteArray, left: Int, right: Int): Int {\n var i = left\n
var j = right\n val pivot = array[(left + right) / 2]\n while (i <= j) {\n while (array[i] < pivot)\n i++\n
while (array[j] > pivot)\n j--\n if (i <= j) {\n val tmp = array[i]\n array[i] = array[j]\n
array[j] = tmp\n i++\n j--\n }\n }\n return i\n }\n\n@ExperimentalUnsignedTypes\nprivate fun
quickSort(\n array: UByteArray, left: Int, right: Int) {\n val index = partition(array, left, right)\n if (left < index
- 1)\n quickSort(array, left, index - 1)\n if (index < right)\n quickSort(array, index, right)\n }\n\n//
UShortArray
=====
\n@Exp
erimentalUnsignedTypes\nprivate fun partition(\n array: UShortArray, left: Int, right: Int): Int {\n var i = left\n
var j = right\n val pivot = array[(left + right) / 2]\n while (i <= j) {\n while (array[i] < pivot)\n
i++\n while (array[j] > pivot)\n j--\n if (i <= j) {\n val tmp = array[i]\n array[i] = array[j]\n
array[j] = tmp\n i++\n j--\n }\n }\n return i\n }\n\n@ExperimentalUnsignedTypes\nprivate fun
quickSort(\n array: UShortArray, left: Int, right: Int) {\n val index = partition(array, left, right)\n if (left <
index - 1)\n quickSort(array, left, index - 1)\n if (index < right)\n quickSort(array, index, right)\n }\n\n//
UIntArray
=====
\n@Exp
erimentalUnsignedTypes\nprivate fun partition(\n array: UIntArray, left: Int, right: Int): Int {\n var i = left\n
var j = right\n val pivot = array[(left + right) / 2]\n while (i <= j) {\n while (array[i] < pivot)\n
i++\n while (array[j] > pivot)\n j--\n if (i <= j) {\n val tmp = array[i]\n array[i] = array[j]\n
array[j] = tmp\n i++\n j--\n }\n }\n return i\n }\n\n@ExperimentalUnsignedTypes\nprivate fun
quickSort(\n array: UIntArray, left: Int, right: Int) {\n val index = partition(array, left, right)\n if (left <
index - 1)\n quickSort(array, left, index - 1)\n if (index < right)\n quickSort(array, index, right)\n }\n\n//
ULongArray
=====
\n@Exp
erimentalUnsignedTypes\nprivate fun partition(\n array: ULongArray, left: Int, right: Int): Int {\n var i = left\n
var j = right\n val pivot = array[(left + right) / 2]\n while (i <= j) {\n while (array[i] < pivot)\n
i++\n

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 while (array[j] > pivot)\n j--\n if (i <= j) {\n val tmp = array[i]\n array[i] = array[j]\n array[j] = tmp\n i++\n j--\n }\n }\n return i\n}\n\n@ExperimentalUnsignedTypes\nprivate fun\nquickSort(\n array: ULongArray, left: Int, right: Int) {\n val index = partition(array, left, right)\n if (left < index\n - 1)\n quickSort(array, left, index - 1)\n if (index < right)\n quickSort(array, index, right)\n}\n\n//

```

Interfaces

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=====
* Sorts the given array using qsort algorithm.\n *
@ExperimentalUnsignedTypes\ninternal fun sortArray(array:
UByteArray, fromIndex: Int, toIndex: Int) = quickSort(array, fromIndex, toIndex -
1)\n@ExperimentalUnsignedTypes\ninternal fun sortArray(array: UShortArray, fromIndex: Int, toIndex: Int) =
quickSort(array, fromIndex, toIndex - 1)\n@ExperimentalUnsignedTypes\ninternal fun sortArray(array: UIntArray,
fromIndex: Int, toIndex: Int) = quickSort(array, fromIndex, toIndex -
1)\n@ExperimentalUnsignedTypes\ninternal fun sortArray(array: ULongArray, fromIndex: Int, toIndex: Int) =
quickSort(array, fromIndex, toIndex - 1)", "/*\n * Copyright 2010-2021 JetBrains s.r.o. and Kotlin Programming
Language contributors.\n * Use of this source code is governed by the Apache 2.0 license that can be found in the
license/LICENSE.txt file.\n */\npackage kotlin\n\nimport kotlin.internal.InlineOnly\n\n/**\n * Compares this
object with the specified object for order. Returns zero if this object is equal\n * to the specified [other] object, a
negative number if it's less than [other], or a positive number\n * if it's greater than [other].\n */\n * This function
delegates to [Comparable.compareTo] and allows to call it in infix form.\n
\n *\n@InlineOnly\n@SinceKotlin("1.6")\npublic inline infix fun <T> Comparable<T>.compareTo(other: T): Int
=\n this.compareTo(other)\n", "/*\n * Copyright 2010-2018 JetBrains s.r.o. and Kotlin Programming Language
contributors.\n * Use of this source code is governed by the Apache 2.0 license that can be found in the
license/LICENSE.txt file.\n */\npackage kotlin.contracts\n\nimport kotlin.internal.ContractsDsl\nimport
kotlin.internal.InlineOnly\n\n/**\n * This marker distinguishes the experimental contract declaration API and is
used to opt-in for that feature\n * when declaring contracts of user functions.\n */\n * Any usage of a declaration
annotated with `@ExperimentalContracts` must be accepted either by\n * annotating that usage with the [OptIn]
annotation, e.g. `@OptIn(ExperimentalContracts::class)`,\n * or by using the compiler argument `-opt-
in=kotlin.contracts.ExperimentalContracts`.\n
\n *\n@Retention(AnnotationRetention.BINARY)\n@SinceKotlin("1.3")\n@RequiresOptIn\n@MustBeDocumente
d\npublic annotation class ExperimentalContracts\n\n/**\n * Provides a scope, where the functions of the contract
DSL, such as [returns], [callsInPlace], etc.,\n * can be used to describe the contract of a function.\n */\n * This type is
used as a receiver type of the lambda function passed to the [contract] function.\n */\n * @see contract\n
\n *\n@ContractsDsl\n@ExperimentalContracts\n@SinceKotlin("1.3")\npublic interface ContractBuilder {\n /**\n
 * Describes a situation when a function returns normally, without any exceptions thrown.\n */\n * Use
[SimpleEffect.implies] function to describe a conditional effect that happens in such case.\n */\n * //
\n @sample samples.contracts.returnsContract\n @ContractsDsl public fun returns(): Returns\n\n /**\n
 * Describes a situation when a function returns normally with the specified return [value].\n */\n * The possible
values of [value] are limited to `true`, `false` or `null`.\n */\n * Use [SimpleEffect.implies] function to describe a
conditional effect that happens in such case.\n */\n * // @sample samples.contracts.returnsTrueContract\n
\n // @sample samples.contracts.returnsFalseContract\n // @sample samples.contracts.returnsNullContract\n
\n @ContractsDsl public fun returns(value: Any?): Returns\n\n /**\n
 * Describes a situation when a function
returns normally with any value that is not `null`.\n */\n * Use [SimpleEffect.implies] function to describe a
conditional effect that happens in such case.\n */\n * // @sample
\n samples.contracts.returnsNotNullContract\n @ContractsDsl public fun returnsNotNull(): ReturnsNotNull\n\n
\n /**\n
 * Specifies that the function parameter [lambda] is invoked in place.\n */\n * This contract specifies
that:\n * 1. the function [lambda] can only be invoked during the call of the owner function,\n * and it won't be
invoked after that owner function call is completed;\n * 2. _(optionally)_ the function [lambda] is invoked the
amount of times specified by the [kind] parameter,\n * see the [InvocationKind] enum for possible values.\n
\n */\n * A function declaring the `callsInPlace` effect must be _inline_.\n */\n * // @sample

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samples.contracts.callsInPlaceAtMostOnceContract\n * @sample
samples.contracts.callsInPlaceAtLeastOnceContract\n * @sample
samples.contracts.callsInPlaceExactlyOnceContract\n * @sample
samples.contracts.callsInPlaceUnknownContract\n */\n @ContractsDsl public fun <R> callsInPlace(lambda:
Function<R>, kind: InvocationKind = InvocationKind.UNKNOWN): CallsInPlace\n}\n\n/**\n * Specifies how
many times a function invokes its function parameter in place.\n *\n * See [ContractBuilder.callsInPlace] for the
details of the call-in-place function contract.\n
*/\n@ContractsDsl\n@ExperimentalContracts\n@SinceKotlin("1.3")\npublic enum class InvocationKind {\n
/**\n * A function parameter will be invoked one time or not invoked at all.\n */\n // @sample
samples.contracts.callsInPlaceAtMostOnceContract\n @ContractsDsl AT_MOST_ONCE,\n\n /**\n * A
function parameter will be invoked one or more times.\n */\n */\n // @sample
samples.contracts.callsInPlaceAtLeastOnceContract\n @ContractsDsl AT_LEAST_ONCE,\n\n /**\n * A
function parameter will be invoked exactly one time.\n */\n */\n // @sample
samples.contracts.callsInPlaceExactlyOnceContract\n @ContractsDsl EXACTLY_ONCE,\n\n /**\n * A
function parameter is called in place, but it's unknown how many times it can be called.\n */\n */\n // @sample
samples.contracts.callsInPlaceUnknownContract\n @ContractsDsl UNKNOWN\n}\n\n/**\n * Specifies the
contract of a function.\n *\n * The contract description must be at the beginning of a function and have at least one
effect.\n *\n * Only the top-level functions can have a contract for now.\n *\n * @param builder the lambda where
the contract of a function is described with the help of the [ContractBuilder] members.\n *\n */\n@sample
samples.contracts.returnsContract\n* @sample samples.contracts.returnsTrueContract\n* @sample
samples.contracts.returnsFalseContract\n* @sample samples.contracts.returnsNullContract\n* @sample
samples.contracts.returnsNotNullContract\n* @sample samples.contracts.callsInPlaceAtMostOnceContract\n*
@sample samples.contracts.callsInPlaceAtLeastOnceContract\n* @sample
samples.contracts.callsInPlaceExactlyOnceContract\n* @sample
samples.contracts.callsInPlaceUnknownContract\n*/\n@ContractsDsl\n@ExperimentalContracts\n@InlineOnly\n@
SinceKotlin("1.3")\n@Suppress("UNUSED_PARAMETER")\npublic inline fun contract(builder:
ContractBuilder.() -> Unit) { }\n\n"/*\n * Copyright 2010-2018 JetBrains s.r.o. and Kotlin Programming Language
contributors.\n * Use of this source code is governed by the Apache 2.0 license that can be found in the
license/LICENSE.txt file.\n */\n\npackage kotlin.coroutines\n\n/**\n * Marks coroutine context element that
intercepts coroutine continuations.\n * The coroutines framework uses [ContinuationInterceptor.Key] to retrieve the
interceptor and\n * intercepts all coroutine continuations with [interceptContinuation] invocations.\n *\n *
[ContinuationInterceptor] behaves like a [polymorphic element][AbstractCoroutineContextKey], meaning that\n *
its implementation delegates [get][CoroutineContext.Element.get] and
[minusKey][CoroutineContext.Element.minusKey]\n * to [getPolymorphicElement] and [minusPolymorphicKey]
respectively.\n * [ContinuationInterceptor] subtypes can be extracted from the coroutine context using either
[ContinuationInterceptor.Key]\n * or subtype key if it extends [AbstractCoroutineContextKey].\n
*/\n\n@SinceKotlin("1.3")\npublic interface ContinuationInterceptor : CoroutineContext.Element {\n /**\n *
The key that defines *the* context interceptor.\n */\n companion object Key :
CoroutineContext.Key<ContinuationInterceptor>\n\n /**\n * Returns continuation that wraps the original
[continuation], thus intercepting all resumptions.\n * This function is invoked by coroutines framework when
needed and the resulting continuations are\n * cached internally per each instance of the original [continuation].\n
*/\n * This function may simply return original [continuation] if it does not want to intercept this particular
continuation.\n */\n * When the original [continuation] completes, coroutine framework invokes
[releaseInterceptedContinuation]\n * with the resulting continuation if it was intercepted, that is if
`interceptContinuation` had previously\n * returned a different continuation instance.\n */\n public fun <T>
interceptContinuation(continuation: Continuation<T>): Continuation<T>\n\n /**\n * Invoked for the
continuation instance returned by [interceptContinuation] when the original\n * continuation completes and will
not be used anymore. This function is invoked only if [interceptContinuation]\n * had returned a different

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continuation instance from the one it was invoked with.\n *\n * Default implementation does nothing.\n *\n * @param continuation Continuation instance returned by this interceptor's [interceptContinuation] invocation.\n *\n public fun releaseInterceptedContinuation(continuation: Continuation<*>) {\n /* do nothing by default\n }\n\n public override operator fun <E : CoroutineContext.Element> get(key: CoroutineContext.Key<E>): E? {\n // getPolymorphicKey specialized for ContinuationInterceptor key\n }\n\n @OptIn(ExperimentalStdlibApi::class)\n if (key is AbstractCoroutineContextKey<*, *>) {\n }\n\n @Suppress("UNCHECKED_CAST")\n return if (key.isSubKey(this.key)) key.tryCast(this) as? E else\n null\n }\n\n @Suppress("UNCHECKED_CAST")\n return if (ContinuationInterceptor === key) this as\n E else null\n }\n\n public override fun minusKey(key: CoroutineContext.Key<*>): CoroutineContext {\n // minusPolymorphicKey specialized for ContinuationInterceptor key\n }\n\n @OptIn(ExperimentalStdlibApi::class)\n if (key is AbstractCoroutineContextKey<*, *>) {\n return if\n (key.isSubKey(this.key) && key.tryCast(this) != null) EmptyCoroutineContext else this\n }\n\n return if\n (ContinuationInterceptor === key) EmptyCoroutineContext else this\n }\n\n /**\n * Copyright 2010-2018\n * JetBrains s.r.o. and Kotlin Programming Language contributors.\n * Use of this source code is governed by the\n * Apache 2.0 license that can be found in the license/LICENSE.txt file.\n */\n\n /**\n * Persistent context for the coroutine. It is an indexed set of [Element] instances.\n * An indexed set is a mix between\n * a set and a map.\n * Every element in this set has a unique [Key].\n */\n\n @SinceKotlin("1.3")\n public interface\n CoroutineContext {\n\n /**\n * Returns the element with the given [key] from this context or `null`.\n */\n public operator fun <E : Element> get(key: Key<E>): E?\n\n /**\n * Accumulates entries of this context\n * starting with [initial] value and applying [operation]\n * from left to right to current accumulator value and each\n * element of this context.\n */\n public fun <R> fold(initial: R, operation: (R, Element) -> R): R\n\n /**\n * Returns a context containing elements from this context and elements from other [context].\n * The elements\n * from this context with the same key as in the other one are dropped.\n */\n public operator fun plus(context:\n CoroutineContext): CoroutineContext =\n if (context === EmptyCoroutineContext) this else // fast path -- avoid\n lambda creation\n context.fold(this) { acc, element ->\n val removed =\n acc.minusKey(element.key)\n if (removed === EmptyCoroutineContext) element else {\n //\n make sure interceptor is always last in the context (and thus is fast to get when present)\n val interceptor\n = removed[ContinuationInterceptor]\n if (interceptor == null) CombinedContext(removed, element) else\n {\n val left = removed.minusKey(ContinuationInterceptor)\n if (left ===\n EmptyCoroutineContext) CombinedContext(element, interceptor) else\n CombinedContext(CombinedContext(left, element), interceptor)\n }\n }\n }\n\n /**\n * Returns a context containing elements from this context, but without an element with\n * the specified [key].\n */\n public fun minusKey(key: Key<*>): CoroutineContext\n\n /**\n * Key for the elements of\n * [CoroutineContext]. [E] is a type of element with this key.\n */\n public interface Key<E : Element>\n\n /**\n * An element of the [CoroutineContext]. An element of the coroutine context is a singleton context by itself.\n */\n public interface Element : CoroutineContext {\n\n /**\n * A key of this coroutine context element.\n */\n public val key: Key<*>\n\n public override operator fun <E : Element> get(key: Key<E>): E? =\n @Suppress("UNCHECKED_CAST")\n if (this.key == key) this as E else null\n\n public override\n fun <R> fold(initial: R, operation: (R, Element) -> R): R =\n operation(initial, this)\n\n public override\n fun minusKey(key: Key<*>): CoroutineContext =\n if (this.key == key) EmptyCoroutineContext else this\n }\n }\n\n /**\n * Copyright 2010-2020 JetBrains s.r.o. and Kotlin Programming Language contributors.\n * Use of\n * this source code is governed by the Apache 2.0 license that can be found in the\n * license/LICENSE.txt file.\n */\n\n /**\n * Package kotlin.coroutines\n */\n import kotlin.coroutines.CoroutineContext.Element\n import\n kotlin.coroutines.CoroutineContext.Key\n\n /**\n * Base class for [CoroutineContext.Element] implementations.\n */\n\n @SinceKotlin("1.3")\n public abstract class AbstractCoroutineContextElement(public override val key:\n Key<*>) : Element\n\n /**\n * Base class for [CoroutineContext.Key] associated with polymorphic\n * [CoroutineContext.Element] implementation.\n * Polymorphic element implementation implies delegating its\n * [get][Element.get] and [minusKey][Element.minusKey]\n * to [getPolymorphicElement] and

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[minusPolymorphicKey] respectively.\n * \n * Polymorphic elements can be extracted from the coroutine context
using both element key and its supertype key.\n * Example of polymorphic elements:\n * ```\n * open class
BaseElement : CoroutineContext.Element {\n * companion object Key : CoroutineContext.Key<BaseElement>\n
* override val key: CoroutineContext.Key<*> get() = Key\n * // It is important to use getPolymorphicKey and
minusPolymorphicKey\n * override fun <E : CoroutineContext.Element> get(key: CoroutineContext.Key<E>):
E? = getPolymorphicElement(key)\n * override fun minusKey(key: CoroutineContext.Key<*>):
CoroutineContext = minusPolymorphicKey(key)\n * } \n * \n * class DerivedElement : BaseElement() {\n *
companion object Key : AbstractCoroutineContextKey<BaseElement, DerivedElement>(BaseElement, { it as?
DerivedElement })\n * } \n * // Now it is possible to query both `BaseElement` and `DerivedElement`\n *
someContext[BaseElement] // Returns BaseElement?, non-null both for BaseElement and DerivedElement
instances\n * someContext[DerivedElement] // Returns DerivedElement?, non-null only for DerivedElement
instance\n * ```\n * @param B base class of a polymorphic element\n * @param baseKey an instance of base key\n
* @param E element type associated with the current key\n * @param safeCast a function that can safely cast
abstract [CoroutineContext.Element] to the concrete [E] type\n * and return the element if it is a subtype
of [E] or `null` otherwise.\n * \n * @SinceKotlin("1.3")\n * @ExperimentalStdlibApi\n * public abstract class
AbstractCoroutineContextKey<B : Element, E : B>(\n baseKey: Key,\n private val safeCast: (element:
Element) -> E?)\n) : Key<E> {\n private val topmostKey: Key<*> = if (baseKey is
AbstractCoroutineContextKey<*, *>) baseKey.topmostKey else baseKey\n internal fun tryCast(element:
Element): E? = safeCast(element)\n internal fun isSubKey(key: Key<*>): Boolean = key === this || topmostKey
=== key\n }\n \n /**\n * Returns the current element if it is associated with the given [key] in a polymorphic manner
or `null` otherwise.\n * This method returns non-null value if either [Element.key] is equal to the given [key] or if
the [key] is associated\n * with [Element.key] via [AbstractCoroutineContextKey].\n * See
[AbstractCoroutineContextKey] for the example of usage.\n
* \n * @SinceKotlin("1.3")\n * @ExperimentalStdlibApi\n * public fun <E : Element>
Element.getPolymorphicElement(key: Key<E>): E? {\n if (key is AbstractCoroutineContextKey<*, *>) {\n
@Suppress("UNCHECKED_CAST")\n return if (key.isSubKey(this.key)) key.tryCast(this) as? E else null\n
}\n @Suppress("UNCHECKED_CAST")\n return if (this.key === key) this as E else null\n }\n \n /**\n * Returns empty coroutine context if the element is associated with the given [key] in a polymorphic manner\n * or
`null` otherwise.\n * This method returns empty context if either [Element.key] is equal to the given [key] or if the
[key] is associated\n * with [Element.key] via [AbstractCoroutineContextKey].\n * See
[AbstractCoroutineContextKey] for the example of usage.\n
* \n * @SinceKotlin("1.3")\n * @ExperimentalStdlibApi\n * public fun Element.minusPolymorphicKey(key: Key<*>):
CoroutineContext {\n if (key is AbstractCoroutineContextKey<*, *>) {\n return if (key.isSubKey(this.key)
&& key.tryCast(this) != null) EmptyCoroutineContext else this\n }\n return if (this.key === key)
EmptyCoroutineContext else this\n }\n \n /**\n * An empty coroutine context.\n * \n * @SinceKotlin("1.3")\n * public
object EmptyCoroutineContext : CoroutineContext, Serializable {\n private const val serialVersionUID: Long =
0\n private fun readResolve(): Any = EmptyCoroutineContext\n public override fun <E : Element> get(key:
Key<E>): E? = null\n public override fun <R> fold(initial: R, operation: (R, Element) -> R): R = initial\n
 public override fun plus(context: CoroutineContext): CoroutineContext = context\n public override fun
minusKey(key: Key<*>): CoroutineContext = this\n public override fun hashCode(): Int = 0\n public override
fun toString(): String = "EmptyCoroutineContext"\n }\n \n //----- internal impl ----- \n \n // this class is not
exposed, but is hidden inside implementations\n // this is a left-biased list, so that `plus` works
naturally\n * \n * @SinceKotlin("1.3")\n * internal class CombinedContext(\n private val left: CoroutineContext,\n
 private val element: Element\n) : CoroutineContext, Serializable {\n override fun <E : Element> get(key:
Key<E>): E? {\n var cur = this\n while (true) {\n cur.element[key]?.let { return it }\n val next
= cur.left\n if (next is CombinedContext) {\n cur = next\n } else {\n return
next[key]\n }\n }\n }\n public override fun <R> fold(initial: R, operation: (R, Element) -> R): R =\n
 operation(left.fold(initial, operation), element)\n public override fun minusKey(key: Key<*>):

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CoroutineContext {
 element[key]?.let { return left }
 val newLeft = left.minusKey(key)
 return when {
 newLeft === left -> this
 newLeft === EmptyCoroutineContext -> element
 else -> CombinedContext(newLeft, element)
 }
 private fun size(): Int {
 var cur = this
 var size = 2
 while (true) {
 cur = cur.left as? CombinedContext?
 return size
 size++
 }
 }
 private fun contains(element: Element): Boolean =
 get(element.key) == element
 private fun containsAll(context: CombinedContext): Boolean {
 var cur = context
 while (true) {
 if (!contains(cur.element)) return false
 val next = cur.left
 if (next is CombinedContext) {
 cur = next
 } else {
 return contains(next as Element)
 }
 }
 }
 override fun equals(other: Any?): Boolean =
 this === other || other is CombinedContext && other.size() == size() &&
 other.containsAll(this)
 override fun hashCode(): Int = left.hashCode() + element.hashCode()
 override fun toString(): String =
 "[" + fold("") { acc, element ->
 if (acc.isEmpty()) element.toString() else
 "$acc, $element"
 } + "]"
 private fun writeReplace(): Any {
 val n = size()
 val elements = arrayOfNulls<CoroutineContext>(n)
 var index = 0
 fold(Unit) { _, element -> elements[index++] = element }
 check(index == n)
 @Suppress("UNCHECKED_CAST")
 return Serialized(elements as Array<CoroutineContext>)
 }
 private class Serialized(val elements: Array<CoroutineContext>) :
 Serializable {
 companion object {
 private const val serialVersionUID: Long = 0L
 }
 private fun readResolve(): Any = elements.fold(EmptyCoroutineContext, CoroutineContext::plus)
 }
}
/*
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 * Use of this source code is governed by the Apache 2.0 license that can be found in the license/LICENSE.txt file.
 */
@file:kotlin.jvm.JvmName("IntrinsicsKt")
@file:kotlin.jvm.JvmMultifileClass
npackage
kotlin.coroutines.intrinsics
nimport kotlin.contracts.*
nimport kotlin.coroutines.*
nimport
kotlin.internal.InlineOnly
n/**
 * Obtains the current continuation instance inside suspend functions and either
 * suspends
 * currently running coroutine or returns result immediately without suspension.
 *
 * If the [block] returns the special [COROUTINE_SUSPENDED] value, it means that suspend function did suspend the execution and will
 * not return any result immediately. In this case, the [Continuation] provided to the [block] shall be
 * resumed by invoking [Continuation.resumeWith] at some moment in the
 * future when the result becomes available to resume the computation.
 *
 * Otherwise, the return value of the [block] must have a type assignable to [T] and represents the result of this suspend function.
 * It means that the execution was not suspended and the [Continuation] provided to the [block] shall not be invoked.
 *
 * As the result type of the [block] is declared as `Any?` and cannot be correctly type-checked,
 * its proper return type remains on the conscience of the suspend function's author.
 *
 * Invocation of [Continuation.resumeWith] resumes coroutine directly in the invoker's thread without going through the
 * [ContinuationInterceptor] that might be present in the coroutine's [CoroutineContext].
 * It is the invoker's responsibility to ensure that a proper invocation context is established.
 *
 * [Continuation.intercepted] can be used to acquire the intercepted continuation.
 *
 * Note that it is not recommended to call either [Continuation.resume] nor [Continuation.resumeWithException] functions synchronously
 * in the same stackframe where suspension function is run. Use [suspendCoroutine] as a safer way to obtain current
 * continuation instance.
 */
@SinceKotlin("1.3")
@InlineOnly
@Suppress("UNUSED_PARAMETER", "RedundantSuspendModifier")
npublic suspend inline fun <T>
suspendCoroutineUninterceptedOrReturn(crossinline block: (Continuation<T>) -> Any?): T {
 contract {
 callsInPlace(block, InvocationKind.EXACTLY_ONCE)
 }
 throw NotImplementedError("Implementation of suspendCoroutineUninterceptedOrReturn is intrinsic")
}
n/**
 * This value is used as a return value of [suspendCoroutineUninterceptedOrReturn] `block` argument to state that
 * the execution was suspended and will not return any result immediately.
 *
 * Note: this value should not be used in general code.
 *
 * Using it outside of the context of `suspendCoroutineUninterceptedOrReturn` function return value (including, but not limited to,
 * storing this value in other properties, returning it from other functions, etc) can lead to unspecified behavior of the code.
 *
 * It is implemented as property with getter to avoid ProGuard <clinit> problem with multifile IntrinsicsKt class
 */
@SinceKotlin("1.3")
npublic val COROUTINE_SUSPENDED: Any get() =

```

CoroutineSingletons.COROUTINE\_SUSPENDED\n\n// Using enum here ensures two important properties:\n// 1. It makes SafeContinuation serializable with all kinds of serialization frameworks (since all of them natively support enums)\n// 2. It improves debugging experience, since you clearly see toString() value of those objects and what package they come from\n\n@SinceKotlin("1.3")\n@PublishedApi // This class is Published API via serialized representation of SafeContinuation, don't rename/move\ninternal enum class CoroutineSingletons {  
COROUTINE\_SUSPENDED, UNDECIDED, RESUMED }  
}\n\n/\*\n \* Copyright 2010-2018 JetBrains s.r.o. and Kotlin Programming Language contributors.\n \* Use of this source code is governed by the Apache 2.0 license that can be found in the license/LICENSE.txt file.\n \*/\n\npackage kotlin.experimental\n\n/\*\* Performs a bitwise AND operation between the two values. \*/\n@SinceKotlin("1.1")\n@kotlin.internal.InlineOnly\npublic inline infix fun Byte.and(other: Byte): Byte = (this.toInt() and other.toInt()).toByte()\n\n/\*\* Performs a bitwise OR operation between the two values. \*/\n@SinceKotlin("1.1")\n@kotlin.internal.InlineOnly\npublic inline infix fun Byte.or(other: Byte): Byte = (this.toInt() or other.toInt()).toByte()\n\n/\*\* Performs a bitwise XOR operation between the two values. \*/\n@SinceKotlin("1.1")\n@kotlin.internal.InlineOnly\npublic inline infix fun Byte.xor(other: Byte): Byte = (this.toInt() xor other.toInt()).toByte()\n\n/\*\* Inverts the bits in this value. \*/\n@SinceKotlin("1.1")\n@kotlin.internal.InlineOnly\npublic inline fun Byte.inv(): Byte = (this.toInt().inv()).toByte()\n\n/\*\* Performs a bitwise AND operation between the two values. \*/\n@SinceKotlin("1.1")\n@kotlin.internal.InlineOnly\npublic inline infix fun Short.and(other: Short): Short = (this.toInt() and other.toInt()).toShort()\n\n/\*\* Performs a bitwise OR operation between the two values. \*/\n@SinceKotlin("1.1")\n@kotlin.internal.InlineOnly\npublic inline infix fun Short.or(other: Short): Short = (this.toInt() or other.toInt()).toShort()\n\n/\*\* Performs a bitwise XOR operation between the two values. \*/\n@SinceKotlin("1.1")\n@kotlin.internal.InlineOnly\npublic inline infix fun Short.xor(other: Short): Short = (this.toInt() xor other.toInt()).toShort()\n\n/\*\* Inverts the bits in this value. \*/\n@SinceKotlin("1.1")\n@kotlin.internal.InlineOnly\npublic inline fun Short.inv(): Short = (this.toInt().inv()).toShort()\n\n\n", /\*\n \* Copyright 2010-2018 JetBrains s.r.o. and Kotlin Programming Language contributors.\n \* Use of this source code is governed by the Apache 2.0 license that can be found in the license/LICENSE.txt file.\n \*/\n\npackage kotlin.experimental\n\n/\*\*\n \* The experimental marker for type inference augmenting annotations.\n \* Any usage of a declaration annotated with `@ExperimentalTypeInference` must be accepted either by\n \* annotating that usage with the [OptIn] annotation, e.g. `@OptIn(ExperimentalTypeInference::class)`,\n \* or by using the compiler argument `-opt-in=kotlin.experimental.ExperimentalTypeInference`.\n \*/\n@RequiresOptIn(level = RequiresOptIn.Level.ERROR)\n@MustBeDocumented\n@Retention(AnnotationRetention.BINARY)\n@Target(AnnotationTarget.ANNOTATION\_CLASS)\n@SinceKotlin("1.3")\npublic annotation class ExperimentalTypeInference\n\n", /\*\n \* Copyright 2010-2018 JetBrains s.r.o. and Kotlin Programming Language contributors.\n \* Use of this source code is governed by the Apache 2.0 license that can be found in the license/LICENSE.txt file.\n \*/\n\npackage kotlin.internal\n\n/\*\* Specifies that the corresponding type should be ignored during type inference. \*/\n@Target(AnnotationTarget.TYPE)\n@Retention(AnnotationRetention.BINARY)\ninternal annotation class NoInfer\n\n/\*\* Specifies that the constraint built for the type during type inference should be an equality one. \*/\n@Target(AnnotationTarget.TYPE)\n@Retention(AnnotationRetention.BINARY)\ninternal annotation class Exact\n\n/\*\* Specifies that a corresponding member has the lowest priority in overload resolution. \*/\n@Target(AnnotationTarget.FUNCTION, AnnotationTarget.PROPERTY, AnnotationTarget.CONSTRUCTOR)\n@Retention(AnnotationRetention.BINARY)\ninternal annotation class LowPriorityInOverloadResolution\n\n/\*\* Specifies that the corresponding member has the highest priority in overload resolution. Effectively this means that\n \* an extension annotated with this annotation will win in overload resolution over a member with the same signature. \*/\n@Target(AnnotationTarget.FUNCTION, AnnotationTarget.PROPERTY)\n@Retention(AnnotationRetention.BINARY)\ninternal annotation class HidesMembers\n\n/\*\* The value of this type parameter should be mentioned in input types (argument types, receiver type or expected type). \*/

```

*/\n@Target(AnnotationTarget.TYPE_PARAMETER)\n@Retention(AnnotationRetention.BINARY)\ninternal
annotation class OnlyInputTypes\n\n/**\n * Specifies that this function should not be called directly without
inlining\n */\n@Target(AnnotationTarget.FUNCTION, AnnotationTarget.PROPERTY,
AnnotationTarget.PROPERTY_GETTER,
AnnotationTarget.PROPERTY_SETTER)\n@Retention(AnnotationRetention.BINARY)\ninternal annotation class
InlineOnly\n\n/**\n * Specifies that this declaration can have dynamic receiver type.\n
*/\n@Target(AnnotationTarget.FUNCTION,
AnnotationTarget.PROPERTY)\n@Retention(AnnotationRetention.BINARY)\ninternal annotation class
DynamicExtension\n\n/**\n * The value of this parameter should be a property reference expression (`this::foo`),
referencing a `lateinit` property,\n * the backing field of which is accessible at the point where the corresponding
argument is passed.\n
*/\n@Target(AnnotationTarget.VALUE_PARAMETER)\n@Retention(AnnotationRetention.BINARY)\n@SinceK
otlin("1.2")\ninternal annotation class AccessibleLateinitPropertyLiteral\n\n/**\n * Specifies that this declaration is
only completely supported since the specified version.\n * \n * The Kotlin compiler of an earlier version is going to
report a diagnostic on usages of this declaration.\n * The diagnostic message can be specified with [message], or via
[errorCode] (takes less space, but might not be immediately clear\n * to the user). The diagnostic severity can be
specified with [level]: WARNING/ERROR mean that either a warning or an error\n * is going to be reported,
HIDDEN means that the declaration is going to be removed from resolution completely.\n * \n * [versionKind]
specifies which version should be compared with the [version] value, when compiling the usage of the annotated
declaration.\n * Note that prior to 1.2, only [RequireKotlinVersionKind.LANGUAGE_VERSION] was supported,
so the Kotlin compiler before 1.2 is going to\n * treat any [RequireKotlin] as if it requires the language version.
Since 1.2, the Kotlin compiler supports\n * [RequireKotlinVersionKind.LANGUAGE_VERSION],
[RequireKotlinVersionKind.COMPILER_VERSION] and [RequireKotlinVersionKind.API_VERSION].\n * If the
actual value of [versionKind] is something different (e.g. a new version kind, added in future versions of Kotlin),\n *
Kotlin 1.2 is going to ignore this [RequireKotlin] altogether, where as Kotlin before 1.2 is going to treat this as a
requirement\n * on the language version.\n * \n * This annotation is erased at compile time; its arguments are stored
in a more compact form in the Kotlin metadata.\n */\n@Target(AnnotationTarget.CLASS,
AnnotationTarget.FUNCTION, AnnotationTarget.PROPERTY, AnnotationTarget.CONSTRUCTOR,
AnnotationTarget.TYPEALIAS)\n@Retention(AnnotationRetention.SOURCE)\n@Repeatable\n@SinceKotlin("1.
2")\ninternal annotation class RequireKotlin(\n val version: String,\n val message: String = "",\n val level:
DeprecationLevel = DeprecationLevel.ERROR,\n val versionKind: RequireKotlinVersionKind =
RequireKotlinVersionKind.LANGUAGE_VERSION,\n val errorCode: Int = -1)\n\n/**\n * The kind of the
version that is required by [RequireKotlin].\n */\n@SinceKotlin("1.2")\ninternal enum class
RequireKotlinVersionKind {\n LANGUAGE_VERSION,\n COMPILER_VERSION,\n
API_VERSION,\n}\n\n/**\n * Specifies that this declaration is a part of special DSL, used for constructing
function's contract.\n */\n@Retention(AnnotationRetention.BINARY)\n@SinceKotlin("1.2")\ninternal annotation
class ContractsDsl\n\n/**\n * Copyright 2010-2018 JetBrains s.r.o. and Kotlin Programming Language
contributors.\n * Use of this source code is governed by the Apache 2.0 license that can be found in the
license/LICENSE.txt file.\n */\n\npackage kotlin.properties\n\nimport kotlin.reflect.KProperty\n\n/**\n * Standard
property delegates.\n */\npublic object Delegates {\n /**\n * Returns a property delegate for a read/write
property with a non-`null` value that is initialized not during\n * object construction time but at a later time.
Trying to read the property before the initial value has been\n * assigned results in an exception.\n * \n
 * @sample samples.properties.Delegates.notNullDelegate\n */\n public fun <T : Any> notNull():
ReadWriteProperty<Any?, T> = NotNullVar()\n\n /**\n * Returns a property delegate for a read/write property
that calls a specified callback function when changed.\n * @param initialValue the initial value of the property.\n
 * @param onChange the callback which is called after the change of the property is made. The value of the
property\n * has already been changed when this callback is invoked.\n * \n * @sample
samples.properties.Delegates.observableDelegate\n */\n public inline fun <T> observable(initialValue: T,

```

```

crossinline onChange: (property: KProperty<*>, oldValue: T, newValue: T) -> Unit):\n
ReadWriteProperty<Any?, T> =\n object : ObservableProperty<T>(initialValue) {\n override fun
afterChange(property: KProperty<*>, oldValue: T, newValue: T) = onChange(property, oldValue, newValue)\n
 }\n\n /**\n * Returns a property delegate for a read/write property that calls a specified callback function when
changed,\n * allowing the callback to veto the modification.\n * @param initialValue the initial value of the
property.\n * @param onChange the callback which is called before a change to the property value is attempted.\n
 * The value of the property hasn't been changed yet, when this callback is invoked.\n * If the callback returns
`true` the value of the property is being set to the new value,\n * and if the callback returns `false` the new value
is discarded and the property remains its old value.\n * \n * @sample
samples.properties.Delegates.vetoableDelegate\n * @sample
samples.properties.Delegates.throwVetoableDelegate\n */\n public inline fun <T> vetoable(initialValue: T,
crossinline onChange: (property: KProperty<*>, oldValue: T, newValue: T) -> Boolean):\n
ReadWriteProperty<Any?, T> =\n object : ObservableProperty<T>(initialValue) {\n override fun
beforeChange(property: KProperty<*>, oldValue: T, newValue: T): Boolean = onChange(property, oldValue,
newValue)\n }\n\n private class NotNullVar<T : Any>(): ReadWriteProperty<Any?, T> {\n private var
value: T? = null\n public override fun getValue(thisRef: Any?, property: KProperty<*>): T {\n return value
?: throw IllegalStateException("\nProperty ${property.name} should be initialized before get.")\n }\n public
override fun setValue(thisRef: Any?, property: KProperty<*>, value: T) {\n this.value = value\n }\n }\n\n /**\n * Copyright 2010-2020 JetBrains s.r.o. and Kotlin Programming Language contributors.\n * Use of
this source code is governed by the Apache 2.0 license that can be found in the license/LICENSE.txt file.\n
 */\n\n package kotlin.properties\n import kotlin.reflect.KProperty\n\n /**\n * Base interface that can be used for
implementing property delegates of read-only properties.\n * This is provided only for convenience; you don't
have to extend this interface\n * as long as your property delegate has methods with the same signatures.\n * \n *
@param T the type of object which owns the delegated property.\n * @param V the type of the property value.\n
 */\n public fun interface ReadOnlyProperty<in T, out V> {\n /**\n * Returns the value of the property for the
given object.\n * @param thisRef the object for which the value is requested.\n * @param property the
metadata for the property.\n * @return the property value.\n */\n public operator fun getValue(thisRef: T,
property: KProperty<*>): V\n }\n\n /**\n * Base interface that can be used for implementing property delegates of
read-write properties.\n * This is provided only for convenience; you don't have to extend this interface\n * as
long as your property delegate has methods with the same signatures.\n * \n * @param T the type of object which
owns the delegated property.\n * @param V the type of the property value.\n */\n public interface
ReadWriteProperty<in T, V> : ReadOnlyProperty<T, V> {\n /**\n * Returns the value of the property for the
given object.\n * @param thisRef the object for which the value is requested.\n * @param property the
metadata for the property.\n * @return the property value.\n */\n public override operator fun
getValue(thisRef: T, property: KProperty<*>): V\n /**\n * Sets the value of the property for the given
object.\n * @param thisRef the object for which the value is requested.\n * @param property the metadata for
the property.\n * @param value the value to set.\n */\n public operator fun setValue(thisRef: T, property:
KProperty<*>, value: V)\n }\n\n /**\n * Base interface that can be used for implementing property delegate
providers.\n * This is provided only for convenience; you don't have to extend this interface\n * as long as your
delegate provider has a method with the same signature.\n * \n * @param T the type of object which owns the
delegated property.\n * @param D the type of property delegates this provider provides.\n
 */\n @SinceKotlin("1.4")\n public fun interface PropertyDelegateProvider<in T, out D> {\n /**\n * Returns the
delegate of the property for the given object.\n * \n * This function can be used to extend the logic of creating
the object (e.g. perform validation checks)\n * to which the property implementation is delegated.\n * \n
 * @param thisRef the object for which property delegate is requested.\n * @param property the metadata for the
property.\n * @return the property delegate.\n */\n public operator fun provideDelegate(thisRef: T, property:
KProperty<*>): D\n }\n\n /**\n * Copyright 2010-2018 JetBrains s.r.o. and Kotlin Programming Language
contributors.\n * Use of this source code is governed by the Apache 2.0 license that can be found in the

```





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V>.setValue(thisRef: T, property: KProperty<*>, value: V) {\n set(thisRef, value)\n}"/**\n * Copyright 2010-
2021 JetBrains s.r.o. and Kotlin Programming Language contributors.\n * Use of this source code is governed by the
Apache 2.0 license that can be found in the license/LICENSE.txt file.\n */\n\npackage kotlin.random\n\nimport
kotlin.math.nextDown\n\n/**\n * An abstract class that is implemented by random number generator algorithms.\n
*\n * The companion object [Random.Default] is the default instance of [Random].\n *\n * To get a seeded instance
of random generator use [Random] function.\n *\n * @sample samples.random.Randoms.defaultRandom\n
*\n */\n\n@SinceKotlin("1.3")\npublic abstract class Random {\n\n /**\n * Gets the next random [bitCount] number
of bits.\n *\n * Generates an `Int` whose lower [bitCount] bits are filled with random values and the remaining
upper bits are zero.\n *\n * @param bitCount number of bits to generate, must be in range 0..32, otherwise the
behavior is unspecified.\n *\n * @sample samples.random.Randoms.nextBits\n */\n public abstract fun
nextBits(bitCount: Int): Int\n\n /**\n * Gets the next random `Int` from the random number generator.\n *\n
* Generates an `Int` random value uniformly distributed between `Int.MIN_VALUE` and `Int.MAX_VALUE`
(inclusive).\n *\n * @sample samples.random.Randoms.nextInt\n */\n public open fun nextInt(): Int =
nextBits(32)\n\n /**\n * Gets the next random non-negative `Int` from the random number generator less than
the specified [until] bound.\n *\n * Generates an `Int` random value uniformly distributed between `0`
(inclusive) and the specified [until] bound (exclusive).\n *\n * @param until must be positive.\n *\n *
@throws IllegalArgumentException if [until] is negative or zero.\n *\n * @sample
samples.random.Randoms.nextIntFromUntil\n */\n public open fun nextInt(until: Int): Int = nextInt(0, until)\n\n
/**\n * Gets the next random `Int` from the random number generator in the specified range.\n *\n *
Generates an `Int` random value uniformly distributed between the specified [from] (inclusive) and [until]
(exclusive) bounds.\n *\n * @throws IllegalArgumentException if [from] is greater than or equal to [until].\n
*\n * @sample samples.random.Randoms.nextIntFromUntil\n */\n public open fun nextInt(from: Int, until:
Int): Int {\n checkRangeBounds(from, until)\n val n = until - from\n if (n > 0 || n == Int.MIN_VALUE)\n
{\n val rnd = if (n and -n == n) {\n val bitCount = fastLog2(n)\n nextBits(bitCount)\n
 } else {\n var v: Int\n do {\n val bits = nextInt().ushr(1)\n v = bits % n\n
 } while (bits - v + (n - 1) < 0)\n v\n }\n return from + rnd\n } else {\n while
(true) {\n val rnd = nextInt()\n if (rnd in from until until) return rnd\n }\n }\n }\n\n
/**\n * Gets the next random `Long` from the random number generator.\n *\n * Generates a `Long` random
value uniformly distributed between `Long.MIN_VALUE` and `Long.MAX_VALUE` (inclusive).\n *\n *
@sample samples.random.Randoms.nextLong\n */\n public open fun nextLong(): Long =
nextInt().toLong().shl(32) + nextInt()\n\n /**\n * Gets the next random non-negative `Long` from the random
number generator less than the specified [until] bound.\n *\n * Generates a `Long` random value uniformly
distributed between `0` (inclusive) and the specified [until] bound (exclusive).\n *\n * @param until must be
positive.\n *\n * @throws IllegalArgumentException if [until] is negative or zero.\n *\n * @sample
samples.random.Randoms.nextLongFromUntil\n */\n public open fun nextLong(until: Long): Long =
nextLong(0, until)\n\n /**\n * Gets the next random `Long` from the random number generator in the specified
range.\n *\n * Generates a `Long` random value uniformly distributed between the specified [from] (inclusive)
and [until] (exclusive) bounds.\n *\n * @throws IllegalArgumentException if [from] is greater than or equal to
[until].\n *\n * @sample samples.random.Randoms.nextLongFromUntil\n */\n public open fun
nextLong(from: Long, until: Long): Long {\n checkRangeBounds(from, until)\n val n = until - from\n
if (n > 0) {\n val rnd: Long\n if (n and -n == n) {\n val nLow = n.toInt()\n val nHigh
= (n ushr 32).toInt()\n rnd = when {\n nLow != 0 -> {\n val bitCount =
fastLog2(nLow)\n // toUInt().toLong()\n nextBits(bitCount).toLong() and
0xFFFF_FFFF\n }\n nHigh == 1 ->{\n // toUInt().toLong()\n
nextInt().toLong() and 0xFFFF_FFFF\n } else -> {\n val bitCount = fastLog2(nHigh)\n
 nextBits(bitCount).toLong().shl(32) + (nextInt().toLong() and 0xFFFF_FFFF)\n }\n
 }\n } else {\n var v: Long\n do {\n val bits = nextLong().ushr(1)\n
v = bits % n\n } while (bits - v + (n - 1) < 0)\n rnd = v\n }\n return from + rnd\n
}

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} else {\n while (true) {\n val rnd = nextLong()\n if (rnd in from until until) return rnd\n }\n }\n}

/**\n * Gets the next random [Boolean] value.\n *\n * @sample\n samples.random.Randoms.nextBoolean\n *\n public open fun nextBoolean(): Boolean = nextBits(1) != 0\n\n /**\n * Gets the next random [Double] value uniformly distributed between 0 (inclusive) and 1 (exclusive).\n *\n * @sample\n samples.random.Randoms.nextDouble\n *\n public open fun nextDouble(): Double =\n doubleFromParts(nextBits(26), nextBits(27))\n\n /**\n * Gets the next random non-negative `Double` from the\n random number generator less than the specified [until] bound.\n *\n * Generates a `Double` random value\n uniformly distributed between 0 (inclusive) and [until] (exclusive).\n *\n * @throws IllegalArgumentException\n if [until] is negative or zero.\n *\n * @sample\n samples.random.Randoms.nextDoubleFromUntil\n *\n public open fun nextDouble(until: Double): Double = nextDouble(0.0, until)\n\n /**\n * Gets the next random\n `Double` from the random number generator in the specified range.\n *\n * Generates a `Double` random value\n uniformly distributed between the specified [from] (inclusive) and [until] (exclusive) bounds.\n *\n * [from]\n and [until] must be finite otherwise the behavior is unspecified.\n *\n * @throws IllegalArgumentException\n if [from] is greater than or equal to [until].\n *\n * @sample\n samples.random.Randoms.nextDoubleFromUntil\n *\n public open fun nextDouble(from: Double, until: Double): Double {\n checkRangeBounds(from, until)\n val size = until - from\n val r = if (size.isInfinite() && from.isFinite() && until.isFinite()) {\n val r1 =\n nextDouble() * (until / 2 - from / 2)\n from + r1 + r1\n } else {\n from + nextDouble() * size\n }\n return if (r >= until) until.nextDown() else r\n }\n\n /**\n * Gets the next random [Float] value\n uniformly distributed between 0 (inclusive) and 1 (exclusive).\n *\n * @sample\n samples.random.Randoms.nextFloat\n *\n public open fun nextFloat(): Float = nextBits(24) / (1 shl\n 24).toFloat()\n\n /**\n * Fills a subrange of the specified byte [array] starting from [fromIndex] inclusive and\n ending [toIndex] exclusive\n * with random bytes.\n *\n * @return [array] with the subrange filled with\n random bytes.\n *\n * @sample\n samples.random.Randoms.nextBytes\n *\n public open fun\n nextBytes(array: ByteArray, fromIndex: Int = 0, toIndex: Int = array.size): ByteArray {\n require(fromIndex in\n 0..array.size && toIndex in 0..array.size) { \"fromIndex ($fromIndex) or toIndex ($toIndex) are out of range:\n 0..${array.size}.\" }\n require(fromIndex <= toIndex) { \"fromIndex ($fromIndex) must be not greater than\n toIndex ($toIndex).\" }\n val steps = (toIndex - fromIndex) / 4\n var position = fromIndex\n repeat(steps) {\n val v = nextInt()\n array[position] = v.toByte()\n array[position + 1] =\n v.ushr(8).toByte()\n array[position + 2] = v.ushr(16).toByte()\n array[position + 3] =\n v.ushr(24).toByte()\n position += 4\n }\n val remainder = toIndex - position\n val vr =\n nextBits(remainder * 8)\n for (i in 0 until remainder) {\n array[position + i] = vr.ushr(i * 8).toByte()\n }\n return array\n }\n\n /**\n * Fills the specified byte [array] with random bytes and returns it.\n *\n * @return [array] filled with random bytes.\n *\n * @sample\n samples.random.Randoms.nextBytes\n *\n public open fun nextBytes(array: ByteArray): ByteArray = nextBytes(array, 0, array.size)\n\n /**\n * Creates a\n byte array of the specified [size], filled with random bytes.\n *\n * @sample\n samples.random.Randoms.nextBytes\n *\n public open fun nextBytes(size: Int): ByteArray =\n nextBytes(ByteArray(size))\n\n /**\n * The default random number generator.\n *\n * On JVM this\n generator is thread-safe, its methods can be invoked from multiple threads.\n *\n * @sample\n samples.random.Randoms.defaultRandom\n *\n companion object Default : Random(), Serializable {\n private val defaultRandom: Random = defaultPlatformRandom()\n private object Serialized : Serializable {\n private const val serialVersionUID = 0L\n private fun readResolve(): Any = Random\n }\n private fun writeReplace(): Any = Serialized\n override fun nextBits(bitCount: Int): Int =\n defaultRandom.nextBits(bitCount)\n override fun nextInt(): Int = defaultRandom.nextInt()\n override fun\n nextInt(until: Int): Int = defaultRandom.nextInt(until)\n override fun nextInt(from: Int, until: Int): Int =\n defaultRandom.nextInt(from, until)\n override fun nextLong(): Long = defaultRandom.nextLong()\n override fun\n nextLong(until: Long): Long = defaultRandom.nextLong(until)\n override fun nextLong(from:\n Long, until: Long): Long = defaultRandom.nextLong(from, until)\n override fun nextBoolean(): Boolean =\n defaultRandom.nextBoolean()\n override fun nextDouble(): Double = defaultRandom.nextDouble()\n}

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override fun nextDouble(until: Double): Double = defaultRandom.nextDouble(until)\n override fun
nextDouble(from: Double, until: Double): Double = defaultRandom.nextDouble(from, until)\n\n override fun
nextFloat(): Float = defaultRandom.nextFloat()\n\n override fun nextBytes(array: ByteArray): ByteArray =
defaultRandom.nextBytes(array)\n override fun nextBytes(size: Int): ByteArray =
defaultRandom.nextBytes(size)\n override fun nextBytes(array: ByteArray, fromIndex: Int, toIndex: Int):
ByteArray =\n defaultRandom.nextBytes(array, fromIndex, toIndex)\n }\n}\n\n/**\n * Returns a repeatable
random number generator seeded with the given [seed] `Int` value.\n * Two generators with the same seed
produce the same sequence of values within the same version of Kotlin runtime.\n * Note: Future versions of
Kotlin may change the algorithm of this seeded number generator so that it will return\n * a sequence of values
different from the current one for a given seed.\n * On JVM the returned generator is NOT thread-safe. Do not
invoke it from multiple threads without proper synchronization.\n * @sample
samples.random.Randoms.seededRandom\n */\n@SinceKotlin("1.3")\npublic fun Random(seed: Int): Random =
XorWowRandom(seed, seed.shr(31))\n\n/**\n * Returns a repeatable random number generator seeded with the
given [seed] `Long` value.\n * Two generators with the same seed produce the same sequence of values within
the same version of Kotlin runtime.\n * Note: Future versions of Kotlin may change the algorithm of this
seeded number generator so that it will return\n * a sequence of values different from the current one for a
given seed.\n * On JVM the returned generator is NOT thread-safe. Do not invoke it from multiple threads without
proper synchronization.\n * @sample samples.random.Randoms.seededRandom\n */\n@SinceKotlin("1.3")\npublic fun Random(seed: Long): Random = XorWowRandom(seed.toInt(),
seed.shr(32).toInt())\n\n/**\n * Gets the next random `Int` from the random number generator in the specified
[range].\n * Generates an `Int` random value uniformly distributed in the specified [range]:\n * from `range.start`
inclusive to `range.endInclusive` inclusive.\n * @throws IllegalArgumentException if [range] is empty.\n */\n@SinceKotlin("1.3")\npublic fun Random.nextInt(range: IntRange): Int = when {\n range.isEmpty() -> throw
IllegalArgumentException("Cannot get random in empty range: $range")\n range.last < Int.MAX_VALUE ->
nextInt(range.first, range.last + 1)\n range.first > Int.MIN_VALUE -> nextInt(range.first - 1, range.last) + 1\n else -> nextInt()\n}\n\n/**\n * Gets the next random `Long` from the random number generator in the specified
[range].\n * Generates a `Long` random value uniformly distributed in the specified [range]:\n * from
`range.start` inclusive to `range.endInclusive` inclusive.\n * @throws IllegalArgumentException if [range] is
empty.\n */\n@SinceKotlin("1.3")\npublic fun Random.nextLong(range: LongRange): Long = when {\n range.isEmpty() -> throw
IllegalArgumentException("Cannot get random in empty range: $range")\n range.last <
Long.MAX_VALUE -> nextLong(range.first, range.last + 1)\n range.first > Long.MIN_VALUE ->
nextLong(range.first - 1, range.last) + 1\n else -> nextLong()\n}\n\n\ninternal expect fun
defaultPlatformRandom(): Random\n\ninternal expect fun doubleFromParts(hi26: Int, low27: Int): Double\n\ninternal
fun fastLog2(value: Int): Int = 31 - value.countLeadingZeroBits()\n\n/**\n * Takes upper [bitCount] bits (0..32) from
this number.\n */\ninternal fun Int.takeUpperBits(bitCount: Int): Int =\n this.ushr(32 - bitCount) and (-
bitCount).shr(31)\n\ninternal fun checkRangeBounds(from: Int, until: Int) = require(until > from) {\n
boundsErrorMessage(from, until) }\n\ninternal fun checkRangeBounds(from: Long, until: Long) = require(until >
from) {\n boundsErrorMessage(from, until) }\n\ninternal fun checkRangeBounds(from: Double, until: Double) =
require(until > from) {\n boundsErrorMessage(from, until) }\n\ninternal fun boundsErrorMessage(from: Any, until:
Any) = "Random range is empty: [$from, $until]."\n\n"/\n * Copyright 2010-2021 JetBrains s.r.o. and Kotlin
Programming Language contributors.\n * Use of this source code is governed by the Apache 2.0 license that can be
found in the license/LICENSE.txt file.\n */\npackage kotlin.random\n\n/**\n * Gets the next random [UInt]
from the random number generator.\n * Generates a [UInt] random value uniformly distributed between
[UInt.MIN_VALUE] and [UInt.MAX_VALUE] (inclusive).\n */\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class)\npublic fun
Random.nextUInt(): UInt = nextInt().toUInt()\n\n/**\n * Gets the next random [UInt] from the random number
generator less than the specified [until] bound.\n * Generates a [UInt] random value uniformly distributed
between `0` (inclusive) and the specified [until] bound (exclusive).\n * @throws IllegalArgumentException if

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[until] is zero.\n *\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class)\npublic fun
Random.nextIntUntil(until: UInt): UInt = nextUInt(0u, until)\n\n/**\n * Gets the next random [UInt] from the random
number generator in the specified range.\n *\n * Generates a [UInt] random value uniformly distributed between the
specified [from] (inclusive) and [until] (exclusive) bounds.\n *\n * @throws IllegalArgumentException if [from] is
greater than or equal to [until].\n
*\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class)\npublic fun
Random.nextIntUInt(from: UInt, until: UInt): UInt {\n checkUIntRangeBounds(from, until)\n\n val signedFrom =
from.toInt() xor Int.MIN_VALUE\n val signedUntil = until.toInt() xor Int.MIN_VALUE\n\n val signedResult =
nextInt(signedFrom, signedUntil) xor Int.MIN_VALUE\n return signedResult.toUInt()\n}\n\n/**\n * Gets the next
random [UInt] from the random number generator in the specified [range].\n *\n * Generates a [UInt] random value
uniformly distributed in the specified [range]:\n * from `range.start` inclusive to `range.endInclusive` inclusive.\n
*\n * @throws IllegalArgumentException if [range] is empty.\n
*\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class)\npublic fun
Random.nextIntUInt(range: UIntRange): UInt = when {\n range.isEmpty() -> throw
IllegalArgumentException("Cannot get random in empty range: $range")\n range.last < UInt.MAX_VALUE ->
nextIntUInt(range.first, range.last + 1u)\n range.first > UInt.MIN_VALUE -> nextUInt(range.first - 1u, range.last) +
1u\n else -> nextUInt()\n}\n\n/**\n * Gets the next random [ULong] from the random number generator.\n *\n *
Generates a [ULong] random value uniformly distributed between [ULong.MIN_VALUE] and
[ULong.MAX_VALUE] (inclusive).\n
*\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class)\npublic fun
Random.nextULong(): ULong = nextLong().toULong()\n\n/**\n * Gets the next random [ULong] from the random
number generator less than the specified [until] bound.\n *\n * Generates a [ULong] random value uniformly
distributed between `0` (inclusive) and the specified [until] bound (exclusive).\n *\n * @throws
IllegalArgumentException if [until] is zero.\n
*\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class)\npublic fun
Random.nextULong(until: ULong): ULong = nextULong(0uL, until)\n\n/**\n * Gets the next random [ULong] from
the random number generator in the specified range.\n *\n * Generates a [ULong] random value uniformly
distributed between the specified [from] (inclusive) and [until] (exclusive) bounds.\n *\n * @throws
IllegalArgumentException if [from] is greater than or equal to [until].\n
*\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class)\npublic fun
Random.nextULong(from: ULong, until: ULong): ULong {\n checkULongRangeBounds(from, until)\n\n val
signedFrom = from.toLong() xor Long.MIN_VALUE\n val signedUntil = until.toLong() xor
Long.MIN_VALUE\n\n val signedResult = nextLong(signedFrom, signedUntil) xor Long.MIN_VALUE\n return
signedResult.toULong()\n}\n\n/**\n * Gets the next random [ULong] from the random number generator in
the specified [range].\n *\n * Generates a [ULong] random value uniformly distributed in the specified [range]:\n *
from `range.start` inclusive to `range.endInclusive` inclusive.\n *\n * @throws IllegalArgumentException if [range]
is empty.\n
*\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class)\npublic fun
Random.nextULong(range: ULongRange): ULong = when {\n range.isEmpty() -> throw
IllegalArgumentException("Cannot get random in empty range: $range")\n range.last < ULong.MAX_VALUE -
> nextULong(range.first, range.last + 1u)\n range.first > ULong.MIN_VALUE -> nextULong(range.first - 1u,
range.last) + 1u\n else -> nextULong()\n}\n\n/**\n * Fills the specified unsigned byte [array] with random bytes
and returns it.\n *\n * @return [array] filled with random bytes.\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun Random.nextUBytes(array: UByteArray):
UByteArray {\n nextBytes(array.asByteArray())\n return array\n}\n\n/**\n * Creates an unsigned byte array of
the specified [size], filled with random bytes.\n
*\n@SinceKotlin("1.3")\n@ExperimentalUnsignedTypes\npublic fun Random.nextUBytes(size: Int): UByteArray =
nextBytes(size).asUByteArray()\n\n/**\n * Fills a subrange of the specified `UByte` [array] starting from
[fromIndex] inclusive and ending [toIndex] exclusive with random
UBytes.\n *\n * @return [array] with the subrange filled with random bytes.\n

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*^@SinceKotlin("1.3")^@ExperimentalUnsignedTypes^@public fun Random.nextUBytes(array: UByteArray,
fromIndex: Int = 0, toIndex: Int = array.size): UByteArray {
 nextBytes(array.asByteArray(), fromIndex,
toIndex)
 return array
}

^@internal fun checkUIntRangeBounds(from: UInt, until: UInt) = require(until >
from) { boundsErrorMessage(from, until) }
^@internal fun checkULongRangeBounds(from: ULong, until: ULong) =
require(until > from) { boundsErrorMessage(from, until) }

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Kotlin Programming Language contributors.
^@ * Use of this source code is governed by the Apache 2.0 license that
can be found in the license/LICENSE.txt file.
^@/^@^@package kotlin.random
^@/^@ * Random number generator,
using Marsaglia's "xorwow" algorithm
^@ * Cycles after 2^192 - 2^32 repetitions.
^@ * For more details, see
Marsaglia, George (July 2003). "Xorshift RNGs". Journal of Statistical Software. 8 (14).
doi:10.18637/jss.v008.i14
^@ * Available at https://www.jstatsoft.org/v08/i14/paper
^@/^@^@internal class
XorWowRandom internal constructor(
 private var x: Int,
 private var y: Int,
 private var z: Int,
 private
var w: Int,
 private var v: Int,
 private var addend: Int) : Random(), Serializable {
 ^@/^@ internal
constructor(seed1: Int, seed2: Int) :
 this(seed1, seed2, 0, 0, seed1.inv(), (seed1 shl 10) xor (seed2 ushr
4))
 init {
 require((x or y or z or w or v) != 0) { "Initial state must have at least one non-zero element."
 }
 // some trivial seeds can produce several values with zeroes in upper bits, so we discard first 64
repeat(64) { nextInt() }
 }
 override fun nextInt(): Int {
 // Equivalent to the xorwow algorithm
 // From Marsaglia, G. 2003. Xorshift RNGs. J. Statis. Soft. 8, 14, p. 5
 var t = x
 t = t xor (t ushr 2)
 x
= y
 y = z
 z = w
 val v0 = v
 w = v0
 t = (t xor (t shl 1)) xor v0 xor (v0 shl 4)
 v =
t
 addend += 362437
 return t + addend
 }
 override fun nextBits(bitCount: Int): Int =
nextInt().takeUpperBits(bitCount)
 ^@/^@ private companion object {
 private const val serialVersionUID: Long
= 0L
 }
}

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^@ * Use of this source code is governed by the Apache 2.0 license that can be found in the license/LICENSE.txt file.
*^@/^@^@file:kotlin.jvm.JvmMultifileClass^@file:kotlin.jvm.JvmName("RangesKt")
^@/^@^@package
kotlin.ranges
^@/^@ * Represents a range of [Comparable] values.
*^@/^@private open class ComparableRange<T> :
Comparable<T>> {
 override val start: T,
 override val endInclusive: T) : ClosedRange<T> {
 override
fun equals(other: Any?): Boolean {
 return other is ComparableRange<*> && (isEmpty() && other.isEmpty())
||
start == other.start && endInclusive == other.endInclusive
 }
 override fun hashCode(): Int
{
 return if (isEmpty()) -1 else 31 * start.hashCode() + endInclusive.hashCode()
 }
 override fun
toString(): String = "$start..$endInclusive"
 }
}

^@/^@ * Creates a range from this [Comparable] value to the
specified [that] value.
^@ * This value needs to be smaller than or equal to [that] value, otherwise the returned
range will be empty.
^@ * @sample samples.ranges.Ranges.rangeFromComparable
*^@/^@public operator fun <T> :
Comparable<T>> T.rangeTo(that: T): ClosedRange<T> = ComparableRange(this, that)
^@/^@ * Represents a
range of floating point numbers.
^@ * Extends [ClosedRange] interface providing custom operation
[lessThanOrEquals] for comparing values of range domain type.
^@ * This interface is implemented by floating
point ranges returned by [Float.rangeTo] and [Double.rangeTo] operators to
^@ * achieve IEEE-754 comparison order
instead of total order of floating point numbers.
*^@/^@SinceKotlin("1.1")
^@/^@public interface
ClosedFloatingPointRange<T> : Comparable<T>> : ClosedRange<T> {
 override fun contains(value: T): Boolean
= lessThanOrEquals(start, value) && lessThanOrEquals(value, endInclusive)
 override fun isEmpty(): Boolean =
!lessThanOrEquals(start, endInclusive)
 /**
 * Compares two values of range domain type and returns true
if first is less than or equal to second.
 */
 fun lessThanOrEquals(a: T, b: T): Boolean
}

^@/^@ * A
closed range of values of type `Double`.
^@ * Numbers are compared with the ends of this range according to
IEEE-754.
*^@/^@private class ClosedDoubleRange(
 start: Double,
 endInclusive: Double) :
ClosedFloatingPointRange<Double> {
 private val _start = start
 private val _endInclusive = endInclusive
 override val start: Double get() = _start
 override val endInclusive: Double get() = _endInclusive
 override
fun lessThanOrEquals(a: Double, b: Double): Boolean = a <= b
 override fun contains(value: Double): Boolean
= value >= _start && value <= _endInclusive
 override fun isEmpty(): Boolean = !(_start <= _endInclusive)
 override fun equals(other: Any?): Boolean {
 return other is ClosedDoubleRange && (isEmpty() &&
other.isEmpty() ||
_start == other._start && _endInclusive == other._endInclusive)
 }
 override

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fun hashCode(): Int {
 return if (isEmpty()) -1 else 31 * _start.hashCode() + _endInclusive.hashCode()
}
override fun toString(): String = "$_start..$_endInclusive"
}

@sample samples.ranges.Ranges.rangeFromDouble
@SinceKotlin("1.1")
public operator fun
Double.rangeTo(that: Double): ClosedFloatingPointRange<Double> = ClosedDoubleRange(this, that)
A closed range of values of type `Float`.
Numbers are compared with the ends of this range according to
IEEE-754.
private class ClosedFloatRange(
 start: Float,
 endInclusive: Float
) :
ClosedFloatingPointRange<Float> {
 private val _start = start
 private val _endInclusive = endInclusive
 override val start: Float get() = _start
 override val endInclusive: Float get() = _endInclusive
 override fun
lessThanOrEquals(a: Float, b: Float): Boolean = a <= b
 override fun contains(value: Float): Boolean = value
>= _start && value <= _endInclusive
 override fun isEmpty(): Boolean = !(_start <= _endInclusive)
 override fun equals(other: Any?): Boolean {
 return other is ClosedFloatRange && (isEmpty() &&
other.isEmpty() ||
_start == other._start && _endInclusive == other._endInclusive)
 }
 override
fun hashCode(): Int {
 return if (isEmpty()) -1 else 31 * _start.hashCode() + _endInclusive.hashCode()
 }
 override fun toString(): String = "$_start..$_endInclusive"
}

@sample samples.ranges.Ranges.rangeFromFloat
@SinceKotlin("1.1")
public operator fun
Float.rangeTo(that: Float): ClosedFloatingPointRange<Float> = ClosedFloatRange(this, that)
Returns
`true` if this iterable range contains the specified [element].
Always returns `false` if the [element] is `null`.
@SinceKotlin("1.3")
@kotlin.internal.InlineOnly
public inline operator fun <T, R> R.contains(element: T?):
Boolean where T : Any, R : Iterable<T>, R : ClosedRange<T> =
element != null &&
contains(element)
internal fun checkStepIsPositive(isPositive: Boolean, step: Number) {
 if (!isPositive)
throw IllegalArgumentException("Step must be positive, was: $step.")
}
/*
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Apache 2.0 license that can be found in the license/LICENSE.txt file.
*/
@file:kotlin.jvm.JvmName("KClasses")
@file:Suppress("UNCHECKED_CAST")
package
kotlin.reflect
import kotlin.internal.LowPriorityInOverloadResolution
/*
Casts the given [value] to the
class represented by this [KClass] object.
Throws an exception if the value is `null` or if it is not an instance of
this class.
This is an experimental function that behaves as a similar function from
kotlin.reflect.full on
JVM.
@see [KClass.isInstance]
@see [KClass.safeCast]
*/
@SinceKotlin("1.4")
@WasExperimental(ExperimentalStdlibApi::class)
@LowPriorityInOverloadResoluti
on
fun <T : Any> KClass<T>.cast(value: Any?): T {
 if (!isInstance(value)) throw ClassCastException("Value
cannot be cast to $qualifiedOrSimpleName")
 return value as T
}
// TODO: replace with qualifiedName
when it is fully supported in K/JS
internal expect val KClass<*>.qualifiedOrSimpleName: String?
/*
Casts
the given [value] to the class represented by this [KClass] object.
Returns `null` if the value is `null` or if it is not
an instance of this class.
This is an experimental function that behaves as a similar function from
kotlin.reflect.full on JVM.
@see [KClass.isInstance]
@see [KClass.cast]
*/
@SinceKotlin("1.4")
@WasExperimental(ExperimentalStdlibApi::class)
@LowPriorityInOverloadResoluti
on
fun <T : Any> KClass<T>.safeCast(value: Any?): T? {
 return if (isInstance(value)) value as T else
null
}
/*
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this source code is governed by the Apache 2.0 license that can be found in the
license/LICENSE.txt file.
*/
package kotlin.reflect
import kotlin.jvm.JvmField
import kotlin.jvm.JvmStatic
/*
Represents
a type projection. Type projection is usually the argument to another type in a
type usage.
For example, in the
type `Array<out Number>`, `out Number` is the covariant projection of the type
represented by the class
`Number`.
Type projection is either the star projection, or an entity consisting of a
specific type plus optional
variance.
See the [Kotlin language documentation](https://kotlinlang.org/docs/reference/generics.html#type-
projections)
for more information.
*/
@SinceKotlin("1.1")
public data class KTypeProjection
constructor(
 /*
 * The use-site variance specified in the projection, or `null` if this is a
star projection.
 */

```

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*/\n public val variance: KVariance?,\n /**\n * The type specified in the projection, or `null` if this is a star
projection.\n */\n public val type: KType?()\n {\n\n init {\n require((variance == null) == (type == null))
{\n if (variance == null)\n \"Star projection must have no type specified.\"\n else\n
\"The projection variance $variance requires type to be specified.\"\n }\n }\n\n override fun toString():
String = when (variance) {\n null -> \"*\n KVariance.INVARIANT -> type.toString()\n
KVariance.IN -> \"in $type\"\n KVariance.OUT -> \"out $type\"\n }\n\n public companion object {\n //
provided for compiler access\n @JvmField\n @PublishedApi\n internal val star: KTypeProjection =
KTypeProjection(null, null)\n /**\n * Star projection, denoted by the `*` character.\n * For example,
in the type `KClass<*>`, `*` is the star projection.\n * See the [Kotlin language
documentation](https://kotlinlang.org/docs/reference/generics.html#star-projections)\n * for more
information.\n */\n public val STAR: KTypeProjection get() = star\n\n /**\n * Creates an
invariant projection of a given type. Invariant projection is just the type itself,\n * without any use-site variance
modifiers applied to it.\n * For example, in the type `Set<String>`, `String` is an invariant projection of the type
represented by the class `String`.\n */\n @JvmStatic\n public fun invariant(type: KType):
KTypeProjection =\n KTypeProjection(KVariance.INVARIANT, type)\n\n /**\n * Creates a
contravariant projection of a given type, denoted by the `in` modifier applied to a type.\n * For example, in the
type `MutableList<in Number>`, `in Number` is a contravariant projection of the type of class `Number`.\n */\n
\n @JvmStatic\n public fun contravariant(type: KType): KTypeProjection =\n
KTypeProjection(KVariance.IN, type)\n\n /**\n * Creates a covariant projection of a given type, denoted
by the `out` modifier applied to a type.\n * For example, in the type `Array<out Number>`, `out Number` is a
covariant projection of the type of class `Number`.\n */\n @JvmStatic\n public fun covariant(type:
KType): KTypeProjection =\n KTypeProjection(KVariance.OUT, type)\n }\n\n }","/*\n * Copyright 2010-
2019 JetBrains s.r.o. and Kotlin Programming Language contributors.\n * Use of this source code is governed by the
Apache 2.0 license that can be found in the license/LICENSE.txt file.\n */\n\npackage kotlin.reflect\n\n/**\n *
Represents variance applied to a type parameter on the declaration site (*declaration-site variance*),\n * or to a type
in a projection (*use-site variance*).\n */\n * See the [Kotlin language
documentation](https://kotlinlang.org/docs/reference/generics.html#variance)\n * for more information.\n */\n *
@see [KTypeParameter.variance]\n * @see [KTypeProjection]\n */\n @SinceKotlin("1.1")\nenum class KVariance
{\n /**\n * The affected type parameter or type is *invariant*, which means it has no variance applied to it.\n
*/\n INVARIANT,\n\n /**\n * The affected type parameter or type is *contravariant*. Denoted by the `in`
modifier in the source code.\n */\n IN,\n\n /**\n * The affected type parameter or type is *covariant*.
Denoted by the `out` modifier in the source code.\n */\n OUT,\n\n }","/*\n * Copyright 2010-2019 JetBrains s.r.o.
and Kotlin Programming Language contributors.\n * Use of this source code is governed by the Apache 2.0 license
that can be found in the license/LICENSE.txt file.\n */\n\npackage kotlin.reflect\n\n/**\n * Returns a runtime
representation of the given reified type [T] as an instance of [KType].\n */\n * Note that on JVM, the created type has
no annotations ([KType.annotations] returns an empty list)\n * even if the type in the source code is annotated.
Support for type annotations might be added in a future version.\n
*/\n @SinceKotlin("1.6")\n @WasExperimental(ExperimentalStdlibApi::class)\n public inline fun <reified T>
typeOf(): KType =\n throw UnsupportedOperationException("This function is implemented as an intrinsic on all
supported platforms.")\n }","/*\n * Copyright 2010-2019 JetBrains s.r.o. and Kotlin Programming Language
contributors.\n * Use of this source code is governed by the Apache 2.0 license that can be found in the
license/LICENSE.txt file.\n
*/\n\n@file:kotlin.jvm.JvmMultifileClass\n@file:kotlin.jvm.JvmName("StringsKt")\n\npackage
kotlin.text\n\n/**\n * An object to which char sequences and values can be appended.\n */\n\nexpect interface
Appendable {\n /**\n * Appends the specified character [value] to this Appendable and returns this instance.\n
*/\n * @param value the character to append.\n */\n fun append(value: Char): Appendable\n\n /**\n *
Appends the specified character sequence [value] to this Appendable and returns this instance.\n */\n * @param
value the character sequence to append. If [value] is `null`, then the four characters `\"null\"` are appended to this

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Appendable.\n * \n fun append(value: CharSequence?): Appendable\n\n /**\n * Appends a subsequence of
the specified character sequence [value] to this Appendable and returns this instance.\n * \n * @param value the
character sequence from which a subsequence is appended. If [value] is `null`,\n * then characters are appended
as if [value] contained the four characters `"\n\n\n\n".\n * @param startIndex the beginning (inclusive) of the
subsequence to append.\n * @param endIndex the end (exclusive) of the subsequence to append.\n * \n *
@throws IndexOutOfBoundsException or [IllegalArgumentException] when [startIndex] or [endIndex] is out of
range of the [value] character sequence indices or when `startIndex > endIndex`. \n * \n fun append(value:
CharSequence?, startIndex: Int, endIndex: Int): Appendable\n}\n\n/**\n * Appends a subsequence of the specified
character sequence [value] to this Appendable and returns this instance.\n * \n * @param value the character
sequence from which a subsequence is appended.\n * @param startIndex the beginning (inclusive) of the
subsequence to append.\n * @param endIndex the end (exclusive) of the subsequence to append.\n * \n * @throws
IndexOutOfBoundsException or [IllegalArgumentException] when [startIndex] or [endIndex] is out of range of the
[value] character sequence indices or when `startIndex > endIndex`. \n
*\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\npublic fun <T : Appendable>
T.appendRange(value: CharSequence, startIndex: Int, endIndex: Int): T {\n
@Suppress("UNCHECKED_CAST")\n return append(value, startIndex, endIndex) as T\n}\n\n/**\n * Appends
all arguments to the given [Appendable].\n * \n public fun <T : Appendable> T.append(vararg value:
CharSequence?): T {\n for (item in value)\n append(item)\n return this\n}\n\n/**\n * Appends a line feed
character (`\n`) to this Appendable. *\n@SinceKotlin("1.4")\n@kotlin.internal.InlineOnly\npublic inline fun
Appendable.appendLine(): Appendable = append("\n")\n\n/**\n * Appends value to the given Appendable and a line
feed character (`\n`) after it. *\n@SinceKotlin("1.4")\n@kotlin.internal.InlineOnly\npublic inline fun
Appendable.appendLine(value: CharSequence?): Appendable = append(value).appendLine()\n\n/**\n * Appends value
to the given Appendable and a line feed character (`\n`) after it. *\n@SinceKotlin("1.4")\n@kotlin.internal.InlineOnly\npublic inline fun Appendable.appendLine(value: Char):
Appendable = append(value).appendLine()\n\n\ninternal fun <T> Appendable.appendElement(element: T,
transform: ((T) -> CharSequence)?) {\n when {\n transform != null -> append(transform(element))\n
element is CharSequence? -> append(element)\n element is Char -> append(element)\n else ->
append(element.toString())\n }\n}\n\n"/*\n * Copyright 2010-2018 JetBrains s.r.o. and Kotlin Programming
Language contributors.\n * Use of this source code is governed by the Apache 2.0 license that can be found in the
license/LICENSE.txt file.\n
*\n\n@file:kotlin.jvm.JvmMultifileClass\n@file:kotlin.jvm.JvmName("StringsKt")\n\npackage
kotlin.text\n\n/**\n * Trims leading whitespace characters followed by [marginPrefix] from every line of a source
string and removes\n * the first and the last lines if they are blank (notice difference blank vs empty).\n * \n * Doesn't
affect a line if it doesn't contain [marginPrefix] except the first and the last blank lines.\n * \n * Doesn't preserve the
original line endings.\n * \n * @param marginPrefix non-blank string, which is used as a margin delimiter. Default is
`|` (pipe character).\n * \n * @sample samples.text.Strings.trimMargin\n * @see trimIndent\n * @see
kotlin.text.isWhitespace\n * \n public fun String.trimMargin(marginPrefix: String = "|"): String =\n
replaceIndentByMargin("|", marginPrefix)\n}\n\n/**\n * Detects indent by [marginPrefix] as it does [trimMargin] and
replace it with [newIndent].\n * \n * @param marginPrefix non-blank string, which is used as a margin delimiter.
Default is `|` (pipe character).\n * \n public fun String.replaceIndentByMargin(newIndent: String = "|",
marginPrefix: String = "|"): String {\n require(marginPrefix.isNotBlank()) { "marginPrefix must be non-blank
string." }\n val lines = lines()\n\n return lines.reindent(length + newIndent.length * lines.size,
getIndentFunction(newIndent), { line ->\n val firstNonWhitespaceIndex = line.indexOfFirst { !it.isWhitespace()
}\n\n when {\n firstNonWhitespaceIndex == -1 -> null\n line.startsWith(marginPrefix,
firstNonWhitespaceIndex) -> line.substring(firstNonWhitespaceIndex + marginPrefix.length)\n else -> null\n
}\n })\n}\n}\n\n/**\n * Detects a common minimal indent of all the input lines, removes it from every line and
also removes the first and the last\n * lines if they are blank (notice difference blank vs empty).\n * \n * Note that
blank lines do not affect the detected indent level.\n * \n * In case if there are non-blank lines with no leading

```

```

whitespace characters (no indent at all) then the\n * common indent is 0, and therefore this function doesn't change
the indentation.\n * \n * Doesn't preserve the original line endings.\n * \n * @sample
samples.text.Strings.trimIndent\n * @see trimMargin\n * @see kotlin.text.isBlank\n * \npublic fun
String.trimIndent(): String = replaceIndent("\\")\n\n/**\n * Detects a common minimal indent like it does
[trimIndent] and replaces it with the specified [newIndent].\n * \npublic fun String.replaceIndent(newIndent: String
= "\\"): String {\n val lines = lines()\n val minCommonIndent = lines\n .filter(String::isNotBlank)\n
.map(String::indentWidth)\n .minOrNull() ?: 0\n return lines.reindent(length + newIndent.length *
lines.size, getIndentFunction(newIndent), { line -> line.drop(minCommonIndent) })\n}\n\n/**\n * Prepends [indent]
to every line of the original string.\n * \n * Doesn't preserve the original line endings.\n * \npublic fun
String.prependIndent(indent: String = "\n\n"): String =\n lineSequence()\n .map {\n when {\n
it.isBlank() -> {\n when {\n it.length < indent.length -> indent\n else -> it\n
 }\n }\n else -> indent + it\n }\n .joinToString("\\n")\nprivate fun
String.indentWidth(): Int = indexOfFirst { !it.isWhitespace() }.let { if (it == -1) length else it }\nprivate fun
getIndentFunction(indent: String) = when {\n indent.isEmpty() -> { line: String -> line }\n else -> { line: String -
> indent + line }\n}\nprivate inline fun List<String>.reindent(\n resultSizeEstimate: Int,\n indentAddFunction:
(String) -> String,\n indentCutFunction: (String) -> String?): String {\n val lastIndex = lastIndex\n return
mapIndexedNotNull { index, value ->\n if ((index == 0 || index == lastIndex) && value.isBlank())\n null\n else\n indentCutFunction(value)?.let(indentAddFunction)?: value\n }\n
.joinTo(StringBuilder(resultSizeEstimate), "\\n")\n .toString()\n}\n\n",/*\n * Copyright 2010-2018 JetBrains
s.r.o. and Kotlin Programming Language contributors.\n * Use of this source code is governed by the Apache 2.0
license that can be found in the license/LICENSE.txt file.\n * \npackage kotlin.text\n\n/**\n * Defines names for
Unicode symbols used in proper Typography.\n * \npublic object Typography {\n /** The character "
\u2013 quotation mark *\n public const val quote: Char = "\u0022"\n /** The character $ \u2013 dollar
sign *\n public const val dollar: Char = "\u0024"\n /** The character & \u2013 ampersand *\n public
const val amp: Char = "\u0026"\n /** The character < \u2013 less-than sign *\n public const val less:
Char = "\u003C"\n /** The character > \u2013 greater-than sign *\n public const val greater: Char =
"\u003E"\n /** The non-breaking space character *\n public const val nbsp: Char = "\u00A0"\n /** The
character × *\n public const val times: Char = "\u00D7"\n /** The character ¢ *\n public const
val cent: Char = "\u00A2"\n /** The character £ *\n public const val pound: Char = "\u00A3"\n /** The
character § *\n public const val section: Char = "\u00A7"\n /** The character © *\n public const
val copyright: Char = "\u00A9"\n /** The character « *\n @SinceKotlin("1.6")\n public const val
leftGuillemet: Char = "\u00AB"\n /** The character » *\n @SinceKotlin("1.6")\n public const val
rightGuillemet: Char = "\u00BB"\n /** The character ® *\n public const val registered: Char =
"\u00AE"\n /** The character ° *\n public const val degree: Char = "\u00B0"\n /** The character
± *\n public const val plusMinus: Char = "\u00B1"\n /** The character ¶ *\n public const val
paragraph: Char = "\u00B6"\n /** The character · *\n public const val middleDot: Char = "\u00B7"\n
/** The character ½ *\n public const val half: Char = "\u00BD"\n /** The character – *\n
public const val ndash: Char = "\u2013"\n /** The character — *\n public const val mdash: Char =
"\u2014"\n /** The character ‘ *\n public const val leftSingleQuote: Char = "\u2018"\n /** The
character ’ *\n public const val rightSingleQuote: Char = "\u2019"\n /** The character ‚ *\n
public const val lowSingleQuote: Char = "\u201A"\n /** The character “ *\n public const val
leftDoubleQuote: Char = "\u201C"\n /** The character ” *\n public const val rightDoubleQuote: Char
= "\u201D"\n /** The character „ *\n public const val lowDoubleQuote: Char = "\u201E"\n /** The
character † *\n public const val dagger: Char = "\u2020"\n /** The character ‡ *\n public
const val doubleDagger: Char = "\u2021"\n /** The character • *\n public const val bullet: Char =
"\u2022"\n /** The character … *\n public const val ellipsis: Char = "\u2026"\n /** The character
′ *\n public const val prime: Char = "\u2032"\n /** The character ″ *\n public const val
doublePrime: Char = "\u2033"\n /** The character € *\n public const val euro: Char = "\u20AC"

```

```

/** The character ™ */ public const val tm: Char = "\u2122" /** The character ≈ */
public const val almostEqual: Char = "\u2248" /** The character ≠ */ public const val notEqual:
Char = "\u2260" /** The character ≤ */ public const val lessOrEqual: Char = "\u2264" /** The
character ≥ */ public const val greaterOrEqual: Char = "\u2265" /** The character « */
@Deprecated("This constant has a typo in the name. Use leftGuillemet instead.")
ReplaceWith("Typography.leftGuillemet()") @DeprecatedSinceKotlin("1.6") public const val
leftGuillemete: Char = "\u00AB" /** The character » */ @Deprecated("This constant has a typo in
the name. Use rightGuillemet instead.") ReplaceWith("Typography.rightGuillemet()")
@DeprecatedSinceKotlin("1.6") public const val rightGuillemete: Char = "\u00BB" */ * Copyright
2010-2018 JetBrains s.r.o. and Kotlin Programming Language contributors. Use of this source code is governed
by the Apache 2.0 license that can be found in the license/LICENSE.txt file. */ package kotlin.text /**
Represents a collection of captured groups in a single match of a regular expression. * This collection has size
of `groupCount + 1` where `groupCount` is the count of groups in the regular expression. * Groups are indexed
from 1 to `groupCount` and group with the index 0 corresponds to the entire match. * An element of the
collection at the particular index can be `null` if the corresponding group in the regular expression is optional
and there was no match captured by that group. */ public interface MatchGroupCollection :
Collection<MatchGroup?> { /** Returns a group with the specified [index]. * @return An instance
of [MatchGroup] if the group with the specified [index] was matched or `null` otherwise. * Groups are
indexed from 1 to the count of groups in the regular expression. A group with the index 0 corresponds to the
entire match. */ public operator fun get(index: Int): MatchGroup? } /** Extends
[MatchGroupCollection] by introducing a way to get matched groups by name, when regex supports it. */
@SinceKotlin("1.1") public interface MatchNamedGroupCollection : MatchGroupCollection { /**
Returns a named group with the specified [name]. * @return An instance of [MatchGroup] if the group with the
specified [name] was matched or `null` otherwise. * @throws IllegalArgumentException if there is no group
with the specified [name] defined in the regex pattern. * @throws UnsupportedOperationException if getting
named groups isn't supported on the current platform. */ public operator fun get(name: String):
MatchGroup? } /** Represents the results from a single regular expression match. */ public interface
MatchResult { /** The range of indices in the original string where match was captured. */ public val range:
IntRange /** The substring from the input string captured by this match. */ public val value: String /**
A collection of groups matched by the regular expression. * This collection has size of `groupCount +
1` where `groupCount` is the count of groups in the regular expression. * Groups are indexed from 1 to
`groupCount` and group with the index 0 corresponds to the entire match. */ public val groups:
MatchGroupCollection /** A list of matched indexed group values. * This list has size of
`groupCount + 1` where `groupCount` is the count of groups in the regular expression. * Groups are indexed
from 1 to `groupCount` and group with the index 0 corresponds to the entire match. * If the group in the
regular expression is optional and there were no match captured by that group, corresponding item in
[groupValues] is an empty string. * @sample
samples.text.Regexp.matchDestructuringToGroupValues */ public val groupValues: List<String> /**
An instance of [MatchResult.Destructured] wrapper providing components for destructuring assignment
of group values. * component1 corresponds to the value of the first group, component2 of the
second, and so on. * @sample samples.text.Regexp.matchDestructuringToGroupValues */
public val destructured: Destructured get() = Destructured(this) /** Returns a new [MatchResult] with the
results for the next match, starting at the position * at which the last match ended (at the character after the last
matched character). */ public fun next(): MatchResult? /** Provides components for
destructuring assignment of group values. * [component1] corresponds to the value of the first group,
[component2] of the second, and so on. * If the group in the regular expression is optional and
there were no match captured by that group, corresponding component value is an empty string. *
@sample samples.text.Regexp.matchDestructuringToGroupValues */ public class Destructured internal

```



```

DurationUnit.SECONDS\n else -> throw IllegalArgumentException("\Invalid duration ISO time unit:
$isoChar")\n }\n }\n }", "/*\n * Copyright 2010-2019 JetBrains s.r.o. and Kotlin Programming
Language contributors.\n * Use of this source code is governed by the Apache 2.0 license that can be found in the
license/LICENSE.txt file.\n */\n\npackage kotlin.time\n\nimport kotlin.annotation.AnnotationTarget.*\n\n/**\n * This annotation marks the experimental preview of the standard library API for measuring time and working with
durations.\n */\n * > Note that this API is in a preview state and has a very high chance of being changed in the
future.\n * Do not use it if you develop a library since your library will become binary incompatible\n * with the
future versions of the standard library.\n */\n * Any usage of a declaration annotated with `@ExperimentalTime`
must be accepted either by\n * annotating that usage with the [OptIn] annotation, e.g.
`@OptIn(ExperimentalTime::class)`,\n * or by using the compiler argument `-opt-
in=kotlin.time.ExperimentalTime`. \n */\n\n@RequiresOptIn(level =
RequiresOptIn.Level.ERROR)\n@MustBeDocumented\n@Retention(AnnotationRetention.BINARY)\n@Target(\n
CLASS,\n ANNOTATION_CLASS,\n PROPERTY,\n FIELD,\n LOCAL_VARIABLE,\n
VALUE_PARAMETER,\n CONSTRUCTOR,\n FUNCTION,\n PROPERTY_GETTER,\n
PROPERTY_SETTER,\n TYPEALIAS)\n\n@SinceKotlin("1.3")\n\npublic annotation class
ExperimentalTime\n", "/*\n * Copyright 2010-2020 JetBrains s.r.o. and Kotlin Programming Language
contributors.\n * Use of this source code is governed by the Apache 2.0 license that can be found in the
license/LICENSE.txt file.\n */\n\npackage kotlin.time\n\n/**\n * A source of time for measuring time intervals.\n
*/\n * The only operation provided by the time source is [markNow]. It returns a [TimeMark], which can be used to
query the elapsed time later.\n */\n * @see [measureTime]\n * @see [measureTimedValue]\n
*/\n\n@SinceKotlin("1.3")\n\n@ExperimentalTime\n\npublic interface TimeSource {\n /**\n * Marks a point in
time on this time source.\n */\n * The returned [TimeMark] instance encapsulates the captured time point and
allows querying\n * the duration of time interval [elapsed][TimeMark.elapsedNow] from that point.\n */\n *
public fun markNow(): TimeMark\n\n /**\n * The most precise time source available in the platform.\n */\n *
This time source returns its readings from a source of monotonic time when it is available in a target platform,\n *
and resorts to a non-monotonic time source otherwise.\n */\n * public object Monotonic : TimeSource by
MonotonicTimeSource {\n override fun toString(): String = MonotonicTimeSource.toString()\n }\n\n public
companion object {\n }\n\n /**\n * Represents a time point notched on a particular [TimeSource].
Remains bound to the time source it was taken from\n * and allows querying for the duration of time elapsed from
that point (see the function [elapsedNow]).\n */\n * @SinceKotlin("1.3")\n * @ExperimentalTime\n * public
abstract class TimeMark {\n /**\n * Returns the amount of time passed from this mark measured with the
time source from
which this mark was taken.\n */\n * Note that the value returned by this function can change on
subsequent
invocations.\n */\n * public abstract fun elapsedNow(): Duration\n\n /**\n * Returns a
time mark on the same
time source that is ahead of this time mark by the specified [duration].\n */\n * The returned time
mark is more
late when the [duration] is positive, and more _early_ when the [duration] is negative.\n */\n *
public open
operator fun plus(duration: Duration): TimeMark = AdjustedTimeMark(this, duration)\n\n /**\n * Returns a
time mark on the same
time source that is behind this time mark by the specified [duration].\n */\n * The
returned time mark is
more _early_ when the [duration] is positive, and more _late_ when the [duration] is
negative.\n */\n * public open
operator fun minus(duration: Duration): TimeMark = plus(-duration)\n\n /**\n * Returns true if
this time mark has passed according to the time source from which this mark was taken.\n */\n *
Note that the value returned by this function can change on subsequent invocations.\n * If the time source
is
monotonic, it can change only from `false` to `true`, namely, when the time mark becomes behind the current point
of the
time source.\n */\n * public fun hasPassedNow(): Boolean = !elapsedNow().isNegative()\n\n /**\n
 * Returns false if this time mark has not passed according to the time source from which this mark was
taken.\n */\n * Note that the value returned by this function can change on subsequent invocations.\n
 * If the time source is
monotonic, it can change only from `true` to `false`, namely, when the time mark becomes behind the current point
of the
time source.\n */\n * public fun hasNotPassedNow(): Boolean =
elapsedNow().isNegative()\n }\n\n\n@ExperimentalTime\n@SinceKotlin("1.3")\n@kotlin.internal.InlineOnly\n@

```

```

Deprecated(\n \ "Subtracting one TimeMark from another is not a well defined operation because these time marks
could have been obtained from the different time sources.\",\n level =
DeprecationLevel.ERROR\n)\n\n@Suppress("UNUSED_PARAMETER")\npublic inline operator fun
TimeMark.minus(other: TimeMark): Duration = throw Error("Operation is
disallowed.\")\n\n@ExperimentalTime\n@SinceKotlin("1.3")\n@kotlin.internal.InlineOnly\n@Deprecated(\n
"Comparing one TimeMark to another is not a well defined operation because these time marks could have been
obtained from the different time sources.\",\n level =
DeprecationLevel.ERROR\n)\n\n@Suppress("UNUSED_PARAMETER")\npublic inline operator fun
TimeMark.compareTo(other: TimeMark): Int = throw Error("Operation is
disallowed.\")\n\n\n@ExperimentalTime\nprivate class AdjustedTimeMark(val mark: TimeMark, val adjustment:
Duration) : TimeMark() {\n override fun elapsedNow(): Duration = mark.elapsedNow() - adjustment\n\n
override fun plus(duration: Duration): TimeMark = AdjustedTimeMark(mark, adjustment + duration)\n}\n"/*\n *
Copyright 2010-2021 JetBrains s.r.o. and Kotlin Programming Language contributors.\n * Use of this source code is
governed by the Apache 2.0 license that can be found in the license/LICENSE.txt file.\n */\n\npackage
kotlin.time\n\n@SinceKotlin("1.3")\n@ExperimentalTime\ninternal expect object MonotonicTimeSource :
TimeSource\n\n/**\n * An abstract class used to implement time sources that return their readings as [Long] values
in the specified [unit].\n * @property unit The unit in which this time source's readings are expressed.\n
*/\n\n@SinceKotlin("1.3")\n@ExperimentalTime\npublic abstract class AbstractLongTimeSource(protected val
unit: DurationUnit) : TimeSource {\n /**\n * This protected method should be overridden to return the current
reading of the time source expressed as a [Long] number\n * in the unit specified by the [unit] property.\n
*/\n\n protected abstract fun read(): Long\n\n private class LongTimeMark(private val startedAt: Long, private val
timeSource: AbstractLongTimeSource, private val offset: Duration) : TimeMark() {\n override fun
elapsedNow(): Duration = (timeSource.read() - startedAt).toDuration(timeSource.unit) - offset\n override fun
plus(duration: Duration): TimeMark = LongTimeMark(startedAt, timeSource, offset + duration)\n }\n\n override
fun markNow(): TimeMark = LongTimeMark(read(), this, Duration.ZERO)\n}\n\n/**\n * An abstract class used to
implement time sources that return their readings as [Double] values in the specified [unit].\n * @property unit
The unit in which this time source's readings are expressed.\n
*/\n\n@SinceKotlin("1.3")\n@ExperimentalTime\npublic abstract class AbstractDoubleTimeSource(protected val
unit: DurationUnit) : TimeSource {\n /**\n * This protected method should be overridden to return the current
reading of the time source expressed as a [Double] number\n * in the unit specified by the [unit] property.\n
*/\n\n protected abstract fun read(): Double\n\n private class DoubleTimeMark(private val startedAt: Double,
private val timeSource: AbstractDoubleTimeSource, private val offset: Duration) : TimeMark() {\n override fun
elapsedNow(): Duration = (timeSource.read() - startedAt).toDuration(timeSource.unit) - offset\n override fun
plus(duration: Duration): TimeMark = DoubleTimeMark(startedAt, timeSource, offset + duration)\n }\n\n
override fun markNow(): TimeMark = DoubleTimeMark(read(), this, Duration.ZERO)\n}\n\n/**\n * A time source
that has programmatically updatable readings. It is useful as a predictable source of time in tests.\n * The current
reading value can be advanced by the specified duration amount with the operator [plusAssign]:\n * val
timeSource = TestTimeSource()\n * timeSource += 10.seconds\n * Implementation note: the current
reading value is stored as a [Long] number of nanoseconds,\n * thus it's capable to represent a time range of
approximately \u00b11292 years.\n * Should the reading value overflow as the result of [plusAssign] operation, an
[IllegalStateException] is thrown.\n */\n\n@SinceKotlin("1.3")\n@ExperimentalTime\npublic class TestTimeSource
: AbstractLongTimeSource(unit = DurationUnit.NANOSECONDS) {\n private var reading: Long = 0L\n\n
override fun read(): Long = reading\n\n /**\n * Advances the current reading value of this time source by the
specified [duration].\n * [duration] value is rounded down towards zero when converting it to a [Long]
number of nanoseconds.\n * For example, if the duration being added is `0.6.nanoseconds`, the reading doesn't
advance because\n * the duration value is rounded to zero nanoseconds.\n */\n\n * @throws
IllegalStateException when the reading value overflows as the result of this operation.\n */\n\n public operator fun
plusAssign(duration: Duration) {\n val longDelta = duration.toLong(unit)\n reading = if (longDelta !=

```

```

Long.MIN_VALUE && longDelta != Long.MAX_VALUE) {
 // when delta fits in long, add it as long
 val newReading = reading + longDelta
 if (reading xor longDelta >= 0 && reading xor newReading < 0)
 overflow(duration)
 newReading
} else {
 // when delta is greater than long, add it as double
 val newReading = reading + delta
 if (newReading > Long.MAX_VALUE || newReading < Long.MIN_VALUE)
 overflow(duration)
 newReading.toLong()
}
}
private fun overflow(duration: Duration) {
 throw IllegalStateException("TestTimeSource will overflow if its reading ${reading}ns is advanced by $duration.\n")
}
}
"/
* Copyright 2010-2020 JetBrains s.r.o. and Kotlin Programming Language contributors.
* Use of this source code is governed by the Apache 2.0 license that can be found in the license/LICENSE.txt file.
*/
package kotlin.time
import kotlin.contracts.*
/**
 * Executes the given function [block] and returns the duration of elapsed time interval.
 *
 * The elapsed time is measured with [TimeSource.Monotonic].
 */
@SinceKotlin("1.3")
@ExperimentalTime
public inline fun measureTime(block: () -> Unit): Duration {
 contract {
 callsInPlace(block, InvocationKind.EXACTLY_ONCE)
 }
 return TimeSource.Monotonic.measureTime(block)
}
"/
* Executes the given function [block] and returns the duration of elapsed time interval.
* The elapsed time is measured with the specified `this` [TimeSource] instance.
*/
@SinceKotlin("1.3")
@ExperimentalTime
public inline fun TimeSource.measureTime(block: () -> Unit): Duration {
 contract {
 callsInPlace(block, InvocationKind.EXACTLY_ONCE)
 }
 val mark = markNow()
 block()
 return mark.elapsedNow()
}
"/
* Data class representing a result of executing an action, along with the duration of elapsed time interval.
* @property value the result of the action.
* @property duration the time elapsed to execute the action.
*/
@SinceKotlin("1.3")
@ExperimentalTime
public data class TimedValue<T>(val value: T, val duration: Duration)
"/
* Executes the given function [block] and returns an instance of [TimedValue] class, containing both
* the result of the function execution and the duration of elapsed time interval.
* The elapsed time is measured with [TimeSource.Monotonic].
*/
@SinceKotlin("1.3")
@ExperimentalTime
public inline fun <T> measureTimedValue(block: () -> T): TimedValue<T> {
 contract {
 callsInPlace(block, InvocationKind.EXACTLY_ONCE)
 }
 return TimeSource.Monotonic.measureTimedValue(block)
}
"/
* Executes the given [block] and returns an instance of [TimedValue] class, containing both
* the result of function execution and the duration of elapsed time interval.
* The elapsed time is measured with the specified `this` [TimeSource] instance.
*/
@SinceKotlin("1.3")
@ExperimentalTime
public inline fun <T> TimeSource.measureTimedValue(block: () -> T): TimedValue<T> {
 contract {
 callsInPlace(block, InvocationKind.EXACTLY_ONCE)
 }
 val mark = markNow()
 val result = block()
 return TimedValue(result, mark.elapsedNow())
}
"/
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* Use of this source code is governed by the Apache 2.0 license that can be found in the license/LICENSE.txt file.
*/
package kotlin
import kotlin.coroutines.*
import kotlin.coroutines.intrinsics.*
import kotlin.native.concurrent.SharedImmutable
"/
* Defines deep recursive function that keeps its stack on the heap,
* which allows very deep recursive computations that do not use the actual call stack.
* To initiate a call to this deep recursive function use its [invoke] function.
* As a rule of thumb, it should be used if recursion goes deeper than a thousand calls.
* The [DeepRecursiveFunction] takes one parameter of type [T] and returns a result of type [R].
* The [block] of code defines the body of a recursive function. In this block
* [callRecursive][DeepRecursiveScope.callRecursive] function can be used to make a recursive call
* to the declared function. Other instances of [DeepRecursiveFunction] can be called
* in this scope with `callRecursive` extension, too.
* For example, take a look at the following recursive tree class and a deeply
* recursive instance of this tree with 100K nodes:
*/
class Tree(val left: Tree? = null, val right: Tree? = null)
val deepTree = generateSequence(Tree()) { Tree(it) }.take(100_000).last()
"/
* A regular recursive function can be defined to compute a depth of a tree:
*/
fun depth(t: Tree?): Int =
 if (t == null) 0 else
 max(depth(t.left), depth(t.right)) + 1
println(depth(deepTree)) // StackOverflowError
"/
* If this `depth` function is called for a `deepTree` it produces [StackOverflowError] because of deep recursion.
*/

```

However, the `depth` function can be rewritten using `DeepRecursiveFunction` in the following way, and then it successfully computes `[depth(deepTree)][DeepRecursiveFunction.invoke]` expression:

```

val depth =
 DeepRecursiveFunction<Tree?, Int> { t -> if (t == null) 0 else max(callRecursive(t.left),
 callRecursive(t.right)) + 1 }
println(depth(deepTree)) // Ok

```

Deep recursive functions can also mutually call each other using a heap for the stack via `[callRecursive][DeepRecursiveScope.callRecursive]` extension. For example, the following pair of mutually recursive functions computes the number of tree nodes at even depth in the tree.

```

val mutualRecursion = object {
 val even: DeepRecursiveFunction<Tree?, Int> = DeepRecursiveFunction { t -> if (t == null) 0 else
 odd.callRecursive(t.left) + odd.callRecursive(t.right) + 1 }
 val odd: DeepRecursiveFunction<Tree?, Int> = DeepRecursiveFunction { t -> if (t == null) 0 else even.callRecursive(t.left) +
 even.callRecursive(t.right) }
}

```

`@param [T] the function parameter type.`  
`@param [R] the function result type.`  
`@param block the function body.`

```

@SinceKotlin("1.4")@ExperimentalStdlibApi
public class DeepRecursiveFunction<T, R> {
 internal val block: suspend DeepRecursiveScope<T, R>.(T) -> R
}

```

Initiates a call to this deep recursive function, forming a root of the call tree. This operator should not be used from inside of `[DeepRecursiveScope]` as it uses the call stack slot for initial recursive invocation. From inside of `[DeepRecursiveScope]` use `[callRecursive][DeepRecursiveScope.callRecursive]`.

```

@SinceKotlin("1.4")@ExperimentalStdlibApi
public operator fun <T, R> DeepRecursiveFunction<T, R>.invoke(value: T): R =
 DeepRecursiveScopeImpl<T, R>(block, value).runCallLoop()

```

A scope class for `[DeepRecursiveFunction]` function declaration that defines `[callRecursive]` methods to recursively call this function or another `[DeepRecursiveFunction]` putting the call activation frame on the heap.

```

@RestrictsSuspension@SinceKotlin("1.4")@ExperimentalStdlibApi
public sealed class DeepRecursiveScope<T, R> {
 /** Makes recursive call to this [DeepRecursiveFunction] function putting the call activation frame on the heap, as opposed to the actual call stack that is used by a regular recursive call. */
 public abstract suspend fun callRecursive(value: T): R
 /** Makes call to the specified [DeepRecursiveFunction] function putting the call activation frame on the heap, as opposed to the actual call stack that is used by a regular call. */
 public abstract suspend fun <U, S> DeepRecursiveFunction<U, S>.callRecursive(value: U): S
}

```

`@Deprecated(level = DeprecationLevel.ERROR, message = "'invoke' should not be called from DeepRecursiveScope. Use 'callRecursive' to do recursion in the heap instead of the call stack.")`  
`replaceWith = ReplaceWith("this.callRecursive(value)")`

```

@Suppress("UNUSED_PARAMETER")
public operator fun DeepRecursiveFunction<*, *>.invoke(value: Any?): Nothing =
 throw UnsupportedOperationException("Should not be called from DeepRecursiveScope()")

```

Implementation

```

@ExperimentalStdlibApi
private typealias DeepRecursiveFunctionBlock = suspend DeepRecursiveScope<*, *>.(Any?) -> Any?
@SharedImmutable
private val UNDEFINED_RESULT = Result.success(COROUTINE_SUSPENDED)
@ExperimentalStdlibApi
private class DeepRecursiveScopeImpl<T, R> {
 block: suspend DeepRecursiveScope<T, R>.(T) -> R,
 value: T
}
private class DeepRecursiveScopeImpl<T, R> {
 block: suspend DeepRecursiveScope<T, R>.(T) -> R,
 value: T
}
private var function: DeepRecursiveFunctionBlock = block as DeepRecursiveFunctionBlock
private var value: Any? = value
private var cont: Continuation<Any?>? = this as Continuation<Any?>
private var result: Result<Any?> = UNDEFINED_RESULT
override val context: CoroutineContext {
 get() = EmptyCoroutineContext
}
override fun resumeWith(result: Result<R>) {
 this.cont = null
 this.result = result
}
override suspend fun callRecursive(value: T): R =
 suspendCoroutineUninterceptedOrReturn { cont -> // calling the same function that is currently active
 this.cont = cont as Continuation<Any?>
 this.value = value
 COROUTINE_SUSPENDED
 }
}

```

`<U, S> DeepRecursiveFunction<U, S>.callRecursive(value: U): S =`



```

suspendCoroutineUninterceptedOrReturn { cont ->\n // calling another recursive function\n val function =
block as DeepRecursiveFunctionBlock\n with(this@DeepRecursiveScopeImpl) {\n val currentFunction
= this.function\n if (function !== currentFunction) {\n // calling a different function -- create a
trampoline to restore function ref\n this.function = function\n this.cont =
crossFunctionCompletion(currentFunction, cont as Continuation<Any?>)\n } else {\n // calling the
same function -- direct\n this.cont = cont as Continuation<Any?>\n }\n this.value = value\n
}\n COROUTINE_SUSPENDED\n }\n\n private fun crossFunctionCompletion(\n currentFunction:
DeepRecursiveFunctionBlock,\n cont: Continuation<Any?>\n): Continuation<Any?> =
Continuation(EmptyCoroutineContext) {\n this.function = currentFunction\n // When going back from a
trampoline we cannot just call cont.resume (stack usage!)\n // We delegate the cont.resumeWith(it) call to
runCallLoop\n this.cont = cont\n this.result = it\n }\n\n @Suppress(\"UNCHECKED_CAST\")\n fun
runCallLoop(): R {\n while (true) {\n // Note: cont is set to null in DeepRecursiveScopeImpl.resumeWith
when the whole computation completes\n val result = this.result\n val cont = this.cont\n ?:
return (result as Result<R>).getOrThrow() // done -- final result\n // The order of comparison is important
here for that case of rogue class with broken equals\n if (UNDEFINED_RESULT == result) {\n //
call \"function\" with \"value\" using \"cont\" as completion\n val r = try {\n // This is
block.startCoroutine(this, value, cont)\n function.startCoroutineUninterceptedOrReturn(this, value,
cont)\n } catch (e: Throwable) {\n cont.resumeWithException(e)\n continue\n
}\n // If the function returns without suspension -- calls its continuation immediately\n if (r !==
COROUTINE_SUSPENDED)\n cont.resume(r as R)\n } else {\n // we returned from a
crossFunctionCompletion trampoline -- call resume here\n this.result = UNDEFINED_RESULT // reset
result back\n cont.resumeWith(result)\n }\n }\n }\n}\n\n }*\n * Copyright 2010-2022
JetBrains s.r.o. and Kotlin Programming Language contributors.\n * Use of this source code is governed by the
Apache 2.0 license that can be found in the license/LICENSE.txt file.\n *^/\n// Auto-generated file. DO NOT
EDIT!\n\n@file:kotlin.jvm.JvmName(\"NumbersKt\")\n@file:kotlin.jvm.JvmMultifileClass\npackage
kotlin\n\nimport kotlin.math.sign\n\n/** Divides this value by the other value, flooring the result to an integer that is
closer to negative infinity. *\n@SinceKotlin(\"1.5\")\n@kotlin.internal.InlineOnly\npublic inline fun
Byte.floorDiv(other: Byte): Int = \n this.toInt().floorDiv(other.toInt())\n\n/**\n * Calculates the remainder of
flooring division of this value by the other value.\n * \n * The result is either zero or has the same sign as the
divisor and has the absolute value less than the absolute value of the divisor.\n
*\n@SinceKotlin(\"1.5\")\n@kotlin.internal.InlineOnly\npublic inline fun Byte.mod(other: Byte): Byte = \n
this.toInt().mod(other.toInt()).toByte()\n\n/** Divides this value by the other value, flooring the result to an integer
that is closer to negative infinity. *\n@SinceKotlin(\"1.5\")\n@kotlin.internal.InlineOnly\npublic inline fun
Byte.floorDiv(other: Short): Int = \n this.toInt().floorDiv(other.toInt())\n\n/**\n * Calculates the remainder of
flooring division of this value by the other value.\n * \n * The result is either zero or has the same sign as the
divisor and has the absolute value less than the absolute value of the divisor.\n
*\n@SinceKotlin(\"1.5\")\n@kotlin.internal.InlineOnly\npublic inline fun Byte.mod(other: Short): Short = \n
this.toInt().mod(other.toInt()).toShort()\n\n/** Divides this value by the other value, flooring the result to an integer
that is closer to negative infinity. *\n@SinceKotlin(\"1.5\")\n@kotlin.internal.InlineOnly\npublic inline fun
Byte.floorDiv(other: Int): Int = \n this.toInt().floorDiv(other)\n\n/**\n * Calculates the remainder of flooring
division of this value by the other value.\n * \n * The result is either zero or has the same sign as the _divisor_ and
has the absolute value less than the absolute value of the divisor.\n
*\n@SinceKotlin(\"1.5\")\n@kotlin.internal.InlineOnly\npublic inline fun Byte.mod(other: Int): Int = \n
this.toInt().mod(other)\n\n/** Divides this value by the other value, flooring the result to an integer that is closer to
negative infinity. *\n@SinceKotlin(\"1.5\")\n@kotlin.internal.InlineOnly\npublic inline fun Byte.floorDiv(other:
Long): Long = \n this.toLong().floorDiv(other)\n\n/**\n * Calculates the remainder of flooring division of this
value by the other value.\n * \n * The result is either zero or has the same sign as the _divisor_ and has the absolute
value less than the absolute value of the divisor.\n *^/\n@SinceKotlin(\"1.5\")\n@kotlin.internal.InlineOnly\npublic

```

```

inline fun Byte.mod(other: Long): Long = \n this.toLong().mod(other)\n\n/** Divides this value by the other
value, flooring the result to an integer that is closer to negative infinity.
*/\n@SinceKotlin("1.5")\n@kotlin.internal.InlineOnly\npublic inline fun Short.floorDiv(other: Byte): Int = \n
this.toInt().floorDiv(other.toInt())\n\n/**\n * Calculates the remainder of flooring division of this value by the other
value.\n * \n * The result is either zero or has the same sign as the _divisor_ and has the absolute value less than the
absolute value of the divisor.\n */\n@SinceKotlin("1.5")\n@kotlin.internal.InlineOnly\npublic inline fun
Short.mod(other: Byte): Byte = \n this.toInt().mod(other.toInt()).toByte()\n\n/** Divides this value by the other
value, flooring the result to an integer that is closer to negative infinity.
*/\n@SinceKotlin("1.5")\n@kotlin.internal.InlineOnly\npublic inline fun Short.floorDiv(other: Short): Int = \n
this.toInt().floorDiv(other.toInt())\n\n/**\n * Calculates the remainder of flooring division of this value by the other
value.\n * \n * The result is either zero or has the same sign as the _divisor_ and has the absolute value less than the
absolute value of the divisor.\n */\n@SinceKotlin("1.5")\n@kotlin.internal.InlineOnly\npublic inline fun
Short.mod(other: Short): Short = \n this.toInt().mod(other.toInt()).toShort()\n\n/** Divides this value by the other
value, flooring the result to an integer that is closer to negative infinity.
*/\n@SinceKotlin("1.5")\n@kotlin.internal.InlineOnly\npublic inline fun Short.floorDiv(other: Int): Int = \n
this.toInt().floorDiv(other)\n\n/**\n * Calculates the remainder of flooring division of this value by the other
value.\n * \n * The result is either zero or has the same sign as the _divisor_ and has the absolute value less than the
absolute value of the divisor.\n */\n@SinceKotlin("1.5")\n@kotlin.internal.InlineOnly\npublic inline fun
Short.mod(other: Int): Int = \n this.toInt().mod(other)\n\n/** Divides this value by the other value, flooring the
result to an integer that is closer to negative infinity.
*/\n@SinceKotlin("1.5")\n@kotlin.internal.InlineOnly\npublic inline fun Short.floorDiv(other: Long): Long = \n
this.toLong().floorDiv(other)\n\n/**\n * Calculates the remainder of flooring division of this value by the other
value.\n * \n * The result is either zero or has the same sign as the _divisor_ and has the absolute value less than the
absolute value of the divisor.\n */\n@SinceKotlin("1.5")\n@kotlin.internal.InlineOnly\npublic inline fun
Short.mod(other: Long): Long = \n this.toLong().mod(other)\n\n/** Divides this value by the other value, flooring
the result to an integer that is closer to negative infinity.
*/\n@SinceKotlin("1.5")\n@kotlin.internal.InlineOnly\npublic inline fun Int.floorDiv(other: Byte): Int = \n
this.floorDiv(other.toInt())\n\n/**\n * Calculates the remainder of flooring division of this value by the other
value.\n * \n * The result is either zero or has the same sign as the _divisor_ and has the absolute value less than the
absolute value of the divisor.\n */\n@SinceKotlin("1.5")\n@kotlin.internal.InlineOnly\npublic inline fun
Int.mod(other: Byte): Byte = \n this.mod(other.toInt()).toByte()\n\n/** Divides this value by the other value,
flooring the result to an integer that is closer to negative infinity.
*/\n@SinceKotlin("1.5")\n@kotlin.internal.InlineOnly\npublic inline fun Int.floorDiv(other: Short): Int = \n
this.floorDiv(other.toInt())\n\n/**\n * Calculates the remainder of flooring division of this value by the other
value.\n * \n * The result is either zero or has the same sign as the _divisor_ and has the absolute value less than the
absolute value of the divisor.\n */\n@SinceKotlin("1.5")\n@kotlin.internal.InlineOnly\npublic inline fun
Int.mod(other: Short): Short = \n this.mod(other.toInt()).toShort()\n\n/** Divides this value by the other value,
flooring the result to an integer that is closer to negative infinity.
*/\n@SinceKotlin("1.5")\n@kotlin.internal.InlineOnly\npublic inline fun Int.floorDiv(other: Int): Int {\n var q =
this / other\n if (this xor other < 0 && q * other != this) q--\n return q\n}\n\n/**\n * Calculates the remainder of
flooring division of this value by the other value.\n * \n * The result is either zero or has the same sign as the
divisor and has the absolute value less than the absolute value of the divisor.\n */\n@SinceKotlin("1.5")\n@kotlin.internal.InlineOnly\npublic inline fun Int.mod(other: Int): Int {\n val r = this
% other\n return r + (other and (((r xor other) and (r or -r)) shr 31))\n}\n\n/** Divides this value by the other value,
flooring the result to an integer that is closer to negative infinity.
*/\n@SinceKotlin("1.5")\n@kotlin.internal.InlineOnly\npublic inline fun Int.floorDiv(other: Long): Long = \n
this.toLong().floorDiv(other)\n\n/**\n * Calculates the remainder of flooring division of this value by the other
value.\n * \n * The result is either zero or has the same sign as the _divisor_ and has the absolute value less than the

```

absolute value of the divisor.  
`@SinceKotlin("1.5")@kotlin.internal.InlineOnly\npublic inline fun Int.mod(other: Long): Long = this.toLong().mod(other)`  
 Divides this value by the other value, flooring the result to an integer that is closer to negative infinity.

`@SinceKotlin("1.5")@kotlin.internal.InlineOnly\npublic inline fun Long.floorDiv(other: Byte): Long = this.floorDiv(other.toLong())`  
 Calculates the remainder of flooring division of this value by the other value. The result is either zero or has the same sign as the `_divisor_` and has the absolute value less than the absolute value of the divisor.  
`@SinceKotlin("1.5")@kotlin.internal.InlineOnly\npublic inline fun Long.mod(other: Byte): Byte = this.mod(other.toLong()).toByte()`  
 Divides this value by the other value, flooring the result to an integer that is closer to negative infinity.

`@SinceKotlin("1.5")@kotlin.internal.InlineOnly\npublic inline fun Long.floorDiv(other: Short): Long = this.floorDiv(other.toLong())`  
 Calculates the remainder of flooring division of this value by the other value. The result is either zero or has the same sign as the `_divisor_` and has the absolute value less than the absolute value of the divisor.  
`@SinceKotlin("1.5")@kotlin.internal.InlineOnly\npublic inline fun Long.mod(other: Short): Short = this.mod(other.toLong()).toShort()`  
 Divides this value by the other value, flooring the result to an integer that is closer to negative infinity.

`@SinceKotlin("1.5")@kotlin.internal.InlineOnly\npublic inline fun Long.floorDiv(other: Int): Long = this.floorDiv(other.toLong())`  
 Calculates the remainder of flooring division of this value by the other value. The result is either zero or has the same sign as the `_divisor_` and has the absolute value less than the absolute value of the divisor.  
`@SinceKotlin("1.5")@kotlin.internal.InlineOnly\npublic inline fun Long.mod(other: Int): Int = this.mod(other.toLong()).toInt()`  
 Divides this value by the other value, flooring the result to an integer that is closer to negative infinity.

`@SinceKotlin("1.5")@kotlin.internal.InlineOnly\npublic inline fun Long.floorDiv(other: Long): Long { var q = this / other if (this xor other < 0 && q * other != this) q-- return q }`  
 Calculates the remainder of flooring division of this value by the other value. The result is either zero or has the same sign as the `_divisor_` and has the absolute value less than the absolute value of the divisor.

`@SinceKotlin("1.5")@kotlin.internal.InlineOnly\npublic inline fun Long.mod(other: Long): Long { val r = this % other return r + (other and (((r xor other) and (r or -r)) shr 63)) }`  
 Calculates the remainder of flooring division of this value by the other value. The result is either zero or has the same sign as the `_divisor_` and has the absolute value less than the absolute value of the divisor. If the result cannot be represented exactly, it is rounded to the nearest representable number. In this case the absolute value of the result can be less than or `_equal to_` the absolute value of the divisor.

`@SinceKotlin("1.5")@kotlin.internal.InlineOnly\npublic inline fun Float.mod(other: Float): Float { val r = this % other return if (r != 0.0.toFloat() && r.sign != other.sign) r + other else r }`  
 Calculates the remainder of flooring division of this value by the other value. The result is either zero or has the same sign as the `_divisor_` and has the absolute value less than the absolute value of the divisor. If the result cannot be represented exactly, it is rounded to the nearest representable number. In this case the absolute value of the result can be less than or `_equal to_` the absolute value of the divisor.

`@SinceKotlin("1.5")@kotlin.internal.InlineOnly\npublic inline fun Float.mod(other: Double): Double = this.toDouble().mod(other)`  
 Calculates the remainder of flooring division of this value by the other value. The result is either zero or has the same sign as the `_divisor_` and has the absolute value less than the absolute value of the divisor. If the result cannot be represented exactly, it is rounded to the nearest representable number. In this case the absolute value of the result can be less than or `_equal to_` the absolute value of the divisor.

`@SinceKotlin("1.5")@kotlin.internal.InlineOnly\npublic inline fun Double.mod(other: Float): Double = this.mod(other.toDouble())`  
 Calculates the remainder of flooring division of this value by the other value. The result is either zero or has the same sign as the `_divisor_` and has the absolute value less than the absolute value of the divisor. If the result cannot be represented exactly, it is rounded to the nearest representable number. In this case the absolute value of the result can be less than or `_equal to_` the absolute value of the divisor.  
`@SinceKotlin("1.5")@kotlin.internal.InlineOnly\npublic inline fun Double.mod(other:`

```

Double): Double {
 val r = this % other
 return if (r != 0.0 && r.sign != other.sign) r + other else
 r
}

"/**
 * Copyright 2010-2018 JetBrains s.r.o. and Kotlin Programming Language contributors.
 * Use of this source code is governed by the Apache 2.0 license that can be found in the license/LICENSE.txt file.
 */
package kotlin.internal.InlineOnly
/**
 * Returns a hash code value for the object or
 * zero if the object is `null`.
 * @see Any.hashCode
 */
@SinceKotlin("1.3")
@InlineOnly
public inline
fun Any?.hashCode(): Int = this?.hashCode() ?: 0

"/**
 * Copyright 2010-2020 JetBrains s.r.o. and Kotlin
 * Programming Language contributors.
 * Use of this source code is governed by the Apache 2.0 license that can be
 * found in the license/LICENSE.txt file.
 */
package kotlin
/**
 * Represents a version of the Kotlin standard
 * library.
 * [major], [minor] and [patch] are integer components of a version,
 * they must be non-negative and
 * not greater than 255 ([MAX_COMPONENT_VALUE]).
 * @constructor Creates a version from all three
 * components.
 */
@SinceKotlin("1.1")
public class KotlinVersion(val major: Int, val minor: Int, val patch: Int) :
 Comparable<KotlinVersion> {
 /**
 * Creates a version from [major] and [minor] components, leaving
 * [patch] component zero.
 */
 public constructor(major: Int, minor: Int) : this(major, minor, 0)

 private val
 version = versionOf(major, minor, patch)

 private fun versionOf(major: Int, minor: Int, patch: Int): Int {
 require(major in 0..MAX_COMPONENT_VALUE && minor in 0..MAX_COMPONENT_VALUE && patch in
 0..MAX_COMPONENT_VALUE) {
 "Version components are out of range: $major.$minor.$patch"
 }
 return major.shl(16) + minor.shl(8) + patch
 }

 /**
 * Returns the string representation of this
 * version.
 */
 override fun toString(): String = "$major.$minor.$patch"

 override fun equals(other:
 Any?): Boolean {
 if (this === other) return true
 val otherVersion = (other as? KotlinVersion) ?: return
 false
 return this.version == otherVersion.version
 }

 override fun hashCode(): Int = version

 override fun compareTo(other: KotlinVersion): Int = version - other.version

 /**
 * Returns `true` if this
 * version is not less than the version specified
 * with the provided [major] and [minor] components.
 */
 public fun isAtLeast(major: Int, minor: Int): Boolean = // this.version >= versionOf(major, minor, 0)
 this.major > major || (this.major == major &&
 this.minor >= minor)

 /**
 * Returns `true` if this
 * version is not less than the version specified
 * with the provided [major], [minor] and [patch] components.
 */
 public fun isAtLeast(major: Int, minor: Int, patch: Int): Boolean = // this.version >= versionOf(major, minor,
 patch)
 this.major > major || (this.major == major &&
 (this.minor > minor || this.minor == minor
 &&
 this.patch >= patch))
}

companion object {
 /**
 * Maximum value a version
 * component can have, a constant value 255.
 */
 // NOTE: Must be placed before CURRENT because its
 // initialization requires this field being initialized in JS
 public const val MAX_COMPONENT_VALUE =
 255

 /**
 * Returns the current version of the Kotlin standard library.
 */
 @kotlin.jvm.JvmField
 public val CURRENT: KotlinVersion = KotlinVersionCurrentValue.get()
}

// this class is ignored during classpath normalization when considering whether to recompile dependencies
// in Kotlin build
private object KotlinVersionCurrentValue {
 @kotlin.jvm.JvmStatic
 fun get():
 KotlinVersion = KotlinVersion(1, 6, 21) // value is written here automatically during build
}

"/**
 * Copyright
 * 2010-2018 JetBrains s.r.o. and Kotlin Programming Language contributors.
 * Use of this source code is governed
 * by the Apache 2.0 license that can be found in the license/LICENSE.txt file.
 */
@file:kotlin.jvm.JvmName("LateinitKt")
@file:Suppress("unused")
package kotlin
import
 kotlin.internal.InlineOnly
import kotlin.internal.AccessibleLateinitPropertyLiteral
import
 kotlin.reflect.KProperty0
/**
 * Returns `true` if this lateinit property has been assigned a value, and `false`
 * otherwise.
 * Cannot be used in an inline function, to avoid binary compatibility issues.
 */
@SinceKotlin("1.2")
@InlineOnly
inline val @receiver:AccessibleLateinitPropertyLiteral
KProperty0<*>.isInitialized: Boolean
 get() = throw NotImplementedError("Implementation is
 intrinsic")

"/**
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 * Use of this source code is governed by the Apache 2.0 license that can be found in the license/LICENSE.txt file.
 */
@file:kotlin.jvm.JvmName("LazyKt")
@file:kotlin.jvm.JvmMultifileClass
package kotlin
import
 kotlin.reflect.KProperty
/**
 * Represents a value with lazy initialization.
 * To create an instance of
 * [Lazy] use the [lazy] function.
 */
public interface Lazy<out T> {
 /**
 * Gets the lazily initialized value of

```

the current Lazy instance.

```

 * Once the value was initialized it must not change during the rest of lifetime of this
 Lazy instance.
 */
 public val value: T
 /**
 * Returns `true` if a value for this Lazy instance has been
 already initialized, and `false` otherwise.
 * Once this function has returned `true` it stays `true` for the rest of
 lifetime of this Lazy instance.
 */
 public fun isInitialized(): Boolean
}

/**
 * Creates a new instance of
 the [Lazy] that is already initialized with the specified [value].
 */
public fun <T> lazyOf(value: T): Lazy<T> =
 InitializedLazyImpl(value)

/**
 * An extension to delegate a read-only property of type [T] to an instance of
 [Lazy].
 */
 * This extension allows to use instances of Lazy for property delegation:
 * `val property: String by lazy { initializer }`
 */
@kotlin.internal.InlineOnly
public inline operator fun <T> Lazy<T>.getValue(thisRef:
 Any?, property: KProperty<*>): T = value

/**
 * Specifies how a [Lazy] instance synchronizes initialization
 among multiple threads.
 */
public enum class LazyThreadSafetyMode {
 /**
 * Locks are used to ensure
 that only a single thread can initialize the [Lazy] instance.
 */
 SYNCHRONIZED,
 /**
 * Initializer
 function can be called several times on concurrent access to uninitialized [Lazy] instance value,
 * but only the
 first returned value will be used as the value of [Lazy] instance.
 */
 PUBLICATION,
 /**
 * No
 locks are used to synchronize an access to the [Lazy] instance value; if the instance is accessed from multiple
 threads, its behavior is undefined.
 */
 NONE,
}

/**
 * This mode should not be used unless the [Lazy] instance is
 guaranteed never to be initialized from more than one thread.
 */
NONE

internal object
UNINITIALIZED_VALUE
// internal to be called from lazy in JS
internal class UnsafeLazyImpl<out
 T>(initializer: () -> T) : Lazy<T>, Serializable {
 private var initializer: (() -> T)? = initializer
 private var
 _value: Any? = UNINITIALIZED_VALUE
 override val value: T
 get() {
 if (_value ===
 UNINITIALIZED_VALUE) {
 _value = initializer!!()
 initializer = null
 }
 @Suppress("UNCHECKED_CAST")
 return _value as T
 }
 override fun isInitialized():
 Boolean = _value != UNINITIALIZED_VALUE
 override fun toString(): String = if (isInitialized())
 value.toString() else "Lazy value not initialized yet."
 private fun writeReplace(): Any =
 InitializedLazyImpl(value)
}

internal class InitializedLazyImpl<out T>(override val value: T) : Lazy<T>,
 Serializable {
 override fun isInitialized(): Boolean = true
 override fun toString(): String =
 value.toString()
}

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license/LICENSE.txt file.
 */

@file:kotlin.jvm.JvmMultifileClass
@file:kotlin.jvm.JvmName("NumbersKt")
package kotlin

/**
 * Counts the number of set bits in the binary representation of this [Int] number.
 */
@SinceKotlin("1.4")
@WasExperimental(ExperimentalStdlibApi::class)
public expect fun
 Int.countOneBits(): Int

/**
 * Counts the number of consecutive most significant bits that are zero in the binary
 representation of this [Int] number.
 */
@SinceKotlin("1.4")
@WasExperimental(ExperimentalStdlibApi::class)
public expect fun
 Int.countLeadingZeroBits(): Int

/**
 * Counts the number of consecutive least significant bits that are zero in
 the binary representation of this [Int] number.
 */
@SinceKotlin("1.4")
@WasExperimental(ExperimentalStdlibApi::class)
public expect fun
 Int.countTrailingZeroBits(): Int

/**
 * Returns a number having a single bit set in the position of the most
 significant set bit of this [Int] number,
 * or zero, if this number is zero.
 */
@SinceKotlin("1.4")
@WasExperimental(ExperimentalStdlibApi::class)
public expect fun
 Int.takeHighestOneBit(): Int

/**
 * Returns a number having a single bit set in the position of the least
 significant set bit of this [Int] number,
 * or zero, if this number is zero.
 */
@SinceKotlin("1.4")
@WasExperimental(ExperimentalStdlibApi::class)
public expect fun
 Int.takeLowestOneBit(): Int

/**
 * Rotates the binary representation of this [Int] number left by the specified
 [bitCount] number of bits.
 * The most significant bits pushed out from the left side reenter the number as the least
 significant bits on the right side.
 * Rotating the number left by a negative bit count is the same as rotating it
 right by the negated bit count:
 * `number.rotateLeft(-n) == number.rotateRight(n)`
 * Rotating by a multiple
 of [Int.SIZE_BITS] (32) returns the same number, or more generally
 * `number.rotateLeft(n) ==

```

```

number.rotateLeft(n % 32)`n
*\n@SinceKotlin("1.6")\n@WasExperimental(ExperimentalStdlibApi::class)\npublic expect fun
Int.rotateLeft(bitCount: Int): Int\n\n/**\n * Rotates the binary representation of this [Int] number right by the
specified [bitCount] number of bits.\n * The least significant bits pushed out from the right side reenter the number
as the most significant bits on the left side.\n * Rotating the number right by a negative bit count is the same as
rotating it left by the negated bit count:\n * `number.rotateRight(-n) == number.rotateLeft(n)`\n * Rotating by a
multiple of [Int.SIZE_BITS] (32) returns the same number, or more generally\n * `number.rotateRight(n) ==
number.rotateRight(n % 32)`n
*\n@SinceKotlin("1.6")\n@WasExperimental(ExperimentalStdlibApi::class)\npublic expect fun
Int.rotateRight(bitCount: Int): Int\n\n/**\n * Counts the number of set bits in the binary representation of this
[Long] number.\n *@\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\npublic expect
fun Long.countOneBits(): Int\n\n/**\n * Counts the number of consecutive most significant bits that are zero in the
binary representation of this [Long] number.\n
*\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\npublic expect fun
Long.countLeadingZeroBits(): Int\n\n/**\n * Counts the number of consecutive least significant bits that are zero in
the binary representation of this [Long] number.\n
*\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\npublic expect fun
Long.countTrailingZeroBits(): Int\n\n/**\n * Returns a number having a single bit set in the position of the most
significant set bit of this [Long] number,\n * or zero, if this number is zero.\n
*\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\npublic expect fun
Long.takeHighestOneBit(): Long\n\n/**\n * Returns a number having a single bit set in the position of the least
significant set bit of this [Long] number,\n * or zero, if this number is zero.\n
*\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\npublic expect fun
Long.takeLowestOneBit(): Long\n\n/**\n * Rotates the binary representation of this [Long] number left by the
specified [bitCount] number of bits.\n * The most significant bits pushed out from the left side reenter the number as
the least significant bits on the right side.\n * Rotating the number left by a negative bit count is the same as
rotating it right by the negated bit count:\n * `number.rotateLeft(-n) == number.rotateRight(n)`\n * Rotating by a
multiple of [Long.SIZE_BITS] (64) returns the same number, or more generally\n * `number.rotateLeft(n) ==
number.rotateLeft(n % 64)`n
*\n@SinceKotlin("1.6")\n@WasExperimental(ExperimentalStdlibApi::class)\npublic expect fun
Long.rotateLeft(bitCount: Int): Long\n\n/**\n * Rotates the binary representation of this [Long] number right by the
specified [bitCount] number of bits.\n * The least significant bits pushed out from the right side reenter the number
as the most significant bits on the left side.\n * Rotating the number right by a negative bit count is the same as
rotating it left by the negated bit count:\n * `number.rotateRight(-n) == number.rotateLeft(n)`\n * Rotating by a
multiple of [Long.SIZE_BITS] (64) returns the same number, or more generally\n * `number.rotateRight(n) ==
number.rotateRight(n % 64)`n
*\n@SinceKotlin("1.6")\n@WasExperimental(ExperimentalStdlibApi::class)\npublic expect fun
Long.rotateRight(bitCount: Int): Long\n\n/**\n * Counts the number of set bits in the binary representation of this
[Byte] number.\n
*\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\n@kotlin.internal.InlineOnly\npubli
c inline fun Byte.countOneBits(): Int = (toInt() and 0xFF).countOneBits()\n\n/**\n * Counts the number of
consecutive most significant bits that are zero in the binary representation of this [Byte] number.\n
*\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\n@kotlin.internal.InlineOnly\npubli
c inline fun Byte.countLeadingZeroBits(): Int = (toInt() and 0xFF).countLeadingZeroBits() - (Int.SIZE_BITS -
Byte.SIZE_BITS)\n\n/**\n * Counts the number of consecutive least significant bits that are zero in the binary
representation of this [Byte] number.\n
*\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\n@kotlin.internal.InlineOnly\npubli
c inline fun Byte.countTrailingZeroBits(): Int = (toInt() or 0x100).countTrailingZeroBits()\n\n/**\n * Returns a

```

number having a single bit set in the position of the most significant set bit of this [Byte] number, \n \* or zero, if this number is zero.\n

```
*\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\n@kotlin.internal.InlineOnly\npublic inline fun Byte.takeHighestOneBit(): Byte = (toInt() and 0xFF).takeHighestOneBit().toByte()\n\n/**\n * Returns a number having a single bit set in the position of the least significant set bit of this [Byte] number,\n * or zero, if this number is zero.\n
```

```
*\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\n@kotlin.internal.InlineOnly\npublic inline fun Byte.takeLowestOneBit(): Byte = toInt().takeLowestOneBit().toByte()\n\n/**\n * Rotates the binary representation of this [Byte] number left by the specified [bitCount] number of bits.\n * The most significant bits pushed out from the left side reenter the number as the least significant bits on the right side.\n * Rotating the number left by a negative bit count is the same as rotating it right by the negated bit count:\n * `number.rotateLeft(-n) == number.rotateRight(n)`\n * Rotating by a multiple of [Byte.SIZE_BITS] (8) returns the same number, or more generally\n * `number.rotateLeft(n) == number.rotateLeft(n % 8)`\n
```

```
*\n@SinceKotlin("1.6")\n@WasExperimental(ExperimentalStdlibApi::class)\npublic fun Byte.rotateLeft(bitCount: Int): Byte =\n (toInt().shl(bitCount and 7) or (toInt() and 0xFF).ushr(8 - (bitCount and 7))).toByte()\n\n/**\n * Rotates the binary representation of this [Byte] number right by the specified [bitCount] number of bits.\n * The least significant bits pushed out from the right side reenter the number as the most significant bits on the left side.\n * Rotating the number right by a negative bit count is the same as rotating it left by the negated bit count:\n * `number.rotateRight(-n) == number.rotateLeft(n)`\n * Rotating by a multiple of [Byte.SIZE_BITS] (8) returns the same number, or more generally\n * `number.rotateRight(n) == number.rotateRight(n % 8)`\n
```

```
*\n@SinceKotlin("1.6")\n@WasExperimental(ExperimentalStdlibApi::class)\npublic fun Byte.rotateRight(bitCount: Int): Byte =\n (toInt().shl(8 - (bitCount and 7)) or (toInt() and 0xFF).ushr(bitCount and 7)).toByte()\n\n/**\n * Counts the number of set bits in the binary representation of this [Short] number.\n
```

```
*\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\n@kotlin.internal.InlineOnly\npublic inline fun Short.countOneBits(): Int = (toInt() and 0xFFFF).countOneBits()\n\n/**\n * Counts the number of consecutive most significant bits that are zero in the binary representation of this [Short] number.\n
```

```
*\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\n@kotlin.internal.InlineOnly\npublic inline fun Short.countLeadingZeroBits(): Int =\n (toInt() and 0xFFFF).countLeadingZeroBits() - (Int.SIZE_BITS - Short.SIZE_BITS)\n\n/**\n * Counts the number of consecutive least significant bits that are zero in the binary representation of this [Short] number.\n
```

```
*\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\n@kotlin.internal.InlineOnly\npublic inline fun Short.countTrailingZeroBits(): Int = (toInt() or 0x10000).countTrailingZeroBits()\n\n/**\n * Returns a number having a single bit set in the position of the most significant set bit of this [Short] number,\n * or zero, if this number is zero.\n
```

```
*\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\n@kotlin.internal.InlineOnly\npublic inline fun Short.takeHighestOneBit(): Short = (toInt() and 0xFFFF).takeHighestOneBit().toShort()\n\n/**\n * Returns a number having a single bit set in the position of the least significant set bit of this [Short] number,\n * or zero, if this number is zero.\n
```

```
*\n@SinceKotlin("1.4")\n@WasExperimental(ExperimentalStdlibApi::class)\n@kotlin.internal.InlineOnly\npublic inline fun Short.takeLowestOneBit(): Short = toInt().takeLowestOneBit().toShort()\n\n/**\n * Rotates the binary representation of this [Short] number left by the specified [bitCount] number of bits.\n * The most significant bits pushed out from the left side reenter the number as the least significant bits on the right side.\n * Rotating the number left by a negative bit count is the same as rotating it right by the negated bit count:\n * `number.rotateLeft(-n) == number.rotateRight(n)`\n * Rotating by a multiple of [Short.SIZE_BITS] (16) returns the same number, or more generally\n * `number.rotateLeft(n) == number.rotateLeft(n % 16)`\n
```

```
*\n@SinceKotlin("1.6")\n@WasExperimental(ExperimentalStdlibApi::class)\npublic fun Short.rotateLeft(bitCount: Int): Short =\n (toInt().shl(bitCount and 15) or (toInt() and 0xFFFF).ushr(16 - (bitCount
```

and 15)).toShort()\n\n\*\*\n \* Rotates the binary representation of this [Short] number right by the specified [bitCount] number of bits.\n \* The least significant bits pushed out from the right side reenter the number as the most significant bits on the left side.\n \*\n \* Rotating the number right by a negative bit count is the same as rotating it left by the negated bit count:\n \* `number.rotateRight(-n) == number.rotateLeft(n)`\n \*\n \* Rotating by a multiple of [Short.SIZE\_BITS] (16) returns the same number, or more generally\n \* `number.rotateRight(n) == number.rotateRight(n % 16)`\n

```
*\n@SinceKotlin("1.6")\n@WasExperimental(ExperimentalStdlibApi::class)\npublic fun
Short.rotateRight(bitCount: Int): Short =\n (toInt().shl(16 - (bitCount and 15)) or (toInt() and
0xFFFF).ushr(bitCount and 15)).toShort()\n", "/**\n * Copyright 2010-2018 JetBrains s.r.o. and Kotlin Programming
Language contributors.\n * Use of this source code is governed by the Apache 2.0 license that can be found in the
license/LICENSE.txt file.\n */\npackage kotlin\nimport kotlin.internal.RequireKotlin\nimport
kotlin.internal.RequireKotlinVersionKind\n\n@kotlin.internal.InlineOnly\n@SinceKotlin("1.2")\n@Suppress("IN
VISIBLE_MEMBER", "INVISIBLE_REFERENCE")\n@RequireKotlin("1.2.30", level =
DeprecationLevel.HIDDEN, versionKind = RequireKotlinVersionKind.COMPILER_VERSION)\npublic inline fun
<R> suspend(noinline block: suspend () -> R): suspend () -> R = block\n", "/**\n * Copyright 2010-2018 JetBrains
s.r.o. and Kotlin Programming Language contributors.\n * Use of this source code is governed by the Apache 2.0
license that can be found in the license/LICENSE.txt file.\n
```

```
*\n\n@file:kotlin.jvm.JvmName("TuplesKt")\n\npackage kotlin\n\n/**\n * Represents a generic pair of two
values.\n *\n * There is no meaning attached to values in this class, it can be used for any purpose.\n * Pair exhibits
value semantics, i.e. two pairs are equal if both components are equal.\n *\n * An example of decomposing it into
values:\n * @sample samples.misc.Tuples.pairDestructuring\n *\n * @param A type of the first value.\n * @param
B type of the second value.\n * @property first First value.\n * @property second Second value.\n * @constructor
Creates a new instance of Pair.\n *\n public data class Pair<out A, out B>(\n public val first: A,\n public val
second: B\n) : Serializable {\n\n /**\n * Returns string representation of the [Pair] including its [first] and
[second] values.\n *\n public override fun toString(): String = "$first, $second"\n}\n\n/**\n * Creates a tuple
of type [Pair] from this and [that].\n *\n * This can be useful for creating [Map] literals with less noise, for
example:\n * @sample samples.collections.Maps.instantiation.mapFromPairs\n *\n public infix fun <A, B>
A.to(that: B): Pair<A, B> = Pair(this, that)\n\n/**\n * Converts this pair into a list.\n * @sample
samples.misc.Tuples.pairToList\n *\n public fun <T> Pair<T, T>.toList(): List<T> = listOf(first, second)\n\n/**\n * Represents a triad of values\n *\n * There is no meaning attached to values in this class, it can be used for any
purpose.\n * Triple exhibits value semantics, i.e. two triples are equal if all three components are equal.\n * An
example of decomposing it into values:\n * @sample samples.misc.Tuples.tripleDestructuring\n *\n * @param A
type of the first value.\n * @param B type of the second value.\n * @param C type of the third value.\n * @property
first First value.\n * @property second Second value.\n * @property third Third value.\n *\n public data class
Triple<out A, out B, out C>(\n public val first: A,\n public val second: B,\n public val third: C\n) : Serializable
{\n\n /**\n * Returns string representation of the [Triple] including its [first], [second] and [third] values.\n *\n public override fun toString(): String = "$first, $second, $third"\n}\n\n/**\n * Converts this triple into a
list.\n * @sample samples.misc.Tuples.tripleToList\n *\n public fun <T> Triple<T, T, T>.toList(): List<T> =
listOf(first, second, third)\n", "/**\n * Copyright 2010-2022 JetBrains s.r.o. and Kotlin Programming Language
contributors.\n * Use of this source code is governed by the Apache 2.0 license that can be found in the
license/LICENSE.txt file.\n */\n\n// Auto-generated file. DO NOT EDIT!\npackage kotlin.ranges\n\nimport
kotlin.internal.*\n\n/**\n * A range of values of type `UInt`.\n
```

```
*\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class)\npublic class UIntRange(start:
UInt, endInclusive: UInt) : UIntProgression(start, endInclusive, 1), ClosedRange<UInt> {\n override val start:
UInt get() = first\n override val endInclusive: UInt get() = last\n\n override fun contains(value: UInt): Boolean =
first <= value && value <= last\n\n /**\n *\n * Checks if the range is empty.\n *\n * The range is empty if its
start value is greater than the end value.\n *\n override fun isEmpty(): Boolean = first > last\n\n override fun
equals(other: Any?): Boolean =\n other is UIntRange && (isEmpty() && other.isEmpty()) ||\n first ==
```



```

other.first && last == other.last)\n\n override fun hashCode(): Int =\n if (isEmpty()) -1 else (31 * first.toInt()\n+ last.toInt())\n\n override fun toString(): String = \"$first..$last\"\n\n companion object {\n /** An empty\nrange of values of type UInt. */\n public val EMPTY: UIntRange = UIntRange(UInt.MAX_VALUE,\nUInt.MIN_VALUE)\n }\n}\n\n/**\n * A progression of values of type `UInt`.\n\n*/\n\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class)\npublic open class\nUIntProgression\n\ninternal constructor(\n start: UInt,\n endInclusive: UInt,\n step: Int\n) : Iterable<UInt> {\n init {\n if (step == 0.toInt()) throw kotlin.IllegalArgumentException("Step must be non-zero.")\n if (step\n== Int.MIN_VALUE) throw kotlin.IllegalArgumentException("Step must be greater than Int.MIN_VALUE to\navoid overflow on negation.")\n }\n\n /**\n * The first element in the progression.\n */\n public val first:\nUInt = start\n\n /**\n * The last element in the progression.\n */\n public val last: UInt =\ngetProgressionLastElement(start, endInclusive, step)\n\n /**\n * The step of the progression.\n */\n public\nval step: Int = step\n\n final override fun iterator(): Iterator<UInt> = UIntProgressionIterator(first, last, step)\n\n /**\n * Checks if the progression is empty.\n */\n fun isEmpty(): Boolean =\n if (step > 0) first > last else first < last\n\n /**\n * Progression with a positive step is empty if its first\n * element is greater than the last element.\n * Progression with a negative step is empty if its first element is less\n * than the last element.\n */\n public open fun isEmpty(): Boolean = if (step > 0) first > last else first < last\n\n override fun equals(other: Any?): Boolean =\n other is UIntProgression && (isEmpty() && other.isEmpty() ||\n first == other.first && last == other.last && step == other.step)\n\n override fun hashCode(): Int =\n if (isEmpty()) -1 else (31 * (31 * first.toInt() + last.toInt()) + step.toInt())\n\n override fun toString(): String = if\n(step > 0) \"$first..$last step $step\" else \"$first downTo $last step ${-step}\"\n\n companion object {\n /**\n * Creates UIntProgression within the specified bounds of a closed range.\n * The progression starts with\n * the [rangeStart] value and goes toward the [rangeEnd] value not excluding it, with the specified [step].\n * In\n * order to go backwards the [step] must be negative.\n * [step] must be greater than `Int.MIN_VALUE`\n * and not equal to zero.\n */\n public fun fromClosedRange(rangeStart: UInt, rangeEnd: UInt, step: Int):\nUIntProgression = UIntProgression(rangeStart, rangeEnd, step)\n }\n}\n\n/**\n * An iterator over a progression\nof values of type `UInt`.\n * @property step the number by which the value is incremented on each step.\n\n*/\n\n@SinceKotlin("1.3")\n@Suppress("DEPRECATION_ERROR")\nprivate class UIntProgressionIterator(first:\nUInt, last: UInt, step: Int) : UIntIterator() {\n private val finalElement = last\n private var hasNext: Boolean = if\n(step > 0) first <= last else first >= last\n private val step = step.toUInt() // use 2-complement math for negative\nsteps\n private var next = if (hasNext) first else finalElement\n\n override fun hasNext(): Boolean = hasNext\n\n override fun nextUInt(): UInt {\n val value = next\n if (value == finalElement) {\n if (!hasNext)\nthrow kotlin.NoSuchElementException()\n hasNext = false\n } else {\n next += step\n }\n return value\n }\n}\n\n/**\n * Copyright 2010-2022 JetBrains s.r.o. and Kotlin Programming Language\ncontributors.\n * Use of this source code is governed by the Apache 2.0 license that can be found in the\nlicense/LICENSE.txt file.\n\n*/\n\n// Auto-generated file. DO NOT EDIT!\n\npackage kotlin.collections\n\n/**\n * An\niterator over a sequence of values of type `UByte`. */\n@Deprecated("This class is not going to be stabilized and is\nto be removed soon.", level = DeprecationLevel.ERROR)\n@SinceKotlin("1.3")\npublic abstract class\nUByteIterator : Iterator<UByte> {\n final override fun next() = nextUByte()\n\n /**\n * Returns the next value in the\nsequence without boxing. */\n public abstract fun nextUByte(): UByte\n}\n\n/**\n * An iterator over a sequence of\nvalues of type `UShort`. */\n@Deprecated("This class is not going to be stabilized and is to be removed soon.",\nlevel = DeprecationLevel.ERROR)\n@SinceKotlin("1.3")\npublic abstract class\nUShortIterator : Iterator<UShort>\n{\n final override fun next() = nextUShort()\n\n /**\n * Returns the next value in the sequence without boxing. */\n public\nabstract fun nextUShort(): UShort\n}\n\n/**\n * An iterator over a sequence of values of type `UInt`.\n\n*/\n\n@Deprecated("This class is not going to be stabilized and is to be removed soon.", level =\nDeprecationLevel.ERROR)\n@SinceKotlin("1.3")\npublic abstract class UIntIterator : Iterator<UInt> {\n final\noverride fun next() = nextUInt()\n\n /**\n * Returns the next value in the sequence without boxing. */\n public\nabstract fun nextUInt(): UInt\n}\n\n/**\n * An iterator over a sequence of values of type `ULong`.\n\n*/\n\n@Deprecated("This class is not going to be stabilized and is to be removed soon.", level =\nDeprecationLevel.ERROR)\n@SinceKotlin("1.3")\npublic abstract class ULongIterator : Iterator<ULong> {\n

```

```

final override fun next() = nextULong()\n\n /** Returns the next value in the sequence without boxing. */\n
public abstract fun nextULong(): ULong\n\n"/**\n * Copyright 2010-2022 JetBrains s.r.o. and Kotlin
Programming Language contributors.\n * Use of this source code is governed by the Apache 2.0 license that can be
found in the license/LICENSE.txt file.\n */\n\n// Auto-generated file. DO NOT EDIT!\n\npackage
kotlin.ranges\n\n\nimport kotlin.internal.*\n\n/**\n * A range of values of type `ULong`.\n
*/\n\n@SinceKotlin("1.5")\n\n@WasExperimental(ExperimentalUnsignedTypes::class)\n\npublic class
ULongRange(start: ULong, endInclusive: ULong) : ULongProgression(start, endInclusive, 1),
ClosedRange<ULong> {\n\n override val start: ULong get() = first\n\n override val endInclusive: ULong get() =
last\n\n\n override fun contains(value: ULong): Boolean = first <= value && value <= last\n\n\n /**\n\n * Checks
if the range is empty.\n\n * The range is empty if its start value is greater than the end value.\n\n */\n\n
 override fun isEmpty(): Boolean = first > last\n\n\n override fun equals(other: Any?): Boolean =\n\n other is
ULongRange && (isEmpty() && other.isEmpty() ||\n\n first == other.first && last == other.last)\n\n\n
 override fun hashCode(): Int =\n\n if (isEmpty()) -1 else (31 * (first xor (first shr 32)).toInt() + (last xor (last shr
32)).toInt())\n\n\n override fun toString(): String = "$first..$last"\n\n\n companion object {\n\n /**\n\n * An empty
range of values of type ULong. */\n\n public val EMPTY: ULongRange = ULongRange(ULong.MAX_VALUE,
ULong.MIN_VALUE)\n\n }\n\n}\n\n/**\n * A progression of values of type `ULong`.\n
*/\n\n@SinceKotlin("1.5")\n\n@WasExperimental(ExperimentalUnsignedTypes::class)\n\npublic open class
ULongProgression\n\ninternal constructor(\n\n start: ULong,\n\n endInclusive: ULong,\n\n step: Long)\n\n:
Iterable<ULong> {\n\n init {\n\n if (step == 0.toLong()) throw kotlin.IllegalArgumentException("Step must be
non-zero.")\n\n if (step == Long.MIN_VALUE) throw kotlin.IllegalArgumentException("Step must be greater
than Long.MIN_VALUE to avoid overflow on negation.")\n\n }\n\n\n /**\n\n * The first element in the
progression.\n\n */\n\n public val first: ULong = start\n\n\n /**\n\n * The last element in the progression.\n\n */\n\n
 public val last: ULong = getProgressionLastElement(start, endInclusive, step)\n\n\n /**\n\n * The step of the
progression.\n\n */\n\n public val step: Long = step\n\n\n final override fun iterator(): Iterator<ULong> =
ULongProgressionIterator(first, last, step)\n\n\n /**\n\n * Checks if the progression is empty.\n\n *
Progression with a positive step is empty if its first element is greater than the last element.\n\n * Progression with a
negative step is empty if its first element is less than the last element.\n\n */\n\n public open fun isEmpty(): Boolean
= if (step > 0) first > last else first < last\n\n\n override fun equals(other: Any?): Boolean =\n\n other is
ULongProgression && (isEmpty() && other.isEmpty() ||\n\n first == other.first && last == other.last &&
step == other.step)\n\n\n override fun hashCode(): Int =\n\n if (isEmpty()) -1 else (31 * (31 * (first xor (first shr
32)).toInt() + (last xor (last shr 32)).toInt()) + (step xor (step ushr 32)).toInt())\n\n\n override fun toString(): String =
if (step > 0) "$first..$last step $step" else "$first downTo $last step ${-step}"\n\n\n companion object {\n\n /**\n\n * Creates ULongProgression within the specified bounds of a closed range.\n\n * The progression
starts with the [rangeStart] value and goes toward the [rangeEnd] value not excluding it, with the specified [step].\n\n *
In order to go backwards the [step] must be negative.\n\n * [step] must be greater than
`Long.MIN_VALUE` and not equal to zero.\n\n */\n\n public fun fromClosedRange(rangeStart: ULong,
rangeEnd: ULong, step: Long): ULongProgression = ULongProgression(rangeStart, rangeEnd, step)\n\n }\n\n}\n\n/**\n * An iterator over a progression of values of type `ULong`.\n
*/\n\n@property step the number by which
the value is incremented on each step.\n
*/\n\n@SinceKotlin("1.3")\n\n@Suppress("DEPRECATION_ERROR")\n\nprivate class
ULongProgressionIterator(first: ULong, last: ULong, step: Long) : ULongIterator() {\n\n private val finalElement =
last\n\n private var hasNext: Boolean = if (step > 0) first <= last else first >= last\n\n private val step =
step.toULong() // use 2-complement math for negative steps\n\n private var next = if (hasNext) first else
finalElement\n\n\n override fun hasNext(): Boolean = hasNext\n\n\n override fun nextULong(): ULong {\n\n val
value = next\n\n if (value == finalElement) {\n\n if (!hasNext) throw kotlin.NoSuchElementException()\n\n
 hasNext = false\n\n } else {\n\n next += step\n\n }\n\n return value\n\n }\n\n}\n\n"/**\n * Copyright
2010-2021 JetBrains s.r.o. and Kotlin Programming Language contributors.\n * Use of this source code is governed
by the Apache 2.0 license that can be found in the license/LICENSE.txt file.\n */\n\n\npackage kotlin.math\n\n/**\n

```

Returns the smaller of two values.\n

```
*\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class)\n@kotlin.internal.InlineOnly\npublic inline fun min(a: UInt, b: UInt): UInt {\n return minOf(a, b)\n}\n\n/**\n * Returns the smaller of two values.\n
```

```
*\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class)\n@kotlin.internal.InlineOnly\npublic inline fun min(a: ULong, b: ULong): ULong {\n return minOf(a, b)\n}\n\n/**\n * Returns the greater of two values.\n
```

```
*\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class)\n@kotlin.internal.InlineOnly\npublic inline fun max(a: UInt, b: UInt): UInt {\n return maxOf(a, b)\n}\n\n/**\n * Returns the greater of two values.\n
```

```
*\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class)\n@kotlin.internal.InlineOnly\npublic inline fun max(a: ULong, b: ULong): ULong {\n return maxOf(a, b)\n}\n\n/**\n * Copyright 2010-2021 JetBrains s.r.o. and Kotlin Programming Language contributors.\n * Use of this source code is governed by the Apache 2.0 license that can be found in the license/LICENSE.txt file.\n
```

```
*\n@file:kotlin.jvm.JvmName("\nUNumbersKt")\n\npackage kotlin\n\n/**\n * Counts the number of set bits in the binary representation of this [UInt] number.\n
```

```
*\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class,\nExperimentalStdlibApi::class)\n@kotlin.internal.InlineOnly\npublic inline fun UInt.countOneBits(): Int =\ntoInt().countOneBits()\n\n/**\n * Counts the number of consecutive most significant bits that are zero in the binary representation of this [UInt] number.\n
```

```
*\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class,\nExperimentalStdlibApi::class)\n@kotlin.internal.InlineOnly\npublic inline fun UInt.countLeadingZeroBits(): Int =\ntoInt().countLeadingZeroBits()\n\n/**\n * Counts the number of consecutive least significant bits that are zero in the binary representation of this [UInt] number.\n
```

```
*\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class,\nExperimentalStdlibApi::class)\n@kotlin.internal.InlineOnly\npublic inline fun UInt.countTrailingZeroBits(): Int =\ntoInt().countTrailingZeroBits()\n\n/**\n * Returns a number having a single bit set in the position of the most significant set bit of this [UInt] number,\n * or zero, if this number is zero.\n
```

```
*\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class,\nExperimentalStdlibApi::class)\n@kotlin.internal.InlineOnly\npublic inline fun UInt.takeHighestOneBit(): UInt =\ntoInt().takeHighestOneBit().toInt()\n\n/**\n * Returns a number having a single bit set in the position of the least significant set bit of this [UInt] number,\n * or zero, if this number is zero.\n
```

```
*\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class,\nExperimentalStdlibApi::class)\n@kotlin.internal.InlineOnly\npublic inline fun UInt.takeLowestOneBit(): UInt =\ntoInt().takeLowestOneBit().toInt()\n\n/**\n * Rotates the binary representation of this [UInt] number left by the specified [bitCount] number of bits.\n * The most significant bits pushed out from the left side reenter the number as the least significant bits on the right side.\n * Rotating the number left by a negative bit count is the same as rotating it right by the negated bit count:\n * `number.rotateLeft(-n) == number.rotateRight(n)`\n * Rotating by a multiple of [UInt.SIZE_BITS] (32) returns the same number, or more generally\n * `number.rotateLeft(n) == number.rotateLeft(n % 32)`\n
```

```
*\n@SinceKotlin("1.6")\n@WasExperimental(ExperimentalStdlibApi::class,\nExperimentalUnsignedTypes::class)\n@kotlin.internal.InlineOnly\npublic inline fun UInt.rotateLeft(bitCount: Int): UInt =\ntoInt().rotateLeft(bitCount).toInt()\n\n/**\n * Rotates the binary representation of this [UInt] number right by the specified [bitCount] number of bits.\n * The least significant bits pushed out from the right side reenter the number as the most significant bits on the left side.\n * Rotating the number right by a negative bit count is the same as rotating it left by the negated bit count:\n * `number.rotateRight(-n) == number.rotateLeft(n)`\n * Rotating by a multiple of [UInt.SIZE_BITS] (32) returns the same number, or more generally\n * `number.rotateRight(n) == number.rotateRight(n % 32)`\n
```

```
*\n@SinceKotlin("1.6")\n@WasExperimental(ExperimentalStdlibApi::class,
```

```

ExperimentalUnsignedTypes::class)\n@kotlin.internal.InlineOnly\npublic inline fun UInt.rotateRight(bitCount: Int):
UInt = toInt().rotateRight(bitCount).toUInt()\n\n/**\n * Counts the number of set bits in the binary representation
of this [ULong] number.\n */\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class,
ExperimentalStdlibApi::class)\n@kotlin.internal.InlineOnly\npublic inline fun ULong.countOneBits(): Int =
toLong().countOneBits()\n\n/**\n * Counts the number of consecutive most significant bits that are zero in the
binary representation of this [ULong] number.\n */\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class,
ExperimentalStdlibApi::class)\n@kotlin.internal.InlineOnly\npublic inline fun ULong.countLeadingZeroBits(): Int =
toLong().countLeadingZeroBits()\n\n/**\n * Counts the number of consecutive least significant bits that are zero
in the binary representation of this [ULong] number.\n */\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class,
ExperimentalStdlibApi::class)\n@kotlin.internal.InlineOnly\npublic inline fun ULong.countTrailingZeroBits(): Int =
toLong().countTrailingZeroBits()\n\n/**\n * Returns a number having a single bit set in the position of the most
significant set bit of this [ULong] number,\n * or zero, if this number is zero.\n */\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class,
ExperimentalStdlibApi::class)\n@kotlin.internal.InlineOnly\npublic inline fun ULong.takeHighestOneBit(): ULong =
toLong().takeHighestOneBit().toULong()\n\n/**\n * Returns a number having a single bit set in the position of the
least significant set bit of this [ULong] number,\n * or zero, if this number is zero.\n */\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class,
ExperimentalStdlibApi::class)\n@kotlin.internal.InlineOnly\npublic inline fun ULong.takeLowestOneBit(): ULong =
toLong().takeLowestOneBit().toULong()\n\n/**\n * Rotates the binary representation of this [ULong] number left
by the specified [bitCount] number of bits.\n * The most significant bits pushed out from the left side reenter the
number as the least significant bits on the right side.\n * Rotating the number left by a negative bit count is the
same as rotating it right by the negated bit count:\n * `number.rotateLeft(-n) == number.rotateRight(n)`\n * Rotating by a multiple of [ULong.SIZE_BITS] (64) returns the same number, or more generally\n * `number.rotateLeft(n) == number.rotateLeft(n % 64)`\n */\n@SinceKotlin("1.6")\n@WasExperimental(ExperimentalStdlibApi::class,
ExperimentalUnsignedTypes::class)\n@kotlin.internal.InlineOnly\npublic inline fun ULong.rotateLeft(bitCount:
Int): ULong = toLong().rotateLeft(bitCount).toULong()\n\n/**\n * Rotates the binary representation of this [ULong]
number right by the specified [bitCount] number of bits.\n * The least significant bits pushed out from the right side
reenter the number as the most significant bits on the left side.\n * Rotating the number right by a negative bit
count is the same as rotating it left by the negated bit count:\n * `number.rotateRight(-n) == number.rotateLeft(n)`\n * Rotating by a multiple of [ULong.SIZE_BITS] (64) returns the same number, or more generally\n * `number.rotateRight(n) == number.rotateRight(n % 64)`\n */\n@SinceKotlin("1.6")\n@WasExperimental(ExperimentalStdlibApi::class,
ExperimentalUnsignedTypes::class)\n@kotlin.internal.InlineOnly\npublic inline fun ULong.rotateRight(bitCount:
Int): ULong = toLong().rotateRight(bitCount).toULong()\n\n/**\n * Counts the number of set bits in the binary
representation of this [UByte] number.\n */\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class,
ExperimentalStdlibApi::class)\n@kotlin.internal.InlineOnly\npublic inline fun UByte.countOneBits(): Int =
toInt().countOneBits()\n\n/**\n * Counts the number of consecutive most significant bits that are zero in the
binary representation of this [UByte] number.\n */\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class,
ExperimentalStdlibApi::class)\n@kotlin.internal.InlineOnly\npublic inline fun UByte.countLeadingZeroBits(): Int =
toByte().countLeadingZeroBits()\n\n/**\n * Counts the number of consecutive least significant bits that are zero in
the binary representation of this [UByte] number.\n */\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class,
ExperimentalStdlibApi::class)\n@kotlin.internal.InlineOnly\npublic inline fun UByte.countTrailingZeroBits(): Int =

```

toByte().countTrailingZeroBits()\n\n/\*\*\n \* Returns a number having a single bit set in the position of the most significant set bit of this [UByte] number,\n \* or zero, if this number is zero.\n

```

*\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class,
ExperimentalStdlibApi::class)\n@kotlin.internal.InlineOnly\npublic inline fun UByte.takeHighestOneBit(): UByte
= toInt().takeHighestOneBit().toUByte()\n\n/**\n * Returns a number having a single bit set in the position of the
least significant set bit of this [UByte] number,\n * or zero, if this number is zero.\n
*\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class,
ExperimentalStdlibApi::class)\n@kotlin.internal.InlineOnly\npublic inline fun UByte.takeLowestOneBit(): UByte =
toInt().takeLowestOneBit().toUByte()\n\n\n/**\n * Rotates the binary representation of this [UByte] number left by
the specified [bitCount] number of bits.\n * The most significant bits pushed out from the left side reenter the
number as the least significant bits on the right side.\n * Rotating the number left by a negative bit count is the
same as rotating it right by the negated bit count:\n * `number.rotateLeft(-n) == number.rotateRight(n)`\n *
Rotating by a multiple of [UByte.SIZE_BITS] (8) returns the same number, or more generally\n *
`number.rotateLeft(n) == number.rotateLeft(n % 8)`\n
*\n@SinceKotlin("1.6")\n@WasExperimental(ExperimentalStdlibApi::class,
ExperimentalUnsignedTypes::class)\n@kotlin.internal.InlineOnly\npublic inline fun UByte.rotateLeft(bitCount:
Int): UByte = toByte().rotateLeft(bitCount).toUByte()\n\n/**\n * Rotates the binary representation of this [UByte]
number right by the specified [bitCount] number of bits.\n * The least significant bits pushed out from the right side
reenter the number as the most significant bits on the left side.\n * Rotating the number right by a negative bit
count is the same as rotating it left by the negated bit count:\n * `number.rotateRight(-n) == number.rotateLeft(n)`\n
*\n * Rotating by a multiple of [UByte.SIZE_BITS] (8) returns the same number, or more generally\n *
`number.rotateRight(n) == number.rotateRight(n % 8)`\n
*\n@SinceKotlin("1.6")\n@WasExperimental(ExperimentalStdlibApi::class,
ExperimentalUnsignedTypes::class)\n@kotlin.internal.InlineOnly\npublic inline fun UByte.rotateRight(bitCount:
Int): UByte = toByte().rotateRight(bitCount).toUByte()\n\n\n/**\n * Counts the number of set bits in the binary
representation of this [UShort] number.\n
*\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class,
ExperimentalStdlibApi::class)\n@kotlin.internal.InlineOnly\npublic inline fun UShort.countOneBits(): Int =
toUInt().countOneBits()\n\n\n/**\n * Counts the number of consecutive most significant bits that are zero in the
binary representation of this [UShort] number.\n
*\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class,
ExperimentalStdlibApi::class)\n@kotlin.internal.InlineOnly\npublic inline fun UShort.countLeadingZeroBits(): Int
= toShort().countLeadingZeroBits()\n\n\n/**\n * Counts the number of consecutive least significant bits that are zero
in the binary representation of this [UShort] number.\n
*\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class,
ExperimentalStdlibApi::class)\n@kotlin.internal.InlineOnly\npublic inline fun UShort.countTrailingZeroBits(): Int
= toShort().countTrailingZeroBits()\n\n\n/**\n * Returns a number having a single bit set in the position of the most
significant set bit of this [UShort] number,\n * or zero, if this number is zero.\n
*\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class,
ExperimentalStdlibApi::class)\n@kotlin.internal.InlineOnly\npublic inline fun UShort.takeHighestOneBit(): UShort
= toInt().takeHighestOneBit().toUShort()\n\n\n/**\n * Returns a number having a single bit set in the position of the
least significant set bit of this [UShort] number,\n * or zero, if this number is zero.\n
*\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class,
ExperimentalStdlibApi::class)\n@kotlin.internal.InlineOnly\npublic inline fun UShort.takeLowestOneBit(): UShort
= toInt().takeLowestOneBit().toUShort()\n\n\n/**\n * Rotates the binary representation of this [UShort] number left
by the specified [bitCount] number of bits.\n * The most significant bits pushed out from the left side reenter the
number as the least significant bits on the right side.\n * Rotating the number left by a negative bit count is the
same as rotating it right by the negated bit count:\n * `number.rotateLeft(-n) == number.rotateRight(n)`\n *

```

```

Rotating by a multiple of [UShort.SIZE_BITS] (16) returns the same number, or more generally
`number.rotateLeft(n) == number.rotateLeft(n % 16)`
*/
@SinceKotlin("1.6")
@WasExperimental(ExperimentalStdlibApi::class,
ExperimentalUnsignedTypes::class)
@kotlin.internal.InlineOnly
public inline fun UShort.rotateLeft(bitCount:
Int): UShort = toShort().rotateLeft(bitCount).toUShort()
*/
* Rotates the binary representation of this
[UShort] number right by the specified [bitCount] number of bits.
* The least significant bits pushed out from the
right side reenter the number as the most significant bits on the left side.
* Rotating the number right by a
negative bit count is the same as rotating it left by the negated bit count:
`number.rotateRight(-n) ==
number.rotateLeft(n)`
* Rotating by a multiple of [UShort.SIZE_BITS] (16) returns the same number, or more
generally
`number.rotateRight(n) == number.rotateRight(n % 16)`
*/
@SinceKotlin("1.6")
@WasExperimental(ExperimentalStdlibApi::class,
ExperimentalUnsignedTypes::class)
@kotlin.internal.InlineOnly
public inline fun UShort.rotateRight(bitCount:
Int): UShort = toShort().rotateRight(bitCount).toUShort()
*/
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Programming Language contributors.
* Use of this source code is governed by the Apache 2.0 license that can be
found in the license/LICENSE.txt file.
*/
package kotlin.internal
private fun
differenceModulo(a: UInt, b: UInt, c: UInt): UInt {
 val ac = a % c
 val bc = b % c
 return if (ac >= bc) ac -
bc else ac - bc + c
}
private fun differenceModulo(a: ULong, b: ULong, c: ULong): ULong {
 val ac = a %
c
 val bc = b % c
 return if (ac >= bc) ac - bc else ac - bc + c
}
*/
* Calculates the final element of a
bounded arithmetic progression, i.e. the last element of the progression which is in the range
* from [start] to [end]
in case of a positive [step], or from [end] to [start] in case of a negative
* [step].
* No validation on passed
parameters is performed. The given parameters should satisfy the condition:
* - either `step > 0` and `start <=
end`,
* - or `step < 0` and `start >= end`.
* @param start first element of the progression
* @param end
ending bound for the progression
* @param step increment, or difference of successive elements in the
progression
* @return the final element of the progression
* @suppress
*/
@PublishedApi
@SinceKotlin("1.3")
internal fun getProgressionLastElement(start: UInt, end: UInt, step:
Int): UInt = when {
 step > 0 -> if (start >= end) end else end - differenceModulo(end, start, step.toUInt())
 step < 0 -> if (start <= end) end else end + differenceModulo(start, end, (-step).toUInt())
 else -> throw
kotlin.IllegalArgumentException("Step is zero.")
}
*/
* Calculates the final element of a bounded
arithmetic progression, i.e. the last element of the progression which is in the range
* from [start] to [end] in case
of a positive [step], or from [end] to [start] in case of a negative
* [step].
* No validation on passed
parameters is performed. The given parameters should satisfy the condition:
* - either `step > 0` and `start <=
end`,
* - or `step < 0` and `start >= end`.
* @param start first element of the progression
* @param end
ending bound for the progression
* @param step increment, or difference of successive elements in the
progression
* @return the final element of the progression
* @suppress
*/
@PublishedApi
@SinceKotlin("1.3")
internal fun getProgressionLastElement(start: ULong, end: ULong,
step: Long): ULong = when {
 step > 0 -> if (start >= end) end else end - differenceModulo(end, start,
step.toULong())
 step < 0 -> if (start <= end) end else end + differenceModulo(start, end, (-step).toULong())
 else -> throw kotlin.IllegalArgumentException("Step is zero.")
}
*/
* Copyright 2010-2021 JetBrains s.r.o.
and Kotlin Programming Language contributors.
* Use of this source code is governed by the Apache 2.0 license
that can be found in the license/LICENSE.txt file.
*/
@file:kotlin.jvm.JvmName("UStringsKt") // string
representation of unsigned numbers
package kotlin.text
*/
* Returns a string representation of this [Byte]
value in the specified [radix].
* @throws IllegalArgumentException when [radix] is not a valid radix for
number to string conversion.
*/
@SinceKotlin("1.5")
@WasExperimental(ExperimentalUnsignedTypes::class)
@kotlin.internal.InlineOnly
public /*inline*/ fun UByte.toString(radix: Int): String = this.toInt().toString(radix)
*/
* Returns a string
representation of this [Short] value in the specified [radix].
* @throws IllegalArgumentException when [radix]
is not a valid radix for number to string conversion.
*/
@SinceKotlin("1.5")
@WasExperimental(ExperimentalUnsignedTypes::class)
@kotlin.internal.InlineOnly

```

```

\npublic /*inline*/ fun UShort.toString(radix: Int): String = this.toInt().toString(radix)\n\n\n/**\n * Returns a string representation of this [Int] value in the specified [radix].\n * \n * @throws IllegalArgumentException when [radix] is not a valid radix for number to string conversion.\n */\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class)\n@kotlin.internal.InlineOnly\n\npublic /*inline*/ fun UInt.toString(radix: Int): String = this.toLong().toString(radix)\n\n\n/**\n * Returns a string representation of this [Long] value in the specified [radix].\n * \n * @throws IllegalArgumentException when [radix] is not a valid radix for number to string conversion.\n */\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class)\n\npublic fun ULong.toString(radix: Int): String = ulongToString(this.toLong(), checkRadix(radix))\n\n\n/**\n * Parses the string as a signed [UByte] number and returns the result.\n * \n * @throws NumberFormatException if the string is not a valid representation of a number.\n */\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class)\n\npublic fun String.toUByte(): UByte = toUByteOrNull() ?: numberFormatError(this)\n\n\n/**\n * Parses the string as a signed [UByte] number and returns the result.\n * \n * @throws NumberFormatException if the string is not a valid representation of a number.\n * \n * @throws IllegalArgumentException when [radix] is not a valid radix for string to number conversion.\n */\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class)\n\npublic fun String.toUByte(radix: Int): UByte = toUByteOrNull(radix) ?: numberFormatError(this)\n\n\n/**\n * Parses the string as a [UShort] number and returns the result.\n * \n * @throws NumberFormatException if the string is not a valid representation of a number.\n */\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class)\n\npublic fun String.toUShort(): UShort = toUShortOrNull() ?: numberFormatError(this)\n\n\n/**\n * Parses the string as a [UShort] number and returns the result.\n * \n * @throws NumberFormatException if the string is not a valid representation of a number.\n * \n * @throws IllegalArgumentException when [radix] is not a valid radix for string to number conversion.\n */\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class)\n\npublic fun String.toUShort(radix: Int): UShort = toUShortOrNull(radix) ?: numberFormatError(this)\n\n\n/**\n * Parses the string as an [UInt] number and returns the result.\n * \n * @throws NumberFormatException if the string is not a valid representation of a number.\n */\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class)\n\npublic fun String.toUInt(): UInt = toUIntOrNull() ?: numberFormatError(this)\n\n\n/**\n * Parses the string as an [UInt] number and returns the result.\n * \n * @throws NumberFormatException if the string is not a valid representation of a number.\n * \n * @throws IllegalArgumentException when [radix] is not a valid radix for string to number conversion.\n */\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class)\n\npublic fun String.toUInt(radix: Int): UInt = toUIntOrNull(radix) ?: numberFormatError(this)\n\n\n/**\n * Parses the string as a [ULong] number and returns the result.\n * \n * @throws NumberFormatException if the string is not a valid representation of a number.\n */\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class)\n\npublic fun String.toULong(): ULong = toULongOrNull() ?: numberFormatError(this)\n\n\n/**\n * Parses the string as a [ULong] number and returns the result.\n * \n * @throws NumberFormatException if the string is not a valid representation of a number.\n * \n * @throws IllegalArgumentException when [radix] is not a valid radix for string to number conversion.\n */\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class)\n\npublic fun String.toULong(radix: Int): ULong = toULongOrNull(radix) ?: numberFormatError(this)\n\n\n\n/**\n * Parses the string as an [UByte] number and returns the result\n * or `null` if the string is not a valid representation of a number.\n */\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class)\n\npublic fun String.toUByteOrNull(): UByte? = toUByteOrNull(radix = 10)\n\n\n/**\n * Parses the string as an [UByte] number and returns the result\n * or `null` if the string is not a valid representation of a number.\n * \n * @throws IllegalArgumentException when [radix] is not a valid radix for string to number conversion.\n */\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class)\n\npublic fun String.toUByteOrNull(radix: Int): UByte? { \n val int = this.toUIntOrNull(radix) ?: return null\n if (int >

```

```

UByte.MAX_VALUE) return null\n return int.toUByte()\n}\n\n/**\n * Parses the string as an [UShort] number
and returns the result\n * or `null` if the string is not a valid representation of a number.\n
*\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class)\npublic fun
String.toUShortOrNull(): UShort? = toUShortOrNull(radix = 10)\n\n/**\n * Parses the string as an [UShort] number
and returns the result\n * or `null` if the string is not a valid representation of a number.\n *\n * @throws
IllegalArgumentException when [radix] is not a valid radix for string to number conversion.\n
*\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class)\npublic fun
String.toUShortOrNull(radix: Int): UShort? {\n val int = this.toUIntOrNull(radix) ?: return null\n if (int >
UShort.MAX_VALUE) return null\n return int.toUShort()\n}\n\n/**\n * Parses the string as an [UInt] number and
returns the result\n * or `null` if the string is not a valid representation of a number.\n
*\n * @throws
IllegalArgumentException when [radix] is not a valid radix for string to number conversion.\n
*\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class)\npublic fun
String.toUIntOrNull(): UInt? = toUIntOrNull(radix = 10)\n\n/**\n * Parses the string as an [UInt] number and
returns the result\n * or `null` if the string is not a valid representation of a number.\n *\n * @throws
IllegalArgumentException when [radix] is not a valid radix for string to number conversion.\n
*\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class)\npublic fun
String.toUIntOrNull(radix: Int): UInt? {\n checkRadix(radix)\n\n val length = this.length\n if (length == 0)
return null\n\n val limit: UInt = UInt.MAX_VALUE\n val start: Int\n\n val firstChar = this[0]\n if (firstChar
< '0') {\n if (length == 1 || firstChar != '+') return null\n start = 1\n } else {\n start = 0\n }\n\n val
limitForMaxRadix = 119304647u // limit / 36\n var limitBeforeMul = limitForMaxRadix\n val uradix =
radix.toUInt()\n var result = 0u\n for (i in start until length) {\n val digit = digitOf(this[i], radix)\n\n if
(digit < 0) return null\n if (result > limitBeforeMul) {\n if (limitBeforeMul == limitForMaxRadix) {\n
 limitBeforeMul = limit / uradix\n }\n if (result > limitBeforeMul) {\n return null\n
 }\n } else {\n return null\n }\n }\n\n result *= uradix\n\n val beforeAdding =
result\n result += digit.toUInt()\n if (result < beforeAdding) return null // overflow has happened\n }\n\n return result\n}\n\n/**\n * Parses the string as an [ULong] number and returns the result\n * or `null` if the string is
not a valid representation of a number.\n
*\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class)\npublic fun
String.toULongOrNull(): ULong? = toULongOrNull(radix = 10)\n\n/**\n * Parses the string as an [ULong] number
and returns the result\n * or `null` if the string is not a valid representation of a number.\n *\n * @throws
IllegalArgumentException when [radix] is not a valid radix for string to number conversion.\n
*\n@SinceKotlin("1.5")\n@WasExperimental(ExperimentalUnsignedTypes::class)\npublic fun
String.toULongOrNull(radix: Int): ULong? {\n checkRadix(radix)\n\n val length = this.length\n if (length ==
0) return null\n\n val limit: ULong = ULong.MAX_VALUE\n val start: Int\n\n val firstChar = this[0]\n if
(firstChar < '0') {\n if (length == 1 || firstChar != '+') return null\n start = 1\n } else {\n start = 0\n
 }\n\n val limitForMaxRadix = 512409557603043100uL // limit / 36\n var limitBeforeMul =
limitForMaxRadix\n val uradix = radix.toULong()\n var result = 0uL\n for (i in start until length) {\n val
digit = digitOf(this[i], radix)\n\n if (digit < 0) return null\n if (result > limitBeforeMul) {\n if
(limitBeforeMul == limitForMaxRadix) {\n limitBeforeMul = limit / uradix\n }\n if (result >
limitBeforeMul) {\n return null\n }\n } else {\n return null\n }\n }\n\n result *= uradix\n\n val beforeAdding = result\n result += digit.toUInt()\n if (result <
beforeAdding) return null // overflow has happened\n }\n\n return result\n}\n\n"/**\n * Copyright 2010-2018
JetBrains s.r.o. and Kotlin Programming Language contributors.\n * Use of this source code is governed by the
Apache 2.0 license that can be found in the license/LICENSE.txt file.\n
*\n@file:Suppress("INVISIBLE_REFERENCE", "INVISIBLE_MEMBER")\npackage kotlin\n\nimport
kotlin.annotation.AnnotationTarget.\nimport kotlin.internal.RequireKotlin\nimport
kotlin.internal.RequireKotlinVersionKind\n\n/**\n * Marks the API that is dependent on the experimental unsigned
types, including those types themselves.\n *\n * Usages of such API will be reported as warnings unless an explicit
opt-in with\n * the [OptIn] annotation, e.g. `@OptIn(ExperimentalUnsignedTypes::class)`\n * or with the `opt-

```



```

in=kotlin.ExperimentalUnsignedTypes` compiler option is given.\n * It's recommended to propagate the
experimental status to the API that depends on unsigned types by annotating it with this annotation.\n
*/\n@RequiresOptIn(level = RequiresOptIn.Level.WARNING)\n@MustBeDocumented\n@Target(CLASS,
ANNOTATION_CLASS, PROPERTY, FIELD, LOCAL_VARIABLE, VALUE_PARAMETER,
CONSTRUCTOR, FUNCTION, PROPERTY_GETTER, PROPERTY_SETTER,
TYPEALIAS)\n@Retention(AnnotationRetention.BINARY)\n@RequireKotlin("1.2.50", versionKind =
RequireKotlinVersionKind.COMPILER_VERSION)\npublic annotation class ExperimentalUnsignedTypes\n"/*\n
* Copyright 2010-2018 JetBrains s.r.o. and Kotlin Programming Language contributors.\n * Use of this source code
is governed by the Apache 2.0 license that can be found in the license/LICENSE.txt file.\n
*/\n\n@file:kotlin.jvm.JvmMultifileClass\n@file:kotlin.jvm.JvmName("MathKt")\n\npackage
kotlin.math\n\n\n// constants, can't use them from nativeMath as they are not constants there\n\n/** Ratio of the
circumference of a circle to its diameter, approximately 3.14159. */\n@SinceKotlin("1.2")\npublic const val PI:
Double = 3.141592653589793\n\n/** Base of the natural logarithms, approximately 2.71828.
*/\n@SinceKotlin("1.2")\npublic const val E: Double = 2.718281828459045\n\n// region =====
Double Math =====\n\n/** Computes the sine of the angle [x]
given in radians.\n * Special cases:\n * - `sin(NaN|+Inf|-Inf)` is `NaN`\n */\n@SinceKotlin("1.2")\npublic
expect fun sin(x: Double): Double\n\n/** Computes the cosine of the angle [x] given in radians.\n * Special
cases:\n * - `cos(NaN|+Inf|-Inf)` is `NaN`\n */\n@SinceKotlin("1.2")\npublic expect fun cos(x: Double):
Double\n\n/** Computes the tangent of the angle [x] given in radians.\n * Special cases:\n * - `tan(NaN|+Inf|-
Inf)` is `NaN`\n */\n@SinceKotlin("1.2")\npublic expect fun tan(x: Double): Double\n\n/** Computes the arc
sine of the value [x];\n * the returned value is an angle in the range from `-PI/2` to `PI/2` radians.\n * Special
cases:\n * - `asin(x)` is `NaN`, when `abs(x) > 1` or x is `NaN`\n */\n@SinceKotlin("1.2")\npublic expect fun
asin(x: Double): Double\n\n/** Computes the arc cosine of the value [x];\n * the returned value is an angle in
the range from `0.0` to `PI` radians.\n * Special cases:\n * - `acos(x)` is `NaN`, when `abs(x) > 1` or x is
`NaN`\n */\n@SinceKotlin("1.2")\npublic expect fun acos(x: Double): Double\n\n/** Computes the arc tangent
of the value [x];\n * the returned value is an angle in the range from `-PI/2` to `PI/2` radians.\n * Special
cases:\n * - `atan(NaN)` is `NaN`\n */\n@SinceKotlin("1.2")\npublic expect fun atan(x: Double): Double\n\n/**
Returns the angle `theta` of the polar coordinates `(r, theta)` that correspond\n * to the rectangular coordinates `(x,
y)` by computing the arc tangent of the value [y] / [x];\n * the returned value is an angle in the range from `-PI` to
`PI` radians.\n * Special cases:\n * - `atan2(0.0, 0.0)` is `0.0`\n * - `atan2(0.0, x)` is `0.0` for `x > 0` and `PI`
for `x < 0`\n * - `atan2(-0.0, x)` is `-0.0` for `x > 0` and `-PI` for `x < 0`\n * - `atan2(y, +Inf)` is `0.0` for `0 < y <
+Inf` and `-0.0` for `-Inf < y < 0`\n * - `atan2(y, -Inf)` is `PI` for `0 < y < +Inf` and `-PI` for `-Inf < y < 0`\n * -
`atan2(y, 0.0)` is `PI/2` for `y > 0` and `-PI/2` for `y < 0`\n * - `atan2(+Inf, x)` is `PI/2` for finite `x`\n * -
`atan2(-Inf, x)` is `-PI/2` for finite `x`\n * - `atan2(NaN, x)` and `atan2(y, NaN)` is `NaN`\n
*/\n@SinceKotlin("1.2")\npublic expect fun atan2(y: Double, x: Double): Double\n\n/** Computes the
hyperbolic sine of the value [x].\n * Special cases:\n * - `sinh(NaN)` is `NaN`\n * - `sinh(+Inf)` is `+Inf`\n *
- `sinh(-Inf)` is `-Inf`\n */\n@SinceKotlin("1.2")\npublic expect fun sinh(x: Double): Double\n\n/** Computes
the hyperbolic cosine of the value [x].\n * Special cases:\n * - `cosh(NaN)` is `NaN`\n * - `cosh(+Inf|-Inf)` is
`+Inf`\n */\n@SinceKotlin("1.2")\npublic expect fun cosh(x: Double): Double\n\n/** Computes the hyperbolic
tangent of the value [x].\n * Special cases:\n * - `tanh(NaN)` is `NaN`\n * - `tanh(+Inf)` is `1.0`\n * - `tanh(-
Inf)` is `-1.0`\n */\n@SinceKotlin("1.2")\npublic expect fun tanh(x: Double): Double\n\n/** Computes the
inverse hyperbolic sine of the value [x].\n * The returned value is `y` such that `sinh(y) == x`.\n * Special
cases:\n * - `asinh(NaN)` is `NaN`\n * - `asinh(+Inf)` is `+Inf`\n * - `asinh(-Inf)` is `-Inf`\n
*/\n@SinceKotlin("1.2")\npublic expect fun asinh(x: Double): Double\n\n/** Computes the inverse hyperbolic
cosine of the value [x].\n * The returned value is positive `y` such that `cosh(y) == x`.\n * Special cases:\n *
- `acosh(NaN)` is `NaN`\n * - `acosh(x)` is `NaN` when `x < 1`\n * - `acosh(+Inf)` is `+Inf`\n
*/\n@SinceKotlin("1.2")\npublic expect fun acosh(x: Double): Double\n\n/** Computes the inverse hyperbolic
tangent of the value [x].\n * The returned value is `y` such that `tanh(y) == x`.\n * Special cases:\n * -

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`tanh(NaN)` is `NaN` \* `tanh(x)` is `NaN` when `x > 1` or `x < -1` \* `tanh(1.0)` is `+Inf` \* `tanh(-1.0)` is `-Inf` \* `@SinceKotlin("1.2")` public expect fun `atanh(x: Double): Double` \* Computes `sqrt(x^2 + y^2)` without intermediate overflow or underflow. \* Special cases: \* - returns `+Inf` if any of arguments is infinite \* - returns `NaN` if any of arguments is `NaN` and the other is not infinite

`@SinceKotlin("1.2")` public expect fun `hypot(x: Double, y: Double): Double` \* Computes the positive square root of the value `[x]`. \* Special cases: \* - `sqrt(x)` is `NaN` when `x < 0` or `x` is `NaN`

`@SinceKotlin("1.2")` public expect fun `sqrt(x: Double): Double` \* Computes Euler's number `e` raised to the power of the value `[x]`. \* Special cases: \* - `exp(NaN)` is `NaN` \* - `exp(+Inf)` is `+Inf` \* - `exp(-Inf)` is `0.0`

`@SinceKotlin("1.2")` public expect fun `exp(x: Double): Double` \* Computes `exp(x) - 1`. \* This function can be implemented to produce more precise result for `[x]` near zero. \* Special cases: \* - `expm1(NaN)` is `NaN` \* - `expm1(+Inf)` is `+Inf` \* - `expm1(-Inf)` is `-1.0` \* @see `[exp]` function.

`@SinceKotlin("1.2")` public expect fun `expm1(x: Double): Double` \* Computes the logarithm of the value `[x]` to the given `[base]`. \* Special cases: \* - `log(x, b)` is `NaN` if either `x` or `b` are `NaN` \* - `log(x, b)` is `NaN` when `x < 0` or `b <= 0` or `b == 1.0` \* - `log(+Inf, +Inf)` is `NaN` \* - `log(+Inf, b)` is `+Inf` for `b > 1` and `-Inf` for `b < 1` \* - `log(0.0, b)` is `-Inf` for `b > 1` and `+Inf` for `b < 1` \* See also logarithm functions for common fixed bases: `[ln]`, `[log10]` and `[log2]`.

`@SinceKotlin("1.2")` public expect fun `log(x: Double, base: Double): Double` \* Computes the natural logarithm (base `E`) of the value `[x]`. \* Special cases: \* - `ln(NaN)` is `NaN` \* - `ln(x)` is `NaN` when `x < 0.0` \* - `ln(+Inf)` is `+Inf` \* - `ln(0.0)` is `-Inf`

`@SinceKotlin("1.2")` public expect fun `ln(x: Double): Double` \* Computes the common logarithm (base 10) of the value `[x]`. \* @see `[ln]` function for special cases.

`@SinceKotlin("1.2")` public expect fun `log10(x: Double): Double` \* Computes the binary logarithm (base 2) of the value `[x]`. \* @see `[ln]` function for special cases.

`@SinceKotlin("1.2")` public expect fun `log2(x: Double): Double` \* Computes `ln(x + 1)`. \* This function can be implemented to produce more precise result for `[x]` near zero. \* Special cases: \* - `ln1p(NaN)` is `NaN` \* - `ln1p(x)` is `NaN` where `x < -1.0` \* - `ln1p(-1.0)` is `-Inf` \* - `ln1p(+Inf)` is `+Inf` \* @see `[ln]` function \* @see `[expm1]` function

`@SinceKotlin("1.2")` public expect fun `ln1p(x: Double): Double` \* Rounds the given value `[x]` to an integer towards positive infinity. \* @return the smallest double value that is greater than or equal to the given value `[x]` and is a mathematical integer. \* Special cases: \* - `ceil(x)` is `x` where `x` is `NaN` or `+Inf` or `-Inf` or already a mathematical integer.

`@SinceKotlin("1.2")` public expect fun `ceil(x: Double): Double` \* Rounds the given value `[x]` to an integer towards negative infinity. \* @return the largest double value that is smaller than or equal to the given value `[x]` and is a mathematical integer. \* Special cases: \* - `floor(x)` is `x` where `x` is `NaN` or `+Inf` or `-Inf` or already a mathematical integer.

`@SinceKotlin("1.2")` public expect fun `floor(x: Double): Double` \* Rounds the given value `[x]` to an integer towards zero. \* @return the value `[x]` having its fractional part truncated. \* Special cases: \* - `truncate(x)` is `x` where `x` is `NaN` or `+Inf` or `-Inf` or already a mathematical integer.

`@SinceKotlin("1.2")` public expect fun `truncate(x: Double): Double` \* Rounds the given value `[x]` towards the closest integer with ties rounded towards even integer. \* Special cases: \* - `round(x)` is `x` where `x` is `NaN` or `+Inf` or `-Inf` or already a mathematical integer.

`@SinceKotlin("1.2")` public expect fun `round(x: Double): Double` \* Returns the absolute value of the given value `[x]`. \* Special cases: \* - `abs(NaN)` is `NaN` \* @see `absoluteValue` extension property for `[Double]`

`@SinceKotlin("1.2")` public expect fun `abs(x: Double): Double` \* Returns the sign of the given value `[x]`: \* - `-1.0` if the value is negative, \* - zero if the value is zero, \* - `1.0` if the value is positive

`@SinceKotlin("1.2")` public expect fun `sign(x: Double): Double` \* Returns the smaller of two values. \* If either value is `NaN`, then the result is `NaN`.

`@SinceKotlin("1.2")` public expect fun `min(a: Double, b: Double): Double` \* Returns the greater of two values. \* If either value is `NaN`, then the result is `NaN`.

`@SinceKotlin("1.2")` public expect fun `max(a: Double, b: Double): Double` // extensions \* Raises this value to the power `[x]`. \* Special cases: \* - `b.pow(0.0)` is `1.0` \* - `b.pow(1.0) == b`

`b.pow(NaN)` is `NaN` `n * - NaN.pow(x)` is `NaN` for `x != 0.0` `n * - b.pow(Inf)` is `NaN` for `abs(b) == 1.0` `n * - b.pow(x)` is `NaN` for `b < 0` and `x` is finite and not an integer `n * /n @SinceKotlin("1.2")\npublic expect fun Double.pow(x: Double): Double\n/n/**\n * Raises this value to the integer power [n].\n * See the other overload of [pow] for details.\n * /n @SinceKotlin("1.2")\npublic expect fun Double.pow(n: Int): Double\n/n/**\n * Returns the absolute value of this value.\n * Special cases:\n * - NaN.absoluteValue is NaN n * /n * @see abs function\n * /n @SinceKotlin("1.2")\npublic expect val Double.absoluteValue: Double\n/n/**\n * Returns the sign of this value:\n * - -1.0 if the value is negative,\n * - zero if the value is zero,\n * - 1.0 if the value is positive\n * Special case:\n * - NaN.sign is NaN n * /n @SinceKotlin("1.2")\npublic expect val Double.sign: Double\n/n/**\n * Returns this value with the sign bit same as of the [sign] value.\n * If [sign] is NaN the sign of the result is undefined.\n * /n @SinceKotlin("1.2")\npublic expect fun Double.withSign(sign: Double): Double\n/n/**\n * Returns this value with the sign bit same as of the [sign] value.\n * /n @SinceKotlin("1.2")\npublic expect fun Double.withSign(sign: Int): Double\n/n/**\n * Returns the ulp (unit in the last place) of this value.\n * An ulp is a positive distance between this value and the next nearest [Double] value larger in magnitude.\n * Special Cases:\n * - NaN.ulp is NaN n * - x.ulp is +Inf when x is +Inf or -Inf n * - 0.0.ulp is Double.MIN_VALUE n * /n @SinceKotlin("1.2")\npublic expect val Double.ulp: Double\n/n/**\n * Returns the [Double] value nearest to this value in direction of positive infinity.\n * /n @SinceKotlin("1.2")\npublic expect fun Double.nextUp(): Double\n/n/**\n * Returns the [Double] value nearest to this value in direction of negative infinity.\n * /n @SinceKotlin("1.2")\npublic expect fun Double.nextDown(): Double\n/n/**\n * Returns the [Double] value nearest to this value in direction from this value towards the value [to].\n * Special cases:\n * - x.nextTowards(y) is NaN if either x or y are NaN n * - x.nextTowards(x) == x n * /n @SinceKotlin("1.2")\npublic expect fun Double.nextTowards(to: Double): Double\n/n/**\n * Rounds this [Double] value to the nearest integer and converts the result to [Int].\n * Ties are rounded towards positive infinity.\n * Special cases:\n * - x.roundToInt() == Int.MAX_VALUE when x > Int.MAX_VALUE n * - x.roundToInt() == Int.MIN_VALUE when x < Int.MIN_VALUE n * /n * @throws IllegalArgumentException when this value is NaN n * /n @SinceKotlin("1.2")\npublic expect fun Double.roundToInt(): Int\n/n/**\n * Rounds this [Double] value to the nearest integer and converts the result to [Long].\n * Ties are rounded towards positive infinity.\n * Special cases:\n * - x.roundToLong() == Long.MAX_VALUE when x > Long.MAX_VALUE n * - x.roundToLong() == Long.MIN_VALUE when x < Long.MIN_VALUE n * /n * @throws IllegalArgumentException when this value is NaN n * /n @SinceKotlin("1.2")\npublic expect fun Double.roundToLong(): Long\n/n// endregion\n/n\n// region ===== Float Math =====\n/n/** Computes the sine of the angle [x] given in radians.\n * Special cases:\n * - sin(NaN|+Inf|-Inf) is NaN n * /n @SinceKotlin("1.2")\npublic expect fun sin(x: Float): Float\n/n/** Computes the cosine of the angle [x] given in radians.\n * Special cases:\n * - cos(NaN|+Inf|-Inf) is NaN n * /n @SinceKotlin("1.2")\npublic expect fun cos(x: Float): Float\n/n/** Computes the tangent of the angle [x] given in radians.\n * Special cases:\n * - tan(NaN|+Inf|-Inf) is NaN n * /n @SinceKotlin("1.2")\npublic expect fun tan(x: Float): Float\n/n/** Computes the arc sine of the value [x];\n * the returned value is an angle in the range from -PI/2 to PI/2 radians.\n * Special cases:\n * - asin(x) is NaN, when abs(x) > 1 or x is NaN n * /n @SinceKotlin("1.2")\npublic expect fun asin(x: Float): Float\n/n/** Computes the arc cosine of the value [x];\n * the returned value is an angle in the range from 0.0 to PI radians.\n * Special cases:\n * - acos(x) is NaN, when abs(x) > 1 or x is NaN n * /n @SinceKotlin("1.2")\npublic expect fun acos(x: Float): Float\n/n/** Computes the arc tangent of the value [x];\n * the returned value is an angle in the range from -PI/2 to PI/2 radians.\n * Special cases:\n * - atan(NaN) is NaN n * /n @SinceKotlin("1.2")\npublic expect fun atan(x: Float): Float\n/n/** Returns the angle theta of the polar coordinates (r, theta) that correspond\n * to the rectangular coordinates (x, y) by computing the arc tangent of the value [y] / [x];\n * the returned value is an angle in the range from -PI to PI radians.\n * Special cases:\n * - atan2(0.0, 0.0) is 0.0 n * - atan2(0.0, x) is 0.0 for x > 0 and PI for x < 0 n * - atan2(-0.0, x) is -0.0 for x > 0 and -PI for x < 0 n * - atan2(y, +Inf) is 0.0 for 0 < y <`

$+\text{Inf}$  and  $-0.0$  for  $-\text{Inf} < y < 0$   $\backslash$ n \*  $-\text{atan2}(y, -\text{Inf})$  is  $\text{PI}$  for  $0 < y < +\text{Inf}$  and  $-\text{PI}$  for  $-\text{Inf} < y < 0$   $\backslash$ n \*  $-\text{atan2}(y, 0.0)$  is  $\text{PI}/2$  for  $y > 0$  and  $-\text{PI}/2$  for  $y < 0$   $\backslash$ n \*  $-\text{atan2}(+\text{Inf}, x)$  is  $\text{PI}/2$  for finite  $x$   $\backslash$ n \*  $-\text{atan2}(-\text{Inf}, x)$  is  $-\text{PI}/2$  for finite  $x$   $\backslash$ n \*  $-\text{atan2}(\text{NaN}, x)$  and  $\text{atan2}(y, \text{NaN})$  is  $\text{NaN}$   $\backslash$ n

$\backslash$ n @SinceKotlin("1.2")\npublic expect fun atan2(y: Float, x: Float): Float\n\n/\*\*\n \* Computes the hyperbolic sine of the value [x].\n \* Special cases:\n \*  $-\text{sinh}(\text{NaN})$  is  $\text{NaN}$   $\backslash$ n \*  $-\text{sinh}(+\text{Inf})$  is  $+\text{Inf}$   $\backslash$ n \*  $-\text{sinh}(-\text{Inf})$  is  $-\text{Inf}$   $\backslash$ n

$\backslash$ n @SinceKotlin("1.2")\npublic expect fun sinh(x: Float): Float\n\n/\*\*\n \* Computes the hyperbolic cosine of the value [x].\n \* Special cases:\n \*  $-\text{cosh}(\text{NaN})$  is  $\text{NaN}$   $\backslash$ n \*  $-\text{cosh}(+\text{Inf})$  is  $+\text{Inf}$   $\backslash$ n \*  $-\text{cosh}(-\text{Inf})$  is  $+\text{Inf}$   $\backslash$ n

$\backslash$ n @SinceKotlin("1.2")\npublic expect fun cosh(x: Float): Float\n\n/\*\*\n \* Computes the hyperbolic tangent of the value [x].\n \* Special cases:\n \*  $-\text{tanh}(\text{NaN})$  is  $\text{NaN}$   $\backslash$ n \*  $-\text{tanh}(+\text{Inf})$  is  $1.0$   $\backslash$ n \*  $-\text{tanh}(-\text{Inf})$  is  $-1.0$   $\backslash$ n

$\backslash$ n @SinceKotlin("1.2")\npublic expect fun tanh(x: Float): Float\n\n/\*\*\n \* Computes the inverse hyperbolic sine of the value [x].\n \* The returned value is `y` such that  $\text{sinh}(y) == x$ .  
 Special cases:\n \*  $-\text{asinh}(\text{NaN})$  is  $\text{NaN}$   $\backslash$ n \*  $-\text{asinh}(+\text{Inf})$  is  $+\text{Inf}$   $\backslash$ n \*  $-\text{asinh}(-\text{Inf})$  is  $-\text{Inf}$   $\backslash$ n

$\backslash$ n @SinceKotlin("1.2")\npublic expect fun asinh(x: Float): Float\n\n/\*\*\n \* Computes the inverse hyperbolic cosine of the value [x].  
 The returned value is positive `y` such that  $\text{cosh}(y) == x$ .  
 Special cases:\n \*  $-\text{acosh}(\text{NaN})$  is  $\text{NaN}$   $\backslash$ n \*  $-\text{acosh}(x)$  is  $\text{NaN}$  when  $x < 1$   $\backslash$ n \*  $-\text{acosh}(+\text{Inf})$  is  $+\text{Inf}$   $\backslash$ n

$\backslash$ n @SinceKotlin("1.2")\npublic expect fun acosh(x: Float): Float\n\n/\*\*\n \* Computes the inverse hyperbolic tangent of the value [x].  
 The returned value is `y` such that  $\text{tanh}(y) == x$ .  
 Special cases:\n \*  $-\text{tanh}(\text{NaN})$  is  $\text{NaN}$   $\backslash$ n \*  $-\text{tanh}(x)$  is  $\text{NaN}$  when  $x > 1$  or  $x < -1$   $\backslash$ n \*  $-\text{tanh}(1.0)$  is  $+\text{Inf}$   $\backslash$ n \*  $-\text{tanh}(-1.0)$  is  $-\text{Inf}$   $\backslash$ n

$\backslash$ n @SinceKotlin("1.2")\npublic expect fun atanh(x: Float): Float\n\n/\*\*\n \* Computes  $\text{sqrt}(x^2 + y^2)$  without intermediate overflow or underflow.  
 Special cases:\n \* - returns  $+\text{Inf}$  if any of arguments is infinite  
 - returns  $\text{NaN}$  if any of arguments is  $\text{NaN}$  and the other is not infinite

$\backslash$ n @SinceKotlin("1.2")\npublic expect fun hypot(x: Float, y: Float): Float\n\n/\*\*\n \* Computes the positive square root of the value [x].  
 Special cases:\n \*  $-\text{sqrt}(x)$  is  $\text{NaN}$  when  $x < 0$  or  $x$  is  $\text{NaN}$

$\backslash$ n @SinceKotlin("1.2")\npublic expect fun sqrt(x: Float): Float\n\n/\*\*\n \* Computes Euler's number `e` raised to the power of the value [x].  
 Special cases:\n \*  $-\text{exp}(\text{NaN})$  is  $\text{NaN}$   $\backslash$ n \*  $-\text{exp}(+\text{Inf})$  is  $+\text{Inf}$   $\backslash$ n \*  $-\text{exp}(-\text{Inf})$  is  $0.0$

$\backslash$ n @SinceKotlin("1.2")\npublic expect fun exp(x: Float): Float\n\n/\*\*\n \* Computes  $\text{exp}(x)$  - 1.  
 This function can be implemented to produce more precise result for [x] near zero.  
 Special cases:\n \*  $-\text{expm1}(\text{NaN})$  is  $\text{NaN}$   $\backslash$ n \*  $-\text{expm1}(+\text{Inf})$  is  $+\text{Inf}$   $\backslash$ n \*  $-\text{expm1}(-\text{Inf})$  is  $-1.0$

$\backslash$ n @see [exp] function.

$\backslash$ n @SinceKotlin("1.2")\npublic expect fun expm1(x: Float): Float\n\n/\*\*\n \* Computes the logarithm of the value [x] to the given [base].  
 Special cases:\n \*  $-\text{log}(x, b)$  is  $\text{NaN}$  if either  $x$  or  $b$  are  $\text{NaN}$   $\backslash$ n \*  $-\text{log}(x, b)$  is  $\text{NaN}$  when  $x < 0$  or  $b \leq 0$  or  $b == 1.0$   $\backslash$ n \*  $-\text{log}(+\text{Inf}, +\text{Inf})$  is  $\text{NaN}$   $\backslash$ n \*  $-\text{log}(+\text{Inf}, b)$  is  $+\text{Inf}$  for  $b > 1$  and  $-\text{Inf}$  for  $b < 1$   $\backslash$ n \*  $-\text{log}(0.0, b)$  is  $-\text{Inf}$  for  $b > 1$  and  $+\text{Inf}$  for  $b > 1$

$\backslash$ n \* See also logarithm functions for common fixed bases: [ln], [log10] and [log2].

$\backslash$ n @SinceKotlin("1.2")\npublic expect fun log(x: Float, base: Float): Float\n\n/\*\*\n \* Computes the natural logarithm (base `E`) of the value [x].  
 Special cases:\n \*  $-\text{ln}(\text{NaN})$  is  $\text{NaN}$   $\backslash$ n \*  $-\text{ln}(x)$  is  $\text{NaN}$  when  $x < 0.0$   $\backslash$ n \*  $-\text{ln}(+\text{Inf})$  is  $+\text{Inf}$   $\backslash$ n \*  $-\text{ln}(0.0)$  is  $-\text{Inf}$

$\backslash$ n @SinceKotlin("1.2")\npublic expect fun ln(x: Float): Float\n\n/\*\*\n \* Computes the common logarithm (base 10) of the value [x].  
 @see [ln] function for special cases.

$\backslash$ n @SinceKotlin("1.2")\npublic expect fun log10(x: Float): Float\n\n/\*\*\n \* Computes the binary logarithm (base 2) of the value [x].  
 @see [ln] function for special cases.

$\backslash$ n @SinceKotlin("1.2")\npublic expect fun log2(x: Float): Float\n\n/\*\*\n \* Computes  $\text{ln}(a + 1)$ .  
 This function can be implemented to produce more precise result for [x] near zero.  
 Special cases:\n \*  $-\text{ln1p}(\text{NaN})$  is  $\text{NaN}$   $\backslash$ n \*  $-\text{ln1p}(x)$  is  $\text{NaN}$  where  $x < -1.0$   $\backslash$ n \*  $-\text{ln1p}(-1.0)$  is  $-\text{Inf}$   $\backslash$ n \*  $-\text{ln1p}(+\text{Inf})$  is  $+\text{Inf}$

$\backslash$ n \* @see [ln] function

$\backslash$ n @SinceKotlin("1.2")\npublic expect fun ln1p(x: Float): Float\n\n/\*\*\n \* Rounds the given value [x] to an integer towards positive infinity.  
 @return the smallest Float value that is greater than or equal to the given value [x] and is a mathematical integer.  
 Special cases:\n \*  $-\text{ceil}(x)$  is  $x$  where  $x$  is  $\text{NaN}$  or  $+\text{Inf}$  or  $-\text{Inf}$  or already a mathematical integer.

$\backslash$ n @SinceKotlin("1.2")\npublic expect fun ceil(x: Float): Float\n\n/\*\*\n \* Rounds the given value [x] to an integer towards negative infinity.  
 @return the largest Float value that is smaller than or equal to the given value [x] and is a mathematical integer.  
 Special cases:\n \* -

`floor(x)` is `x` where `x` is `NaN` or `+Inf` or `-Inf` or already a mathematical integer.  
`@SinceKotlin("1.2")` public expect fun `floor(x: Float): Float`: Rounds the given value `[x]` to an integer towards zero.  
`@return` the value `[x]` having its fractional part truncated.  
`Special cases:` `truncate(x)` is `x` where `x` is `NaN` or `+Inf` or `-Inf` or already a mathematical integer.  
`@SinceKotlin("1.2")` public expect fun `truncate(x: Float): Float`: Rounds the given value `[x]` towards the closest integer with ties rounded towards even integer.  
`Special cases:` `round(x)` is `x` where `x` is `NaN` or `+Inf` or `-Inf` or already a mathematical integer.  
`@SinceKotlin("1.2")` public expect fun `round(x: Float): Float`: Returns the absolute value of the given value `[x]`.  
`Special cases:` `abs(NaN)` is `NaN`.  
`@see` `absoluteValue` extension property for `[Float]`.  
`@SinceKotlin("1.2")` public expect fun `abs(x: Float): Float`: Returns the sign of the given value `[x]`: `-1.0` if the value is negative, `0` if the value is zero, `1.0` if the value is positive.  
`Special case:` `sign(NaN)` is `NaN`.  
`@SinceKotlin("1.2")` public expect fun `sign(x: Float): Float`: Returns the smaller of two values.  
`Special cases:` If either value is `NaN`, then the result is `NaN`.  
`@SinceKotlin("1.2")` public expect fun `min(a: Float, b: Float): Float`: Returns the greater of two values.  
`Special cases:` If either value is `NaN`, then the result is `NaN`.  
`@SinceKotlin("1.2")` public expect fun `max(a: Float, b: Float): Float`: Raises this value to the power `[x]`.  
`Special cases:` `b.pow(0.0)` is `1.0`, `b.pow(1.0) == b`, `b.pow(NaN)` is `NaN`, `NaN.pow(x)` is `NaN` for `x != 0.0`, `b.pow(Inf)` is `NaN` for `abs(b) == 1.0`, `b.pow(x)` is `NaN` for `b < 0` and `x` is finite and not an integer.  
`@SinceKotlin("1.2")` public expect fun `Float.pow(x: Float): Float`: Raises this value to the integer power `[n]`.  
`See` the other overload of `[pow]` for details.  
`@SinceKotlin("1.2")` public expect fun `Float.pow(n: Int): Float`: Returns the absolute value of this value.  
`Special cases:` `NaN.absoluteValue` is `NaN`.  
`@see` `abs` function.  
`@SinceKotlin("1.2")` public expect val `Float.absoluteValue: Float`: Returns the sign of this value: `-1.0` if the value is negative, `0` if the value is zero, `1.0` if the value is positive.  
`Special case:` `NaN.sign` is `NaN`.  
`@SinceKotlin("1.2")` public expect val `Float.sign: Float`: Returns this value with the sign bit same as of the `[sign]` value.  
`Special cases:` If `[sign]` is `NaN` the sign of the result is undefined.  
`@SinceKotlin("1.2")` public expect fun `Float.withSign(sign: Float): Float`: Returns this value with the sign bit same as of the `[sign]` value.  
`@SinceKotlin("1.2")` public expect fun `Float.withSign(sign: Int): Float`: Rounds this `[Float]` value to the nearest integer and converts the result to `[Int]`.  
`Ties` are rounded towards positive infinity.  
`Special cases:` `x.roundToInt() == Int.MAX_VALUE` when `x > Int.MAX_VALUE`, `x.roundToInt() == Int.MIN_VALUE` when `x < Int.MIN_VALUE`.  
`@throws` `IllegalArgumentException` when this value is `NaN`.  
`@SinceKotlin("1.2")` public expect fun `Float.roundToInt(): Int`: Rounds this `[Float]` value to the nearest integer and converts the result to `[Long]`.  
`Ties` are rounded towards positive infinity.  
`Special cases:` `x.roundToLong() == Long.MAX_VALUE` when `x > Long.MAX_VALUE`, `x.roundToLong() == Long.MIN_VALUE` when `x < Long.MIN_VALUE`.  
`@throws` `IllegalArgumentException` when this value is `NaN`.  
`@SinceKotlin("1.2")` public expect fun `Float.roundToLong(): Long`: `endregion` region  
`==== Integer Math ====`  
`Special cases:` `abs(Int.MIN_VALUE)` is `Int.MIN_VALUE` due to an overflow.  
`@see` `absoluteValue` extension property for `[Int]`.  
`@SinceKotlin("1.2")` public expect fun `abs(n: Int): Int`: Returns the smaller of two values.  
`@SinceKotlin("1.2")` public expect fun `min(a: Int, b: Int): Int`: Returns the greater of two values.  
`@SinceKotlin("1.2")` public expect fun `max(a: Int, b: Int): Int`: Returns the absolute value of this value.  
`Special cases:` `Int.MIN_VALUE.absoluteValue` is `Int.MIN_VALUE` due to an overflow.  
`@see` `abs` function.  
`@SinceKotlin("1.2")` public expect val `Int.absoluteValue: Int`: Returns the sign of this value: `-1` if the value is negative, `0` if the value is zero, `1` if the value is positive.  
`@SinceKotlin("1.2")` public expect val `Int.sign: Int`: Returns the absolute value of the given value `[n]`.  
`Special cases:` `abs(Long.MIN_VALUE)` is `Long.MIN_VALUE` due to an

overflow\n \* \n \* @see absoluteValue extension property for [Long]\n \* ^\n@SinceKotlin("1.2")\npublic expect fun  
abs(n: Long): Long\n\n/\*\*\n \* Returns the smaller of two values.\n \* ^\n@SinceKotlin("1.2")\npublic expect fun  
min(a: Long, b: Long): Long\n\n/\*\*\n \* Returns the greater of two values.\n \* ^\n@SinceKotlin("1.2")\npublic  
expect fun max(a: Long, b: Long): Long\n\n/\*\*\n \* Returns the absolute value of this value.\n \* \n \* Special cases:\n \*  
\* - `Long.MIN\_VALUE.absoluteValue` is `Long.MIN\_VALUE` due to an overflow\n \* \n \* @see abs function\n \*  
\* ^\n@SinceKotlin("1.2")\npublic expect val Long.absoluteValue: Long\n\n/\*\*\n \* Returns the sign of this value:\n \*  
\* - `-1` if the value is negative,\n \* - `0` if the value is zero,\n \* - `1` if the value is positive\n \*  
\* ^\n@SinceKotlin("1.2")\npublic expect val Long.sign: Int\n\n\n//  
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6B,Y;MAE7B,yBAEqC,MAAO,G;MAE5C,yBAEqC,CAAC,GAAD,GAAQ,G;MAE7C,WAEuB,EAAE,MAAO,G  
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MAAA,kC;MAEI,iBACqB,W;MAErB,iBACqB,U;MAErB,kBACuB,C;MAEvB,iBACsB,E;K;;IAZ1B,0C;MAAA,  
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AAA,oC;MAEI,iBACuB,U;MAEvB,iBACuB,K;MAEvB,kBACuB,C;MAEvB,iBACsB,E;K;;IAZ1B,4C;MAAA,2  
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vB,iBACsB,C;K;;IAZ1B,2C;MAAA,0C;QAAA,yB;;MAAA,mC;K;IAeA,+B;MAAA,mC;MAEI,iBACmC,C;MAE  
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,+B;yBAEQ,kC;;gBCr0C6C,yB;;IC/ErF,kD;MAMuF,wC;K;IANvF,4CAOI,  
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e;UA15SI,IAhHsC,SAgHIC,EAk5SkB,cA15SIB,EAk5SkB,sBA15SIB,Wak5S2B,IA15S3B,CAAJ,C;YAA2C,sBAk5  
SZ,IA15SY,C;;QA hH/C,OAKHO,W;O;KA1HX,C;kGAWA,yB;MAAA,+D;MAAA,uC;QAQW,kBAAgB,gB;QAig  
TV,gB;QADb,YAAy,C;QACZ,iD;UAAa,WAAb,e;UA94SI,IANHuC,SAmHnC,EA84SkB,cA94SIB,EA84SkB,sBA  
94SIB,WA84S2B,IA94S3B,CAAJ,C;YAA2C,sBA84SZ,IA94SY,C;;QAnH/C,OAqHO,W;O;KA7HX,C;kGAWA,y  
B;MAAA,+D;MAAA,uC;QAQW,kBAAgB,gB;QAaggTV,gB;QADb,YAAy,C;QACZ,iD;UAAa,WAAb,e;UA14SI,  
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SY,C;;QAtH/C,OA wHO,W;O;KAhIX,C;kGAWA,yB;MAAA,+D;MAAA,uC;QAQW,kBAAgB,gB;QA+/SV,gB;Q  
ADb,YAAy,C;QACZ,iD;UAAa,WAAb,e;UA4SI,IAzHyC,SAyHrC,EA4SkB,cAt4SIB,EA4SkB,sBA4SIB,WAs  
4S2B,IA4S3B,CAAJ,C;YAA2C,sBA4SZ,IA4SY,C;;QAzH/C,OA2HO,W;O;KANIX,C;kGAWA,yB;MAAA,+D;  
MA2HA,gC;MAo4SA,oC;MA//SA,uC;QAQW,kBAAgB,gB;QA8/SV,gB;QADb,YAAy,C;QACZ,iD;UAAa,WAA  
b,0B;UAAmB,eAAO,cAAP,EAAO,sBAAP,S;UAAA,cAAgB,iB;UA14S/B,IA5HsC,SA4HIC,CAAU,OAAV,EAai  
B,OAAjB,CAAJ,C;YAA2C,sBAAI,OAAJ,C;;QA5H/C,OA8HO,W;O;KA tIX,C;oGAWA,6C;MA26SiB,gB;MADb,  
YAAy,C;MACZ,iD;QAAa,WAAb,e;QA16SI,IAAI,Wak6SkB,cA16SIB,EAk6SkB,sBA16SIB,Wak6S2B,IA16S3B,  
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,sBA85SZ,IA95SY,C;;MAE/C,OAAO,W;K;sGAGX,6C;MAm6SiB,gB;MADb,YAAy,C;MACZ,iD;QAAa,WAAb,  
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SY,C;;MAE/C,OAAO,W;K;qGAGX,6C;MA+5SiB,gB;MADb,YAAy,C;MACZ,iD;QAAa,WAAb,e;QAt5SI,IAAI,WA55SkB,cAt5SIB,EAs5SkB,sBA5SIB,WA55S2B,IAt5S3B,CAAJ,C;UAA2C,sBA5S5Z,IAt5SY,C;;MAE/C,OAAO,W;K;sGAGX,6C;MA25SiB,gB;MADb,YAAy,C;MACZ,iD;QAAa,WAAb,e;QAI5SI,IAAI,Wak5SkB,cAI5SIB,Eak5SkB,sBAI5SIB,Wak5S2B,IAI5S3B,CAAJ,C;UAA2C,sBAk5SZ,IAI5SY,C;;MAE/C,OAAO,W;K;sGAGX,6C;MAu5SiB,gB;MADb,YAAy,C;MACZ,iD;QAAa,WAAb,e;QA94SI,IAAI,WA84SkB,cA94SIB,EA84SkB,sBA94SIB,WA84S2B,IA94S3B,CAAJ,C;UAA2C,sBA84SZ,IA94SY,C;;MAE/C,OAAO,W;K;sGAGX,6C;MAM5SiB,gB;MADb,YAAy,C;MACZ,iD;QAAa,WAAb,e;QA14SI,IAAI,WA04SkB,cA14SIB,EA04SkB,sBA14SIB,WA04S2B,IA14S3B,CAAJ,C;UAA2C,sBA04SZ,IA14SY,C;;MAE/C,OAAO,W;K;sGAGX,6C;MA+4SiB,gB;MADb,YAAy,C;MACZ,iD;QAAa,WAAb,e;QAt4SI,IAAI,WA4SkB,cAt4SIB,EAs4SkB,sBA4SIB,WA4S2B,IAt4S3B,CAAJ,C;UAA2C,sBA4S4Z,IAt4SY,C;;MAE/C,OAAO,W;K;sGAGX,yB;MAAA,gC;MAo4SA,oC;Map4SA,oD;QA24SiB,gB;QADb,YAAy,C;QACZ,iD;UAAa,WAAb,0B;UAAmB,eAAO,cAAP,EAAO,sBAAP,S;UAAA,cAAgB,iB;UAI4S/B,IAAI,UAAU,OAAV,EAaiB,OAAjB,CAAJ,C;YAA2C,sBAAI,OAAJ,C;;QAE/C,OAAO,W;O;KAXX,C;sGAcA,yB;MAAA,+D;MAAA,sC;QAMW,kBAAmB,gB;QASV,Q;QAaHb,iD;UAAgB,cAAhB,e;UAAsB,IAAI,YAAJ,C;YAAkB,WAAy,WAAI,OAAJ,C;;QATpD,OAuO,W;O;KAhBX,C;0GASA,4C;MAMoB,Q;MAAhB,wBAAgB,SAAhB,gB;QAAgB,cAAA,SAAhB,M;QAAsB,IAAI,YAAJ,C;UAAkB,WAAy,WAAI,OAAJ,C;;MACpD,OAAO,W;K;wFAGX,yB;MAAA,+D;MAAA,uC;QAMW,kBAAY,gB;QAoGH,Q;QAaHb,iD;UAAgB,cAAhB,e;UAAsB,IAAI,CApGS,SAoGR,CAAU,OAAV,CAAL,C;YAAyB,WAAy,WAAI,OAAJ,C;;QApG3D,OAqGO,W;O;KA3GX,C;0FASA,yB;MAAA,+D;MAAA,uC;QAMW,kBAAY,gB;QAqGH,Q;QAaHb,iD;UAAgB,cAAhB,e;UAAsB,IAAI,CArGY,SAqGX,CAAU,OAAV,CAAL,C;YAAyB,WAAy,WAAI,OAAJ,C;;QArG3D,OAsgo,W;O;KA5GX,C;0FASA,yB;MAAA,+D;MAAA,uC;QAMW,kBAAY,gB;QAsGH,Q;QAaHb,iD;UAAgB,cAAhB,e;UAAsB,IAAI,CAtGa,SAsgZ,CAAU,OAAV,CAAL,C;YAAyB,WAAy,WAAI,OAAJ,C;;QAtG3D,OAuGO,W;O;KA7GX,C;0FASA,yB;MAAA,+D;MAAA,uC;QAMW,kBAAY,gB;QAwGH,Q;QAaHb,iD;UAAgB,cAAhB,e;UAAsB,IAAI,CAvGW,SAuGV,CAAU,OAAV,CAAL,C;YAAyB,WAAy,WAAI,OAAJ,C;;QAvG3D,OAwGO,W;O;KA9GX,C;0FASA,yB;MAAA,+D;MAAA,uC;QAMW,kBAAY,gB;QAxGH,Q;QAaHb,iD;UAAgB,cAAhB,e;UAAsB,IAAI,CAxGY,SAwGX,CAAU,OAAV,CAAL,C;YAAyB,WAAy,WAAI,OAAJ,C;;QAxG3D,OAyGO,W;O;KA/GX,C;0FASA,yB;MAAA,+D;MAAA,uC;QAMW,kBAAY,gB;QAYGH,Q;QAaHb,iD;UAAgB,cAAhB,e;UAAsB,IAAI,CAzGa,SAyGZ,CAAU,OAAV,CAAL,C;YAAyB,WAAy,WAAI,OAAJ,C;;QAzG3D,OA0GO,W;O;KAhHX,C;0FASA,yB;MAAA,+D;MAAA,uC;QAMW,kBAAY,gB;QA0GH,Q;QAaHb,iD;UAAgB,cAAhB,e;UAAsB,IAAI,CA1Gc,SA0Gb,CAAU,OAAV,CAAL,C;YAAyB,WAAy,WAAI,OAAJ,C;;QA1G3D,OA2GO,W;O;KAjHX,C;0FASA,yB;MAAA,+D;MAAA,uC;QAMW,kBAAY,gB;QA2GH,Q;QAaHb,iD;UAAgB,cAAhB,e;UAAsB,IAAI,CA3Ge,SA2Gd,CAAU,OAAV,CAAL,C;YAAyB,WAAy,WAAI,OAAJ,C;;QA3G3D,OA4GO,W;O;KAiHX,C;0FASA,yB;MAAA,+D;MAAA,oC;MAAA,gC;MA5GA,uC;QAMW,kBAAY,gB;QA4GH,Q;QAaHb,iD;UAAgB,cAAhB,0B;UAAsB,IAAI,CA5GY,SA4GX,CAAU,oBAAV,CAAL,C;YAAyB,WAAy,WAAI,oBAAJ,C;;QA5G3D,OA6GO,W;O;KANHX,C;IASA,kC;MAMI,OAAO,2BAAgB,gBAAhB,C;K;IAGX,iD;MAMoB,Q;MAAhB,wBAAgB,SAAhB,gB;QAAgB,cAAA,SAAhB,M;QAAsB,IAAI,eAAJ,C;UAAqB,WAAy,WAAI,OAAJ,C;;MACvD,OAAO,W;K;4FAGX,6C;MAMoB,Q;MAAhB,wBAAgB,SAAhB,gB;QAAgB,cAAA,SAAhB,M;QAAsB,IAAI,CAAC,UAAU,OAAV,CAAL,C;UAAyB,WAAy,WAAI,OAAJ,C;;MAC3D,OAAO,W;K;8FAGX,6C;MAMoB,Q;MAAhB,wBAAgB,SAAhB,gB;QAAgB,cAAA,SAAhB,M;QAAsB,IAAI,CAAC,UAAU,OAAV,CAAL,C;UAAyB,WAAy,WAAI,OAAJ,C;;MAC3D,OAAO,W;K;8FAGX,6C;MAMoB,Q;MAAhB,wBAAgB,SAAhB,gB;QAAgB,cAAA,SAAhB,M;QAAsB,IAAI,CAAC,UAAU,OAAV,CAAL,C;UAAyB,WAAy,WAAI,OAAJ,C;;MAC3D,OAAO,W;K;8FAGX,6C;MAMoB,Q;MAAhB,wBAAgB,SAAhB,gB;QAAgB,cAAA,SAAhB,M;QAAsB,IAAI,CAAC,UAAU,OAAV,CAAL,C;UAAyB,WAAy,WAAI,OAAJ,C;;MAC3D,OAAO,W;K;8FAGX,6C;MAMoB,Q;MAAhB,wBAAgB,SAAhB,gB;QAAgB,cAAA,SAAhB,M;QAAsB,IAAI,CAAC,UAAU,OAAV,CAAL,C;UAAyB,WAAy,WAAI,OAAJ,C;;MAC3D,OAAO,W;K;8FAGX,6C;MAMoB,Q;MAAhB,wBAAgB,SAAhB,gB;QAAgB,cAAA,SAAhB,M;QAAsB,IAAI,CAAC,UAAU,OAAV,CAAL,C;UAAyB,WAAy,WAAI,OAAJ,C;;MAC3D,OAAO,W;K;8FAGX,6C;MAMoB,Q;MAAhB,wBAAgB,SAAhB,gB;QAAgB,cAAA,SAAhB,M;QAAsB,IAAI,CAAC,UAAU,OAAV,CAAL,C;UAAyB,WAAy,WAAI,OAAJ,C;;MAC3D,OAAO,W;K;8FAGX,6C;MAMoB,Q;MAAhB,wBAAgB,SAAhB,gB;QAAgB,cAAA,SAAhB,M;QAAsB,IAAI,CAAC,UAAU,OAAV,CAAL,C;UAAyB,WAAy,WAAI,OAAJ,C;;MAC3D,OAAO,W;K;8FAGX,6C;MAMoB,Q;MAAhB,wBAAgB,SAAhB,gB;QAAgB,cAAA,SAAhB,M;QAAsB,IAAI,CAAC,UAAU,OAAV,CAAL,C;UAAyB,WAAy,WAAI,OAAJ,C;;MAC3D,OAAO,W;K;8FAGX,yB;MAAA,

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AGW,sB;;QAUP,eAAe,oB;QACf,IAAI,CAAC,QAAS,UAAAd,C;UAAyB,qBAAO,I;UAAP,uB;;QACzB,cAAc,QA  
AS,O;QACvB,IAAI,CAAC,QAAS,UAAAd,C;UAAyB,qBAAO,O;UAAP,uB;;QACzB,eAdmB,QAcJ,CAAS,OAAT,  
C;;UAEX,QAAQ,QAAS,O;UACjB,QAjBe,QAiBP,CAAS,CAAT,C;UACR,IAAI,2BAAW,CAAX,KAAJ,C;YACI,  
UAAU,C;YACV,WAAW,C;;;QAED,QAAT,QAAS,W;QACIB,qBAAO,O;;;MAvBP,yB;K;8FAGJ,+B;MAOI,eAA  
e,oB;MACf,IAAI,CAAC,QAAS,UAAAd,C;QAAyB,OAAO,I;MACHc,cAAc,QAAS,O;MACvB,IAAI,CAAC,QAAS  
,UAAAd,C;QAAyB,OAAO,O;MACHc,eAAe,SAAS,OAAT,C;;QAEX,QAAQ,QAAS,O;QACjB,QAAQ,SAAS,CAA  
T,C;QACR,IAAI,2BAAW,CAAX,KAAJ,C;UACI,UAAU,C;UACV,WAAW,C;;;MAED,QAAT,QAAS,W;MACIB,  
OAAO,O;K;mFAGX,yB;MAAA,sE;MF/yDA,iB;ME+yDA,sC;QAaI,eAAe,oB;QACf,IAAI,CAAC,QAAS,UAAAd,C  
;UAAyB,MAAM,6B;QAC/B,eAAe,SAAS,QAAS,OAAIB,C;QACf,OAAO,QAAS,UAAhB,C;UACI,QAAQ,SAAS,  
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X,C;mFAuBA,yB;MAAA,sE;MFj1DA,iB;MEi1DA,sC;QAaI,eAAe,oB;QACf,IAAI,CAAC,QAAS,UAAAd,C;UAAy  
B,MAAM,6B;QAC/B,eAAe,SAAS,QAAS,OAAIB,C;QACf,OAAO,QAAS,UAAhB,C;UACI,QAAQ,SAAS,QAAS,  
OAAIB,C;UACR,Wf31DG,MAAO,KE21DO,QF31DP,EE21DiB,CF31DjB,C;;QE61Dd,OAAO,Q;O;KApBX,C;m  
FAuBA,yB;MAAA,sE;MAAA,sC;QAWI,eAAe,oB;QACf,IAAI,CAAC,QAAS,UAAAd,C;UAAyB,MAAM,6B;QAC  
/B,eAAe,SAAS,QAAS,OAAIB,C;QACf,OAAO,QAAS,UAAhB,C;UACI,QAAQ,SAAS,QAAS,OAAIB,C;UACR,I  
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3DA,sC;QAWI,eAAe,oB;QACf,IAAI,CAAC,QAAS,UAAAd,C;UAAyB,OAAO,I;QACHc,eAAe,SAAS,QAAS,OA  
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QF53DP,EE43DiB,CF53DjB,C;;QE83Dd,OAAO,Q;O;KAlBX,C;+FAqBA,yB;MFp5DA,iB;MEo5DA,sC;QAWI,e  
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AO,QAAS,UAAhB,C;UACI,QAAQ,SAAS,QAAS,OAAIB,C;UACR,Wf55DG,MAAO,KE45DO,QF55DP,EE45Di  
B,CF55DjB,C;;QE85Dd,OAAO,Q;O;KAlBX,C;+FAqBA,+B;MASI,eAAe,oB;MACf,IAAI,CAAC,QAAS,UAAAd,C  
;QAAyB,OAAO,I;MACHc,eAAe,SAAS,QAAS,OAAIB,C;MACf,OAAO,QAAS,UAAhB,C;QACI,QAAQ,SAAS,  
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AA,sE;MAAA,kD;QAWI,eAAe,oB;QACf,IAAI,CAAC,QAAS,UAAAd,C;UAAyB,MAAM,6B;QAC/B,eAAe,SAAS  
,QAAS,OAAIB,C;QACf,OAAO,QAAS,UAAhB,C;UACI,QAAQ,SAAS,QAAS,OAAIB,C;UACR,IAAI,UAAW,S  
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BA,2C;MASI,eAAe,oB;MACf,IAAI,CAAC,QAAS,UAAAd,C;QAAyB,OAAO,I;MACHc,eAAe,SAAS,QAAS,OAAI  
B,C;MACf,OAAO,QAAS,UAAhB,C;QACI,QAAQ,SAAS,QAAS,OAAIB,C;QACR,IAAI,UAAW,SAAQ,QAAR,E  
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ACI,QAAQ,QAAS,O;QACjB,MFn+DG,MAAO,KEm+DE,GFn+DF,EE+DO,CFn+DP,C;;MEq+Dd,OAAO,G;K;  
IAGX,iC;MAOI,eAAe,oB;MACf,IAAI,CAAC,QAAS,UAAAd,C;QAAyB,OAAO,I;MACHc,UAAU,QAAS,O;MAC  
nB,OAAO,QAAS,UAAhB,C;QACI,QAAQ,QAAS,O;QACjB,MF//DG,MAAO,KE+/DE,GF//DF,EE+/DO,CF//DP,  
C;;MEigEd,OAAO,G;K;IAGX,iC;MAKI,eAAe,oB;MACf,IAAI,CAAC,QAAS,UAAAd,C;QAAyB,OAAO,I;MACHc  
,UAAU,QAAS,O;MACnB,OAAO,QAAS,UAAhB,C;QACI,QAAQ,QAAS,O;QACjB,IAAI,sBAAM,CAAN,KAAJ,  
C;UAAa,MAAM,C;;MAEvB,OAAO,G;K;IAGX,0C;MAGI,OAAO,2BAAc,UAAAd,C;K;IAGX,gD;MAKI,eAAe,oB  
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,C;QACI,QAAQ,QAAS,O;QACjB,IAAI,UAAW,SAAQ,GAAR,EAAa,CAAb,CAAX,GAA6B,CAAjC,C;UAAoC,  
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AO,uB;K;kFAGX,+B;MAGW,sB;;QAUP,eAAe,oB;QACf,IAAI,CAAC,QAAS,UAAAd,C;UAAyB,qBAAO,I;UAAP

,uB;;QACzB,cAAc,QAAS,O;QACvB,IAAI,CAAC,QAAS,UAAAd,C;UAAyB,qBAAO,O;UAAP,uB;;QACzB,eAdm  
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B,C;UACI,QAAQ,SAAS,QAAS,OAAIB,C;UACR,WF54DG,MAAO,KE44DO,QF54DP,EE44DiB,CF54DjB,C;;Q  
E84Dd,OAAO,Q;O;KApBX,C;mFAuBA,yB;MAAA,sE;MFp6DA,iB;MEo6DA,sC;QAaI,eAAe,oB;QACf,IAAI,C  
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;UACI,QAAQ,SAAS,QAAS,OAAIB,C;UACR,WF96DG,MAAO,KE86DO,QF96DP,EE86DiB,CF96DjB,C;;QEg7  
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,C;UAAyB,MAAM,6B;QAC/B,eAAe,SAAS,QAAS,OAAIB,C;QACf,OAAO,QAAS,UAAhB,C;UACI,QAAQ,SA  
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FAuBA,yB;MFv8DA,iB;MEu8DA,sC;QAWI,eAAe,oB;QACf,IAAI,CAAC,QAAS,UAAAd,C;UAAyB,OAAO,I;QA  
ChC,eAAe,SAAS,QAAS,OAAIB,C;QACf,OAAO,QAAS,UAAhB,C;UACI,QAAQ,SAAS,QAAS,OAAIB,C;UACR  
,WF/8DG,MAAO,KE+8DO,QF/8DP,EE+8DiB,CF/8DjB,C;;QEi9Dd,OAAO,Q;O;KAIBX,C;+FAqBA,yB;MFv+D  
A,iB;MEu+DA,sC;QAWI,eAAe,oB;QACf,IAAI,CAAC,QAAS,UAAAd,C;UAAyB,OAAO,I;QACChC,eAAe,SAAS,Q  
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KE++DO,QF/+DP,EE++DiB,CF/+DjB,C;;QEi/Dd,OAAO,Q;O;KAIBX,C;+FAqBA,+B;MASI,eAAe,oB;MACf,IA  
AI,CAAC,QAAS,UAAAd,C;QAAyB,OAAO,I;MACHc,eAAe,SAAS,QAAS,OAAIB,C;MACf,OAAO,QAAS,UAAh  
B,C;QACI,QAAQ,SAAS,QAAS,OAAIB,C;QACR,IAAI,2BAAW,CAAX,KAAJ,C;UACI,WAAW,C;;;MAGnB,OA  
AO,Q;K;0FAGX,yB;MAAA,sE;MAAA,kD;QAWI,eAAe,oB;QACf,IAAI,CAAC,QAAS,UAAAd,C;UAAyB,MAAM  
,6B;QAC/B,eAAe,SAAS,QAAS,OAAIB,C;QACf,OAAO,QAAS,UAAhB,C;UACI,QAAQ,SAAS,QAAS,OAAIB,C  
;UACR,IAAI,UAAW,SAAQ,QAAR,EAakB,CAAIB,CAAX,GAakC,CAAtC,C;YACI,WAAW,C;;;QAGnB,OAA  
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Ed,OAAO,G;K;IAGX,iC;MAOI,eAAe,oB;MACf,IAAI,CAAC,QAAS,UAAAd,C;QAAyB,OAAO,I;MACHc,UAAU,  
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AO,I;MACHc,UAAU,QAAS,O;MACnB,OAAO,QAAS,UAAhB,C;QACI,QAAQ,QAAS,O;QACjB,IAAI,sBAAM,  
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jC,C;UAAoC,MAAM,C;;MAE9C,OAAO,G;K;IAGX,4B;MAMI,IAAI,oCAAJ,C;QAAwB,OAAO,mB;MAC/B,OA  
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d,C;QACI,OAAO,OjB8PiD,SiB9PiC,KjB8P+C,IAAL,EiB9PiC,KjB8PoD,MAAV,CiB9PiD,C;;MACX,aAAa,iBA  
AsB,cAAAtB,C;MACb,MAAO,WjB4PqD,SiB5PjD,KjB4PsD,IAAL,EiB5PjD,KjB4P2D,MAAV,CiB5PrD,C;;QAEw  
B,kBAAhB,QAAS,O;QAAPB,MAAO,WjB0PiD,SAAK,eAAL,EAU,iBAAV,CiB1PiD,C;;MACO,QAAT,QAAS,  
W;MACIB,OAAO,M;K;uFAGX,yB;MAAA,+D;MASBA,gD;MatBA,uC;QAMW,kBAAU,gB;QAoBD,Q;QAAA,  
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M;QAAmC,OAAN,KAAM,a;;QAC3B,gB;MAHZ,W;K;IW1rCJ,oD;MAMuF,wC;K;IANvF,8CAOI,Y;MAAuC,8B;  
K;IAP3C,gF;IkBQA,yC;MAMI,OAAO,sBAAQ,OAAR,KAAoB,C;K;IAWG,2C;MAAA,qB;QAAE,MAAM,8BAA  
0B,+CAA4C,aAA5C,MAA1B,C;O;K;IAR1C,uC;MAQI,OAAO,8BAAgB,KAAhB,EAAuB,yBAAvB,C;K;IAGX,4  
D;MAcqB,Q;MANjB,IAAI,QAAQ,CAAZ,C;QACI,OAAO,aAAa,KAAb,C;MACX,eAAe,oB;MACf,YAAy,C;MA  
CZ,OAAO,QAAS,UAAhB,C;QACI,cAAc,QAAS,O;QACvB,IAAI,WAAS,YAAT,EAAS,oBAAT,OAAJ,C;UACI,  
OAAO,O;;MAEf,OAAO,aAAa,KAAb,C;K;IAGX,8C;MAcqB,Q;MANjB,IAAI,QAAQ,CAAZ,C;QACI,OAAO,I;M  
ACX,eAAe,oB;MACf,YAAy,C;MACZ,OAAO,QAAS,UAAhB,C;QACI,cAAc,QAAS,O;QACvB,IAAI,WAAS,Y  
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AAhB,OAAGB,cAAhB,C;UAAgB,yB;UAAM,IA3FH,SA2FO,CAAU,OAAV,CAAJ,C;YAAwB,qBAAO,O;YAAP,  
uB;;QAC9C,qBAAO,I;;MA5FP,yB;K;uFAGJ,gC;MAkOoB,Q;MADhB,WAAe,I;MACC,2B;MAAhB,OAAGB,cA  
AhB,C;QAAgB,yB;QACZ,IA1Nc,SA0NV,CAAU,OAAV,CAAJ,C;UACI,OAAO,O;;MA3Nf,OA8NO,I;K;IA3NX,  
6B;MAOI,eAAe,oB;MACf,IAAI,CAAC,QAAS,UAAc,C;QACI,MAAM,2BAAuB,oBAAvB,C;MACV,OAAO,QA  
AS,O;K;IFAGpB,yB;MAAA,iE;MAAA,uC;QAOoB,Q;QAAA,2B;QAAhB,OAAGB,cAAhB,C;UAAgB,yB;UAAM  
,IAAI,UAAU,OAAV,CAAJ,C;YAAwB,OAAO,O;;QACrD,MAAM,gCAAuB,sDAAvB,C;O;KARV,C;kGAWA,yB  
;MAAA,iE;MAAA,uC;QAWW,Q;QAAA,+B;;UAcS,U;UAAA,6B;UAAhB,OAAGB,gBAAhB,C;YAAgB,2B;YAC  
Z,aAfwB,SAeX,CAAU,OAAV,C;YAcB,IAAI,cAAJ,C;cACI,8BAAO,M;cAAP,gC;;UAGR,8BAAO,I;;QApBA,k  
C;QAAA,iB;UAAmC,MAAM,gCAAuB,iEAAvB,C;;QAAhD,OAAO,I;O;KAXX,C;8GAcA,gC;MAWoB,Q;MAA  
A,2B;MAAhB,OAAGB,cAAhB,C;QAAgB,yB;QACZ,aAAa,UAAU,OAAV,C;QACb,IAAI,cAAJ,C;UACI,OAAO,

M;;;MAGf,OAAO,I;K;IAGX,mC;MAMI,eAAe,oB;MACf,IAAI,CAAC,QAAS,UAAAd,C;QACI,OAAO,I;MACX,OAAO,QAAS,O;K;6FAGpB,gC;MAMoB,Q;MAAA,2B;MAAhB,OAAGB,cAAhB,C;QAAGB,yB;QAAM,IAAI,UA AU,OAAV,CAAJ,C;UAAwB,OAAO,O;MACrD,OAAO,I;K;IAGX,wC;MAOiB,Q;MADb,YAAY,C;MACC,2B;M AAb,OAAa,cAAb,C;QAAa,sB;QACT,mBAAmB,KAAAnB,C;QACA,IAAI,gBAAW,IAAX,CAAJ,C;UACI,OAAO, K;QACX,qB;MAEJ,OAAO,E;K;+FAGX,yB;MAAA,wE;MAAA,uC;QAOiB,Q;QADb,YAAY,C;QACC,2B;QAA b,OAAa,cAAb,C;UAAa,sB;UACT,mBAAmB,KAAAnB,C;UACA,IAAI,UAAU,IAAV,CAAJ,C;YACI,OAAO,K;UA CX,qB;QAEJ,OAAO,E;O;KAbX,C;6FAGbA,yB;MAAA,wE;MAAA,uC;QAQiB,Q;QAFb,gBAAGB,E;QACHB,Y AAY,C;QACC,2B;QAAb,OAAa,cAAb,C;UAAa,sB;UACT,mBAAmB,KAAAnB,C;UACA,IAAI,UAAU,IAAV,CA AJ,C;YACI,YAAY,K;UACHB,qB;QAEJ,OAAO,S;O;KAdX,C;IAiBA,4B;MAUI,eAAe,oB;MACf,IAAI,CAAC,Q AAS,UAAAd,C;QACI,MAAM,2BAAuB,oBAAvB,C;MACV,WAAW,QAAS,O;MACpB,OAAO,QAAS,UAAhB,C; QACI,OAAO,QAAS,O;MACpB,OAAO,I;K;+EAGX,yB;MAAA,iE;MAAA,gB;MAAA,8B;MAAA,uC;QAYoB,U AQT,M;QAVP,WAAe,I;QACf,YAAY,K;QACI,2B;QAAhB,OAAGB,cAAhB,C;UAAgB,yB;UACZ,IAAI,UAAU,O AAV,CAAJ,C;YACI,OAAO,O;YACP,QAAQ,I;QAGhB,IAAI,CAAC,KAAL,C;UAAy,MAAM,gCAAuB,sDAA vB,C;QAEIB,OAAO,2E;O;KApBX,C;IAuBA,4C;MAQiB,Q;MAFb,gBAAGB,E;MACHB,YAAY,C;MACC,2B;MA Ab,OAAa,cAAb,C;QAAa,sB;QACT,mBAAmB,KAAAnB,C;QACA,IAAI,gBAAW,IAAX,CAAJ,C;UACI,YAAY,K; QACHB,qB;MAEJ,OAAO,S;K;IAGX,kC;MAQI,eAAe,oB;MACf,IAAI,CAAC,QAAS,UAAAd,C;QACI,OAAO,I;M ACX,WAAW,QAAS,O;MACpB,OAAO,QAAS,UAAhB,C;QACI,OAAO,QAAS,O;MACpB,OAAO,I;K;2FAGX,g C;MASoB,Q;MADhB,WAAe,I;MACC,2B;MAAhB,OAAGB,cAAhB,C;QAAGB,yB;QACZ,IAAI,UAAU,OAAV,C AAJ,C;UACI,OAAO,O;MAGf,OAAO,I;K;IAGX,8B;MAMI,eAAe,oB;MACf,IAAI,CAAC,QAAS,UAAAd,C;QAC I,MAAM,2BAAuB,oBAAvB,C;MACV,aAAa,QAAS,O;MACtB,IAAI,QAAS,UAAb,C;QACI,MAAM,gCAAyB,q CAAzB,C;MACV,OAAO,M;K;mFAGX,yB;MAAA,kF;MAAA,iE;MAAA,gB;MAAA,8B;MAAA,uC;QAQoB,UA ST,M;QAXP,aAAiB,I;QACjB,YAAY,K;QACI,2B;QAAhB,OAAGB,cAAhB,C;UAAgB,yB;UACZ,IAAI,UAAU,O AAV,CAAJ,C;YACI,IAAI,KAAJ,C;cAAW,MAAM,8BAAYB,mDAAzB,C;YACjB,SAAS,O;YACT,QAAQ,I;QA GhB,IAAI,CAAC,KAAL,C;UAAy,MAAM,gCAAuB,sDAAvB,C;QAEIB,OAAO,6E;O;KAjBX,C;IAoBA,oC;MA MI,eAAe,oB;MACf,IAAI,CAAC,QAAS,UAAAd,C;QACI,OAAO,I;MACX,aAAa,QAAS,O;MACtB,IAAI,QAAS,U AAb,C;QACI,OAAO,I;MACX,OAAO,M;K;+FAGX,gC;MAQoB,Q;MAFhB,aAAiB,I;MACjB,YAAY,K;MACI,2B ;MAAhB,OAAGB,cAAhB,C;QAAGB,yB;QACZ,IAAI,UAAU,OAAV,CAAJ,C;UACI,IAAI,KAAJ,C;YAAW,OAA O,I;UACIB,SAAS,O;UACT,QAAQ,I;MAGhB,IAAI,CAAC,KAAL,C;QAAY,OAAO,I;MACnB,OAAO,M;K;IAG X,8B;MAWW,Q;MhBhXP,IAAI,EgB+WI,KAACK,ChB/WT,CAAJ,C;QACI,cgB8Wc,sD;QhB7Wd,MAAM,gCAAy B,OAAQ,WAAjC,C;MgB+WN,UAAK,CAAL,C;QAAU,gB;WACV,+C;QAAiC,OAAAL,SAAK,cAAK,CAAL,C;; QACzB,wBAAa,SAAb,EAAmB,CAAnB,C;MAHZ,W;K;IAOJ,2C;MAQI,OAAO,sBAAkB,SAaIB,EAAwB,SAAx B,C;K;IAGX,wC;MAQI,OAAO,sBAAkB,SAaIB,EAAwB,IAAxB,EAA8B,SAa9B,C;K;IAcqE,iD;MAAA,qB;QA AE,yBAAU,EAAG,MAAb,EAAoB,EAAG,MAAvB,C;O;K;IAAkC,oC;MAAE,OAAA,EAAG,M;K;IAXzH,+C;M AWI,OAAO,yBAAqB,sBAAkB,qBAAiB,SAaJB,CAaIB,EAA0C,IAA1C,EAAgD,+BAAhD,CAArB,EAAyG,sBA AzG,C;K;oGAGX,yB;MA80BA,wE;MA90BA,oD;QAU1BiB,gB;QADb,YAAY,C;QACC,2B;QAAb,OAAa,cAAb, C;UAAa,sB;UA50BT,IAAI,UA40BkB,oBAAmB,cAAAnB,EAAmB,sBAAnB,UA50BIB,EA40B+C,IA50B/C,CAAJ, C;YAA2C,sBA40BQ,IA50BR,C;;QAE/C,OAAO,W;O;KAbX,C;sGAGbA,yB;MAAA,8C;MAAA,0C;MAAA,8B; MASKB,qD;QAAA,qB;UAAE,c;S;O;MATpB,sC;QASW,Q;QAAP,OAAO,uCAAo,iCAAP,gC;O;KATX,C;0GAY A,4C;MAQoB,Q;MAAA,2B;MAAhB,OAAGB,cAAhB,C;QAAGB,yB;QAAM,IAAI,YAAJ,C;UAAkB,WAAy,WA AI,OAAJ,C;MACpD,OAAO,W;K;IAGX,2C;MAQI,OAAO,sBAAkB,SAaIB,EAAwB,KAAxB,EAA+B,SAa/B,C; K;IAYU,kC;MAAE,iB;K;IATvB,oC;MASW,Q;MAAP,OAAO,4CAAU,oBAAV,kC;K;IAGX,mD;MAQoB,Q;MA AA,2B;MAAhB,OAAGB,cAAhB,C;QAAGB,yB;QAAM,IAAI,eAAJ,C;UAAqB,WAAy,WAAI,OAAJ,C;MACvD, OAAO,W;K;4FAGX,6C;MAQoB,Q;MAAA,2B;MAAhB,OAAGB,cAAhB,C;QAAGB,yB;QAAM,IAAI,CAAC,UA AU,OAAV,CAAL,C;UAAyB,WAAy,WAAI,OAAJ,C;MAC3D,OAAO,W;K;sFAGX,6C;MAQoB,Q;MAAA,2B; MAAhB,OAAGB,cAAhB,C;QAAGB,yB;QAAM,IAAI,UAAU,OAAV,CAAJ,C;UAAwB,WAAy,WAAI,OAAJ,C;; MAC1D,OAAO,W;K;IAGX,8B;MAWW,Q;MhBzGp,IAAI,EgBwgBI,KAACK,ChBxgBT,CAAJ,C;QACI,cgBugBc ,sD;QhBtgBd,MAAM,gCAAyB,OAAQ,WAAjC,C;MgBwgBN,UAAK,CAAL,C;QAAU,sB;WACV,+C;QAAiC,O AAL,SAAK,cAAK,CAAL,C;;QACzB,wBAAa,SAAb,EAAmB,CAAnB,C;MAHZ,W;K;IAOJ,2C;MAQI,OAAO,sB

AAkB, SAAIB, EAAwB, SAAxB, C; K; IAWA, 2C; MAAA, 8B; K; 8CACH, Y; MACI, iBAA6B, iBAAZ, gBAAY, C; MAC  
IB, QAAX, UAAW, C; MACX, OAAO, UAAW, W; K; IAZ9B, 6B; MAQI, 0C; K; sFASJ, yB; MAAA, sD; MdjfA, sC; MAA  
A, oC; MAAA, uBAOe, yB; QArEf, 8D; eAqEe, 4B; UAAA, uB; YAAU, eAAsB, gB; YAAAtB, OA5Dd, cAAc, SA4DgB, CA  
5DhB, CAAd, EAA2B, SA4DM, CA5DN, CAA3B, C; W; S; OA4DI, C; Mc0ef, sC; QAU, OAAO, sBdpfP, eAAW, iBcofiB,  
QdpfjB, CAAX, CcofO, C; O; KAVX, C; 0GAaA, yB; MAAA, sD; Md3eA, sC; MAAA, oC; MAAA, iCAOe, yB; QAxFf, 8D;  
eAwFe, 4B; UAAA, uB; YAAU, eAAsB, gB; YAAAtB, OA/Ed, cAAc, SA+EgB, CA/EhB, CAAd, EAA2B, SA+EM, CA/EN,  
CAA3B, C; W; S; OA+EI, C; Mcoef, sC; QAQI, OAAO, sBd5eP, eAAW, 2Bc4e2B, Qd5e3B, CAAX, Cc4eO, C; O; KARX, C;  
IAWA, uC; MAQI, OAAO, wBAAW, cAAX, C; K; IAWA, uE; MAAA, sC; MAAA, 4C; K; kDACH, Y; MACI, iBAAiC, iBA  
AhB, oBAAGB, C; MACtB, WAAX, UAAW, EAAS, uBAAT, C; MACX, OAAO, UAAW, W; K; IAZ9B, 6C; MAQI, 0D; K;  
wFASJ, yB; MAAA, wE; MAAA, uC; QaAW, kBAAy, oB; QAI FH, Q; QAAA, 2B; QAAhB, OAAgB, cAAhB, C; UAAgB, y  
B; UACZ, WAlFsC, SAKFvB, CAU, OAAV, C; UvBnEnB, wBAAI, IAAK, MAAT, EAAGB, IAAK, OAArB, C; QuBfA,  
OAoFO, W; O; KAjGX, C; 6FAGBA, yB; MAAA, wE; MAAA, yC; QaAW, kBAAc, oB; QA8BL, Q; QAAA, 2B; QAAhB, O  
AAgB, cAAhB, C; UAAgB, yB; UACZ, WAAY, aA/B4B, WA+BxB, CAAY, OAAZ, CAAJ, EAA0B, OAA1B, C; QA/Bh  
B, OAiCO, W; O; KA9CX, C; 6FAGBA, yB; MAAA, wE; MAAA, yD; QAYW, kBAAc, oB; QAI CL, Q; QAAA, 2B; QAAhB,  
OAAgB, cAAhB, C; UAAgB, yB; UACZ, WAAY, aAlC4B, WakCxB, CAAY, OAAZ, CAAJ, EAICyC, cAkCf, CA Ae, OA  
Af, CAA1B, C; QAIChB, OAoCO, W; O; KahDX, C; iGAeA, +C; MAYoB, Q; MAAA, 2B; MAAhB, OAAgB, cAAhB, C; Q  
AAgB, yB; QACZ, WAAY, aAAI, YAAY, OAAZ, CAAJ, EAA0B, OAA1B, C; MAEhB, OAAO, W; K; iGAGX, +D; MAY  
oB, Q; MAAA, 2B; MAAhB, OAAgB, cAAhB, C; QAAgB, yB; QACZ, WAAY, aAAI, YAAY, OAAZ, CAAJ, EAA0B, eA  
Ae, OAAf, CAA1B, C; MAEhB, OAAO, W; K; 4FAGX, 6C; MAWoB, Q; MAAA, 2B; MAAhB, OAAgB, cAAhB, C; QAA  
gB, yB; QACZ, WAAe, UAAU, OAAV, C; QvBnEnB, wBAAI, IAAK, MAAT, EAAGB, IAAK, OAArB, C; MuBqEA, OA  
AO, W; K; gGAGX, yB; MAAA, wE; MAAA, 2C; QAcI, aAAa, oB; QAGBG, Q; QAAA, 2B; QAAhB, OAAgB, cAAhB, C; U  
AAgB, yB; UafO, MAgBP, aAAI, OAAJ, EAhBe, aAgBF, CAAC, OAAAd, CAAb, C; QAhBhB, OAAuB, M; O; Kaf3B, C; o  
GakBA, iD; MAYoB, Q; MAAA, 2B; MAAhB, OAAgB, cAAhB, C; QAAgB, yB; QACZ, WAAY, aAAI, OAAJ, EAAa, cA  
Ac, OAAAd, CAAb, C; MAEhB, OAAO, W; K; IAGX, gD; MAMiB, Q; MAAA, 2B; MAAb, OAAa, cAAAb, C; QAAa, sB; QA  
CT, WAAY, WAAI, IAAJ, C; MAEhB, OAAO, W; K; IAGX, gC; MAMI, OAAO, 0BAAa, cAAAb, C; K; IAGX, 8B; MAMI, O  
AA4B, qBAAhB, iBAAL, SAAK, CAAGB, C; K; IAGhC, qC; MAMI, OAAO, 0BAAa, gBAAb, C; K; IAGX, 4B; MAQI, OA  
AwC, oBAAjC, 0BAAa, sBAAb, CAAiC, C; K; IAG5C, 0C; MAYI, OAAO, uBAAmB, SAAnB, EAAyB, SAAzB, 6BAAo  
C, qB; OAApC, E; K; IAGX, 0C; MAQI, OAAO, uBAAmB, SAAnB, EAAyB, SAAzB, 6BAAoC, qB; OAApC, E; K; IAGX  
, iD; MAaI, OAAO, kBAAe, SAAf, EAAqB, SAArB, 6BAAgC, qB; OAAhC, E; K; IAGX, iD; MAaI, OAAO, kBAAe, SAAf  
, EAAqB, SAArB, 6BAAgC, qB; OAAhC, E; K; sGAGX, yB; MAAA, wE; MAAA, gD; MAAA, oD; QAaoB, UAC4B, M; Q  
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mB, sBAAnB, UAAV, EAAuC, OAAvC, C; UACC, OAAZ, WAAY, EAAO, IAAP, C; QAEhB, OAAO, W; O; KAjBX, C; u  
GAoBA, yB; MAAA, wE; MAAA, gD; MAAA, oD; QAaoB, UAC4B, M; QAF5C, YAAY, C; QACI, 2B; QAAhB, OAAgB,  
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ACC, OAAZ, WAAY, EAAO, IAAP, C; QAEhB, OAAO, W; O; KAjBX, C; yFAoBA, yB; MAAA, gD; MAAA, oD; QAUo  
B, Q; QAAA, 2B; QAAhB, OAAgB, cAAhB, C; UAAgB, yB; UACZ, WAAW, UAAU, OAAV, C; UACC, OAAZ, WAAY, E  
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B; QAAhB, OAAgB, cAAhB, C; UAAgB, yB; UACZ, UA9BiD, WA8BvC, CAAY, OAAZ, C; UvBjoBP, U; UADP, YuBm  
oBe, WvBnoBH, WuBmoBwB, GvBnoBxB, C; UACL, IAAI, aAAJ, C; YACH, auBioBuC, gB; YAA5B, WvBhoBX, auBg  
oBgC, GvBhoBhC, EAAS, MAAT, C; YACA, e; YAEA, c; UuB6nBA, iB; UACA, IAAK, WAAI, OAAJ, C; QAhCT, OAK  
CO, W; O; KA7CX, C; qFAcA, yB; MAAA, wE; MAkCA, +D; MAICA, yD; QAYW, kBAAU, oB; QAkCD, Q; QAAA, 2B; Q  
AAhB, OAAgB, cAAhB, C; UAAgB, yB; UACZ, UAnCiD, WAmCvC, CAAY, OAAZ, C; UvBrpBP, U; UADP, YuBupBe,  
WvBvpBH, WuBupBwB, GvBvpBxB, C; UACL, IAAI, aAAJ, C; YACH, auBqpBuC, gB; YAA5B, WvBppBX, auBopBg  
C, GvBppBhC, EAAS, MAAT, C; YACA, e; YAEA, c; UuBipBA, iB; UACA, IAAK, WArCyD, cAqCrD, CA Ae, OAAf, C  
AAJ, C; QArCT, OAuCO, W; O; KAnDX, C; yFAeA, yB; MAAA, +D; MAAA, sD; QAWoB, Q; QAAA, 2B; QAAhB, OAA  
gB, cAAhB, C; UAAgB, yB; UACZ, UAAU, YAAY, OAAZ, C; UvBjoBP, U; UADP, YuBmoBe, WvBnoBH, WuBmoBwB

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AI,CAAJ,C;K;6FAGX,qB;MAUI,OAAO,sBAAI,CAAJ,C;K;6FAGX,qB;MAUI,OAAO,sBAAI,CAAJ,C;K;uGAu  
C X,yB;MA8gHI,8D;MA9gHJ,iD;QASe,oBAAS,C;QAAT,S;UAAc,gBAqgHT,cAAR,iBAAQ,C;;QArgHhB,OAAO,  
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BAAS,C;QAAT,S;UAAc,gBAigHT,cAAR,iBAAQ,C;;QAjgHhB,OAAO,OAAcC,sBAAI,KAJ,CAATc,GAAsD,a  
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R,iBAAQ,C;;QA7/GhB,OAAO,OAAcC,sBAAI,KAJ,CAATc,GAAsD,aAAa,KAAb,C;O;KATjE,C;uGAYA,yB;M  
AkgHI,8D;MAIgHJ,iD;QASe,oBAAS,C;QAAT,S;UAAc,gBAy/GT,cAAR,iBAAQ,C;;QAz/GhB,OAAO,OAAcC,s  
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L,SAAK,EAAU,KAAV,C;O;KAThB,C;uGAYA,yB;MAAA,sD;MAAA,mC;QASI,OAAy,UAAAL,SAAK,EAAU,KAAV,  
C;O;KAThB,C;uGAYA,yB;MAAA,sD;MAAA,mC;QASI,OAAy,UAAAL,SAAK,EAAU,KAAV,C;O;KAThB,C;MA  
SW,sB;;QA8NS,Q;QAAA,2B;QAAhB,OAAGB,cAAhB,C;UAAgB,yB;UAAM,IA9NH,SA8NO,CAAU,OAAV,CA  
AJ,C;YAAwB,qBAAO,O;YAAP,uB;;QAC9C,qBAAO,I;;MA/NP,yB;K;iFAGJ,gC;MASW,sB;;QA6NS,Q;QAAA,  
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hB,C;UAAgB,yB;UAAM,IA5NH,SA4NO,CAAU,OAAV,CAAJ,C;YAAwB,qBAAO,O;YAAP,uB;;QAC9C,qBAA  
AO,I;;MA7NP,yB;K;iFAGJ,gC;MASW,sB;;QA2NS,Q;QAAA,2B;QAAhB,OAAGB,cAAhB,C;UAAgB,yB;UAA  
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AztFW,CAAb,W;UAAAd,OAAC,cAAAd,C;YAAc,uB;YACV,cAAc,sBAAK,KAAL,C;YACd,IA9nBc,SA8nBV,CAA  
U,OAAV,CAAJ,C;cAAwB,oBAAO,O;cAAP,sB;;UAE5B,oBAAO,I;;QAhoBP,wB;O;KATJ,C;yFAYA,yB;MAgo  
BA,+C;MA0tFI,0D;MA11GJ,uC;QASW,qB;;UAgoBO,Q;UAAA,OAAa,SAitFX,YAAR,iBAAQ,CAjtFW,CAAb,  
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,C;cAAwB,oBAAO,O;cAAP,sB;;UAE5B,oBAAO,I;;QApoBP,wB;O;KATJ,C;yFAYA,yB;MAooBA,+C;MAktFI,  
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AO,O;cAAP,sB;;;UAE5B,oBAAO,I;;;QAxoBP,wB;O;KATJ,C;yFAYA,yB;MAwoBA,+C;MA0sFI,0D;MAI1GJ,uC  
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;;;UAE5B,oBAAO,I;;;QA5oBP,wB;O;KATJ,C;mFAYA,yB;MAAA,8C;Mn CpHA,6B;MmCoHA,4B;QAQI,OnCIH  
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CtLA,iC;MkCsLA,4B;QAQI,OICpLyC,gBkCoL1B,MAAR,iBAAQ,CICpL0B,C;O;KkC4K7C,C;mFAWA,yB;MA  
AA,iE;MAAA,uC;QAQoB,Q;QAAA,2B;QAAhB,OAAgB,cAAhB,C;UAAgB,yB;UAAM,IAAI,UAAU,OAAV,CA  
AJ,C;YAAwB,OAAO,O;;QACrD,MAAM,gCAAuB,mDAAvB,C;O;KATV,C;mFAYA,yB;MAAA,iE;MAAA,uC;  
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,cAAhB,C;UAAgB,yB;UAAM,IAAI,UAAU,OAAV,CAAJ,C;YAAwB,OAAO,O;;QACrD,MAAM,gCAAuB,mDA  
AvB,C;O;KATV,C;IA YA,mC;MAMI,OAAW,mBAAJ,GAAe,IAAf,GAAyB,sBAAK,CAAL,C;K;IAGpC,mC;MA  
MI,OAAW,mBAAJ,GAAe,IAAf,GAAyB,sBAAK,CAAL,C;K;IAGpC,mC;MAMI,OAAW,mBAAJ,GAAe,IAAf,G  
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C,gC;MAOoB,Q;MAAA,2B;MAAhB,OAAgB,cAAhB,C;QAAGB,yB;QAAM,IAAI,UAAU,OAAV,CAAJ,C;UAA  
wB,OAAO,O;;MACrD,OAAO,I;K;+FAGX,gC;MAOoB,Q;MAAA,2B;MAAhB,OAAgB,cAAhB,C;QAAGB,yB;Q  
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O,I;K;+FAGX,gC;MAOoB,Q;MAAA,2B;MAAhB,OAAgB,cAAhB,C;QAAGB,yB;QAAM,IAAI,UAAU,OAAV,C  
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,C;IAUA,wC;MAQe,oBAAS,C;MAAT,S;QAAC,gBAknGT,gBAAR,iBAAQ,C;;MAlnGhB,OAAO,OAAcS,sBAAI,  
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hB,OAAO,OAAcS,sBAAI,KAAJ,CAAtC,GAAsD,I;K;IAGjE,wC;MAQe,oBAAS,C;MAAT,S;QAAC,gBA4mGT,g  
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GjE,yB;MAAA,kD;MAAA,qC;QAOI,OAAe,QAAR,iBAAQ,EAAQ,OnCtdU,KmCsdIB,C;O;KAPnB,C;uFAUA,yB  
;MAAA,kD;MAAA,qC;QAOI,OAAe,QAAR,iBAAQ,EAAQ,OnBrdY,KmBqdpB,C;O;KAPnB,C;uFAUA,yB;MAA  
A,kD;MAAA,qC;QAOI,OAAe,QAAR,iBAAQ,EAAQ,OpClhBY,KoCkhBpB,C;O;KAPnB,C;uFAUA,yB;MAAA,k  
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C5ZA,6B;MmC4ZA,0BAOgC,yB;QnCnahC,6B;emCmagC,6B;UAAA,qB;YAAE,yBnCzZK,cmCyZK,EnCzZL,C  
mCyZL,C;W;S;OAAF,C;MAPhC,uC;QAOMb,kBAAR,iB;QAAQ,uB;;UtC40Bf,0D;YACI,IsC70B0B,UnCzZK,cH  
suCjB,YAAK,KAAL,CGtuCiB,CmCyZL,CtC60B1B,C;cACI,sBAAO,K;cAAP,wB;;;UAGR,sBAAO,E;;;QsCj1BP,  
0B;O;KAPJ,C;iGAUA,yB;MAAA,sC;MnBvZA,+B;MmBuZA,0BAOgC,yB;QnB9ZhC,+B;emB8ZgC,6B;UAAA,q  
B;YAAE,yBnBpZQ,emBoZE,EnBpZF,CmBoZR,C;W;S;OAAF,C;MAPhC,uC;QAOMb,kBAAR,iB;QAAQ,uB;;Ut  
C80Bf,0D;YACI,IsC/0B0B,UnBpZQ,enBmuCpB,YAAK,KAAL,CmBnuCoB,CmBoZR,CtC+0B1B,C;cACI,sBAA  
O,K;cAAP,wB;;;UAGR,sBAAO,E;;;QsCn1BP,0B;O;KAPJ,C;iGAUA,yB;MAAA,sC;MpC9dA,+B;MoC8dA,0BA  
OgC,yB;QpCrehC,+B;eoCqegC,6B;UAAA,qB;YAAE,yBpC3dQ,eoC2dE,EpC3dF,CoC2dR,C;W;S;OAAF,C;MAP

hC,uC;QAOmB,kBAAR,iB;QAAQ,uB;;UtCgyBf,0D;YACI,IsCjyB0B,UpC3dQ,eF4vCpB,YAAK,KAAL,CE5vCo  
B,CoC2dR,CtCiyB1B,C;cACI,sBAAO,K;cAAP,wB;;;UAGR,sBAAO,E;;;QsCryBP,0B;O;KAPJ,C;iGAUA,yB;MA  
AA,sC;MIC3dA,iC;MkC2dA,0BAOgC,yB;QlCleH,C,iC;ekCkegC,6B;UAAA,qB;YAAE,yBlCxdW,gBkCwdD,ElCx  
dC,CkCwdX,C;W;S;OAAF,C;MAPhC,uC;QAOmB,kBAAR,iB;QAAQ,uB;;UtCkyBf,0D;YACI,IsCnyB0B,UlCxd  
W,gBJ2vCvB,YAAK,KAAL,CI3vCuB,CkCwdX,CtCmyB1B,C;cACI,sBAAO,K;cAAP,wB;;;UAGR,sBAAO,E;;;Q  
sCvyBP,0B;O;KAPJ,C;+FAUA,yB;MAAA,sC;MtCm5BA,0D;MAAA,+C;MGv1CA,6B;MmCocA,yBAO+B,yB;Q  
nC3c/B,6B;emC2c+B,6B;UAAA,qB;YAAE,yBnCjcm,cmCicI,EnCjCj,CmCicN,C;W;S;OAAF,C;MAP/B,uC;QAO  
mB,kBAAR,iB;QAAQ,sB;;UtCg5BD,Q;UAAA,OAAQ,SAAR,wBAAQ,CAAR,W;UAAAd,OAAc,cAAAd,C;YAAc,u  
B;YACV,IsCj5ByB,UnCjcm,cHk1CjB,YAAK,KAAL,CG11CiB,CmCicN,CtCi5BzB,C;cACI,qBAAO,K;cAAP,uB;  
;;UAGR,qBAAO,E;;;QsCr5BP,yB;O;KAPJ,C;+FAUA,yB;MAAA,sC;MtCq5BA,0D;MAAA,+C;MmBp1CA,+B;M  
mB+bA,yBAO+B,yB;QnBtc/B,+B;emBsc+B,6B;UAAA,qB;YAAE,yBnB5bS,emB4bC,EnB5bD,CmB4bT,C;W;S;  
OAAF,C;MAP/B,uC;QAOmB,kBAAR,iB;QAAQ,sB;;UtCk5BD,Q;UAAA,OAAQ,SAAR,wBAAQ,CAAR,W;UA  
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BzB,C;cACI,qBAAO,K;cAAP,uB;;;UAGR,qBAAO,E;;;QsCv5BP,yB;O;KAPJ,C;+FAUA,yB;MAAA,sC;MtCu2B  
A,0D;MAAA,+C;ME72CA,+B;MoCsgBA,yBAO+B,yB;QpC7gB/B,+B;eoC6gB+B,6B;UAAA,qB;YAAE,yBpCng  
BS,eoCmgBC,EpCngBD,CoCmgBT,C;W;S;OAAF,C;MAP/B,uC;QAOmB,kBAAR,iB;QAAQ,sB;;UtCo2BD,Q;U  
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O;KAPJ,C;+FAUA,yB;MAAA,sC;MtCy2BA,0D;MAAA,+C;MI52CA,iC;MkCmgBA,yBAO+B,yB;QlC1gB/B,iC;e  
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,kBAAR,iB;QAAQ,sB;;UtCs2BD,Q;UAAA,OAAQ,SAAR,wBAAQ,CAAR,W;UAAAd,OAAc,cAAAd,C;YAAc,uB;Y  
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B;;;UAGR,qBAAO,E;;;QsC32BP,yB;O;KAPJ,C;iFAUA,yB;MAAA,4C;MnC5eA,6B;MmC4eA,4B;QAWI,OnC7e  
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I,OnB5esC,emB4evB,KAAR,iBAAQ,CnB5euB,C;O;KmBie1C,C;iFAcA,yB;MAAA,4C;MpCtjBA,+B;MoCsjBA,4  
B;QAWI,OpCvjBsC,eoCujBvB,KAAR,iBAAQ,CpCvjBuB,C;O;KoC4iB1C,C;iFAcA,yB;MAAA,4C;MICvjBA,iC;  
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Ab,W;QAAd,OAAc,cAAAd,C;UAAc,uB;UACV,cAAc,sBAAK,KAAL,C;UACd,IAAI,UAAU,OAAV,CAAJ,C;YA  
AwB,OAAO,O;QAEnC,MAAM,gCAAuB,mDAAvB,C;O;KafV,C;iFAkBA,yB;MAAA,+C;MAAA,iE;MAo3FI,0  
D;MAp3FJ,uC;QAWkB,Q;QAAA,OAAa,SAY2FX,YAz2FF,SAY2FN,QAAQ,CAz2FW,CAAb,W;QAAd,OAAc,cA  
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AvB,C;O;KafV,C;iFAkBA,yB;MAAA,+C;MAAA,iE;MAG2FI,0D;MAh2FJ,uC;QAWkB,Q;QAAA,OAAa,SAq1F  
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BA,yB;MAAA,0D;MAAA,qC;QAOI,OAAe,YAAR,iBAAQ,EAAY,OnC9sBM,KmC8sBIB,C;O;KAPnB,C;+FAU  
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AV,CAAL,C;YAAyB,WAAY,WAAI,OAAJ,C;;QAjD3D,OAKDO,W;O;KA3DX,C;2FAYA,yB;MAAA,+D;MAAA  
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,CAAL,C;UAAyB,WAAY,WAAI,OAAJ,C;;MAC3D,OAAO,W;K;+FAGX,6C;MASoB,Q;MAAA,2B;MAAhB,OA  
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K;IAGX,+B;MAGBiB,Q;MxB7xEb,IAAI,EwBuxEI,KAAK,CxBvxET,CAAJ,C;QACI,cwBsxEc,sD;QxBrxEd,MA  
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BvhJX,a+BuhJgC,G/BvhJhC,EAAS,MAAT,C;YACA,e;;YAEA,c;;U+BohJA,iB;UACA,IAAK,WAAI,OAAJ,C;;Q  
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;UAAgB,yB;UACZ,UAAU,YAAY,OAAZ,C;U/B7iJP,U;UADP,Y+B+iJe,W/B/iJH,W+B+iJwB,G/B/iJxB,C;UACL  
,IAAI,aAAJ,C;YACH,a+B6iJuC,gB;YAA5B,W/B5iJX,a+B4iJgC,G/B5iJhC,EAAS,MAAT,C;YACA,e;;YAEA,c;;  
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EA,c;;U+BmlJA,iB;UACA,IAAK,WAAI,eAAe,OAAf,CAAJ,C;;QAET,OAAO,W;O;KAlBX,C;2FAqBA,yB;MAA  
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X,C;QmB64SrB,2B;QAAhB,OAAGB,cAAhB,C;UAGB,yB;UACZ,MnBjtTmD,emBitTnD,GnBjtT8D,KAAK,Km  
BitT5D,SAAS,OAAT,CnBjtTuE,KAAX,CAAhB,C;;QmBmtTvD,OAAO,G;O;KAhBX,C;mFAmBA,yB;MnB95SA

,+B;MmB85SA,sC;QAaoB,Q;QADhB,UnB/5SqC,eAAW,oBmB+5S/B,CnB/5S+B,CAAX,C;QmBg6SrB,2B;QAAhB,OAAGB,cAAhB,C;UAAgB,yB;UACZ,MnBpuTmD,emBouTnD,GnBpuT8D,KAAK,KmBouT5D,SAAS,OAAT,CnBpuTuE,KAAK,CAAhB,C;;QmBsuTvD,OAAO,G;O;KAhBX,C;IAmBA,kC;MA2DI,WpBnnTO,MAAO,KoBm nTG,cpBnnTH,EoBikTH,KAkDkB,OpBnnTf,C;MoBonTd,WAAW,iBAaA,IAAb,C;MACX,aAAU,CAAV,MAAkB,IAAIB,M;QACI,IAAK,WArDqB,GAqDP,sBAAK,CAAL,CARDO,EAAAnB,KAqDqB,CAAM,CAAN,CARDF,CAq DrB,C;;MArDT,OAuDO,I;K;IApDX,kC;MAkEI,WpBtoTO,MAAO,KoBsoTG,cpBtoTH,EoB6kTH,KAyDkB,OpBt oTf,C;MoBuoTd,WAAW,iBAaA,IAAb,C;MACX,aAAU,CAAV,MAAkB,IAAIB,M;QACI,IAAK,WA5DqB,GA4D P,sBAAK,CAAL,CA5DO,EAAAnB,KA4DqB,CAAM,CAAN,CA5DF,CA4DrB,C;;MA5DT,OA8DO,I;K;IA3DX,kC ;MAyEI,WpBzpTO,MAAO,KoBypTG,cpBzpTH,EoBylTH,KAgEkB,OpBzpTf,C;MoB0pTd,WAAW,iBAaA,IAAb ,C;MACX,aAAU,CAAV,MAAkB,IAAIB,M;QACI,IAAK,WAnEqB,GAmEP,sBAAK,CAAL,CAnEO,EAAAnB,KA mEqB,CAAM,CAAN,CAnEF,CAMerB,C;;MANET,OAqEO,I;K;IAIEX,kC;MAGFI,WpB5qTO,MAAO,KoB4qTG, cpB5qTH,EoBqmTH,KAuEkB,OpB5qTf,C;MoB6qTd,WAAW,iBAaA,IAAb,C;MACX,aAAU,CAAV,MAAkB,IA AIB,M;QACI,IAAK,WA1EqB,GA0EP,sBAAK,CAAL,CA1EO,EAAAnB,KA0EqB,CAAM,CAAN,CA1EF,CA0ErB ,C;;MAIET,OA4EO,I;K;+EAzEX,yB;MAAA,gE;MpB9mTA,iB;MoB8mTA,8C;QAWI,WpBnnTO,MAAO,KoBm nTG,cpBnnTH,EoBmnTS,KAAM,OpBnnTf,C;QoBonTd,WAAW,eAAa,IAAb,C;QACX,aAAU,CAAV,MAAkB,IA AIB,M;UACI,IAAK,WAAI,UAAU,sBAAK,CAAL,CAAV,EAAMB,MAAM,CAAN,CAAnB,CAAJ,C;;QAET,O AAO,I;O;KAhBX,C;+EAmBA,yB;MAAA,gE;MpBjoTA,iB;MoBioTA,8C;QAWI,WpBtoTO,MAAO,KoBsoTG,cp BtoTH,EoBsoTS,KAAM,OpBtoTf,C;QoBuoTd,WAAW,eAAa,IAAb,C;QACX,aAAU,CAAV,MAAkB,IAAIB,M;U ACI,IAAK,WAAI,UAAU,sBAAK,CAAL,CAAV,EAAMB,MAAM,CAAN,CAAnB,CAAJ,C;;QAET,OAAO,I;O;K AhBX,C;+EAmBA,yB;MAAA,gE;MpBppTA,iB;MoBopTA,8C;QAWI,WpBzpTO,MAAO,KoBypTG,cpBzpTH,E oBypTS,KAAM,OpBzpTf,C;QoB0pTd,WAAW,eAAa,IAAb,C;QACX,aAAU,CAAV,MAAkB,IAAIB,M;UACI,IA AK,WAAI,UAAU,sBAAK,CAAL,CAAV,EAAMB,MAAM,CAAN,CAAnB,CAAJ,C;;QAET,OAAO,I;O;KAhBX, C;+EAmBA,yB;MAAA,gE;MpBvqTA,iB;MoBuqTA,8C;QAWI,WpB5qTO,MAAO,KoB4qTG,cpB5qTH,EoB4qT S,KAAM,OpB5qTf,C;QoB6qTd,WAAW,eAAa,IAAb,C;QACX,aAAU,CAAV,MAAkB,IAAIB,M;UACI,IAAK,W AAI,UAAU,sBAAK,CAAL,CAAV,EAAMB,MAAM,CAAN,CAAnB,CAAJ,C;;QAET,OAAO,I;O;KAhBX,C;IAm BA,kC;MA8DoB,gB;MAHhB,gBAAGB,c;MACHB,WAAW,iBpBhvTJ,MAAO,KoBgvTsB,wBAnDzB,KAmDyB,E AAwB,EAAXB,CpBhvTtB,EoBgvTmD,SpBhvTnD,CoBgvTH,C;MACX,QAAQ,C;MACQ,OARDL,KAqDK,W;M AAhB,OAAGB,cAAhB,C;QAAGB,yB;QACZ,IAAI,KAAK,SAAT,C;UAAoB,K;QACpB,IAAK,WAvDqB,GAuDP, uBAAK,UAAAL,EAAK,kBAAL,UAvDO,EAuDI,OAxDJ,CAuDrB,C;;MAvDT,OAyDO,I;K;IAtdX,kC;MAuEoB,g B;MAHhB,gBAAGB,c;MACHB,WAAW,iBpBrwTJ,MAAO,KoBqwTsB,wBA5DzB,KA4DyB,EAawB,EAAXB,Cp BrwTtB,EoBqwTmD,SpBrwTnD,CoBqwTH,C;MACX,QAAQ,C;MACQ,OA9DL,KA8DK,W;MAAhB,OAAGB,c AAhB,C;QAAGB,yB;QACZ,IAAI,KAAK,SAAT,C;UAAoB,K;QACpB,IAAK,WAhEqB,GAGEP,uBAAK,UAAAL,E AAK,kBAAL,UAhEO,EAqEI,OAHEJ,CAGErB,C;;MAhET,OAkEO,I;K;IA/DX,kC;MAGFoB,gB;MAHhB,gBAAG B,c;MACHB,WAAW,iBpB1xTJ,MAAO,KoB0xTsB,wBArEzB,KAqEyB,EAawB,EAAXB,CpB1xTtB,EoB0xTmD, SpB1xTnD,CoB0xTH,C;MACX,QAAQ,C;MACQ,OAveL,KAuEK,W;MAAhB,OAAGB,cAAhB,C;QAAGB,yB;Q ACZ,IAAI,KAAK,SAAT,C;UAAoB,K;QACpB,IAAK,WAZEqB,GAYEP,uBAAK,UAAAL,EAAK,kBAAL,UAZEO, EAYEI,OAzEJ,CAYErB,C;;MAzET,OA2EO,I;K;IAxEX,kC;MAyFoB,gB;MAHhB,gBAAGB,c;MACHB,WAAW,iB pB/yTJ,MAAO,KoB+yTsB,wBA9EzB,KA8EyB,EAawB,EAAXB,CpB/yTtB,EoB+yTmD,SpB/yTnD,CoB+yTH,C; MACX,QAAQ,C;MACQ,OAFL,KAqFK,W;MAAhB,OAAGB,cAAhB,C;QAAGB,yB;QACZ,IAAI,KAAK,SAAT, C;UAAoB,K;QACpB,IAAK,WAlFqB,GAKFP,uBAAK,UAAAL,EAAK,kBAAL,UAlFO,EAKFI,OAIFJ,CakFrB,C;; MAIFT,OAoFO,I;K;+EAjFX,yB;MAAA,kF;MAAA,gE;MpB1uTA,iB;MoB0uTA,8C;QAcOB,UAEY,M;QAL5B,g BAAGB,c;QACHB,WAAW,epBhvTJ,MAAO,KoBgvTsB,wBAAN,KAAM,EAawB,EAAXB,CpBhvTtB,EoBgvTm D,SpBhvTnD,CoBgvTH,C;QACX,QAAQ,C;QACQ,uB;QAAhB,OAAGB,cAAhB,C;UAAgB,yB;UACZ,IAAI,KAA K,SAAT,C;YAAoB,K;UACpB,IAAK,WAAI,UAAU,uBAAK,UAAAL,EAAK,kBAAL,UAAV,EAaqB,OAARb,CA AJ,C;;QAET,OAAO,I;O;KAIBX,C;+EAqBA,yB;MAAA,kF;MAAA,gE;MpB/vTA,iB;MoB+vTA,8C;QAcOB,UAE Y,M;QAL5B,gBAAGB,c;QACHB,WAAW,epBrwTJ,MAAO,KoBqwTsB,wBAAN,KAAM,EAawB,EAAXB,CpBr wTtB,EoBqwTmD,SpBrwTnD,CoBqwTH,C;QACX,QAAQ,C;QACQ,uB;QAAhB,OAAGB,cAAhB,C;UAAgB,yB; UACZ,IAAI,KAAK,SAAT,C;YAAoB,K;UACpB,IAAK,WAAI,UAAU,uBAAK,UAAAL,EAAK,kBAAL,UAAV,E

AAqB, OAArB, CAAJ, C;; QAET, OAAO, I; O; KAIBX, C; +EAqBA, yB; MAAA, kF; MAAA, gE; MpBpxTA, iB; MoBoxT  
A, 8C; QAcOB, UAEY, M; QAL5B, gBAAgB, c; QACHB, WAAW, epB1xTJ, MAAO, KoB0xTsB, wBAAN, KAAM, EAA  
wB, EAAxB, CpB1xTtB, EoB0xTmD, SpB1xTnD, CoB0xTH, C; QACX, QAAQ, C; QACQ, uB; QAAhB, OAAgB, cAAh  
B, C; UAAgB, yB; UACZ, IAAI, KAAK, SAAT, C; YAAoB, K; UACpB, IAAK, WAAI, UAAU, uBAAK, UAAAL, EAAK, k  
BAAL, UAAV, EAAqB, OAArB, CAAJ, C;; QAET, OAAO, I; O; KAIBX, C; 8EAqBA, yB; MAAA, kF; MAAA, gE; MpBzy  
TA, iB; MoByyTA, 8C; QAcOB, UAEY, M; QAL5B, gBAAgB, c; QACHB, WAAW, epB/yTJ, MAAO, KoB+yTsB, wBAA  
N, KAAM, EAAwB, EAAxB, CpB/yTtB, EoB+yTmD, SpB/yTnD, CoB+yTH, C; QACX, QAAQ, C; QACQ, uB; QAAhB,  
OAAgB, cAAhB, C; UAAgB, yB; UACZ, IAAI, KAAK, SAAT, C; YAAoB, K; UACpB, IAAK, WAAI, UAAU, uBAAK, U  
AAL, EAAK, kBAAL, UAAV, EAAqB, OAArB, CAAJ, C;; QAET, OAAO, I; O; KAIBX, C; IAqBA, kC; MA2DI, WpBn3T  
O, MAAO, KoBm3TG, cpBn3TH, EoBi0TH, KAKdKb, KpBn3Tf, C; MoBo3Td, WAAW, iBAaA, IAAb, C; MACX, aAA  
U, CAAV, MAaKB, IAAIB, M; QACI, IAAK, WArDqB, GAqDP, sBAAK, CAAL, CArDO, EAAnB, KAqDqB, aAAM, C  
AAN, CArDF, CAqDrB, C;; MARDT, OAuDO, I; K; IAPDX, kC; MAkEI, WpBt4TO, MAAO, KoBs4TG, cpBt4TH, EoB60  
TH, KAyDk, KpBt4Tf, C; MoBu4Td, WAAW, iBAaA, IAAb, C; MACX, aAAU, CAAV, MAaKB, IAAIB, M; QACI, IAA  
K, WA5DqB, GA4DP, sBAAK, CAAL, CA5DO, EAAnB, KA4DqB, aAAM, CAAN, CA5DF, CA4DrB, C;; MA5DT, OA8  
DO, I; K; IA3DX, kC; MAyEI, WpBz5TO, MAAO, KoBy5TG, cpBz5TH, EoBy1TH, KAqEkB, KpBz5Tf, C; MoB05Td, W  
AAW, iBAaA, IAAb, C; MACX, aAAU, CAAV, MAaKB, IAAIB, M; QACI, IAAK, WAnEqB, GAmEP, sBAAK, CAAL, C  
AnEO, EAAnB, KAmEqB, aAAM, CAAN, CAnEF, CAmErB, C;; MAnET, OAqEO, I; K; IAIE, kC; MAgFI, WpB56TO,  
MAAO, KoB46TG, cpB56TH, EoBq2TH, KAqEkB, KpB56Tf, C; MoB66Td, WAAW, iBAaA, IAAb, C; MACX, aAAU, C  
AAV, MAaKB, IAAIB, M; QACI, IAAK, WA1EqB, GA0EP, sBAAK, CAAL, CA1EO, EAAnB, KA0EqB, aAAM, CAAN,  
CA1EF, CA0ErB, C;; MA1ET, OA4EO, I; K; +EAzEX, yB; MAAA, gE; MpB92TA, iB; MoB82TA, 8C; QAWI, WpBn3TO,  
MAAO, KoBm3TG, cpBn3TH, EoBm3TS, KAAM, KpBn3Tf, C; QoBo3Td, WAAW, eAAa, IAAb, C; QACX, aAAU, CA  
AV, MAaKB, IAAIB, M; UACI, IAAK, WAAI, UAAU, sBAAK, CAAL, CAAV, EAAMb, kBAAM, CAAN, CAAnB, CA  
AJ, C;; QAET, OAAO, I; O; KAhBX, C; +EAmBA, yB; MAAA, gE; MpBj4TA, iB; MoBi4TA, 8C; QAWI, WpBt4TO, MAA  
O, KoBs4TG, cpBt4TH, EoBs4TS, KAAM, KpBt4Tf, C; QoBu4Td, WAAW, eAAa, IAAb, C; QACX, aAAU, CAAV, MA  
aKB, IAAIB, M; UACI, IAAK, WAAI, UAAU, sBAAK, CAAL, CAAV, EAAMb, kBAAM, CAAN, CAAnB, CAAJ, C;; QAE  
T, OAAO, I; O; KAhBX, C; +EAmBA, yB; MAAA, gE; MpBp5TA, iB; MoBo5TA, 8C; QAWI, WpBz5TO, MAAO, KoBy5  
TG, cpBz5TH, EoBy5TS, KAAM, KpBz5Tf, C; QoB05Td, WAAW, eAAa, IAAb, C; QACX, aAAU, CAAV, MAaKB, IAA  
IB, M; UACI, IAAK, WAAI, UAAU, sBAAK, CAAL, CAAV, EAAMb, kBAAM, CAAN, CAAnB, CAAJ, C;; QAET, OAA  
O, I; O; KAhBX, C; +EAmBA, yB; MAAA, gE; MpBv6TA, iB; MoBu6TA, 8C; QAWI, WpB56TO, MAAO, KoB46TG, cpB  
56TH, EoB46TS, KAAM, KpB56Tf, C; QoB66Td, WAAW, eAAa, IAAb, C; QACX, aAAU, CAAV, MAaKB, IAAIB, M; U  
ACI, IAAK, WAAI, UAAU, sBAAK, CAAL, CAAV, EAAMb, kBAAM, CAAN, CAAnB, CAAJ, C;; QAET, OAAO, I; O;  
KAhBX, C; IAmBA, 2B; MAQoB, Q; MADhB, UAAgB, W; MACHB, wBAAgB, SAAhB, gB; QAAgB, cAAA, SAAhB, M; QACI, Mn  
B5nUmD, UmB4nUnD, GnB5nU8D, KAAK, KmB4nU5D, OnB5nUuE, KAAX, CAAhB, C;; MmB8nUvD, OAAO, G; K;  
IAGX, 2B; MAQoB, Q; MADhB, UAAgB, W; MACHB, wBAAgB, SAAhB, gB; QAAgB, cAAA, SAAhB, M; QACI, MnC7  
oUiD, SmC6oUjD, GnC7oU2D, KAAK, GAAW, CD2O5C, SoCk6TxB, OpCl6TkC, KAAL, GAAiB, GAAtB, CC3O4C,  
MAAX, IAaf, C;; MmC+oUrD, OAAO, G; K; IAGX, 2B; MAQoB, Q; MADhB, UAAgB, W; MACHB, wBAAgB, SAAhB,  
gB; QAAgB, cAAA, SAAhB, M; QACI, MnC3pUiD, SmC2pUjD, GnC3pU2D, KAAK, GAAW, CC4O5C, SkC+6TxB, Ol  
C/6TkC, KAAL, GAAiB, KAAtB, CD5O4C, MAAX, IAaf, C;; MmC6pUrD, OAAO, G; K; +EAGX, yB; MAAA, 0C; MnC  
x2TA, 6B; MmCw2TA, 4B; QAOI, OnCr2TmC, cmCq2TpB, IAAR, iBAAQ, CnCr2ToB, C; O; KmC81TvC, C; +EAUA, y  
B; MAAA, 0C; MnBn2TA, +B; MmBm2TA, 4B; QAOI, OnBh2TsC, emBg2TvB, IAAR, iBAAQ, CnBh2TuB, C; O; KmBy  
1T1C, C; +EAUA, yB; MAAA, sC; MnC53TA, 6B; MmC43TA, iBAOiB, yB; QpCz9Tb, 6B; eoCy9Ta, c; UAAE, OpCh9To  
B, coCg9TpB, EpCh9T8B, KAAL, GAAiB, GAAtB, C; S; OoCg9TtB, C; MAPjB, 4B; QA7iBoB, Q; QADhB, UnCp0SmC,  
cmCo0SnB, CnCP0SmB, C; QmCq0SnB, 2B; QAAhB, OAAgB, cAAhB, C; UAAgB, yB; UACZ, MnCxoTiD, cmCwoTjD,  
GnCxoT2D, KAAK, GAAW, CD2O5C, coC65Sf, OpC75SyB, KAAL, GAAiB, GAAtB, CC3O4C, MAAX, IAaf, C;; Qm  
C2rUrD, OAjjBo, G; O; KA0iBX, C; +EAUA, yB; MAAA, sC; MnCt4TA, 6B; MmCs4TA, iBAOiB, yB; QlCl+Tb, 6B; ekCk  
+Ta, c; UAAE, OlCz9ToB, ckCy9TpB, ElCz9T8B, KAAL, GAAiB, KAAtB, C; S; OkCy9TtB, C; MAPjB, 4B; QApiBoB, Q;





GAAN,EA AW,CAAX,C;;MACvB,OAAO,G;K;gFC7OX,yB;MAAA,mC;MAAA,2C;MAAA,4B;QASI,OAAO,kB  
AAO,cAAP,C;O;KATX,C;gFAYA,yB;MAAA,mC;MAAA,2C;MAAA,4B;QASI,OAAO,kBAAO,cAAP,C;O;KAT  
X,C;IAYA,sC;;QASQ,OAAc,WAAP,MAAO,EAAS,SAAT,C;;QACHB,+C;UACE,MAAM,2BAAuB,CAAE,QAAZ  
B,C;;UAHV,O;;K;IAOJ,sC;;QASQ,OAAc,YAAP,MAAO,EAAU,SAAV,C;;QACHB,+C;UACE,MAAM,2BAAuB,  
CAAE,QAAZB,C;;UAHV,O;;K;4FAOJ,yB;MAAA,mC;MAAA,uD;MAAA,4B;QAOI,OAAO,wBAAa,cAAb,C;O;  
KAPX,C;4FAUA,yB;MAAA,mC;MAAA,uD;MAAA,4B;QAOI,OAAO,wBAAa,cAAb,C;O;KAPX,C;IAUA,4C;M  
AMI,IAAI,mBAAJ,C;QACI,OAAO,I;MACX,OAAc,WAAP,MAAO,EAAS,SAAT,C;K;IAGIB,4C;MAMI,IAAI,m  
BAAJ,C;QACI,OAAO,I;MACX,OAAc,YAAP,MAAO,EAAU,SAAV,C;K;oFAGIB,8B;MASI,OAAO,WAAW,IA  
AX,IAAmB,2BAAS,OAAT,C;K;oFAG9B,8B;MASI,OAAO,WAAW,IAAX,IAAmB,2BAAS,OAAT,C;K;IAG9B,u  
C;MAMI,OAAO,2BvC4K4B,SuC5KnB,KvC4K6B,KAAL,GAAiB,GAAtB,CuC5K5B,C;K;IAGX,uC;MAMI,OAA  
O,2BvC6K8B,UAAW,oBuC7KhC,KvC6K2B,KAAK,CAAL,UAAN,CuC7K9B,C;K;IAGX,uC;MAMI,OAAO,2Bt  
CwL8B,UAAW,oBsCxLhC,KtCwL2B,KAAK,CAAL,iBAAN,CsCxL9B,C;K;IAGX,uC;MAMY,Q;MAAD,cAAC,  
OtBqF4C,UsBrF5C,KtBqFkD,yBsBrFxC,EtBqFwC,CAAN,CsBrF7C,wBAA8B,2BAA9B,Q;MAAA,W;QAAqC,o  
CtCoPR,SsCpPiB,KtB6KIB,KhBuEW,QAAV,CsCpPQ,C;;MAA5C,a;K;IAGJ,uC;MAMI,OAAO,2BrCyI4B,SqCzI  
nB,KrCyI6B,KAAL,GAAiB,KAAtB,CqCzI5B,C;K;IAGX,uC;MAMI,OAAO,2BrC0I8B,UAAW,oBqC1IhC,KrC0I  
2B,KAAK,CAAL,YAAN,CqC1I9B,C;K;IAGX,kC;MASI,OAAO,uCAAgB,yBvCmHY,SuCnHI,SvCmHM,KAAL,  
GAAiB,GAAtB,CuCnHZ,EvCmHY,SuCnHmB,EvCmHT,KAAL,GAAiB,GAAtB,CuCnHZ,EAA4C,EAA5C,C;K;I  
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O,wCAAiB,yBAAGB,SAAhB,EAAsB,EAAtB,M;K;IAG5B,kC;MASI,OAAO,uCAAgB,yBrCgFY,SqChFI,SrCgF  
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C;K;IAG3B,gC;MAMI,OAAO,uCAAgB,yBAAGB,cAAhB,EAAsB,eAAtB,EAA6B,CAAC,cAAD,IAA7B,C;K;IA  
G3B,gC;MAMI,OAAO,wCAAiB,yBAAGB,cAAhB,EAAsB,eAAtB,EAA8B,cAAD,AA7B,C;K;IAG5B,iC;MAMI,  
oBAAoB,OAAO,CAA3B,EAA8B,IAA9B,C;MACA,OAAO,uCAAgB,yBAAGB,eAAhB,EAAuB,cAAvB,EAAiC,S  
AAK,KAAL,GAAy,CAAhB,GAAMB,IAAnB,GAA6B,CAAC,IAAD,IAA1D,C;K;IAG3B,iC;MAMI,oBAAoB,kB  
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C;K;wDACZ,Y;MAAyB,oBAAQ,kBAAM,O;K;yDACvC,Y;MAAwD,Q;MAA9B,IAAI,aAAQ,kBAAM,OAAIB,C  
;QAAA,OAAwB,mBAAM,iBAAN,EAAM,yBAAN,O;;QAAoB,MAAM,2BAAyB,UAAF,WAAvB,C;K;;IAJhF,kC  
;MACmD,iD;K;IAOpB,gC;MAAC,wB;K;;IAEhC,+B;MAC8C,MAAM,mC;K;IAEpD,8C;MAEI,IAAI,qBAAJ,C;Q  
ACI,OAAO,C5ByIIF,W4BzIIE,U5ByIqE,E4BzIzD,Q5ByIyD,C;;Q4BvIxF,OAAS,CAAY,qBAAsB,UAAtB,EAak  
C,QAAIC,C;;K;IAI7B,2C;MAEI,IAAI,KAAY,kBAAhB,C;QAGI,KAAY,mBAAkB,QAAIB,C;;QAEH,QAAT,SA  
A+C,CAAlB,IAAjC,KAAiC,EAakB,O;;K;IAIvD,sC;MAGwB,Q;MADpB,gBAAgB,IAAhB,KAAGB,E;MACI,IA  
AI,OCnGkB,ODmGT,OAAT,EAaqB,WAArB,CAAJ,C;QChB,OAAl,aAAJ,GAAMB,KAAM,WAAzB,GAAyC,I  
;;QAEzC,c;;MAHJ,wB;MAKA,kBAakB,K;MACIB,iBAaiB,W;MACjB,OAAO,S;K;IAIa,sB;MAAC,U;K;iCACrB  
,iB;MACI,OAAO,mCAAsB,WAAK,KAAM,E;K;mCAG5C,Y;MACI,OAAO,M;K;mCAGX,Y;MACI,OAAuC,oB  
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I,UAGCc,IAhCJ,CAAK,CAAL,C;UACV,IAAI,oBAAJ,C;YACI,MAAM,CAAN,IAAW,EAAS,MAAM,MAAK,GA  
AL,C;;YAE1B,MAAM,CAAN,IAAW,G;;QA4Bf,OAZBG,EAAS,OAAO,OAAM,EAAN,EAAGB,KAAhB,C;;QA2  
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,KAakB,SAAtB,C;UF4F4B,ME3FxB,UF2FqB,CE3FF,O;;QF4FnB,OAAO,C;QACP,OBAAU,IAAV,e;UAE0B,YA  
CX,M;UAFX,YAAU,IAAQ,CAAH,GAAG,C;UACI,SAAJ,KAAI,O;UAAtB,aAAU,CAAV,kB;YACI,OAAO,aAA  
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DAIJ,kB;MACI,kBAAc,IAAd,C;MACiC,oB;MCuBrB,Q;MADR,IdtBsB,MCsBtB,W;QADJ,mBACiB,I;;QADjB,  
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,Y;K;IACA,+C;MAAA,0D;MAAwC,6BAAK,SAAL,EAAGB,KAAhB,C;MAAxC,Y;K;IAG8C,kD;MAA0D,4BAA  
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,OAA sC,Ue3nBtB,Kf2nBsB,C;;Qe3nBb,MAAM,8BAA0B,iCAAuB,gBA AvB,MAA1B,C;;MAAtC,W;K;IAGJ,uC;  
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Bb,MAAM,8BAA0B,iCAAuB,gBA AvB,MAA1B,C;;MAAtC,W;K;IAGJ,2B;MAII,OAAO,cAAa,SAAb,C;K;oFAG  
X,yB;MAAA,gD;MAAA,4B;QAKI,OAA sC,OAA/B,SAA+B,C;O;KAL1C,C;oFAQA,yB;MAAA,gD;MAAA,4B;Q  
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Q,C;;MArgHT,U;MAAA,S;QAAA,SAAsC,sBwC7StB,KxC6SsB,C;;QwC7Sb,MAAM,8BAA0B,iCAAuB,cAAvB,  
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C9C,mB;MAAkD,OAAA,gBAAY,gBAAS,OAAT,C;K;mDAC9D,iB;MACI,oCAAA,2BAAkB,KAA1B,EAAYB,SA  
AZB,C;MACb,OAAO,6BAAY,KAAZ,C;K;qDAEX,mB;MAES,Q;MAAL,IAAI,eAAC,0EAAD,SAAJ,C;QAAkC,  
OAAO,E;MACzC,OxCmoBO,UwCnoBA,gBxCmoBR,QAAQ,EwCnoBoB,O1EkHE,KkCihBtB,C;K;yDwCjoBX,  
mB;MAES,Q;MAAL,IAAI,eAAC,0EAAD,SAAJ,C;QAAkC,OAAO,E;MACzC,OxCs3BO,cwCt3BA,gBxCs3BR,Q  
AAQ,EwCt3BwB,O1E6GF,KkCywBtB,C;K;;IwC54BnB,8B;MAMI,4C;K;ICtIJ,qC;MAII,SAAS,SID+BiC,I;MkD9  
B1C,OAAa,CAAN,gBAAc,EAAd,KACU,EAAN,gBAAc,EADIB,KAEl,OAAM,GAFV,KAGI,KAAK,IAAL,KAC  
C,OAAM,IAAN,KACS,IAAN,gBAAc,IADjB,KAEG,OAAM,IAFT,IAGG,OAAM,IAHT,IAIG,OAAM,IAJT,IAK  
G,OAAM,IALT,IAMG,OAAM,KAPV,CAHJ,C;K;;;mCCTP,gB;;K;;ICAJ,wB;K;;IAIA,wB;K;;IAIA,wB;K;;IAKiC  
,uB;MAAC,oB;QAAA,OAA0B,E;MAA1B,gB;K;;IAE1C,kB;K;;IAqCqC,sB;MAAC,gB;K;;IAgCN,4B;MAAC,sB;  
K;;IAEjC,uB;K;;IA8DmC,4B;MAAC,kB;K;;IAEpC,oB;K;;IAMCA,+B;K;;ICvLA,oB;K;;IAIA,wB;K;;oF7DLA,qB;  
MAKqE,uCoCHtB,E;K;iGpCK/C,yB;MAAA,kD;MAAA,4B;QAQsE,mBAAY,SAAZ,C;O;KARtE,C;IAUA,iC;MA  
GI,OAAaB,UAAAY,QAAvB,KAAmC,SAAYC,GACe,UAAAY,UAD3B,GAGI,gBAAgB,UAAhB,C;K;IAGR,qC;MA  
EI,YoC1B2C,E;MpC2B3C,eAAe,UAAW,W;MAC1B,OAAO,QAAS,UAAhB,C;QACU,KAAAY,MAAK,QAAS,OA  
Ad,C;MACTB,OAAO,K;K;IAGX,8C;MAQc,Q;MANV,IAAI,KAAM,OAAN,GAAa,UAAW,KAA5B,C;QACI,OA  
AO,gBAAgB,UAAhB,C;;MAEX,eAAe,UAAW,W;MAC1B,YAAY,C;MACZ,OAAO,QAAS,UAAhB,C;QACI,MA  
AM,YAAN,EAAM,oBAAN,UAAiB,QAAS,O;;MAE9B,IAAI,QAAQ,KAAM,OAAlB,C;QACI,MAAM,KAAAN,IA  
Ae,I;;MAEnB,OAAO,K;K;IAIX,yB;MAG6C,sBAAY,OAAY,E;K;wGAE7C,yB;MAAA,+D;MAAA,gC;QAI0B,gB  
AAf,gB;QAAqB,aJW5B,W;QIXA,OJYO,SIZoC,Q;O;KAJ/C,C;yGAOA,yB;MAAA,4E;MAAA,gE;MAAA,0C;QA

II,qBAaQB,QAArB,C;QAC8B,gBAAvB,eAAa,QAAb,C;QAA6B,aJGpC,W;QIHA,OJIO,SIJ4C,Q;O;KALvD,C;IA  
SA,wB;MAG2C,oBAAU,OAAV,E;K;sGAE3C,yB;MAAA,uE;MAAA,gC;QAI8B,gBAAnB,oB;QAAyB,aJvHc,W;  
QIUA,OJTO,SISwC,Q;O;KAJnD,C;wGAOA,yB;MAAA,wE;MAAA,0C;QAIc,gBAA3B,mBAAiB,QAAjB,C;QA  
AiC,aJjBxC,W;QliBA,OJhBO,SIgBgD,Q;O;KAJ3D,C;IAQA,qB;MAIuD,oBAAU,IAAV,E;K;sGAEvD,yB;MAAA  
,wE;MAAA,gC;QAIiC,gBAAtB,oB;QAA4B,aJ/BnC,W;QI+BA,OJ9BO,SI8B2C,Q;O;KAJtD,C;uGAOA,yB;MAA  
A,uE;MAAA,0C;QAIyC,gBAA9B,mBAAoB,QAApB,C;QAAoC,aJtC3C,W;QIsCA,OJrCO,SIqCmD,Q;O;KAJ9D,  
C;IAQA,mC;MAOqB,Q;MAAA,kC;MAAjB,iBAAc,CAAd,yB;QACI,sBAAK,KAAL,EAAc,KAAd,C;;K;IAIR,+B;  
MAMuD,sBAAQ,4BAAR,C;K;IAEvD,6B;MAIwE,kBAAhB,0B;MAAwB,uB;MAAxB,OJJE7C,W;K;IImEX,4B;M  
AQI,gBAAgB,SAAhB,EAAsB,cAAtB,C;K;IAGJ,2C;MAQI,gBAAgB,SAAhB,EAAsB,UAAtB,C;K;IAGJ,2C;MA  
CI,IAAI,IAAK,KAAL,IAAa,CAAjB,C;QAAoB,M;MAEpB,YAAY,YAAY,IAAZ,C;MACZ,gBAAc,KAAd,EAAq  
B,UAArB,C;MAEA,aAAU,CAAV,MAAkB,KAAM,OAAxB,M;QACI,iBAAK,CAAL,EAAU,MAAM,CAAN,CA  
AV,C;;K;IAIR,uC;MACI,OAAO,gBAAkB,IAAI,B,O;K;IAGX,iF;MAII,oCAAa,2BAAkB,UAAIB,EAA8B,QAA9B  
,EAAwC,MAAO,OAA/C,C;MACb,gBAAgB,WAAW,UAAx,I;MACHB,oCAAa,2BAAkB,iBAAI,B,EAAqC,oBAA  
oB,SAApB,IAArC,EAAoE,WAAy,OAAhF,C;MAEb,IAAI,WAAkB,QAAO,WAAp,CAAIB,IAAyC,WAAkB,QA  
AO,MAAP,CAA/D,C;QACI,eAAsB,MAAY,UAAS,UAAT,EAAqB,QAArB,C;QACtB,WAAy,KAAl,QAAJ,EAA  
c,iBAAd,C;;QAExB,IAAI,WAAW,WAAx,IAA0B,qBAaQB,UAAAnD,C;UACI,iBAAc,CAAd,UAAsB,SAAtB,U;Y  
ACI,YAAY,oBAAoB,KAApB,IAAZ,IAAyC,OAAO,aAAa,KAAb,IAAP,C;;;UAG7C,mBAAc,YAAY,CAAZ,IAA  
d,aAAmC,CAAnC,Y;YACI,YAAY,oBAAoB,OAApB,IAAZ,IAAyC,OAAO,aAAa,OAAb,IAAP,C;;;K;8GAMzD,  
qB;MAEgF,gB;K;kGAehF,yB;MAAA,4D;MAAA,4B;QAC8E,OAAK,aAAL,SAAK,C;O;KADnF,C;sGAIA,gC;M  
AEI,OAAI,SAAJ,GAEL,SAFJ,GAII,SN83BoB,Q;K;IM13B5B,mC;MAEI,IAAI,QAAQ,CAAZ,C;QACI,oB;;MAEJ,  
OAAO,K;K;IAGX,mC;MAEI,IAAI,QAAQ,CAAZ,C;QACI,oB;;MAEJ,OAAO,K;K;IAIX,mC;MAIqD,mB;K;IAEr  
D,wC;MPzNI,IAAI,EOgOI,YAAY,CPhOhB,CAAJ,C;QACI,cO+NqB,gC;QP9NrB,MAAM,gCAAyB,OAAQ,WA  
AjC,C;;K;IOiOd,8C;MAAoE,Y;K;I8D1PV,qC;MAAiC,6B;K;uDAlvF,mB;MACI,qB;MACA,eAAe,e;MACf,OAA  
O,QAAS,UAAhB,C;QACI,IAAI,OAAA,QAAS,OAAAT,EAAmB,OAAAnB,CAAJ,C;UACI,QAAS,S;UACT,OAAO,I  
;;;MAGf,OAAO,K;K;yDAGX,oB;MAGoB,Q;MAFhB,qB;MACA,eAAe,K;MACC,0B;MAAhB,OAAgB,cAAhB,C  
;QAAgB,yB;QACZ,IAAI,eAAI,OAAJ,CAAJ,C;UAAkB,WAAW,I;;MAEjC,OAAO,Q;K;IAKuC,sE;MAAA,qB;Q  
AAE,OAAm,gBAAN,mB;O;K;4DAFpD,oB;MAEY,Q;MADR,qB;MACA,OAAoC,YAA5B,iEAA4B,EAAU,oDA  
AV,C;K;IAKU,sE;MAAA,qB;QAAE,QAAO,gBAAP,mB;O;K;4DAFpD,oB;MAEY,Q;MADR,qB;MACA,OAAoC  
,YAA5B,iEAA4B,EAAU,oDAAV,C;K;gDAGxC,Y;MACI,qB;MACA,eAAe,IAAK,W;MACpB,OAAO,QAAS,UA  
AhB,C;QACI,QAAS,O;QACT,QAAS,S;;K;iDAIjB,Y;MAE8B,OAAA,IAAK,U;K;yDAGnC,Y;K;;IC3CgD,+B;MA  
AiC,oC;MACJf,gBAA8B,C;K;8CAM9B,mB;MAMI,qB;MACA,iBAAI,SAAJ,EAAU,OAAV,C;MACA,OAAO,I;  
K;mDAGX,2B;MAMc,UACF,M;MANR,oCAAa,4BAAmB,KAAAnB,EAA0B,SAAI1B,C;MAEb,qB;MACA,aAAa,  
K;MACb,cAAc,K;MACJ,0B;MAAV,OAAU,cAAV,C;QAAU,mB;QACN,kBAAI,eAAJ,EAAI,uBAAJ,WAAc,CA  
Ad,C;QACA,UAAU,I;;MAEd,OAAO,O;K;0CAGX,Y;MACI,qB;MACA,yBAAY,CAAZ,EAAe,SAAF,C;K;IAKiB,  
gE;MAAA,qB;QAAE,OAAm,gBAAN,mB;O;K;sDAFvB,oB;MACI,qB;MACA,OAAO,kBAAU,8CAAV,C;K;IAK  
U,gE;MAAA,qB;QAAE,QAAO,gBAAP,mB;O;K;sDAFvB,oB;MACI,qB;MACA,OAAO,kBAAU,8CAAV,C;K;6C  
AIX,Y;MAAqD,iD;K;mDAErD,mB;MAAoD,0BAAQ,OAAr,KAAoB,C;K;kDAExE,mB;MACqB,Q;MAAA,6B;  
MAAjB,iBAAc,CAAd,yB;QACI,IAAI,wBAAI,KAAJ,GAAC,OAAAd,CAAJ,C;UACI,OAAO,K;;;MAGf,OAAO,E;K  
;sDAGX,mB;MACI,iBAAc,sBAAd,WAA+B,CAA/B,U;QACI,IAAI,wBAAI,KAAJ,GAAC,OAAAd,CAAJ,C;UACI,  
OAAO,K;;;MAGf,OAAO,E;K;iDAGX,Y;MAA6D,iCAAa,CAAb,C;K;yDAC7D,iB;MAAuE,sDAAiB,KAAjB,C;K  
;oDAGvE,8B;MAA4E,uCAAQ,IAAR,EAAc,SAAd,EAAyB,OAAzB,C;K;wDAE5E,8B;MAII,eAAe,0BAAa,SAAb  
,C;MACf,YAAO,UAAU,SAAV,I;MnEuDX,iBAAc,CAAd,UAAsB,KAAtB,U;QmEtDiB,e;QACA,iB;;K;2CAIjB,i  
B;MAMI,IAAI,UAAU,IAAd,C;QAAoB,OAAO,I;MAC3B,IAAI,2BAAJ,C;QAAuB,OAAO,K;MAE9B,OAAO,oC  
AAa,uBAAc,IAAd,EAAoB,KAApB,C;K;6CAGxB,Y;MAG+B,OAAA,oCAAa,yBAAgB,IAAhB,C;K;IAG5C,kD;  
MAAA,oB;MACI,eAcSb,C;MACtB,cAIqB,E;K;yDAErB,Y;MAAkC,sBAAQ,gB;K;sDAE1C,Y;MAEW,Q;MADP  
,IAAI,CAAC,cAAL,C;QAAgB,MAAM,6B;MACtB,eAAO,mBAAP,EAAO,2BAAP,O;MACA,OAAO,wBAAI,WA  
AJ,C;K;wDAGX,Y;MtE5CJ,IAAI,EsE6CU,gBAAQ,EtE7CIB,CAAJ,C;QACI,csE4CwB,sE;QtE3CxB,MAAM,6BA  
AsB,OAAQ,WAA9B,C;;MsE6CF,6BAAS,WAAAT,C;MACA,eAAQ,W;MACR,cAAO,E;K;;IAOqB,6D;MAHpC,o

B;MAGmD,wD;MAG3C,oCAAA,4BAAmB,KAAAnB,EAA0B,WAAyB,KAAAnD,C;MACb,eAAa,K;K;iEAGjB,Y;M  
AAAsC,sBAAQ,C;K;+DAE9C,Y;MAAgC,mB;K;8DAEhC,Y;MACl,IAAI,CAAC,kBAAL,C;QAAoB,MAAM,6B;M  
AE1B,eAAO,mCAAP,EAAO,YAAP,C;MACA,OAAO,wBAAI,WAAJ,C;K;mEAGX,Y;MAAoC,sBAAQ,CAAR,I;  
K;+DAEpC,mB;MACl,wBAAI,YAAJ,EAAW,OAAAX,C;MACA,mC;MACA,cAAO,E;K;+DAGX,mB;MtElFJ,IAA  
I,EsEmFU,gBAAQ,EtEnFIB,CAAJ,C;QACl,csEkFwB,4E;QtEjFxB,MAAM,6BAAsB,OAAQ,WAA9B,C;;MsEkFF  
,wBAAI,WAAJ,EAAU,OAAV,C;K;;IAIgb,+D;MAAuF,8B;MAAtF,kB;MAA0C,4B;MAC/D,eAAyB,C;MAGrB,o  
CAAA,2BAAkB,gBAAIB,EAA6B,OAA7B,EAA5C,WAAK,KAA3C,C;MACb,eAAa,UAAU,gBAAV,I;K;wDAGjB  
,0B;MACl,oCAAA,4BAAmB,KAAAnB,EAA0B,YAA1B,C;MAEb,WAAK,aAAI,mBAAY,KAAZ,IAAJ,EAAuB,OA  
AvB,C;MACl,mC;K;wDAGJ,iB;MACl,oCAAA,2BAAkB,KAAIB,EAAyB,YAAzB,C;MAEb,OAAO,wBAAK,mB  
AAY,KAAZ,IAAL,C;K;6DAGX,iB;MACl,oCAAA,2BAAkB,KAAIB,EAAyB,YAAzB,C;MAEb,aAAa,WAAK,kB  
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AyB,YAAzB,C;MAEb,OAAO,WAAK,aAAI,mBAAY,KAAZ,IAAJ,EAAuB,OAAvB,C;K;mGAGO,Y;MAAQ,mB  
;K;2DAE/B,Y;MAA+C,WAAK,iB;K;;ICxMN,8B;MAAiC,sB;MAwCnF,uBAAoC,I;MA+CpC,yBAA6C,I;K;IAIF  
R,oD;MAAC,wB;MAGlC,gBAAqB,K;K;IFAHa,Y;MAAA,yB;K;uGAKZ,Y;MAAQ,oB;K;8DAE9B,oB;MAKI,eA  
Ae,IAAK,S;MACpB,gBAAc,Q;MACd,OAAO,Q;K;wDAGX,Y;MAA+B,iEAAc,IAAd,C;K;wDAC/B,Y;MAAKC,i  
EAAc,IAAd,C;K;SDAClC,iB;MAA4C,+DAAY,IAAZ,EAakB,KAAIB,C;K;;IAIB5C,8E;MAAA,wE;MAAsC,2CA  
AK,KAAM,IAAX,EAAGB,KAAM,MAAtB,C;MAAtC,Y;K;IASBJ,+C;MACsE,6B;K;mEACIE,mB;MAAmD,kCA  
Ac,OAAAd,C;K;iEAEnD,mB;MAAiD,gCAAY,OAAZ,C;K;;yCAIrD,Y;MACl,YAAQ,Q;K;IAOQ,+F;MAAA,sD;M  
AAS,6B;K;uFACb,mB;MAAwC,MAAM,qCAA8B,8BAA9B,C;K;mFAC9C,Y;MACl,4BAAwB,Q;K;4FAG5B,mB  
;MAAsD,sDAAY,OAAZ,C;K;IAI3C,oH;MAAA,kD;K;4GACH,Y;MAAkC,OAAA,0BAAc,U;K;yGACHd,Y;MAA  
yB,OAAA,0BAAc,OAAO,I;K;2GAC9C,Y;MAAwB,0BAAc,S;K;;sFAL9C,Y;MACl,oBAAoB,oCAAQ,W;MAC5  
B,6G;K;0FAOJ,mB;MACl,qB;MACA,IAAI,+CAAY,OAAZ,CAAJ,C;QACl,4BAAwB,cAAO,OAAAP,C;QACxB,O  
AAO,I;;MAEX,OAAO,K;K;oIAGY,Y;MAAQ,OAAA,4BAAwB,K;K;4FAEvD,Y;MAAsC,4BAAwB,iB;K;;0FA9B  
1E,Y;MACl,IAAI,4BAAJ,C;QACl,6F;;MA+BJ,OAAO,mC;K;kDAKf,gB;MAEyB,Q;MADrB,qB;MACqB,OAAA,  
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MxD,iBAAI,GAAJ,EAAS,KAAT,C;;K;IAQc,iG;MAAA,sD;MAAS,oC;K;yFACf,mB;MAAwC,MAAM,qCAA8B,  
gCAA9B,C;K;qFAC9C,Y;MAAuB,4BAAwB,Q;K;8FAE/C,mB;MAAsD,wDAAc,OAAAd,C;K;IAI3C,sH;MAAA,k  
D;K;8GACH,Y;MAAKC,OAAA,0BAAc,U;K;2GACHd,Y;MAAyB,OAAA,0BAAc,OAAO,M;K;6GAC9C,Y;MAA  
wB,0BAAc,S;K;;wFAL9C,Y;MACl,oBAAoB,oCAAQ,W;MAC5B,+G;K;sIAOmB,Y;MAAQ,OAAA,4BAAwB,K;  
K;8FAEvD,Y;MAAsC,4BAAwB,iB;K;;4FAnB1E,Y;MACl,IAAI,8BAAJ,C;QACl,iG;;MAoBJ,OAAO,qC;K;gDA  
Gf,e;MACl,qB;MACA,WAAW,YAAQ,W;MACnB,OAAO,IAAK,UAAZ,C;QACl,YAAy,IAAK,O;QACjB,QAA  
Q,KAAM,I;QACd,IAAI,YAAO,CAAP,CAAJ,C;UACl,YAAy,KAAM,M;UACIB,IAAK,S;UACL,OAAO,K;;MA  
Gf,OAAO,I;K;kDAIX,Y;K;;IC3I+C,8B;MAAiC,oC;K;0CAEhF,iB;MAMI,IAAI,UAAU,IAAd,C;QAAoB,OAAO,I;  
MAC3B,IAAI,0BAAJ,C;QAAsB,OAAO,K;MAC7B,OAAO,mCAAY,mBAAU,IAAV,EAAGB,KAAhB,C;K;4CAG  
vB,Y;MAG+B,OAAA,mCAAY,2BAAkB,IAAIB,C;K;;ICbT,0B;MAAuD,8B;MAAIC,4B;MACvD,4BAAkC,K;K;g  
CAKBIC,Y;MAEl,qB;MACA,4BAAa,I;MACb,OAAO,I;K;qCAGX,Y;K;iDAGA,uB;K;iFAG8B,Y;MAAQ,OAAA,  
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MAHpB,qB;MACA,0BAAW,KAAX,C;MAEoB,gBAAb,qBAAM,KAAN,C;MAAqB,qC;MAA5B,OAAO,CAAA,O  
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CAGX,0B;MACl,qB;MACM,oBAAY,QAAO,mCAAoB,KAApB,CAAP,EAAMC,CAAnC,EAAsC,OAAIc,C;MA  
CIB,qC;K;yCAGJ,oB;MACl,qB;MACA,IAAI,QAAS,UAAb,C;QAAwB,OAAO,K;MAE/B,uBAAA,oBxEioDoB,Q  
MjrD0C,YkEgDrD,QIEhDqD,CNirD1C,C;MwEhoDpB,qC;MACA,OAAO,I;K;yCAGX,2B;MACl,qB;MACA,mC  
AAoB,KAApB,C;MAEA,IAAI,UAAS,SAAb,C;QAAMB,OAAO,oBAAO,QAAP,C;MAC1B,IAAI,QAAS,UAAb,C  
;QAAwB,OAAO,K;MAE3B,IADE,KACF,e;QAAQ,OAAO,oBAAO,QAAP,C;WACf,IAFE,KAEF,O;QAAK,uBIE  
7DqD,YkE6D7C,QIE7D6C,CNirD1C,QwEpnD6B,oBxEonD7B,C;;QwEnnDR,uBAAoC,cAA5B,oBAA4B,EAAY,  
CAAU,EAAP,KAAO,CAAY,QIE9DE,YkE8DK,QIE9DL,CkE8DF,EAA4C,cAAN,oBAAM,EAAY,KAAZ,EAAM  
B,SAAnB,CAA5C,C;;MAG5D,qC;MACA,OAAO,I;K;2CAGX,iB;MACl,qB;MACA,0BAAW,KAAX,C;MACA,q  
C;MACA,OAAW,UAAS,sBAAb,GACG,oBAAY,MADf,GAGG,oBAAY,QAAO,KAAP,EAAC,CAAd,CAAIB,CA



AmC,CAAnC,C;K;uCAGR,mB;MAEkB,Q;MADd,qB;MACc,2B;MAAd,mD;QACI,IAAI,4BAAM,KAAN,GAAG  
B,OAAhB,CAAJ,C;UACU,oBAAY,QAAO,KAAP,EAAC,CAAd,C;UACIB,qC;UACA,OAAO,I;;MAGf,OAAO,K;  
K;8CAGX,8B;MACI,qB;MACA,qC;MACM,oBAAY,QAAO,SAAP,EAakB,UAAU,SAAV,IAAIB,C;K;gCAGtB,  
Y;MACI,qB;MACA,uB9BhHuC,E;M8BiHvC,qC;K;wCAIJ,mB;MAA+C,OAAM,QAAN,oBAAM,EAAQ,OAAR,  
C;K;4CAErD,mB;MAAmD,OAAM,YAAN,oBAAM,EAAY,OAAZ,C;K;mCAEzD,Y;MAA0B,uBAAC,oBAAd,C;  
K;0CAE1B,iB;MAGe,UAGL,MAHK,EAMO,M;MAPIB,IAAI,KAAM,OAAN,GAAa,SAAJB,C;QACI,OAAO,2D;;  
MAGc,gBAAXB,eAAK,SAAL,IAAK,gBAAL,yB;MxEuwBL,UAAU,SAAV,EwEvwBsC,KxEuwBtC,EAD+F,CA  
C/F,EADoH,CACpH,EADuI,gBACvI,C;MwErwBI,IAAI,KAAM,OAAN,GAAa,SAAJB,C;QACI,MAAM,SAAN,I  
AAc,6E;;MAGIB,OAAO,K;K;kCAGX,Y;MACI,OAAO,EAAS,MAAM,MAAK,oBAAL,C;K;yCAI1B,Y;MACI,IA  
AI,yBAAJ,C;QAAGB,MAAM,oC;K;+CAG1B,iB;MACI,oCAAa,kCAAYB,SAAZB,C;MADoB,Y;K;wDAIrC,iB;M  
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;IAKA,kD;MAAA,mD;MAIkD,sB9BdP,E8BcO,C;MAJID,Y;K;IAMA,2C;MAAA,mD;MAGqD,sBIENa,YkEMR,  
QIENQ,CkEMb,C;MAHrD,Y;K;ICrBJ,0C;MACI,IAAI,6BAAJ,C;QACU,KAAY,MAAK,UAAL,C;;QAEIB,UAAU  
,KAAV,EAAwC,CAAxC,EAAd,cAAN,KAAM,CAAJD,EAA4D,eAAW,UAAAX,CAA5D,C;;K;IAMiB,kD;MAAA  
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iB,gC;QACX,KAAY,MAAK,UAAL,C;;QAEIB,UAAU,KAAV,EAAwC,CAAxC,EAAd,cAAN,KAAM,CAAJD,E  
AA4D,UAA5D,C;;K;IAIR,gE;MACI,IAAI,aAAY,UAAU,CAAV,IAAZ,CAAJ,C;QACI,UAAU,KAAV,EAAwC,S  
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B,O;MACb,aAAa,YAAU,KAAV,EAaiB,MAAJB,EAAYB,KAAzB,EAAGC,YAAhC,EAAsC,UAA9C,C;MACb,IA  
AI,WAAW,KAAf,C;QACI,aAAU,KAAV,OAAiB,YAAjB,M;UAA+B,MAAM,CAAN,IAAW,OAAO,CAAP,C;;K;  
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hB,I;MACb,WAAW,YAAU,KAAV,EAaiB,MAAJB,EAAYB,KAAzB,EAAGC,MAAhC,EAAWC,UAAxC,C;MAC  
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Z,aAAiB,SAAS,MAAb,GAAqB,KAArB,GAAgC,M;MAG7C,gBAAGB,K;MAChB,iBAAiB,SAAS,CAAT,I;MACj  
B,aAAU,KAAV,OAAiB,GAAjB,M;QAEQ,iBAAa,MAAb,IAAuB,cAAc,GAAR,C;UACI,gBAAGB,KAAK,SAAL  
,C;UACHB,iBAAiB,MAAM,UAAN,C;UAEjB,IAAI,UAAW,SAAQ,SAAR,EAAMB,UAAnB,CAAX,IAA6C,CAAj  
D,C;YACI,OAAO,CAAP,IAAY,S;YACZ,6B;;YAEA,OAAO,CAAP,IAAY,U;YACZ,+B;;eAGR,iBAAa,MAAb,C;  
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B;;MAMZ,OAAO,M;K;ICrGX,4C;MAMoB,UACM,M;MAHtB,IAAI,iBAAJ,C;QAAkB,OAAO,C;MACzB,aAAa,  
C;MACb,wBAAGB,SAAhB,gB;QAAGB,cAAA,SAAhB,M;QAEQ,oB;UAAmB,U;;UACnB,I1BFiC,MAAA,Y0BEn  
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C,2BAAR,OAAQ,C;eACnC,sC;YAAmC,2BAAR,OAAQ,C;eACnC,uC;YAAmC,2BAAR,OAAQ,C;;YAEA,kBAA  
R,OAAQ,C;;QATvC,wB;QAYA,SAAS,MAAK,MAAL,QAAC,WAAAd,I;;MAEb,OAAO,M;K;;ICTP,uC;MAAA,2  
C;K;2DACI,0B;MAA2D,sBAAU,MAAV,C;K;gEAE3D,iB;MAA6C,Q;MAAA,wEAAqB,C;K;;IAHtE,mD;MAAA  
,kD;QAAA,iC;;MAAA,2C;K;;MC0BA,iC;MAKA,8B;MA6CA,0BAAMe,I;;IAzEnE,kC;MAAA,oB;MAA+B,8C;  
K;2CAE3B,mB;MAAYd,MAAM,qCAA8B,iCAA9B,C;K;uCAC/D,Y;MACI,WAAa,Q;K;uDAGjB,mB;MAAGe,O  
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iB;MAAmE,gBAAZ,0B;MAAY,c;;QvE+mDnD,Q;QADhB,IAAI,wCAAsB,mBAA1B,C;UAAqC,aAAO,K;UAAP,  
e;;QACrB,2B;QAAhB,OAAgB,cAAhB,C;UAAgB,yB;UAAM,IuE/mDmD,uBAAS,gBvE+mD9C,OuE/mDwD,MA

AV,QvE+mD5D,C;YAAwB,aAAO,I;YAAP,e;;;QAC9C,aAAO,K;;;MuEhnDgD,iB;K;kFAInD,Y;MACI,IAAI,+BA  
AJ,C;QACI,0BAAW,qB;;MAEf,OAAO,sC;K;uCAGf,Y;MAAgF,iC;K;kCAEHf,e;MAA+C,OAAA,0BAAY,WAAI  
,GAAJ,C;K;oCAE3D,sB;MAAgD,OAAA,0BAAY,aAAI,GAAJ,EAAS,KAAT,C;K;qCAE5D,e;MAAYC,OAAA,0B  
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L,Q;MAHvB,Y;K;IAKA,4D;MAAA,iD;MAQ8D,qB;M7EpC9D,IAAI,E6EsCQ,mBAAmB,C7EtC3B,CAAJ,C;QA  
CI,c6EqCgC,+C;Q7EpChC,MAAM,gCAAYB,OAAQ,WAAjC,C;;MAFV,IAAI,E6EuCQ,cAAc,C7EvCtB,CAAJ,C;  
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,eAAK,eAAL,EAAsB,GAAtB,Q;MAA3C,Y;K;IAGA,yC;MAAA,iD;MAG8C,qB;MAC1C,KAAK,gBAAO,QAAP,  
C;MAJT,Y;K;IAqCJ,4B;MAK8E,gBAAnE,aAAmB,gEAAnB,C;MAA2E,wB;MAAlF,O1EvCO,S;K;;M2EjEP,uB;;  
kCAyCA,mB;MACI,UAAU,gBAAI,aAAI,OAAJ,EAAs,IAAb,C;MACd,OAAO,W;K;8BAGX,Y;MACI,gBAAI,Q;  
K;uCAOR,mB;MAA6D,OAAA,gBAAI,mBAAY,OAAZ,C;K;gCAEjE,Y;MAAYC,OAAA,gBAAI,U;K;iCAE7C,Y;  
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C,6B;MAA3C,O3ENO,S;K;I4EzD6B,uC;MAAC,kC;MAErC,oBAAkC,kB;MACiC,sBAAYB,C;K;2EAHY,Y;MAA  
A,8B;K;2FAGrC,Y;MAAA,0B;K,OAAA,gB;MAAA,0B;K;gDAGA,sB;MACI,eAAe,aAAS,qBAAY,GAAZ,C;MA  
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BxE/B,C4BwE2C,Q5BxE3C,C;;c4B2EoB,KAAY,QAAO,KAAP,EAAc,CAAd,C;;YAEtB,6B;YAEA,OAAO,OAA  
M,M;;;MAIzB,OAAO,I;K;0CAGX,Y;MACI,oBAAa,kB;MACb,YAAO,C;K;mDAGX,e;MAAYC,uBAAS,GAAT,  
S;K;8CAEzC,e;MAA+B,Q;MAAA,+BAAS,GAAT,8B;K;+CAE/B,e;MACuB,Q;MAAA,oCAAsB,aAAS,qBAAY,  
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AuC,Y;QACvC,OAAa,wBAAN,KAAM,EAAiB,GAAjB,C;;K;uDAlrB,0B;MACI,sB;;Q7F+nCY,Q;QAAb,iD;UA  
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L,C;MACvC,gBAAe,E;MAEf,oBAA4B,I;MAC5B,eAAc,K;MACd,iBAAgB,E;MACHB,iBAAqC,I;K;yEAERc,Y;  
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AAY,C;QACZ,OAAO,C;;QAEp,oBAAe,I;QACf,OAAO,C;;K;mEAI,f,Y;MACI,IAAI,eAAS,EAAb,C;QACI,aAAQ,  
oB;MACZ,OAAO,eAAS,C;K;gEAGpB,Y;MAEOB,Q;MADhB,IAAI,CAAC,cAAL,C;QAAGB,MAAM,6B;MACN,  
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R,OAAO,S;K;kEAGX,Y;M/E/CR,I+EgDyB,c/EhDrB,QA AJ,C;QACI,cAhByB,0B;QAIzBzB,MAAM,6BAAsB,OA  
AQ,WAA9B,C;;M+E+CE,6BAAYB,cAAO,6BAAY,IAAnB,C;MACzB,iBAA,Y,I;MAEZ,uC;K;;6CAtdZ,Y;MAEI,  
2D;K;4DAyDJ,oB;MACI,mBAAmB,kBAAW,QAAX,C;MACnB,OAAW,iBAAiB,SAArB,GAAGC,IAAhC,GAAO

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FUN,eAAe,kBAAW,GAAX,C;MACf,kBAAW,GAAX,IAAkB,K;MAEIB,IAAI,aAAa,SAAjB,C;QACI,6B;QAEA,  
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OA,4BAaKc,K;;IArIE,sD;MAZpC,oB;MAYyD,0CAAqC,GAArC,EAAOC,KAAIC,C;MACrD,oBAAuC,I;MACv  
C,oBAAuC,I;K;wDAEvC,oB;MACI,WAAmB,iB;MACnB,OAAa,mEAAS,QAAT,C;K;;IAIrB,wC;MAAA,oB;MA  
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Ca,gBAAb,OAAQ,a;;MAAf,c/E0DS,S+E1DoB,KAAO,iC/E0DzC,GAAqB,SAArB,GAA+B,I;M+EzD1B,OAAO,O  
;K;4DAGX,Y;MIFwBR,IAAI,EkFvBc,eAAQ,IIFuBtB,CAAJ,C;QACI,cAdW,e;QAeX,MAAM,6BAAsB,OAAQ,W  
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,CAAJ,C;QACI,WAAmB,cAAO,OAAQ,IAAf,C;QACnB,OAAO,I;;MAEX,OAAO,K;K;8FAGY,Y;MAAQ,OAAA  
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Z,IAAI,SAAS,IAAb,C;QACI,sBAAO,S;QACP,yBAAO,S;QACP,yBAAO,S;;QAGK,YAAa,KAAM,a;QIFIBhC,uB  
;QAeP,IAfoB,KAehB,QAAJ,C;UACI,gBAhByB,0B;UAIbZB,MAAM,6BAAsB,SAAQ,WAA9B,C;;UAEN,sBAnB  
gB,K;;QkFkBZ,+B;QAEA,yBAAO,K;QACP,yBAAO,K;QAEP,qBAAa,S;QACb,qBAAa,S;;K;+CAIrB,qB;MAIL,I  
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AAc,sB;QACd,qDAAc,sB;;MAEIB,yBAAO,I;MACP,yBAAO,I;K;oCA8CX,Y;MAEI,qB;MACA,4BAAa,I;MACb,  
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AvB,Q;MA/KIE,yB;MAGLQ,sBAAM,gB;MATV,Y;K;IAYA,sD;MAAA,uD;MAA2C,qBAAK,eAAL,EAASB,GA  
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,QAAP,C;MALT,Y;K;IA6EJ,kC;MAKwD,gBAA7C,qBAAYB,eAAzB,C;MAAqD,wB;MAA5D,O/EjMO,S;K;;;oC  
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CAAY,C;K;uEASnC,yB;MAAA,iB;MAAA,oB;QAOgD,OAAA,MAA6B,KAAZ,CAAY,C;O;KAP7E,C;uEASA,yB;MAAA,iB;MAAA,oB;QAOgD,OAAA,MAA6B,KAAZ,CAAY,C;O;KAP7E,C;uEASA,yB;MAAA,iB;MAAA,oB;QASiD,OAAA,MAA8B,MAAZ,CAAY,C;O;KAT/E,C;yEAWA,yB;MAAA,iB;MAAA,oB;QASiD,OAAA,MAA8B,MAAZ,CAAY,C;O;KAT/E,C;yEAWA,yB;MAAA,iB;MAAA,oB;QASiD,OAAA,MAA8B,MAAZ,CAAY,C;O;KAT/E,C;2EAWA,yB;MAAA,iB;MAAA,uB;QAKb4D,OAAA,MAA6C,OAA1B,CAA0B,EAAZ,CAAY,C;O;KAIbZg,C;yEAoBA,yB;MAAA,iB;MAAA,oB;QAUiD,OAAA,MAA8B,MAAZ,CAAY,C;O;KAV/E,C;yEAYA,yB;MAAA,iB;MAAA,oB;QASiD,OAAA,MAA8B,MAAZ,CAAY,C;O;KAT/E,C;yEAWA,yB;MAAA,iB;MAAA,oB;QAUiD,OAAA,MAA8B,MAAZ,CAAY,C;O;KAV/E,C;2EAYA,yB;MAAA,iB;MAAA,oB;QAYkD,OAAA,MAA+B,OAAZ,CAAY,C;O;KAZjF,C;2EAcA,yB;MAAA,iB;MAAA,oB;QAYkD,OAAA,MAA+B,OAAZ,CAAY,C;O;KAZjF,C;2EAcA,yB;MAAA,iB;MAAA,oB;QAakD,OAAA,MAA+B,OAAZ,CAAY,C;O;KAbjF,C;2EAeA,yB;MAAA,iB;MAAA,uB;QAS4D,OAAA,MAA6C,OAA1B,CAA0B,EAAZ,CAAY,C;O;KATzG,C;yEAWA,yB;MAAA,iB;MAAA,oB;QAOiD,OAAA,MAA8B,MAAZ,CAAY,C;O;KAR/E,C;uEAUA,yB;MAAA,iB;MAAA,oB;QAUgD,OAAA,MAA6B,KAAZ,CAAY,C;O;KAV7E,C;2EAYA,yB;MAAA,iB;MAAA,oB;QACKD,OAAA,MAA+B,OAAZ,CAAY,C;O;KAdjF,C;uEAgBA,yB;MAAA,mC;MAAA,0B;QAc6D,OAAmC,IAA7B,CAA6B,EAAZ,IAAY,C;O;KadhG,C;qEAgBA,yB;MAAA,iB;MAAA,oB;QAW+C,OAAA,MAA6B,KAAZ,CAAY,C;O;KAX5E,C;2EAaA,yB;MAAA,iB;MAAA,oB;QAOkD,OAAA,MAA+B,OAAZ,CAAY,C;O;KAPjF,C;yEASA,yB;MAAA,iB;MAAA,oB;QAOiD,OAAA,MAA8B,MAAZ,CAAY,C;O;KAP/E,C;yEASA,yB;MAAA,iB;MAAA,oB;QAGBiD,OAAA,MAA+B,OAAZ,CAAY,C;O;KAhBhF,C;yEakBA,yB;MAAA,iB;MAAA,oB;QAUiD,OAAA,MAA8B,MAAZ,CAAY,C;O;KAV/E,C;2EAYA,yB;MAAA,iB;MAAA,oB;QAUkD,OAAA,MAA+B,OAAZ,CAAY,C;O;KAVjF,C;iFAYA,yB;MA3gBA,iB;MA2gBA,oB;QAUqD,OA3gBE,MAAW,OA2gBF,CA3gBE,C;O;KAigBIE,C;2EAYA,yB;MAAA,uC;MAAA,oB;QAQkD,OAaOB,MAAZ,CAAY,C;O;KARtE,C;uEAWA,yB;MAAA,iB;MAAA,oB;QAUgD,OAAA,MAA6B,KAAZ,CAAY,C;O;KAV7E,C;yEAYA,yB;MAAA,iB;MAAA,oB;QAWiD,OAAA,MAA8B,MAAZ,CAAY,C;O;KAX/E,C;wEAeA,yB;MAAA,iB;MAAA,uB;QAO0D,OAAA,MAAW,KAAI,CAAJ,EAAO,CAAP,C;O;KAPrE,C;wEASA,yB;MAAA,iB;MAAA,uB;QAO0D,OAAA,MAAW,KAAI,CAAJ,EAAO,CAAP,C;O;KAPrE,C;SEAYA,yB;MAAA,iB;MAAA,+B;QAAsD,OAAA,MAA8C,KAA1B,SAA0B,EAAZ,CAAY,C;O;KAbpG,C;uEAeA,yB;MAAA,iB;MAAA,+B;QAOoD,OAAA,MAA8C,KAA1B,SAA0B,EAAZ,CAAY,C;O;KAPiG,C;kGAmBoD,yB;MAAA,iB;MAAA,4B;QAAQ,OAAA,MAAgC,KAAZ,SAAY,C;O;KAAxC,C;gFAaT,yB;MAAA,iB;MAAA,4B;QAAQ,OAAA,MAAiC,MAAZ,SAAY,C;O;KAAzC,C;gFAE3C,yB;MAAA,6C;MAAA,kC;QAO8D,OAA0C,SAArC,SAaQc,EAAZ,IAAY,C;O;KAPxG,C;iFASA,yB;MAAA,6C;MAAA,kC;QAK4D,OAA0C,SAArC,SAaQc,EAAZ,IAAY,C;O;KALtG,C;oFAQA,yB;MAAA,iD;MAAA,4B;QAYmD,OAAW,WAAX,SAAW,C;O;KAZ9D,C;sFAcA,yB;MAAA,mD;MAAA,4B;QAYqD,OAAW,YAAX,SAAW,C;O;KAZhE,C;IAoBA,kB;MAUqC,OAAI,IAAI,CAAR,GAAY,CAAC,CAAD,OAAAM,CAAIB,GAA0B,C;K;wEAE/D,yB;MAAA,iB;MAAA,uB;QAKoD,OAAA,MAAW,KAAI,CAAJ,EAAO,CAAP,C;O;KAL/D,C;wEAOA,yB;MAAA,iB;MAAA,uB;QAKoD,OAAA,MAAW,KAAI,CAAJ,EAAO,CAAP,C;O;KAL/D,C;mGAIbGd,yB;MAAA,mC;MAAA,4B;QAAQ,WAAL,SAAJ,C;O;KAAR,C;IAShB,+B;MAC5B,gBAAO,CAAP,C;QADoC,OACxB,E;WACZ,gBAAO,CAAP,C;QAFoC,OAExB,C;QAFwB,OAG5B,C;K;IAKZ,kB;MASuC,OAAI,eAAI,CAAR,GAAY,CAAD,aAAX,GAAMB,C;K;wEAE1D,gB;MAKuD,OAAI,kBAAK,CAAL,MAAJ,GAAY,CAAZ,GAAMB,C;K;wEAE1E,gB;MAKuD,OAAI,kBAAK,CAAL,MAAJ,GAAY,CAAZ,GAAMB,C;K;mGAYxB,yB;MAAA,mC;MAAA,4B;QAAQ,WAAL,SAAJ,C;O;KAAR,C;IASjB,+B;MAC7B,2BAAO,CAAP,C;QADqC,OA CzB,E;WACZ,2BAAO,CAAP,C;QAFqC,OAeZB,C;QAFyB,OAG7B,C;K;IC1kCZ,4B;MAI4C,qBAAQ,S;K;IAEpD,4B;MAI2C,qBAAQ,S;K;IAEnD,+B;MAGiD,qBAAQ,wCAAO,kBAAf,IAAoC,cAAQ,wCAAO,kB;K;IAEpG,iC;MAGgD,qBAAQ,uCAAM,kBAAd,IAAmC,cAAQ,uCAAM,kB;K;IAEjG,6B;MAG+C,QAAC,qBAAD,IAAiB,CAAC,kB;K;IAEjE,+B;MAG8C,QAAC,uBAAD,IAAiB,CAAC,kB;K;IAGhE,iC;MAOI,QAAQ,S;MACR,IAAI,CAAC,IAAM,UAAP,KAAAsB,CAAE,KAAK,CAAP,GAAC,UAAP,C;K;MACJ,IAAI,CAAC,IAAM,SAAP,KAAAsB,CAAE,KAAK,CAAP,GAAC,SAAP,C;K;MACJ,IAAI,CAAC,IAAM,QAAP,KAAAsB,CAAE,KAAK,CAAP,GAAC,QAAP,C;K;MACJ,IAAI,CAAC,IAAM,KAAP,KAAAsB,CAAE,KAAK,EAA7B,K;MACJ,OAAO,C;K;kGAGX,yB;MAAA,iB;MAAA,4B;QAM2D,OAAA,MAAO,OAAM,SAAN,C;O;KANIE,C;IAQA,0C;MAOI,YATuD,MAAO,OAS9B,EAAf,aAAQ,CAAC,SAAD,IAA



C,I;MACxC,2BAAgD,W;MACHD,kCAAyC,K;K;0FAFzC,Y;MAAA,gC;K;yFACA,Y;MAAA,+B;K;gGACA,Y;M  
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CA,Y;MAAA,+B;K;4CAEA,Y;MAAkC,gB;K;;;8CANtC,Y;MACI,gB;K;8CADJ,Y;MAEI,uB;K;8CAFJ,Y;MAGI,o  
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E,gCAApE,C;MAEf,mBACKB,wBAAoB,MAApB,EAAGe,QAaHE,EAA0E,mCAA1E,C;MAELB,oBACmB,+B;M  
AEnB,oBACmB,wBAAoB,OAApB,EAaKE,SAAIE,EAA6E,oCAA7E,C;MAEnB,iBACgB,wBAAoB,MAApB,EA  
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F,wCAA1F,C;K;IAMkB,qE;MAAA,qB;QAAE,OvE/DD,OuE+DU,EAAT,KAAiB,UAAjB,IAAkC,EAAY,OAAf,K  
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,a;QACH,aAAa,wBAAoB,QAApB,EAA+D,kBAA/D,EACoB,mDADpB,C;QAEg,eAAhB,UAAqC,M;QAHIC,SA  
IH,M;;;MAJJ,a;K;IA7D+E,8C;MAAE,6B;K;IAGO,iD;MAAE,0B;K;IAME,kD;MAAE,8B;K;IAGZ,+C;MAAE,6B;  
K;IAGC,gD;MAAE,6B;K;IAGR,8C;MAAE,6B;K;IAGI,gD;MAAE,6B;K;IAGC,iD;MAAE,6B;K;IAGH,gD;MAA  
E,yB;K;IAGD,iD;MAAE,6B;K;IAGM,oD;MAAE,mC;K;IAGO,uD;MAAE,gC;K;IAGL,oD;MAAE,6B;K;IAGJ,oD  
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GC,sD;MAAE,+B;K;;;IA5DvH,wC;MAAA,uC;QAAA,sB;;;MAAA,gC;K;;;ICCA,2B;MAEW,Q;MAAA,IAAI,KAA  
Y,SAAQ,MAAR,CAAhB,C;QACH,kBAAW,MAAX,C;;;QAEA,kBAAW,MAAX,C;;;MAHJ,W;K;IAOJ,8B;MAC4  
E,QAAM,QAAS,OAAf,C;aACxE,C;UADwE,OACnE,WAAW,SAAS,CAAT,CAAX,C;aACL,C;UAFwE,OAEnE,+  
B;;UAFmE,OAGhE,iB;;;K;IAGZ,oC;MAEU,IAAN,I;MAAA,QxEhB0C,OwEgB3B,CAAf,C;aACI,Q;UAA6B,OAA  
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AAjB,8BAAiB,eAAGB,CAAY,OAA5B,C;UAA/B,K;;;UAGQ,6B;YAAAsC,OAAjB,8BAAiB,kB;eACtC,0B;YAAmC  
,OAAjB,8BAAiB,e;eACnC,0B;YAAmC,OAAjB,8BAAiB,e;eACnC,2B;YAAoC,OAAjB,8BAAiB,gB;eACpC,yB;  
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pC,4B;YAAqC,OAAjB,8BAAiB,iB;eACrC,6B;;;eACA,sB;YAAkC,OAAjB,8BAAiB,W;;YAE9B,kBAAkB,MAAA,  
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AAgD,OAAjB,8BAAiB,e;;cAE5C,cAA0B,W;cAC1B,kBAAW,OAAX,C;;;UAxBxB,K;;;MAAA,W;K;IAGCJ,4B;  
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gBAAJ,C;QACH,IAAI,QAAS,SAAT,QAAJ,C;UACI,aAAa,qBAAiB,MAAjB,C;UACb,oBAAsB,M;UACtB,a;;UA  
ES,OAAT,QAAS,S;;;QAGb,4BAAiB,MAAjB,C;;;MATJ,W;K;ICrCJ,0B;MAII,sBAAY,C;K;qEAChB,4B;MAIkE,iB  
AAy,KAAZ,C;K;2EAEIE,qB;MAI8D,gB;K;ICIDb,2C;MAC7C,qBAAwC,Q;K;iDAExC,Y;MACmB,Q;MAAA,yB  
;MAAA,iB;QAAe,MAAM,6BAAsB,OCAAtB,C;;;MAApC,eAAe,I;MACf,qBAAC,I;MACd,OAAO,QAAS,W;K;;;;I  
CLa,kD;MADrC,e;MACsC,0B;MAAyB,gB;MAD/D,iB;MAAA,uB;K;IAAA,mC;MAAA,sC;O;MAEL,qEAGW,CA  
HX,EAGc,IAHd,C;MAKA,iFAGiB,CAHjB,EAGoB,IAHpB,C;MAKA,iFAGiB,CAHjB,EAGoB,IAHpB,C;MAKA,  
iFAGiB,CAHjB,EAGoB,IAHpB,C;MAKA,+EAGgB,CAHhB,EAGmB,IAHnB,C;MAKA,yEAGa,CAHb,EAGgB,I  
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W;K;6FAStC,qB;MAAQ,OAAy,W;K;6FAEpB,qB;MAAQ,OAAy,W;K;uFAEvB,qB;MAAQ,OAAS,Q;K;qFAEn  
B,qB;MAAQ,OAAO,M;K;uFASX,qB;MAAQ,OAAS,Q;K;yFAEjB,qB;MAAQ,OAAS,Q;K;qGAEX,qB;MAAQ,O  
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B,C;MAAG,qB;QAAA,QAAiB,C;MAAG,uB;QAAA,UAAoB,K;MAAO,0B;QAAA,aAAuB,K;MAAO,wB;QAAA  
,WAAqB,K;MAC3L,QAAQ,E;MACR,EAAE,kBAAF,IAAwB,gB;MACxB,EAAE,QAAF,IAAc,M;MACd,EAAE,  
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ChB,OAAO,C;K;mFAU8E,qB;MAAQ,OAAG,E;K;+FAEL,qB;MAAQ,OAAC,a;K;iFAE7B,qB;MAAQ,OAAO,M;  
K;yFAEX,qB;MAAQ,OAAW,U;K;+EAEvB,qB;MAAQ,OAAO,M;K;+EAEf,qB;MAAQ,OAAO,M;K;oEtJlvG,yB  
;MAAA,kF;MAAA,0B;MAAA,uB;QAaI,IAAI,OAAO,CAAP,IAA8B,OAAO,KAAzC,C;UACI,MAAM,8BAAYB,  
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V,6B;MAAC,qB;QAAA,8C;MAAA,kB;K;IACjC,2C;MAAA,e;MAAA,iB;MAAA,uB;K;IAAA,yC;MAAA,4C;O;  
MAKI,0E;MAEA,sE;K;;IAFA,kD;MAAA,+B;MAAA,0C;K;;IAEA,gD;MAAA,+B;MAAA,wC;K;;IAPJ,qC;MAA  
A,yF;K;;IAAA,0C;MAAA,a;aAAA,S;UAAA,+C;aAAA,O;UAAA,6C;;UAAA,8D;;K;;IA0BmC,sC;MACnC,8B;K;  
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K;;IAyByB,4B;MACzB,8B;K;;IC/C4C,8B;K;kDAI5C,mB;MAA6D,c;;QrJ2rD7C,Q;QADhB,IAAI,mCAAsB,cAA

1B,C;UAAqC,aAAO,K;UAAP,e;;QACrB,sB;QAAhB,OAAGB,cAAhB,C;UAAgB,2B;UAAM,IqJ3rD6C,OrJ2rD/B,  
SqJ3rD+B,UrJ2rD7C,C;YAAwB,aAAO,I;YAAP,e;;;QAC9C,aAAO,K;;;MqJ5rDsD,iB;K;uDAE7D,oB;MACa,c;;Qr  
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,iC;;UAAA,6D;;K;;IAOA,4B;MAKI,mD;MACA,2BAA4B,I;K;yCAE5B,Y;MAEiB,IAAN,I;M5JUX,IAAI,E4JXQ,  
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CA,OAAO,kD;K;+CAeX,iB;MAII,2BAAy,K;MACZ,gD;K;sCAGJ,Y;MAII,+C;K;;ICjDkC,wB;MAoFtC,oC;MAp  
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;;QAGR,qBAAO,E;;MuJjWqD,yB;K;0CAE5D,Y;MAA+C,+CAAiB,CAAjB,C;K;kDAE/C,iB;MAAyD,+CAAiB,  
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A/E,kB;MAAmC,4B;MAC5D,eAAyB,C;MAGrB,+DAAkB,gBAAIB,EAA6B,OAA7B,EAAsC,WAAK,KAA3C,C;  
MACA,eAAa,UAAU,gBAAV,I;K;iDAGjB,iB;MACI,+DAAkB,KAAIB,EAAYB,YAAzB,C;MAEA,OAAO,wBAA  
K,mBAAy,KAAZ,IAAL,C;K;4FAGY,Y;MAAQ,mB;K;;oCAGnC,iB;MAMI,IAAI,UAAU,IAAd,C;QAAoB,OAA  
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,IAAjB,C;;QACT,IxKtS6C,CAAC,cwKsS9C,C;UACS,OAAZ,kBAAy,EA AK,IAAL,EA AW,WAAW,EA AiB,kB  
AAy,OAA7B,C;UACA,OAAZ,kBAAy,EA AK,IAAL,EA AW,CAAX,EA Ac,IAAd,C;;MAEhB,cAAO,C;MACP,YA  
AO,C;K;2CAGX,iB;MAGe,IAAC,IAAD,EA cJ,M;MAfP,WACW,eAAC,OAAI,KAAM,OAAN,IAAc,SAAI B,GAA  
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AZ,C;MA8bhD,IAAI,cAAO,IAAX,C;Q/J2XJ,U+J1XQ,kB/J0XR,E+J1X6B,I/J0X7B,EAD+F,CAC/F,E+J1XgD,W/  
J0XhD,E+J1XiE,I/J0XjE,C;;Q+JzXW,IxKtT6C,CAAC,cwKsT9C,C;U/JyXX,U+JxXQ,kB/JwXR,E+JxX6B,I/JwX7  
B,E+JxXuD,C/JwXvD,E+JxXuE,W/JwXvE,E+JxXwF,kBAAy,O/JwXpG,C;UAAA,U+JvXQ,kB/JuXR,E+JvX6B,I  
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1C,gC;MAAA,oC;MACI,0BrHriBuC,E;MqHsiBvC,sBAAiC,U;MACjC,4BAAuC,E;K;yDAEvC,oC;MAEI,kBAAk  
B,eAAe,eAAGB,CAA/B,K;MACIB,IAAI,eAAc,WAAAd,QAA4B,CAAhC,C;QACI,cAAc,W;MACIB,IAAI,eAAc,U  
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AwB,4D;WACxB,sBAAkB,CAAIB,C;QAAuB,uBAAa,eAAb,O;;QACf,MAAM,gCAAyB,uBAAoB,eAA7C,C;MA  
HIB,0B;MAJJ,Y;K;IAWA,kC;MAAA,oD;MAGoB,+B;MA/BxB,sB;MAGCQ,sBAAc,qD;MAJIB,Y;K;IAOA,4C;M  
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C;MACZ,wBAAa,SAAb,gB;QAAa,WAAA,SAAb,M;QACI,KAAM,WAAI,IAAK,MAAT,C;QACN,KAAM,WAA  
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B,YAAQ,C;;M+K1qPf,W;K;oFAGJ,mC;MAUI,O/K6pPO,qBAAQ,C+K7pPf,GAAe,cAAf,GAAmC,S;K;IAGvC,iD

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X,yB;MAAA,wE;MAAA,uC;QAOW,kBAAY,oB;QafH,Q;QAAA,OApJoE,iBAAQ,W;QAoJ5F,OAAgB,cAAhB,  
C;UAAgB,yB;UACZ,IAAI,CackC,SadjC,CAAU,OAAV,CAAL,C;YACI,WAAY,aAAI,OAAQ,IAAZ,EAAiB,OA  
AQ,MAAzB,C;;;QAapB,OAVO,W;O;KAGX,C;IAUA,0B;MAQqB,IAAN,I;MADX,IAAI,oCAAJ,C;QACW,QAA  
M,cAAN,C;eACH,C;YAAK,iB;YAAL,K;eACA,C;YAAK,aAAU,8BAAJ,GAakB,sBAAK,CAAL,CAAIB,GAA+  
B,oBAAW,OAAdD,C;YAAL,K;;YACQ,0BAAM,qBAAoB,YAAy,cAAZ,CAApB,CAAN,C;YAhL,K;;QAAP,W;;  
MAMJ,OAAoC,oBAA7B,mBAAM,oBAAN,CAA6B,C;K;IAGxC,yC;MAIwB,SAApB,WAAoB,Y;MAApB,kB;K;  
IAEJ,4B;MAM6D,QAAM,gBAAN,C;aACzD,C;UADyD,OACpD,U;aACL,C;UAFyD,OAEPD,MAAM,UAAK,CA  
AL,CAAN,C;;UAFoD,OAGjD,mBAAM,qBAAoB,YAAy,gBAAZ,CAApB,CAAN,C;;K;IAGZ,yC;MAIwB,OAAP  
B,WAAoB,Y;MAApB,kB;K;IAEJ,4B;MAM4D,OAA6B,oBAA7B,mBAAM,oBAAN,CAA6B,C;K;IAEZf,yC;MAI  
wB,SAApB,WAAoB,Y;MAApB,kB;K;IAEJ,4B;MAMqD,QAAM,cAAN,C;aACjD,C;UADiD,OAC5C,U;aACL,C;  
UAFiD,OC/X8B,uB;;Ud+X9B,OAGzC,uB;;K;IAGZ,iC;MAMmE,4BAAC,SAAd,C;K;IAEnE,yC;MAKI,WAAoB,0  
B;MAApB,kB;K;IAEJ,kC;MAOI,Q;MAAA,IAAI,SAAK,UAAT,C;QAAA,OAAoB,MAAM,IAAN,C;;QAAqC,kB  
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;MAOI,Q;MAAA,IAAI,SAAK,UAAT,C;QAAA,OAA0B,MAAN,KAAM,C;;QAAiC,kBAApB,qBAAC,SAAd,C;Q  
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B,IAAK,OAArB,C;K;4FAGJ,yB;MAAA,gD;MAAA,mC;QAKI,kBAAO,KAAP,C;O;KALJ,C;4FAQA,yB;MAAA,  
gD;MAAA,mC;QAKI,kBAAO,KAAP,C;O;KALJ,C;4FAQA,yB;MAAA,gD;MAAA,mC;QAKI,kBAAO,KAAP,C;  
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MARCV,OAAgD,oBUhoBzC,WVgoByC,C;K;IAEPD,mC;MAQwB,kBAAf,aAAL,SAAK,C;MAoCK,YAAL,gBA  
AK,O;MApCV,OAAgD,oBU1oBzC,WV0oByC,C;K;IAEPD,mC;MAQwB,kBAAf,aAAL,SAAK,C;MAMCK,YAA  
L,gBAAK,O;MANCV,OAAgD,oBUppBzC,WVopByC,C;K;4FAEPD,0B;MAMI,uBAAO,GAAP,C;K;8FAGJ,yB;  
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B,OAA2D,CAA9B,sEAA8B,oBAAU,QAAV,C;O;KAT/D,C;wFAWA,yB;MAAA,8D;MAAA,8B;MAAA,sC;QASi  
C,Q;QAA7B,OAA2D,CAA9B,sEAA8B,oBAAU,QAAV,C;O;KAT/D,C;4FAWA,8B;MAKI,SAAK,WAAI,OA AJ,  
C;K;4FAGT,yB;MAAA,gD;MAAA,sC;QAKS,OAAL,SAAK,EAAO,QAAP,C;O;KALT,C;4FAQA,yB;MAAA,gD;  
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U,QAAV,C;O;KALT,C;8FAQA,yB;MAAA,sD;MAAA,sC;QAKS,UAAL,SAAK,EAAU,QAAV,C;O;KALT,C;IA  
QA,qC;MAIU,IAIe,I;MAHjB,kBADE,QACF,c;QAAiB,OAAO,yBAAO,QAAP,C;;QAEpB,aAAsB,K;QACT,0B;Q  
AAb,OAAa,cAAb,C;UAAa,sB;UACT,IAAI,oBAAI,IAAJ,CAAJ,C;YAAe,SAAS,I;;QAC5B,OAAO,M;;K;IAKnB,  
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IW,iBAAmB,gCAAT,QAAS,EAAGC,SAAhC,C;MAIHG,Q;MAkH7B,OAIH2D,CAA9B,sEAA8B,oBAAU,UA AV,  
C;K;IAqH/D,0C;MAII,UAAmB,8BAAT,QAAS,C;MACnB,09K0EwD,C8K1EjD,G9K0EkD,U8K1EID,IAAoB,4B  
AAU,GA AV,C;K;IAG/B,0C;MAII,OpLqoPO,EoLroPA,QpL6jPA,YAAQ,CAwER,CoLroPA,IAAyB,4BAAmB,8B  
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AO,wB;K;IAGf,kC;MACI,a9KmCwD,CAAC,mB;M8K1CzD,iB;MACA,OAAO,M;K;IAIX,2C;MAKkF,gCAAc,S  
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C;MnKlJgB,kBmKmJX,oB;MACD,OAAO,qBAAP,C;QACI,IAAI,UAAU,kBAAV,6BAAJ,C;UACI,oB;UACA,W  
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MAAM,2BAAuB,gBAAvB,C;;QAArB,OAAMe,2BAAS,CAAT,C;K;IAEpH,sC;MAKwD,OAAI,mBAAJ,GAAe,I  
AAf,GAAYB,2BAAS,CAAT,C;K;IAEjF,+B;MAKgD,IAAI,mBAAJ,C;QAAe,MAAM,2BAAuB,gBAAvB,C;;QAA  
rB,OAAMe,2BAAS,2BAAT,C;K;IAEnH,qC;MAKuD,OAAI,mBAAJ,GAAe,IAAf,GAAYB,2BAAS,2BAAT,C;K;I  
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E9E,wE;MAEgB,UAGS,MAHT,EAcY,MAdZ,EAc6B,M;MAfzC,IAAI,uCAAJ,C;QACI,OAAoC,cAA5B,sEAA4B,  
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K,UAAL,EAAMB,OAAnB,C;QAEJ,+B;;MAEJ,IAAI,aAAa,cAAjB,C;QACwB,oC;QAAiB,mB;QAArC,oE;UACI,  
2BAAS,WAA T,C;QAEJ,OAAO,I;;QAEp,OAAO,K;;K;IChS+w,C;MAAkC,uB;MAAjC,0B;K;4FACpB,Y;MAA  
Q,OAAA,eAAS,K;K;iDACxC,iB;MAAkC,mCAAS,0BAAoB,KAApB,CAAT,C;K;;IAGT,gC;MAAyC,8B;MAAx  
C,0B;K;oFACH,Y;MAAQ,OAAA,eAAS,K;K;yCACxC,iB;MAAkC,mCAAS,0BAAoB,KAApB,CAAT,C;K;mCA  
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I,I;;QAAkB,MAAM,8BAA0B,oBAAiB,KAAjB,2BAA2C,gBAAG,cAAH,CAA3C,OAA1B,C;K;IAGID,+B;MAK+  
C,gCAAqB,SAArB,C;K;IAE/C,iC;MAM6D,wBAAa,SAAb,C;K;;;IxKpC7D,oD;MAQuF,wC;K;IARvF,8CASI,Y;  
MAAuC,8B;K;IAT3C,gF;IyKY8G,wC;MAAA,mB;QAAE,kBAAS,aAAT,C;O;K;IATHh,yB;MASqG,oCAAS,sBA  
AT,C;K;8FAErG,yB;MAAA,kD;MzKdA,kC;MAAA,0C;MAAA,kD;QAQuF,wC;O;MARvF,4CASI,Y;QAAuC,8B;  
O;MAT3C,8E;MyKiB2I,qD;QAAA,mB;UAAE,gBAAS,qBAAT,C;S;O;MAH7I,gC;QAGkI,kCAAS,mCAAT,C;O;  
KAHII,C;IAKA,2B;MAQI,eAAe,6B;MACf,oBAA0B,+BAAN,KAAM,EAAwC,QAAxC,EAA+D,QAA/D,C;MAC  
1B,OAAO,Q;K;8FAGX,yB;MAAA,kD;MAAA,gC;QAGkI,gBAAS,aAAT,C;O;KAHII,C;IAGB0C,yB;K;+CAoBtC,

kC;MAOI,IAAI,uCAA0B,QAAS,UAAvC,C;QAAkD,M;MACID,OAAO,sBAAS,QAAS,WAAIB,e;K;+CAGX,kC;  
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5B,sBAAyC,I;MACzC,gBAAoC,I;K;gDAEpC,Y;MACI,OAAO,IAAP,C;QACI,QAAM,YAAN,C;eACI,C;YAAA,  
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,QAAM,YAAN,C;aACI,C;aAAA,C;UAAsC,OAAO,qB;aAC7C,C;UACI,eAAQ,C;UACR,OAAO,kCAAe,O;aAE1  
B,C;UACI,eAAQ,C;UACR,aACa,mF;UACb,mBAAy,I;UACZ,OAAO,M;::UAEH,MAAM,yB;::K;uDAItB,Y;MACI  
,IAAI,CAAC,cAAL,C;QAAgB,MAAM,6B;::QAA8B,OAAO,W;K;2DAG/D,Y;MAA4C,QAAM,YAAN,C;aACxC,  
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1D,C;::K;IAOqC,4E;MAAA,oB;QACzC,wCAAW,C;QAAX,OACA,yB;O;K;oDALR,+B;MACI,mBAAy,K;MACZ  
,eAAQ,C;MACR,OAA6C,0CAAtC,c;K;IAUsC,+E;MAAA,oB;QACzC,wCAAW,C;QAAX,OACA,yB;O;K;yDAN  
R,kC;MACI,IAAI,CAAC,QAAS,UAAc,C;QAAyB,M;MACzB,sBAAe,Q;MACf,eAAQ,C;MACR,OAA6C,6CAAt  
C,c;K;2DAMX,kB;M1HjBO,Q;MADP,e0HoBI,M1HpbJ,C;MACO,Q0HmBH,M1HnBG,+D;M0HoBH,eAAQ,C;K  
;kGAIR,Y;MAAQ,0C;K;::IzK1LhB,oD;K;MAQuF,wC;K;IARvF,8CASI,Y;MAAuC,8B;K;IAT3C,gF;sFAAA,yB;MA  
AA,kC;MAAA,0C;MAAA,kD;QAQuF,wC;O;MARvF,4CASI,Y;QAAuC,8B;O;MAT3C,8E;MAAA,2B;QAQuF,2  
C;O;KARvF,C;IAiBgE,+C;MAAA,mB;QAAE,sB;O;K;IALIE,kC;MAKuD,OAakB,2CAAT,+BAAS,E;K;IAEzE,8  
B;MAK6D,OAAI,Qb2rPtD,YAAQ,Ca3rP0C,GAawB,eAaxB,GAAsD,WAAT,QAAS,C;K;IAEnH,yB;MAG8C,kC  
;K;IAE9C,yB;MAAA,6B;K;uCACI,Y;MAA6C,kC;K;2CAC7C,a;MAA4B,kC;K;2CAC5B,a;MAA4B,kC;K;::IAHh  
C,qC;MAAA,oC;QAAA,mB;::MAAA,6B;K;oFAMA,yB;MAAA,2D;MAAA,4B;QAM4D,uCAAQ,e;O;KANpE,C;I  
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,KAAT,C;K;IAGX,+B;MAQqD,6BAAS,4BAAT,C;K;IAW0B,+G;MAAA,wC;MAAA,6B;MAAA,yB;MAAA,0C;  
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C;gBAAA,gB;:::;cACI,QAAQ,yBAAO,iBAAQ,iBAAO,KAAf,C;cACf,WAAkB,WAAP,iBAAO,C;cACIB,YAAgB,  
IAAI,iBAAO,KAAf,GAAqB,iBAAO,aAAI,CAAJ,EAAO,IAAP,CAA5B,GAA8C,I;cAC1D,gB;8BAAA,iCAAM,K  
AAN,O;kBAAA,2C;uBAAA,yB;cAAA,Q;::cAJJ,gB;:::;cAMJ,W;:::;:::;K;IAR+E,4D;MAAA,yD;uBAAA,mG;Y  
AAA,S;iBAAA,Q;::iBAAA,uB;O;K;IAT/E,uC;MASmE,gBAAY,kCAAZ,C;K;IAkBhC,0D;MAE/B,wB;QAAA,WA  
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Aa,a;MACb,gBAAW,I;MACX,iBAAy,E;MAEZ,OAAO,yE;K;IEAGX,Y;MACI,IAAI,mBAAa,EAAjB,C;QACI,iB  
;MACJ,OAAO,mBAAa,C;K;::2CAhC5B,Y;MAAuC,yD;K;::IA2C3C,qD;MAAY,0B;MAAmC,gC;K;IACJ,gF;MAA  
A,0D;MACnC,gBAAe,oCAAS,W;K;IEACxB,Y;MACI,OAAO,6CAAY,aAAS,OAAR,B,C;K;OEAGX,Y;MACI,OA  
AO,aAAS,U;K;::8CAPxB,Y;MAAuC,4D;K;qDAWvC,oB;MACI,OAAO,uBAA4B,eAA5B,EAAsC,kBAAtC,EAA  
mD,QAAnD,C;K;::IAUf,4D;MAAY,0B;MAAmC,gC;K;IACJ,8F;MAAA,wE;MACnC,gBAAe,2CAAS,W;MACxB,  
aAAy,C;K;wEACZ,Y;MAC0C,Q;MAAtC,OAAO,oDAAY,oBAAmB,iBAAnB,EAAM,yBAAnB,QAAY,EAAyC,  
aAAS,OAALD,C;K;2EAGX,Y;MACI,OAAO,aAAS,U;K;::qDARxB,Y;MAAuC,mE;K;::IAkB3C,oC;MAAY,0B;K;I  
AC6C,wE;MACjD,gBAAe,gCAAS,W;MACxB,aAAy,C;K;6DACZ,Y;MAC2C,Q;MAAvC,OAAO,iBAAa,oBAA  
mB,iBAAnB,EAAM,yBAAnB,QAAb,EAA0C,aAAS,OAAnD,C;K;GEAGX,Y;MACI,OAAO,aAAS,U;K;::0CARx

B, Y;MAAqD,wD;K;;IAmBzD,0D;MACI,4B;MACA,4B;MACA,4B;K;IAEuC,sE;MAAA,gD;MACnC,iBAAGB,gC  
AAU,W;MAC1B,iBAAGB,gCAAU,W;K;4DAC1B,Y;MACI,OAAO,sCAAU,cAAU,OAApB,EAA4B,cAAU,OAA  
C,C;K;+DAGX,Y;MACI,OAAO,cAAU,UAAV,IAAuB,cAAU,U;K;;yCARhD,Y;MAAuC,uD;K;;Iac3C,6D;MACI,  
0B;MACA,gC;MACA,0B;K;IAEuC,4E;MAAA,sD;MACnC,gBA Ae,kCAAS,W;MACxB,oBAAiC,I;K;+DAEjC,Y;  
MACI,IAAI,CAAC,2BAAL,C;QACI,MAAM,6B;MACV,OAAO,gCA Ae,O;K;kEAG1B,Y;MACI,OAAO,2B;K;+E  
AGX,Y;MACQ,Q;MAAJ,IAAI,iEAA2B,KAA/B,C;QACI,oBA Ae,I;MAEnB,OAAO,yBAAP,C;QACI,IAAI,CAAC  
,aAAS,UAA d,C;UACI,OAAO,K;;UAEP,cAAc,aAAS,O;UACvB,uBA AuB,wCAAS,2CAAY,OAAZ,CAAT,C;UA  
CvB,IAAI,gBA AiB,UAArB,C;YACI,oBA Ae,gB;YACf,OAAO,I;;;MAInB,OAAO,I;K;;4CA9Bf,Y;MAAuC,0D;K;  
;IAoC9B,6I;MAAA,wC;MAAA,6B;MAAA,yB;MAAA,4C;MAAA,kD;MAAA,gD;MAAA,wB;MAAA,yB;MAAA  
,kC;K;;;yDAAA,Y;;;;kBAGyC,I;iCAFIC,C;cACI,sD;cAAhB,gB;;;;cAAA,KAAgB,yBA AhB,C;gBAAA,gB;;;;cA  
AgB,oC;cACZ,aAAa,6BAAU,oBA AmB,uBA AnB,EA AmB,+BA AnB,QAAV,EA AuC,OAAvC,C;cACb,gB;8BAA  
A,sCAAS,4BAAS,MAAT,CAAT,O;kBAAA,2C;uBAAA,yB;cAAA,Q;;cAFJ,gB;;;cAIJ,W;;;;K;IANS,0F;M  
AAA,yD;uBAAA,iI;YAAA,S;iBAAA,Q;;iBAAA,uB;O;K;IADb,wD;MACI,gBAAS,kDAAT,C;K;;;IAoByB,qD;M  
ACzB,0B;MACA,8B;MACA,0B;MC3TA,IAAI,ED+TQ,qBA Ac,CC/TtB,CAAJ,C;QACI,cD8T2B,+CAA4C,iB;QC  
7TvE,MAAM,gCA AyB,OAAQ,WAAjC,C;;MAFV,IAAI,EDgUQ,mBAAY,CChUpB,CAAJ,C;QACI,gBD+TyB,6  
CAA0C,e;QC9TnE,MAAM,gCA AyB,SAAQ,WAAjC,C;;MAFV,IAAI,EDiUQ,mBAAY,iBCjUpB,CAAJ,C;QACI,  
gBDgUkC,0DAAuD,eAAvD,WAAmE,iB;QC/TrG,MAAM,gCA AyB,SAAQ,WAAjC,C;;K;sFDkUa,Y;MAAQ,yB  
AAW,iBAAX,I;K;yCAE/B,a;MAAyC,OAAI,KAAK,YAAT,GAAgB,eAAhB,GAAqC,gBAAY,eAAZ,EAAsB,oBA  
Aa,CAAb,IAAtB,EAAsC,eAAtC,C;K;yCAC9E,a;MAAyC,OAAI,KAAK,YAAT,GAAgB,IAAhB,GAA0B,gBAAY  
,eAAZ,EAAsB,iBAAtB,EAAC,oBA Aa,CAAb,IAAI,C;K;IAEzC,8D;MAAA,wC;MAEtB,gBA Ae,2BAAS,W;M  
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;K;2DAIR,Y;MACI,a;MACA,OAAQ,gBA AW,gCAAZ,IAAyB,aAAS,U;K;wDAG7C,Y;MACI,a;MACA,IAAI,iBA  
AY,gCA AhB,C;QACI,MAAM,6B;MACV,qC;MACA,OAAO,aAAS,O;K;qCAvBxB,Y;MAA0B,mD;K;;IAgCA,u  
C;MAC1B,0B;MACA,oB;MC3WA,IAAI,ED+WQ,gBAAS,CC/WjB,CAAJ,C;QACI,cD8WsB,yCAAsC,YAAtC,M  
;QC7WtB,MAAM,gCA AyB,OAAQ,WAAjC,C;;K;0CDgXV,a;MAAyC,OAAI,KAAK,YAAT,GAAgB,eAAhB,GA  
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hB,GAA0B,iBA Aa,eAAb,EA AuB,CAAvB,C;K;IAE5B,gE;MACnC,YAAW,yB;MACX,gBA Ae,4BAAS,W;K;yDA  
ExB,Y;MACI,IAAI,cAAQ,CAAZ,C;QACI,MAAM,6B;MACV,6B;MACA,OAAO,aAAS,O;K;4DAGpB,Y;MACI,  
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0E;MAAA,oD;MACnC,gBA Ae,iCAAS,W;MACxB,iBA AqB,E;MACrB,gBA AmB,I;K;oEAEnB,Y;MACI,IAAI,aA  
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ACX,M;;;MAGR,iBAAY,C;K;8DAGhB,Y;MAMiB,Q;MALb,IAAI,mBA Aa,EAAjB,C;QACI,iB;MACJ,IAAI,mB  
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GX,Y;MACI,IAAI,mBA Aa,EAAjB,C;QACI,iB;MACJ,OAAO,mBA Aa,C;K;;2CAIC5B,Y;MAAuC,yD;K;;IA2Cb,u  
C;MAC1B,0B;MACA,oB;MC5bA,IAAI,ED+bQ,gBAAS,CC/bjB,CAAJ,C;QACI,cD8bsB,yCAAsC,YAAtC,M;QC  
7btB,MAAM,gCA AyB,OAAQ,WAAjC,C;;K;0CDgcV,a;MitXO,SJsXmC,eAAQ,CAAR,I;MAAD,OAA4B,KAAK,  
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EjE,gE;MACnC,gBA Ae,4BAAS,W;MACxB,YAAW,yB;K;2DAEX,Y;MAEI,OAAO,YAAO,CAAP,IAAY,aAAS,  
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A,OAAO,aAAS,U;K;;sCAnBxB,Y;MAAuC,oD;K;;IA6B3C,gD;MACI,0B;MACA,4B;K;IAGuC,0E;MAAA,oD;M  
ACnC,gBA Ae,iCAAS,W;MACxB,iBA AqB,E;MACrB,gBA AmB,I;K;gEAEnB,Y;MACI,OAAO,aAAS,UAAhB,C;  
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,M;;;MAGR,iBAAY,C;K;8DAGhB,Y;MAMqB,Q;MALjB,IAAI,mBA Aa,EAAjB,C;QACI,a;MAEJ,IAAI,mBA Aa,  
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AuC,yD;K;;IAuCN,+C;MAAC,sB;MAAiC,gC;K;0CACnE,Y;MAAuC,4BA AiB,aAAO,WAAxB,EAAoC,kBAAPC  
,C;K;;IAGP,+C;MAAuE,2B;MAAtE,sB;MAAiC,gC;MACIE,kBA AuB,c;K;6CAEvB,Y;MACI,OAAO,aAAO,UAA

d,C;QACI,WAAW,aAAO,O;QACIB,UAAU,mBAAY,IAAZ,C;QAEV,IAAI,eAAS,WAAI,GAAJ,CAAAb,C;UACI,mBAAQ,IAAR,C;UACA,M;;;MAIR,W;K;;IAKgC,0D;MAAC,wC;MAAuC,kC;K;IACrC,0E;MAAA,oD;MACnC,gBAAMb,I;MACnB,iBAAqB,E;K;oEAERB,Y;MACI,gBAAe,mBAAa,EAAjB,GAAqB,+CAArB,GAA4C,2CAAa,4BAAb,C;MACvD,iBAAgB,qBAAJ,GAASB,CAAtB,GAA6B,C;K;8DAG7C,Y;MAMiB,Q;MALb,IAAI,iBAAY,C AAhB,C;QACI,iB;MAEJ,IAAI,mBAAa,CAAjB,C;QACI,MAAM,6B;MACV,aAAa,8D;MAEb,iBAAY,E;MACZ,OAAO,M;K;iEAGX,Y;MACI,IAAI,iBAAY,CAAhB,C;QACI,iB;MACJ,OAAO,mBAAa,C;K;;2CAxB5B,Y;MAAuC,yD;K;;IA6B3C,kC;MAWI,OAAW,iDAAJ,GAAwC,SAAxC,GAakD,4BAAwB,SAAxB,C;K;IAeIb,uD;MAAA,qB;QAAE,6B;O;K;IAX7C,wC;MAWI,OAA2D,cAApD,sBAakB,YAAIB,EAAgC,qCAAhC,CAAoD,C;K;IAqBrC,iD;MAAA,mB;QAAE,mB;O;K;IAIB5B,gD;MAeI,OAAI,YAAJ,GACI,2BADJ,GAGI,sBAakB,+BAAIB,EAA4B,YAA5B,C;K;IAER,wD;MAcI,6BAakB,YAAIB,EAAgC,YAAhC,C;K;ILxpBJ,oB;MAAA,wB;MACI,8C;K;gCAEA,iB;MAA4C,oCAAMb,KAAM,U;K;kCACrE,Y;MAA+B,Q;K;kCAC/B,Y;MAAkC,W;K;gFAEX,Y;MAAQ,Q;K;iCAC/B,Y;MAAkC,W;K;wCACIC,mB;MAAMd,Y;K;6CACnD,oB;MAAMe,OAAA,QAAS,U;K;kCAE5E,Y;MAA6C,kC;K;uCAE7C,Y;MAAiC,6B;K;;IAdrC,gC;MAAA,+B;QAAA,c;;MAAA,wB;K;IAkBA,oB;MAIoC,6B;K;IAEpcC,2B;MAMmD,OAAI,QAAS,OAAT,GAAgB,CAApB,GAAgC,MAAT,QAAS,CAAhC,GAA6C,U;K;iFAEHg,yB;MAAA,mD;MAAA,mB;QAKwC,iB;O;KALxC,C;6FAOA,yB;MAAA,uE;MAAA,mB;QAQsD,2B;O;KARtD,C;IAUA,kC;MAKiE,OAAS,aAAT,QAAS,EAAa,qBAAc,YAAY,QAAS,OAARb,CAAd,CAAAb,C;K;uFAE1E,yB;MAAA,2D;MAAA,mB;QAGgD,qB;O;KAHhD,C;IAKA,+B;MAC2D,OAAS,aAAT,QAAS,EAAa,eAAQ,YAAY,QAAS,OAARb,CAAR,CAAAb,C;K;2FAEpE,yB;MAAA,uE;MAAA,mB;QAMwD,2B;O;KANxD,C;IAQA,iC;MAKME,OAAAS,aAAT,QAAS,EAAa,qBAAc,YAAY,QAAS,OAARb,CAAd,CAAAb,C;K;IAE5E,+B;MAMyD,OAAI,eAAJ,GAAqB,MAAM,OAAN,CAARb,GAAyC,U;K;IAEIG,kC;MAQI,OAAgB,gBAAT,QAAS,EAAgB,sBAAhB,C;K;sFAGpB,yB;MavBA,uE;MbuBA,gC;QanB8B,gBAAnB,oB;QbqCiB,aS/CxB,W;QT+CA,OS9CO,SISwC,Q;O;KbmBnD,C;wFA0BA,yB;MaICA,wE;Mb0CA,0C;QatCsC,gBAA3B,mBb4DiB,Qa5DjB,C;Qb4D2B,aS7EIC,W;QT6EA,OS5EO,SIgBgD,Q;O;KbsC3D,C;sFA+BA,yB;MAAA,mD;MAAA,4B;QAEkD,uCAAQ,U;O;KAF1D,C;IAIA,wC;MAAgD,QAAM,cAAN,C;aAC5C,C;UAD4C,OACvC,U;aACL,C;UAF4C,OAEvC,MAAM,oBAAW,OAAjB,C;;UAFuC,OAGpC,S;;K;IKnKZ,oD;MAQuF,wC;K;IARvF,8CASI,Y;MAAuC,8B;K;IAT3C,gF;I0KLA,yC;MzK4BI,IAAI,EyK3BI,OAAO,CAAP,IAAY,OAAO,CzK2BvB,CAAJ,C;QACI,cyK3BI,aAAJ,GACI,yEADJ,GAGI,8C;QzKyBJ,MAAM,gCAAyB,OAAQ,WAAjC,C;;K;IyKnBM,mI;MAAA,mB;QAAE,wBAAiB,gCAAjB,EAA6B,YAA7B,EAAMC,YAANc,EAAyC,sBAAzC,EAAyD,mBAAzD,C;O;K;IAFtB,gF;MACI,oBAAoB,IAApB,EAA0B,IAA1B,C;MACA,oCAAgB,6EAAhB,C;K;IAKyB,yL;MAAA,wC;MAAA,6B;MAAA,yB;MAAA,wC;MAAA,wC;MAAA,gD;MAAA,sD;MAAA,4D;MAAA,wB;MAAA,0B;MAAA,uB;MAAA,0B;MAAA,wB;MAAA,qB;MAAA,4B;MAAA,kC;K;;;2DAAA,Y;;;cACrB,4BAAiC,eAAL,uBAAK,EAAa,IAAb,C;+BACvB,0BAAO,uBAAP,I;cACV,IAAI,kBAAO,CAAX,C;oCACiB,iBAAa,qBAAb,C;kCACF,C;gBACD,6C;gBAAV,iB;;;sCAaa,gBAAc,qBAAd,C;gBACH,+C;gBAAV,gB;;;cAAA,KAAU,2BAAV,C;gBAAA,gB;;;cAAU,kC;cACN,mBAAO,WAAI,GAAJ,C;cACP,IAAI,mBAAO,SAAX,C;gBACI,IAAI,mBAAO,KAAP,GAAc,uBAAIB,C;kBAA0B,sBAAS,mBAAO,kBAAuB,uBAAvB,C;kBAA8B,gB;;;kBAAxE,gB;;;gBADJ,gB;;;cAGI,gB;8BAAA,iCAAU,8BAAJ,GAAiB,mBAAjB,GAA6B,iBAAU,mBAAV,CAANc,O;kBAAA,2C;uBAAA,yB;cAAA,Q;;cACA,mBAAO,qBAAy,uBAAZ,C;cAJX,gB;;;cAFJ,gB;;;cASA,IAAI,iCAAJ,C;gBACI,gB;;;gBADJ,iB;;;cACI,IAAO,mBAAO,KAAd,IAAqB,uBAARb,C;gBAAA,gB;;;cACI,gB;8BAAA,iCAAU,8BAAJ,GAAiB,mBAAjB,GAA6B,iBAAU,mBAAV,CAANc,O;kBAAA,2C;uBAAA,yB;cAAA,Q;;cACA,mBAAO,qBAAy,uBAAZ,C;cAFX,gB;;;cAIA,IjL4K4C,CiL5KxC,mBjL4KyC,UiL5K7C,C;gBAyB,iB;gCAAA,iCAAM,mBAAN,O;oBAAA,2C;yBAAA,yB;gBAAA,Q;;gBAAzB,iB;;;cAjCR,W;;cA4BI,iB;;cA1BJ,iB;;cAGI,KAAU,yBAAV,C;gBAAA,iB;;;6BAAU,sB;cACN,IAAI,kBAAO,CAAX,C;gBAAgB,oCAAQ,CAAR,I;gBAAW,iB;;gBAA3B,iB;;;cACA,iBAAO,WAAI,YAAJ,C;cACP,IAAI,iBAAO,KAAP,KAAe,uBAANb,C;gBACI,iB;gCAAA,iCAAM,iBAAN,O;oBAAA,2C;yBAAA,yB;gBAAA,Q;;gBADJ,iB;;;cAEI,IAAI,8BAAJ,C;gBAiB,iBAAO,Q;;gBAAa,oBAAS,iBAAU,uBAAV,C;cAC9C,kBAAO,c;cAHX,iB;;cAHJ,iB;;cASA,IjL+LgD,CiL/L5C,iBjL+L6C,UiL/LjD,C;gBACI,IAAI,qCAAkB,iBAAO,KAAP,KAAe,uBAARc,C;kBAA2C,iB;kCAAA,iCAAM,iBAAN,O;sBAAA,2C;2BAAA,yB;kBAAA,Q;;kBAA3C,iB;;gBADJ,iB;;;cAdJ,W;;cAcI,iB;;cAZJ,iB;;cAkCJ,W;K;IARCyB,sI;MAAA,yD;uBAAA,6K;YAAA,S;iBAAA,Q;;iBAAA,uB;O;K;IAF7B,6E;MACI,IAAI,CAAC,QAAS,UAAAd,C;QAAyB,OAAO,2B;MACHc,OAAO,WAAkB,0EAAIB,C;K;IAwCwB,6B;MAA8B,uB;MAA7B,



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E;QACf,mB;QACA,iB;;MAGJ,MAAM,C;MACN,OAAO,OAAO,IAAd,C;QACI,OAAO,IAAP,IAAe,wBAAO,GA  
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AAhD,C;;K;8CAdxB,mB;MAKI,OAAI,YAAY,mCAAhB,GAAuC,IAAvC,GACI,OAAQ,cAAK,IAAL,EA AW,4B  
AAX,C;K;;qDAiCz,e;MAEyB,Q;MADrB,OACI,OAAA,IAAK,IAAL,EAAY,GA AZ,CAAJ,GAAqB,0EAAR,B,G  
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;MAEjE,kC;MAEA,4BAAqC,mDAAJ,GAakD,OAAQ,qBAA1D,GAA0E,O;K;4DAE3G,mB;MAA6C,+BAAS,OA  
AT,C;K;6DAC7C,e;MAA8C,eAAQ,IAAR,IAAgB,8BAAE,G;K;;IAGjF,+C;MAW2C,IAAI,IAAJ,EAGV,M;MAL7  
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C,6C;MAAA,4C;QAAA,2B;;MAAA,qC;K;IAqB8B,wC;MAC1B,kB;MACA,wB;K;4CAGA,e;MAGQ,Q;MAFJ,U  
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,iB;MAAiD,OAAA,oBAAc,oBAAW,KAAX,C;K;kDAC/D,uB;MAA+D,OAAA,oBAAc,oBAAW,IAAX,EAAiB,KAAjB,C;K;yCAE7E,Y;MAAkC,OAAA,oBAAc,Y;K;iDAEhD,iB;MAAsD,OAAA,oBAAc,mBAAU,KAAY,C;K;iDACP,E,gB;MAA+C,OAAA,oBAAc,mBAAU,IAAV,C;K;yDAC7D,qC;MACI,OAAA,oBAAc,mBAAU,KAAY,EA AiB,SAAjB,EAA4B,OAA5B,C;K;;;IAtCtB,sC;MAAA,qC;QAAA,oB;;MAAA,8B;K;;IAOCJ,wB;MAAuC,yBAAa,IA AAb,EAAMb,IAAK,IAAI,EAA5B,C;K;IAEvC,wB;MAawC,yBAAa,IAAK,QAAiB,EAA2B,IAAK,YAAI,EA AJ,C AAQ,QAAxC,C;K;IAGxC,mC;MAUI,IAAA,KAAM,UAAAN,C;QAAmB,MAAM,gCAAYB,uCAAoC,KAA7D,C; WACzB,IAAA,KAAM,KAAN,GAAa,UAAb,C;QAF8C,OAEB,0BAAQ,KAAM,MAAd,EAAqB,KAAM,KAAN, GAAa,CAAb,IAArB,C;WAC9B,IAAA,KAAM,MAAN,GAAc,WAAd,C;QAH8C,OAGf,0BAAQ,KAAM,MAAN, GAAc,CAAd,IAAR,EAAyB,KAAM,KAA/B,IAAuC,CAAvC,I;;QAHe,OAIc,mB;K;IAGZ,oC;MAUI,IAAA,KAA M,UAAAN,C;QAAmB,MAAM,gCAAYB,uCAAoC,KAA7D,C;WACzB,IAAA,KAAM,KAAN,+C;QAFiD,OAEiB,2 BAAS,KAAM,MAAf,EAA5B,KAAM,KAAN,yBAAa,CAAb,EAAtB,C;WAC/B,IAAA,KAAM,MAAN,+C;QAHi D,OAGjB,2BAAS,KAAM,MAAN,8BAAc,CAAd,EAAT,EAA0B,KAAM,KAAhC,0BAAwC,CAAxC,E;;QAHiB, OAIzC,oB;K;IAOZ,yB;MAAyC,YjFrTkB,MAAO,OiFqTpB,KjFrToB,CiFqTzB,I;K;IAEzC,4C;MAEI,OAAA,SAA K,KAAK,EAAL,GAAU,QAAf,GAAyC,CAAX,CAAC,QAAD,IAAW,KAAI,E;K;IAEjD,uC;MxLlVI,IAAI,EwLsV uD,QAAQ,IxLtV/D,CAAJ,C;QACI,cwLqVuE,+B;QxLpVvE,MAAM,gCAAYB,OAAQ,WAAjC,C;;K;IwLqVd,yC; MxLvVI,IAAI,EwLuVyD,sBAAQ,IAAR,KxLvVzD,CAAJ,C;QACI,cwLsVyE,+B;QxLrVzE,MAAM,gCAAYB,OA AQ,WAAjC,C;;K;IwLsVd,yC;MxLxVI,IAAI,EwLwV6D,QAAQ,IxLxVrE,CAAJ,C;QACI,cwLuV6E,+B;QxLlV7E ,MAAM,gCAAYB,OAAQ,WAAjC,C;;K;IwLwVd,yC;MAAYD,oCAA0B,IAA1B,qBAAiC,KAAjC,kB;K;ICrXzD,6 B;MAOqC,OpMmYE,SoMnYF,mBpMmYE,C;K;IoMjYvC,sC;MASgD,6BAAS,WAAT,EAAa,KAAb,C;K;IAEhD ,4C;MAUI,qBAAqB,IAArB,EAA2B,KAA3B,C;MAEA,iBAAiB,IpMqQgB,KoMrQhB,GAAiB,W;MACiC,kBAAk B,KpMoQe,KoMpQf,GAAkB,W;MAEpC,mBAAMB,0BAAQ,UAAAR,EAAoB,WAApB,IAAqC,W;MACxD,OpMs WmC,SoMtW5B,YpMsW4B,C;K;IoMnWvC,sC;MAWI,IAAA,KAAM,UAAAN,C;QAAmB,MAAM,gCAAYB,uCA AoC,KAA7D,C;;QACzB,IpMGkE,YoMHIE,KAAM,KpMG6E,KAAjB,EoMHRd,4BAAK,UpMG6E,KAA7B,CoM HIE,K;UAFiD,OAEiB,sBAAS,KAAM,MAAf,EpMqBsB,SoMrBA,KAAM,KpMqBI,KAAK,GAAW,CoMrBb,Wp MqBa,MAAX,IAAf,CoMrBtB,C;;UAC/B,IpMEkE,YoMFIE,KAAM,MpME6E,KAAjB,EoMFPd,4BAAK,UpME4 E,KAA7B,CoMFIE,K;YAHiD,OpMuBI,SoMpBrB,sBpMiCsB,SoMjCb,KAAM,MpMiCiB,KAAK,GAAy,CoMjC1 B,WpMiC0B,MAAZ,IAAf,CoMjCtB,EAA2B,KAAM,KAAjC,CpMoB+B,KAAK,GAAW,CoMpBN,WpMoBM,M AAX,IAAf,C;;YoMvBJ,OAIzC,mB;;;K;IAGZ,8B;MAOuC,OpL0VG,UoL1VH,oBpL0VG,C;K;IoLxV1C,uC;MAS mD,8BAAU,2BAAV,EAAe,KAAf,C;K;IAEnD,6C;MAUI,sBAAsB,IAAtB,EAA4B,KAA5B,C;MAEA,iBAAiB,Ip LwNkB,KoLxNIB,8B;MACjB,kBAAkB,KpLuNiB,KoLvNjB,8B;MAEiB,mBAAMb,2BAAS,UAAAT,EAAqB,WA ArB,+B;MACnB,OpL6TsC,UoL7T/B,YpL6T+B,C;K;IoL1T1C,uC;MAWI,IAAA,KAAM,UAAAN,C;QAAmB,MA AM,gCAAYB,uCAAoC,KAA7D,C;;QACzB,IpL7CmE,aoL6CnE,KAAM,KpL7C+E,KAAiB,EoL6CtD,6BAAM,Up L7C8E,KAA9B,CoL6CnE,K;UAFoD,OAEPB,uBAAU,KAAM,MAAhB,EpLhCuB,UoLgCA,KAAM,KpLhCK,KA AK,KAAW,ChBsQ7C,UAAW,oBAAL,CoMtOyB,WpMsOzB,MAAK,CAAL,iBAAN,CgBtQ6C,MAAX,CAAhB, CoLgCvB,C;;UACHC,IpL9CmE,aoL8CnE,KAAM,MpL9C+E,KAAiB,EoL8CrD,6BAAM,UpL9C6E,KAA9B,CoL 8CnE,K;YAHoD,OpL9BG,UoLiCtB,uBpLpBuB,UoLoBb,KAAM,MpLpBkB,KAAK,UAAy,ChByP/C,UAAW,oB AAL,CoMrOc,WpMqOd,MAAK,CAAL,iBAAN,CgBzP+C,MAAZ,CAAhB,CoLoBvB,EAA4B,KAAM,KAAiC,Cp LjCiC,KAAK,KAAW,ChBsQ7C,UAAW,oBAAL,CoMrOgC,WpMqOhC,MAAK,CAAL,iBAAN,CgBtQ6C,MAA X,CAAhB,C;;YoL8BH,OAI5C,oB;;;K;IAGZ,sC;MAQI,4BAAU,KjK4+FH,QiK5+FP,C;MACA,OAAO,K;K;IAGX ,uC;MAKsD,OjK2iG3C,eiK3iG2C,4BAAU,IAAV,CjK2iG3C,C;K;IiKziGX,4D;MAOGD,yB;QAAA,YAAiB,C;M AAG,uB;QAAA,UAAe,KAAM,K;MACrF,4BAAU,KjKy9FH,QiKz9FP,EAA+B,SAA/B,EAA0C,OAA1C,C;MAC A,OAAO,K;K;IAIX,2C;MzLrHI,IAAI,EX2B8D,YoM0FD,KpM1FkB,KAAjB,EoM0FO,IpM1FsB,KAA7B,CoM0F D,IzLrH7D,CAAJ,C;QACI,cyLoH6E,+B;QzLnH7E,MAAM,gCAAYB,OAAQ,WAAjC,C;;K;IyLoHd,4C;MzLlHI,IA AI,EKMc+D,aoLmFC,KpLnFiB,KAAiB,EoLmFS,IpLnFqB,KAA9B,CoLmFC,IzLlHhE,CAAJ,C;QACI,cyLqHg F,+B;QzLpHhF,MAAM,gCAAYB,OAAQ,WAAjC,C;;K;IoLpBc,6C;MAsCxB,oC;MA/BA,iB;MANA,Y;MACA,Y; MACA,Y;MACA,Y;MACA,Y;MACA,sB;MILYA,IAAI,E0LLQ,CAAC,WAAK,QAAL,GAAU,QAAV,GAAe,QA Af,GAAoB,QAArB,MAA2B,C1LKnC,CAAJ,C;QACI,c0LNwC,wD;Q1LOxC,MAAM,gCAAYB,OAAQ,WAAjC, C;;MGoHV,iBAAc,CAAd,UuLxHW,EvLwHX,U;QuLxHiB,c;;K;qCAGjB,Y;MAGI,QAAQ,Q;MACR,IAAI,IAAO,

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J,8C;MAAA,6C;QAAA,4B;;MAAA,sC;K;;IA7BA,gD;MAAA,sD;MACQ,yBAAK,KAAL,EAAY,KA AZ,EAAMB,  
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CbiD,8C;MACjD,4B;MACA,0C;K;oEADA,Y;MAAA,2B;K;2EACA,Y;MAAA,kC;K;uCAGA,iB;MACI,OAAO,0  
CAA gC,kBA Aa,KAAM,UAA nB,KAC/B,mBAAS,KAAM,MAAf,KA AwB,0BAA gB,KAAM,aAA tB,CADO,CAA  
hC,C;K;yCAIX,Y;MACI,OAAW,cAAJ,GAAe,EA Af,GAAuB,MAAW,SAAN,UAA M,CAAX,QAAqC,SAAb,iBA  
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C;K;;iDAC7E,Y;MAAkC,QAAC,8BAAiB,UAAjB,EA AwB,iBA AxB,C;K;;IAcR,gD;MAI3B,gBAAqB,K;MACrB,u  
BAA4B,Y;K;0FACD,Y;MAAQ,oB;K;iGACD,Y;MAAQ,2B;K;2DAE1C,gB;MAA+D,YAAK,C;K;mDAEpE,iB;M  
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A/B,C;K;2CAIX,Y;MACI,OAAW,cAAJ,GAAe,EA Af,GAAuB,MAAY,SAAP,aAAO,CAAZ,QAAuC,SAAd,oBAA  
c,CAA vC,I;K;2CAGIc,Y;MAAkC,OAAE,aAA F,qBAAW,oB;K;;IAGjD,oC;MAOqF,6BAAkB,SAAiB,EA AwB,IA  
Ax B,C;K;IAQvD,+C;MAI1B,gBAAqB,K;MACrB,uBAA4B,Y;K;yFACF,Y;MAAQ,oB;K;gGACD,Y;MAAQ,2B;  
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B;K;;IAGjD,oC;MAOKF,4BAAiB,SAAjB,EA AuB,IAAvB,C;K;oFAGIF,8B;MAQI,0BAAmB,2BAAS,OAAT,C;K;  
IAGvB,+C;MACI,IAAI,CAAC,UAA L,C;QAAiB,MAAM,gCAAyB,iCAA8B,IAA9B,iBAAzB,C;K;IC5I3B,gC;MA  
cW,Q;MADP,IAAI,CAAC,6BAAW,KAAX,CAAL,C;QAAwB,MAAM,uBAAmB,sC/EjBzC,oB+EiByC,CAAnB,C  
;;MAC9B,OAAO,sD;K;IAMX,oC;MAAkC,Q;MAA9B,OAAW,6BAAW,KAAX,CAAJ,GAAuB,sDAAvB,GAAuC,  
I;K;;;ICvBhB,yC;MA2B9B,uC;MA1BA,wB;MAIA,gB;M7LQA,IAAI,E6LDS,iBAAY,IAAb,MAAuB,iBAAvB,  
C7LCR,CAAJ,C;QACI,c6LDQ,iBAAY,IAAhB,GACI,8CADJ,GAGI,sCAA0B,aAA1B,qC;Q7LDR,MAAM,gCAA  
yB,OAAQ,WAAjC,C;;K;yC6LKV,Y;MAAwC,Q;MAAA,oB;MACpC,iB;QAD8B,OACtB,G;WACR,oD;QAF8B,O  
AEF,SAAL,SAAK,C;WAC5B,6C;QAH8B,OAGd,iBAAK,SAAL,C;WACHB,8C;QAJ8B,OAIb,kBAAM,SAAN,C;;  
QAJa,mC;K;IAOIC,qC;MAAA,yC;MACI,YAGqC,oBAAgB,IAAhB,EAAsB,IAAtB,C;K;iGAQJ,Y;MAAQ,gB;K;4  
DAEzC,gB;MAOI,8DAAqC,IAArC,C;K;gEA EJ,gB;MAMI,uDAA8B,IAA9B,C;K;4DAEJ,gB;MAMI,wDAA+B,I  
AA/B,C;K;;;IArCR,iD;MAAA,gD;QAAA,+B;;MAAA,yC;K;;2CArCJ,Y;MAWI,oB;K;2CAXJ,Y;MAeI,gB;K;6CA  
fJ,0B;MAAA,2BAWI,8CAXJ,EAeI,kCAfJ,C;K;yCAAA,Y;MAAA,c;MAWI,yD;MAIA,qD;MAfJ,a;K;uCAAA,iB;  
MAAA,4IAWI,4CAXJ,IAeI,oCAfJ,I;K;ICLA,kC;MAAA,e;MAAA,iB;MAAA,uB;K;IAAA,gC;MAAA,mC;O;MA  
YI,4D;MAKA,8C;MAKA,gD;K;;IAVA,2C;MAAA,sB;MAAA,mC;K;;IAKA,oC;MAAA,sB;MAAA,4B;K;;IAKA,  
qC;MAAA,sB;MAAA,6B;K;;IAtBJ,4B;MAAA,mG;K;;IAAA,iC;MAAA,a;AAAA,W;UAAA,wC;aAAA,I;UAAA,i  
C;aAAA,K;UAAA,kC;;UAAA,6D;;K;;6ECAa,yB;MAAA,4F;MAAA,2B;QASI,MAAM,mCAA8B,0EAA9B,C;O;  
KATV,C;ICKCA,+D;MAaW,Q;MAAP,OAAO,8CAA0,KAAP,EAAC,UAA d,EA A0B,QAA1B,oC;K;IAGX,kC;MA  
IiB,Q;MAAb,wBA Aa,KAAb,gB;QAAa,WAAA,KAAb,M;QACI,yBAAO,IAAP,C;;MACJ,OAAO,S;K;mFAGX,qB  
;MAGwD,gCAAO,EAAP,C;K;qFAExD,4B;MAG4E,OAAA,yBAAO,KAAP,CALpB,gBAAO,EAAP,C;K;qFAOx  
D,4B;MAGmE,OAAA,yBAAO,KAAP,CAVX,gBAAO,EAAP,C;K;IAaxD,wD;MAEQ,sB;QAAqB,yBAAO,UAA  
U,OAAV,CAAP,C;WACrB,sD;QAA4B,yBAAO,OAAP,C;WAC5B,2B;QAAmB,yBAAO,kBAAP,C;;QACX,yBA  
Ae,SAAR,OAAQ,CAAf,C;K;IIL7EhB,+B;MAY6B,kBAAIB,QAAQ,SAAR,EAAC,EAAd,C;MACH,IX0EE,WWIE  
E,GA AK,CAAT,C;QAAY,MAAM,gCAAyB,oEAAzB,C;MADtB,OX4EO,W;K;IWvEX,wC;MAGBW,Q;MAAA,q  
CAAiB,KAAjB,C;MAAA,iB;QAA2B,MAAM,gCAAyB,8BAAO,SAAP,4CAA+C,KAAxE,C;;MAAxC,OAAO,I;K  
;IAGX,qC;MAY6B,kBAAIB,QAAQ,SAAR,EAAC,EAAd,C;MAAP,OXmEqB,WWnEa,IAAM,CXmEjC,GAAqB,  
WAArB,GAA+B,I;K;IWhE1C,8C;MAGBI,WAAW,KAAX,C;MAC4B,kBAArB,QAAQ,SAAR,EAAC,KAAd,C;M  
AAP,OX+CqB,WW/CgB,IAAM,CX+CpC,GAAqB,WAArB,GAA+B,I;K;IW5C1C,gC;MAWI,IAAY,CAAR,8BA

AW,CAAf,C;QACI,OAAO,YAAM,SAAN,C;;MAEX,MAAM,gCAAyB,SAAM,SAAN,4BAAzB,C;K;IAGV,yC;M  
AkBW,Q;MANP,IAAI,EAAU,CAAV,sBAaA,EAAb,CAAJ,C;QACI,MAAM,gCAAyB,oBAAiB,KAAjB,4CAAzB,  
C;;MAEV,IAAI,YAAO,CAAP,IAAY,aAAQ,KAAxB,C;QACI,MAAM,gCAAyB,WAAQ,SAAR,mDAAwD,KAAj  
F,C;;MAEH,IAAI,YAAO,EAAX,C;QACH,mBAAM,SAAN,C;;QAEA,0BAAM,SAAN,IAAa,EAAb,C;;MAHJ,W;  
K;IAuFJ,8B;MAWSc,+B;K;0EAEtC,4B;MAM8D,OAAK,oBAAL,SAAK,CAAL,GAaKB,K;K;IAEhF,gD;MAQoC  
,0B;QAAA,aAAsB,K;MAcTD,IAAI,cAAQ,KAAZ,C;QAAMb,OAAO,I;MAC1B,IAAI,CAAC,UAAAL,C;QAAiB,O  
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YAAY,CAAZ,C;;MEoNID,W;K;IAGJ,gC;MAGyC,QAAQ,cAAA,sCAAk,cAAL,EAAoB,sCAAk,cAAzB,CAAR,  
6B;K;ImL3OzC,6C;MAc6B,4B;QAAA,eAAuB,G;MAChD,wCAAsB,EAAtB,EAA0B,YAA1B,C;K;IAEJ,mE;MA  
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B,kB;;YAHA,CAAC,YAAS,CAAT,IAAc,qBAAf,KAA4C,Q3LktDG,I2LltDH,C;UAC5C,a;;UAEA,4B;UA9E+B,u  
B;;Y/KgHzB,kC;YAAA,wBZ6qDyC,IY7qDzC,C;YAAA,qB;YAAA,oB;YAAA,oB;YAAAd,gE;cACI,I+KjHkD,CA  
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LzE,2BAKY,I;;UAyER,iE9LJD,yB8LIC,4B3L+sD+C,I;;QA1RpB,8B;UAA6C,6B;;;M2LpgDhF,OAIkFk,S3Lo7CE,  
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EzC,6C;MAGgC,yB;QAAA,YAAoB,E;MAM3C,Q;MALL,cAAY,gB;M3LurBL,kBAAS,gB;MA2FA,U;MAAA,S2  
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2hB9B,C;UAAwB,WAAy,WAAI,OAAJ,C;;M2L9wBrD,kB3L+wBE,W;MAMrBA,oBAAM,iBAAa,qCAAwB,EA  
AxB,CAAb,C;MAuEA,U;MAAA,+B;MAAb,OAAa,gBAAb,C;QAAa,wB;QACT,aAAY,uBAAC,IAAd,E;;M2L5gD  
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C,OAIoB,E;;UAJpB,OAoY,iBAAS,E;O;K;IAfjC,0C;MAKgC,sB;QAAA,SAAiB,M;MAC7C,OAYK,eAXA,OAD  
L,uBACK,EAAL,4BAAJ,CAWA,EAAa,IAAb,C;K;IAET,gC;MAAwC,uB;;Q/KmDtB,gC;QAAA,gC;QAAA,mB;Q  
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nD,C;YACI,sBAAO,K;YAAP,wB;;QAGR,sBAAO,E;;Mf3CA,4B;M8Lb6B,OAA8C,OAAM,EAAV,GAAC,gBA  
Ad,GAA0B,E;K;IAGpF,wC;MAAkB,W;K;IAC9B,oD;MAAA,uB;QAAkB,wBAAS,I;O;K;IAFvC,mC;MACI,IAA  
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Ad,C;QAA8B,avHhVrC,W;QuHgVA,OvH/uo,SuH+U6C,W;O;KARxD,C;IAWA,oC;MAiB,Q;MAAb,wBAAa,K



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c,CAAd,I;;UAEJ,IAAI,CAAC,KAAL,C;YACI,K;;YAEA,sBAAY,CAAZ,I;;MAuDqC,OAnD1C,gCAAY,UAAZ,E  
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,gB;MAAA,iE;MAAJ,4C;K;+CAEvC,Y;MAAyC,sBAAQ,yB;K;;IARrD,+B;MAG4D,4C;K;+EAQ5D,qB;MAE8C, uCAAQ,E;K;+EAEtD,mC;MASI,OA5DgD,qBAAU,CA4D1D,GAAe,cAAf,GAAMC,S;K;6EAEvC,yB;MAAA,2C; MAAA,0C;QASI,OAAI,kBAAJ,GAAe,cAAf,GAAMC,S;O;KATvC,C;IAeI,mC;MAAQ,uBAAG,mBAAS,CAAT,I AAh,C;K;IAMR,qC;MAAQ,OAAA,SAAK,OAAL,GAAc,CAAd,I;K;IAEZ,8C;MAIuB,Q;MAAA,0BAAS,CAAT, I;MAAnB,OAAGB,CAAT,8BACgB,gBAAZ,qBAAK,KAAL,CAAY,CADhB,IAEoB,eAAhB,qBAAK,QAAQ,CA AR,IAAL,CAAGB,C;K;IAG/B,uC;MAGuD,ONpKyC,oBMoK/B,KAAM,MNpKyB,EMoKIB,KAAM,aAN,GAA qB,CAArB,INpKkB,C;K;IMsKhG,yC;MAGqE,qCAAY,KAAM,MAAIB,EAAYB,KAAM,aAN,GAAqB,CAArB,I AAzB,C;K;uFAErE,iC;MAS2E,2BAAY,KAAZ,EAAMB,GAANB,C;K;mFAE3E,2C;MAO0D,wB;QAAA,WAAgB ,gB;MAAkB,OAAA,8BAAY,UAAZ,EAawB,QAAxB,CAAKC,W;K;IAE9H,uC;MAG6D,OAAA,8BAAY,KAAM, MAAIB,EAAYB,KAAM,aAN,GAAqB,CAArB,IAAzB,CAAI,D,W;K;IAE9G,sE;MAImD,qC;QAAA,wBAAGC,S; MAC/E,YAAY,sBAAQ,SAAR,C;MACZ,OAAW,UAAS,EAAPB,GAAwB,qBAAXB,GN1M4F,oBM0M/B,CN1M+ B,EM0M5B,KN1M4B,C;K;IM6MhG,wE;MAIqD,qC;QAAA,wBAAGC,S;MACjF,YAAY,sBAAQ,SAAR,C;MAC Z,OAAW,UAAS,EAAPB,GAAwB,qBAAXB,GNnN4F,oBMmN/B,CNnN+B,EMmN5B,KNnN4B,C;K;IMsNhG,qE ;MAIkD,qC;QAAA,wBAAGC,S;MAC9E,YAAY,sBAAQ,SAAR,C;MACZ,OAAW,UAAS,EAAPB,GAAwB,qBA AxB,GN5N4F,oBM4N/B,QAAQ,CAAR,IN5N+B,EM4NpB,gBN5NoB,C;K;IM+NhG,uE;MAIoD,qC;QAAA,wBA AgC,S;MACHf,YAAY,sBAAQ,SAAR,C;MACZ,OAAW,UAAS,EAAPB,GAAwB,qBAAXB,GNrO4F,oBMqO/B, QAAQ,SAAU,OAAIB,INrO+B,EMqOL,gBNrOK,C;K;IMwOhG,0E;MAIuD,qC;QAAA,wBAAGC,S;MACnF,YA AY,0BAAY,SAAZ,C;MACZ,OAAW,UAAS,EAAPB,GAAwB,qBAAXB,GN9O4F,oBM8O/B,CN9O+B,EM8O5B, KN9O4B,C;K;IMiPhG,4E;MAIyD,qC;QAAA,wBAAGC,S;MACrF,YAAY,0BAAY,SAAZ,C;MACZ,OAAW,UAAS,EAAPB,GAAwB,qBAAXB,GNvP4F,oBMuP/B,CNvP+B,EMuP5B,KNvP4B,C;K;IM0PhG,yE;MAIsD,qC;QAAA ,wBAAGC,S;MACIF,YAAY,0BAAY,SAAZ,C;MACZ,OAAW,UAAS,EAAPB,GAAwB,qBAAXB,GNhQ4F,oBMg Q/B,QAAQ,CAAR,INhQ+B,EMgQpB,gBNhQoB,C;K;IMmQhG,2E;MAIwD,qC;QAAA,wBAAGC,S;MACpF,YA AY,0BAAY,SAAZ,C;MACZ,OAAW,UAAS,EAAPB,GAAwB,qBAAXB,GNzQ4F,oBMMyQ/B,QAAQ,SAAU,OAA IB,INzQ+B,EMyQL,gBNzQK,C;K;IM4QhG,oE;MAOI,IAAI,WAAW,UAAf,C;QACI,MAAM,8BAA0B,gBAAa,Q AAb,oCAAKD,UAAID,OAA1B,C;MACV,SAAS,sB;MACT,EAAG,qBAAY,SAAZ,EAAKB,CAAIB,EAAqB,UAA rB,C;MACH,EAAG,gBAAO,WAAP,C;MACH,EAAG,qBAAY,SAAZ,EAAKB,QAAIB,EAA4B,gBAA5B,C;MAC H,OAAO,E;K;yFAGX,yB;MAAA,8B;MAAA,qD;MAAA,+D;QAOK,Q;QAAD,OAAuB,aAAtB,2DAAsB,EAAa,U AAb,EAAYB,QAAzB,EAAMC,WAAAnC,CAAGD,W;O;KAP3E,C;IASA,uD;MAOI,+BAAa,KAAM,MAAnB,EAA 0B,KAAM,aAN,GAAqB,CAArB,IAA1B,EAAKD,WAAID,C;K;yFAEJ,yB;MAAA,8B;MAAA,qD;MAAA,gD;Q AOK,Q;QAAD,OAAuB,aAAtB,2DAAsB,EAAa,KAAb,EAAoB,WAApB,CAAiC,W;O;KAP5D,C;IASA,sD;MASI ,IAAI,WAAW,UAAf,C;QACI,MAAM,8BAA0B,gBAAa,QAAb,oCAAKD,UAAID,OAA1B,C;MAEV,IAAI,aAAY, UAAhB,C;QACI,OAAy,mBAAL,SAAK,EAAY,CAAZ,EAAe,gBAAf,C;MAEhB,SAAS,mBAAC,oBAAU,QAAV, GAAqB,UAArB,KAAd,C;MACT,EAAG,qBAAY,SAAZ,EAAKB,CAAIB,EAAqB,UAArB,C;MACH,EAAG,qBA AY,SAAZ,EAAKB,QAAIB,EAA4B,gBAA5B,C;MACH,OAAO,E;K;uFAGX,yB;MAAA,8B;MAAA,mD;MAAA,k D;QASK,Q;QAAD,OAAuB,YAAtB,2DAAsB,EAAY,UAAZ,EAawB,QAAxB,CAAKC,W;O;KAT7D,C;IAWA,yC ;MAKqE,8BAAY,KAAM,MAAIB,EAAYB,KAAM,aAN,GAAqB,CAArB,IAAzB,C;K;uFAErE,yB;MAAA,8B;M AAA,mD;MAAA,mC;QAOK,Q;QAAD,OAAuB,YAAtB,2DAAsB,EAAY,KAAZ,CAAMB,W;O;KAP9C,C;IASA, yC;MAKI,IAAI,wBAAW,MAAX,CAAJ,C;QACI,OAAO,8BAAY,MAAO,OAAAnB,EAA2B,gBAA3B,C;;MAEX,O AAO,8BAAY,CAAZ,EAAe,gBAAf,C;K;IAGX,2C;MAKI,IAAI,wBAAW,MAAX,CAAJ,C;QACI,ON3XyE,oBM2 XxD,MAAO,ON3XiD,C;;MM6X7E,OAAO,S;K;IAGX,yC;MAKI,IAAI,sBAAS,MAAT,CAAJ,C;QACI,OAAO,8B AAY,CAAZ,EAAe,mBAAS,MAAO,OAAhB,IAAf,C;;MAEX,OAAO,8BAAY,CAAZ,EAAe,gBAAf,C;K;IAGX,2 C;MAKI,IAAI,sBAAS,MAAT,CAAJ,C;QACI,ON9YwF,oBM8YvE,CN9YuE,EM8YpE,mBAAS,MAAO,OAAhB, IN9YoE,C;;MMgZ5F,OAAO,S;K;IAGX,sD;MAMI,IAAK,qBAAU,MAAO,OAAP,GAAgB,MAAO,OAAvB,IAA V,CAAD,IAA6C,wBAAW,MAAX,CAA7C,IAAmE,sBAAS,MAAT,CAAvE,C;QACI,OAAO,8BAAY,MAAO,OA AnB,EAA2B,mBAAS,MAAO,OAAhB,IAA3B,C;;MAEX,OAAO,8BAAY,CAAZ,EAAe,gBAAf,C;K;IAGX,wD;M AMI,IAAK,qBAAU,MAAO,OAAP,GAAgB,MAAO,OAAvB,IAAV,CAAD,IAA6C,wBAAW,MAAX,CAA7C,IA AmE,sBAAS,MAAT,CAAvE,C;QACI,ONTawF,oBMsavE,MAAO,ONTagE,EMsaxD,mBAAS,MAAO,OAAhB,INt awD,C;;MMwa5F,OAAO,S;K;IAGX,mD;MAKmF,oCAAKB,SAAlB,EAA6B,SAAT7B,C;K;IAEnF,mD;MAKuE,sC

AAkB, SAAIB, EAA6B, SAA7B, C; K; IAEvE, iF; MAIsE, qC; QAAA, wBAAgC, S; MACIG, YAAy, sBAAQ, SAAR, C; M  
ACL, Q; MAAA, IAAI, UAAS, EAAb, C; QAAA, OAAiB, qB;; QA5JvB, U; QA4JM, OA5JgB, aAAtB, +DAAsB, EA4JyC,  
CA5JzC, EA4J4C, KA5J5C, EA4JmD, WA5JnD, CAAGD, W;; MA4JvE, W; K; IAGJ, mF; MAIwE, qC; QAAA, wBAAgC,  
S; MACpG, YAAy, sBAAQ, SAAR, C; MACL, Q; MAAA, IAAI, UAAS, EAAb, C; QAAA, OAAiB, qB;; QArKvB, U; QAq  
KM, OArKgB, aAAtB, +DAAsB, EAqKyC, CArKzC, EAqK4C, KA5K5C, EAqKmD, WArKnD, CAAGD, W;; MAqKvE,  
W; K; IAGJ, gF; MAIqE, qC; QAAA, wBAAgC, S; MACjG, YAAy, sBAAQ, SAAR, C; MACL, Q; MAAA, IAAI, UAAS, E  
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AtB, +DAAsB, EAaA, UAAb, EAAYB, QAAZB, EA8K4D, WA9K5D, CAAGD, W;; MA8KvE, W; K; IAGJ, kF; MAIuE, qC  
; QAAA, wBAAgC, S; MACnG, YAAy, sBAAQ, SAAR, C; MACL, Q; MAAA, IAAI, UAAS, EAAb, C; QAAA, OAAiB, q  
B;; QAA2B, iBAaA, QAAQ, SAAU, OAAIB, I; QAAb, eAAuC, gB; QAvLzF, U; QAUlM, OAvLgB, aAAtB, +DAAsB, EA  
Aa, UAAb, EAAYB, QAAZB, EAuL2E, WAvL3E, CAAGD, W;; MAuLvE, W; K; IAGJ, oF; MAI2E, qC; QAAA, wBAAgC,  
S; MACvG, YAAy, 0BAAy, SAAZ, C; MACL, Q; MAAA, IAAI, UAAS, EAAb, C; QAAA, OAAiB, qB;; QAA2B, iBAaA,  
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B, QAAZB, EAqM2E, WAhM3E, CAAGD, W;; MAGMvE, W; K; IAGJ, sF; MAIyE, qC; QAAA, wBAAgC, S; MACrG, YA  
AY, 0BAAy, SAAZ, C; MACL, Q; MAAA, IAAI, UAAS, EAAb, C; QAAA, OAAiB, qB;; QAA2B, iBAaA, QAAQ, CAAR,  
I; QAAb, eAAwB, gB; QzM1E, U; QAYMM, OAzMgB, aAAtB, +DAAsB, EAaA, UAAb, EAAYB, QAAZB, EAyM4D, W  
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NyC, CAInzC, EAkN4C, KAIN5C, EAkNmD, WAlNnD, CAAGD, W;; MAkNvE, W; K; IAGJ, uF; MAI4E, qC; QAAA, wB  
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, U; QA2NM, OA3NgB, aAAtB, +DAAsB, EA2NyC, CA3NzC, EA2N4C, KA3N5C, EA2NmD, WA3NnD, CAAGD, W;;  
MA2NvE, W; K; +EAOJ, yC; MAQoF, OAAA, KAAM, iBAAQ, SAAR, EAAC, WAAd, C; K; +EAE1F, uC; MAOI, OAAA,  
KAAM, iBAAQ, SAAR, EAAC, SAAd, C; K; yFAEV, yC; MAMyF, OAAA, KAAM, sBAAa, SAAb, EAAMb, WAAAnB, C;  
K; +FAE/F, yB; MAAA, oC; MAAA, gC; MAAA, uC; QAEW, Q; QAAA, IApe4C, mBAAS, CAoerD, C; uBAAkB, oBAAU,  
iCAAK, CAAL, EAAV, E; UAAA, YNljBoD, oBMkjBrB, CNljBqB, C; UMkjBtE, OLrjBwD, 2BAAL, GAAkB, K;; UKqj  
BrE, OAAyD, S; QAAhE, W; O; KAFJ, C; iGAKBA, yB; MAAA, oC; MAAA, uC; QAEI, OAtfmD, mBAAS, CA5f5D, GAAy  
B, UAAU, iCAAK, CAAL, EAAV, CAAMb, WAAAnB, GNpkBoD, oBMokBV, CNpkBU, CMokB7E, GAA2E, S; O; KAF/  
E, C; +EAMBA, 4B; MAIsE, OAAA, KAAM, iBAAQ, SAAR, C; K; IAE5E, 0F; MAKI, IAAK, cAAc, CAaf, IAAsB, aAAa,  
CAAnC, IAA0C, cAAa, SAAK, OAAL, GAAC, MAAd, IAAb, CAA1C, IAAiF, eAAc, KAAM, OAAAn, GAAe, MAAf, IAA  
d, CAARf, C; QACI, OAAO, K;; MAGX, iBAAC, CAAd, UAAsB, MAAtB, U; QACI, IAAI, CAA0B, SAAZB, qBAAK, aAA  
a, KAAb, IAAL, CAAYB, EAAO, iBAAM, cAAc, KAAd, IAAN, CAAP, EAAMc, UAAAnC, CAA9B, C; UACI, OAAO, K;;  
MAEf, OAAO, I; K; IAGX, mD; MAG+C, 0B; QAAA, aAAsB, K; MACjE, OAAA, SAAK, OAAL, GAAC, CAAd, IAA2B, S  
AAR, qBAAK, CAAL, CAAQ, EAAO, IAAP, EAaA, UAAb, C; K; IAE/B, iD; MAG6C, 0B; QAAA, aAAsB, K; MAC/D, O  
AAA, SAAK, OAAL, GAAC, CAAd, IAAMc, SAAhB, qBAAK, 2BAAL, CAAGB, EAAO, IAAP, EAaA, UAAb, C; K; IAE  
vC, qD; MAGyD, 0B; QAAA, aAAsB, K; MAC3E, IAAI, CAAC, UAAD, IAaE, 6BAaf, IAAiC, 0BAArC, C; QACI, OAAy  
, WAAL, SAAK, EAAW, MAAX, C;; QAEZ, OAAO, 6BAakB, CAAIB, EAAqB, MAArB, EAA6B, CAA7B, EAAGC, MA  
AO, OAAvC, EAA+C, UAA/C, C; K; IAGf, iE; MAG0E, 0B; QAAA, aAAsB, K; MAC5F, IAAI, CAAC, UAAD, IAaE, 6BA  
Af, IAAiC, 0BAArC, C; QACI, OAAy, aAAL, SAAK, EAAW, MAAX, EAAMb, UAAAnB, C;; QAEZ, OAAO, 6BAakB, U  
AAIB, EAA8B, MAA9B, EAAsC, CAAtC, EAAYC, MAAO, OAAhD, EAAwD, UAAxD, C; K; IAGf, mD; MAGuD, 0B; Q  
AAA, aAAsB, K; MACzE, IAAI, CAAC, UAAD, IAaE, 6BAaf, IAAiC, 0BAArC, C; QACI, OAAy, SAAL, SAAK, EAAS,  
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AAK, OfjnBIB, EeinB0B, KAAM, OfjnBhC, C; MemnBd, QAAQ, C; MACR, OAAO, IAAI, cAAJ, IAA8B, SAAR, qBAA  
K, CAAL, CAAQ, EAAO, iBAAM, CAAN, CAAP, EAA8B, UAA9B, CAAR, C; QACI, a;; MAEJ, IAAS, mBAAL, SAAK  
, EAAMb, IAAI, CAAJ, IAAAnB, CAAL, IAAwC, mBAAN, KAAM, EAAMb, IAAI, CAAJ, IAAAnB, CAA5C, C; QACI, a;;  
MAEJ, OAAO, 8BAAy, CAAZ, EAaE, CAaf, CAakB, W; K; IAG7B, wD; MAQ8D, 0B; QAAA, aAAsB, K; MACHf, iBA  
AiB, SAAK, O; MACtB, kBAakB, KAAM, O; MACxB, qBfxoBO, MAAO, KewoBa, UfxoBb, EewoByB, WfxoBzB, C; M  
e0oBd, QAAQ, C; MACR, OAAO, IAAI, cAAJ, IAA+C, SAAZB, qBAAK, aAAa, CAAb, GAAiB, CAAjB, IAAL, CAAYB,

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,MAAM,gCAAYB,mDAAGD,SAAzE,C;;K;IAGIB,0C;MAUsD,QAAM,SAAN,C;aACID,M;UADkD,OACxC,I;aA  
CV,O;UAFkD,OAeVc,K;;UAFuC,OAG1C,I;K;I+Kr8CZ,sB;MAAA,0B;MAII,aAC+B,e;MAC/B,cACgC,e;MACH  
C,WAC6B,e;MAC7B,YAC8B,e;MAC9B,eACiC,e;MACjC,YAC8B,gB;MAC9B,aAC+B,gB;MAC/B,YAC8B,gB;  
MAC9B,aAC+B,gB;MAC/B,eACiC,gB;MACjC,iBACmC,gB;MACnC,qBAEuC,gB;MACvC,sBAEwC,gB;MACx  
C,kBACoC,gB;MACpC,cACgC,gB;MACHC,iBACmC,gB;MACnC,iBACmC,gB;MACnC,iBACmC,gB;MACnC,Y  
AC8B,gB;MAC9B,aAC+B,iB;MAC/B,aAC+B,iB;MAC/B,uBACyC,iB;MACzC,wBAC0C,iB;MAC1C,sBACwC,i  
B;MACxC,uBACyC,iB;MACzC,wBAC0C,iB;MAC1C,sBACwC,iB;MACxC,cACgC,iB;MACHC,oBACsC,iB;MA  
CtC,cACgC,iB;MACHC,gBACkC,iB;MACiC,aAC+B,iB;MAC/B,mBACqC,iB;MACrC,YAC8B,iB;MAC9B,UAC4  
B,iB;MAC5B,mBACqC,iB;MACrC,gBACkC,iB;MACiC,mBACqC,iB;MACrC,sBACwC,iB;MAExC,sBAGwC,gB  
;MAExC,uBAGyC,gB;K;;;IA7F7C,kC;MAAA,iC;QAAA,gB;;MAAA,0B;K;;;;2FCuE0C,Y;MAAQ,oCAAa,IA  
Ab,C;K;IAiBpB,yC;MAAqB,kB;K;mIAC3C,Y;MACmD,OAAA,UAAM,YAAN,aAAkB,CAAIB,C;K;mIACnD,Y;  
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B,C;K;mIACnD,Y;MACmD,OAAA,UAAM,YAAN,aAAkB,CAAIB,C;K;mIACnD,Y;MACmD,OAAA,UAAM,Y  
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D,OAAA,UAAM,YAAN,aAAkB,CAAIB,C;K;mIACnD,Y;MACmD,OAAA,UAAM,YAAN,aAAkB,CAAIB,C;K;  
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K;;;6EhEjH9D,yB;MAAA,iD;MAAA,4B;QAI4C,kBAAM,SAAN,C;O;KAJ5C,C;+EAMA,yB;MAAA,gD;MAAA,  
oC;QAI+D,kBAAM,SAAN,EAAY,MAAZ,C;O;KAJ/D,C;+EAMA,yB;MAAA,oC;MAAA,qC;QAIqE,sBAAM,SA  
AN,EAAY,OAaz,C;O;KAJrE,C;IvIY4B,4B;MAMbxB,gC;MANb6C,0B;MAW7B,UAEA,MAFA,EAGA,M;MAL  
Z,IkIjC8D,IlIc9D,C;QACI,IAAI,kBAAJ,C;UACQ,mB;UAAJ,IAAI,sEAAAsB,SAAtB,EAaj,C;YAAqC,MAAM,sB  
AAiB,YAAF,+CAAf,C;;UAEvC,qB;UAAJ,IAAI,0EAAuB,UAAvB,EAaj,C;YAAuC,MAAM,sBAaiB,YAAF,gD  
AAf,C;UACzC,qB;UAAJ,IAAI,kEAA+B,mBAA/B,CAAJ,C;YAAwD,MAAM,sBAaiB,YAAF,mCAAf,C;;K;mF  
AZID,Y;MAAQ,kCAAa,CAAAb,C;K;+FACU,Y;MAAQ,OAAA,eAAS,QAAT,GAAqB,C;K;qCACvE,Y;MAA0B,Q  
ADwB,eAAS,QAAT,GAAqB,CAC7C,MAAqB,C;K;sCAC/C,Y;MAA2B,QAFuB,eAAS,QAAT,GAAqB,CAE5C,  
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,iBAAiB,UAAjB,C;MACHC,4BAAsC,uC;K;mDAEtC,yC;MAGI,2BAAoB,KAAPB,EAa2B,UAA3B,EAuC,UA  
AvC,C;K;iJAM8B,yB;MAAA,6C;MAAA,iD;MAAA,4B;QAAQ,sD;O;KAAR,C;iJAIC,yB;MAAA,6C;MAAA,iD;  
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AM,0C;K;wDAEtD,iB;MAKiD,OAAM,aAAN,KAAM,0C;K;wDAEvD,iB;MASmD,OAAM,aAAN,KAAM,0C;K;  
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,iB;MAS8C,OAAM,aAAN,KAAM,qC;K;mDAGpD,iB;MAK2C,OAAM,WAAN,KAAM,qC;K;mDAEjD,iB;MAK  
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D,I;;UAHwD,O;;K;;;IA/XhE,0C;MAAA,yC;QAAA,wB;;MAAA,kC;K;oCAwYA,Y;MAC6C,kBAAY,YAAD,aAA  
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,C;QAET,uB;UACI,iCAA0B,MAA1B,C;;UAEA,kCAA2B,MAA3B,C;aAGZ,IAAA,IAAK,eAAL,C;QACI,mCAA  
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BAAO,E;;;QtBuzBC,oBAAoB,qBAAuC,CAAvC,I;QAEhB,KAAC,SAAD,IAAc,gBAAgB,CAA9B,C;UAAmC,8B  
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C,gBAAgB,CAAhB,IAAD,IAAsB,CAAtB,IAAD,IAA4B,CAA5B,IAA3B,C;;MAGhB,yBAAO,IAAP,C;K;0CAGJ,  
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X,C;QAAyB,OAAO,MAAO,W;MACvC,OAAO,sBAAsB,MAAtB,EAAuC,eAAT,QAAS,EAAa,EAAb,CAAvC,IA  
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Aa,sBAAoB,SAApB,EAA0B,IAA1B,0C;QACb,OAAO,iBAAwB,WAAP,MAAO,yBAAsB,UAAtB,CAAxB,C;;K;I  
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B;MAAQ,+D;K;yEAG/B,+B;MAIqE,8BAAW,SAAX,C;K;2EAERE,+B;MAUwE,8BAAW,SAAX,C;K;IAIxE,yC;  
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,C;K;oEACtC,oB;MAAkD,mDAAe,gBAAf,EA A0B,iBAA1B,EAAsC,0BAAS,QAAT,CAAtC,C;K;;iDAGtD,Y;M  
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AVf,qB;K;0CACJ,oB;MACI,MAAM,6BAAsB,iDAA+C,cAA/C,qCAA0E,QAA1E,MAAtB,C;K;;qFC7Fd,yB;MAA  
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AYI,WA AW,mB;MACX,O;MACA,OAAO,IAAK,a;K;IAYe,qC;MAAC,kB;MAAc,wB;K;;sCAR9C,Y;MAQgC,iB  
;K;sCARhC,Y;MAQ8C,oB;K;wCAR9C,2B;MAAA,sBAQgC,qCARhC,EAQ8C,8CAR9C,C;K;oCAAA,Y;MAAA,

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C,IAAvC,C;K;;;IATnG,kD;MAAA,iD;QAAA,gC;;MAAA,0C;K;;IAoBkC,qD;MAA0C,wB;MAC5E,sBAA2B,I;M  
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jOkWnB,C;O;KiOzWvC,C;gFASA,yB;MAAA,4C;MjOsVA,6B;MiOtVA,sC;QAayD,OjOmVIB,ciOnV0B,WjO8O  
5B,ciO9O4B,EAAW,QAAX,CjOmV1B,C;O;KiOhWvC,C;kFAgBA,yB;MAAA,8C;MjOsUA,6B;MiOtUA,sC;QAa  
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C;O;KANhE,C;8FAQA,yB;MAAA,0D;MjN6SA,+B;MiN7SA,4B;QAOqD,OjNgTX,eiNhToB,kBjNuMvB,ciNvMu  
B,CjNgTpB,C;O;KiNvT1C,C;4FASA,yB;MAAA,wD;MjNoSA,+B;MiNpSA,4B;QAOoD,OjNuSV,eiNvSmB,iBjN  
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Nxr0B,WjN+K7B,ciN/K6B,EAAW,QAAX,CjNwR1B,C;O;KiNrS1C,C;iFAeA,yB;M/GgEA,4C;MIG4MA,+B;Mi  
N5QA,sC;QAa4D,OjNyQIB,ekGzMuB,WIGgG1B,ckGhG0B,EAAW,C+GhEK,Q/GgEL,IAAX,ClGyMvB,C;O;Ki  
NtR1C,C;oFAeA,yB;MIOWJI,6B;MkO1SJ,gD;MAKJA,4B;QAM8C,OAIJO,ajO+RhB,CDcE,cAAU,cAAL,GAAiB,  
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INF/services/com.tangosol.coherence.config.SystemPropertyResolver

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\* /opt/cola/permits/1331473926\_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-jar/io/micronaut/coherence/namespace/BeanBuilder.java

\* /opt/cola/permits/1331473926\_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-jar/io/micronaut/coherence/messaging/package-info.java

\* /opt/cola/permits/1331473926\_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-jar/io/micronaut/coherence/CoherenceContext.java

\* /opt/cola/permits/1331473926\_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-jar/io/micronaut/coherence/grpc/GrpcServerBuilder.java

\* /opt/cola/permits/1331473926\_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-jar/io/micronaut/coherence/SessionType.java

\* /opt/cola/permits/1331473926\_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-jar/io/micronaut/coherence/namespace/BeanProcessor.java

\* /opt/cola/permits/1331473926\_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-jar/io/micronaut/coherence/messaging/SubscriberExecutorServiceConfig.java

\* /opt/cola/permits/1331473926\_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-jar/io/micronaut/coherence/config/MicronautSystemPropertyResolver.java

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\* /opt/cola/permits/1331473926\_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-jar/io/micronaut/coherence/package-info.java

\* /opt/cola/permits/1331473926\_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-jar/io/micronaut/coherence/SessionConfigurationProvider.java

\* /opt/cola/permits/1331473926\_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-jar/io/micronaut/coherence/AbstractSessionConfigurationBean.java

\* /opt/cola/permits/1331473926\_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-jar/io/micronaut/coherence/namespace/MicronautNamespaceHandler.java

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* /opt/cola/permits/1331473926_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-
jar/io/micronaut/coherence/messaging/TopicKey.java
* /opt/cola/permits/1331473926_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-
jar/io/micronaut/coherence/JsonSerializerFactory.java
* /opt/cola/permits/1331473926_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-
jar/io/micronaut/coherence/grpc/GrpcServerConfigurer.java
* /opt/cola/permits/1331473926_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-
jar/io/micronaut/coherence/grpc/package-info.java
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jar/io/micronaut/coherence/SerializerFactories.java
* /opt/cola/permits/1331473926_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-
jar/io/micronaut/coherence/SessionConfigurationBean.java
* /opt/cola/permits/1331473926_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-
jar/io/micronaut/coherence/InjectorImpl.java
```

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```

io.micronaut.coherence.grpc.GrpcServerBuilder\$GrpcServerBuilderProviderBean

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INF/services/com.oracle.coherence.grpc.proxy.GrpcServerBuilderProvider
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- \* /opt/cola/permits/1331473926\_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-jar/io/micronaut/coherence/ExtractorFactory.java
- \* /opt/cola/permits/1331473926\_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-jar/io/micronaut/coherence/annotation/Updated.java
- \* /opt/cola/permits/1331473926\_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-jar/io/micronaut/coherence/annotation/WhereFilter.java
- \* /opt/cola/permits/1331473926\_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-jar/io/micronaut/coherence/event/EventArgumentBinder.java
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- \* /opt/cola/permits/1331473926\_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-jar/io/micronaut/coherence/annotation/Activated.java
- \* /opt/cola/permits/1331473926\_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-jar/io/micronaut/coherence/annotation/MapEventTransformerBinding.java
- \* /opt/cola/permits/1331473926\_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-jar/io/micronaut/coherence/annotation/Committed.java
- \* /opt/cola/permits/1331473926\_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-jar/io/micronaut/coherence/annotation/CoherenceEventListener.java
- \* /opt/cola/permits/1331473926\_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-jar/io/micronaut/coherence/messaging/binders/ElementBinder.java
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- \* /opt/cola/permits/1331473926\_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-jar/io/micronaut/coherence/event/package-info.java
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- \* /opt/cola/permits/1331473926\_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-jar/io/micronaut/coherence/annotation/ChainedExtractor.java

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\* /opt/cola/permits/1331473926\_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-jar/io/micronaut/coherence/annotation/ScopeName.java

\* /opt/cola/permits/1331473926\_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-jar/io/micronaut/coherence/annotation/Committing.java

\* /opt/cola/permits/1331473926\_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-jar/io/micronaut/coherence/annotation/Processor.java

\* /opt/cola/permits/1331473926\_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-jar/io/micronaut/coherence/annotation/CommitStrategy.java

\* /opt/cola/permits/1331473926\_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-jar/io/micronaut/coherence/annotation/Connecting.java

\* /opt/cola/permits/1331473926\_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-jar/io/micronaut/coherence/annotation/CoherenceTopicListener.java

\* /opt/cola/permits/1331473926\_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-jar/io/micronaut/coherence/annotation/Executed.java

\* /opt/cola/permits/1331473926\_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-jar/io/micronaut/coherence/messaging/CoherencePublisherIntroductionAdvice.java

\* /opt/cola/permits/1331473926\_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-jar/io/micronaut/coherence/annotation/Executing.java

\* /opt/cola/permits/1331473926\_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-jar/io/micronaut/coherence/annotation/SessionName.java

\* /opt/cola/permits/1331473926\_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-jar/io/micronaut/coherence/annotation/CoherencePublisher.java

\* /opt/cola/permits/1331473926\_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-jar/io/micronaut/coherence/ExtractorFactories.java

\* /opt/cola/permits/1331473926\_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-jar/io/micronaut/coherence/annotation/CommittingLocal.java

\* /opt/cola/permits/1331473926\_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-jar/io/micronaut/coherence/event/BaseExecutableMethodObserver.java

\* /opt/cola/permits/1331473926\_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-jar/io/micronaut/coherence/messaging/SubscriberExceptionHandler.java

\* /opt/cola/permits/1331473926\_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-jar/io/micronaut/coherence/messaging/binders/TypedElementBinder.java

\* /opt/cola/permits/1331473926\_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-jar/io/micronaut/coherence/annotation/Inserting.java

\* /opt/cola/permits/1331473926\_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-jar/io/micronaut/coherence/annotation/PofExtractor.java

\* /opt/cola/permits/1331473926\_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-jar/io/micronaut/coherence/messaging/binders/ElementValueBinder.java

\* /opt/cola/permits/1331473926\_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-jar/io/micronaut/coherence/event/CoherenceEventListenerProcessor.java

\* /opt/cola/permits/1331473926\_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-jar/io/micronaut/coherence/annotation/AlwaysFilter.java

\* /opt/cola/permits/1331473926\_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-jar/io/micronaut/coherence/annotation/Destroyed.java

\* /opt/cola/permits/1331473926\_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-jar/io/micronaut/coherence/annotation/Deleted.java

\* /opt/cola/permits/1331473926\_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-jar/io/micronaut/coherence/annotation/Rollback.java



\* /opt/cola/permits/1331473926\_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-jar/io/micronaut/coherence/event/AnnotatedMapListener.java

\* /opt/cola/permits/1331473926\_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-jar/io/micronaut/coherence/annotation/Arrived.java

\* /opt/cola/permits/1331473926\_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-jar/io/micronaut/coherence/annotation/Truncated.java

\* /opt/cola/permits/1331473926\_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-jar/io/micronaut/coherence/messaging/CoherenceTopicListenerProcessor.java

\* /opt/cola/permits/1331473926\_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-jar/io/micronaut/coherence/annotation/ExtractorBinding.java

\* /opt/cola/permits/1331473926\_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-jar/io/micronaut/coherence/annotation/Created.java

\* /opt/cola/permits/1331473926\_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-jar/io/micronaut/coherence/annotation/ServiceName.java

\* /opt/cola/permits/1331473926\_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-jar/io/micronaut/coherence/messaging/binders/DefaultTopicBinder.java

\* /opt/cola/permits/1331473926\_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-jar/io/micronaut/coherence/annotation/View.java

\* /opt/cola/permits/1331473926\_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-jar/io/micronaut/coherence/annotation/Topic.java

\* /opt/cola/permits/1331473926\_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-jar/io/micronaut/coherence/annotation/Replicating.java

\* /opt/cola/permits/1331473926\_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-jar/io/micronaut/coherence/annotation/Updating.java

\* /opt/cola/permits/1331473926\_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-jar/io/micronaut/coherence/annotation/CacheName.java

\* /opt/cola/permits/1331473926\_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-jar/io/micronaut/coherence/annotation/Name.java

\* /opt/cola/permits/1331473926\_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-jar/io/micronaut/coherence/annotation/Backlog.java

\* /opt/cola/permits/1331473926\_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-jar/io/micronaut/coherence/messaging/binders/ElementArgumentBinderRegistry.java

\* /opt/cola/permits/1331473926\_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-jar/io/micronaut/coherence/annotation/Removing.java

\* /opt/cola/permits/1331473926\_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-jar/io/micronaut/coherence/annotation/Activating.java

\* /opt/cola/permits/1331473926\_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-jar/io/micronaut/coherence/event/EventObserverSupport.java

\* /opt/cola/permits/1331473926\_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-jar/io/micronaut/coherence/CoherenceFactory.java

\* /opt/cola/permits/1331473926\_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-jar/io/micronaut/coherence/annotation/Lite.java

\* /opt/cola/permits/1331473926\_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-jar/io/micronaut/coherence/annotation/MapName.java

\* /opt/cola/permits/1331473926\_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-jar/io/micronaut/coherence/annotation/Topics.java

\* /opt/cola/permits/1331473926\_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-jar/io/micronaut/coherence/event/ExecutableMethodEventObserver.java

```
* /opt/cola/permits/1331473926_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-
jar/io/micronaut/coherence/annotation/Disposing.java
* /opt/cola/permits/1331473926_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-
jar/io/micronaut/coherence/annotation/Disconnected.java
* /opt/cola/permits/1331473926_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-
jar/io/micronaut/coherence/annotation/Lost.java
* /opt/cola/permits/1331473926_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-
jar/io/micronaut/coherence/NamedCacheFactories.java
* /opt/cola/permits/1331473926_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-
jar/io/micronaut/coherence/MapEventTransformerFactories.java
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#
```

io.micronaut.coherence.grpc.GrpcServerConfigurer\$GrpcServerConfigurationBean

Found in path(s):

```
* /opt/cola/permits/1331473926_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-jar/META-
INF/services/com.oracle.coherence.grpc.proxy.GrpcServerConfiguration
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```

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```

```
io.micronaut.coherence.InjectorImpl
```

Found in path(s):

```
* /opt/cola/permits/1331473926_1653068590.7919037/0/micronaut-coherence-3-0-1-sources-jar/META-INF/services/com.oracle.coherence.inject.Injector
```

## 1.45 metrics-utility-servlets 4.0.5

### 1.45.1 Available under license :

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Manifest-Version: 1.0

Bnd-LastModified: 1545938238563

Build-Jdk: 1.8.0\_191

Built-By: artem

Bundle-Description: A set of utility servlets for Metrics, allowing you to expose valuable information about your production environment.

Bundle-License: <http://www.apache.org/licenses/LICENSE-2.0.html>

Bundle-ManifestVersion: 2

Bundle-Name: Metrics Utility Servlets

Bundle-SymbolicName: io.dropwizard.metrics.servlets

Bundle-Version: 4.0.5

Created-By: Apache Maven Bundle Plugin

Export-Package: com.codahale.metrics.servlets;uses:="com.codahale.metrics,com.codahale.metrics.health,javax.servlet,javax.servlet.http";version="4.0.5"

Implementation-Title: Metrics Utility Servlets

Implementation-URL: <http://metrics.dropwizard.io/metrics-servlets>

Implementation-Vendor-Id: io.dropwizard.metrics

Implementation-Version: 4.0.5

Import-Package: javax.servlet;version="[2.5.0,4.0.0)",javax.servlet.http;version="[2.5.0,4.0.0)",com.codahale.metrics;version="[4.0,5)",com.codahale.metrics.health;version="[4.0,5)",com.codahale.metrics.json;version="[4.0,5)",com.codahale.metrics.jvm;version="[4.0,5)",com.fasterxml.jackson.databind;version="[2.9,3)",com.fasterxml.jackson.databind.util;version="[2.9,3)",com.papertrail.profiler,org.joda.time;version="[2.9,3)"

Require-Capability: osgi.ee;filter:="(&(osgi.ee=JavaSE)(version=1.8))"

Tool: Bnd-3.3.0.201609221906

Found in path(s):

```
* /opt/cola/permits/1274701310_1648835822.95/0/metrics-servlets-4-0-5-jar/META-INF/MANIFEST.MF
```

# 1.46 rxjava 2.2.14

## 1.46.1 Available under license :

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Found in path(s):

```
* /opt/cola/permits/1473459956_1668478047.951896/0/rxjava-2-2-14-sources-
jar/io/reactivex/internal/schedulers/AbstractDirectTask.java
* /opt/cola/permits/1473459956_1668478047.951896/0/rxjava-2-2-14-sources-
jar/io/reactivex/internal/schedulers/SchedulerWhen.java
* /opt/cola/permits/1473459956_1668478047.951896/0/rxjava-2-2-14-sources-
jar/io/reactivex/internal/schedulers/InstantPeriodicTask.java
* /opt/cola/permits/1473459956_1668478047.951896/0/rxjava-2-2-14-sources-
jar/io/reactivex/internal/schedulers/ScheduledDirectTask.java
* /opt/cola/permits/1473459956_1668478047.951896/0/rxjava-2-2-14-sources-
jar/io/reactivex/internal/schedulers/ScheduledDirectPeriodicTask.java
```

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```

\*/

Found in path(s):

- \* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-jar/io/reactivex/internal/operators/maybe/MaybeDoOnTerminate.java
- \* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-jar/io/reactivex/SingleOnSubscribe.java
- \* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-jar/io/reactivex/ObservableConverter.java
- \* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-jar/io/reactivex/internal/operators/flowable/FlowableBufferExactBoundary.java
- \* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-jar/io/reactivex/internal/operators/maybe/MaybeOnErrorComplete.java
- \* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-jar/io/reactivex/observers/LambdaConsumerIntrospection.java
- \* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-jar/io/reactivex/internal/operators/observable/ObservableSerialized.java
- \* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-jar/io/reactivex/functions/Cancellable.java
- \* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-jar/io/reactivex/internal/observers/BiConsumerSingleObserver.java
- \* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-jar/io/reactivex/internal/operators/flowable/BlockingFlowableLatest.java
- \* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-jar/io/reactivex/internal/schedulers/DisposeOnCancel.java
- \* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-jar/io/reactivex/internal/operators/maybe/MaybeIgnoreElementCompletable.java
- \* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-jar/io/reactivex/internal/operators/flowable/FlowableDetach.java
- \* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-jar/io/reactivex/internal/fuseable/ScalarCallable.java
- \* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-jar/io/reactivex/observers/TestObserver.java
- \* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-jar/io/reactivex/internal/operators/flowable/FlowableDoOnLifecycle.java
- \* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-jar/io/reactivex/internal/operators/maybe/MaybeToFlowable.java
- \* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-jar/io/reactivex/internal/fuseable/HasUpstreamPublisher.java
- \* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-jar/io/reactivex/internal/subscribers/SubscriberResourceWrapper.java
- \* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-jar/io/reactivex/internal/operators/observable/ObservableWindowBoundarySupplier.java
- \* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-jar/io/reactivex/internal/operators/flowable/FlowableDoAfterNext.java
- \* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-jar/io/reactivex/internal/operators/observable/ObservableGenerate.java
- \* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-

jar/io/reactivex/internal/operators/single/SingleTimeout.java  
\* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-  
jar/io/reactivex/internal/operators/flowable/FlowableRefCount.java  
\* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-  
jar/io/reactivex/FlowableConverter.java  
\* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-  
jar/io/reactivex/internal/fuseable/ConditionalSubscriber.java  
\* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-  
jar/io/reactivex/internal/util/BackpressureHelper.java  
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\* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-  
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jar/io/reactivex/SingleTransformer.java  
\* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-  
jar/io/reactivex/CompletableConverter.java  
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\* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-  
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jar/io/reactivex/internal/operators/single/SingleFlatMapIterableFlowable.java  
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jar/io/reactivex/subscribers/ResourceSubscriber.java  
\* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-  
jar/io/reactivex/internal/operators/completable/CompletableLift.java  
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jar/io/reactivex/internal/util/AtomicThrowable.java  
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jar/io/reactivex/internal/operators/flowable/FlowableScan.java  
\* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-

jar/io/reactivex/internal/operators/observable/ObservableConcatWithMaybe.java  
\* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-  
jar/io/reactivex/internal/operators/mixed/SingleFlatMapObservable.java  
\* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-jar/io/reactivex/SingleEmitter.java  
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\* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-jar/io/reactivex/internal/operators/observable/ObservableTakeWhile.java  
\* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-jar/io/reactivex/internal/operators/flowable/FlowableSerialized.java  
\* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-jar/io/reactivex/internal/fuseable/FuseToMaybe.java  
\* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-jar/io/reactivex/internal/operators/observable/ObservableToListSingle.java  
\* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-jar/io/reactivex/internal/operators/single/SingleFlatMapPublisher.java  
\* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-jar/io/reactivex/internal/operators/mixed/FlowableSwitchMapCompletable.java  
\* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-jar/io/reactivex/internal/util/HashMapSupplier.java  
\* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-jar/io/reactivex/internal/subscriptions/BasicQueueSubscription.java  
\* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-

jar/io/reactivex/internal/operators/flowable/FlowableSequenceEqual.java  
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jar/io/reactivex/internal/schedulers/ImmediateThinScheduler.java  
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\* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-  
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jar/io/reactivex/internal/operators/observable/ObservableAllSingle.java  
\* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-  
jar/io/reactivex/exceptions/UndeliverableException.java  
\* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-  
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\* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-  
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\* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-  
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jar/io/reactivex/internal/operators/flowable/FlowableTakeWhile.java  
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\* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-  
jar/io/reactivex/internal/operators/observable/ObservableTakeUntilPredicate.java  
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jar/io/reactivex/internal/operators/flowable/FlowableWithLatestFrom.java  
\* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-  
jar/io/reactivex/internal/operators/flowable/FlowableScanSeed.java  
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\* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-  
jar/io/reactivex/internal/operators/mixed/ObservableSwitchMapMaybe.java  
\* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-  
jar/io/reactivex/internal/operators/maybe/MaybeToPublisher.java  
\* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-  
jar/io/reactivex/internal/operators/completable/CompletableMaterialize.java  
\* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-  
jar/io/reactivex/internal/operators/completable/CompletableMergeDelayErrorIterable.java  
\* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-  
jar/io/reactivex/internal/operators/flowable/FlowableIgnoreElements.java  
\* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-  
jar/io/reactivex/internal/operators/observable/ObservableDoFinally.java  
\* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-  
jar/io/reactivex/internal/operators/single/SingleEquals.java  
\* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-  
jar/io/reactivex/internal/operators/single/SingleTimer.java  
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jar/io/reactivex/internal/disposables/DisposableHelper.java  
\* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-  
jar/io/reactivex/internal/operators/flowable/FlowableTimeout.java  
\* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-jar/io/reactivex/MaybeSource.java  
\* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-  
jar/io/reactivex/internal/subscriptions/BooleanSubscription.java  
\* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-  
jar/io/reactivex/internal/operators/maybe/MaybeSwitchIfEmptySingle.java  
\* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-  
jar/io/reactivex/internal/operators/flowable/FlowableCreate.java  
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* /opt/cola/permits/1473459956_1668478047.951896/0/rxjava-2-2-14-sources-
jar/io/reactivex/internal/operators/flowable/FlowableOnBackpressureError.java
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core/src/main/java/org/jctools/util/Pow2.java
```

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*/
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* /opt/cola/permits/1473459956_1668478047.951896/0/rxjava-2-2-14-sources-
jar/io/reactivex/internal/util/Pow2.java
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\* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-jar/io/reactivex/internal/schedulers/ComputationScheduler.java

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\* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-jar/io/reactivex/internal/operators/flowable/FlowablePublishMulticast.java

\* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-jar/io/reactivex/BackpressureOverflowStrategy.java

\* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-jar/io/reactivex/internal/operators/observable/ObservableJoin.java

\* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-jar/io/reactivex/functions/package-info.java

\* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-jar/io/reactivex/exceptions/CompositeException.java

\* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-jar/io/reactivex/processors/package-info.java

\* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-jar/io/reactivex/subscribers/package-info.java

\* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-jar/io/reactivex/observables/package-info.java

\* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-jar/io/reactivex/observers/package-info.java

\* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-jar/io/reactivex/internal/operators/flowable/FlowableGroupJoin.java  
\* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-jar/io/reactivex/internal/operators/observable/ObservableGroupJoin.java  
\* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-jar/io/reactivex/flowables/package-info.java  
\* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-jar/io/reactivex/parallel/package-info.java  
\* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-jar/io/reactivex/subjects/package-info.java  
\* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-jar/io/reactivex/schedulers/package-info.java  
\* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-jar/io/reactivex/internal/schedulers/NewThreadScheduler.java  
\* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-jar/io/reactivex/plugins/package-info.java  
\* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-jar/io/reactivex/internal/schedulers/IOScheduler.java  
\* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-jar/io/reactivex/package-info.java  
\* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-jar/io/reactivex/internal/schedulers/TrampolineScheduler.java  
\* /opt/cola/permits/1473459956\_1668478047.951896/0/rxjava-2-2-14-sources-jar/io/reactivex/disposables/package-info.java

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# 1.48 micronaut-views 3.2.0

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```

Found in path(s):

```
* /opt/cola/permits/1331474137_1653511933.527574/0/micronaut-views-core-3-2-0-sources-jar/META-INF/native-
```

image/io.micronaut.views.model.security/native-image.properties

\* /opt/cola/permits/1331474137\_1653511933.527574/0/micronaut-views-core-3-2-0-sources-jar/META-INF/native-image/io.micronaut.views.csp/native-image.properties

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\* /opt/cola/permits/1331474137\_1653511933.527574/0/micronaut-views-core-3-2-0-sources-jar/io/micronaut/views/csp/package-info.java

\* /opt/cola/permits/1331474137\_1653511933.527574/0/micronaut-views-core-3-2-0-sources-jar/io/micronaut/views/View.java

\* /opt/cola/permits/1331474137\_1653511933.527574/0/micronaut-views-core-3-2-0-sources-jar/io/micronaut/views/ViewsConfigurationProperties.java

\* /opt/cola/permits/1331474137\_1653511933.527574/0/micronaut-views-core-3-2-0-sources-jar/io/micronaut/views/csp/CspConfiguration.java

\* /opt/cola/permits/1331474137\_1653511933.527574/0/micronaut-views-core-3-2-0-sources-jar/io/micronaut/views/csp/CspFilter.java

\* /opt/cola/permits/1331474137\_1653511933.527574/0/micronaut-views-core-3-2-0-sources-jar/io/micronaut/views/ModelAndView.java

\* /opt/cola/permits/1331474137\_1653511933.527574/0/micronaut-views-core-3-2-0-sources-jar/io/micronaut/views/model/ViewModelProcessor.java

\* /opt/cola/permits/1331474137\_1653511933.527574/0/micronaut-views-core-3-2-0-sources-jar/io/micronaut/views/ViewUtils.java

\* /opt/cola/permits/1331474137\_1653511933.527574/0/micronaut-views-core-3-2-0-sources-jar/io/micronaut/views/ViewsRenderer.java

\* /opt/cola/permits/1331474137\_1653511933.527574/0/micronaut-views-core-3-2-0-sources-jar/io/micronaut/views/model/security/SecurityViewModelProcessor.java

\* /opt/cola/permits/1331474137\_1653511933.527574/0/micronaut-views-core-3-2-0-sources-jar/io/micronaut/views/ViewsConfiguration.java

\* /opt/cola/permits/1331474137\_1653511933.527574/0/micronaut-views-core-3-2-0-sources-jar/io/micronaut/views/package-info.java

\* /opt/cola/permits/1331474137\_1653511933.527574/0/micronaut-views-core-3-2-0-sources-jar/io/micronaut/views/model/package-info.java

\* /opt/cola/permits/1331474137\_1653511933.527574/0/micronaut-views-core-3-2-0-sources-jar/io/micronaut/views/model/security/SecurityViewModelProcessorConfigurationProperties.java  
\* /opt/cola/permits/1331474137\_1653511933.527574/0/micronaut-views-core-3-2-0-sources-jar/io/micronaut/views/exceptions/ViewRenderingException.java  
\* /opt/cola/permits/1331474137\_1653511933.527574/0/micronaut-views-core-3-2-0-sources-jar/io/micronaut/views/exceptions/package-info.java  
\* /opt/cola/permits/1331474137\_1653511933.527574/0/micronaut-views-core-3-2-0-sources-jar/io/micronaut/views/model/security/package-info.java  
\* /opt/cola/permits/1331474137\_1653511933.527574/0/micronaut-views-core-3-2-0-sources-jar/io/micronaut/views/exceptions/ViewNotFoundException.java  
\* /opt/cola/permits/1331474137\_1653511933.527574/0/micronaut-views-core-3-2-0-sources-jar/io/micronaut/views/model/security/SecurityViewModelProcessorConfiguration.java  
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\* /opt/cola/permits/1331474137\_1653511933.527574/0/micronaut-views-core-3-2-0-sources-jar/io/micronaut/views/ViewsFilter.java

\* /opt/cola/permits/1331474137\_1653511933.527574/0/micronaut-views-core-3-2-0-sources-jar/io/micronaut/views/ViewsResolver.java

\* /opt/cola/permits/1331474137\_1653511933.527574/0/micronaut-views-core-3-2-0-sources-jar/io/micronaut/views/DefaultViewsRendererLocator.java

\* /opt/cola/permits/1331474137\_1653511933.527574/0/micronaut-views-core-3-2-0-sources-jar/io/micronaut/views/ViewsModelDecorator.java

\* /opt/cola/permits/1331474137\_1653511933.527574/0/micronaut-views-core-3-2-0-sources-jar/io/micronaut/views/DefaultViewsResolver.java

\* /opt/cola/permits/1331474137\_1653511933.527574/0/micronaut-views-core-3-2-0-sources-jar/io/micronaut/views/DefaultViewsModelDecorator.java

\* /opt/cola/permits/1331474137\_1653511933.527574/0/micronaut-views-core-3-2-0-sources-jar/io/micronaut/views/ViewsRendererKey.java

\* /opt/cola/permits/1331474137\_1653511933.527574/0/micronaut-views-core-3-2-0-sources-jar/io/micronaut/views/ViewsRendererLocator.java

# 1.49 zstd-jni 1.4.9-1

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Manifest-Version: 1.0

Automatic-Module-Name: com.github.luben.zstd\_jni

Bnd-LastModified: 1615191527618

Bundle-Description: JNI bindings for Zstd native library that provides fast and high compression lossless algorithm for Java and all JVM languages.

Bundle-License: <https://opensource.org/licenses/BSD-2-Clause>;description=BSD 2-Clause License

Bundle-ManifestVersion: 2

Bundle-Name: zstd-jni

Bundle-NativeCode: aix/ppc64/libzstd-jni.so;osname=AIX;processor=ppc64, darwin/x86\_64/libzstd-jni.dylib;osname=MacOS;osname=MacOSX;processor=x86\_64, darwin/aarch64/libzstd-jni.dylib;osname=MacOS;osname=MacOSX;processor=aarch64, freebsd/amd64/libzstd-jni.so;osname=FreeBSD;processor=amd64, freebsd/i386/libzstd-jni.so;osname=FreeBSD;processor=i386, linux/aarch64/libzstd-jni.so;osname=Linux;processor=aarch64, linux/amd64/libzstd-jni.so;osname=Linux;processor=amd64, linux/arm/libzstd-jni.so;osname=Linux;processor=arm, linux/i386/libzstd-jni.so;osname=Linux;processor=i386, linux/mips64/libzstd-jni.so;osname=Linux;processor=mips64, linux/ppc64/libzstd-jni.so;osname=Linux;processor=ppc64, linux/ppc64le/libzstd-jni.so;osname=Linux;processor=ppc64le, linux/s390x/libzstd-jni.so;osname=Linux;processor=s390x, win/amd64/libzstd-jni.dll;osname=Win32;processor=amd64, win/x86/libzstd-jni.dll;osname=Win32;processor=x86

Bundle-SymbolicName: com.github.luben.zstd-jni

Bundle-Vendor: com.github.luben

Bundle-Version: 1.4.9.1

Created-By: 1.8.0\_275 (Debian)

Export-Package: com.github.luben.zstd;version="1.4.9.1",com.github.luben.zstd.util;version="1.4.9.1"

Implementation-Title: zstd-jni

Implementation-Vendor: com.github.luben

Implementation-Vendor-Id: com.github.luben

Implementation-Version: 1.4.9-1

Import-Package: org.osgi.framework;resolution:=optional

Private-Package: linux.amd64,linux.i386,linux.aarch64,linux.arm,linux.ppc64,linux.ppc64le,linux.mips64,linux.s390x,aix.ppc64,darwin.x86\_64,darwin.aarch64,win.amd64,win.x86,freebsd.amd64,freebsd.i386

Require-Capability: osgi.ee;filter="(&(osgi.ee=JavaSE)(version=1.8))"

Specification-Title: zstd-jni

Specification-Vendor: com.github.luben

Specification-Version: 1.4.9-1  
Tool: Bnd-4.0.0.201805111645

Found in path(s):

\* /opt/cola/permits/1183892379\_1627494642.79/0/zstd-jni-1-4-9-1-1-jar/META-INF/MANIFEST.MF

# 1.50 open-telemetry/opentelemetry-java

## 1.16.0

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```
* /opt/cola/permits/1131003150_1612875443.99/0/j2objc-annotations-1-3-sources-3-
jar/com/google/j2objc/annotations/RetainedWith.java
* /opt/cola/permits/1131003150_1612875443.99/0/j2objc-annotations-1-3-sources-3-
jar/com/google/j2objc/annotations/Property.java
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jar/com/google/j2objc/annotations/ObjectiveCName.java
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jar/com/google/j2objc/annotations/ReflectionSupport.java
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\* /opt/cola/permits/1131003150\_1612875443.99/0/j2objc-annotations-1-3-sources-3-jar/com/google/j2objc/annotations/AutoreleasePool.java  
\* /opt/cola/permits/1131003150\_1612875443.99/0/j2objc-annotations-1-3-sources-3-jar/com/google/j2objc/annotations/WeakOuter.java

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Found in path(s):

- \* /opt/cola/permits/1299411403\_1650627395.55/0/javax-inject-1-sources-jar/javax/inject/Provider.java
- \* /opt/cola/permits/1299411403\_1650627395.55/0/javax-inject-1-sources-jar/javax/inject/Named.java
- \* /opt/cola/permits/1299411403\_1650627395.55/0/javax-inject-1-sources-jar/javax/inject/Qualifier.java
- \* /opt/cola/permits/1299411403\_1650627395.55/0/javax-inject-1-sources-jar/javax/inject/Inject.java
- \* /opt/cola/permits/1299411403\_1650627395.55/0/javax-inject-1-sources-jar/javax/inject/package-info.java
- \* /opt/cola/permits/1299411403\_1650627395.55/0/javax-inject-1-sources-jar/javax/inject/Scope.java
- \* /opt/cola/permits/1299411403\_1650627395.55/0/javax-inject-1-sources-jar/javax/inject/Singleton.java

# 1.60 io.grpc:grpc-bom 1.39.0

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## 1.63 asm-analysis 7.2

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## 1.64 micronaut 3.7.3

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neo4j:3.5.0-enterprise

a

b

mcr.microsoft.com/mssql/server:2017-CU12

## 1.66 bom 4.1.77.Final

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\* /opt/cola/permits/1343420747\_1655288093.4536247/0/netty-bom-4-1-77-final-pom-zip/netty-bom-4.1.77.Final.pom

## 1.67 jackson-datatype-jdk8 2.13.4

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# 1.68 commons-logging 1.2

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Found in path(s):

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* /opt/cola/permits/1331473554_1653513966.161154/0/micronaut-cache-core-3-3-0-sources-
jar/io/micronaut/cache/jcache/JCacheSyncCache.java
* /opt/cola/permits/1331473554_1653513966.161154/0/micronaut-cache-core-3-3-0-sources-
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jar/io/micronaut/cache/CacheInfo.java
* /opt/cola/permits/1331473554_1653513966.161154/0/micronaut-cache-core-3-3-0-sources-
```



jar/io/micronaut/cache/package-info.java  
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jar/io/micronaut/cache/interceptor/package-info.java
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jar/io/micronaut/cache/annotation/CachePut.java
* /opt/cola/permits/1331473554_1653513966.161154/0/micronaut-cache-core-3-3-0-sources-
jar/io/micronaut/cache/CacheConfiguration.java
* /opt/cola/permits/1331473554_1653513966.161154/0/micronaut-cache-core-3-3-0-sources-
jar/io/micronaut/cache/DelegatingAsyncBlockingCache.java
* /opt/cola/permits/1331473554_1653513966.161154/0/micronaut-cache-core-3-3-0-sources-
jar/io/micronaut/cache/interceptor/ValueSupplierException.java
* /opt/cola/permits/1331473554_1653513966.161154/0/micronaut-cache-core-3-3-0-sources-
jar/io/micronaut/cache/CacheManager.java
```

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```

Found in path(s):

```
* /opt/cola/permits/1331473554_1653513966.161154/0/micronaut-cache-core-3-3-0-sources-
jar/io/micronaut/cache/annotation/CacheAnnotation.java
```

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\* /opt/cola/permits/1331473554\_1653513966.161154/0/micronaut-cache-core-3-3-0-sources-jar/META-INF/native-image/io.micronaut.cache/micronaut-cache-core/native-image.properties

## 1.71 profiler 1.0.2

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## 1.72 micronaut-reactor 2.2.2

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Found in path(s):

\* /opt/cola/permits/1331473741\_1653068550.395305/0/micronaut-reactor-2-2-2-sources-1-jar/io/micronaut/reactor/convert/ReactorConverterRegistrar.java  
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Found in path(s):

\* /opt/cola/permits/1331473741\_1653068550.395305/0/micronaut-reactor-2-2-2-sources-1-jar/io/micronaut/reactor/convert/ReactorToRxJava2ConverterRegistrar.java  
\* /opt/cola/permits/1331473741\_1653068550.395305/0/micronaut-reactor-2-2-2-sources-1-jar/io/micronaut/reactor/convert/ReactorToRxJava3ConverterRegistrar.java

## 1.73 appdynamics-java-agent-api 4.5.13.27526

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\* /opt/cola/permits/1337070300\_1654792344.40951/0/java-agent-api-4-5-13-27526-zip/agent-api-javadoc-jar/overview-tree.html  
\* /opt/cola/permits/1337070300\_1654792344.40951/0/java-agent-api-4-5-13-27526-zip/agent-api-javadoc-jar/com/appdynamics/agent/api/package-tree.html  
\* /opt/cola/permits/1337070300\_1654792344.40951/0/java-agent-api-4-5-13-27526-zip/agent-api-javadoc-jar/com/appdynamics/agent/api/ExitCall.html  
\* /opt/cola/permits/1337070300\_1654792344.40951/0/java-agent-api-4-5-13-27526-zip/agent-api-javadoc-jar/deprecated-list.html  
\* /opt/cola/permits/1337070300\_1654792344.40951/0/java-agent-api-4-5-13-27526-zip/agent-api-javadoc-jar/com/appdynamics/agent/api/impl/NoOpTransaction.html

\* /opt/cola/permits/1337070300\_1654792344.40951/0/java-agent-api-4-5-13-27526-zip/agent-api-javadoc-jar/com/appdynamics/agent/api/Transaction.html  
\* /opt/cola/permits/1337070300\_1654792344.40951/0/java-agent-api-4-5-13-27526-zip/agent-api-javadoc-jar/com/appdynamics/instrumentation/sdk/logging/package-tree.html  
\* /opt/cola/permits/1337070300\_1654792344.40951/0/java-agent-api-4-5-13-27526-zip/agent-api-javadoc-jar/com/appdynamics/instrumentation/sdk/logging/package-summary.html  
\* /opt/cola/permits/1337070300\_1654792344.40951/0/java-agent-api-4-5-13-27526-zip/agent-api-javadoc-jar/com/appdynamics/agent/api/AppdynamicsAgent.html  
\* /opt/cola/permits/1337070300\_1654792344.40951/0/java-agent-api-4-5-13-27526-zip/agent-api-javadoc-jar/com/appdynamics/instrumentation/sdk/logging/ISDKLogger.html  
\* /opt/cola/permits/1337070300\_1654792344.40951/0/java-agent-api-4-5-13-27526-zip/agent-api-javadoc-jar/com/appdynamics/agent/api/EventPublisher.html  
\* /opt/cola/permits/1337070300\_1654792344.40951/0/java-agent-api-4-5-13-27526-zip/agent-api-javadoc-jar/com/appdynamics/agent/api/impl/package-summary.html  
\* /opt/cola/permits/1337070300\_1654792344.40951/0/java-agent-api-4-5-13-27526-zip/agent-api-javadoc-jar/com/appdynamics/agent/api/EntryTypes.html  
\* /opt/cola/permits/1337070300\_1654792344.40951/0/java-agent-api-4-5-13-27526-zip/agent-api-javadoc-jar/overview-summary.html  
\* /opt/cola/permits/1337070300\_1654792344.40951/0/java-agent-api-4-5-13-27526-zip/agent-api-javadoc-jar/constant-values.html  
\* /opt/cola/permits/1337070300\_1654792344.40951/0/java-agent-api-4-5-13-27526-zip/agent-api-javadoc-jar/com/appdynamics/agent/api/package-summary.html  
\* /opt/cola/permits/1337070300\_1654792344.40951/0/java-agent-api-4-5-13-27526-zip/agent-api-javadoc-jar/index-all.html  
\* /opt/cola/permits/1337070300\_1654792344.40951/0/java-agent-api-4-5-13-27526-zip/agent-api-javadoc-jar/com/appdynamics/agent/api/ExitTypes.html  
\* /opt/cola/permits/1337070300\_1654792344.40951/0/java-agent-api-4-5-13-27526-zip/agent-api-javadoc-jar/help-doc.html  
\* /opt/cola/permits/1337070300\_1654792344.40951/0/java-agent-api-4-5-13-27526-zip/agent-api-javadoc-jar/com/appdynamics/agent/api/impl/NoOpExitCall.html  
\* /opt/cola/permits/1337070300\_1654792344.40951/0/java-agent-api-4-5-13-27526-zip/agent-api-javadoc-jar/com/appdynamics/agent/api/impl/package-tree.html  
\* /opt/cola/permits/1337070300\_1654792344.40951/0/java-agent-api-4-5-13-27526-zip/agent-api-javadoc-jar/com/appdynamics/agent/api/MetricPublisher.html  
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\* /opt/cola/permits/1337070300\_1654792344.40951/0/java-agent-api-4-5-13-27526-zip/agent-api-sources-jar/com/appdynamics/agent/api/impl/NoOpTransaction.java  
\* /opt/cola/permits/1337070300\_1654792344.40951/0/java-agent-api-4-5-13-27526-zip/agent-api-sources-

```
jar/com/appdynamics/agent/api/EumDelegate.java
* /opt/cola/permits/1337070300_1654792344.40951/0/java-agent-api-4-5-13-27526-zip/agent-api-sources-
jar/com/appdynamics/agent/api/impl/NoOpExitCall.java
* /opt/cola/permits/1337070300_1654792344.40951/0/java-agent-api-4-5-13-27526-zip/agent-api-sources-
jar/com/appdynamics/agent/api/AppdynamicsAgent.java
* /opt/cola/permits/1337070300_1654792344.40951/0/java-agent-api-4-5-13-27526-zip/agent-api-sources-
jar/com/appdynamics/agent/api/ExitCall.java
* /opt/cola/permits/1337070300_1654792344.40951/0/java-agent-api-4-5-13-27526-zip/agent-api-sources-
jar/com/appdynamics/agent/api/EventPublisher.java
* /opt/cola/permits/1337070300_1654792344.40951/0/java-agent-api-4-5-13-27526-zip/agent-api-sources-
jar/com/appdynamics/agent/api/MetricPublisher.java
* /opt/cola/permits/1337070300_1654792344.40951/0/java-agent-api-4-5-13-27526-zip/agent-api-sources-
jar/com/appdynamics/agent/api/Transaction.java
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* /opt/cola/permits/1337070300_1654792344.40951/0/java-agent-api-4-5-13-27526-zip/agent-api-sources-
jar/com/appdynamics/agent/api/bootstrap/NoOpTransactionDelegate.java
* /opt/cola/permits/1337070300_1654792344.40951/0/java-agent-api-4-5-13-27526-zip/agent-api-sources-
jar/com/appdynamics/agent/api/ExitTypes.java
* /opt/cola/permits/1337070300_1654792344.40951/0/java-agent-api-4-5-13-27526-zip/agent-api-sources-
jar/com/appdynamics/agent/api/EntryTypes.java
* /opt/cola/permits/1337070300_1654792344.40951/0/java-agent-api-4-5-13-27526-zip/agent-api-sources-
jar/com/appdynamics/agent/api/bootstrap/IApiBootstrapFacade.java
* /opt/cola/permits/1337070300_1654792344.40951/0/java-agent-api-4-5-13-27526-zip/agent-api-sources-
jar/com/appdynamics/agent/api/bootstrap/IApiTransactionDelegate.java
```

## 1.74 micronaut-groovy 3.1.0

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- \* /opt/cola/permits/1331474157\_1653512453.5913334/0/micronaut-runtime-groovy-3-1-0-sources-jar/io/micronaut/context/env/groovy/SetPropertyTransformer.groovy
- \* /opt/cola/permits/1331474157\_1653512453.5913334/0/micronaut-runtime-groovy-3-1-0-sources-jar/io/micronaut/context/env/groovy/ConfigurationEvaluator.groovy
- \* /opt/cola/permits/1331474157\_1653512453.5913334/0/micronaut-runtime-groovy-3-1-0-sources-jar/io/micronaut/context/env/groovy/GroovyPropertySourceLoader.java
- \* /opt/cola/permits/1331474157\_1653512453.5913334/0/micronaut-runtime-groovy-3-1-0-sources-jar/io/micronaut/context/env/groovy/package-info.java

## 1.75 azure-java-sdk-bom-(bill-of-materials)

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Found in path(s):

```
* /opt/cola/permits/1470281385_1668115980.505427/0/netty-codec-http-4-1-84-final-jar/META-INF/native-
image/io.netty.codec-http/native-image.properties
```

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Manifest-Version: 1.0

Implementation-Title: Netty/Codec/HTTP

Bundle-Description: Netty is an asynchronous event-driven network application framework for rapid development of maintainable high performance protocol servers and clients.

Automatic-Module-Name: io.netty.codec.http

Bundle-License: <https://www.apache.org/licenses/LICENSE-2.0>

Bundle-SymbolicName: io.netty.codec-http

Implementation-Version: 4.1.84.Final

Built-By: chris

Bnd-LastModified: 1665536154725

Bundle-ManifestVersion: 2

Implementation-Vendor-Id: io.netty

Bundle-DocURL: <https://netty.io/>

Bundle-Vendor: The Netty Project

Import-Package: com.aayushatharva.brotli4j.encoder;resolution:=optional,com.jcraft.jzlib;resolution:=optional,io.netty.buffer;version="[4.1,5)",io.netty.channel;version="[4.1,5)",io.netty.channel.embedded;version="[4.1,5)",io.netty.handler.codec,io.netty.handler.codec.base64;version="[4.1,5)",io.netty.handler.codec.compression;version="[4.1,5)",io.netty.handler.ssl;version="[4.1,5)",io.netty.handler.stream;version="[4.1,5)",io.netty.util;version="[4.1,5)",io.netty.util.concurrent;version="[4.1,5)",io.netty.util.internal;version="[4.1,5)",io.netty.util.internal.logging;version="[4.1,5)",sun.nio.ch;resolution:=optional,org.eclipse.jetty.npn;version="[1,2)";resolution:=optional,org.eclipse.jetty.alpn;version="[1,2)";resolution:=optional

Require-Capability: osgi.ee;filter="(&(osgi.ee=JavaSE)(version=1.6))"

Tool: Bnd-2.4.1.201501161923

Implementation-Vendor: The Netty Project

Export-Package: io.netty.handler.codec.http;uses="io.netty.buffer,io.



io.netty.channel,io.netty.channel.embedded,io.netty.handler.codec,io.netty.handler.codec.compression,io.netty.handler.codec.http.cookie,io.netty.handler.stream,io.netty.util";version="4.1.84",io.netty.handler.codec.http.cookie;version="4.1.84",io.netty.handler.codec.http.cors;uses="io.netty.channel,io.netty.handler.codec.http";version="4.1.84",io.netty.handler.codec.http.multipart;uses="io.netty.buffer,io.netty.channel,io.netty.handler.codec,io.netty.handler.codec.http,io.netty.handler.stream,io.netty.util";version="4.1.84",io.netty.handler.codec.http.websocketx;uses="io.netty.buffer,io.netty.channel,io.netty.handler.codec,io.netty.handler.codec.http,io.netty.handler.stream,io.netty.util,io.netty.util.internal.logging";version="4.1.84",io.netty.handler.codec.http.websocketx.extensions;uses="io.netty.channel,io.netty.handler.codec,io.netty.handler.codec.http.websocketx";version="4.1.84",io.netty.handler.codec.http.websocketx.extensions.compression;uses="io.netty.channel,io.netty.handler.codec.http.websocketx.extensions";version="4.1.84",io.netty.handler.codec.rtsp;uses="io.netty.buffer,io.netty.channel,io.netty.handler.codec.http,io.netty.util";version="4.1.84",io.netty.handler.codec.spdy;uses="io.netty.buffer,io.netty.channel,io.netty.handler.codec,io.netty.handler.codec.http,io.netty.util";version="4.1.84"

Bundle-Name: Netty/Codec/HTTP

Bundle-Version: 4.1.84.Final

Created-By: Apache Maven Bundle Plugin

Build-Jdk: 1.8.0\_312

Implementation-URL: <https://netty.io/netty-codec-http/>

Found in path(s):

\* /opt/cola/permits/1470281385\_1668115980.505427/0/netty-codec-http-4-1-84-final-jar/META-INF/MANIFEST.MF

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## 1.78 lz4-and-xxhash 1.7.1

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## 1.79 abegocore 1.0.3

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Manifest-Version: 1.0  
Bnd-LastModified: 1446804256758  
Build-Jdk: 1.8.0\_60  
Built-By: ub  
Bundle-Description: Efficient and customizable TreeLayout Algorithm in Java.  
Bundle-DocURL: <http://abego-software.de>  
Bundle-License: <http://www.abego-software.de/legal/apl-v10.html>  
Bundle-ManifestVersion: 2  
Bundle-Name: abego TreeLayout Core  
Bundle-SymbolicName: org.abego.treelayout.core  
Bundle-Vendor: abego Software GmbH, Germany  
Bundle-Version: 1.0.3  
Created-By: Apache Maven Bundle Plugin  
Export-Package: org.abego.treelayout.util;uses:="org.abego.treelayout";version="1.0.3",org.abego.treelayout;version="1.0.3"  
Implementation-Title: abego TreeLayout Core  
Implementation-Vendor: abego Software GmbH, Germany  
Implementation-Vendor-Id: org.abego.treelayout  
Implementation-Version: 1.0.3  
Import-Package: sun.misc;resolution:=optional  
Specification-Title: abego TreeLayout Core

Specification-Vendor: abego Software GmbH, Germany

Specification-Version: 1.0.3

Tool: Bnd-1.50.0

Found in path(s):

\* /opt/cola/permits/1162863034\_1649022203.09/0/org-abego-treelayout-core-1-0-3-jar/META-INF/MANIFEST.MF

# 1.80 jakarta-dependency-injection 2.0.1

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message(id, text) ::= "<id> <text>"

report(location, message, type) ::= "<type><message.id>: <location> <message.text>"

wantsSingleLineMessage() ::= "false"

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\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/tool/templates/messages/formats/antlr.stg

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/\*\* The definitive ANTLR v3 tree grammar to walk/visit ANTLR v4 grammars.

\* Parses trees created by ANTLRParser.g.

\*

\* Rather than have multiple tree grammars, one for each visit, I'm creating this generic visitor that knows about context. All of the boilerplate pattern recognition is done here. Then, subclasses can override the methods they care about. This prevents a lot of the same context tracking stuff like "set current alternative for current rule node" that is repeated in lots of tree filters.

\*/

tree grammar GrammarTreeVisitor;

options {

language = Java;

tokenVocab = ANTLRParser;

ASTLabelType = GrammarAST;

}

// Include the copyright in this source and also the generated source

@header {

/\*

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\*/

```
package org.antlr.v4.parse;
import org.antlr.v4.Tool;
import org.antlr.v4.tool.*;
import org.antlr.v4.tool.ast.*;
import java.lang.reflect.InvocationTargetException;
import java.lang.reflect.Method;
}

@members {
public String grammarName;
public GrammarAST currentRuleAST;
public String currentModeName = LexerGrammar.DEFAULT_MODE_NAME;
public String currentRuleName;
public GrammarAST currentOuterAltRoot;
public int currentOuterAltNumber = 1; // 1..n
public int rewriteEBNFLevel = 0;

public GrammarTreeVisitor() { this(null); }

// Should be abstract but can't make gen'd parser abstract;
// subclasses should implement else everything goes to stderr!
public ErrorManager getErrorManager() { return null; }

public void visitGrammar(GrammarAST t) { visit(t, "grammarSpec"); }
public void visit(GrammarAST t, String ruleName) {
 CommonTreeNodeStream nodes = new CommonTreeNodeStream(new GrammarASTAdaptor(), t);
 setTreeNodeStream(nodes);
 try {
 Method m = getClass().getMethod(ruleName);
```

```

m.invoke(this);
}
catch (Throwable e) {
 ErrorManager errMgr = getErrorManager();
 if (e instanceof InvocationTargetException) {
 e = e.getCause();
 }
 //e.printStackTrace(System.err);
 if (errMgr==null) {
 System.err.println("can't find rule "+ruleName+
 " or tree structure error: "+t.toStringTree()
);
 e.printStackTrace(System.err);
 }
 else errMgr.toolError(ErrorType.INTERNAL_ERROR, e);
}
}

public void discoverGrammar(GrammarRootAST root, GrammarAST ID) { }
public void finishPrequels(GrammarAST firstPrequel) { }
public void finishGrammar(GrammarRootAST root, GrammarAST ID) { }

public void grammarOption(GrammarAST ID, GrammarAST valueAST) { }
public void ruleOption(GrammarAST ID, GrammarAST valueAST) { }
public void blockOption(GrammarAST ID, GrammarAST valueAST) { }
public void defineToken(GrammarAST ID) { }
public void defineChannel(GrammarAST ID) { }
public void globalNamedAction(GrammarAST scope, GrammarAST ID, ActionAST action) { }
public void importGrammar(GrammarAST label, GrammarAST ID) { }

public void modeDef(GrammarAST m, GrammarAST ID) { }

public void discoverRules(GrammarAST rules) { }
public void finishRules(GrammarAST rule) { }
public void discoverRule(RuleAST rule, GrammarAST ID, List<GrammarAST> modifiers,
 ActionAST arg, ActionAST returns, GrammarAST thrws,
 GrammarAST options, ActionAST locals,
 List<GrammarAST> actions,
 GrammarAST block) { }
public void finishRule(RuleAST rule, GrammarAST ID, GrammarAST block) { }
public void discoverLexerRule(RuleAST rule, GrammarAST ID, List<GrammarAST> modifiers,
 GrammarAST block) { }
public void finishLexerRule(RuleAST rule, GrammarAST ID, GrammarAST block) { }
public void ruleCatch(GrammarAST arg, ActionAST action) { }
public void finallyAction(ActionAST action) { }
public void discoverOuterAlt(AltAST alt) { }
public void finishOuterAlt(AltAST alt) { }
public void discoverAlt(AltAST alt) { }

```

```

public void finishAlt(AltAST alt) { }

public void ruleRef(GrammarAST ref, ActionAST arg) { }
public void tokenRef(TerminalAST ref) { }
public void elementOption(GrammarASTWithOptions t, GrammarAST ID, GrammarAST valueAST) { }
public void stringRef(TerminalAST ref) { }
public void wildcardRef(GrammarAST ref) { }
public void actionInAlt(ActionAST action) { }
public void sempredInAlt(PredAST pred) { }
public void label(GrammarAST op, GrammarAST ID, GrammarAST element) { }
public void lexerCallCommand(int outerAltNumber, GrammarAST ID, GrammarAST arg) { }
public void lexerCommand(int outerAltNumber, GrammarAST ID) { }

protected void enterGrammarSpec(GrammarAST tree) { }
protected void exitGrammarSpec(GrammarAST tree) { }

protected void enterPrequelConstructs(GrammarAST tree) { }
protected void exitPrequelConstructs(GrammarAST tree) { }

protected void enterPrequelConstruct(GrammarAST tree) { }
protected void exitPrequelConstruct(GrammarAST tree) { }

protected void enterOptionsSpec(GrammarAST tree) { }
protected void exitOptionsSpec(GrammarAST tree) { }

protected void enterOption(GrammarAST tree) { }
protected void exitOption(GrammarAST tree) { }

protected void enterOptionValue(GrammarAST tree) { }
protected void exitOptionValue(GrammarAST tree) { }

protected void enterDelegateGrammars(GrammarAST tree) { }
protected void exitDelegateGrammars(GrammarAST tree) { }

protected void enterDelegateGrammar(GrammarAST tree) { }
protected void exitDelegateGrammar(GrammarAST tree) { }

protected void enterTokensSpec(GrammarAST tree) { }
protected void exitTokensSpec(GrammarAST tree) { }

protected void enterTokenSpec(GrammarAST tree) { }
protected void exitTokenSpec(GrammarAST tree) { }

protected void enterChannelsSpec(GrammarAST tree) { }
protected void exitChannelsSpec(GrammarAST tree) { }

protected void enterChannelSpec(GrammarAST tree) { }
protected void exitChannelSpec(GrammarAST tree) { }

```

```
protected void enterAction(GrammarAST tree) { }
protected void exitAction(GrammarAST tree) { }

protected void enterRules(GrammarAST tree) { }
protected void exitRules(GrammarAST tree) { }

protected void enterMode(GrammarAST tree) { }
protected void exitMode(GrammarAST tree) { }

protected void enterLexerRule(GrammarAST tree) { }
protected void exitLexerRule(GrammarAST tree) { }

protected void enterRule(GrammarAST tree) { }
protected void exitRule(GrammarAST tree) { }

protected void enterExceptionGroup(GrammarAST tree) { }
protected void exitExceptionGroup(GrammarAST tree) { }

protected void enterExceptionHandler(GrammarAST tree) { }
protected void exitExceptionHandler(GrammarAST tree) { }

protected void enterFinallyClause(GrammarAST tree) { }
protected void exitFinallyClause(GrammarAST tree) { }

protected void enterLocals(GrammarAST tree) { }
protected void exitLocals(GrammarAST tree) { }

protected void enterRuleReturns(GrammarAST tree) { }
protected void exitRuleReturns(GrammarAST tree) { }

protected void enterThrowsSpec(GrammarAST tree) { }
protected void exitThrowsSpec(GrammarAST tree) { }

protected void enterRuleAction(GrammarAST tree) { }
protected void exitRuleAction(GrammarAST tree) { }

protected void enterRuleModifier(GrammarAST tree) { }
protected void exitRuleModifier(GrammarAST tree) { }

protected void enterLexerRuleBlock(GrammarAST tree) { }
protected void exitLexerRuleBlock(GrammarAST tree) { }

protected void enterRuleBlock(GrammarAST tree) { }
protected void exitRuleBlock(GrammarAST tree) { }

protected void enterLexerOuterAlternative(AltAST tree) { }
protected void exitLexerOuterAlternative(AltAST tree) { }
```

```
protected void enterOuterAlternative(AltAST tree) { }
protected void exitOuterAlternative(AltAST tree) { }

protected void enterLexerAlternative(GrammarAST tree) { }
protected void exitLexerAlternative(GrammarAST tree) { }

protected void enterLexerElements(GrammarAST tree) { }
protected void exitLexerElements(GrammarAST tree) { }

protected void enterLexerElement(GrammarAST tree) { }
protected void exitLexerElement(GrammarAST tree) { }

protected void enterLabeledLexerElement(GrammarAST tree) { }
protected void exitLabeledLexerElement(GrammarAST tree) { }

protected void enterLexerBlock(GrammarAST tree) { }
protected void exitLexerBlock(GrammarAST tree) { }

protected void enterLexerAtom(GrammarAST tree) { }
protected void exitLexerAtom(GrammarAST tree) { }

protected void enterActionElement(GrammarAST tree) { }
protected void exitActionElement(GrammarAST tree) { }

protected void enterAlternative(AltAST tree) { }
protected void exitAlternative(AltAST tree) { }

protected void enterLexerCommand(GrammarAST tree) { }
protected void exitLexerCommand(GrammarAST tree) { }

protected void enterLexerCommandExpr(GrammarAST tree) { }
protected void exitLexerCommandExpr(GrammarAST tree) { }

protected void enterElement(GrammarAST tree) { }
protected void exitElement(GrammarAST tree) { }

protected void enterAstOperand(GrammarAST tree) { }
protected void exitAstOperand(GrammarAST tree) { }

protected void enterLabeledElement(GrammarAST tree) { }
protected void exitLabeledElement(GrammarAST tree) { }

protected void enterSubrule(GrammarAST tree) { }
protected void exitSubrule(GrammarAST tree) { }

protected void enterLexerSubrule(GrammarAST tree) { }
protected void exitLexerSubrule(GrammarAST tree) { }
```

```
protected void enterBlockSuffix(GrammarAST tree) { }
protected void exitBlockSuffix(GrammarAST tree) { }
```

```
protected void enterEbnfSuffix(GrammarAST tree) { }
protected void exitEbnfSuffix(GrammarAST tree) { }
```

```
protected void enterAtom(GrammarAST tree) { }
protected void exitAtom(GrammarAST tree) { }
```

```
protected void enterBlockSet(GrammarAST tree) { }
protected void exitBlockSet(GrammarAST tree) { }
```

```
protected void enterSetElement(GrammarAST tree) { }
protected void exitSetElement(GrammarAST tree) { }
```

```
protected void enterBlock(GrammarAST tree) { }
protected void exitBlock(GrammarAST tree) { }
```

```
protected void enterRuleref(GrammarAST tree) { }
protected void exitRuleref(GrammarAST tree) { }
```

```
protected void enterRange(GrammarAST tree) { }
protected void exitRange(GrammarAST tree) { }
```

```
protected void enterTerminal(GrammarAST tree) { }
protected void exitTerminal(GrammarAST tree) { }
```

```
protected void enterElementOptions(GrammarAST tree) { }
protected void exitElementOptions(GrammarAST tree) { }
```

```
protected void enterElementOption(GrammarAST tree) { }
protected void exitElementOption(GrammarAST tree) { }
```

```
@Override
```

```
public void traceIn(String ruleName, int ruleIndex) {
 System.err.println("enter "+ruleName+": "+input.LT(1));
}
```

```
@Override
```

```
public void traceOut(String ruleName, int ruleIndex) {
 System.err.println("exit "+ruleName+": "+input.LT(1));
}
}
```

```
grammarSpec
```

```
@init {
 enterGrammarSpec($start);
}
```

```

}
@after {
exitGrammarSpec($start);
}
: ^(GRAMMAR ID {grammarName=$ID.text;}
{discoverGrammar((GrammarRootAST)$GRAMMAR, $ID);}
prequelConstructs
{finishPrequels($prequelConstructs.firstOne);}
rules mode*
{finishGrammar((GrammarRootAST)$GRAMMAR, $ID);}
)
;

```

prequelConstructs returns [GrammarAST firstOne=null]

```

@init {
enterPrequelConstructs($start);
}
@after {
exitPrequelConstructs($start);
}
: {$firstOne=$start;} prequelConstruct+
|
;

```

prequelConstruct

```

@init {
enterPrequelConstructs($start);
}
@after {
exitPrequelConstructs($start);
}
: optionsSpec
| delegateGrammars
| tokensSpec
| channelsSpec
| action
;

```

optionsSpec

```

@init {
enterOptionsSpec($start);
}
@after {
exitOptionsSpec($start);
}
: ^(OPTIONS option*)
;

```



```

option
@init {
 enterOption($start);
 boolean rule = inContext("RULE ...");
 boolean block = inContext("BLOCK ...");
}
@after {
 exitOption($start);
}
: ^(a=ASSIGN ID v=optionValue)
{
 if (block) blockOption($ID, $v.start); // most specific first
 else if (rule) ruleOption($ID, $v.start);
 else grammarOption($ID, $v.start);
}
;

```

optionValue returns [String v]

```

@init {
 enterOptionValue($start);
 $v = $start.token.getText();
}
@after {
 exitOptionValue($start);
}
: ID
| STRING_LITERAL
| INT
;

```

delegateGrammars

```

@init {
 enterDelegateGrammars($start);
}
@after {
 exitDelegateGrammars($start);
}
: ^(IMPORT delegateGrammar+)
;

```

delegateGrammar

```

@init {
 enterDelegateGrammar($start);
}
@after {
 exitDelegateGrammar($start);
}
: ^(ASSIGN label=ID id=ID) {importGrammar($label, $id);}

```

```
| id=ID {importGrammar(null, $id);}
;
```

tokensSpec

```
@init {
 enterTokensSpec($start);
}
@after {
 exitTokensSpec($start);
}
: ^(TOKENS_SPEC tokenSpec+)
;
```

tokenSpec

```
@init {
 enterTokenSpec($start);
}
@after {
 exitTokenSpec($start);
}
: ID {defineToken($ID);}
;
```

channelsSpec

```
@init {
 enterChannelsSpec($start);
}
@after {
 exitChannelsSpec($start);
}
: ^(CHANNELS channelSpec+)
;
```

channelSpec

```
@init {
 enterChannelSpec($start);
}
@after {
 exitChannelSpec($start);
}
: ID {defineChannel($ID);}
;
```

action

```
@init {
 enterAction($start);
}
@after {
```

```

exitAction($start);
}
: ^(AT sc=ID? name=ID ACTION) {globalNamedAction($sc, $name, (ActionAST)$ACTION);}
;

```

rules

```

@init {
enterRules($start);
}
@after {
exitRules($start);
}
: ^(RULES {discoverRules($RULES);} (rule|lexerRule)* {finishRules($RULES);})
;

```

mode

```

@init {
enterMode($start);
}
@after {
exitMode($start);
}
: ^(MODE ID {currentModeName=$ID.text; modeDef($MODE, $ID);} lexerRule*)
;

```

lexerRule

```

@init {
enterLexerRule($start);
List<GrammarAST> mods = new ArrayList<GrammarAST>();
currentOuterAltNumber=0;
}
@after {
exitLexerRule($start);
}
: ^(RULE TOKEN_REF
{currentRuleName=$TOKEN_REF.text; currentRuleAST=$RULE;}
(^ (RULEMODIFIERS m=FRAGMENT {mods.add($m);}))?
{discoverLexerRule((RuleAST)$RULE, $TOKEN_REF, mods, (GrammarAST)input.LT(1));}
lexerRuleBlock
{
finishLexerRule((RuleAST)$RULE, $TOKEN_REF, $lexerRuleBlock.start);
currentRuleName=null; currentRuleAST=null;
}
)
;

```

rule

```

@init {

```

```

enterRule($start);
List<GrammarAST> mods = new ArrayList<GrammarAST>();
List<GrammarAST> actions = new ArrayList<GrammarAST>(); // track roots
currentOuterAltNumber=0;
}
@after {
exitRule($start);
}
: ^(RULE RULE_REF {currentRuleName=$RULE_REF.text; currentRuleAST=$RULE;}
 (^RULEMODIFIERS (m=ruleModifier{mods.add($m.start);})+)?
 ARG_ACTION?
 ret=ruleReturns?
 thr=throwsSpec?
 loc=locals?
 (opts=optionsSpec
 | a=ruleAction {actions.add($a.start);}
)*
 {discoverRule((RuleAST)$RULE, $RULE_REF, mods, (ActionAST)$ARG_ACTION,
 $ret.start!=null?(ActionAST)$ret.start.getChild(0):null,
 $thr.start, $opts.start,
 $loc.start!=null?(ActionAST)$loc.start.getChild(0):null,
 actions, (GrammarAST)input.LT(1));}
 ruleBlock exceptionGroup
 {finishRule((RuleAST)$RULE, $RULE_REF, $ruleBlock.start); currentRuleName=null; currentRuleAST=null;}
)
;

exceptionGroup
@init {
enterExceptionGroup($start);
}
@after {
exitExceptionGroup($start);
}
: exceptionHandler* finallyClause?
;

exceptionHandler
@init {
enterExceptionHandler($start);
}
@after {
exitExceptionHandler($start);
}
: ^(CATCH ARG_ACTION ACTION) {ruleCatch($ARG_ACTION, (ActionAST)$ACTION);}
;

finallyClause

```

```
@init {
 enterFinallyClause($start);
}
@after {
 exitFinallyClause($start);
}
: ^(FINALLY ACTION) {finallyAction((ActionAST)$ACTION);}
;
```

locals

```
@init {
 enterLocals($start);
}
@after {
 exitLocals($start);
}
: ^(LOCALS ARG_ACTION)
;
```

ruleReturns

```
@init {
 enterRuleReturns($start);
}
@after {
 exitRuleReturns($start);
}
: ^(RETURNS ARG_ACTION)
;
```

throwsSpec

```
@init {
 enterThrowsSpec($start);
}
@after {
 exitThrowsSpec($start);
}
: ^(THROWS ID+)
;
```

ruleAction

```
@init {
 enterRuleAction($start);
}
@after {
 exitRuleAction($start);
}
: ^(AT ID ACTION)
;
```

```

ruleModifier
@init {
 enterRuleModifier($start);
}
@after {
 exitRuleModifier($start);
}
: PUBLIC
| PRIVATE
| PROTECTED
| FRAGMENT
;

```

```

lexerRuleBlock
@init {
 enterLexerRuleBlock($start);
}
@after {
 exitLexerRuleBlock($start);
}
: ^(BLOCK
 ({
 currentOuterAltRoot = (GrammarAST)input.LT(1);
 currentOuterAltNumber++;
 }
 lexerOuterAlternative
)+
)
;

```

```

ruleBlock
@init {
 enterRuleBlock($start);
}
@after {
 exitRuleBlock($start);
}
: ^(BLOCK
 ({
 currentOuterAltRoot = (GrammarAST)input.LT(1);
 currentOuterAltNumber++;
 }
 outerAlternative
)+
)
;

```

```
lexerOuterAlternative
@init {
 enterLexerOuterAlternative((AltAST)$start);
 discoverOuterAlt((AltAST)$start);
}
@after {
 finishOuterAlt((AltAST)$start);
 exitLexerOuterAlternative((AltAST)$start);
}
: lexerAlternative
;
```

```
outerAlternative
@init {
 enterOuterAlternative((AltAST)$start);
 discoverOuterAlt((AltAST)$start);
}
@after {
 finishOuterAlt((AltAST)$start);
 exitOuterAlternative((AltAST)$start);
}
: alternative
;
```

```
lexerAlternative
@init {
 enterLexerAlternative($start);
}
@after {
 exitLexerAlternative($start);
}
: ^(LEXER_ALT_ACTION lexerElements lexerCommand+)
 | lexerElements
;
```

```
lexerElements
@init {
 enterLexerElements($start);
}
@after {
 exitLexerElements($start);
}
: ^(ALT lexerElement+)
;
```

```
lexerElement
@init {
```

```

enterLexerElement($start);
}
@after {
exitLexerElement($start);
}
: labeledLexerElement
| lexerAtom
| lexerSubrule
| ACTION {actionInAlt((ActionAST)$ACTION);}
| SEMPRED {sempredInAlt((PredAST)$SEMPRED);}
| ^(ACTION elementOptions) {actionInAlt((ActionAST)$ACTION);}
| ^(SEMPRED elementOptions) {sempredInAlt((PredAST)$SEMPRED);}
| EPSILON
;

```

```

labeledLexerElement
@init {
enterLabeledLexerElement($start);
}
@after {
exitLabeledLexerElement($start);
}
: ^((ASSIGN|PLUS_ASSIGN) ID (lexerAtom|block))
;

```

```

lexerBlock
@init {
enterLexerBlock($start);
}
@after {
exitLexerBlock($start);
}
: ^(BLOCK optionsSpec? lexerAlternative+)
;

```

```

lexerAtom
@init {
enterLexerAtom($start);
}
@after {
exitLexerAtom($start);
}
: terminal
| ^(NOT blockSet)
| blockSet
| ^(WILDCARD elementOptions)
| WILDCARD
| LEXER_CHAR_SET

```



```
| range
| ruleref
;
```

actionElement

```
@init {
 enterActionElement($start);
}
@after {
 exitActionElement($start);
}
: ACTION
| ^(ACTION elementOptions)
| SEMPRED
| ^(SEMPRED elementOptions)
;
```

alternative

```
@init {
 enterAlternative((AltAST)$start);
 discoverAlt((AltAST)$start);
}
@after {
 finishAlt((AltAST)$start);
 exitAlternative((AltAST)$start);
}
: ^(ALT elementOptions? element+)
| ^(ALT elementOptions? EPSILON)
;
```

lexerCommand

```
@init {
 enterLexerCommand($start);
}
@after {
 exitLexerCommand($start);
}
: ^(LEXER_ACTION_CALL ID lexerCommandExpr)
 {lexerCallCommand(currentOuterAltNumber, $ID, $lexerCommandExpr.start);}
| ID
 {lexerCommand(currentOuterAltNumber, $ID);}
;
```

lexerCommandExpr

```
@init {
 enterLexerCommandExpr($start);
}
@after {
```

```
exitLexerCommandExpr($start);
}
: ID
| INT
;
```

```
element
@init {
enterElement($start);
}
@after {
exitElement($start);
}
: labeledElement
| atom
| subrule
| ACTION {actionInAlt((ActionAST)$ACTION);}
| SEMPRED {sempredInAlt((PredAST)$SEMPRED);}
| ^(ACTION elementOptions) {actionInAlt((ActionAST)$ACTION);}
| ^(SEMPRED elementOptions) {sempredInAlt((PredAST)$SEMPRED);}
| range
| ^(NOT blockSet)
| ^(NOT block)
;
```

```
astOperand
@init {
enterAstOperand($start);
}
@after {
exitAstOperand($start);
}
: atom
| ^(NOT blockSet)
| ^(NOT block)
;
```

```
labeledElement
@init {
enterLabeledElement($start);
}
@after {
exitLabeledElement($start);
}
: ^((ASSIGN|PLUS_ASSIGN) ID element) {label($start, $ID, $element.start);}
;
```

```
subrule
```

```
@init {
 enterSubrule($start);
}
@after {
 exitSubrule($start);
}
: ^(blockSuffix block)
| block
;
```

```
lexerSubrule
@init {
 enterLexerSubrule($start);
}
@after {
 exitLexerSubrule($start);
}
: ^(blockSuffix lexerBlock)
| lexerBlock
;
```

```
blockSuffix
@init {
 enterBlockSuffix($start);
}
@after {
 exitBlockSuffix($start);
}
: ebnfSuffix
;
```

```
ebnfSuffix
@init {
 enterEbnfSuffix($start);
}
@after {
 exitEbnfSuffix($start);
}
: OPTIONAL
| CLOSURE
| POSITIVE_CLOSURE
;
```

```
atom
@init {
 enterAtom($start);
}
@after {
```

```

exitAtom($start);
}
: ^(DOT ID terminal)
| ^(DOT ID ruleref)
| ^(WILDCARD elementOptions) {wildcardRef($WILDCARD);}
| WILDCARD {wildcardRef($WILDCARD);}
| terminal
| blockSet
| ruleref
;

```

```

blockSet
@init {
enterBlockSet($start);
}
@after {
exitBlockSet($start);
}
: ^(SET setElement+)
;

```

```

setElement
@init {
enterSetElement($start);
}
@after {
exitSetElement($start);
}
: ^(STRING_LITERAL elementOptions) {stringRef((TerminalAST)$STRING_LITERAL);}
| ^(TOKEN_REF elementOptions) {tokenRef((TerminalAST)$TOKEN_REF);}
| STRING_LITERAL {stringRef((TerminalAST)$STRING_LITERAL);}
| TOKEN_REF {tokenRef((TerminalAST)$TOKEN_REF);}
| ^(RANGE a=STRING_LITERAL b=STRING_LITERAL)
{
stringRef((TerminalAST)$a);
stringRef((TerminalAST)$b);
}
| LEXER_CHAR_SET
;

```

```

block
@init {
enterBlock($start);
}
@after {
exitBlock($start);
}
: ^(BLOCK optionsSpec? ruleAction* ACTION? alternative+)

```

```

;

ruleref
@init {
 enterRuleref($start);
}
@after {
 exitRuleref($start);
}
: ^(RULE_REF arg=ARG_ACTION? elementOptions?)
 {
 ruleRef($RULE_REF, (ActionAST)$ARG_ACTION);
 if ($arg!=null) actionInAlt((ActionAST)$arg);
 }
;

range
@init {
 enterRange($start);
}
@after {
 exitRange($start);
}
: ^(RANGE STRING_LITERAL STRING_LITERAL)
;

terminal
@init {
 enterTerminal($start);
}
@after {
 exitTerminal($start);
}
: ^(STRING_LITERAL elementOptions)
 {stringRef((TerminalAST)$STRING_LITERAL);}
| STRING_LITERAL {stringRef((TerminalAST)$STRING_LITERAL);}
| ^(TOKEN_REF elementOptions) {tokenRef((TerminalAST)$TOKEN_REF);}
| TOKEN_REF {tokenRef((TerminalAST)$TOKEN_REF);}
;

elementOptions
@init {
 enterElementOptions($start);
}
@after {
 exitElementOptions($start);
}
: ^(ELEMENT_OPTIONS elementOption[(GrammarASTWithOptions)$start.getParent()]*

```

```

;

elementOption[GrammarASTWithOptions t]
@init {
 enterElementOption($start);
}
@after {
 exitElementOption($start);
}
: ID { elementOption(t, $ID, null);}
| ^(ASSIGN id=ID v=ID) { elementOption(t, $id, $v);}
| ^(ASSIGN ID v=STRING_LITERAL) { elementOption(t, $ID, $v);}
| ^(ASSIGN ID v=ACTION) { elementOption(t, $ID, $v);}
| ^(ASSIGN ID v=INT) { elementOption(t, $ID, $v);}
;

```

Found in path(s):

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```

```
* (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF
* THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.
```

```
*/
```

```
/** ANTLR tool checks output templates are compatible with tool code generation.
```

```
* For now, a simple string match used on x.y of x.y.z scheme.
```

```
* Must match Tool.VERSION during load to templates.
```

```
*
```

```
* REQUIRED.
```

```
*/
```

```
pythonTypeInitMap ::= [
 "bool": "False",
 "int": "0",
 "float": "0.0",
 "str": "",
 default: "None" // anything other than a primitive type is an object
]
```

```
// args must be <object-model-object>, <fields-resulting-in-STs>
```

```
ParserFile(file, parser, namedActions, contextSuperClass) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
```

```
encoding: utf-8
```

```
from antlr4 import *
```

```
from io import StringIO
```

```
import sys
```

```
if sys.version_info[1] > 5:
```

```
 from typing import TextIO
```

```
else:
```

```
 from typing.io import TextIO
```

```
<namedActions.header>
```

```
<parser>
```

```
>>
```

```
ListenerFile(file, header, namedActions) ::= <<
```

```
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
```

```
from antlr4 import *
```

```
if __name__ is not None and "." in __name__:
```

```
 from <file.parserName> import <file.parserName>
```

```
else:
```

```
 from <file.parserName> import <file.parserName>
```

```
<header>
```

```
This class defines a complete listener for a parse tree produced by <file.parserName>.
```

```
class <file.grammarName>Listener(ParseTreeListener):
```

```

 <file.listenerNames:{lname |
Enter a parse tree produced by <file.parserName>#<lname>.
def enter<lname; format="cap">(self, ctx:<file.parserName>.<lname; format="cap">Context):
 pass

Exit a parse tree produced by <file.parserName>#<lname>.
def exit<lname; format="cap">(self, ctx:<file.parserName>.<lname; format="cap">Context):
 pass

}; separator="\n">

del <file.parserName>
>>

```

```

VisitorFile(file, header, namedActions) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
from antlr4 import *
if __name__ is not None and "." in __name__:
 from .<file.parserName> import <file.parserName>
else:
 from <file.parserName> import <file.parserName>
<header>

```

# This class defines a complete generic visitor for a parse tree produced by <file.parserName>.

```

class <file.grammarName>Visitor(ParseTreeVisitor):

 <file.visitorNames:{lname |
Visit a parse tree produced by <file.parserName>#<lname>.
def visit<lname; format="cap">(self, ctx:<file.parserName>.<lname; format="cap">Context):
 return self.visitChildren(ctx)

}; separator="\n">

del <file.parserName>
>>

```

```

fileHeader(grammarFileName, ANTLRVersion) ::= <<
Generated from <grammarFileName> by ANTLR <ANTLRVersion>
>>

```

```

Parser(parser, funcs, atn, sempredFuncs, superClass) ::= <<
<Parser_(ctor="parser_ctor", ...)>
>>

```



```

Parser_(parser, funcs, atn, sempredFuncs, ctor, superClass) ::= <<
<if(superClass)>
if __name__ is not None and "." in __name__:
 from .<superClass> import <superClass>
else:
 from <superClass> import <superClass>

<endif>
<atn>

class <parser.name> (<if(superClass)><superClass><else>Parser<endif>):

 grammarFileName = "<parser.grammarFileName>"

 atn = ATNDeserializer().deserialize(serializedATN())

 decisionsToDFA = [DFA(ds, i) for i, ds in enumerate(atn.decisionToState)]

 sharedContextCache = PredictionContextCache()

 literalNames = [<parser.literalNames:{t | <t>}; null="\\"<INVALID>\"", separator=", ", wrap, anchor>]

 symbolicNames = [<parser.symbolicNames:{t | <t>}; null="\\"<INVALID>\"", separator=", ", wrap, anchor>]

 <if(parser.rules)>
 <parser.rules:{r | RULE_<r.name> = <r.index>}; separator="\n", wrap, anchor>
 <endif>

 ruleNames = [<parser.ruleNames:{r | "<r>"}; separator=", ", wrap, anchor>]

 EOF = <TokenLabelType().EOF

 <if(parser.tokens)>
 <parser.tokens:{k | <k>=<parser.tokens.(k)>}; separator="\n", wrap, anchor>
 <endif>

 <parser:(ctor())>

 <namedActions.members>

 <funcs; separator="\n">

 <if(sempredFuncs)>
 def sempred(self, localctx:RuleContext, ruleIndex:int, predIndex:int):
 if self._predicates == None:
 self._predicates = dict()
 <parser.sempredFuncs.values:{ f |
 self._predicates[<f.ruleIndex>] = self.<f.name>_sempred }; separator="\n
">

```

```

 pred = self._predicates.get(ruleIndex, None)
 if pred is None:
 raise Exception("No predicate with index:" + str(ruleIndex))
 else:
 return pred(localctx, predIndex)

<sempredFuncs.values; separator="\n">
<endif>

>>

dumpActions(recog, argFuncs, actionFuncs, sempredFuncs) ::= <<
<if(actionFuncs)>
def action(self, localctx:RuleContext, ruleIndex:int, actionIndex:int):
 if self._actions is None:
 actions = dict()
 <recog.actionFuncs.values:{f]
 actions[<f.ruleIndex>] = self.<f.name>_action }; separator="\n">
 self._actions = actions
 action = self._actions.get(ruleIndex, None)
 if action is not None:
 action(localctx, actionIndex)
 else:
 raise Exception("No registered action for:" + str(ruleIndex))

<actionFuncs.values; separator="\n">

<endif>
<if(sempredFuncs)>
def sempred(self, localctx:RuleContext, ruleIndex:int, predIndex:int):
 if self._predicates is None:
 preds = dict()
 <recog.sempredFuncs.values:{f]
 preds[<f.ruleIndex>] = self.<f.name>_sempred}; separator="\n">
 self._predicates = preds
 pred = self._predicates.get(ruleIndex, None)
 if pred is not None:
 return pred(localctx, predIndex)
 else:
 raise Exception("No registered predicate for:" + str(ruleIndex))

<sempredFuncs.values; separator="\n">
<endif>

>>

parser_ctor(p) ::= <<

```

```

def __init__(self, input:TokenStream, output:TextIO = sys.stdout):
 super().__init__(input, output)
 self.checkVersion("<file.ANTLRVersion>")
 self._interp = ParserATNSimulator(self, self.atn, self.decisionsToDFA, self.sharedContextCache)
 self._predicates = None

>>

/* This generates a private method since the actionIndex is generated, making an
* overriding implementation impossible to maintain.
*/
RuleActionFunction(r, actions) ::= <<

def <r.name>_action(self, localctx:<r.ctxType> , actionIndex:int):
<actions:{index|
<if(first(actions))>
 if actionIndex == <index>:
 <actions.(index)>
<elseif(rest(actions))>
 elif actionIndex == <index>:
 <actions.(index)>
<endif> }; separator="\n">
>>

/* This generates a private method since the predIndex is generated, making an
* overriding implementation impossible to maintain.
*/
RuleSempredFunction(r, actions) ::= <<
def <r.name>_sempred(self, localctx:<r.ctxType>, predIndex:int):
 <actions:{index|
<if(first(actions))>
 if predIndex == <index>:
 return <actions.(index)>
<elseif(rest(actions))>
 elif predIndex == <index>:
 return <actions.(index)>
<endif> }; separator="\n">

>>

RuleFunction(currentRule,args,code,locals,ruleCtx,altLabelCtxs,namedActions,finallyAction,postamble,exceptions)
::= <<

<ruleCtx>

<altLabelCtxs:{l | <altLabelCtxs.(l)>}; separator="\n">

def <currentRule.name>(self<currentRule.args:{a | , <a.name><if(a.type)>:<a.type><endif> }>):

```

```

localctx = <parser.name>.<currentRule.ctxType>(self, self._ctx, self.state<currentRule.args:{ a | , <a.name>}>)
self.enterRule(localctx, <currentRule.startState>, self.RULE_<currentRule.name>)
<namedActions.init>
<locals; separator="\n">
try:
 <code>
 <postamble; separator="\n">
 <namedActions.after>
<if(exceptions)>
<exceptions; separator="\n">
<else>
except RecognitionException as re:
 localctx.exception = re
 self._errHandler.reportError(self, re)
 self._errHandler.recover(self, re)
<endif>
finally:
 <finallyAction>
 self.exitRule()
return localctx

>>

```

```

LeftRecursiveRuleFunction(currentRule,args,code,locals,ruleCtx,altLabelCtxs,
namedActions,finallyAction,postamble) ::=
<<

```

```

<ruleCtx>
<altLabelCtxs:{ l | <altLabelCtxs.(l)> }; separator="\n">

```

```

def <currentRule.name>(self, _p:int=0<if(currentRule.args)>, <args:{ a | , <a>}><endif>):
 _parentctx = self._ctx
 _parentState = self.state
 localctx = <parser.name>.<currentRule.ctxType>(self, self._ctx, _parentState<args:{ a | , <a.name>}>)
 _prevctx = localctx
 _startState = <currentRule.startState>
 self.enterRecursionRule(localctx, <currentRule.startState>, self.RULE_<currentRule.name>, _p)
 <namedActions.init>
 <locals; separator="\n">
 try:
 <code>
 <postamble; separator="\n">
 <namedActions.after>
 except RecognitionException as re:
 localctx.exception = re
 self._errHandler.reportError(self, re)
 self._errHandler.recover(self, re)

```

```

 finally:
 <finallyAction>
 self.unrollRecursionContexts(_parentctx)
 return localctx

>>

CodeBlockForOuterMostAlt(currentOuterMostAltCodeBlock, locals, preamble, ops) ::= <<
<if(currentOuterMostAltCodeBlock.altLabel)>localctx = <parser.name>.<currentOuterMostAltCodeBlock.altLabel;
format="cap">Context(self, localctx)<endif>
self.enterOuterAlt(localctx, <currentOuterMostAltCodeBlock.alt.altNum>)
<CodeBlockForAlt(currentAltCodeBlock=currentOuterMostAltCodeBlock, ...)>
>>

CodeBlockForAlt(currentAltCodeBlock, locals, preamble, ops) ::= <<
<locals; separator="\n">
<preamble; separator="\n">
<ops; separator="\n">
>>

LL1AltBlock(choice, preamble, alts, error) ::= <<
self.state = <choice.stateNumber>
self._errHandler.sync(self)
<if(choice.label)><labelref(choice.label)> = _input.LT(1)<endif>
<preamble; separator="\n">
token = self._input.LA(1)
<choice.altLook,alts:{look,alt| <cases(ttypes=look)>
 <alt>
 pass}; separator="\n1">
else:
 <error>

>>

LL1OptionalBlock(choice, alts, error) ::= <<
self.state = <choice.stateNumber>
self._errHandler.sync(self)
token = self._input.LA(1)
<choice.altLook,alts:{look,alt| <cases(ttypes=look)>
 <alt>
 pass}; separator="\n1">
else:
 pass
>>

LL1OptionalBlockSingleAlt(choice, expr, alts, preamble, error, followExpr) ::= <<
self.state = <choice.stateNumber>
self._errHandler.sync(self)

```

```

<preamble; separator="\n">
if <expr>:
 <alts; separator="\n">

<!else if (!(<followExpr>) <error>!>
>>

```

```

LL1StarBlockSingleAlt(choice, loopExpr, alts, preamble, iteration) ::= <<
self.state = <choice.stateNumber>
self._errHandler.sync(self)
<preamble; separator="\n">
while <loopExpr>:
 <alts; separator="\n">
 self.state = <choice.loopBackStateNumber>
 self._errHandler.sync(self)
 <iteration>

>>

```

```

LL1PlusBlockSingleAlt(choice, loopExpr, alts, preamble, iteration) ::= <<
self.state = <choice.blockStartStateNumber> <! alt block decision !>
self._errHandler.sync(self)
<preamble; separator="\n">
while True:
 <alts; separator="\n">
 self.state = <choice.stateNumber> <! loopback/exit decision !>
 self._errHandler.sync(self)
 <iteration>
 if not (<loopExpr>):
 break

>>

```

```

// LL(*) stuff

```

```

AltBlock(choice, preamble, alts, error) ::= <<
self.state = <choice.stateNumber>
self._errHandler.sync(self)
<if(choice.label)><labelref(choice.label)> = _input.LT(1)<endif>
<preamble; separator="\n">
la_ = self._interp.adaptivePredict(self._input,<choice.decision>,self._ctx)
<alts:{ alt |
if la_ == <i>:
 <alt>
 pass
}; separator="\n">

```

>>

```
OptionalBlock(choice, alts, error) ::= <<
self.state = <choice.stateNumber>
self._errHandler.sync(self)
la_ = self._interp.adaptivePredict(self._input,<choice.decision>,self._ctx)
<alts:{ alt |
if la_ == <i><if(!choice.ast.greedy)>+1<endif>:
 <alt>
}; separator="\nel">
```

>>

```
StarBlock(choice, alts, sync, iteration) ::= <<
self.state = <choice.stateNumber>
self._errHandler.sync(self)
_alt = self._interp.adaptivePredict(self._input,<choice.decision>,self._ctx)
while _alt!=<choice.exitAlt> and _alt!=ATN.INVALID_ALT_NUMBER:
 if _alt==1<if(!choice.ast.greedy)>+1<endif>:
 <iteration>
 <alts> <! should only be one !>
 self.state = <choice.loopBackStateNumber>
 self._errHandler.sync(self)
 _alt = self._interp.adaptivePredict(self._input,<choice.decision>,self._ctx)
```

>>

```
PlusBlock(choice, alts, error) ::= <<
self.state = <choice.blockStartStateNumber> <! alt block decision !>
self._errHandler.sync(self)
_alt = 1<if(!choice.ast.greedy)>+1<endif>
while _alt!=<choice.exitAlt> and _alt!=ATN.INVALID_ALT_NUMBER:
 <alts:{ alt|
if _alt == <i><if(!choice.ast.greedy)>+1<endif>:
 <alt>
}; separator="\nel">
 else:
 <error>
 self.state = <choice.loopBackStateNumber> <! loopback/exit decision !>
 self._errHandler.sync(self)
 _alt = self._interp.adaptivePredict(self._input,<choice.decision>,self._ctx)
```

>>

```
Sync(s) ::= "sync(<s.expecting.name>)"
```

```
ThrowNoViableAlt(t) ::= "raise NoViableAltException(self)"
```

```

TestSetInline(s) ::= <<
<s.bitsets:{bits | <if(rest(rest(bits.ttypes))><bitsetBitfieldComparison(s, bits)><else><bitsetInlineComparison(s,
bits)><endif>}; separator=" or ">
>>

// Java language spec 15.19 - shift operators mask operands rather than overflow to 0... need range test
testShiftInRange(shiftAmount) ::= <<
((<shiftAmount>) & ~0x3f) == 0
>>

// produces smaller bytecode only when bits.ttypes contains more than two items
bitsetBitfieldComparison(s, bits) ::= <%
(<testShiftInRange({<offsetShiftVar(s.varName, bits.shift)>})> and ((1 \<< <offsetShiftVar(s.varName,
bits.shift)>) & (<bits.ttypes:{ttype | (1 \<< <offsetShiftType(ttype, bits.shift)>)); separator=" | ">)) != 0)
%>

isZero ::= [
"0":true,
default:false
]

offsetShiftVar(shiftAmount, offset) ::= <%
<if(!isZero.(offset))><shiftAmount> - <offset><else><shiftAmount><endif>
%>

offsetShiftType(shiftAmount, offset) ::= <%
<if(!isZero.(offset))><parser.name>.<shiftAmount> - <offset><else><parser.name>.<shiftAmount><endif>
%>

// produces more efficient bytecode when bits.ttypes contains at most two items
bitsetInlineComparison(s, bits) ::= <%
<bits.ttypes:{ttype | <s.varName>==<parser.name>.<ttype>}; separator=" or ">
%>

cases(ttypes) ::= <<
if token in [<ttypes:{t | <parser.name>.<t>}; separator=", ">]:
>>

InvokeRule(r, argExprsChunks) ::= <<
self.state = <r.stateNumber>
<if(r.labels)><r.labels:{1 | <labelref(l)> =
}><endif>self.<r.name>(<if(r.ast.options.p)><r.ast.options.p><if(argExprsChunks)>,<endif><endif><argExprsChu
nks>)
>>

MatchToken(m) ::= <<
self.state = <m.stateNumber>
<if(m.labels)><m.labels:{1 | <labelref(l)> = }><endif>self.match(<parser.name>.<m.name>)

```



>>

```
MatchSet(m, expr, capture) ::= "<CommonSetStuff(m, expr, capture, false)>"
```

```
MatchNotSet(m, expr, capture) ::= "<CommonSetStuff(m, expr, capture, true)>"
```

```
CommonSetStuff(m, expr, capture, invert) ::= <<
```

```
self.state = <m.stateNumber>
```

```
<if(m.labels)><m.labels:{1 | <labelref(1)> = }>self._input.LT(1)<endif>
```

```
<capture>
```

```
<if(invert)>if <m.varName> \<= 0 or <expr><else>if not(<expr><endif>:
```

```
<if(m.labels)><m.labels:{1 | <labelref(1)> = }><else> <endif>self._errHandler.recoverInline(self)
```

```
else:
```

```
 self._errHandler.reportMatch(self)
```

```
 self.consume()
```

>>

```
Wildcard(w) ::= <<
```

```
self.state = <w.stateNumber>
```

```
<if(w.labels)><w.labels:{1 | <labelref(1)> = }><endif>self.matchWildcard()
```

>>

```
// ACTION STUFF
```

```
Action(a, foo, chunks) ::= "<chunks>"
```

```
ArgAction(a, chunks) ::= "<chunks>"
```

```
SemPred(p, chunks, failChunks) ::= <<
```

```
self.state = <p.stateNumber>
```

```
if not <chunks>:
```

```
 from antlr4.error.Errors import FailedPredicateException
```

```
 raise FailedPredicateException(self, <p.predicate><if(failChunks)>, <failChunks><elseif(p.msg)>,
```

```
<p.msg><endif>)
```

>>

```
ExceptionClause(e, catchArg, catchAction) ::= <<
```

```
except <catchArg>:
```

```
 <catchAction>
```

>>

```
// lexer actions are not associated with model objects
```

```
LexerSkipCommand() ::= "skip()"
```

```
LexerMoreCommand() ::= "more()"
```

```
LexerPopModeCommand() ::= "popMode()"
```

```
LexerTypeCommand(arg, grammar) ::= "_type = <arg>"
```

```

LexerChannelCommand(arg, grammar) ::= "_channel = <arg>"
LexerModeCommand(arg, grammar) ::= "_mode = <arg>"
LexerPushModeCommand(arg, grammar) ::= "pushMode(<arg>)"

ActionText(t) ::= "<t.text>"
ActionTemplate(t) ::= "<t.st>"
ArgRef(a) ::= "localctx.<a.name>"
LocalRef(a) ::= "localctx.<a.name>"
RetValRef(a) ::= "localctx.<a.name>"
QRetValRef(a) ::= "<ctx(a)>.<a.dict>.<a.name>"
/** How to translate $tokenLabel */
TokenRef(t) ::= "<ctx(t)>.<t.name>"
LabelRef(t) ::= "<ctx(t)>.<t.name>"
ListLabelRef(t) ::= "<ctx(t)>.<ListLabelName(t.name)>"
SetAttr(s,rhsChunks) ::= "<ctx(s)>.<s.name> = <rhsChunks>"

TokenLabelType() ::= "<file.TokenLabelType; null={Token}>"
InputSymbolType() ::= "<file.InputSymbolType; null={Token}>"

TokenPropertyRef_text(t) ::= "(None if <ctx(t)>.<t.label> is None else <ctx(t)>.<t.label>.text)"
TokenPropertyRef_type(t) ::= "(0 if <ctx(t)>.<t.label> is None else <ctx(t)>.<t.label>.type)"
TokenPropertyRef_line(t) ::= "(0 if <ctx(t)>.<t.label> is None else <ctx(t)>.<t.label>.line)"
TokenPropertyRef_pos(t) ::= "(0 if <ctx(t)>.<t.label> is None else <ctx(t)>.<t.label>.column)"
TokenPropertyRef_channel(t) ::= "(0 if <ctx(t)>.<t.label> is None else <ctx(t)>.<t.label>.channel)"
TokenPropertyRef_index(t) ::= "(0 if <ctx(t)>.<t.label> is None else <ctx(t)>.<t.label>.tokenIndex)"
TokenPropertyRef_int(t) ::= "(0 if <ctx(t)>.<t.label> is None else int(<ctx(t)>.<t.label>.text))"

RulePropertyRef_start(r) ::= "(None if <ctx(r)>.<r.label> is None else <ctx(r)>.<r.label>.start)"
RulePropertyRef_stop(r) ::= "(None if <ctx(r)>.<r.label> is None else <ctx(r)>.<r.label>.stop)"
RulePropertyRef_text(r) ::= "(None if <ctx(r)>.<r.label> is None else
self._input.getText(<ctx(r)>.<r.label>.start,<ctx(r)>.<r.label>.stop))"
RulePropertyRef_ctx(r) ::= "<ctx(r)>.<r.label>"
RulePropertyRef_parser(r) ::= "self"

ThisRulePropertyRef_start(r) ::= "localctx.start"
ThisRulePropertyRef_stop(r) ::= "localctx.stop"
ThisRulePropertyRef_text(r) ::= "self._input.getText(localctx.start, self._input.LT(-1))"
ThisRulePropertyRef_ctx(r) ::= "localctx"
ThisRulePropertyRef_parser(r) ::= "self"

NonLocalAttrRef(s) ::= "self.getInvokingContext(<s.ruleIndex>).<s.name>"
SetNonLocalAttr(s, rhsChunks) ::= "self.getInvokingContext(<s.ruleIndex>).<s.name> = <rhsChunks>"

AddToLabelList(a) ::= "<ctx(a.label)>.<a.listName>.append(<labelref(a.label)>)"

TokenDecl(t) ::= "self.<t.name> = None # <TokenLabelType()>"
TokenTypeDecl(t) ::= "self.<t.name> = 0 # <TokenLabelType()> type"
TokenListDecl(t) ::= "self.<t.name> = list() # of <TokenLabelType()>s"

```

```

RuleContextDecl(r) ::= "self.<r.name> = None # <r.ctxName>"
RuleContextListDecl(rdecl) ::= "self.<rdecl.name> = list() # of <rdecl.ctxName>s"

ContextTokenGetterDecl(t) ::= <<
def <t.name>(self):
 return self.getToken(<parser.name>.<t.name>, 0)
>>

// should never be called
ContextTokenListGetterDecl(t) ::= <<
def <t.name>_list(self):
 return self.getTokens(<parser.name>.<t.name>)
>>

ContextTokenListIndexedGetterDecl(t) ::= <<
def <t.name>(self, i:int=None):
 if i is None:
 return self.getTokens(<parser.name>.<t.name>)
 else:
 return self.getToken(<parser.name>.<t.name>, i)
>>

ContextRuleGetterDecl(r) ::= <<
def <r.name>(self):
 return self.getTypedRuleContext(<parser.name>.<r.ctxName>,0)

>>

// should never be called
ContextRuleListGetterDecl(r) ::= <<
def <r.name>_list(self):
 return self.getTypedRuleContexts(<parser.name>.<r.ctxName>)

>>

ContextRuleListIndexedGetterDecl(r) ::= <<
def <r.name>(self, i:int=None):
 if i is None:
 return self.getTypedRuleContexts(<parser.name>.<r.ctxName>)
 else:
 return self.getTypedRuleContext(<parser.name>.<r.ctxName>,i)

>>

LexerRuleContext() ::= "RuleContext"

/** The rule context name is the rule followed by a suffix; e.g.,
 * r becomes rContext.

```

```

*/
RuleContextNameSuffix() ::= "Context"

ImplicitTokenLabel(tokenName) ::= "_<tokenName>"
ImplicitRuleLabel(ruleName) ::= "_<ruleName>"
ImplicitSetLabel(id) ::= "_tset<id>"
ListLabelName(label) ::= "<label>"

CaptureNextToken(d) ::= "<d.varName> = self._input.LT(1)"
CaptureNextTokenType(d) ::= "<d.varName> = self._input.LA(1)"

StructDecl(struct,ctorAttrs,attrs, getters,dispatchMethods,interfaces,extensionMembers) ::= <<
class <struct.name><(if(contextSuperClass)><contextSuperClass><else>ParserRuleContext<endif>):
 __slots__ = 'parser'

 def __init__(self, parser, parent:ParserRuleContext=None, invokingState:int=-1<struct.ctorAttrs:{ a | ,
<a.name><(if(a.type)>:<a.type><endif>=None }>):
 super().__init__(parent, invokingState)
 self.parser = parser
 <attrs:{ a | <a>}; separator="\n">
 <struct.ctorAttrs:{ a | self.<a.name> = <a.name>}; separator="\n">

 <getters:{ g | <g>}; separator="\n\n">

 def getRuleIndex(self):
 return <parser.name>.RULE_<struct.derivedFromName>

<if(struct.provideCopyFrom)> <! don't need copy unless we have subclasses !>
 def copyFrom(self, ctx:ParserRuleContext):
 super().copyFrom(ctx)
 <struct.attrs:{ a | self.<a.name> = ctx.<a.name>}; separator="\n">

<endif>
 <dispatchMethods; separator="\n">
 <extensionMembers; separator="\n">

>>

AltLabelStructDecl(struct,attrs, getters,dispatchMethods) ::= <<
class <struct.name><(currentRule.name; format="cap">Context):

 def __init__(self, parser, ctx:ParserRuleContext): # actually a <parser.name>.<currentRule.name;
format="cap">Context
 super().__init__(parser)
 <attrs:{ a | <a>}; separator="\n">
 self.copyFrom(ctx)

 <getters:{ g | <g>}; separator="\n">

```

```

 <dispatchMethods; separator="\n">

>>

ListenerDispatchMethod(method) ::= <<
def <if(method.isEnter)>enter<else>exit<endif>Rule(self, listener:ParseTreeListener):
 if hasattr(listener, "<if(method.isEnter)>enter<else>exit<endif><struct.derivedFromName; format="cap">"):
 listener.<if(method.isEnter)>enter<else>exit<endif><struct.derivedFromName; format="cap">(self)

>>

VisitorDispatchMethod(method) ::= <<
def accept(self, visitor:ParseTreeVisitor):
 if hasattr(visitor, "visit<struct.derivedFromName; format="cap">"):
 return visitor.visit<struct.derivedFromName; format="cap">(self)
 else:
 return visitor.visitChildren(self)

>>

AttributeDecl(d) ::= "self.<d.name> = <if(d.initValue)><d.initValue><else>None<endif>"

/** If we don't know location of label def x, use this template */
labelref(x) ::= "<if(!x.isLocal)>localctx.<endif><x.name>"

/** For any action chunk, what is correctly-typed context struct ptr? */
ctx(actionChunk) ::= "localctx"

// used for left-recursive rules
recRuleAltPredicate(ruleName,opPrec) ::= "self.precpred(self._ctx, <opPrec>)"
recRuleSetReturnAction(src,name) ::= "$<name>=<src>.<name>"
recRuleSetStopToken() ::= "self._ctx.stop = self._input.LT(-1)"

recRuleAltStartAction(ruleName, ctxName, label) ::= <<
localctx = <parser.name>.<ctxName>Context(self, _parentctx, _parentState)
<if(label)>localctx.<label> = _prevctx<endif>
self.pushNewRecursionContext(localctx, _startState, self.RULE_<ruleName>)
>>

recRuleLabeledAltStartAction(ruleName, currentAltLabel, label, isListLabel) ::= <<
localctx = <parser.name>.<currentAltLabel; format="cap">Context(self, <parser.name>.<ruleName;
format="cap">Context(self, _parentctx, _parentState))
<if(label)>
<if(isListLabel)>
localctx.<label>.append(_prevctx)
<else>
localctx.<label> = _prevctx

```

```

<endif>
<endif>
self.pushNewRecursionContext(localctx, _startState, self.RULE_<ruleName>)
>>

```

```

recRuleReplaceContext(ctxName) ::= <<
localctx = <parser.name>.<ctxName>Context(self, localctx)
self._ctx = localctx
_prevctx = localctx
>>

```

```

recRuleSetPrevCtx() ::= <<
if self._parseListeners is not None:
 self.triggerExitRuleEvent()
_prevctx = localctx
>>

```

```

LexerFile(lexerFile, lexer, namedActions) ::= <<
<fileHeader(lexerFile.grammarFileName, lexerFile.ANTLRVersion)>
from antlr4 import *
from io import StringIO
import sys
if sys.version_info[1] > 5:
 from typing import TextIO
else:
 from typing.io import TextIO

```

```

<namedActions.header>

```

```

<lexer>
>>

```

```

Lexer(lexer, atn, actionFuncs, sempredFuncs, superClass) ::= <<
<if(superClass)>
if __name__ is not None and "." in __name__:
 from .<superClass> import <superClass>
else:
 from <superClass> import <superClass>

```

```

<endif>
<atn>

```

```

class <lexer.name>(<if(superClass)><superClass><else>Lexer<endif>):

```

```

 atn = ATNDeserializer().deserialize(serializedATN())

```

```

 decisionsToDFA = [DFA(ds, i) for i, ds in enumerate(atn.decisionToState)]

```

```

<if(lexer.channels)>
 <lexer.channels:{c| <c> = <lexer.channels.(c)>}; separator="\n">

<endif>
<if(rest(lexer.modes))>
 <rest(lexer.modes){m| <m> = <i>}; separator="\n">

<endif>
<if(lexer.tokens)>
 <lexer.tokens:{k | <k> = <lexer.tokens.(k)>}; separator="\n", wrap, anchor>
<endif>

channelNames = [u"DEFAULT_TOKEN_CHANNEL", u"HIDDEN"<if (lexer.channels)>, <lexer.channels:{c|
u"<c>"}; separator=", ", wrap, anchor><endif>]

modeNames = [<lexer.modes:{m| "<m>"}; separator=", ", wrap, anchor>]

literalNames = ["\<INVALID>",
 <lexer.literalNames:{t | <t>}; separator=", ", wrap, anchor>]

symbolicNames = ["\<INVALID>",
 <lexer.symbolicNames:{t | <t>}; separator=", ", wrap, anchor>]

ruleNames = [<lexer.ruleNames:{r | "<r>"}; separator=", ", wrap, anchor>]

grammarFileName = "<lexer.grammarFileName>"

def __init__(self, input=None, output:TextIO = sys.stdout):
 super().__init__(input, output)
 self.checkVersion("<lexerFile.ANTLRVersion>")
 self._interp = LexerATNSimulator(self, self.atn, self.decisionsToDFA, PredictionContextCache())
 self._actions = None
 self._predicates = None

<namedActions.members>

<dumpActions(lexer, "", actionFuncs, sempredFuncs)>

>>

SerializedATN(model) ::= <<
<! only one segment, can be inlined !>

def serializedATN():
 with StringIO() as buf:
 buf.write("<model.serialized; wrap={}<n> buf.write(">")")
 return buf.getvalue()

```

```
>>
```

```
/** Using a type to init value map, try to init a type; if not in table
* must be an object, default value is "null".
*/
```

```
initValue(typeName) ::= <<
<pythonTypeInitMap.(typeName)>
>>
```

```
>>
```

```
codeFileExtension() ::= ".py"
```

Found in path(s):

```
* /opt/cola/permits/1300428068_1649144266.79/0/antlr4-4-9-2-sources-
jar/org/antlr/v4/tool/templates/codegen/Python3/Python3.stg
```

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```

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```
*/
```

```
/** Find left-recursive rules */
```



```

tree grammar LeftRecursiveRuleWalker;

options {
 tokenVocab=ANTLRParser;
 ASTLabelType=GrammarAST;
}

@header {
package org.antlr.v4.parse;

import org.antlr.v4.misc.*;
import org.antlr.v4.tool.*;
import org.antlr.v4.tool.ast.*;
}

@members {
private String ruleName;
private int currentOuterAltNumber; // which outer alt of rule?
public int numAlts; // how many alts for this rule total?

public void setAltAssoc(AltAST altTree, int alt) {}
public void binaryAlt(AltAST altTree, int alt) {}
public void prefixAlt(AltAST altTree, int alt) {}
public void suffixAlt(AltAST altTree, int alt) {}
public void otherAlt(AltAST altTree, int alt) {}
public void setReturnValues(GrammarAST t) {}
}

@rulecatch { }

// TODO: can get parser errors for not matching pattern; make them go away
public
rec_rule returns [boolean isLeftRec]
@init
{
 currentOuterAltNumber = 1;
}
: ^(r=RULE id=RULE_REF {ruleName=$id.getText();}
 ruleModifier?
// (ARG_ACTION)? shouldn't allow args, right?
 (^ (RETURNS a=ARG_ACTION {setReturnValues($a);}))?
// (^(THROWS .+))?. don't allow
 (^(LOCALS ARG_ACTION))? // TODO: copy these to gen'd code
 (^(OPTIONS .*))
 | ^(AT ID ACTION) // TODO: copy
)*
ruleBlock { $isLeftRec = $ruleBlock.isLeftRec;}
exceptionGroup

```

```

)
;

exceptionGroup
: exceptionHandler* finallyClause?
;

exceptionHandler
: ^(CATCH ARG_ACTION ACTION)
;

finallyClause
: ^(FINALLY ACTION)
;

ruleModifier
: PUBLIC
| PRIVATE
| PROTECTED
;

ruleBlock returns [boolean isLeftRec]
@init{boolean lr=false; this.numAlts = $start.getChildCount();}
: ^(BLOCK
(
o=outerAlternative
{if ($o.isLeftRec) $isLeftRec = true;}
{currentOuterAltNumber++;}
)+
)
;

/** An alt is either prefix, suffix, binary, or ternary operation or "other" */
outerAlternative returns [boolean isLeftRec]
: (binary)=> binary
 {binaryAlt((AltAST)$start, currentOuterAltNumber); $isLeftRec=true;}
| (prefix)=> prefix
 {prefixAlt((AltAST)$start, currentOuterAltNumber);}
| (suffix)=> suffix
 {suffixAlt((AltAST)$start, currentOuterAltNumber); $isLeftRec=true;}
| nonLeftRecur {otherAlt((AltAST)$start, currentOuterAltNumber);}
;

binary
: ^(ALT elementOptions? recurse element* recurse epsilonElement*)
 {setAltAssoc((AltAST)$ALT,currentOuterAltNumber);}
;

```

```

prefix
: ^(ALT elementOptions?
 element+
 recurse epsilonElement*
)
 {setAltAssoc((AltAST)$ALT,currentOuterAltNumber);}
;

suffix
: ^(ALT elementOptions? recurse element+)
 {setAltAssoc((AltAST)$ALT,currentOuterAltNumber);}
;

nonLeftRecur
: ^(ALT elementOptions? element+)
;

recurse
: ^(ASSIGN ID recurseNoLabel)
| ^(PLUS_ASSIGN ID recurseNoLabel)
| recurseNoLabel
;

recurseNoLabel : {((CommonTree)input.LT(1)).getText().equals(ruleName)}? RULE_REF;

token returns [GrammarAST t=null]
: ^(ASSIGN ID s=token {$t = $s.t;})
| ^(PLUS_ASSIGN ID s=token {$t = $s.t;})
| b=STRING_LITERAL {$t = $b;}
| ^(b=STRING_LITERAL elementOptions) {$t = $b;}
| ^(c=TOKEN_REF elementOptions) {$t = $c;}
| c=TOKEN_REF {$t = $c;}
;

elementOptions
: ^(ELEMENT_OPTIONS elementOption*)
;

elementOption
: ID
| ^(ASSIGN ID ID)
| ^(ASSIGN ID STRING_LITERAL)
| ^(ASSIGN ID ACTION)
| ^(ASSIGN ID INT)
;

element
: atom

```

```
| ^(NOT element)
| ^(RANGE atom atom)
| ^(ASSIGN ID element)
| ^(PLUS_ASSIGN ID element)
| ^(SET setElement+)
| RULE_REF
| ebnf
| epsilonElement
;
```

```
epsilonElement
: ACTION
| SEMPRED
| EPSILON
| ^(ACTION elementOptions)
| ^(SEMPRED elementOptions)
;
```

```
setElement
: ^(STRING_LITERAL elementOptions)
| ^(TOKEN_REF elementOptions)
| STRING_LITERAL
| TOKEN_REF
;
```

```
ebnf: block
| ^(OPTIONAL block)
| ^(CLOSURE block)
| ^(POSITIVE_CLOSURE block)
;
```

```
block
: ^(BLOCK ACTION? alternative+)
;
```

```
alternative
: ^(ALT elementOptions? element+)
;
```

```
atom
: ^(RULE_REF ARG_ACTION? elementOptions?)
| ^(STRING_LITERAL elementOptions)
| STRING_LITERAL
| ^(TOKEN_REF elementOptions)
| TOKEN_REF
| ^(WILDCARD elementOptions)
| WILDCARD
| ^(DOT ID element)
```

;

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 \*/

```
dartTypeInitMap ::= [
 "int": "0",
 "double": "0.0",
 "bool": "false",
 default: "null" // anything other than a primitive type is an object
]
```

// args must be <object-model-object>, <fields-resulting-in-STs>

```
ParserFile(file, parser, namedActions, contextSuperClass) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
<if(file.genPackage)>
library <file.genPackage>;
```

```
import 'package:antlr4/antlr4.dart';
import 'dart:io';
```

```
<if(file.genListener)>
part '<file.grammarName>Listener.dart';
part '<file.grammarName>BaseListener.dart';
<endif>
<if(file.genVisitor)>
part '<file.grammarName>Visitor.dart';
part '<file.grammarName>BaseVisitor.dart';
<endif>
part '<file.grammarName>Lexer.dart';
<else>
```

```

import 'package:antlr4/antlr4.dart';
import 'dart:io';

<if(file.genListener)>
import '<file.grammarName>Listener.dart';
import '<file.grammarName>BaseListener.dart';
<endif>
<if(file.genVisitor)>
import '<file.grammarName>Visitor.dart';
import '<file.grammarName>BaseVisitor.dart';
<endif>
<endif>

<namedActions.header>
<parser>
>>

ListenerFile(file, header, namedActions) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
<if(file.genPackage)>
part of <file.genPackage>;
<else>
import 'package:antlr4/antlr4.dart';

import '<file.parserName>.dart';
<endif>
<header>

/// This abstract class defines a complete listener for a parse tree produced by
/// [<file.parserName>].
abstract class <file.grammarName>Listener extends ParseTreeListener {
<file.listenerNames>: { Iname |
<if(file.listenerLabelRuleNames.(Iname))>
/// Enter a parse tree produced by the [<Iname>]
/// labeled alternative in [file.parserName>.<file.listenerLabelRuleNames.(Iname)>].
<else>
/// Enter a parse tree produced by [<file.parserName>.<Iname>].
<endif>
/// [ctx] the parse tree
void enter<Iname; format="cap">(<Iname; format="cap">Context ctx);
<if(file.listenerLabelRuleNames.(Iname))>
/// Exit a parse tree produced by the [<Iname>]
/// labeled alternative in [<file.parserName>.<file.listenerLabelRuleNames.(Iname)>].
<else>
/// Exit a parse tree produced by [<file.parserName>.<Iname>].
<endif>
/// [ctx] the parse tree
void exit<Iname; format="cap">(<Iname; format="cap">Context ctx);}; separator="\n">

```

```

}
>>

BaseListenerFile(file, header, namedActions) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
<if(file.genPackage)>
part of <file.genPackage>;
<else>
import 'package:antlr4/antlr4.dart';

import '<file.parserName>.dart';
import '<file.grammarName>Listener.dart';
<endif>

<header>

/// This class provides an empty implementation of [<file.grammarName>Listener],
/// which can be extended to create a listener which only needs to handle
/// a subset of the available methods.
class <file.grammarName>BaseListener implements <file.grammarName>Listener {
<file.listenerNames>:{Iname |

/// The default implementation does nothing.
@override
void enter<Iname; format="cap">(<Iname; format="cap">Context ctx) {}

/// The default implementation does nothing.
@override
void exit<Iname; format="cap">(<Iname; format="cap">Context ctx) {}}; separator="\n">

/// The default implementation does nothing.
@override
void enterEveryRule(ParserRuleContext ctx) {}

/// The default implementation does nothing.
@override
void exitEveryRule(ParserRuleContext ctx) {}

/// The default implementation does nothing.
@override
void visitTerminal(TerminalNode node) {}

/// The default implementation does nothing.
@override
void visitErrorNode(ErrorNode node) {}
}

>>

```



```

VisitorFile(file, header, namedActions) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
<if(file.genPackage)>
part of <file.genPackage>;
<else>
import 'package:antlr4/antlr4.dart';

import '<file.parserName>.dart';
<endif>
<header>

/// This abstract class defines a complete generic visitor for a parse tree
/// produced by [<file.parserName>].
///
/// [T] is the return type of the visit operation. Use `void` for
/// operations with no return type.
abstract class <file.grammarName>Visitor<T> extends ParseTreeVisitor<T> {
 <file.visitorNames:{lname |
<if(file.visitorLabelRuleNames.(lname))>
 /// Visit a parse tree produced by the {@code <lname>}
 /// labeled alternative in {@link <file.parserName>#<file.visitorLabelRuleNames.(lname)>}|.
 <else>
 /// Visit a parse tree produced by [<file.parserName>.<lname>].
 <endif>
 <file.ctx> ctx;
 /// Return the visitor result.
 T visit<lname; format="cap">(<lname; format="cap">Context ctx); separator="\n"
}
>>

```

```

BaseVisitorFile(file, header, namedActions) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
<if(file.genPackage)>
part of <file.genPackage>;
<else>
import 'package:antlr4/antlr4.dart';

import '<file.parserName>.dart';
import '<file.grammarName>Visitor.dart';
<endif>
<header>

/// This class provides an empty implementation of [<file.grammarName>Visitor],
/// which can be extended to create a visitor which only needs to handle
/// a subset of the available methods.
///
/// [T] is the return type of the visit operation. Use `void` for

```

```

// operations with no return type.
class <file.grammarName>BaseVisitor<T> extends ParseTreeVisitor<T> implements
<file.grammarName>Visitor<T> {
 <file.visitorNames:{lname |
// The default implementation returns the result of calling
// [visitChildren] on [ctx].
@Override
T visit<lname; format="cap">(<lname; format="cap">Context ctx) => visitChildren(ctx);}; separator="\n">
}
>>

```

```

fileHeader(grammarFileName, ANTLRVersion) ::= <<
// Generated from <grammarFileName> by ANTLR <ANTLRVersion>
// ignore_for_file: unused_import, unused_local_variable, prefer_single_quotes
>>

```

```

Parser(parser, funcs, atn, sempredFuncs, superClass) ::= <<
<Parser_(ctor="parser_ctor", ...)>
>>

```

```

Parser_(parser, funcs, atn, sempredFuncs, ctor, superClass) ::= <<
<if(namedActions.definitions)><namedActions.definitions><endif>
<if(parser.rules)>
const int <parser.rules:{r | RULE_<r.name> = <r.index>}; separator=", ", wrap, anchor>;
<endif>
class <parser.name> extends <superClass; null="Parser"> {
 static final checkVersion = () => RuntimeMetaData.checkVersion('<file.ANTLRVersion>',
RuntimeMetaData.VERSION);
 static const int TOKEN_EOF = IntStream.EOF;

 static final List<DFA> _decisionToDFA = List.generate(
 _ATN.numberOfDecisions, (i) => DFA(_ATN.getDecisionState(i), i));
 static final PredictionContextCache _sharedContextCache = PredictionContextCache();
 <if(parser.tokens)>
 static const int <parser.tokens:{k | TOKEN_<k> = <parser.tokens.(k)>}; separator=", ", wrap, anchor>;
 <endif>

```

```

@Override
final List<String> ruleNames = [
 <parser.ruleNames:{r | '<r>'}; separator=", ", wrap, anchor>
];

```

```

<vocabulary(parser.literalNames, parser.symbolicNames)>

```

```

@Override
String get grammarFileName => '<parser.grammarFileName>';

```

```

@Override

```

```
String get serializedATN => _serializedATN;
```

```
@override
ATN getATN() {
 return _ATN;
}
```

```
<namedActions.members>
<parser:(ctor)()>
<funcs; separator="\n">
```

```
<if(sempredFuncs)>
 @override
 bool sempred(RuleContext _localctx, int ruleIndex, int predIndex) {
 switch (ruleIndex) {
 <parser.sempredFuncs.values:{f}
case <f.ruleIndex>:
 return _<f.name>_sempred(_localctx, predIndex);}; separator="\n">
 }
 return true;
 }
<sempredFuncs.values; separator="\n">
<endif>
```

```
<atn>
}
<funcs:{ func | <if(func.ruleCtx)><func.ruleCtx><endif>}; separator="\n\n">
```

```
<funcs:{ func | <if(func.altLabelCtxs)><func.altLabelCtxs:{l | <func.altLabelCtxs.(l)>};
separator="\n\n"><endif>}>
>>
```

```
vocabulary(literalNames, symbolicNames) ::= <<
 static final List<String> _LITERAL_NAMES = [
 <literalNames:{t | <t>}; null="null", separator=", ", wrap, anchor>
];
 static final List<String> _SYMBOLIC_NAMES = [
 <symbolicNames:{t | <t>}; null="null", separator=", ", wrap, anchor>
];
 static final Vocabulary VOCABULARY = VocabularyImpl(_LITERAL_NAMES, _SYMBOLIC_NAMES);
```

```
@override
Vocabulary get vocabulary {
 return VOCABULARY;
}
>>
```

```
dumpActions(recog, argFuncs, actionFuncs, sempredFuncs) ::= <<
```

```

<if(actionFuncs)>
void action(RuleContext _localctx, int ruleIndex, int actionIndex) {
 switch (ruleIndex) {
 <recog.actionFuncs.values: {f|
case <f.ruleIndex>:
 _<f.name>_action(_localctx, actionIndex);
 break;}; separator="\n">
 }
}
<actionFuncs.values; separator="\n">
<endif>
<if(sempredFuncs)>
bool sempred(RuleContext _localctx, int ruleIndex, int predIndex) {
 switch (ruleIndex) {
 <recog.sempredFuncs.values: {f|
case <f.ruleIndex>:
 return _<f.name>_sempred(_localctx, predIndex);}; separator="\n">
 }
 return true;
}
<sempredFuncs.values; separator="\n">
<endif>
>>

parser_ctor(p) ::= <<
<p.name>(TokenStream input) : super(input) {
 interpreter = ParserATNSimulator(this, _ATN, _decisionToDFA, _sharedContextCache);
}
>>

/// This generates a private method since the actionIndex is generated, making an
/// overriding implementation impossible to maintain.
RuleActionFunction(r, actions) ::= <<
void _<r.name>_action(<r.ctxType> _localctx, int actionIndex) {
 switch (actionIndex) {
 <actions: {index|case <index>: <actions.(index)> break;}; separator="\n">
 }
}
>>

/// This generates a private method since the predIndex is generated, making an
/// overriding implementation impossible to maintain.
RuleSempredFunction(r, actions) ::= <<
bool _<r.name>_sempred(<r.ctxType> _localctx, int predIndex) {
 switch (predIndex) {
 <actions: {index|case <index>: return <actions.(index)>;}; separator="\n">
 }
 return true;
}

```

```
}
>>
```

```
RuleFunction(currentRule,args,code,locals,ruleCtx,altLabelCtxs,namedActions,finallyAction,postamble,exceptions)
::= <<
```

```
<if(currentRule.modifiers)><currentRule.modifiers:{ f | <f> }><else><endif><currentRule.ctxType>
<currentRule.name><(args; separator=", "> {
 dynamic _localctx = <currentRule.ctxType>(context, state<currentRule.args:{ a | , <a.name> }>);
 enterRule(_localctx, <currentRule.startState>, RULE_<currentRule.name>);
 <namedActions.init>
 <locals; separator="\n">
 try {
 <if(currentRule.hasLookaheadBlock)>
 int _alt;
 <endif>
 <code>
 <postamble; separator="\n">
 <namedActions.after>
 } <if(exceptions)> <exceptions; separator="\n"><else>on RecognitionException catch (re) {
 _localctx.exception = re;
 errorHandler.reportError(this, re);
 errorHandler.recover(this, re);
 }<endif> finally {
 <finallyAction>
 exitRule();
 }
 return _localctx;
}
>>
```

```
LeftRecursiveRuleFunction(currentRule,args,code,locals,ruleCtx,altLabelCtxs,
 namedActions,finallyAction,postamble) ::= <<
```

```
<currentRule.ctxType> <currentRule.name><([int _p = 0]<args:{ a | , <a> }>) {
 final _parentctx = context;
 final _parentState = state;
 dynamic _localctx = <currentRule.ctxType>(context, _parentState<currentRule.args:{ a | , <a.name> }>);
 var _prevctx = _localctx;
 var _startState = <currentRule.startState>;
 enterRecursionRule(_localctx, <currentRule.startState>, RULE_<currentRule.name>, _p);
 <namedActions.init>
 <locals; separator="\n">
 try {
 <if(currentRule.hasLookaheadBlock)>
 int _alt;
 <endif>
```

```

<code>
<postamble; separator="\n">
<namedActions.after>
} on RecognitionException catch (re) {
 _localctx.exception = re;
 errorHandler.reportError(this, re);
 errorHandler.recover(this, re);
} finally {
 <finallyAction>
 unrollRecursionContexts(_parentctx);
}
return _localctx;
}
>>

```

```

CodeBlockForOuterMostAlt(currentOuterMostAltCodeBlock, locals, preamble, ops) ::= <<
<if(currentOuterMostAltCodeBlock.altLabel)>_localctx = <currentOuterMostAltCodeBlock.altLabel;
format="cap">Context(_localctx);<endif>
enterOuterAlt(_localctx, <currentOuterMostAltCodeBlock.alt.altNum>);
<CodeBlockForAlt(currentAltCodeBlock=currentOuterMostAltCodeBlock, ...)>
>>

```

```

CodeBlockForAlt(currentAltCodeBlock, locals, preamble, ops) ::= <<
<locals; separator="\n">
<preamble; separator="\n">
<ops; separator="\n">
>>

```

```

LL1AltBlock(choice, preamble, alts, error) ::= <<
state = <choice.stateNumber>;
errorHandler.sync(this);
<if(choice.label)><labelref(choice.label)> = tokenStream.LT(1);<endif>
<preamble; separator="\n">
switch (tokenStream.LA(1)) {
<choice.altLook,alts:{look,alt| <cases(ttypes=look)>
 <alt>
 break;}; separator="\n">
default:
 <error>
}
>>

```

```

LL1OptionalBlock(choice, alts, error) ::= <<
state = <choice.stateNumber>;
errorHandler.sync(this);
switch (tokenStream.LA(1)) {
<choice.altLook,alts:{look,alt| <cases(ttypes=look)>
 <alt>

```

```

break;}; separator="\n">
default:
break;
}
>>

```

```

LL1OptionalBlockSingleAlt(choice, expr, alts, preamble, error, followExpr) ::= <<
state = <choice.stateNumber>;
errorHandler.sync(this);
<preamble; separator="\n">
if (<expr>) {
<alts; separator="\n">
}
<!else if (!(<followExpr>) <error>!>
>>

```

```

LL1StarBlockSingleAlt(choice, loopExpr, alts, preamble, iteration) ::= <<
state = <choice.stateNumber>;
errorHandler.sync(this);
<preamble; separator="\n">
while (<loopExpr>) {
<alts; separator="\n">
state = <choice.loopBackStateNumber>;
errorHandler.sync(this);
<iteration>
}
>>

```

```

LL1PlusBlockSingleAlt(choice, loopExpr, alts, preamble, iteration) ::= <<
state = <choice.blockStartStateNumber>; <! alt block decision !>
errorHandler.sync(this);
<preamble; separator="\n">
do {
<alts; separator="\n">
state = <choice.stateNumber>; <! loopback/exit decision !>
errorHandler.sync(this);
<iteration>
} while (<loopExpr>);
>>

```

```

// LL(*) stuff

```

```

AltBlock(choice, preamble, alts, error) ::= <<
state = <choice.stateNumber>;
errorHandler.sync(this);
<if(choice.label)><labelref(choice.label)> = tokenStream.LT(1);<endif>
<preamble; separator="\n">
switch (interpreter.adaptivePredict(tokenStream, <choice.decision>, context)) {

```

```

<alts:{alt |
case <i>:
 <alt>
 break;}; separator="\n">
}
>>

```

```

OptionalBlock(choice, alts, error) ::= <<
state = <choice.stateNumber>;
errorHandler.sync(this);
switch (interpreter.adaptivePredict(tokenStream, <choice.decision>, context)) {
<alts:{alt |
case <i><if(!choice.ast.greedy)>+1<endif>:
 <alt>
 break;}; separator="\n">
}
>>

```

```

StarBlock(choice, alts, sync, iteration) ::= <<
state = <choice.stateNumber>;
errorHandler.sync(this);
_alt = interpreter.adaptivePredict(tokenStream, <choice.decision>, context);
while (_alt != <choice.exitAlt> && _alt != ATN.INVALID_ALT_NUMBER) {
if (_alt == 1<if(!choice.ast.greedy)> + 1<endif>) {
 <iteration>
 <alts> <! should only be one !>
}
state = <choice.loopBackStateNumber>;
errorHandler.sync(this);
_alt = interpreter.adaptivePredict(tokenStream, <choice.decision>, context);
}
>>

```

```

PlusBlock(choice, alts, error) ::= <<
state = <choice.blockStartStateNumber>; <! alt block decision !>
errorHandler.sync(this);
_alt = 1<if(!choice.ast.greedy)>+1<endif>;
do {
switch (_alt) {
<alts:{alt|
case <i><if(!choice.ast.greedy)> + 1<endif>:
 <alt>
 break;}; separator="\n">
default:
 <error>
}
state = <choice.loopBackStateNumber>; <! loopback/exit decision !>
errorHandler.sync(this);

```



```

_alt = interpreter.adaptivePredict(tokenStream, <choice.decision>, context);
} while (_alt != <choice.exitAlt> && _alt != ATN.INVALID_ALT_NUMBER);
>>

Sync(s) ::= "sync(<s.expecting.name>);"

ThrowNoViableAlt(t) ::= "throw NoViableAltException(this);"

TestSetInline(s) ::= <<
<s.bitsets:{bits | <if(rest(rest(bits.ttypes)))><bitsetBitfieldComparison(s, bits)><else><bitsetInlineComparison(s,
bits)><endif>}; separator=" || ">
>>

// Java language spec 15.19 - shift operators mask operands rather than overflow to 0... need range test
testShiftInRange(shiftAmount) ::= <<
((<shiftAmount>) & ~0x3f) == 0
>>

// produces smaller bytecode only when bits.ttypes contains more than two items
bitsetBitfieldComparison(s, bits) ::= <%
(<testShiftInRange({ <offsetShift(s.varName, bits.shift)>}) >&& ((BigInt.one \<< <offsetShift(s.varName,
bits.shift)>) & (<bits.ttypes:{ttype | (BigInt.one \<< <offsetShift({TOKEN_<ttype>}, bits.shift)>}); separator=" |
">>) != BigInt.zero)
%>

isZero ::= [
"0":true,
default:false
]

offsetShift(shiftAmount, offset) ::= <%
<if(!isZero.(offset))><shiftAmount> - <offset><else><shiftAmount><endif>
%>

// produces more efficient bytecode when bits.ttypes contains at most two items
bitsetInlineComparison(s, bits) ::= <%
<bits.ttypes:{ttype | <s.varName> == TOKEN_<ttype>}; separator=" || ">
%>

cases(ttypes) ::= <<
<ttypes:{t | case TOKEN_<t>:}; separator="\n">
>>

InvokeRule(r, argExprsChunks) ::=<<
state = <r.stateNumber>;
<if(r.labels)><r.labels:{l | <labelref(l)> =
}><endif><r.name><(<if(r.ast.options.p)><r.ast.options.p><if(argExprsChunks)><endif><endif><argExprsChunks>
);

```

>>

```
MatchToken(m) ::= <<
state = <m.stateNumber>;
<if(m.labels)><m.labels:{1 | <labelref(l)> = }><endif>match(TOKEN_<m.name>);
>>
```

```
MatchSet(m, expr, capture) ::= "<CommonSetStuff(m, expr, capture, false)>"
```

```
MatchNotSet(m, expr, capture) ::= "<CommonSetStuff(m, expr, capture, true)>"
```

```
CommonSetStuff(m, expr, capture, invert) ::= <<
state = <m.stateNumber>;
<if(m.labels)><m.labels:{1 | <labelref(l)> = }>tokenStream.LT(1);<endif>
<capture>
if (<if(invert)><m.varName> \<= 0 || <else>!<endif><expr>) {
 <if(m.labels)><m.labels:{1 | <labelref(l)> = }><endif>errorHandler.recoverInline(this);
} else {
 if (tokenStream.LA(1)==IntStream.EOF) matchedEOF = true;
 errorHandler.reportMatch(this);
 consume();
}
>>
```

```
Wildcard(w) ::= <<
state = <w.stateNumber>;
<if(w.labels)><w.labels:{1 | <labelref(l)> = }><endif>matchWildcard();
>>
```

```
// ACTION STUFF
```

```
Action(a, foo, chunks) ::= "<chunks>"
```

```
ArgAction(a, chunks) ::= "<chunks>"
```

```
SemPred(p, chunks, failChunks) ::= <<
state = <p.stateNumber>;
if (!(<chunks>)) {
 throw FailedPredicateException(this, <p.predicate><if(failChunks)>, <failChunks><elseif(p.msg)>,
 <p.msg><endif>);
}
>>
```

```
ExceptionClause(e, catchArg, catchAction) ::= <<
catch (<catchArg>) {
 <catchAction>
}
>>
```

```

// lexer actions are not associated with model objects

LexerSkipCommand() ::= "skip();"
LexerMoreCommand() ::= "more();"
LexerPopModeCommand() ::= "popMode();"

LexerTypeCommand(arg, grammar) ::= "type = <arg>);"
LexerChannelCommand(arg, grammar) ::= "channel = <arg>);"
LexerModeCommand(arg, grammar) ::= "mode_ = <arg>);"
LexerPushModeCommand(arg, grammar) ::= "pushMode(<arg>);"

ActionText(t) ::= "<t.text>"
ActionTemplate(t) ::= "<t.st>"
ArgRef(a) ::= "_localctx.<a.name>"
LocalRef(a) ::= "_localctx.<a.name>"
RetValRef(a) ::= "_localctx.<a.name>"
QRetValRef(a) ::= "<ctx(a)>.<a.dict>.<a.name>"
/** How to translate $tokenLabel */
TokenRef(t) ::= "<ctx(t)>.<t.name>"
LabelRef(t) ::= "<ctx(t)>.<t.name>"
ListLabelRef(t) ::= "<ctx(t)>.<ListLabelName(t.name)>"
SetAttr(s,rhsChunks) ::= "<ctx(s)>.<s.name> = <rhsChunks>);"

TokenLabelType() ::= "<file.TokenLabelType; null={Token}>"
InputSymbolType() ::= "<file.InputSymbolType; null={Token}>"

TokenPropertyRef_text(t) ::= "<ctx(t)>.<t.label>?.text"
TokenPropertyRef_type(t) ::= "<ctx(t)>.<t.label> != null ? <ctx(t)>.<t.label>.type : 0"
TokenPropertyRef_line(t) ::= "<ctx(t)>.<t.label> != null ? <ctx(t)>.<t.label>.line : 0"
TokenPropertyRef_pos(t) ::= "<ctx(t)>.<t.label> != null ? <ctx(t)>.<t.label>.charPositionInLine : 0"
TokenPropertyRef_channel(t) ::= "<ctx(t)>.<t.label> != null ? <ctx(t)>.<t.label>.channel : 0"
TokenPropertyRef_index(t) ::= "<ctx(t)>.<t.label> != null ? <ctx(t)>.<t.label>.tokenIndex : 0"
TokenPropertyRef_int(t) ::= "<ctx(t)>.<t.label> != null ? int.parse(<ctx(t)>.<t.label>.text) : 0"

RulePropertyRef_start(r) ::= "<ctx(r)>.<r.label>?.start"
RulePropertyRef_stop(r) ::= "<ctx(r)>.<r.label>?.stop"
RulePropertyRef_text(r) ::= "<ctx(r)>.<r.label> != null ? tokenStream.getTextRange(<ctx(r)>.<r.label>.start,
<ctx(r)>.<r.label>.stop) : null)"
RulePropertyRef_ctx(r) ::= "<ctx(r)>.<r.label>"
RulePropertyRef_parser(r) ::= "this"

ThisRulePropertyRef_start(r) ::= "_localctx.start"
ThisRulePropertyRef_stop(r) ::= "_localctx.stop"
ThisRulePropertyRef_text(r) ::= "tokenStream.getTextRange(_localctx.start, tokenStream.LT(-1))"
ThisRulePropertyRef_ctx(r) ::= "_localctx"
ThisRulePropertyRef_parser(r) ::= "this"

```

```

NonLocalAttrRef(s) ::= "(getInvokingContext(<s.ruleIndex>) as <s.ruleName; format=\"cap\">Context).<s.name>"
SetNonLocalAttr(s, rhsChunks) ::=
"(getInvokingContext(<s.ruleIndex>) as <s.ruleName; format=\"cap\">Context).<s.name> = <rhsChunks>";

AddToLabelList(a) ::= "<ctx(a.label)>.<a.listName>.add(<labelref(a.label)>);"

TokenDecl(t) ::= "<TokenLabelType()> <t.name>"
TokenTypeDecl(t) ::= "int <t.name>";
TokenListDecl(t) ::= "List<Token> <t.name> = List<Token>()"
RuleContextDecl(r) ::= "<r.ctxName> <r.name>"
RuleContextListDecl(rdecl) ::= "List<<rdecl.ctxName>> <rdecl.name> = List<<rdecl.ctxName>>()"

ContextTokenGetterDecl(t) ::= <<
TerminalNode <t.name>() => getToken(<parser.name>.TOKEN_<t.name>, 0);
>>
ContextTokenListGetterDecl(t) ::= <<
List<TerminalNode> <t.name>s() => getTokens(<parser.name>.TOKEN_<t.name>);
>>
ContextTokenListIndexedGetterDecl(t) ::= <<
TerminalNode <t.name>(int i) => getToken(<parser.name>.TOKEN_<t.name>, i);
>>
ContextRuleGetterDecl(r) ::= <<
<r.ctxName> <r.name>() => getRuleContext<<r.ctxName>>()();
>>
ContextRuleListGetterDecl(r) ::= <<
List<<r.ctxName>> <r.name>s() => getRuleContexts<<r.ctxName>>();
>>
ContextRuleListIndexedGetterDecl(r) ::= <<
<r.ctxName> <r.name>(int i) => getRuleContext<<r.ctxName>>(i);
>>

LexerRuleContext() ::= "RuleContext"

/// The rule context name is the rule followed by a suffix; e.g.,
/// r becomes rContext.
RuleContextNameSuffix() ::= "Context"

ImplicitTokenLabel(tokenName) ::= "_<tokenName>"
ImplicitRuleLabel(ruleName) ::= "_<ruleName>"
ImplicitSetLabel(id) ::= "_tset<id>"
ListLabelName(label) ::= "<label>"

CaptureNextToken(d) ::= "<d.varName> = tokenStream.LT(1);"
CaptureNextTokenType(d) ::= "<d.varName> = tokenStream.LA(1);"

StructDecl(struct,ctorAttrs,attrs, getters,dispatchMethods,interfaces,extensionMembers)
::= <<
class <struct.name> extends

```

```

<if(contextSuperClass)><contextSuperClass><else>ParserRuleContext<endif><if(interfaces)> implements
<interfaces; separator=", "><endif> {
 <attrs:{ a | <a>;}; separator="\n">
 <getters:{ g | <g>;}; separator="\n">
 <struct.name>([ParserRuleContext parent, int invokingState<ctorAttrs:{ a | , <a>}>]) : super(parent,
invokingState)<if(struct.ctorAttrs)> {
 <struct.ctorAttrs:{ a | this.<a.name> = <a.name>;}; separator="\n">
 }<else>;<endif>

 @override
 int get ruleIndex => RULE_<struct.derivedFromName>;
<if(struct.provideCopyFrom)> <! don't need copy unless we have subclasses !>
 @override
 void copyFrom(<if(contextSuperClass)><contextSuperClass><else>ParserRuleContext<endif> ctx) {
 super.copyFrom(ctx);
 <struct.attrs:{ a | this.<a.name> = (ctx as <struct.name>).<a.name>;}; separator="\n">
 }
<endif>
 <dispatchMethods; separator="\n">
 <extensionMembers; separator="\n">
}
>>

```

```

AltLabelStructDecl(struct,attrs,getters,dispatchMethods) ::= <<
class <struct.name> extends <struct.parentRule; format="cap">Context {
 <attrs:{ a | <a>;}; separator="\n">
 <getters:{ g | <g>;}; separator="\n">
 <struct.name>(<struct.parentRule; format="cap">Context ctx) { copyFrom(ctx); }
 <dispatchMethods; separator="\n">
}
>>

```

```

ListenerDispatchMethod(method) ::= <<
@override
void <if(method.isEnter)>enter<else>exit<endif>Rule(ParseTreeListener listener) {
 if (listener is <parser.grammarName>Listener)
 listener.<if(method.isEnter)>enter<else>exit<endif><struct.derivedFromName; format="cap">(this);
}
>>

```

```

VisitorDispatchMethod(method) ::= <<
@override
T accept<T>(ParseTreeVisitor<T> visitor) {
 if (visitor is <parser.grammarName>Visitor<T>) {
 return visitor.visit<struct.derivedFromName; format="cap">(this);
 } else {
 return visitor.visitChildren(this);
 }
}

```

```

}
>>

AttributeDecl(d) ::= "<d.type> <d.name><if(d.initValue)> = <d.initValue><endif>"

// If we don't know location of label def x, use this template
labelref(x) ::= "<if(!x.isLocal)>_localctx.<endif><x.name>"

// For any action chunk, what is correctly-typed context struct ptr?
ctx(actionChunk) ::= "_localctx"

// used for left-recursive rules
recRuleAltPredicate(ruleName,opPrec) ::= "precpred(context, <opPrec>)"
recRuleSetReturnAction(src,name) ::= "$<name> = $<src>.<name>;"
recRuleSetStopToken() ::= "context.stop = tokenStream.LT(-1);"

recRuleAltStartAction(ruleName, ctxName, label, isListLabel) ::= <<
_localctx = <ctxName>Context(_parentctx, _parentState);
<if(label)>
<if(isListLabel)>
_localctx.<label>.add(_prevctx);
<else>
_localctx.<label> = _prevctx;
<endif>
<endif>
pushNewRecursionContext(_localctx, _startState, RULE_<ruleName>);
>>

recRuleLabeledAltStartAction(ruleName, currentAltLabel, label, isListLabel) ::= <<
_localctx = <currentAltLabel; format="cap">Context(new <ruleName; format="cap">Context(_parentctx,
_parentState));
<if(label)>
<if(isListLabel)>
_localctx.<label>.add(_prevctx);
<else>
_localctx.<label> = _prevctx;
<endif>
<endif>
pushNewRecursionContext(_localctx, _startState, RULE_<ruleName>);
>>

recRuleReplaceContext(ctxName) ::= <<
_localctx = <ctxName>Context(_localctx);
context = _localctx;
_prevctx = _localctx;
>>

recRuleSetPrevCtx() ::= <<

```

```

if (parseListeners != null) triggerExitRuleEvent();
_prevctx = _localctx;
>>

```

```

LexerFile(lexerFile, lexer, namedActions) ::= <<
<fileHeader(lexerFile.grammarFileName, lexerFile.ANTLRVersion)>
<if(lexerFile.genPackage)>
part of <lexerFile.genPackage>;
<else>
import 'package:antlr4/antlr4.dart';
<endif>
<namedActions.header>

<lexer>
>>

```

```

Lexer(lexer, atn, actionFuncs, sempredFuncs, superClass) ::= <<
<if(namedActions.definitions)><namedActions.definitions><endif>

class <lexer.name> extends <superClass; null="Lexer"> {
 static final checkVersion = () => RuntimeMetaData.checkVersion('<lexerFile.ANTLRVersion>',
RuntimeMetaData.VERSION);

 static final List<DFA> _decisionToDFA = List.generate(
 _ATN.numberOfDecisions, (i) => DFA(_ATN.getDecisionState(i), i));
 static final PredictionContextCache _sharedContextCache = PredictionContextCache();
 <if(lexer.tokens)>
 static const int
 <lexer.tokens:{k | TOKEN_<k> = <lexer.tokens.(k)>}; separator=", ", wrap, anchor>;
 <endif>
 <if(lexer.channels)>
 static const int
 <lexer.channels:{c | <c> = <lexer.channels.(c)>}; separator=", ", wrap, anchor>;
 <endif>
 <if(rest(lexer.modes)>
 static const int
 <rest(lexer.modes):{m | <m> = <i>}; separator=", ", wrap, anchor>;
 <endif>

 @override
 final List<String> channelNames = [
 'DEFAULT_TOKEN_CHANNEL', 'HIDDEN'<if (lexer.channels)>, <lexer.channels:{c| '<c>'}; separator=", ",
wrap, anchor><endif>
];

 @override
 final List<String> modeNames = [

```

```

 <lexer.modes:{m| '<m>'}; separator=", ", wrap, anchor>
];

@override
final List<String> ruleNames = [
 <lexer.ruleNames:{r | '<r>'}; separator=", ", wrap, anchor>
];

<vocabulary(lexer.literalNames, lexer.symbolicNames)>

<namedActions.members>

<lexer.name>(CharStream input) : super(input) {
 interpreter = LexerATNSimulator(_ATN, _decisionToDFA, _sharedContextCache, recog: this);
}

@override
String get serializedATN => _serializedATN;

@override
String get grammarFileName => '<lexer.grammarFileName>';

@override
ATN getATN() { return _ATN; }

<dumpActions(lexer, "", actionFuncs, sempredFuncs)>
<atn>
}
>>

SerializedATN(model) ::= <<
<if(rest(model.segments))>
<! requires segmented representation !>
static const int _serializedATNSegments = <length(model.segments)>;
<model.segments:{segment|static final String _serializedATNSegment<i0> =
'<segment; wrap={'<\n><\t>'}>'}; separator="\n">
static final String _serializedATN = [
 <model.segments:{segment | _serializedATNSegment<i0>}; separator=",\n">
].join();
<else>
<! only one segment, can be inlined !>
static const String _serializedATN = '<model.serialized; wrap={'<\n><\t>'}>';
<endif>
static final ATN _ATN =
 ATNDeserializer().deserialize(_serializedATN.codeUnits);
>>

/// Using a type to init value map, try to init a type; if not in table

```



```
/// must be an object, default value is "null".
```

```
initValue(typeName) ::= <<
<dartTypeInitMap.(typeName)>
>>
```

```
codeFileExtension() ::= ".dart"
```

Found in path(s):

```
* /opt/cola/permits/1300428068_1649144266.79/0/antlr4-4-9-2-sources-
jar/org/antlr/v4/tool/templates/codegen/Dart/Dart.stg
```

No license file was found, but licenses were detected in source scan.

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```

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```

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```

```
*/
```

```
/** How to generate rules derived from left-recursive rules.
```

```
* These rely on recRuleAltPredicate(),
```

```
* recRuleArg(), recRuleSetResultAction(), recRuleSetReturnAction()
```

```
* templates in main language.stg
```

```
*/
```

```
group LeftRecursiveRules;
```

```

recRule(ruleName, argName, primaryAlts, opAlts, setResultAction,
 userRetvals, leftRecursiveRuleRefLabels) ::=
<<
<ruleName><if(userRetvals)> returns [<userRetvals>]<endif>
: ({ } <primaryAlts:{alt | <alt.altText> }; separator="\n | ">
)
(
 <opAlts; separator="\n | ">
)*
;
>>

```

```

recRuleAlt(alt, precOption, opPrec, pred) ::= <<
{<pred>}?<<precOption>=<opPrec>> <alt.altText>
>>

```

Found in path(s):

\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/tool/templates/LeftRecursiveRules.stg

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\*/

Found in path(s):

\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/tool/templates/codegen/Cpp/Cpp.stg

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\*/

/\*\* ANTLR tool checks output templates are compatible with tool code generation.

\* For now, a simple string match used on x.y of x.y.z scheme.

\* Must match Tool.VERSION during load to templates.

\*

\* REQUIRED.

\*/

javascriptTypeInitMap ::= [

"bool": "false",

```

 "int": "0",
 "float": "0.0",
 "str": "",
 default: "{}" // anything other than a primitive type is an object
]

 // args must be <object-model-object>, <fields-resulting-in-STs>

 ParserFile(file, parser, namedActions, contextSuperClass) ::= <<
 <fileHeader(file.grammarFileName, file.ANTLRVersion)>
 import antlr4 from 'antlr4';
 <if(file.genListener)>
 import <file.grammarName>Listener from './<file.grammarName>Listener.js';
 <endif>
 <if(file.genVisitor)>
 import <file.grammarName>Visitor from './<file.grammarName>Visitor.js';
 <endif>

 <namedActions.header>
 <parser>
 >>

 ListenerFile(file, header, namedActions) ::= <<
 <fileHeader(file.grammarFileName, file.ANTLRVersion)>
 import antlr4 from 'antlr4';

 // This class defines a complete listener for a parse tree produced by <file.parserName>.
 export default class <file.grammarName>Listener extends antlr4.tree.ParseTreeListener {

 <file.listenerNames:{Iname |
 // Enter a parse tree produced by <file.parserName>#<Iname>.
 enter<Iname; format="cap">(ctx) {
 \}

 // Exit a parse tree produced by <file.parserName>#<Iname>.
 exit<Iname; format="cap">(ctx) {
 \}

 }; separator="\n">

 }
 >>

 VisitorFile(file, header, namedActions) ::= <<
 <fileHeader(file.grammarFileName, file.ANTLRVersion)>
 import antlr4 from 'antlr4';

```

```

// This class defines a complete generic visitor for a parse tree produced by <file.parserName>.

export default class <file.grammarName>Visitor extends antlr4.tree.ParseTreeVisitor {

 <file.visitorNames: { lname |
 // Visit a parse tree produced by <file.parserName>#<lname>.
 visit<lname; format="cap">(ctx) {
 return this.visitChildren(ctx);
 }
 }

 }; separator="\n">

}
>>

fileHeader(grammarFileName, ANTLRVersion) ::= <<
// Generated from <grammarFileName; format="java-escape"> by ANTLR <ANTLRVersion>
// jshint ignore: start
>>

Parser(parser, funcs, atn, sempredFuncs, superClass) ::= <<
<if(superClass)>
import <superClass> from './<superClass>.js';
<endif>

<atn>

const atn = new antlr4.atn.ATNDeserializer().deserialize(serializedATN);

const decisionsToDFA = atn.decisionToState.map((ds, index) => new antlr4.dfa.DFA(ds, index));

const sharedContextCache = new antlr4.PredictionContextCache();

export default class <parser.name> extends <superClass; null="antlr4.Parser"> {

 static grammarFileName = "<parser.grammarFileName; format="java-escape">";
 static literalNames = [<parser.literalNames: {t | <t>} ; null="null", separator=", ", wrap, anchor >];
 static symbolicNames = [<parser.symbolicNames: {t | <t>} ; null="null", separator=", ", wrap, anchor >];
 static ruleNames = [<parser.ruleNames: {r | "<r>"} ; separator=", ", wrap, anchor >];

 constructor(input) {
 super(input);
 this._interp = new antlr4.atn.ParserATNSimulator(this, atn, decisionsToDFA, sharedContextCache);
 this.ruleNames = <parser.name>.ruleNames;
 this.literalNames = <parser.name>.literalNames;
 this.symbolicNames = <parser.name>.symbolicNames;
 <namedActions.members>
 }
}

```

```

}

get atn() {
 return atn;
}

<if(sempredFuncs)>
sempred(localctx, ruleIndex, predIndex) {
 switch(ruleIndex) {
 <parser.sempredFuncs.values:{f | case <f.ruleIndex>:
 return this.<f.name>_sempred(localctx, predIndex);}; separator="\n">
 default:
 throw "No predicate with index:" + ruleIndex;
 }
}

<sempredFuncs.values; separator="\n">
<endif>

<funcs; separator="\n">

}

<parser.name>.EOF = antlr4.Token.EOF;
<if(parser.tokens)>
<parser.tokens:{k | <parser.name>.<k> = <parser.tokens.(k)>}; separator="\n", wrap, anchor>
<endif>

<if(parser.rules)>
<parser.rules:{r | <parser.name>.RULE_<r.name> = <r.index>}; separator="\n", wrap, anchor>
<endif>

<funcs:{f | <ruleContexts(f)>}; separator="\n">

<! Define fields of this parser to export the context classes !>
<parser.funcs:{f | <parser.name>.<f.ctxType> = <f.ctxType>; }; separator="\n">

>>

ruleContexts(currentRule) ::= <<
<currentRule.ruleCtx>

<currentRule.altLabelCtxs:{l | <currentRule.altLabelCtxs.(l)>}; separator="\n">
>>

dumpActions(recog, argFuncs, actionFuncs, sempredFuncs) ::= <<
<if(actionFuncs)>
<lexer.name>.prototype.action = function(localctx, ruleIndex, actionIndex) {

```

```

switch (ruleIndex) {
 <recog.actionFuncs.values:{f}
case <f.ruleIndex>:
 this.<f.name>_action(localctx, actionIndex);
 break;}; separator="\n">
default:
 throw "No registered action for:" + ruleIndex;
}
};

<actionFuncs.values; separator="\n">
<endif>
<if(sempredFuncs)>
<lexer.name>.prototype.sempred = function(localctx, ruleIndex, predIndex) {
 switch (ruleIndex) {
 <recog.sempredFuncs.values:{f} case <f.ruleIndex>:
 return this.<f.name>_sempred(localctx, predIndex);}; separator="\n">
 default:
 throw "No registered predicate for:" + ruleIndex;
 }
};

<sempredFuncs.values; separator="\n">
<endif>
>>

/* This generates a private method since the actionIndex is generated, making an
* overriding implementation impossible to maintain.
*/
RuleActionFunction(r, actions) ::= <<

<lexer.name>.prototype.<r.name>_action = function(localctx , actionIndex) {
 switch (actionIndex) {
 <actions:{index|
case <index>:
 <actions.(index)>
 break;}; separator="\n">
 default:
 throw "No registered action for:" + actionIndex;
 }
};
>>

/* This generates a private method since the predIndex is generated, making an
* overriding implementation impossible to maintain.
*/
RuleSempredFunction(r, actions) ::= <<

```

```

<if (r.factory.g.lexer)><lexer.name>.prototype.<r.name>_sempred =
function<else><r.name>_sempred<endif>(localctx, predIndex) {
 switch(predIndex) {
 <actions:{index| case <index>:
return <actions.(index)>;}; separator="\n">
 default:
 throw "No predicate with index:" + predIndex;
 }
};

>>

```

```

RuleFunction(currentRule,args,code,locals,ruleCtx,altLabelCtxs,namedActions,finallyAction,postamble,exceptions)
::= <<

```

```

<currentRule.name>(<currentRule.args:{a | <a.name>}; separator=", ">) {
 let localctx = new <currentRule.ctxType>(this, this._ctx, this.state<currentRule.args:{a | , <a.name>}>);
 this.enterRule(localctx, <currentRule.startState>, <parser.name>.RULE_<currentRule.name>);
 <namedActions.init>
 <locals; separator="\n">
 try {
 <code>
 <postamble; separator="\n">
 <namedActions.after>
 }<if(exceptions)>
 <exceptions; separator="\n">
 <else> catch (re) {
 if(re instanceof antlr4.error.RecognitionException) {
 localctx.exception = re;
 this._errHandler.reportError(this, re);
 this._errHandler.recover(this, re);
 } else {
 throw re;
 }
 }<endif> finally {
 <finallyAction>
 this.exitRule();
 }
 return localctx;
}

>>

```

```

LeftRecursiveRuleFunction(currentRule,args,code,locals,ruleCtx,altLabelCtxs,
namedAction,finallyAction,postamble) ::=
<<

```



```

<currentRule.name>(_p<if(currentRule.args)>, <args:{a | , <a>}><endif>) {
 if(_p===undefined) {
 _p = 0;
 }
 const _parentctx = this._ctx;
 const _parentState = this.state;
 let localctx = new <currentRule.ctxType>(this, this._ctx, _parentState<args:{a | , <a.name>}>);
 let _prevctx = localctx;
 const _startState = <currentRule.startState>;
 this.enterRecursionRule(localctx, <currentRule.startState>, <parser.name>.RULE_<currentRule.name>, _p);
 <namedActions.init>
 <locals; separator="\n">
 try {
 <code>
 <postamble; separator="\n">
 <namedActions.after>
 } catch(error) {
 if(error instanceof antlr4.error.RecognitionException) {
 localctx.exception = error;
 this._errHandler.reportError(this, error);
 this._errHandler.recover(this, error);
 } else {
 throw error;
 }
 } finally {
 <finallyAction>
 this.unrollRecursionContexts(_parentctx)
 }
 return localctx;
}

```

>>

```

CodeBlockForOuterMostAlt(currentOuterMostAltCodeBlock, locals, preamble, ops) ::= <<
<if(currentOuterMostAltCodeBlock.altLabel)>localctx = new <currentOuterMostAltCodeBlock.altLabel;
format="cap">Context(this, localctx);<endif>
this.enterOuterAlt(localctx, <currentOuterMostAltCodeBlock.alt.altNum>);
<CodeBlockForAlt(currentAltCodeBlock=currentOuterMostAltCodeBlock, ...)>
>>

```

```

CodeBlockForAlt(currentAltCodeBlock, locals, preamble, ops) ::= <<
<locals; separator="\n">
<preamble; separator="\n">
<ops; separator="\n">
>>

```

```

LL1AltBlock(choice, preamble, alts, error) ::= <<
this.state = <choice.stateNumber>;

```

```

this._errHandler.sync(this);
<if(choice.label)><labelref(choice.label)> = this._input.LT(1);<endif>
<preamble; separator="\n">
switch(this._input.LA(1)) {
<choice.altLook,alts:{look,alt| <cases(ttypes=look)>
 <alt>
 break;}; separator="\n">
default:
 <error>
}
>>

```

```

LL1OptionalBlock(choice, alts, error) ::= <<
this.state = <choice.stateNumber>;
this._errHandler.sync(this);
switch (this._input.LA(1)) {
<choice.altLook,alts:{look,alt| <cases(ttypes=look)>
 <alt>
 break;}; separator="\n">
default:
 break;
}
>>

```

```

LL1OptionalBlockSingleAlt(choice, expr, alts, preamble, error, followExpr) ::= <<
this.state = <choice.stateNumber>;
this._errHandler.sync(this);
<preamble; separator="\n">
if(<expr>) {
 <alts; separator="\n">
}
<!else if (!(<followExpr>) <error>!>
>>

```

```

LL1StarBlockSingleAlt(choice, loopExpr, alts, preamble, iteration) ::= <<
this.state = <choice.stateNumber>;
this._errHandler.sync(this);
<preamble; separator="\n">
while(<loopExpr>) {
 <alts; separator="\n">
 this.state = <choice.loopBackStateNumber>;
 this._errHandler.sync(this);
 <iteration>
}
>>

```

```

LL1PlusBlockSingleAlt(choice, loopExpr, alts, preamble, iteration) ::= <<
this.state = <choice.blockStartStateNumber>; <! alt block decision !>

```

```

this._errHandler.sync(this);
<preamble; separator="\n">
do {
 <alts; separator="\n">
 this.state = <choice.stateNumber>; <! loopback/exit decision !>
 this._errHandler.sync(this);
 <iteration>
} while(<loopExpr>);
>>

// LL(*) stuff

AltBlock(choice, preamble, alts, error) ::= <<
this.state = <choice.stateNumber>;
this._errHandler.sync(this);
<if(choice.label)><labelref(choice.label)> = _input.LT(1)<endif>
<preamble; separator="\n">
var la_ = this._interp.adaptivePredict(this._input,<choice.decision>,this._ctx);
switch(la_) {
<alts:{alt |
case <i>:
 <alt>
 break;
}; separator="\n">
}
>>

OptionalBlock(choice, alts, error) ::= <<
this.state = <choice.stateNumber>;
this._errHandler.sync(this);
var la_ = this._interp.adaptivePredict(this._input,<choice.decision>,this._ctx);
<alts:{alt |
if(la_===<i><if(!choice.ast.greedy)>+1<endif>) {
 <alt>
}; separator="\n} else ">
}
>>

StarBlock(choice, alts, sync, iteration) ::= <<
this.state = <choice.stateNumber>;
this._errHandler.sync(this);
var _alt = this._interp.adaptivePredict(this._input,<choice.decision>,this._ctx)
while(!_alt!=<choice.exitAlt> && _alt!=antlr4.atn.ATN.INVALID_ALT_NUMBER) {
 if(_alt===1<if(!choice.ast.greedy)>+1<endif>) {
 <iteration>
 <alts> <! should only be one !>
 }
 this.state = <choice.loopBackStateNumber>;

```

```

 this._errHandler.sync(this);
 _alt = this._interp.adaptivePredict(this._input,<choice.decision>,this._ctx);
}

>>

```

```

PlusBlock(choice, alts, error) ::= <<
this.state = <choice.blockStartStateNumber>; <! alt block decision !>
this._errHandler.sync(this);
var _alt = 1<if(!choice.ast.greedy)>+1<endif>;
do {
 switch (_alt) {
 <alts:{alt|
case <i><if(!choice.ast.greedy)>+1<endif>:
 <alt>
break;}; separator="\n">
 default:
 <error>
 }
 this.state = <choice.loopBackStateNumber>; <! loopback/exit decision !>
 this._errHandler.sync(this);
 _alt = this._interp.adaptivePredict(this._input,<choice.decision>, this._ctx);
} while (_alt!=<choice.exitAlt> && _alt!=antlr4.atn.ATN.INVALID_ALT_NUMBER);
>>

```

```

Sync(s) ::= "sync(<s.expecting.name>)"

```

```

ThrowNoViableAlt(t) ::= "throw new antlr4.error.NoViableAltException(this);"

```

```

TestSetInline(s) ::= <<
<s.bitsets:{bits | <if(rest(rest(bits.ttypes)))><bitsetBitfieldComparison(s, bits)><else><bitsetInlineComparison(s,
bits)><endif>}; separator=" || ">
>>

```

```

// Javascript language spec - shift operators are 32 bits long max
testShiftInRange(shiftAmount) ::= <<
((<shiftAmount>) & ~0x1f) == 0
>>

```

```

// produces smaller bytecode only when bits.ttypes contains more than two items
bitsetBitfieldComparison(s, bits) ::= <%
(<testShiftInRange({<offsetShiftVar(s.varName, bits.shift)>})> && ((1 \<< <offsetShiftVar(s.varName,
bits.shift)>) & (<bits.ttypes:{ttype | (1 \<< <offsetShiftType(ttype, bits.shift)>)); separator=" | ">)) != 0)
%>

```

```

isZero ::= [
"0":true,
default:false

```

]

```
offsetShiftVar(shiftAmount, offset) ::= <%
<if(!isZero.(offset))><shiftAmount> - <offset><else><shiftAmount><endif>
>%>
```

```
offsetShiftType(shiftAmount, offset) ::= <%
<if(!isZero.(offset))><parser.name>.<shiftAmount> - <offset><else><parser.name>.<shiftAmount><endif>
>%>
```

```
// produces more efficient bytecode when bits.ttypes contains at most two items
bitsetInlineComparison(s, bits) ::= <%
<bits.ttypes:{ ttype | <s.varName>====<parser.name>.<ttype>}; separator=" || ">
>%>
```

```
cases(ttypes) ::= <<
<ttypes:{ t | case <parser.name>.<t>:}; separator="\n">
>>
```

```
InvokeRule(r, argExprsChunks) ::= <<
this.state = <r.stateNumber>;
<if(r.labels)><r.labels:{ l | <labelref(l)> =
}><endif>this.<r.name><(<if(r.ast.options.p)><r.ast.options.p><(<if(argExprsChunks)><endif><endif><argExprsChu
nks>);
>>
```

```
MatchToken(m) ::= <<
this.state = <m.stateNumber>;
<if(m.labels)><m.labels:{ l | <labelref(l)> = }><endif>this.match(<parser.name>.<m.name>);
>>
```

```
MatchSet(m, expr, capture) ::= "<CommonSetStuff(m, expr, capture, false)>"
```

```
MatchNotSet(m, expr, capture) ::= "<CommonSetStuff(m, expr, capture, true)>"
```

```
CommonSetStuff(m, expr, capture, invert) ::= <<
this.state = <m.stateNumber>;
<if(m.labels)><m.labels:{ l | <labelref(l)> = }>this._input.LT(1);<endif>
<capture>
<if(invert)>if(<m.varName><=<0 || <expr>><else>if(!(<expr>))<endif> {
 <if(m.labels)><m.labels:{ l | <labelref(l)> = }><endif>this._errHandler.recoverInline(this);
}
else {
 this._errHandler.reportMatch(this);
 this.consume();
}
>>
```

```

Wildcard(w) ::= <<
this.state = <w.stateNumber>;
<if(w.labels)><w.labels:{1 | <labelref(l)> = }><endif>this.matchWildcard();
>>

// ACTION STUFF

Action(a, foo, chunks) ::= "<chunks>"

ArgAction(a, chunks) ::= "<chunks>"

SemPred(p, chunks, failChunks) ::= <<
this.state = <p.stateNumber>;
if (!(<chunks>)) {
 throw new antlr4.error.FailedPredicateException(this, <p.predicate><if(failChunks)>,
<failChunks><elseif(p.msg)>, <p.msg><endif>);
}
>>

ExceptionClause(e, catchArg, catchAction) ::= <<
catch (<catchArg>) {
 <catchAction>
}
>>

// lexer actions are not associated with model objects

LexerSkipCommand() ::= "this.skip()"
LexerMoreCommand() ::= "this.more()"
LexerPopModeCommand() ::= "this.popMode()"
LexerTypeCommand(arg, grammar) ::= "this._type = <arg>"
LexerChannelCommand(arg, grammar) ::= "this._channel = <arg>"
LexerModeCommand(arg, grammar) ::= "this._mode = <arg>"
LexerPushModeCommand(arg, grammar) ::= "this.pushMode(<arg>)"

ActionText(t) ::= "<t.text>"
ActionTemplate(t) ::= "<t.st>"
ArgRef(a) ::= "localctx.<a.name>"
LocalRef(a) ::= "localctx.<a.name>"
RetValRef(a) ::= "localctx.<a.name>"
QRetValRef(a) ::= "<ctx(a)>.<a.dict>.<a.name>"
/** How to translate $tokenLabel */
TokenRef(t) ::= "<ctx(t)>.<t.name>"
LabelRef(t) ::= "<ctx(t)>.<t.name>"
ListLabelRef(t) ::= "<ctx(t)>.<ListLabelName(t.name)>"
SetAttr(s,rhsChunks) ::= "<ctx(s)>.<s.name> = <rhsChunks>"

TokenLabelType() ::= "<file.TokenLabelType; null={Token}>"

```

```

InputSymbolType() ::= "<file.InputSymbolType; null={Token}>"

TokenPropertyRef_text(t) ::= "<ctx(t)>.<t.label>====null ? null : <ctx(t)>.<t.label>.text)"
TokenPropertyRef_type(t) ::= "<ctx(t)>.<t.label> === null ? 0 : <ctx(t)>.<t.label>.type)"
TokenPropertyRef_line(t) ::= "<ctx(t)>.<t.label> === null ? 0 : <ctx(t)>.<t.label>.line)"
TokenPropertyRef_pos(t) ::= "<ctx(t)>.<t.label> === null ? 0 : <ctx(t)>.<t.label>.column)"
TokenPropertyRef_channel(t) ::= "<ctx(t)>.<t.label> === null ? 0 : <ctx(t)>.<t.label>.channel)"
TokenPropertyRef_index(t) ::= "<ctx(t)>.<t.label> === null ? 0 : <ctx(t)>.<t.label>.tokenIndex)"
TokenPropertyRef_int(t) ::= "<ctx(t)>.<t.label> === null ? 0 : parseInt(<ctx(t)>.<t.label>.text))"

RulePropertyRef_start(r) ::= "<ctx(r)>.<r.label>====null ? null : <ctx(r)>.<r.label>.start)"
RulePropertyRef_stop(r) ::= "<ctx(r)>.<r.label>====null ? null : <ctx(r)>.<r.label>.stop)"
RulePropertyRef_text(r) ::= "<ctx(r)>.<r.label>====null ? null : this._input.getText(new
antlr4.Interval(<ctx(r)>.<r.label>.start,<ctx(r)>.<r.label>.stop)))"
RulePropertyRef_ctx(r) ::= "<ctx(r)>.<r.label>"
RulePropertyRef_parser(r) ::= "this"

ThisRulePropertyRef_start(r) ::= "localctx.start"
ThisRulePropertyRef_stop(r) ::= "localctx.stop"
ThisRulePropertyRef_text(r) ::= "this._input.getText(new antlr4.Interval(localctx.start, this._input.LT(-1)))"
ThisRulePropertyRef_ctx(r) ::= "localctx"
ThisRulePropertyRef_parser(r) ::= "this"

NonLocalAttrRef(s) ::= "this.getInvokingContext(<s.ruleIndex>).<s.name>"
SetNonLocalAttr(s, rhsChunks) ::= "this.getInvokingContext(<s.ruleIndex>).<s.name> = <rhsChunks>"

AddToLabelList(a) ::= "<ctx(a.label)>.<a.listName>.push(<labelref(a.label)>);"

TokenDecl(t) ::= "this.<t.name> = null; // <TokenLabelType()>"
TokenTypeDecl(t) ::= "var <t.name> = 0; // <TokenLabelType()> type"
TokenListDecl(t) ::= "this.<t.name> = []; // of <TokenLabelType()>s"
RuleContextDecl(r) ::= "this.<r.name> = null; // <r.ctxName>"
RuleContextListDecl(rdecl) ::= "this.<rdecl.name> = []; // of <rdecl.ctxName>s"

ContextTokenGetterDecl(t) ::= <<
<t.name>() {
 return this.getToken(<parser.name>.<t.name>, 0);
};
>>

// should never be called
ContextTokenListGetterDecl(t) ::= <<
<t.name>_list() {
 return this.getTokens(<parser.name>.<t.name>);
}
>>

ContextTokenListIndexedGetterDecl(t) ::= <<

```

```

<t.name> = function(i) {
 if(i===undefined) {
 i = null;
 }
 if(i===null) {
 return this.getTokens(<parser.name>.<t.name>);
 } else {
 return this.getToken(<parser.name>.<t.name>, i);
 }
};

```

>>

```

ContextRuleGetterDecl(r) ::= <<
<r.name>() {
 return this.getTypedRuleContext(<r.ctxName>,0);
};
>>

```

// should never be called

```

ContextRuleListGetterDecl(r) ::= <<
<r.name>_list() {
 return this.getTypedRuleContexts(<parser.name>.<r.ctxName>);
}
>>

```

```

ContextRuleListIndexedGetterDecl(r) ::= <<
<r.name> = function(i) {
 if(i===undefined) {
 i = null;
 }
 if(i===null) {
 return this.getTypedRuleContexts(<r.ctxName>);
 } else {
 return this.getTypedRuleContext(<r.ctxName>,i);
 }
};
>>

```

```

LexerRuleContext() ::= "RuleContext"

```

```

/** The rule context name is the rule followed by a suffix; e.g.,
 * r becomes rContext.
 */

```

```

RuleContextNameSuffix() ::= "Context"

```

```

ImplicitTokenLabel(tokenName) ::= "_<tokenName>"

```

```

ImplicitRuleLabel(ruleName) ::= "_<ruleName>"

```



```
ImplicitsetLabel(id) ::= "_tset<id>"
```

```
ListLabelName(label) ::= "<label>"
```

```
CaptureNextToken(d) ::= "<d.varName> = self._input.LT(1)"
```

```
CaptureNextTokenType(d) ::= "<d.varName> = this._input.LA(1);"
```

```
StructDecl(struct,ctorAttrs,attrs, getters,dispatchMethods,interfaces,extensionMembers) ::= <<
```

```
class <struct.name> extends <if(contextSuperClass)><contextSuperClass><else>antlr4.ParserRuleContext<endif> {
```

```
 constructor(parser, parent, invokingState<struct.ctorAttrs:{ a | , <a.name>}>) {
```

```
 if(parent===undefined) {
```

```
 parent = null;
```

```
 }
```

```
 if(invokingState===undefined || invokingState===null) {
```

```
 invokingState = -1;
```

```
 }
```

```
 super(parent, invokingState);
```

```
 this.parser = parser;
```

```
 this.ruleIndex = <parser.name>.RULE_<struct.derivedFromName>;
```

```
 <attrs:{ a | <a>}; separator="\n">
```

```
 <struct.ctorAttrs:{ a | this.<a.name> = <a.name> || null;}; separator="\n">
```

```
 }
```

```
<getters:{ g | <g>}; separator="\n\n">
```

```
<if(struct.provideCopyFrom)> <! don't need copy unless we have subclasses !>
```

```
copyFrom(ctx) {
```

```
 super.copyFrom(ctx);
```

```
 <struct.attrs:{ a | this.<a.name> = ctx.<a.name>}; separator="\n">
```

```
}
```

```
<endif>
```

```
<dispatchMethods; separator="\n">
```

```
<extensionMembers; separator="\n">
```

```
}
```

```
>>
```

```
AltLabelStructDecl(struct,attrs, getters,dispatchMethods) ::= <<
```

```
class <struct.name> extends <struct.parentRule; format="cap">Context {
```

```
 constructor(parser, ctx) {
```

```
 super(parser);
```

```
 <attrs:{ a | <a>}; separator="\n">
```

```
 super.copyFrom(ctx);
```

```
 }
```

```
<getters:{ g | <g>}; separator="\n\n">
```

```

<dispatchMethods; separator="\n">

}

<! Define fields of this parser to export this struct/context class !>
<parser.name>.<struct.name> = <struct.name>;

>>

ListenerDispatchMethod(method) ::= <<
<if(method.isEnter)>enter<else>exit<endif>Rule(listener) {
 if(listener instanceof <parser.grammarName>Listener) {
 listener.<if(method.isEnter)>enter<else>exit<endif><struct.derivedFromName; format="cap">(this);
 }
}
>>

VisitorDispatchMethod(method) ::= <<
accept(visitor) {
 if (visitor instanceof <parser.grammarName>Visitor) {
 return visitor.visit<struct.derivedFromName; format="cap">(this);
 } else {
 return visitor.visitChildren(this);
 }
}
>>

AttributeDecl(d) ::= "this.<d.name> = <if(d.initValue)><d.initValue><else>>null<endif>"

/** If we don't know location of label def x, use this template */
labelref(x) ::= "<if(!x.isLocal)>localctx.<endif><x.name>"

/** For any action chunk, what is correctly-typed context struct ptr? */
ctx(actionChunk) ::= "localctx"

// used for left-recursive rules
recRuleAltPredicate(ruleName,opPrec) ::= "this.precpred(this._ctx, <opPrec>)"
recRuleSetReturnAction(src,name) ::= "$<name>=$<src>.<name>"
recRuleSetStopToken() ::= "this._ctx.stop = this._input.LT(-1);"

recRuleAltStartAction(ruleName, ctxName, label) ::= <<
localctx = new <ctxName>Context(this, _parentctx, _parentState);
<if(label)>localctx.<label> = _prevctx;<endif>
this.pushNewRecursionContext(localctx, _startState, <parser.name>.RULE_<ruleName>);
>>

```

```

recRuleLabeledAltStartAction(ruleName, currentAltLabel, label, isListLabel) ::= <<
localctx = new <currentAltLabel; format="cap">Context(this, new <ruleName; format="cap">Context(this,
_parentctx, _parentState));
<if(label)>
<if(isListLabel)>
localctx.<label>.push(_prevctx);
<else>
localctx.<label> = _prevctx;
<endif>
<endif>
this.pushNewRecursionContext(localctx, _startState, <parser.name>.RULE_<ruleName>);
>>

```

```

recRuleReplaceContext(ctxName) ::= <<
localctx = new <ctxName>Context(this, localctx);
this._ctx = localctx;
_prevctx = localctx;
>>

```

```

recRuleSetPrevCtx() ::= <<
if(this._parseListeners!==null) {
 this.triggerExitRuleEvent();
}
_prevctx = localctx;
>>

```

```

LexerFile(lexerFile, lexer, namedActions) ::= <<
<fileHeader(lexerFile.grammarFileName, lexerFile.ANTLRVersion)>
import antlr4 from 'antlr4';

<namedActions.header>

<lexer>

>>

```

```

Lexer(lexer, atn, actionFuncs, sempredFuncs, superClass) ::= <<
<if(superClass)>
import <superClass> from './<superClass>.js';
<endif>

<atn>

const atn = new antlr4.atn.ATNDeserializer().deserialize(serializedATN);

const decisionsToDFA = atn.decisionToState.map((ds, index) => new antlr4.dfa.DFA(ds, index));

```

```

export default class <lexer.name> extends <if(superClass)><superClass><else>antlr4.Lexer<endif> {

 static grammarFileName = "<lexer.grammarFileName>";
 static channelNames = ["DEFAULT_TOKEN_CHANNEL", "HIDDEN"<if (lexer.channels)>,
<lexer.channels:{c| "<c>"}; separator=", ", wrap, anchor><endif>];
 static modeNames = [<lexer.modes:{m| "<m>"}; separator=", ", wrap, anchor>];
 static literalNames = [<lexer.literalNames:{t| <t>}; null="null", separator=", ", wrap, anchor>];
 static symbolicNames = [<lexer.symbolicNames:{t| <t>}; null="null", separator=", ", wrap, anchor>];
 static ruleNames = [<lexer.ruleNames:{r| "<r>"}; separator=", ", wrap, anchor>];

 constructor(input) {
 super(input)
 this._interp = new antlr4.atn.LexerATNSimulator(this, atn, decisionsToDFA, new
antlr4.PredictionContextCache());
 <namedActions.members>
 }

 get atn() {
 return atn;
 }
}

<lexer.name>.EOF = antlr4.Token.EOF;
<if(lexer.tokens)>
<lexer.tokens:{k| <lexer.name>.<k> = <lexer.tokens.(k)>}; separator="\n", wrap, anchor>
<endif>

<if(lexer.channels)>
<lexer.channels:{c| <lexer.name>.<c> = <lexer.channels.(c)>}; separator="\n">

<endif>
<if(rest(lexer.modes))>
<rest(lexer.modes):{m| <lexer.name>.<m> = <i>}; separator="\n">

<endif>

<dumpActions(lexer, "", actionFuncs, sempredFuncs)>

>>

SerializedATN(model) ::= <<
<! only one segment, can be inlined !>

const serializedATN = ["<model.serialized; wrap={", <\n> " }>"].join("");

>>

```

```
/** Using a type to init value map, try to init a type; if not in table
 * must be an object, default value is "null".
 */
initValue(typeName) ::= <<
<javacriptTypeInitMap.(typeName)>
>>
```

```
codeFileExtension() ::= ".js"
```

Found in path(s):

```
* /opt/cola/permits/1300428068_1649144266.79/0/antlr4-4-9-2-sources-
jar/org/antlr/v4/tool/templates/codegen/JavaScript/JavaScript.stg
No license file was found, but licenses were detected in source scan.
```

```
/*
 * [The "BSD license"]
 * Copyright (c) 2012-2016 Terence Parr
 * Copyright (c) 2012-2016 Sam Harwell
 * Copyright (c) 2015 Janyou
 * All rights reserved.
 *
 * Redistribution and use in source and binary forms, with or without
 * modification, are permitted provided that the following conditions
 * are met:
 *
 * 1. Redistributions of source code must retain the above copyright
 * notice, this list of conditions and the following disclaimer.
 * 2. Redistributions in binary form must reproduce the above copyright
 * notice, this list of conditions and the following disclaimer in the
 * documentation and/or other materials provided with the distribution.
 * 3. The name of the author may not be used to endorse or promote products
 * derived from this software without specific prior written permission.
 *
 * THIS SOFTWARE IS PROVIDED BY THE AUTHOR ``AS IS" AND ANY EXPRESS OR
 * IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES
 * OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED.
 * IN NO EVENT SHALL THE AUTHOR BE LIABLE FOR ANY DIRECT, INDIRECT,
 * INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
 * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE,
 * DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY
 * THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT
 * (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF
 * THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.
 */
```

```
SwiftTypeInitMap ::= [
 "Int": "0",
```

```

"Int64": "0",
"Float": "0.0",
"Double": "0.0",
"Bool": "false",
default: "nil" // anything other than a primitive type is an object
]
SwiftTypeMap ::= [
 "int": "Int",
 "float": "Float",
 "long": "Int64",
 "double": "Double",
 "bool": "Bool",
 "boolean": "Bool",
 default : key
]
// args must be <object-model-object>, <fields-resulting-in-STs>

accessLevelOpenOK(obj) ::= "<obj.accessLevel; null=\\"open\\">"
accessLevelNotOpen(obj) ::= "<obj.accessLevel; null=\\"public\\">"

ParserFile(file, parser, namedActions, contextSuperClass) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
<if(file.genPackage)>
<!package <file.genPackage>;!>
<endif>
<namedActions.header>
import Antlr4

<parser>
>>

ListenerFile(file, header, namedActions) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
<if(file.genPackage)>
<!package <file.genPackage>;!>
<endif>
<header>
import Antlr4

/**
 * This interface defines a complete listener for a parse tree produced by
 * { @link <file.parserName> }.
 */
<accessLevelNotOpen(file)> protocol <file.grammarName>Listener: ParseTreeListener {
 <file.listenerNames>: {Iname |
/**
<if(file.listenerLabelRuleNames.(Iname))>
 * Enter a parse tree produced by the { @code <Iname>}

```

```

* labeled alternative in { @link <file.parserName>#<file.listenerLabelRuleNames.(lname)>\}.
<else>
* Enter a parse tree produced by { @link <file.parserName>#<lname>\}.
<endif>
- Parameters:
 - ctx: the parse tree
*/
func enter<lname; format="cap">(_ ctx: <file.parserName>.<lname; format="cap">Context)
/**
<if(file.listenerLabelRuleNames.(lname))>
* Exit a parse tree produced by the { @code <lname>\}
* labeled alternative in { @link <file.parserName>#<file.listenerLabelRuleNames.(lname)>\}.
<else>
* Exit a parse tree produced by { @link <file.parserName>#<lname>\}.
<endif>
- Parameters:
 - ctx: the parse tree
*/
func exit<lname; format="cap">(_ ctx: <file.parserName>.<lname; format="cap">Context); separator="\n">
}
>>

```

```

BaseListenerFile(file, header, namedActions) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
<if(file.genPackage)>
<!package <file.genPackage>;!>
<endif>
<header>

```

```

import Antlr4

```

```

/**
* This class provides an empty implementation of { @link <file.grammarName>Listener },
* which can be extended to create a listener which only needs to handle a subset
* of the available methods.
*/
<accessLevelOpenOK(file)> class <file.grammarName>BaseListener: <file.grammarName>Listener {
 <accessLevelNotOpen(file)> init() { \}
 <file.listenerNames:{lname |

/**
* { @inheritDoc\}
*
* \<p>The default implementation does nothing.\</p>
*/
<accessLevelOpenOK(file)> func enter<lname; format="cap">(_ ctx: <file.parserName>.<lname;
format="cap">Context) { \}

```

```

/**
 * {@inheritDoc}
 *
 * \<p>The default implementation does nothing.\</p>
 */
<accessLevelOpenOK(file)> func exit<lname; format="cap">(_ ctx: <file.parserName>.<lname;
format="cap">Context) { \} }; separator="\n">

/**
 * {@inheritDoc}
 *
 * \<p>The default implementation does nothing.\</p>
 */
<accessLevelOpenOK(file)> func enterEveryRule(_ ctx: ParserRuleContext) throws { }
/**
 * {@inheritDoc}
 *
 * \<p>The default implementation does nothing.\</p>
 */
<accessLevelOpenOK(file)> func exitEveryRule(_ ctx: ParserRuleContext) throws { }
/**
 * {@inheritDoc}
 *
 * \<p>The default implementation does nothing.\</p>
 */
<accessLevelOpenOK(file)> func visitTerminal(_ node: TerminalNode) { }
/**
 * {@inheritDoc}
 *
 * \<p>The default implementation does nothing.\</p>
 */
<accessLevelOpenOK(file)> func visitErrorNode(_ node: ErrorNode) { }
}
>>

```

```

VisitorFile(file, header, namedActions) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
<if(file.genPackage)>
<!package <file.genPackage>;!>
<endif>
<header>
import Antlr4

```

```

/**
 * This interface defines a complete generic visitor for a parse tree produced
 * by { @link <file.parserName> }.
 *
 * @param \<T> The return type of the visit operation. Use { @link Void } for

```



```

* operations with no return type.
*/
<accessLevelOpenOK(file)> class <file.grammarName>Visitor<T>: ParseTreeVisitor<T> {
 <file.visitorNames:{Iname |
/**
<if(file.visitorLabelRuleNames.(Iname))>
* Visit a parse tree produced by the { @code <Iname>\}
* labeled alternative in { @link <file.parserName>#<file.visitorLabelRuleNames.(Iname)>\}.
<else>
* Visit a parse tree produced by { @link <file.parserName>#<Iname>\}.
<endif>
- Parameters:
- ctx: the parse tree
- returns: the visitor result
*/
<accessLevelOpenOK(file)> func visit<Iname; format="cap">(_ ctx: <file.parserName>.<Iname;
format="cap">Context) -> T {
 fatalError(#function + " must be overridden")
\}
}; separator="\n">
}
>>

BaseVisitorFile(file, header, namedActions) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
<if(file.genPackage)>
<!package <file.genPackage>;!>
<endif>
<header>
import Antlr4

/**
* This class provides an empty implementation of { @link <file.grammarName>Visitor},
* which can be extended to create a visitor which only needs to handle a subset
* of the available methods.
*
* @param \<T> The return type of the visit operation. Use { @link Void} for
* operations with no return type.
*/
<accessLevelOpenOK(file)> class <file.grammarName>BaseVisitor<T>: AbstractParseTreeVisitor<T> {
 <file.visitorNames:{Iname |
/**
* { @inheritDoc\}
*
* \<p>The default implementation returns the result of calling
* { @link #visitChildren\} on { @code ctx\}.\</p>
*/
<accessLevelOpenOK(file)> func visit<Iname; format="cap">(_ ctx: <file.parserName>.<Iname;

```

```

format="cap">Context) -> T? { return visitChildren(ctx) \}}; separator="\n">
}
>>

fileHeader(grammarFileName, ANTLRVersion) ::= <<
// Generated from <grammarFileName; format="java-escape"> by ANTLR <ANTLRVersion>
>>

Parser(parser, funcs, atn, sempredFuncs, superClass) ::= <<
<Parser_(ctor="parser_ctor", ...)>
>>

Parser_(parser, funcs, atn, sempredFuncs, ctor, superClass) ::= <<
<!--@SuppressWarnings({"all", "warnings", "unchecked", "unused", "cast"})!>
<accessLevelOpenOK(parser)> class <parser.name>: <superClass; null="Parser"> {

internal static var _decisionToDFA: [DFA] = {
 var decisionToDFA = [DFA]()
 let length = <parser.name>._ATN.getNumberOfDecisions()
 for i in 0..\<length {
 <!-- decisionToDFA[i] = DFA(<parser.name>._ATN.getDecisionState(i)!, i)!>
 decisionToDFA.append(DFA(<parser.name>._ATN.getDecisionState(i)!, i))
 }
 return decisionToDFA
}()

internal static let _sharedContextCache = PredictionContextCache()

<if(parser.tokens)>
<accessLevelNotOpen(parser)>
enum Tokens: Int {
 case EOF = -1, <parser.tokens:{k | <k> = <parser.tokens.(k)>}; separator=", ", wrap, anchor>
}
<endif>

<accessLevelNotOpen(parser)>
<if(parser.rules)>
static let <parser.rules:{r | RULE_<r.name> = <r.index>}; separator=", ", wrap, anchor>
<endif>

<accessLevelNotOpen(parser)>
static let ruleNames: [String] = [
 <parser.ruleNames:{r | "<r>"}; separator=", ", wrap, anchor>
]

<vocabulary(parser.literalNames, parser.symbolicNames,
 accessLevelNotOpen(parser))>

```

```

override <accessLevelOpenOK(parser)>
func getGrammarFileName() -> String { return "<parser.grammarFileName; format="java-escape">" }

override <accessLevelOpenOK(parser)>
func getRuleNames() -> [String] { return <parser.name>.ruleNames }

override <accessLevelOpenOK(parser)>
func getSerializedATN() -> String { return <parser.name>._serializedATN }

override <accessLevelOpenOK(parser)>
func getATN() -> ATN { return <parser.name>._ATN }

<namedActions.members>
<parser:(ctor)()>
<funcs; separator="\n">

<if(sempredFuncs)>
override <accessLevelOpenOK(parser)>
func sempred(_ localctx: RuleContext?, _ ruleIndex: Int, _ predIndex: Int)throws -> Bool {
switch (ruleIndex) {
<parser.sempredFuncs.values:{f}
case <f.ruleIndex>:
return try <f.name>_sempred(_ localctx?.castdown(<f.ctxType>.self), predIndex)); separator="\n">
default: return true
}
<!return true;!>
}
<sempredFuncs.values; separator="\n">
<endif>

<atn>

<accessLevelNotOpen(parser)>
static let _serializedATN = <parser.name>ATN().jsonString

<accessLevelNotOpen(parser)>
static let _ATN = ATNDeserializer().deserializeFromJson(_serializedATN)
}
>>

vocabulary(literalNames, symbolicNames, accessLevel) ::= <<
private static let _LITERAL_NAMES: [String?] = [
<literalNames:{t | <t>}; null="nil", separator=", ", wrap, anchor>
]
private static let _SYMBOLIC_NAMES: [String?] = [
<symbolicNames:{t | <t>}; null="nil", separator=", ", wrap, anchor>
]
<accessLevel>

```

```

static let VOCABULARY = Vocabulary(_LITERAL_NAMES, _SYMBOLIC_NAMES)
>>

dumpActions(recog, argFuncs, actionFuncs, sempredFuncs) ::= <<
<if(actionFuncs)>
override <accessLevelOpenOK(parser)>
func action(_ _localctx: RuleContext?, _ ruleIndex: Int, _ actionIndex: Int) throws {
 switch (ruleIndex) {
 <recog.actionFuncs.values: {f|
 case <f.ruleIndex>:
 <f.name>_action((_localctx as <f.ctxType>?), actionIndex)
 }; separator="\n">
 default: break
 }
}
<actionFuncs.values; separator="\n">
<endif>
<if(sempredFuncs)>
override <accessLevelOpenOK(parser)>
func sempred(_ _localctx: RuleContext?, _ ruleIndex: Int, _ predIndex: Int) throws -> Bool {
 switch (ruleIndex) {
 <recog.sempredFuncs.values: {f|
 case <f.ruleIndex>:
 return try <f.name>_sempred(_localctx?.castdown(<f.ctxType>.self), predIndex); separator="\n">
 default: return true
 }
 <!return true;!>
}
<sempredFuncs.values; separator="\n">
<endif>
>>

parser_ctor(p) ::= <<

override <accessLevelOpenOK(parser)>
func getVocabulary() -> Vocabulary {
 return <p.name>.VOCABULARY
}

override <accessLevelNotOpen(parser)>
init(_ input:TokenStream) throws {
 RuntimeMetaData.checkVersion("4.9.2", RuntimeMetaData.VERSION)
 try super.init(input)
 _interp = ParserATNSimulator(self,<p.name>._ATN,<p.name>._decisionToDFA,
<p.name>._sharedContextCache)
}

>>

```

```

/* This generates a private method since the actionIndex is generated, making an
* overriding implementation impossible to maintain.
*/

```

```

RuleActionFunction(r, actions) ::= <<
private func <r.name>_action(_ localctx: <r.ctxType>?, _ actionIndex: Int) {
 switch (actionIndex) {
 <actions:{index|
case <index>:
 <actions.(index)>
 }; separator="\n">
 default: break
 }
}
>>

```

```

/* This generates a private method since the predIndex is generated, making an
* overriding implementation impossible to maintain.
*/

```

```

RuleSempredFunction(r, actions) ::= <<
private func <r.name>_sempred(_ localctx: <r.ctxType>!, _ predIndex: Int) throws -> Bool {
 switch (predIndex) {
 <actions:{index|
 case <index>:return <actions.(index)>}; separator="\n">
 default: return true
 }
 <!return true;!>
}
>>

```

```

RuleFunction(currentRule,args,code,locals,ruleCtx,altLabelCtxs,namedActions,finallyAction,postamble,exceptions)
::= <<
<ruleCtx>
<altLabelCtxs:{l | <altLabelCtxs.(l)>}; separator="\n">
@discardableResult
<if(currentRule.modifiers)><currentRule.modifiers:{f | <f> }><else> <accessLevelOpenOK(parser)> func
<endif><currentRule.name><(if(first(args))>_ <endif><args; separator=", _">) throws -> <currentRule.ctxType> {
 var _localctx: <currentRule.ctxType> = <currentRule.ctxType>(_ctx, getState())<currentRule.args:{a | ,
<a.name>}>>)
 try enterRule(_localctx, <currentRule.startState>, <parser.name>.RULE_<currentRule.name>)
 <namedActions.init>
 <locals; separator="\n">
 defer {
 <finallyAction>
 try! exitRule()
 }
 do {
 <if(currentRule.hasLookaheadBlock)>

```

```

 var _alt: Int
<endif>
 <code>
 <postamble; separator="\n">
 <namedActions.after>
 }
<if(exceptions)>
<exceptions; separator="\n">
<else>
catch ANTLRException.recognition(let re) {
 _localctx.exception = re
 _errHandler.reportError(self, re)
 try _errHandler.recover(self, re)
 }
<endif>

return _localctx
}
>>

```

```

LeftRecursiveRuleFunction(currentRule, args, code, locals, ruleCtx, altLabelCtxs,
 namedActions, finallyAction, postamble) ::=
<<

```

```

<ruleCtx>
<altLabelCtxs: {l | <altLabelCtxs.(l)>}; separator="\n">

<if(currentRule.modifiers)><currentRule.modifiers: {f | <f> }><else> <accessLevelNotOpen(parser)> final <endif>
func <currentRule.name>(<if(first(args))>_ <endif><args; separator=", _">) throws -> <currentRule.ctxType> {
 return try <currentRule.name>(0<currentRule.args: {a | , <a.name>}>)
 }
@discardableResult
private func <currentRule.name>(_ _p<args: {a | , <a>}>: Int) throws -> <currentRule.ctxType> {
 let _parentctx: ParserRuleContext? = _ctx
 let _parentState: Int = getState()
 var _localctx: <currentRule.ctxType> = <currentRule.ctxType>(_ctx, _parentState<currentRule.args: {a | ,
 <a.name>}>)
 var _prevctx: <currentRule.ctxType> = _localctx
 let _startState: Int = <currentRule.startState>
 try enterRecursionRule(_localctx, <currentRule.startState>, <parser.name>.RULE_<currentRule.name>, _p)
 <namedActions.init>
 <locals; separator="\n">
 defer {
 <finallyAction>
 try! unrollRecursionContexts(_parentctx)
 }
 do {
 <if(currentRule.hasLookaheadBlock)>

```

```

 var _alt: Int
<endif>
<code>
<postamble; separator="\n">
<namedActions.after>
}
catch ANTLRException.recognition(let re) {
 _localctx.exception = re
 _errHandler.reportError(self, re)
 try _errHandler.recover(self, re)
}

return _localctx;
}
>>

```

```

CodeBlockForOuterMostAlt(currentOuterMostAltCodeBlock, locals, preamble, ops) ::= <<
<if(currentOuterMostAltCodeBlock.altLabel)>_localctx = <currentOuterMostAltCodeBlock.altLabel;
format="cap">Context(_localctx);<endif>
try enterOuterAlt(_localctx, <currentOuterMostAltCodeBlock.alt.altNum>)
<CodeBlockForAlt(currentAltCodeBlock=currentOuterMostAltCodeBlock, ...)>
>>

```

```

CodeBlockForAlt(currentAltCodeBlock, locals, preamble, ops) ::= <<
<!/{!>
<locals; separator="\n">
<preamble; separator="\n">
<ops; separator="\n">
<!/{}!>
>>

```

```

LL1AltBlock(choice, preamble, alts, error) ::= <<
setState(<choice.stateNumber>)
try _errHandler.sync(self)
<if(choice.label)><labelref(choice.label)> = try _input.LT(1)<endif>
<preamble; separator="\n">
switch (<parser.name>.Tokens(rawValue: try _input.LA(1))!) {
<choice.altLook,alts:{look,alt | <cases(ttypes=look)>
<alt>
break }; separator="\n">
default:
<error>
}
>>

```

```

LL1OptionalBlock(choice, alts, error) ::= <<
setState(<choice.stateNumber>)
try _errHandler.sync(self)

```

```

switch (<parser.name>.Tokens(rawValue: try _input.LA(1))!) {
<choice.altLook,alts:{look,alt| <cases(ttypes=look)>
<alt>
break}; separator="\n">
default:
break
}
>>

```

```

LL1OptionalBlockSingleAlt(choice, expr, alts, preamble, error, followExpr) ::= <<
setState(<choice.stateNumber>)
try _errHandler.sync(self)
<preamble; separator="\n">
if (<expr>) {
<alts; separator="\n">
}
<!else if (!(<followExpr>)) <error!>
>>

```

```

LL1StarBlockSingleAlt(choice, loopExpr, alts, preamble, iteration) ::= <<
setState(<choice.stateNumber>)
try _errHandler.sync(self)
<preamble; separator="\n">
while (<loopExpr>) {
<alts; separator="\n">
setState(<choice.loopBackStateNumber>)
try _errHandler.sync(self)
<iteration>
}
>>

```

```

LL1PlusBlockSingleAlt(choice, loopExpr, alts, preamble, iteration) ::= <<
setState(<choice.blockStartStateNumber>) <! alt block decision !>
try _errHandler.sync(self)
<preamble; separator="\n">
repeat {
<alts; separator="\n">
setState(<choice.stateNumber>); <! loopback/exit decision !>
try _errHandler.sync(self)
<iteration>
} while (<loopExpr>)
>>

```

```
// LL(*) stuff
```

```

AltBlock(choice, preamble, alts, error) ::= <<
setState(<choice.stateNumber>)
try _errHandler.sync(self)

```



```

<if(choice.label)><labelref(choice.label)> = try _input.LT(1)<endif>
<preamble; separator="\n">
switch(try getInterpreter().adaptivePredict(_input,<choice.decision>, _ctx)) {
<alts:{alt |
case <i>:
<alt>
break }; separator="\n">
default: break
}
>>

```

```

OptionalBlock(choice, alts, error) ::= <<
setState(<choice.stateNumber>)
try _errHandler.sync(self)
switch (try getInterpreter().adaptivePredict(_input,<choice.decision>,_ctx)) {
<alts:{alt |
case <i><if(!choice.ast.greedy)>+1<endif>:
<alt>
break }; separator="\n">
default: break
}
>>

```

```

StarBlock(choice, alts, sync, iteration) ::= <<
setState(<choice.stateNumber>)
try _errHandler.sync(self)
_alt = try getInterpreter().adaptivePredict(_input,<choice.decision>,_ctx)
while (_alt != <choice.exitAlt> && _alt != ATN.INVALID_ALT_NUMBER) {
if (_alt==1<if(!choice.ast.greedy)>+1<endif>) {
<iteration>
<alts> <! should only be one !>
}
setState(<choice.loopBackStateNumber>)
try _errHandler.sync(self)
_alt = try getInterpreter().adaptivePredict(_input,<choice.decision>,_ctx)
}
>>

```

```

PlusBlock(choice, alts, error) ::= <<
setState(<choice.blockStartStateNumber>); <! alt block decision !>
try _errHandler.sync(self)
_alt = 1<if(!choice.ast.greedy)>+1<endif>;
repeat {
switch (_alt) {
<alts:{alt|
case <i><if(!choice.ast.greedy)>+1<endif>:
<alt>
break }; separator="\n">

```

```

default:
 <error>
}
setState(<choice.loopBackStateNumber>); <! loopback/exit decision !>
try _errHandler.sync(self)
_alt = try getInterpreter().adaptivePredict(_input,<choice.decision>,_ctx)
} while (_alt != <choice.exitAlt> && _alt != ATN.INVALID_ALT_NUMBER)
>>

Sync(s) ::= "sync(<s.expecting.name>);"

ThrowNoViableAlt(t) ::= "throw ANTLRException.recognition(e: NoViableAltException(self))"

TestSetInline(s) ::= <<
<!<s.bitsets:{bits | <if(rest(rest(bits.ttypes)))><bitsetBitfieldComparison(s, bits)><else><bitsetInlineComparison(s,
bits)><endif>} ; separator=" || ">!>
//closure
{ () -> Bool in
 <if(rest(s.bitsets)>>var<else>let<endif> testSet: Bool = <first(s.bitsets):{bits |
<if(rest(rest(bits.ttypes)))><bitsetBitfieldComparison(s, bits)><else><bitsetInlineComparison(s, bits)><endif>}>
 <rest(s.bitsets):{bits | testSet = testSet || <if(rest(rest(bits.ttypes)))><bitsetBitfieldComparison(s,
bits)><else><bitsetInlineComparison(s, bits)><endif>} ; separator="\n">
 return testSet
}()
>>

// Java language spec 15.19 - shift operators mask operands rather than overflow to 0... need range test
testShiftInRange(shiftAmount) ::= <<
((<shiftAmount>) & ~0x3f) == 0
>>

// produces smaller bytecode only when bits.ttypes contains more than two items
bitsetBitfieldComparison(s, bits) ::= <<
<!(<testShiftInRange({<offsetShift(s.varName, bits.shift)>})> && ((1 \<< <offsetShift(s.varName, bits.shift)>) &
(<bits.ttypes:{ttype | (1 \<< <offsetShift(ttype, bits.shift)>)} ; separator=" | ">)) != 0)!>
{ () -> Bool in
 <! let test: Bool = (<testShiftInRange({<offsetShift(s.varName, bits.shift)>})>)!>
 <!var temp: Int64 = Int64(<offsetShift(s.varName, bits.shift)>)!>
 <!temp = (temp \< 0) ? (64 + (temp % 64)) : (temp % 64)!>
 <!let test1: Int64 = (Int64(1) \<< temp)!>
 <!var test2: Int64 = (<first(bits.ttypes):{ttype | Utils.bitLeftShift(<offsetShift(parserName(ttype), bits.shift)>)}>)!>
 <!<rest(bits.ttypes):{ttype | test2 = test2 | Utils.bitLeftShift(<offsetShift(parserName(ttype), bits.shift)>)}>};
separator="\n">!>
 let testArray: [Int] = [<s.varName>, <bits.ttypes:{ttype |<parserName(ttype)>} ; separator=", ">]
 <!var test2: Int64 = Utils.testBitLeftShiftArray(testArray)!>
 return Utils.testBitLeftShiftArray(testArray, <bits.shift>)
}()
>>

```

```

isZero ::= [
"0": true,
default: false
]
parserName(ttype) ::= <%
<parser.name>.Tokens.<ttype>.rawValue
%>
offsetShift(shiftAmount, offset) ::= <%
<if(!isZero.(offset))><shiftAmount> - <offset><else><shiftAmount><endif>
%>

// produces more efficient bytecode when bits.ttypes contains at most two items
bitsetInlineComparison(s, bits) ::= <%
<bits.ttypes:{ttype | <s.varName> == <parser.name>.Tokens.<ttype>.rawValue}; separator=" || ">
%>

cases(ttypes) ::= <<
<trunc(ttypes): {t | case .<t>:fallthrough} ; separator="\n">
<last(ttypes): {t | case .<t>:} ; separator="\n">
>>

InvokeRule(r, argExprsChunks) ::= <<
setState(<r.stateNumber>)
<if(r.labels)>
try {
let assignmentValue = try
<r.name><(if(r.ast.options.p))<r.ast.options.p><if(argExprsChunks)><endif><endif><argExprsChunks>
<r.labels:{l | <labelref(l)> = assignmentValue} ; separator="\n">
}()
<else>try
<r.name><(if(r.ast.options.p))<r.ast.options.p><if(argExprsChunks)><endif><endif><argExprsChunks><endif>
>>

MatchToken(m) ::= <<
setState(<m.stateNumber>)
<if(m.labels)>
try {
let assignmentValue = try match(<parser.name>.Tokens.<m.name>.rawValue)
<m.labels:{l | <labelref(l)> = assignmentValue} ; separator="\n">
}()
<else>try match(<parser.name>.Tokens.<m.name>.rawValue)<endif>
>>

MatchSet(m, expr, capture) ::= "<CommonSetStuff(m, expr, capture, false)>"

MatchNotSet(m, expr, capture) ::= "<CommonSetStuff(m, expr, capture, true)>"

```

```

CommonSetStuff(m, expr, capture, invert) ::= <<
setState(<m.stateNumber>)
<if(m.labels)><m.labels:{1 | <labelref(l)> = }>try _input.LT(1)<endif>
<capture>
if (<if(invert)><m.varName> \<= 0 || <else>!<endif>(<expr>)) {
 <if(m.labels)><m.labels:{1 | <labelref(l)> = }><endif>try _errHandler.recoverInline(self)<if(m.labels)> as
 Token<endif>
}
else {
 _errHandler.reportMatch(self)
 try consume()
}
>>

```

```

Wildcard(w) ::= <<
setState(<w.stateNumber>)
<if(w.labels)><w.labels:{1 | <labelref(l)> = }><endif>try matchWildcard();
>>

```

```
// ACTION STUFF
```

```
Action(a, foo, chunks) ::= "<chunks>"
```

```
ArgAction(a, chunks) ::= "<chunks>"
```

```

SemPred(p, chunks, failChunks) ::= <<
setState(<p.stateNumber>)
if (!(<chunks>)) {
 throw ANTLRException.recognition(e:FailedPredicateException(self, <p.predicate><if(failChunks)>,
 <failChunks><elseif(p.msg)>, <p.msg><endif>))
}
>>

```

```

ExceptionClause(e, catchArg, catchAction) ::= <<
catch (<catchArg>) {
 <catchAction>
}
>>

```

```
// lexer actions are not associated with model objects
```

```
LexerSkipCommand() ::= "skip()"
```

```
LexerMoreCommand() ::= "more()"
```

```
LexerPopModeCommand() ::= "popMode()"
```

```
LexerTypeCommand(arg) ::= "_type = <arg>"
```

```
LexerChannelCommand(arg) ::= "_channel = <arg>"
```

```
LexerModeCommand(arg) ::= "_mode = <arg>"
```

```

LexerPushModeCommand(arg) ::= "pushMode(<arg>)"

ActionText(t) ::= "<t.text>"
ActionTemplate(t) ::= "<t.st>"
ArgRef(a) ::= "_localctx.<a.name>"
LocalRef(a) ::= "_localctx.<a.name>"
RetValRef(a) ::= "_localctx.<a.name>"
QRetValRef(a) ::= "<ctx(a)>.<a.dict>.<a.name>"
/** How to translate $tokenLabel */
TokenRef(t) ::= "<ctx(t)>.<t.name>"
LabelRef(t) ::= "<ctx(t)>.<t.name>"
ListLabelRef(t) ::= "<ctx(t)>.<ListLabelName(t.name)>"
SetAttr(s,rhsChunks) ::= "<ctx(s)>.<s.name> = <rhsChunks>"

TokenLabelType() ::= "<file.TokenLabelType; null={Token}>"
InputSymbolType() ::= "<file.InputSymbolType; null={Token}>"

TokenPropertyRef_text(t) ::= "<ctx(t)>.<t.label> != nil ? <ctx(t)>.<t.label>!.getText()! : \"\""
TokenPropertyRef_type(t) ::= "<ctx(t)>.<t.label> != nil ? <ctx(t)>.<t.label>!.getType() : 0)"
TokenPropertyRef_line(t) ::= "<ctx(t)>.<t.label> != nil ? <ctx(t)>.<t.label>!.getLine() : 0)"
TokenPropertyRef_pos(t) ::= "<ctx(t)>.<t.label> != nil ? <ctx(t)>.<t.label>!.getCharPositionInLine() : 0)"
TokenPropertyRef_channel(t) ::= "<ctx(t)>.<t.label> != nil ? <ctx(t)>.<t.label>!.getChannel() : 0)"
TokenPropertyRef_index(t) ::= "<ctx(t)>.<t.label> != nil ? <ctx(t)>.<t.label>!.getTokenIndex() : 0)"
TokenPropertyRef_int(t) ::= "<ctx(t)>.<t.label> != nil ? Int(<ctx(t)>.<t.label>!.getText()) : 0)"

RulePropertyRef_start(r) ::= "<ctx(r)>.<r.label> != nil ? (<ctx(r)>.<r.label>!.start?.description ?? \"\") : \"\""
RulePropertyRef_stop(r) ::= "<ctx(r)>.<r.label> != nil ? (<ctx(r)>.<r.label>!.stop?.description ?? \"\") : \"\""
RulePropertyRef_text(r) ::= "<ctx(r)>.<r.label> != nil ? try
_input.getText(<ctx(r)>.<r.label>!.start,<ctx(r)>.<r.label>!.stop) : \"\""
RulePropertyRef_ctx(r) ::= "<ctx(r)>.<r.label>"
RulePropertyRef_parser(r) ::= "self"

ThisRulePropertyRef_start(r) ::= "_localctx.start"
ThisRulePropertyRef_stop(r) ::= "_localctx.stop"
ThisRulePropertyRef_text(r) ::= "(try _input.getText(_localctx.start, try _input.LT(-1)))"
ThisRulePropertyRef_ctx(r) ::= "_localctx"
ThisRulePropertyRef_parser(r) ::= "self"

NonLocalAttrRef(s) ::= "((<s.ruleName; format=\"cap\">Context)getInvokingContext(<s.ruleIndex>)).<s.name>"
SetNonLocalAttr(s, rhsChunks) ::=
"((<s.ruleName; format=\"cap\">Context)getInvokingContext(<s.ruleIndex>)).<s.name> = <rhsChunks>"

AddToLabelList(a) ::= "<ctx(a.label)>.<a.listName>.append(<labelref(a.label)>)"

TokenDecl(t) ::= "<t.name>: <SwiftTypeMap.(TokenLabelType)>!"
TokenTypeDecl(t) ::= "var <t.name>: Int = 0"
TokenListDecl(t) ::= "<t.name>: [Token] = [Token]()"
RuleContextDecl(r) ::= "<r.name>: <r.ctxName>!"

```

```
RuleContextListDecl(rdecl) ::= "<rdecl.name>: [<rdecl.ctxName>] = [<rdecl.ctxName>]()"
```

```
ContextTokenGetterDecl(t) ::= <<
<accessLevelOpenOK(parser)>
func <t.name>() -> TerminalNode? {
 return getToken(<parser.name>.Tokens.<t.name>.rawValue, 0)
}
>>
```

```
ContextTokenListGetterDecl(t) ::= <<
<accessLevelOpenOK(parser)>
func <t.name>() -> [TerminalNode] {
 return getTokens(<parser.name>.Tokens.<t.name>.rawValue)
}
>>
```

```
ContextTokenListIndexedGetterDecl(t) ::= <<
<accessLevelOpenOK(parser)>
func <t.name>(_ i: Int) -> TerminalNode? {
 return getToken(<parser.name>.Tokens.<t.name>.rawValue, i)
}
>>
```

```
ContextRuleGetterDecl(r) ::= <<
<accessLevelOpenOK(parser)>
func <r.name>() -> <r.ctxName>? {
 return getRuleContext(<r.ctxName>.self, 0)
}
>>
```

```
ContextRuleListGetterDecl(r) ::= <<
<accessLevelOpenOK(parser)>
func <r.name>() -> [<r.ctxName>] {
 return getRuleContexts(<r.ctxName>.self)
}
>>
```

```
ContextRuleListIndexedGetterDecl(r) ::= <<
<accessLevelOpenOK(parser)>
func <r.name>(_ i: Int) -> <r.ctxName>? {
 return getRuleContext(<r.ctxName>.self, i)
}
>>
```

```
LexerRuleContext() ::= "RuleContext"
```

```
/** The rule context name is the rule followed by a suffix; e.g.,
* r becomes rContext.
*/
```

```
RuleContextNameSuffix() ::= "Context"
```

```
ImplicitTokenLabel(tokenName) ::= "_<tokenName>"
```

```
ImplicitRuleLabel(ruleName) ::= "_<ruleName>"
```

```
ImplicitsetLabel(id) ::= "_tset<id>"
```

```
ListLabelName(label) ::= "<label>"
```

```
CaptureNextToken(d) ::= "<d.varName> = try _input.LT(1)"
```

```
CaptureNextTokenType(d) ::= "<d.varName> = try _input.LA(1)"
```

```
StructDecl(struct,ctorAttrs,attrs, getters,dispatchMethods,interfaces,extensionMembers,
 superClass={ParserRuleContext}) ::= <<
```

```
<accessLevelNotOpen(parser)> class <struct.name>:
```

```
<if(contextSuperClass)><contextSuperClass><else>ParserRuleContext<endif><if(interfaces)>, <interfaces>;
```

```
separator=", "><endif> {
```

```
<attrs:{a | <accessLevelOpenOK(parser)> var <a>}; separator="\n">
```

```
<getters:{g | <g>}; separator="\n">
```

```
<! <if(ctorAttrs)> <accessLevelNotOpen(parser)> init(_ parent: ParserRuleContext,_ invokingState: Int) {
```

```
super.init(parent, invokingState) }<endif> !>
```

```
<if(ctorAttrs)>
```

```
<accessLevelNotOpen(parser)> convenience init(_ parent: ParserRuleContext?, _ invokingState: Int<ctorAttrs:{a | ,
_ <a>}>) {
```

```
self.init(parent, invokingState)
```

```
<struct.ctorAttrs:{a | self.<a.name> = <a.name>}; separator="\n">
```

```
}
```

```
<endif>
```

```
override <accessLevelOpenOK(parser)>
```

```
func getRuleIndex() -> Int {
```

```
return <parser.name>.RULE_<struct.derivedFromName>
```

```
}
```

```
<if(struct.provideCopyFrom && struct.attrs)> <! don't need copy unless we have subclasses !>
```

```
<accessLevelOpenOK(parser)>
```

```
override func copyFrom(_ ctx_: ParserRuleContext) {
```

```
super.copyFrom(ctx_)
```

```
let ctx = ctx_ as! <struct.name>
```

```
<struct.attrs:{a | self.<a.name> = ctx.<a.name>}; separator="\n">
```

```
}
```

```
<endif>
```

```
<dispatchMethods; separator="\n">
```

```
<extensionMembers; separator="\n">
```

```
}
```

```
>>
```

```
AltLabelStructDecl(struct,attrs, getters,dispatchMethods) ::= <<
```

```
<accessLevelNotOpen(parser)> class <struct.name>: <currentRule.name; format="cap">Context {
```

```
<attrs:{a | <accessLevelNotOpen(parser)> var <a>}; separator="\n">
```

```
<getters:{g | <g>}; separator="\n">
```

```
<accessLevelNotOpen(parser)>
```

```
init(_ ctx: <currentRule.name; format="cap">Context) {
```

```

super.init()
copyFrom(ctx)
}
<dispatchMethods; separator="\n">
}
>>

```

```

ListenerDispatchMethod(method) ::= <<
override <accessLevelOpenOK(parser)>
func <if(method.isEnter)>enter<else>exit<endif>Rule(_ listener: ParseTreeListener) {
if let listener = listener as? <parser.grammarName>Listener {
listener.<if(method.isEnter)>enter<else>exit<endif><<struct.derivedFromName; format="cap">(self)
}
}
>>

```

```

VisitorDispatchMethod(method) ::= <<
override <accessLevelOpenOK(parser)>
func accept<T>(<T>(_ visitor: ParseTreeVisitor<T>) -> T? {
if let visitor = visitor as? <parser.grammarName>Visitor {
return visitor.visit<<struct.derivedFromName; format="cap">(self)
}
else if let visitor = visitor as? <parser.grammarName>BaseVisitor {
return visitor.visit<<struct.derivedFromName; format="cap">(self)
}
else {
return visitor.visitChildren(self)
}
}
>>

```

```

AttributeDecl(d) ::= "<d.name>: <SwiftTypeMap.(d.type)><if(d.initValue)> = <d.initValue><else>!<endif>"

```

```

/** If we don't know location of label def x, use this template (_localctx as! <x.ctx.name> */
labelref(x) ::= "<if(!x.isLocal)>_localctx.castdown(<x.ctx.name>.self).<endif><x.name>"

```

```

/** For any action chunk, what is correctly-typed context struct ptr? */
ctx(actionChunk) ::= "_localctx.castdown(<actionChunk.ctx.name>.self)"

```

```

// used for left-recursive rules
recRuleAltPredicate(ruleName,opPrec) ::= "precpred(_ctx, <opPrec>)"
recRuleSetReturnAction(src,name) ::= "$<name>=<src>.<name>"
recRuleSetStopToken() ::= "_ctx!.stop = try _input.LT(-1)"

```

```

recRuleAltStartAction(ruleName, ctxName, label, isListLabel) ::= <<
_localctx = <ctxName>Context(_parentctx, _parentState);
<if(label)>
<if(isListLabel)>

```



```

_localctx.<label>.append(_prevctx)
<else>
_localctx.<label> = _prevctx
<endif>
<endif>
<if(label)>_localctx.<label> = _prevctx;<endif>
try pushNewRecursionContext(_localctx, _startState, <parser.name>.RULE_<ruleName>)
>>

recRuleLabeledAltStartAction(ruleName, currentAltLabel, label, isListLabel) ::= <<
_localctx = <currentAltLabel; format="cap">Context(<ruleName; format="cap">Context(_parentctx,
_parentState))
<if(label)>
<if(isListLabel)>
(_localctx as! <currentAltLabel; format="cap">Context).<label>.append(_prevctx)
<else>
(_localctx as! <currentAltLabel; format="cap">Context).<label> = _prevctx
<endif>
<endif>
try pushNewRecursionContext(_localctx, _startState, <parser.name>.RULE_<ruleName>)
>>

recRuleReplaceContext(ctxName) ::= <<
_localctx = <ctxName>Context(_localctx)
_ctx = _localctx
_prevctx = _localctx
>>

recRuleSetPrevCtx() ::= <<
if _parseListeners != nil {
try triggerExitRuleEvent()
}
_prevctx = _localctx
>>

LexerFile(lexerFile, lexer, namedActions) ::= <<
<fileHeader(lexerFile.grammarFileName, lexerFile.ANTLRVersion)>
<if(lexerFile.genPackage)>
<!package <lexerFile.genPackage>;!>
<endif>
<namedActions.header>
import Antlr4

<lexer>
>>

Lexer(lexer, atn, actionFuncs, sempredFuncs, superClass) ::= <<
<accessLevelOpenOK(lexer)> class <lexer.name>: <superClass; null="Lexer"> {

```

```

internal static var _decisionToDFA: [DFA] = {
 var decisionToDFA = [DFA]()
 let length = <lexer.name>._ATN.getNumberOfDecisions()
 for i in 0..<length {
 <! decisionToDFA[i] = DFA(<lexer.name>._ATN.getDecisionState(i)!, i);!>
 decisionToDFA.append(DFA(<lexer.name>._ATN.getDecisionState(i)!, i))
 }
 return decisionToDFA
}()

internal static let _sharedContextCache = PredictionContextCache()

<accessLevelNotOpen(lexer)>
<if(lexer.tokens)>
static let <lexer.tokens:{k | <k>=<lexer.tokens.(k)>}; separator=", ", wrap, anchor>
<endif>

<if(lexer.channels)>
<accessLevelNotOpen(lexer)>
static let <lexer.channels:{k | <k>=<lexer.channels.(k)>}; separator=", ", wrap, anchor>
<endif>
<if(rest(lexer.modes))>
<accessLevelNotOpen(lexer)>
static let <rest(lexer.modes):{m | <m>=<i>}; separator=", ", wrap, anchor>
<endif>
<accessLevelNotOpen(lexer)>
static let channelNames: [String] = [
 "DEFAULT_TOKEN_CHANNEL", "HIDDEN"<if (lexer.channels)>, <lexer.channels:{c | "<c>"}; separator=", ",
wrap, anchor><endif>
]

<accessLevelNotOpen(lexer)>
static let modeNames: [String] = [
 <lexer.modes:{m | "<m>"}; separator=", ", wrap, anchor>
]

<accessLevelNotOpen(lexer)>
static let ruleNames: [String] = [
 <lexer.ruleNames:{r | "<r>"}; separator=", ", wrap, anchor>
]

<vocabulary(lexer.literalNames, lexer.symbolicNames,
 accessLevelNotOpen(lexer))>

<namedActions.members>

override <accessLevelOpenOK(lexer)>

```

```

func getVocabulary() -> Vocabulary {
 return <lexer.name>.VOCABULARY
}

<accessLevelNotOpen(lexer)>
required init(_ input: CharStream) {
 RuntimeMetaData.checkVersion("<lexerFile.ANTLRVersion>", RuntimeMetaData.VERSION)
 super.init(input)
 _interp = LexerATNSimulator(self, <lexer.name>._ATN, <lexer.name>._decisionToDFA,
<lexer.name>._sharedContextCache)
}

override <accessLevelOpenOK(lexer)>
func getGrammarFileName() -> String { return "<lexer.grammarFileName>" }

override <accessLevelOpenOK(lexer)>
func getRuleNames() -> [String] { return <lexer.name>.ruleNames }

override <accessLevelOpenOK(lexer)>
func getSerializedATN() -> String { return <lexer.name>._serializedATN }

override <accessLevelOpenOK(lexer)>
func getChannelNames() -> [String] { return <lexer.name>.channelNames }

override <accessLevelOpenOK(lexer)>
func getModeNames() -> [String] { return <lexer.name>.modeNames }

override <accessLevelOpenOK(lexer)>
func getATN() -> ATN { return <lexer.name>._ATN }

<dumpActions(lexer, "", actionFuncs, sempredFuncs)>
<atn>

<accessLevelNotOpen(lexer)>
static let _serializedATN: String = <lexer.name>ATN().jsonString

<accessLevelNotOpen(lexer)>
static let _ATN: ATN = ATNDeserializer().deserializeFromJson(_serializedATN)
}
>>

/** Don't need to define anything. The tool generates a XParserATN.swift file (and same for lexer)
 * which is referenced from static field _serializedATN. This json string is passed to
 * deserializeFromJson(). Note this is not the "serialization as array of ints" that other targets
 * do. It is more or less the output of ATNPrinter which gets read back in.
 */
SerializedATN(model) ::= <<
>>

```

```
/** Using a type to init value map, try to init a type; if not in table
 * must be an object, default value is "null".
 */
initValue(typeName) ::= <<
<SwiftTypeInitMap.(typeName)>
>>
```

```
codeFileExtension() ::= ".swift"
```

Found in path(s):

```
* /opt/cola/permits/1300428068_1649144266.79/0/antlr4-4-9-2-sources-
jar/org/antlr/v4/tool/templates/codegen/Swift/Swift.stg
```

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```
/*
```

```
[The "BSD licence"]
```

```
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```

```
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```
*/
```

```
/*
```

```
This file contains the actual layout of the messages emitted by ANTLR.
```

```
The text itself is coming out of the languages/*stg files, according to the chosen locale.
```

```
This file contains the default format ANTLR uses.
```

```
*/
```

location(file, line, column) ::= "<file>(<line>,<column>)"

message(id, text) ::= "error <id> : <text>"

report(location, message, type) ::= "<location> : <type> <message.id> : <message.text>"

wantsSingleLineMessage() ::= "true"

Found in path(s):

\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/tool/templates/messages/formats/vs2005.stg

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\*/

Found in path(s):

\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/parse/ANTLRParser.java

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*/
```

Found in path(s):

```
*/opt/cola/permits/1300428068_1649144266.79/0/antlr4-4-9-2-sources-
jar/org/antlr/v4/tool/templates/codegen/Cpp/Files.stg
```

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```
/*
```

```
* Copyright (c) 2012-2017 The ANTLR Project. All rights reserved.
```

```
* Use of this file is governed by the BSD 3-clause license that
```

```
* can be found in the LICENSE.txt file in the project root.
```

```
*/
```

```
/**
```

```
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```

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Found in path(s):

\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/gui/GraphicsSupport.java

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\*/

```
phpTypeInitMap ::= [
 "int": "0",
 "long": "0",
 "float": "0.0",
 "double": "0.0",
 "boolean": "false",
 default: "null"
]
```

// args must be <object-model-object>, <fields-resulting-in-STs>

```
ParserFile(file, parser, namedActions, contextSuperClass) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
<parser>
>>
```

```
ListenerFile(file, header, namedActions) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
<if(file.genPackage)>
namespace <file.genPackage>;
<endif>
<header>
use Antlr\Antlr4\Runtime\Tree\ParseTreeListener;
```

```
/**
```

```
* This interface defines a complete listener for a parse tree produced by
```

```
* { @see <file.parserName> }.
```

```
*/
```

```
interface <file.grammarName>Listener extends ParseTreeListener {
```

```
 <file.listenerNames> { Iname |
```

```
 /**
```

```
 <if(file.listenerLabelRuleNames.(Iname))>
```

```
 * Enter a parse tree produced by the `<Iname>`
```

```
 * labeled alternative in { @see <file.parserName>::<file.listenerLabelRuleNames.(Iname)>() }.
```

```
 <else>
```

```
 * Enter a parse tree produced by { @see <file.parserName>::<Iname>() }.
```

```
 <endif>
```

```
 * @param $context The parse tree.
```

```
 */
```

```
 public function enter<Iname; format="cap">(Context\<Iname; format="cap">Context $context) : void;
```

```
 /**
```

```
 <if(file.listenerLabelRuleNames.(Iname))>
```

```
 * Exit a parse tree produced by the `<Iname>` labeled alternative
```

```
 * in { @see <file.parserName>::<file.listenerLabelRuleNames.(Iname)>() }.
```

```
 <else>
```



```

* Exit a parse tree produced by { @see <file.parserName>::<lname>()}.
<endif>
* @param $context The parse tree.
*/
public function exit<lname; format="cap">(Context\\<lname; format="cap">Context $context) : void;
separator="\n">
}
>>

BaseListenerFile(file, header, namedActions) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
<if(file.genPackage)>
namespace <file.genPackage>;
<endif>
<header>

use Antlr\\Antlr4\\Runtime\\ParserRuleContext;
use Antlr\\Antlr4\\Runtime\\Tree\\ErrorNode;
use Antlr\\Antlr4\\Runtime\\Tree\\TerminalNode;

/**
 * This class provides an empty implementation of { @see <file.grammarName>Listener },
 * which can be extended to create a listener which only needs to handle a subset
 * of the available methods.
 */
class <file.grammarName>BaseListener implements <file.grammarName>Listener
{
 <file.listenerNames:{lname |
/**
 * { @inheritdoc}
 *
 * The default implementation does nothing.
 */
public function enter<lname; format="cap">(Context\\<lname; format="cap">Context $context) : void {}

/**
 * { @inheritdoc}
 *
 * The default implementation does nothing.
 */
public function exit<lname; format="cap">(Context\\<lname; format="cap">Context $context) : void {}};
separator="\n">

/**
 * { @inheritdoc}
 *
 * The default implementation does nothing.
 */

```

```

public function enterEveryRule(ParserRuleContext $context) : void {}

/**
 * {@inheritdoc}
 *
 * The default implementation does nothing.
 */
public function exitEveryRule(ParserRuleContext $context) : void {}

/**
 * {@inheritdoc}
 *
 * The default implementation does nothing.
 */
public function visitTerminal(TerminalNode $node) : void {}

/**
 * {@inheritdoc}
 *
 * The default implementation does nothing.
 */
public function visitErrorNode(ErrorNode $node) : void {}
}
>>

```

```

VisitorFile(file, header, namedActions) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
<if(file.genPackage)>
namespace <file.genPackage>;
<endif>

<header>
use Antlr\Antlr4\Runtime\Tree\ParseTreeVisitor;

/**
 * This interface defines a complete generic visitor for a parse tree produced by {@see <file.parserName>}.
 */
interface <file.grammarName>Visitor extends ParseTreeVisitor
{
 <file.visitorNames:{ Iname |
/**
<if(file.visitorLabelRuleNames.(Iname))>
 * Visit a parse tree produced by the `<Iname>` labeled alternative
 * in {@see <file.parserName>::<file.visitorLabelRuleNames.(Iname)>()}.
<else>
 * Visit a parse tree produced by {@see <file.parserName>::<Iname>()}.
<endif>
 }
}

```

```

* @param Context\<Iname; format="cap">Context $context The parse tree.
*
* @return mixed The visitor result.
*/
public function visit<Iname; format="cap">(Context\<Iname; format="cap">Context $context);
separator="\n\n"
}
>>

```

```

BaseVisitorFile(file, header, namedActions) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
<if(file.genPackage)>
namespace <file.genPackage>;
<endif>
<header>
use Antlr\Antlr4\Runtime\Tree\AbstractParseTreeVisitor;

/**
 * This class provides an empty implementation of { @see <file.grammarName>Visitor },
 * which can be extended to create a visitor which only needs to handle a subset
 * of the available methods.
 */
class <file.grammarName>BaseVisitor extends AbstractParseTreeVisitor implements <file.grammarName>Visitor
{
 <file.visitorNames:{Iname |
/**
 * { @inheritdoc\}
 *
 * The default implementation returns the result of calling
 * { @see self::visitChildren()\} on `context`.
 */
public function visit<Iname; format="cap">(Context\<Iname; format="cap">Context $context)
{
 return $this->visitChildren($context);
\}}; separator="\n\n"
}
>>

```

```

fileHeader(grammarFileName, ANTLRVersion) ::= <<
\<?php

/*
 * Generated from <grammarFileName> by ANTLR <ANTLRVersion>
 */

```

```

>>
Parser(parser, funcs, atn, sempredFuncs, superClass) ::= <<
<Parser_(ctor="parser_ctor", ...)>

```

>>

```
Parser_(parser, funcs, atn, sempredFuncs, ctor, superClass) ::= <<
namespace<if(file.genPackage)> <file.genPackage><endif> {
<if(namedActions.header)><namedActions.header><endif>
use Antlr\Antlr4\Runtime\Atn\ATN;
use Antlr\Antlr4\Runtime\Atn\ATNDeserializer;
use Antlr\Antlr4\Runtime\Atn\ParserATNSimulator;
use Antlr\Antlr4\Runtime\Dfa\DFA;
use Antlr\Antlr4\Runtime\Error\Exceptions\FailedPredicateException;
use Antlr\Antlr4\Runtime\Error\Exceptions\NoViableAltException;
use Antlr\Antlr4\Runtime\PredictionContexts\PredictionContextCache;
use Antlr\Antlr4\Runtime\Error\Exceptions\RecognitionException;
use Antlr\Antlr4\Runtime\RuleContext;
use Antlr\Antlr4\Runtime\Token;
use Antlr\Antlr4\Runtime\TokenStream;
use Antlr\Antlr4\Runtime\Vocabulary;
use Antlr\Antlr4\Runtime\VocabularyImpl;
use Antlr\Antlr4\Runtime\RuntimeMetaData;
use Antlr\Antlr4\Runtime\Parser;
<if(namedActions.definitions)><namedActions.definitions><endif>

final class <parser.name> extends <superClass; null="Parser">
{
<if(parser.tokens)>
public const <parser.tokens>:{k | <k> = <parser.tokens.(k)>}; separator=", ", wrap, anchor>;
<endif>

<if(parser.rules)>
public const <parser.rules>:{r | RULE_<r.name> = <r.index>}; separator=", ", wrap, anchor>;
<endif>

/**
 * @var array<string>
 */
public const RULE_NAMES = [
<parser.ruleNames>:{r | '<r>'}; separator=", ", wrap, anchor>
];

<vocabulary(parser.literalNames, parser.symbolicNames)>

<atn>
protected static $atn;
protected static $decisionToDFA;
protected static $sharedContextCache;
<if(namedActions.members)>

<namedActions.members>
```

<endif>

<parser:(ctor())>

private static function initialize() : void

```
{
 if (self::$atn !== null) {
 return;
 }
}
```

RuntimeMetaData::checkVersion('<file.ANTLRVersion>', RuntimeMetaData::VERSION);

\$atn = (new ATNDeserializer())->deserialize(self::SERIALIZED\_ATN);

\$decisionToDFA = [];

```
for ($i = 0, $count = $atn->getNumberOfDecisions(); $i < $count; $i++) {
 $decisionToDFA[] = new DFA($atn->getDecisionState($i), $i);
}
```

self::\$atn = \$atn;

self::\$decisionToDFA = \$decisionToDFA;

self::\$sharedContextCache = new PredictionContextCache();

```
}
```

public function getGrammarFileName() : string

```
{
 return "<parser.grammarFileName>";
}
```

public function getRuleNames() : array

```
{
 return self::RULE_NAMES;
}
```

public function getSerializedATN() : string

```
{
 return self::SERIALIZED_ATN;
}
```

public function getATN() : ATN

```
{
 return self::$atn;
}
```

public function getVocabulary() : Vocabulary

```
{
 static $vocabulary;
```

```

 return $vocabulary = $vocabulary ?? new VocabularyImpl(self::LITERAL_NAMES, self::SYMBOLIC_NAMES);
 }
<endif(funcs)>

<funcs; separator="\n\n">
<endif>
<if(sempredFuncs)>

public function sempred(?RuleContext $localContext, int $ruleIndex, int $predicateIndex) : bool
{
 switch ($ruleIndex) {
 <parser.sempredFuncs.values:{f}
 case <f.ruleIndex>:
 return $this->sempred<f.name; format="cap">($localContext, $predicateIndex);}; separator="\n\n">

 default:
 return true;
 }
}

<sempredFuncs.values; separator="\n\n">
<endif>
}
}

namespace <if(file.genPackage)><file.genPackage>\\<endif>Context {
 use Antlr\\Antlr4\\Runtime\\ParserRuleContext;
 use Antlr\\Antlr4\\Runtime\\Token;
 use Antlr\\Antlr4\\Runtime\\Tree\\ParseTreeVisitor;
 use Antlr\\Antlr4\\Runtime\\Tree\\TerminalNode;
 use Antlr\\Antlr4\\Runtime\\Tree\\ParseTreeListener;
 use <if(file.genPackage)><file.genPackage>\\<endif><parser.name>;
 <if (file.genVisitor)>use <if(file.genPackage)><file.genPackage>\\<endif><file.grammarName>Visitor;<endif>
 <if (file.genListener)>use <if(file.genPackage)><file.genPackage>\\<endif><file.grammarName>Listener;<endif>
 <namedActions.contexts>

 <funcs :{ func | <func.ruleCtx><if(func.altLabelCtxs)>

 <func.altLabelCtxs:{1 | <func.altLabelCtxs.(1)>}; separator="\n\n"><endif> }; separator="\n\n">
 }
>>

vocabulary(literalNames, symbolicNames) ::= <<
/**
 * @var array<string|null>
 */
private const LITERAL_NAMES = [

```

```

 <literalNames:{t | <t>}; null="null", separator=", ", wrap, anchor>
];

/**
 * @var array<string>
 */
private const SYMBOLIC_NAMES = [
 <symbolicNames:{t | <t>}; null="null", separator=", ", wrap, anchor>
];
>>

dumpActions(recog, argFuncs, actionFuncs, sempredFuncs) ::= <<
<if(actionFuncs)>

public function action(?RuleContext $localContext, int $ruleIndex, int $actionIndex) : void
{
 switch ($ruleIndex) {
 <recog.actionFuncs.values:{f}
 case <f.ruleIndex>:
 $this->action<f.name; format="cap">($localContext, $actionIndex);
 break;}; separator="\n\n">
 }
}

<actionFuncs.values; separator="\n">
<endif>
<if(sempredFuncs)>

public function sempred(?RuleContext $localContext, int $ruleIndex, int $predicateIndex) : bool
{
 switch ($ruleIndex) {
 <recog.sempredFuncs.values:{f}
 case <f.ruleIndex>:
 return $this->sempred<f.name; format="cap">($localContext, $predicateIndex);}; separator="\n\n">
 }

 return true;
}
<sempredFuncs.values; separator="\n\n">
<endif>
>>

parser_ctor(p) ::= <<
public function __construct(TokenStream $input)
{
 parent::__construct($input);

 self::initialize();
}
}

```

```

$this->interp = new ParserATNSimulator($this, self::$atn, self::$decisionToDFA, self::$sharedContextCache);
}
>>

/**
 * This generates a private method since the actionIndex is generated, making
 * an overriding implementation impossible to maintain.
 */
RuleActionFunction(r, actions) ::= <<
private function action<r.name; format="cap">(Context<r.ctxType> $localContext, int $actionIndex) : void
{
 switch ($actionIndex) {
 <actions:{index|
 case <index>:
 <actions.(index)>

 break;}; separator="\n\n">
 }
}
>>

/**
 * This generates a private method since the predicateIndex is generated, making
 * an overriding implementation impossible to maintain.
 */
RuleSempredFunction(r, actions) ::= <<
private function sempred<r.name; format="cap">(Context<r.ctxType> $localContext, int $predicateIndex) : bool
{
 switch ($predicateIndex) {
 <actions:{index|
 case <index>:
 return <actions.(index)>;}; separator="\n\n">
 }

 return true;
}
>>

RuleFunction(currentRule, args, code, locals, ruleCtx, altLabelCtxs, namedActions, finallyAction, exceptions, postamble)
::= <<
/**
 * @throws RecognitionException
 */
<if(currentRule.modifiers)><currentRule.modifiers:{f | <f> }><endif>public function <currentRule.name>(args;
separator=", ">) : Context<<currentRule.ctxType>
{
 $localContext = new Context<<currentRule.ctxType>($this->ctx, $this->getState())<currentRule.args:{a | ,

```



```
$<a.name>}>);
```

```
$this->enterRule($localContext, <currentRule.startState>, self::RULE_<currentRule.name>);
<namedActions.init>
<locals; separator="\n">

try {
 <code>
 <postamble; separator="\n">
 <namedActions.after>
}<if(exceptions)><exceptions; separator="\n"><else> catch (RecognitionException $exception) {
 $localContext->exception = $exception;
 $this->errorHandler->reportError($this, $exception);
 $this->errorHandler->recover($this, $exception);
}<endif> finally {
 <finallyAction>
 $this->exitRule();
}

return $localContext;
}
>>
```

```
LeftRecursiveRuleFunction(currentRule,args,code,locals,ruleCtx,altLabelCtxs,namedActions,finallyAction,postamble) ::= <<
```

```
/**
```

```
* @throws RecognitionException
```

```
*/
```

```
<if(currentRule.modifiers)><currentRule.modifiers:{f | <f> }><endif>public function <currentRule.name>(<args;
separator=", ">) : Context\<currentRule.ctxType>
```

```
{
```

```
return $this->recursive<currentRule.name; format="cap">(0<currentRule.args:{a | , <a.name>}>);
```

```
}
```

```
/**
```

```
* @throws RecognitionException
```

```
*/
```

```
private function recursive<currentRule.name; format="cap">(int $precedence<args:{a | , <a>}>) :
```

```
Context\<currentRule.ctxType>
```

```
{
```

```
$parentContext = $this->ctx;
```

```
$parentState = $this->getState();
```

```
$localContext = new Context\<currentRule.ctxType>($this->ctx, $parentState<currentRule.args:{a | ,
<a.name>}>);
```

```
$previousContext = $localContext;
```

```
$startState = <currentRule.startState>;
```

```
$this->enterRecursionRule($localContext, <currentRule.startState>, self::RULE_<currentRule.name>,
$precedence);
```

```

<namedActions.init>
<locals; separator="\n">

try {
 <code>
 <postamble; separator="\n">
 <namedActions.after>
} catch (RecognitionException $exception) {
 $localContext->exception = $exception;
 $this->errorHandler->reportError($this, $exception);
 $this->errorHandler->recover($this, $exception);
} finally {
 <finallyAction>
 $this->unrollRecursionContexts($parentContext);
}

return $localContext;
}
>>

```

```

CodeBlockForOuterMostAlt(currentOuterMostAltCodeBlock, locals, preamble, ops) ::= <<
<if(currentOuterMostAltCodeBlock.altLabel)>$localContext = new
Context\|<currentOuterMostAltCodeBlock.altLabel; format="cap">Context($localContext);<endif>
$this->enterOuterAlt($localContext, <currentOuterMostAltCodeBlock.alt.altNum>);
<CodeBlockForAlt(currentAltCodeBlock=currentOuterMostAltCodeBlock, ...)>
>>

```

```

CodeBlockForAlt(currentAltCodeBlock, locals, preamble, ops) ::= <<
<locals; separator="\n">
<preamble; separator="\n">
<ops; separator="\n">
>>

```

```

LL1AltBlock(choice, preamble, alts, error) ::= <<
$this->setState(<choice.stateNumber>);
$this->errorHandler->sync($this);
<if(choice.label)><labelref(choice.label)> = $this->input->LT(1);<endif>
<preamble; separator="\n">

switch ($this->input->LA(1)) {
 <choice.altLook,alts:{look,alt| <cases(ttypes=look)>
 <alt>
 break;}; separator="\n\n">

default:
 <error>
}
>>

```

```

LL1OptionalBlock(choice, alts, error) ::= <<
$this->setState(<choice.stateNumber>);
$this->errorHandler->sync($this);

switch ($this->input->LA(1)) {
 <choice.altLook,alts:{look,alt| <cases(ttypes=look)>
 <alt>
 break;}; separator="\n\n">

default:
 break;
}
>>

LL1OptionalBlockSingleAlt(choice, expr, alts, preamble, error, followExpr) ::= <<
$this->setState(<choice.stateNumber>);
$this->errorHandler->sync($this);
<preamble; separator="\n">

if (<expr>) {
 <alts; separator="\n">
}
>>

LL1StarBlockSingleAlt(choice, loopExpr, alts, preamble, iteration) ::= <<
$this->setState(<choice.stateNumber>);
$this->errorHandler->sync($this);

<preamble; separator="\n">
while (<loopExpr>) {
 <alts; separator="\n">
 $this->setState(<choice.loopBackStateNumber>);
 $this->errorHandler->sync($this);
 <iteration>
}
>>

LL1PlusBlockSingleAlt(choice, loopExpr, alts, preamble, iteration) ::= <<
$this->setState(<choice.blockStartStateNumber>); <! alt block decision !>
$this->errorHandler->sync($this);

<preamble; separator="\n">
do {
 <alts; separator="\n">
 $this->setState(<choice.stateNumber>); <! loopback/exit decision !>
 $this->errorHandler->sync($this);
 <iteration>
}

```

```

} while (<loopExpr>);
>>

// LL(*) stuff

AltBlock(choice, preamble, alts, error) ::= <<
$this->setState(<choice.stateNumber>);
$this->errorHandler->sync($this);
<if(choice.label)><labelref(choice.label)> = $this->input->LT(1);<endif>
<preamble; separator="\n">

switch ($this->getInterpreter()->adaptivePredict($this->input, <choice.decision>, $this->ctx)) {
 <alts:{alt |
case <i>:
 <alt>
break;}; separator="\n\n">
}
>>

OptionalBlock(choice, alts, error) ::= <<
$this->setState(<choice.stateNumber>);
$this->errorHandler->sync($this);

switch ($this->getInterpreter()->adaptivePredict($this->input, <choice.decision>, $this->ctx)) {
<alts:{alt |
 case <i><if(!choice.ast.greedy)>+1<endif>:
 <alt>
break;}; separator="\n\n">
}
>>

StarBlock(choice, alts, sync, iteration) ::= <<
$this->setState(<choice.stateNumber>);
$this->errorHandler->sync($this);

$alt = $this->getInterpreter()->adaptivePredict($this->input, <choice.decision>, $this->ctx);

while ($alt !== <choice.exitAlt> && $alt !== ATN::INVALID_ALT_NUMBER) {
if ($alt === 1<if(!choice.ast.greedy)>+1<endif>) {
 <iteration>
 <alts> <! should only be one !>
}

$this->setState(<choice.loopBackStateNumber>);
$this->errorHandler->sync($this);

$alt = $this->getInterpreter()->adaptivePredict($this->input, <choice.decision>, $this->ctx);
}

```

>>

```
PlusBlock(choice, alts, error) ::= <<
$this->setState(<choice.blockStartStateNumber>); <! alt block decision !>
$this->errorHandler->sync($this);
```

```
$salt = 1<if(!choice.ast.greedy)>+1<endif>;
```

```
do {
 switch ($salt) {
 <alts:{alt|
 case <i><if(!choice.ast.greedy)>+1<endif>:
 <alt>
 break;}; separator="\n\n">
 default:
 <error>
 }
}
```

```
$this->setState(<choice.loopBackStateNumber>); <! loopback/exit decision !>
$this->errorHandler->sync($this);
```

```
$salt = $this->getInterpreter()->adaptivePredict($this->input, <choice.decision>, $this->ctx);
} while ($salt !== <choice.exitAlt> && $salt !== ATN::INVALID_ALT_NUMBER);
```

>>

```
Sync(s) ::= "sync(<s.expecting.name>);"
```

```
ThrowNoViableAlt(t) ::= "throw new NoViableAltException($this);"
```

```
TestSetInline(s) ::= <<
<s.bitsets:{bits | <if(rest(rest(bits.ttypes)))><bitsetBitfieldComparison(s, bits)><else><bitsetInlineComparison(s,
bits)><endif>}; separator=" || ">
>>
```

```
// Java language spec 15.19 - shift operators mask operands rather than overflow to 0... need range test
```

```
testShiftInRange(shiftAmount) ::= <<
```

```
((<shiftAmount>) & ~0x3f) === 0
```

>>

```
// produces smaller bytecode only when bits.ttypes contains more than two items
```

```
bitsetBitfieldComparison(s, bits) ::= <%
```

```
(<testShiftInRange({<offsetShiftVar(s.varName, bits.shift)>})> && ((1 \<< <offsetShiftVar(s.varName,
bits.shift)>) & (<bits.ttypes:{ttype | (1 \<< <offsetShiftConst(ttype, bits.shift)>}); separator=" | ">)) !== 0)
%>
```

```
isZero ::= [
```

```
"0":true,
```

```
default:false
```

]

```
offsetShiftVar(shiftAmount, offset) ::= <%
<if(!isZero.(offset))>(<$<shiftAmount> - <offset></else><$<shiftAmount></endif>
%>
offsetShiftConst(shiftAmount, offset) ::= <%
<if(!isZero.(offset))>(self::<shiftAmount> - <offset></else>self::<shiftAmount></endif>
%>

// produces more efficient bytecode when bits.ttypes contains at most two items
bitsetInlineComparison(s, bits) ::= <%
<bits.ttypes: { ttype | $<s.varName> === self::<ttype> }; separator=" || ">
%>

cases(ttypes) ::= <<
<ttypes: { t | case self::<t> }; separator="\n">
>>

InvokeRule(r, argExprsChunks) ::= <<
$this->setState(<r.stateNumber>);
<if(r.labels)><r.labels: {1 | <labelref(1)> = }></endif>$this-><if(r.ast.options.p)>recursive<r.name>;
format="cap"></else><r.name></endif>(<if(r.ast.options.p)><r.ast.options.p></if><argExprsChunks>></endif></endif>
<argExprsChunks>;
>>

MatchToken(m) ::= <<
$this->setState(<m.stateNumber>);
<if(m.labels)><m.labels: {1 | <labelref(1)> = }></endif>$this->match(self::<m.name>);
>>

MatchSet(m, expr, capture) ::= "<CommonSetStuff(m, expr, capture, false)>"

MatchNotSet(m, expr, capture) ::= "<CommonSetStuff(m, expr, capture, true)>"

CommonSetStuff(m, expr, capture, invert) ::= <<
$this->setState(<m.stateNumber>);

<if(m.labels)><m.labels: {1 | <labelref(1)> = }>$this->input->LT(1);</endif>
<capture>

if (<if(invert)><$<m.varName> \<= 0 || </else>!</endif><(<expr>)) {
 <if(m.labels)><m.labels: {1 | <labelref(1)> = }></endif>$this->errorHandler->recoverInline($this);
} else {
 if ($this->input->LA(1) === Token::EOF) {
 $this->matchedEOF = true;
 }

 $this->errorHandler->reportMatch($this);
```

```

 $this->consume();
}
>>

Wildcard(w) ::= <<
$this->setState(<w.stateNumber>);
<if(w.labels)><w.labels:{1 | <labelref(l)> = }><endif>$this->matchWildcard();
>>

// ACTION STUFF

Action(a, foo, chunks) ::= "<chunks>"

ArgAction(a, chunks) ::= "<chunks>"

SemPred(p, chunks, failChunks) ::= <<
$this->setState(<p.stateNumber>);

if (!(<chunks>)) {
 throw new FailedPredicateException($this, <p.predicate><if(failChunks)>, <failChunks><elseif(p.msg)>,
 <p.msg><endif>);
}
>>

ExceptionClause(e, catchArg, catchAction) ::= <<
catch (<catchArg>) {
 <catchAction>
}
>>

// lexer actions are not associated with model objects

LexerSkipCommand() ::= "$this->skip();"
LexerMoreCommand() ::= "$this->more();"
LexerPopModeCommand() ::= "$this->popMode();"

LexerTypeCommand(arg, grammar) ::= "$this->type = <arg>";
LexerChannelCommand(arg, grammar) ::= "$this->channel = <arg>";
LexerModeCommand(arg, grammar) ::= "$this->mode = <arg>";
LexerPushModeCommand(arg, grammar) ::= "$this->pushMode(<arg>);"

ActionText(t) ::= "<t.text>"
ActionTemplate(t) ::= "<t.st>"
ArgRef(a) ::= "$localContext-><a.name>"
LocalRef(a) ::= "$localContext-><a.name>"
RetValRef(a) ::= "$localContext-><a.name>"
QRetValRef(a) ::= "<ctx(a)>-><a.dict>-><a.name>"
/** How to translate $tokenLabel */

```

```

TokenRef(t) ::= "<ctx(t)>-><t.name>"
LabelRef(t) ::= "<ctx(t)>-><t.name>"
ListLabelRef(t) ::= "<ctx(t)>-><ListLabelName(t.name)>"
SetAttr(s,rhsChunks) ::= "<ctx(s)>-><s.name> = <rhsChunks>;"

TokenLabelType() ::= "<file.TokenLabelType; null={Token}>"
InputSymbolType() ::= "<file.InputSymbolType; null={Token}>"

TokenPropertyRef_text(t) ::= "<ctx(t)>-><t.label> !== null ? <ctx(t)>-><t.label>->getText() : null)"
TokenPropertyRef_type(t) ::= "<ctx(t)>-><t.label> !== null ? <ctx(t)>-><t.label>->getType() : 0)"
TokenPropertyRef_line(t) ::= "<ctx(t)>-><t.label> !== null ? <ctx(t)>-><t.label>->getLine() : 0)"
TokenPropertyRef_pos(t) ::= "<ctx(t)>-><t.label> !== null ? <ctx(t)>-><t.label>->getCharPositionInLine() : 0)"
TokenPropertyRef_channel(t) ::= "<ctx(t)>-><t.label> !== null ? <ctx(t)>-><t.label>->getChannel() : 0)"
TokenPropertyRef_index(t) ::= "<ctx(t)>-><t.label> !== null ? <ctx(t)>-><t.label>->getTokenIndex() : 0)"
TokenPropertyRef_int(t) ::= "<ctx(t)>-><t.label> !== null ? (int) <ctx(t)>-><t.label>->getText() : 0)"

RulePropertyRef_start(r) ::= "<ctx(r)>-><r.label> !== null ? (<ctx(r)>-><r.label>->start) : null)"
RulePropertyRef_stop(r) ::= "<ctx(r)>-><r.label> !== null ? (<ctx(r)>-><r.label>->stop) : null)"
RulePropertyRef_text(r) ::= "<ctx(r)>-><r.label> !== null ? $this->input->getTextByTokens(<ctx(r)>-><r.label>->start, <ctx(r)>-><r.label>->stop) : null)"
RulePropertyRef_ctx(r) ::= "<ctx(r)>-><r.label>"
RulePropertyRef_parser(r) ::= "\$this"

ThisRulePropertyRef_start(r) ::= "$localContext->start"
ThisRulePropertyRef_stop(r) ::= "$localContext->stop"
ThisRulePropertyRef_text(r) ::= "$this->input->getTextByTokens($localContext->start, $this->input->LT(-1))"
ThisRulePropertyRef_ctx(r) ::= "$localContext"
ThisRulePropertyRef_parser(r) ::= "$this"

NonLocalAttrRef(s) ::= "\$this->getInvokingContext(<s.ruleIndex>)-><s.name>"
SetNonLocalAttr(s, rhsChunks) ::= "\$this->getInvokingContext(<s.ruleIndex>)-><s.name> = <rhsChunks>;"

AddToLabelList(a) ::= "<ctx(a.label)>-><a.listName>[] = <labelref(a.label)>;"

TokenDecl(t) ::= "<TokenLabelType()> $<t.name>"
TokenTypeDecl(t) ::= ""
TokenListDecl(t) ::= "array $<t.name> = []"
RuleContextDecl(r) ::= "<r.ctxName> $<r.name>"
RuleContextListDecl(rdecl) ::= "array $<rdecl.name> = []"
AttributeDecl(d) ::= "<d.type> $<d.name><if(d.initValue)> = <d.initValue><endif>"

PropertiesDecl(struct) ::= <<
<if(struct.tokenListDecls)>
<struct.tokenListDecls : { d | /**
* @var array<Token>|null $<d.name>
*/
public $<d.name>;}; separator="\n\n">
<endif>

```



```

<if(struct.tokenDecls)>
<if(struct.tokenListDecls)>

<endif>
<struct.tokenDecls : {d | /**
* @var <TokenLabelType()>|null $<d.name>
*/
public $<d.name>;}; separator="\n\n">
<endif>
<if(struct.ruleContextDecls)>
<if(struct.tokenListDecls || struct.tokenDecls)>

<endif>
<struct.ruleContextDecls : {d | /**
* @var <d.ctxName>|null $<d.name>
*/
public $<d.name>;}; separator="\n\n">
<endif>
<if(struct.ruleContextListDecls)>
<if(struct.tokenListDecls || struct.tokenDecls || struct.ruleContextDecls)>

<endif>
<struct.ruleContextListDecls : {d | /**
* @var array\<<d.ctxName>\>|null $<d.name>
*/
public $<d.name>;}; separator="\n\n">
<endif>
<if(struct.attributeDecls)>
<if(struct.tokenListDecls || struct.tokenDecls || struct.ruleContextDecls || struct.ruleContextListDecls)>

<endif>
<struct.attributeDecls : {d | /**
* @var <d.type><if(!d.initValue)>|null<endif> $<d.name>
*/
public $<d.name><if(d.initValue)> = <d.initValue><endif>;}; separator="\n\n">
<endif>

>>

ContextTokenGetterDecl(t) ::= <<
public function <t.name>() : ?TerminalNode
{
 return $this->getToken(<parser.name>::<t.name>, 0);
}
>>

ContextTokenListGetterDecl(t) ::= <<
>>

```

```

ContextTokenListIndexedGetterDecl(t) ::= <<
/**
 * @return array<<TerminalNode>|TerminalNode|null
 */
public function <t.name>(int $index = null)
{
 if ($index === null) {
 return $this->getTokens(<parser.name>::<t.name>);
 }

 return $this->getToken(<parser.name>::<t.name>, $index);
}
>>

ContextRuleGetterDecl(r) ::= <<
public function <r.name>() : ?<r.ctxName>
{
 return $this->getTypedRuleContext(<r.ctxName>::class, 0);
}
>>

ContextRuleListGetterDecl(r) ::= <<
>>

ContextRuleListIndexedGetterDecl(r) ::= <<
/**
 * @return array<<<r.ctxName>>|<r.ctxName>|null
 */
public function <r.name>(int $index = null)
{
 if ($index === null) {
 return $this->getTypedRuleContexts(<r.ctxName>::class);
 }

 return $this->getTypedRuleContext(<r.ctxName>::class, $index);
}
>>

LexerRuleContext() ::= "RuleContext"

/**
 * The rule context name is the rule followed by a suffix; e.g., r becomes rContext.
 */
RuleContextNameSuffix() ::= "Context"

ImplicitTokenLabel(tokenName) ::= "<tokenName>"
ImplicitRuleLabel(ruleName) ::= "<ruleName>"

```

```

ImplicitsetLabel(id) ::= "_tset<id>"
ListLabelName(label) ::= "<label>"

CaptureNextToken(d) ::= "$<d.varName> = \${this->input->LT(1)};"
CaptureNextTokenType(d) ::= "$<d.varName> = \${this->input->LA(1)};"

StructDecl(struct,ctorAttrs,attrs, getters,dispatchMethods,interfaces,extensionMembers) ::= <<
class <struct.name> extends
<if(contextSuperClass)><contextSuperClass><else>ParserRuleContext<endif><if(interfaces)> implements
<interfaces; separator=", "><endif>
{
<PropertiesDecl(struct)>
public function __construct(?ParserRuleContext $parent, ?int $invokingState = null<ctorAttrs:{a | , ?<a> = null}>)
{
parent::__construct($parent, $invokingState);
<if(struct.ctorAttrs)>

<struct.ctorAttrs:{a | \${this-><a.name> = \${<a.name> ?? \${this-><a.name>}}; separator="\n">
<endif>
}

public function getRuleIndex() : int
{
return <parser.name>::RULE_<struct.derivedFromName>;
}
<if(getters)>

<getters:{g | <g>}; separator="\n\n">
<endif>
<if(struct.provideCopyFrom)> <! don't need copy unless we have subclasses !>
public function copyFrom(ParserRuleContext $context) : void
{
parent::copyFrom($context);

<struct.attrs:{a | \${this-><a.name> = \${<context>-><a.name>}}; separator="\n">
}
<endif>
<if(dispatchMethods)>

<dispatchMethods; separator="\n\n">
<endif>
<if(extensionMembers)>

<extensionMembers; separator="\n\n">
<endif>
}
>>

```

```

AltLabelStructDecl(struct,attrs, getters,dispatchMethods) ::= <<
class <struct.name> extends <struct.parentRule; format="cap">Context
{
<PropertiesDecl(struct)>
public function __construct(<struct.parentRule; format="cap">Context $context)
{
 parent::__construct($context);

 $this->copyFrom($context);
}
<if(getters)>

 <getters:{ g | <g>}; separator="\n\n">
<endif>
<if(dispatchMethods)>

 <dispatchMethods; separator="\n\n">
<endif>
}
>>

ListenerDispatchMethod(method) ::= <<
public function <if(method.isEnter)>enter<else>exit<endif>Rule(ParseTreeListener $listener) : void
{
 if ($listener instanceof <parser.grammarName>Listener) {
 $listener-><if(method.isEnter)>enter<else>exit<endif><struct.derivedFromName; format="cap">($this);
 }
}
>>

VisitorDispatchMethod(method) ::= <<
public function accept(ParseTreeVisitor $visitor)
{
 if ($visitor instanceof <parser.grammarName>Visitor) {
 return $visitor->visit<struct.derivedFromName; format="cap">($this);
 }

 return $visitor->visitChildren($this);
}
>>

/** If we don't know location of label def x, use this template */
labelref(x) ::= "<if(!x.isLocal)>$localContext-><endif><x.name>"

/** For any action chunk, what is correctly-typed context struct ptr? */
ctx(actionChunk) ::= "$localContext"

// used for left-recursive rules

```

```

recRuleAltPredicate(ruleName,opPrec) ::= "\$this->precpred(\$this->ctx, <opPrec>)"

recRuleSetReturnAction(src,name) ::= "\$<name> = \$<src-><name>;"

recRuleSetStopToken() ::= "\$this->ctx->stop = \$this->input->LT(-1);"

recRuleAltStartAction(ruleName, ctxName, label, isListLabel) ::= <<
$localContext = new Context\\<ctxName>Context($parentContext, $parentState);
<if(label)>
<if(isListLabel)>
$localContext-><label>[] = $previousContext;
<else>
$localContext-><label> = $previousContext;
<endif>
<endif>

$this->pushNewRecursionContext($localContext, $startState, self::RULE_<ruleName>);
>>

recRuleLabeledAltStartAction(ruleName, currentAltLabel, label, isListLabel) ::= <<
$localContext = new Context\\<currentAltLabel; format="cap">Context(new Context\\<ruleName;
format="cap">Context($parentContext, $parentState));
<if(label)>
<if(isListLabel)>
$localContext-><label>[] = $previousContext;
<else>
$localContext-><label> = $previousContext;
<endif>
<endif>

$this->pushNewRecursionContext($localContext, $startState, self::RULE_<ruleName>);
>>

recRuleReplaceContext(ctxName) ::= <<
$localContext = new Context\\<ctxName>Context($localContext);
$this->ctx = $localContext;
$previousContext = $localContext;
>>

recRuleSetPrevCtx() ::= <<
if ($this->getParseListeners() !== null) {
 $this->triggerExitRuleEvent();
}

$previousContext = $localContext;
>>

```

```

LexerFile(lexerFile, lexer, namedActions) ::= <<
<fileHeader(lexerFile.grammarFileName, lexerFile.ANTLRVersion)>
<lexer>
>>

```

```

Lexer(lexer, atn, actionFuncs, sempredFuncs, superClass) ::= <<
namespace<if(lexerFile.genPackage)> <lexerFile.genPackage><endif> {
<if(namedActions.header)><namedActions.header><endif>
use Antlr\\Antlr4\\Runtime\\Atn\\ATNDeserializer;
use Antlr\\Antlr4\\Runtime\\Atn\\LexerATNSimulator;
use Antlr\\Antlr4\\Runtime\\Lexer;
use Antlr\\Antlr4\\Runtime\\CharStream;
use Antlr\\Antlr4\\Runtime\\PredictionContexts\\PredictionContextCache;
use Antlr\\Antlr4\\Runtime\\RuleContext;
use Antlr\\Antlr4\\Runtime\\Atn\\ATN;
use Antlr\\Antlr4\\Runtime\\Dfa\\DFA;
use Antlr\\Antlr4\\Runtime\\Vocabulary;
use Antlr\\Antlr4\\Runtime\\RuntimeMetaData;
use Antlr\\Antlr4\\Runtime\\VocabularyImpl;
<if(namedActions.definitions)><namedActions.definitions><endif>

final class <lexer.name> extends <superClass; null="Lexer">
{
<if(lexer.tokens)>
public const <lexer.tokens:{k | <k> = <lexer.tokens.(k)>}; separator=", ", wrap, anchor>;
<endif>

<if(lexer.channels)>
public const <lexer.channels:{c | <c> = <lexer.channels.(c)>}; separator=", ", wrap, anchor>;
<endif>

<if(rest(lexer.modes))>
public const <rest(lexer.modes):{m | <m>=<i>}; separator=", ", wrap, anchor>;
<endif>

/**
 * @var array<string>
 */
public const CHANNEL_NAMES = [
'DEFAULT_TOKEN_CHANNEL', 'HIDDEN'<if (lexer.channels)>, <lexer.channels:{c| '<c>'}; separator=", ",
wrap, anchor><endif>
];

/**
 * @var array<string>
 */
public const MODE_NAMES = [
<lexer.modes:{m| '<m>'}; separator=", ", wrap, anchor>

```

```

];

/**
 * @var array<string>
 */
public const RULE_NAMES = [
<lexer.ruleNames:{r | '<r>'}; separator=", ", wrap, anchor>
];

<vocabulary(lexer.literalNames, lexer.symbolicNames)>

<atn>
protected static $atn;
protected static $decisionToDFA;
protected static $sharedContextCache;
<if(namedActions.members)>

<namedActions.members>
<endif>

public function __construct(CharStream $input)
{
 parent::__construct($input);

 self::initialize();

 $this->interp = new LexerATNSimulator($this, self::$atn, self::$decisionToDFA, self::$sharedContextCache);
}

private static function initialize() : void
{
 if (self::$atn !== null) {
 return;
 }

 RuntimeMetaData::checkVersion('<lexerFile.ANTLRVersion>', RuntimeMetaData::VERSION);

 $atn = (new ATNDeserializer()->deserialize(self::SERIALIZED_ATN);

 $decisionToDFA = [];
 for ($i = 0, $count = $atn->getNumberOfDecisions(); $i < $count; $i++) {
 $decisionToDFA[] = new DFA($atn->getDecisionState($i), $i);
 }

 self::$atn = $atn;
 self::$decisionToDFA = $decisionToDFA;
 self::$sharedContextCache = new PredictionContextCache();
}

```

```

public static function vocabulary() : Vocabulary
{
 static $vocabulary;

 return $vocabulary = $vocabulary ?? new VocabularyImpl(self::LITERAL_NAMES, self::SYMBOLIC_NAMES);
}

public function getGrammarFileName() : string
{
 return '<lexer.grammarFileName>';
}

public function getRuleNames() : array
{
 return self::RULE_NAMES;
}

public function getSerializedATN() : string
{
 return self::SERIALIZED_ATN;
}

/**
 * @return array<string>
 */
public function getChannelNames() : array
{
 return self::CHANNEL_NAMES;
}

/**
 * @return array<string>
 */
public function getModeNames() : array
{
 return self::MODE_NAMES;
}

public function getATN() : ATN
{
 return self::$atn;
}

public function getVocabulary() : Vocabulary
{
 return self::vocabulary();
}

```



```

 <dumpActions(lexer, "", actionFuncs, sempredFuncs)>
 }
}
>>

SerializedATN(model) ::= <<
<if(rest(model.segments))>
/**
 * @var string
 */
private const SERIALIZED_ATN =
 <model.segments:{segment| "<segment; wrap={ " .<\n>" }>"; separator=" .\n">;
<else>
/**
 * @var string
 */
private const SERIALIZED_ATN =
 "<model.serialized; wrap={ " .<\n> " }>";
<endif>
>>

/**
 * Using a type to init value map, try to init a type; if not in table
 * must be an object, default value is `null`.
 */
initValue(typeName) ::= <<
<phpTypeInitMap.(typeName)>
>>

codeFileExtension() ::= ".php"

```

Found in path(s):

```

* /opt/cola/permits/1300428068_1649144266.79/0/antlr4-4-9-2-sources-
jar/org/antlr/v4/tool/templates/codegen/PHP/PHP.stg

```

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```

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- \*/

```

tree grammar BlockSetTransformer;
options {
 language = Java;
 tokenVocab = ANTLRParser;
 ASTLabelType = GrammarAST;
 output = AST;
 filter = true;
}

@header {
package org.antlr.v4.parse;
import org.antlr.v4.misc.Utils;
import org.antlr.v4.misc.*;
import org.antlr.v4.tool.*;
import org.antlr.v4.tool.ast.*;
import java.util.List;
import java.util.Set;
import java.util.HashSet;
import java.util.ArrayList;
import org.antlr.v4.runtime.misc.IntervalSet;
}

@members {
public String currentRuleName;
public GrammarAST currentAlt;
public Grammar g;
public BlockSetTransformer(TreeNodeStream input, Grammar g) {
 this(input, new RecognizerSharedState());
 this.g = g;
}
}

```

```

}

topdown
: ^(RULE (id=TOKEN_REF|id=RULE_REF) {currentRuleName=$id.text;} .+)
| setAlt
| ebnfBlockSet
| blockSet
;

setAlt
: {inContext("RULE BLOCK")}?
 ALT {currentAlt = $start;}
;

// (BLOCK (ALT (+ (BLOCK (ALT INT) (ALT ID))))))
ebnfBlockSet
@after {
 GrammarTransformPipeline.setGrammarPtr(g, $tree);
}
: ^(ebnfSuffix blockSet) -> ^(ebnfSuffix ^(BLOCK<BlockAST> ^(ALT<AltAST> blockSet)))
;

ebnfSuffix
@after {$tree = (GrammarAST)adaptor.dupNode($start);}
: OPTIONAL
| CLOSURE
| POSITIVE_CLOSURE
;

blockSet
@init {
 boolean inLexer = Grammar.isTokenName(currentRuleName);
}
@after {
 GrammarTransformPipeline.setGrammarPtr(g, $tree);
}
: {inContext("RULE")}? // top-level: rule block and > 1 alt
 ^(BLOCK ^(alt=ALT elementOptions? {((AltAST)$alt).altLabel==null}? setElement[inLexer]) (^(ALT
 elementOptions? setElement[inLexer]))+)
 -> ^(BLOCK<BlockAST>[$BLOCK.token] ^(ALT<AltAST>[$BLOCK.token,"ALT"] ^(SET[$BLOCK.token,
 "SET"] setElement+)))
| {!inContext("RULE")}? // if not rule block and > 1 alt
 ^(BLOCK ^(ALT elementOptions? setElement[inLexer]) (^(ALT elementOptions? setElement[inLexer]))+)
 -> ^(SET[$BLOCK.token, "SET"] setElement+)
;

setElement[boolean inLexer]
@after {

```

```

GrammarTransformPipeline.setGrammarPtr(g, $tree);
}
: (^(a=STRING_LITERAL elementOptions) {!inLexer ||
CharSupport.getCharValueFromGrammarCharLiteral($a.getText())!=-1 }?
| a=STRING_LITERAL {!inLexer || CharSupport.getCharValueFromGrammarCharLiteral($a.getText())!=-1 }?
| {!inLexer}?=> ^(TOKEN_REF elementOptions)
| {!inLexer}?=> TOKEN_REF
| {!inLexer}?=> ^(RANGE a=STRING_LITERAL b=STRING_LITERAL)
{CharSupport.getCharValueFromGrammarCharLiteral($a.getText())!=-1 &&
CharSupport.getCharValueFromGrammarCharLiteral($b.getText())!=-1 }?
)
;

```

```

elementOptions
: ^(ELEMENT_OPTIONS elementOption*)
;

```

```

elementOption
: ID
| ^(ASSIGN id=ID v=ID)
| ^(ASSIGN ID v=STRING_LITERAL)
| ^(ASSIGN ID v=ACTION)
| ^(ASSIGN ID v=INT)
;

```

Found in path(s):

\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/parse/BlockSetTransformer.g

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```

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```

```
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* THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.
*/
```

```
/** ANTLR tool checks output templates are compatible with tool code generation.
```

```
* For now, a simple string match used on x.y of x.y.z scheme.
```

```
* Must match Tool.VERSION during load to templates.
```

```
*
```

```
* REQUIRED.
```

```
*/
```

```
pythonTypeInitMap ::= [
 "bool":"False",
 "int":"0",
 "float":"0.0",
 "str": "",
 default:"None" // anything other than a primitive type is an object
]
```

```
// args must be <object-model-object>, <fields-resulting-in-STs>
```

```
ParserFile(file, parser, namedActions, contextSuperClass) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
```

```
encoding: utf-8
```

```
from __future__ import print_function
```

```
from antlr4 import *
```

```
from io import StringIO
```

```
import sys
```

```
<namedActions.header>
```

```
<parser>
```

```
>>
```

```
ListenerFile(file, header, namedActions) ::= <<
```

```
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
```

```
from antlr4 import *
```

```
<header>
```

# This class defines a complete listener for a parse tree produced by <file.parserName>.

```
class <file.grammarName>Listener(ParseTreeListener):
```

```
 <file.listenerNames:{lname |
```

```
Enter a parse tree produced by <file.parserName>#<lname>.
```

```
def enter<lname; format="cap">(self, ctx):
```

```
 pass
```

```
Exit a parse tree produced by <file.parserName>#<lname>.
```

```
def exit<lname; format="cap">(self, ctx):
```

```
 pass
```

```
}; separator="\n">
```

```
>>
```

```
VisitorFile(file, header, namedActions) ::= <<
```

```
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
```

```
from antlr4 import *
```

```
<header>
```

# This class defines a complete generic visitor for a parse tree produced by <file.parserName>.

```
class <file.grammarName>Visitor(ParseTreeVisitor):
```

```
 <file.visitorNames:{lname |
```

```
Visit a parse tree produced by <file.parserName>#<lname>.
```

```
def visit<lname; format="cap">(self, ctx):
```

```
 return self.visitChildren(ctx)
```

```
}; separator="\n">
```

```
>>
```

```
fileHeader(grammarFileName, ANTLRVersion) ::= <<
```

```
Generated from <grammarFileName> by ANTLR <ANTLRVersion>
```

```
>>
```

```
Parser(parser, funcs, atn, sempredFuncs, superClass) ::= <<
```

```
<Parser_(ctor="parser_ctor", ...)>
```

```
>>
```

```
Parser_(parser, funcs, atn, sempredFuncs, ctor, superClass) ::= <<
```

```
<if(superClass)>
```

```
if __name__ is not None and "." in __name__:
```

```
 from .<superClass> import <superClass>
```

```

else:
 from <superClass> import <superClass>

<endif>
<atn>

class <parser.name> (<if(superClass)><superClass><else>Parser<endif>):

 grammarFileName = "<parser.grammarFileName>"

 atn = ATNDeserializer().deserialize(serializedATN())

 decisionsToDFA = [DFA(ds, i) for i, ds in enumerate(atn.decisionToState)]

 sharedContextCache = PredictionContextCache()

 literalNames = [<parser.literalNames:{t | u<t>}; null="u\"<INVALID>\"", separator=", ", wrap, anchor >]

 symbolicNames = [<parser.symbolicNames:{t | u<t>}; null="u\"<INVALID>\"", separator=", ", wrap, anchor >]

 <if(parser.rules)>
 <parser.rules:{r | RULE_<r.name> = <r.index>}; separator="\n", wrap, anchor>
 <endif>

 ruleNames = [<parser.ruleNames:{r | u"<r>"}; separator=", ", wrap, anchor >]

 EOF = <TokenLabelType().EOF>
 <if(parser.tokens)>
 <parser.tokens:{k | <k>=<parser.tokens.(k)>}; separator="\n", wrap, anchor>
 <endif>

 <parser:(ctor())>

 <namedActions.members>

 <funcs; separator="\n">

 <if(semanticPredFuncs)>
 def semanticPred(self, localctx, ruleIndex, predIndex):
 if self._predicates == None:
 self._predicates = dict()
 <parser.semanticPredFuncs.values:{f |
 self._predicates[<f.ruleIndex>] = self.<f.name>_semanticPred}; separator="\n
 ">
 pred = self._predicates.get(ruleIndex, None)
 if pred is None:
 raise Exception("No predicate with index:" + str(ruleIndex))
 else:

```

```

 return pred(localctx, predIndex)

 <sempredFuncs.values; separator="\n">
<endif>

>>

dumpActions(recog, argFuncs, actionFuncs, sempredFuncs) ::= <<
<if(actionFuncs)>
def action(self, localctx, ruleIndex, actionIndex):
 if self._actions is None:
 actions = dict()
 <recog.actionFuncs.values: {f|
 actions[<f.ruleIndex>] = self.<f.name>_action }; separator="\n">
 self._actions = actions
 action = self._actions.get(ruleIndex, None)
 if action is not None:
 action(localctx, actionIndex)
 else:
 raise Exception("No registered action for:" + str(ruleIndex))

 <actionFuncs.values; separator="\n">

<endif>
<if(sempredFuncs)>
def sempred(self, localctx, ruleIndex, predIndex):
 if self._predicates is None:
 preds = dict()
 <recog.sempredFuncs.values: {f|
 preds[<f.ruleIndex>] = self.<f.name>_sempred}; separator="\n">
 self._predicates = preds
 pred = self._predicates.get(ruleIndex, None)
 if pred is not None:
 return pred(localctx, predIndex)
 else:
 raise Exception("No registered predicate for:" + str(ruleIndex))

 <sempredFuncs.values; separator="\n">
<endif>

>>

parser_ctor(p) ::= <<
def __init__(self, input, output=sys.stdout):
 super(<parser.name>, self).__init__(input, output=output)
 self.checkVersion("<file.ANTLRVersion>")
 self._interp = ParserATNSimulator(self, self.atn, self.decisionsToDFA, self.sharedContextCache)

```



```

self._predicates = None

>>

/* This generates a private method since the actionIndex is generated, making an
* overriding implementation impossible to maintain.
*/
RuleActionFunction(r, actions) ::= <<

def <r.name>_action(self, localctx , actionIndex):
<actions:{index|
<if(first(actions))>
 if actionIndex == <index>:
 <actions.(index)>
<elseif(rest(actions))>
 elif actionIndex == <index>:
 <actions.(index)>
<endif> }; separator="\n">
>>

/* This generates a private method since the predIndex is generated, making an
* overriding implementation impossible to maintain.
*/
RuleSempredFunction(r, actions) ::= <<
def <r.name>_sempred(self, localctx, predIndex):
 <actions:{index|
<if(first(actions))>
 if predIndex == <index>:
 return <actions.(index)>
<elseif(rest(actions))>
 elif predIndex == <index>:
 return <actions.(index)>
<endif> }; separator="\n">

>>

RuleFunction(currentRule,args,code,locals,ruleCtx,altLabelCtxs,namedActions,finallyAction,postamble,exceptions)
::= <<

<ruleCtx>

<altLabelCtxs:{l | <altLabelCtxs.(l)>}; separator="\n">

def <currentRule.name>(self<currentRule.args:{a | , <a.name>}>):

 localctx = <parser.name>.<currentRule.ctxType>(self, self._ctx, self.state<currentRule.args:{a | , <a.name>}>)
 self.enterRule(localctx, <currentRule.startState>, self.RULE_<currentRule.name>)
 <namedActions.init>

```

```

<locals; separator="\n">
try:
 <code>
 <postamble; separator="\n">
 <namedActions.after>
<if(exceptions)>
<exceptions; separator="\n">
<else>
except RecognitionException as re:
 localctx.exception = re
 self._errHandler.reportError(self, re)
 self._errHandler.recover(self, re)
<endif>
finally:
 <finallyAction>
 self.exitRule()
return localctx

>>

LeftRecursiveRuleFunction(currentRule,args,code,locals,ruleCtx,altLabelCtxs,
namedActions,finallyAction,postamble) ::=

<<

<ruleCtx>
<altLabelCtxs:{l | <altLabelCtxs.(l)>}; separator="\n">

def <currentRule.name>(self, _p=0<if(currentRule.args)>, <args:{a | , <a>}><endif>):
 _parentctx = self._ctx
 _parentState = self.state
 localctx = <parser.name>.<currentRule.ctxType>(self, self._ctx, _parentState<args:{a | , <a.name>}>)
 _prevctx = localctx
 _startState = <currentRule.startState>
 self.enterRecursionRule(localctx, <currentRule.startState>, self.RULE_<currentRule.name>, _p)
 <namedActions.init>
 <locals; separator="\n">
 try:
 <code>
 <postamble; separator="\n">
 <namedActions.after>
 except RecognitionException as re:
 localctx.exception = re
 self._errHandler.reportError(self, re)
 self._errHandler.recover(self, re)
 finally:
 <finallyAction>
 self.unrollRecursionContexts(_parentctx)
 return localctx

```

>>

```
CodeBlockForOuterMostAlt(currentOuterMostAltCodeBlock, locals, preamble, ops) ::= <<
<if(currentOuterMostAltCodeBlock.altLabel)>localctx = <parser.name>.<currentOuterMostAltCodeBlock.altLabel;
format="cap">Context(self, localctx)<endif>
self.enterOuterAlt(localctx, <currentOuterMostAltCodeBlock.alt.altNum>)
<CodeBlockForAlt(currentAltCodeBlock=currentOuterMostAltCodeBlock, ...)>
>>
```

```
CodeBlockForAlt(currentAltCodeBlock, locals, preamble, ops) ::= <<
<locals; separator="\n">
<preamble; separator="\n">
<ops; separator="\n">
>>
```

```
LL1AltBlock(choice, preamble, alts, error) ::= <<
self.state = <choice.stateNumber>
self._errHandler.sync(self)
<if(choice.label)><labelref(choice.label)> = _input.LT(1)<endif>
<preamble; separator="\n">
token = self._input.LA(1)
<choice.altLook,alts:{look,alt| <cases(ttypes=look)>
 <alt>
 pass}; separator="\nel">
else:
 <error>
>>
```

```
LL1OptionalBlock(choice, alts, error) ::= <<
self.state = <choice.stateNumber>
self._errHandler.sync(self)
token = self._input.LA(1)
<choice.altLook,alts:{look,alt| <cases(ttypes=look)>
 <alt>
 pass}; separator="\nel">
else:
 pass
>>
```

```
LL1OptionalBlockSingleAlt(choice, expr, alts, preamble, error, followExpr) ::= <<
self.state = <choice.stateNumber>
self._errHandler.sync(self)
<preamble; separator="\n">
if <expr>:
 <alts; separator="\n">
```

```
<!else if (!(<followExpr>) <error>!>
```

```
>>
```

```
LL1StarBlockSingleAlt(choice, loopExpr, alts, preamble, iteration) ::= <<
```

```
self.state = <choice.stateNumber>
```

```
self._errHandler.sync(self)
```

```
<preamble; separator="\n">
```

```
while <loopExpr>:
```

```
 <alts; separator="\n">
```

```
 self.state = <choice.loopBackStateNumber>
```

```
 self._errHandler.sync(self)
```

```
 <iteration>
```

```
>>
```

```
LL1PlusBlockSingleAlt(choice, loopExpr, alts, preamble, iteration) ::= <<
```

```
self.state = <choice.blockStartStateNumber> <! alt block decision !>
```

```
self._errHandler.sync(self)
```

```
<preamble; separator="\n">
```

```
while True:
```

```
 <alts; separator="\n">
```

```
 self.state = <choice.stateNumber> <! loopback/exit decision !>
```

```
 self._errHandler.sync(self)
```

```
 <iteration>
```

```
 if not (<loopExpr>):
```

```
 break
```

```
>>
```

```
// LL(*) stuff
```

```
AltBlock(choice, preamble, alts, error) ::= <<
```

```
self.state = <choice.stateNumber>
```

```
self._errHandler.sync(self)
```

```
<if(choice.label)><labelref(choice.label)> = _input.LT(1)<endif>
```

```
<preamble; separator="\n">
```

```
la_ = self._interp.adaptivePredict(self._input,<choice.decision>,self._ctx)
```

```
<alts:{ alt |
```

```
if la_ == <i>:
```

```
 <alt>
```

```
 pass
```

```
}; separator="\nel">
```

```
>>
```

```
OptionalBlock(choice, alts, error) ::= <<
```

```
self.state = <choice.stateNumber>
```

```

self._errHandler.sync(self)
la_ = self._interp.adaptivePredict(self._input,<choice.decision>,self._ctx)
<alts:{ alt |
if la_ == <i><if(!choice.ast.greedy)>+1<endif>:
 <alt>
}; separator="\nел">

```

>>

```

StarBlock(choice, alts, sync, iteration) ::= <<
self.state = <choice.stateNumber>
self._errHandler.sync(self)
_alt = self._interp.adaptivePredict(self._input,<choice.decision>,self._ctx)
while _alt!=<choice.exitAlt> and _alt!=ATN.INVALID_ALT_NUMBER:
 if _alt==1<if(!choice.ast.greedy)>+1<endif>:
 <iteration>
 <alts> <! should only be one !>
 self.state = <choice.loopBackStateNumber>
 self._errHandler.sync(self)
 _alt = self._interp.adaptivePredict(self._input,<choice.decision>,self._ctx)

```

>>

```

PlusBlock(choice, alts, error) ::= <<
self.state = <choice.blockStartStateNumber> <! alt block decision !>
self._errHandler.sync(self)
_alt = 1<if(!choice.ast.greedy)>+1<endif>
while _alt!=<choice.exitAlt> and _alt!=ATN.INVALID_ALT_NUMBER:
 <alts:{ alt|
if _alt == <i><if(!choice.ast.greedy)>+1<endif>:
 <alt>
}; separator="\nел">
 else:
 <error>
 self.state = <choice.loopBackStateNumber> <! loopback/exit decision !>
 self._errHandler.sync(self)
 _alt = self._interp.adaptivePredict(self._input,<choice.decision>,self._ctx)

```

>>

```

Sync(s) ::= "sync(<s.expecting.name>)"

```

```

ThrowNoViableAlt(t) ::= "raise NoViableAltException(self)"

```

```

TestSetInline(s) ::= <<
<s.bitsets:{ bits | <if(rest(rest(bits.ttypes)))><bitsetBitfieldComparison(s, bits)><else><bitsetInlineComparison(s,
bits)><endif>}; separator=" or ">

```

>>

```

// Java language spec 15.19 - shift operators mask operands rather than overflow to 0... need range test
testShiftInRange(shiftAmount) ::= <<
((<shiftAmount>) & ~0x3f) == 0
>>

// produces smaller bytecode only when bits.ttypes contains more than two items
bitsetBitfieldComparison(s, bits) ::= <%
(<testShiftInRange({<offsetShiftVar(s.varName, bits.shift)>})> and ((1 \<< <offsetShiftVar(s.varName,
bits.shift)>) & (<bits.ttypes:{ttype | (1 \<< <offsetShiftType(ttype, bits.shift)>)}; separator=" | ">)) != 0)
%>

isZero ::= [
"0":true,
default:false
]

offsetShiftVar(shiftAmount, offset) ::= <%
<if(!isZero.(offset))><shiftAmount> - <offset><else><shiftAmount><endif>
%>

offsetShiftType(shiftAmount, offset) ::= <%
<if(!isZero.(offset))><parser.name>.<shiftAmount> - <offset><else><parser.name>.<shiftAmount><endif>
%>

// produces more efficient bytecode when bits.ttypes contains at most two items
bitsetInlineComparison(s, bits) ::= <%
<bits.ttypes:{ttype | <s.varName>==<parser.name>.<ttype>}; separator=" or ">
%>

cases(ttypes) ::= <<
if token in [<ttypes:{t | <parser.name>.<t>}; separator=", ">]:
>>

InvokeRule(r, argExprsChunks) ::= <<
self.state = <r.stateNumber>
<if(r.labels)><r.labels:{1 | <labelref(l)> =
}><endif>self.<r.name>(<if(r.ast.options.p)><r.ast.options.p><if(argExprsChunks)>,<endif><endif><argExprsChu
nks>)
>>

MatchToken(m) ::= <<
self.state = <m.stateNumber>
<if(m.labels)><m.labels:{1 | <labelref(l)> = }><endif>self.match(<parser.name>.<m.name>)
>>

MatchSet(m, expr, capture) ::= "<CommonSetStuff(m, expr, capture, false)>"

```

```
MatchNotSet(m, expr, capture) ::= "<CommonSetStuff(m, expr, capture, true)>"
```

```
CommonSetStuff(m, expr, capture, invert) ::= <<
self.state = <m.stateNumber>
<if(m.labels)><m.labels:{1 | <labelref(l)> = }>self._input.LT(1)<endif>
<capture>
<if(invert)>if <m.varName> \<= 0 or <expr><else>if not(<expr>)<endif>:
<if(m.labels)><m.labels:{1 | <labelref(l)> = }><else> <endif>self._errHandler.recoverInline(self)
else:
 self._errHandler.reportMatch(self)
 self.consume()
>>
```

```
Wildcard(w) ::= <<
self.state = <w.stateNumber>
<if(w.labels)><w.labels:{1 | <labelref(l)> = }><endif>self.matchWildcard()
>>
```

```
// ACTION STUFF
```

```
Action(a, foo, chunks) ::= "<chunks>"
```

```
ArgAction(a, chunks) ::= "<chunks>"
```

```
SemPred(p, chunks, failChunks) ::= <<
self.state = <p.stateNumber>
if not <chunks>:
 from antlr4.error.Errors import FailedPredicateException
 raise FailedPredicateException(self, <p.predicate><if(failChunks)>, <failChunks><elseif(p.msg)>,
<p.msg><endif>)
>>
```

```
ExceptionClause(e, catchArg, catchAction) ::= <<
except <catchArg>:
 <catchAction>
>>
```

```
// lexer actions are not associated with model objects
```

```
LexerSkipCommand() ::= "skip()"
```

```
LexerMoreCommand() ::= "more()"
```

```
LexerPopModeCommand() ::= "popMode()"
```

```
LexerTypeCommand(arg, grammar) ::= "_type = <arg>"
```

```
LexerChannelCommand(arg, grammar) ::= "_channel = <arg>"
```

```
LexerModeCommand(arg, grammar) ::= "_mode = <arg>"
```

```
LexerPushModeCommand(arg, grammar) ::= "pushMode(<arg>)"
```

```

ActionText(t) ::= "<t.text>"
ActionTemplate(t) ::= "<t.st>"
ArgRef(a) ::= "localctx.<a.name>"
LocalRef(a) ::= "localctx.<a.name>"
RetValRef(a) ::= "localctx.<a.name>"
QRetValRef(a) ::= "<ctx(a)>.<a.dict>.<a.name>"
/** How to translate $tokenLabel */
TokenRef(t) ::= "<ctx(t)>.<t.name>"
LabelRef(t) ::= "<ctx(t)>.<t.name>"
ListLabelRef(t) ::= "<ctx(t)>.<ListLabelName(t.name)>"
SetAttr(s,rhsChunks) ::= "<ctx(s)>.<s.name> = <rhsChunks>"

TokenLabelType() ::= "<file.TokenLabelType; null={Token}>"
InputSymbolType() ::= "<file.InputSymbolType; null={Token}>"

TokenPropertyRef_text(t) ::= "(None if <ctx(t)>.<t.label> is None else <ctx(t)>.<t.label>.text)"
TokenPropertyRef_type(t) ::= "(0 if <ctx(t)>.<t.label> is None else <ctx(t)>.<t.label>.type)"
TokenPropertyRef_line(t) ::= "(0 if <ctx(t)>.<t.label> is None else <ctx(t)>.<t.label>.line)"
TokenPropertyRef_pos(t) ::= "(0 if <ctx(t)>.<t.label> is None else <ctx(t)>.<t.label>.column)"
TokenPropertyRef_channel(t) ::= "(0 if <ctx(t)>.<t.label> is None else <ctx(t)>.<t.label>.channel)"
TokenPropertyRef_index(t) ::= "(0 if <ctx(t)>.<t.label> is None else <ctx(t)>.<t.label>.tokenIndex)"
TokenPropertyRef_int(t) ::= "(0 if <ctx(t)>.<t.label> is None else int(<ctx(t)>.<t.label>.text))"

RulePropertyRef_start(r) ::= "(None if <ctx(r)>.<r.label> is None else <ctx(r)>.<r.label>.start)"
RulePropertyRef_stop(r) ::= "(None if <ctx(r)>.<r.label> is None else <ctx(r)>.<r.label>.stop)"
RulePropertyRef_text(r) ::= "(None if <ctx(r)>.<r.label> is None else
self._input.getText(<ctx(r)>.<r.label>.start,<ctx(r)>.<r.label>.stop))"
RulePropertyRef_ctx(r) ::= "<ctx(r)>.<r.label>"
RulePropertyRef_parser(r) ::= "self"

ThisRulePropertyRef_start(r) ::= "localctx.start"
ThisRulePropertyRef_stop(r) ::= "localctx.stop"
ThisRulePropertyRef_text(r) ::= "self._input.getText(localctx.start, self._input.LT(-1))"
ThisRulePropertyRef_ctx(r) ::= "localctx"
ThisRulePropertyRef_parser(r) ::= "self"

NonLocalAttrRef(s) ::= "self.getInvokingContext(<s.ruleIndex>).<s.name>"
SetNonLocalAttr(s, rhsChunks) ::= "self.getInvokingContext(<s.ruleIndex>).<s.name> = <rhsChunks>"

AddToLabelList(a) ::= "<ctx(a.label)>.<a.listName>.append(<labelref(a.label)>)"

TokenDecl(t) ::= "self.<t.name> = None # <TokenLabelType()>"
TokenTypeDecl(t) ::= "self.<t.name> = 0 # <TokenLabelType()> type"
TokenListDecl(t) ::= "self.<t.name> = list() # of <TokenLabelType()>s"
RuleContextDecl(r) ::= "self.<r.name> = None # <r.ctxName>"
RuleContextListDecl(rdecl) ::= "self.<rdecl.name> = list() # of <rdecl.ctxName>s"

ContextTokenGetterDecl(t) ::= <<

```



```

def <t.name>(self):
 return self.getToken(<parser.name>.<t.name>, 0)
>>

// should never be called
ContextTokenListGetterDecl(t) ::= <<
def <t.name>_list(self):
 return self.getTokens(<parser.name>.<t.name>)
>>

ContextTokenListIndexedGetterDecl(t) ::= <<
def <t.name>(self, i=None):
 if i is None:
 return self.getTokens(<parser.name>.<t.name>)
 else:
 return self.getToken(<parser.name>.<t.name>, i)
>>

ContextRuleGetterDecl(r) ::= <<
def <r.name>(self):
 return self.getTypedRuleContext(<parser.name>.<r.ctxName>,0)

>>

// should never be called
ContextRuleListGetterDecl(r) ::= <<
def <r.name>_list(self):
 return self.getTypedRuleContexts(<parser.name>.<r.ctxName>)

>>

ContextRuleListIndexedGetterDecl(r) ::= <<
def <r.name>(self, i=None):
 if i is None:
 return self.getTypedRuleContexts(<parser.name>.<r.ctxName>)
 else:
 return self.getTypedRuleContext(<parser.name>.<r.ctxName>,i)

>>

LexerRuleContext() ::= "RuleContext"

/** The rule context name is the rule followed by a suffix; e.g.,
 * r becomes rContext.
 */
RuleContextNameSuffix() ::= "Context"

ImplicitTokenLabel(tokenName) ::= "_<tokenName>"

```

```

ImplicitRuleLabel(ruleName) ::= "_<ruleName>"
ImplicitSetLabel(id) ::= "_tset<id>"
ListLabelName(label) ::= "<label>"

CaptureNextToken(d) ::= "<d.varName> = self._input.LT(1)"
CaptureNextTokenType(d) ::= "<d.varName> = self._input.LA(1)"

StructDecl(struct,ctorAttrs,attrs, getters,dispatchMethods,interfaces,extensionMembers) ::= <<
class <struct.name>(<if(contextSuperClass)><contextSuperClass><else>ParserRuleContext<endif>):

 def __init__(self, parser, parent=None, invokingState=-1<struct.ctorAttrs:{a | <a.name>=None}>):
 super(<parser.name>.<struct.name>, self).__init__(parent, invokingState)
 self.parser = parser
 <attrs:{a | <a>}; separator="\n">
 <struct.ctorAttrs:{a | self.<a.name> = <a.name>}; separator="\n">

 <getters:{g | <g>}; separator="\n\n">

 def getRuleIndex(self):
 return <parser.name>.RULE_<struct.derivedFromName>

<if(struct.provideCopyFrom)> <! don't need copy unless we have subclasses !>
 def copyFrom(self, ctx):
 super(<parser.name>.<struct.name>, self).copyFrom(ctx)
 <struct.attrs:{a | self.<a.name> = ctx.<a.name>}; separator="\n">

<endif>
 <dispatchMethods; separator="\n">
 <extensionMembers; separator="\n">

>>

AltLabelStructDecl(struct,attrs, getters,dispatchMethods) ::= <<
class <struct.name>(<currentRule.name; format="cap">Context):

 def __init__(self, parser, ctx): # actually a <parser.name>.<currentRule.name; format="cap">Context)
 super(<parser.name>.<struct.name>, self).__init__(parser)
 <attrs:{a | <a>}; separator="\n">
 self.copyFrom(ctx)

 <getters:{g | <g>}; separator="\n">

 <dispatchMethods; separator="\n">

>>

ListenerDispatchMethod(method) ::= <<
def <if(method.isEnter)>enter<else>exit<endif>Rule(self, listener):

```

```

 if hasattr(listener, "<if(method.isEnter)>enter<else>exit<endif><struct.derivedFromName; format="cap">"):
 listener.<if(method.isEnter)>enter<else>exit<endif><struct.derivedFromName; format="cap">(self)

>>

VisitorDispatchMethod(method) ::= <<
def accept(self, visitor):
 if hasattr(visitor, "visit<struct.derivedFromName; format="cap">"):
 return visitor.visit<struct.derivedFromName; format="cap">(self)
 else:
 return visitor.visitChildren(self)

>>

AttributeDecl(d) ::= "self.<d.name> = <if(d.initValue)><d.initValue><else>None<endif>"

/** If we don't know location of label def x, use this template */
labelref(x) ::= "<if(!x.isLocal)>localctx.<endif><x.name>"

/** For any action chunk, what is correctly-typed context struct ptr? */
ctx(actionChunk) ::= "localctx"

// used for left-recursive rules
recRuleAltPredicate(ruleName,opPrec) ::= "self.precpred(self._ctx, <opPrec>)"
recRuleSetReturnAction(src,name) ::= "$<name>=<src>.<name>"
recRuleSetStopToken() ::= "self._ctx.stop = self._input.LT(-1)"

recRuleAltStartAction(ruleName, ctxName, label) ::= <<
localctx = <parser.name>.<ctxName>Context(self, _parentctx, _parentState)
<if(label)>localctx.<label> = _prevctx<endif>
self.pushNewRecursionContext(localctx, _startState, self.RULE_<ruleName>)
>>

recRuleLabeledAltStartAction(ruleName, currentAltLabel, label, isListLabel) ::= <<
localctx = <parser.name>.<currentAltLabel; format="cap">Context(self, <parser.name>.<ruleName;
format="cap">Context(self, _parentctx, _parentState))
<if(label)>
<if(isListLabel)>
localctx.<label>.append(_prevctx)
<else>
localctx.<label> = _prevctx
<endif>
<endif>
self.pushNewRecursionContext(localctx, _startState, self.RULE_<ruleName>)
>>

recRuleReplaceContext(ctxName) ::= <<

```

```

localctx = <parser.name>.<ctxName>Context(self, localctx)
self._ctx = localctx
_prevctx = localctx
>>

```

```

recRuleSetPrevCtx() ::= <<
if self._parseListeners is not None:
 self.triggerExitRuleEvent()
_prevctx = localctx
>>

```

```

LexerFile(lexerFile, lexer, namedActions) ::= <<
<fileHeader(lexerFile.grammarFileName, lexerFile.ANTLRVersion)>
encoding: utf-8
from __future__ import print_function
from antlr4 import *
from io import StringIO
import sys

```

```

<namedActions.header>

```

```

<lexer>
>>

```

```

Lexer(lexer, atn, actionFuncs, sempredFuncs, superClass) ::= <<
<if(superClass)>
if __name__ is not None and "." in __name__:
 from .<superClass> import <superClass>
else:
 from <superClass> import <superClass>

```

```

<endif>

```

```

<atn>

```

```

class <lexer.name>(<if(superClass)><superClass><else>Lexer<endif>):

```

```

 atn = ATNDeserializer().deserialize(serializedATN())

```

```

 decisionsToDFA = [DFA(ds, i) for i, ds in enumerate(atn.decisionToState)]

```

```

<if(lexer.channels)>
 <lexer.channels: {c| <c> = <lexer.channels.(c)>}; separator="\n">

```

```

<endif>

```

```

<if(rest(lexer.modes))>
 <rest(lexer.modes): {m| <m> = <i>}; separator="\n">

```

```

<endif>
 <if(lexer.tokens)>
 <lexer.tokens:{k | <k> = <lexer.tokens.(k)>}; separator="\n", wrap, anchor>
 <endif>

 channelNames = [u"DEFAULT_TOKEN_CHANNEL", u"HIDDEN"<if (lexer.channels)>, <lexer.channels:{c|
u"<c>"}; separator=", ", wrap, anchor><endif>]

 modeNames = [<lexer.modes:{m| u"<m>"}; separator=", ", wrap, anchor>]

 literalNames = [u"\<INVALID>",
 <lexer.literalNames:{t | u"<t>"}; separator=", ", wrap, anchor>]

 symbolicNames = [u"\<INVALID>",
 <lexer.symbolicNames:{t | u"<t>"}; separator=", ", wrap, anchor>]

 ruleNames = [<lexer.ruleNames:{r | u"<r>"}; separator=", ", wrap, anchor>]

 grammarFileName = u"<lexer.grammarFileName>"

 def __init__(self, input=None, output=sys.stdout):
 super(<lexer.name>, self).__init__(input, output=output)
 self.checkVersion("<lexerFile.ANTLRVersion>")
 self._interp = LexerATNSimulator(self, self.atn, self.decisionsToDFA, PredictionContextCache())
 self._actions = None
 self._predicates = None

 <namedActions.members>

 <dumpActions(lexer, "", actionFuncs, sempredFuncs)>

>>

SerializedATN(model) ::= <<
<! only one segment, can be inlined !>

def serializedATN():
 with StringIO() as buf:
 buf.write(u"<model.serialized; wrap={ }<\n> buf.write(u"}>")
 return buf.getvalue()

>>

/** Using a type to init value map, try to init a type; if not in table
 * must be an object, default value is "null".
 */
initValue(typeName) ::= <<

```

```
<pythonTypeInitMap.(typeName)>
```

```
>>
```

```
codeFileExtension() ::= ".py"
```

```
Found in path(s):
```

```
* /opt/cola/permits/1300428068_1649144266.79/0/antlr4-4-9-2-sources-
jar/org/antlr/v4/tool/templates/codegen/Python2/Python2.stg
```

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```

```
/*
```

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```

```
*/
```

```
tree grammar SourceGenTriggers;
```

```
options {
```

```
language = Java;
```

```
tokenVocab = ANTLRParser;
```

```
ASTLabelType = GrammarAST;
```

```
}
```

```
@header {
```

```

package org.antlr.v4.codegen;
import org.antlr.v4.misc.Utils;
import org.antlr.v4.codegen.model.*;
import org.antlr.v4.codegen.model.decl.*;
import org.antlr.v4.tool.*;
import org.antlr.v4.tool.ast.*;
import java.util.Collections;
import java.util.Map;
import java.util.HashMap;
}

@members {
public OutputModelController controller;
public boolean hasLookaheadBlock;
public SourceGenTriggers(TreeNodeStream input, OutputModelController controller) {
 this(input);
 this.controller = controller;
}
}

dummy : block[null, null] ;

block[GrammarAST label, GrammarAST ebnfRoot] returns [List<? extends SrcOp> omos]
: ^(blk=BLOCK (^ (OPTIONS .+))?
{List<CodeBlockForAlt> alts = new ArrayList<CodeBlockForAlt>();
(alternative {alts.add($alternative.altCodeBlock);})+
)
{
if (alts.size()==1 && ebnfRoot==null) return alts;
if (ebnfRoot==null) {
Somos = DefaultOutputModelFactory.list(controller.getChoiceBlock((BlockAST)$blk, alts, $label));
}
else {
Choice choice = controller.getEBNFBlock($ebnfRoot, alts);
hasLookaheadBlock |= choice instanceof PlusBlock || choice instanceof StarBlock;
Somos = DefaultOutputModelFactory.list(choice);
}
}
;

alternative returns [CodeBlockForAlt altCodeBlock, List<SrcOp> ops]
@init {
boolean outerMost = inContext("RULE BLOCK");
}
@after {
controller.finishAlternative($altCodeBlock, $ops, outerMost);
}
: a=alt[outerMost] { $altCodeBlock=$a.altCodeBlock; $ops=$a.ops;}

```

```

;

alt[boolean outerMost] returns [CodeBlockForAlt altCodeBlock, List<SrcOp> ops]
@init {
// set alt if outer ALT only (the only ones with alt field set to Alternative object)
AltAST altAST = (AltAST)retval.start;
if (outerMost) controller.setCurrentOuterMostAlt(altAST.alt);
}
: {
List<SrcOp> elems = new ArrayList<SrcOp>();
// TODO: shouldn't we pass $start to controller.alternative()?
$altCodeBlock = controller.alternative(controller.getCurrentOuterMostAlt(), outerMost);
$altCodeBlock.ops = $ops = elems;
controller.setCurrentBlock($altCodeBlock);
}
^(ALT elementOptions? (element {if ($element.omos!=null) elems.addAll($element.omos);})+)

| ^(ALT elementOptions? EPSILON)
 { $altCodeBlock = controller.epsilon(controller.getCurrentOuterMostAlt(), outerMost); }
;

```

```

element returns [List<? extends SrcOp> omos]
: labeledElement { $omos = $labeledElement.omos; }
| atom[null,false] { $omos = $atom.omos; }
| subrule { $omos = $subrule.omos; }
| ACTION { $omos = controller.action((ActionAST)$ACTION); }
| SEMPRED { $omos = controller.sempred((ActionAST)$SEMPRED); }
| ^(ACTION elementOptions) { $omos = controller.action((ActionAST)$ACTION); }
| ^(SEMPRED elementOptions) { $omos = controller.sempred((ActionAST)$SEMPRED); }
;

```

```

labeledElement returns [List<? extends SrcOp> omos]
: ^(ASSIGN ID atom[$ID,false]) { $omos = $atom.omos; }
| ^(PLUS_ASSIGN ID atom[$ID,false]) { $omos = $atom.omos; }
| ^(ASSIGN ID block[$ID,null]) { $omos = $block.omos; }
| ^(PLUS_ASSIGN ID block[$ID,null]) { $omos = $block.omos; }
;

```

```

subrule returns [List<? extends SrcOp> omos]
: ^(OPTIONAL b=block[null,$OPTIONAL])
{
$omos = $block.omos;
}
| (^(op=CLOSURE b=block[null,null])
| ^(op=POSITIVE_CLOSURE b=block[null,null])
)
{
List<CodeBlockForAlt> alts = new ArrayList<CodeBlockForAlt>();

```



```

SrcOp blk = $b.omos.get(0);
CodeBlockForAlt alt = new CodeBlockForAlt(controller.delegate);
alt.addOp(blk);
alts.add(alt);
SrcOp loop = controller.getEBNFBlock($op, alts); // "star it"
 hasLookaheadBlock |= loop instanceof PlusBlock || loop instanceof StarBlock;
 $omos = DefaultOutputModelFactory.list(loop);
}
| block[null, null] {$omos = $block.omos;}
;

blockSet[GrammarAST label, boolean invert] returns [List<SrcOp> omos]
: ^(SET atom[label,invert]+) {$omos = controller.set($SET, $label, invert);}
;

/*
setElement
: STRING_LITERAL
| TOKEN_REF
| ^(RANGE STRING_LITERAL STRING_LITERAL)
;
*/

// TODO: combine ROOT/BANG into one then just make new op ref'ing return value of atom/terminal...
// TODO: same for NOT
atom[GrammarAST label, boolean invert] returns [List<SrcOp> omos]
: ^(NOT a=atom[$label, true]) {$omos = $a.omos;}
| range[label] {$omos = $range.omos;}
| ^(DOT ID terminal[$label])
| ^(DOT ID ruleref[$label])
| ^(WILDCARD .) {$omos = controller.wildcard($WILDCARD, $label);}
| WILDCARD {$omos = controller.wildcard($WILDCARD, $label);}
| terminal[label] {$omos = $terminal.omos;}
| ruleref[label] {$omos = $ruleref.omos;}
| blockSet[$label, invert] {$omos = $blockSet.omos;}
;

ruleref[GrammarAST label] returns [List<SrcOp> omos]
: ^(RULE_REF ARG_ACTION? elementOptions?) {$omos = controller.ruleRef($RULE_REF, $label,
$ARG_ACTION);}
;

range[GrammarAST label] returns [List<SrcOp> omos]
: ^(RANGE a=STRING_LITERAL b=STRING_LITERAL)
;

terminal[GrammarAST label] returns [List<SrcOp> omos]
: ^(STRING_LITERAL .) {$omos = controller.stringRef($STRING_LITERAL, $label);}
;

```

```

| STRING_LITERAL {$omos = controller.stringRef($STRING_LITERAL, $label);}
| ^(TOKEN_REF ARG_ACTION .) {$omos = controller.tokenRef($TOKEN_REF, $label, $ARG_ACTION);}
| ^(TOKEN_REF .) {$omos = controller.tokenRef($TOKEN_REF, $label, null);}
| TOKEN_REF {$omos = controller.tokenRef($TOKEN_REF, $label, null);}
;

```

elementOptions

```

: ^(ELEMENT_OPTIONS elementOption+)
;

```

elementOption

```

: ID
| ^(ASSIGN ID ID)
| ^(ASSIGN ID STRING_LITERAL)
| ^(ASSIGN ID ACTION)
| ^(ASSIGN ID INT)
;

```

Found in path(s):

```

* /opt/cola/permits/1300428068_1649144266.79/0/antlr4-4-9-2-sources-
jar/org/antlr/v4/codegen/SourceGenTriggers.g

```

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```

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```

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```

*/

```

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\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/tool/AttributeResolver.java

\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/codegen/target/JavaScriptTarget.java

\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/analysis/LeftRecursionDetector.java

\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/codegen/model/chunk/ArgRef.java

\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/tool/ast/RuleRefAST.java

\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/codegen/model/decl/TokenDecl.java

\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/codegen/model/chunk/TokenPropertyRef\_int.java

\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/codegen/model/SemPred.java

\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/tool/ast/RuleElementAST.java

\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/tool/ToolMessage.java

\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/codegen/model/chunk/ThisRulePropertyRef\_parser.java

\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/codegen/model/chunk/TokenPropertyRef\_index.java

\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/codegen/target/SwiftTarget.java

\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/tool/ast/GrammarASTWithOptions.java

\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/tool/LabelType.java

\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/parse/ScopeParser.java

\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/semantics/SymbolCollector.java

\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/codegen/model/decl/ContextRuleListIndexedGetterDecl.java

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\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/semantics/UseDefAnalyzer.java  
\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/codegen/model/decl/TokenListDecl.java  
\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/unicode/UnicodeDataTemplateController.java  
\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/codegen/model/ListenerDispatchMethod.java  
\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/codegen/model/chunk/SetNonLocalAttr.java  
\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/semantics/SemanticPipeline.java  
\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/gui/TreeView.java  
\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/codegen/CodeGeneratorExtension.java  
\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/codegen/model/CaptureNextToken.java  
\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-



jar/org/antlr/v4/codegen/model/ThrowNoViableAlt.java  
\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/tool/ErrorSeverity.java  
\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/tool/LeftRecursionCyclesMessage.java  
\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/codegen/model/DispatchMethod.java  
\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/codegen/target/Python3Target.java  
\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/codegen/model/LexerFile.java  
\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/codegen/model/LL1AltBlock.java  
\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/codegen/model/chunk/TokenPropertyRef.java  
\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/codegen/model/chunk/RulePropertyRef\_parser.java  
\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/codegen/model/dbg.java  
\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/codegen/model/Recognizer.java  
\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/codegen/target/DartTarget.java  
\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/tool/ast/SetAST.java  
\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/tool/LeftRecursiveRule.java  
\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/codegen/model/chunk/RetValRef.java  
\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/gui/TestRig.java  
\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/codegen/model/Action.java  
\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/codegen/DefaultOutputModelFactory.java  
\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/codegen/model/Sync.java  
\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/misc/CharSupport.java  
\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/codegen/model/decl/ContextRuleGetterDecl.java  
\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/codegen/OutputModelController.java  
\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/automata/ATNPrinter.java  
\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/codegen/model/LeftRecursiveRuleFunction.java  
\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/codegen/model/ListenerFile.java  
\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/tool/ast/StarBlockAST.java  
\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/misc/Graph.java  
\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/codegen/model/decl/TokenTypeDecl.java  
\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/semantics/AttributeChecks.java  
\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/codegen/model/ElementFrequenciesVisitor.java

\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/codegen/model/decl/RuleContextListDecl.java  
\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/tool/ast/OptionalBlockAST.java  
\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/tool/GrammarSemanticsMessage.java  
\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/codegen/model/chunk/ActionChunk.java  
\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/codegen/ActionTranslator.java  
\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/codegen/model/chunk/TokenPropertyRef\_text.java  
\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/codegen/CodeGenerator.java  
\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/analysis/LeftRecursiveRuleAnalyzer.java  
\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/codegen/model/LL1PlusBlockSingleAlt.java  
\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/codegen/model/VisitorFile.java  
\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/tool/ast/PlusBlockAST.java  
\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/tool/ast/GrammarRootAST.java  
\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/parse/GrammarASTAdaptor.java  
\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/gui/Trees.java  
\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/gui/TreeTextProvider.java  
\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/codegen/target/CppTarget.java  
\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/codegen/model/chunk/SetAttr.java  
\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/tool/ast/TerminalAST.java  
\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/misc/Utils.java  
\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/codegen/target/GoTarget.java  
\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/codegen/model/decl/CodeBlock.java  
\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/codegen/model/StarBlock.java  
\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/codegen/model/decl/ContextTokenGetterDecl.java  
\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/codegen/model/decl/AttributeDecl.java  
\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/codegen/model/chunk/RulePropertyRef\_start.java  
\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/automata/ParserATNFactory.java  
\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/codegen/model/Parser.java

\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/codegen/model/chunk/TokenRef.java  
\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/misc/OrderedHashMap.java  
\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/tool/ANTLRMessage.java  
\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/codegen/target/PHPTarget.java  
\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/misc/FrequencySet.java  
\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/tool/LexerGrammar.java  
\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/tool/Grammar.java  
\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/tool/ast/BlockAST.java  
\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/tool/ast/GrammarASTErrorNode.java  
\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/codegen/model/LL1StarBlockSingleAlt.java  
\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/codegen/model/LL1OptionalBlock.java  
\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/tool/ast/GrammarAST.java  
\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/codegen/model/TestSetInline.java

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/\*

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\*/

```
tree grammar ATNBuilder;
```

```
options {
```

```
language = Java;
```

```
tokenVocab = ANTLRParser;
```

```
ASTLabelType = GrammarAST;
```

```
// filter = true;
```

```
}
```

```
// Include the copyright in this source and also the generated source
```

```
@header {
```

```
/*
```

```
[The "BSD license"]
```

```
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```

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```

```
*/
```

```
package org.antlr.v4.parse;
```

```
import org.antlr.v4.tool.*;
```

```
import org.antlr.v4.tool.ast.*;
```

```
import org.antlr.v4.automata.ATNFactory;
```

```
}
```

```
@members {
```

```
ATNFactory factory;
```

```
public ATNBuilder(TreeNodeStream input, ATNFactory factory) {
```

```
this(input);
```

```

 this.factory = factory;
 }
}

```

dummy : block[null] ; // avoid error about no start rule

ruleBlock[GrammarAST ebnfRoot] returns [ATNFactory.Handle p]

```

@init {
 List<ATNFactory.Handle> alts = new ArrayList<ATNFactory.Handle>();
 int alt = 1;
 factory.setCurrentOuterAlt(alt);
}
: ^(BLOCK
 (^ (OPTIONS .*)?
 (a=alternative
 {alts.add($a.p); factory.setCurrentOuterAlt(++alt);}
)+
)
 {$p = factory.block((BlockAST)$BLOCK, ebnfRoot, alts);}
;

```

block[GrammarAST ebnfRoot] returns [ATNFactory.Handle p]

```

@init {List<ATNFactory.Handle> alts = new ArrayList<ATNFactory.Handle>();}
: ^(BLOCK (^ (OPTIONS .*)? (a=alternative {alts.add($a.p);}))+
 {$p = factory.block((BlockAST)$BLOCK, ebnfRoot, alts);}
;

```

alternative returns [ATNFactory.Handle p]

```

@init {List<ATNFactory.Handle> els = new ArrayList<ATNFactory.Handle>();}
: ^(LEXER_ALT_ACTION a=alternative lexerCommands)
 {$p = factory.lexerAltCommands($a.p,$lexerCommands.p);}
| ^(ALT elementOptions? EPSILON) {$p = factory.epsilon($EPSILON);}
| ^(ALT elementOptions? (e=element {els.add($e.p);}))+ {$p = factory.alt(els);}
;

```

lexerCommands returns [ATNFactory.Handle p]

```

@init {List<ATNFactory.Handle> cmds = new ArrayList<ATNFactory.Handle>();}
: (c=lexerCommand {if ($c.cmd != null) cmds.add($c.cmd);}+
 {
 $p = factory.alt(cmds);
 }
;

```

lexerCommand returns [ATNFactory.Handle cmd]

```

: ^(LEXER_ACTION_CALL ID lexerCommandExpr)
 {$cmd = factory.lexerCallCommand($ID, $lexerCommandExpr.start);}
| ID
 {$cmd = factory.lexerCommand($ID);}

```

```

;

lexerCommandExpr
: ID
| INT
;

element returns [ATNFactory.Handle p]
: labeledElement {$p = $labeledElement.p;}
| atom {$p = $atom.p;}
| subrule {$p = $subrule.p;}
| ACTION {$p = factory.action((ActionAST)$ACTION);}
| SEMPRED {$p = factory.sempred((PredAST)$SEMPRED);}
| ^(ACTION .) {$p = factory.action((ActionAST)$ACTION);}
| ^(SEMPRED .) {$p = factory.sempred((PredAST)$SEMPRED);}
| ^(NOT b=blockSet[true]) {$p = $b.p;}
| LEXER_CHAR_SET {$p = factory.charSetLiteral($start);}
;

astOperand returns [ATNFactory.Handle p]
: atom {$p = $atom.p;}
| ^(NOT blockSet[true]) {$p = $blockSet.p;}
;

labeledElement returns [ATNFactory.Handle p]
: ^(ASSIGN ID element) {$p = factory.label($element.p);}
| ^(PLUS_ASSIGN ID element) {$p = factory.listLabel($element.p);}
;

subrule returns [ATNFactory.Handle p]
: ^(OPTIONAL block[$start]) {$p = $block.p;}
| ^(CLOSURE block[$start]) {$p = $block.p;}
| ^(POSITIVE_CLOSURE block[$start]) {$p = $block.p;}
| block[null] {$p = $block.p;}
;

blockSet[boolean invert] returns [ATNFactory.Handle p]
@init {List<GrammarAST> alts = new ArrayList<GrammarAST>();}
: ^(SET (setElement {alts.add($setElement.start);})+) {$p = factory.set($start, alts, $invert);}
;

/** Don't combine with atom otherwise it will build spurious ATN nodes */
setElement
: ^(STRING_LITERAL .)
| ^(TOKEN_REF .)
| STRING_LITERAL
| TOKEN_REF
| ^(RANGE a=STRING_LITERAL b=STRING_LITERAL)

```

```
| LEXER_CHAR_SET
```

```
;
```

```
atom returns [ATNFactory.Handle p]
```

```
: range { $p = $range.p; }
```

```
| ^(DOT ID terminal) { $p = $terminal.p; }
```

```
| ^(DOT ID ruleref) { $p = $ruleref.p; }
```

```
| ^(WILDCARD .) { $p = factory.wildcard($start); }
```

```
| WILDCARD { $p = factory.wildcard($start); }
```

```
| blockSet[false] { $p = $blockSet.p; }
```

```
| terminal { $p = $terminal.p; }
```

```
| ruleref { $p = $ruleref.p; }
```

```
;
```

```
ruleref returns [ATNFactory.Handle p]
```

```
: ^(RULE_REF ARG_ACTION? ^(ELEMENT_OPTIONS .*)) { $p = factory.ruleRef($RULE_REF); }
```

```
| ^(RULE_REF ARG_ACTION?) { $p = factory.ruleRef($RULE_REF); }
```

```
| RULE_REF { $p = factory.ruleRef($RULE_REF); }
```

```
;
```

```
range returns [ATNFactory.Handle p]
```

```
: ^(RANGE a=STRING_LITERAL b=STRING_LITERAL) { $p = factory.range($a,$b); }
```

```
;
```

```
terminal returns [ATNFactory.Handle p]
```

```
: ^(STRING_LITERAL .) { $p = factory.stringLiteral((TerminalAST)$start); }
```

```
| STRING_LITERAL { $p = factory.stringLiteral((TerminalAST)$start); }
```

```
| ^(TOKEN_REF ARG_ACTION .) { $p = factory.tokenRef((TerminalAST)$start); }
```

```
| ^(TOKEN_REF .) { $p = factory.tokenRef((TerminalAST)$start); }
```

```
| TOKEN_REF { $p = factory.tokenRef((TerminalAST)$start); }
```

```
;
```

```
elementOptions
```

```
: ^(ELEMENT_OPTIONS elementOption*)
```

```
;
```

```
elementOption
```

```
: ID
```

```
| ^(ASSIGN ID ID)
```

```
| ^(ASSIGN ID STRING_LITERAL)
```

```
| ^(ASSIGN ID ACTION)
```

```
| ^(ASSIGN ID INT)
```

```
;
```

```
Found in path(s):
```

```
* /opt/cola/permits/1300428068_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/parse/ATNBuilder.g
```

```
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```

```

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*/

```

```

atn(startState, states, edges, rankdir, decisionRanks, useBox) ::= <<
digraph ATN {
rankdir=LR;
<decisionRanks; separator="\n">
<states; separator="\n">
<edges; separator="\n">
}
>>

```

```

dfa(name, startState, states, edges, rankdir, decisionRanks, useBox) ::= <<
digraph <name> {
<if(rankdir)>rankdir=<rankdir>;<endif>
<decisionRanks; separator="\n">
<states; separator="\n">
<edges; separator="\n">
}
>>

```



```

decision-rank(states) ::= <<
{rank=same; rankdir=TB; <states:{s | s<s>}; separator="; ">}
>>

edge(src,target,label,arrowhead,transitionIndex) ::= <<
<src><if(transitionIndex)>p<transitionIndex><endif> -> <target> [fontsize=11, fontname="Courier", arrowsize=.7,
label = "<label>"<if(arrowhead)>, arrowhead = <arrowhead><endif>];
>>

action-edge(src,target,label,arrowhead,transitionIndex) ::= <<
<src><if(transitionIndex)>p<transitionIndex><endif> -> <target> [fontsize=11, fontname="Courier", arrowsize=.7,
label = "<label>"<if(arrowhead)>, arrowhead = <arrowhead><endif>];
>>

epsilon-edge(src,label,target,arrowhead,transitionIndex,loopback=false) ::= <<
<src><if(transitionIndex)>p<transitionIndex><endif> -> <target> [fontname="Times-Italic",
label="ε"<if(loopback)>, style="dashed"<endif>];
>>

state(state, label, name, transitions) ::= <%
<name>[fontsize=11,
label="
 <! rest(transition) tests for decision states: these nodes have a non-empty set of transitions after the first one. !>
 <if(rest(transitions))>
 {
 <! Label on the left side of the record node. !>
 <label>
 |
 <! Named ports in order on right side of record node, no display text. !>
 {<transitions:{t|\<p<i0>>}; separator="|">}}
 }
 <else>
 <label>
 <endif>
 "
 <if(rest(transitions))>
 , shape=record, fixedsize=false
 <else>
 , shape=circle, fixedsize=true, width=.55
 <endif>
 , peripheries=1];
%>

stopstate(name,label,actionIndex,useBox) ::= <<
<name>[fontsize=11, label="<label>"<if(actionIndex)>,\naction:<actionIndex><endif>",
<if(useBox)>shape=polygon,sides=4,peripheries=2,fixedsize=false<else>shape=doublecircle, fixedsize=true,
width=.6<endif>];
>>

```

Found in path(s):

```
* /opt/cola/permits/1300428068_1649144266.79/0/antlr4-4-9-2-sources-
jar/org/antlr/v4/tool/templates/dot/graphs.stg
```

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```

```
*/
```

```
/** templates used to generate make-compatible dependencies */
```

```
/** Generate "f : x, y, z" dependencies for input
```

```
* dependencies and generated files. in and out
```

```
* are File objects. For example, you can say
```

```
* <f.canonicalPath>
```

```
*/
```

```
dependencies(grammarFileName,in,out) ::= <<
```

```
<if(in)><grammarFileName>: <in; separator=", "><endif>
```

```
<out:{f | <f> : <grammarFileName>}; separator="\n">
```

```
>>
```

Found in path(s):

\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/tool/templates/depend.stg

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\*/

```
javaTypeInitMap ::= [
```

```
 "int": "0",
```

```
 "long": "0",
```

```
 "float": "0.0f",
```

```
 "double": "0.0",
```

```
 "boolean": "false",
```

```
 "byte": "0",
```

```
 "short": "0",
```

```
 "char": "0",
```

```
 default: "null" // anything other than a primitive type is an object
```

```
]
```

```
// args must be <object-model-object>, <fields-resulting-in-STs>
```

```
ParserFile(file, parser, namedActions, contextSuperClass) ::= <<
```

```

<fileHeader(file.grammarFileName, file.ANTLRVersion)>
<if(file.genPackage)>
package <file.genPackage>;
<endif>
<namedActions.header>
import org.antlr.v4.runtime.atn.*;
import org.antlr.v4.runtime.dfa.DFA;
import org.antlr.v4.runtime.*;
import org.antlr.v4.runtime.misc.*;
import org.antlr.v4.runtime.tree.*;
import java.util.List;
import java.util.Iterator;
import java.util.ArrayList;

<parser>
>>

```

```

ListenerFile(file, header, namedActions) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
<if(file.genPackage)>
package <file.genPackage>;
<endif>
<header>
import org.antlr.v4.runtime.tree.ParseTreeListener;

/**
 * This interface defines a complete listener for a parse tree produced by
 * { @link <file.parserName> }.
 */
public interface <file.grammarName>Listener extends ParseTreeListener {
 <file.listenerNames: {lname |
/**
<if(file.listenerLabelRuleNames.(lname))>
 * Enter a parse tree produced by the { @code <lname>}
 * labeled alternative in { @link <file.parserName>#<file.listenerLabelRuleNames.(lname)>}}.
<else>
 * Enter a parse tree produced by { @link <file.parserName>#<lname>}}.
<endif>
 * @param ctx the parse tree
 */
void enter<lname; format="cap">(<file.parserName>.<lname; format="cap">Context ctx);
/**
<if(file.listenerLabelRuleNames.(lname))>
 * Exit a parse tree produced by the { @code <lname>}
 * labeled alternative in { @link <file.parserName>#<file.listenerLabelRuleNames.(lname)>}}.
<else>
 * Exit a parse tree produced by { @link <file.parserName>#<lname>}}.
<endif>

```

```

* @param ctx the parse tree
*/
void exit<lname; format="cap">(<file.parserName>.<lname; format="cap">Context ctx);}; separator="\n">
}
>>

BaseListenerFile(file, header, namedActions) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
<if(file.genPackage)>
package <file.genPackage>;
<endif>
<header>

import org.antlr.v4.runtime.ParserRuleContext;
import org.antlr.v4.runtime.tree.ErrorNode;
import org.antlr.v4.runtime.tree.TerminalNode;

/**
 * This class provides an empty implementation of { @link <file.grammarName>Listener},
 * which can be extended to create a listener which only needs to handle a subset
 * of the available methods.
 */
public class <file.grammarName>BaseListener implements <file.grammarName>Listener {
 <file.listenerNames:{lname |
/**
 * { @inheritDoc\}
 *
 * \<p>The default implementation does nothing.\</p>
 */
 @Override public void enter<lname; format="cap">(<file.parserName>.<lname; format="cap">Context ctx) { \}
/**
 * { @inheritDoc\}
 *
 * \<p>The default implementation does nothing.\</p>
 */
 @Override public void exit<lname; format="cap">(<file.parserName>.<lname; format="cap">Context ctx) { \} };
 separator="\n">

/**
 * { @inheritDoc\}
 *
 * \<p>The default implementation does nothing.\</p>
 */
 @Override public void enterEveryRule(ParserRuleContext ctx) { }
/**
 * { @inheritDoc\}
 *
 * \<p>The default implementation does nothing.\</p>

```

```

*/
@Override public void exitEveryRule(ParserRuleContext ctx) { }
/**
 * {@inheritDoc}
 *
 * \<p>The default implementation does nothing.\</p>
*/
@Override public void visitTerminal(TerminalNode node) { }
/**
 * {@inheritDoc}
 *
 * \<p>The default implementation does nothing.\</p>
*/
@Override public void visitErrorNode(ErrorNode node) { }
}
>>

VisitorFile(file, header, namedActions) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
<if(file.genPackage)>
package <file.genPackage>;
<endif>
<header>
import org.antlr.v4.runtime.tree.ParseTreeVisitor;

/**
 * This interface defines a complete generic visitor for a parse tree produced
 * by { @link <file.parserName> }.
 *
 * @param \<T> The return type of the visit operation. Use { @link Void } for
 * operations with no return type.
 */
public interface <file.grammarName>Visitor\<T> extends ParseTreeVisitor\<T> {
 <file.visitorNames:{ lname |
/**
<if(file.visitorLabelRuleNames.(lname))>
 * Visit a parse tree produced by the { @code <lname>}
 * labeled alternative in { @link <file.parserName>#<file.visitorLabelRuleNames.(lname)>}|.
<else>
 * Visit a parse tree produced by { @link <file.parserName>#<lname>}|.
<endif>
 * @param ctx the parse tree
 * @return the visitor result
 */
 T visit<lname; format="cap">(<file.parserName>.<lname; format="cap">Context ctx);}; separator="\n">
}
>>

```

```

BaseVisitorFile(file, header, namedActions) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
<if(file.genPackage)>
package <file.genPackage>;
<endif>
<header>
import org.antlr.v4.runtime.tree.AbstractParseTreeVisitor;

/**
 * This class provides an empty implementation of { @link <file.grammarName>Visitor},
 * which can be extended to create a visitor which only needs to handle a subset
 * of the available methods.
 *
 * @param \<T> The return type of the visit operation. Use { @link Void} for
 * operations with no return type.
 */
public class <file.grammarName>BaseVisitor\<T> extends AbstractParseTreeVisitor\<T> implements
<file.grammarName>Visitor\<T> {
 <file.visitorNames:{lname |
/**
 * { @inheritDoc\}
 *
 * \<p>The default implementation returns the result of calling
 * { @link #visitChildren\} on { @code ctx\}.\</p>
 */
 @Override public T visit<lname; format="cap">(<file.parserName>.<lname; format="cap">Context ctx) { return
visitChildren(ctx); \} }; separator="\n">
 }
>>

fileHeader(grammarFileName, ANTLRVersion) ::= <<
// Generated from <grammarFileName; format="java-escape"> by ANTLR <ANTLRVersion>
>>

Parser(parser, funcs, atn, sempredFuncs, superClass) ::= <<
<Parser_(ctor="parser_ctor", ...)>
>>

Parser_(parser, funcs, atn, sempredFuncs, ctor, superClass) ::= <<
@SuppressWarnings({"all", "warnings", "unchecked", "unused", "cast"})
public class <parser.name> extends <superClass; null="Parser"> {
 static { RuntimeMetaData.checkVersion("<file.ANTLRVersion>", RuntimeMetaData.VERSION); }

 protected static final DFA[] _decisionToDFA;
 protected static final PredictionContextCache _sharedContextCache =
 new PredictionContextCache();
 <if(parser.tokens)>
 public static final int

```

```

<parser.tokens:{k | <k>=<parser.tokens.(k)>}; separator=", ", wrap, anchor>;
<endif>
<if(parser.rules)>
public static final int
<parser.rules:{r | RULE_<r.name> = <r.index>}; separator=", ", wrap, anchor>;
<endif>
private static String[] makeRuleNames() {
return new String[] {
<parser.ruleNames:{r | "<r>"}; separator=", ", wrap, anchor>
};
}
public static final String[] ruleNames = makeRuleNames();

<vocabulary(parser.literalNames, parser.symbolicNames)>

@Override
public String getGrammarFileName() { return "<parser.grammarFileName; format="java-escape">"; }

@Override
public String[] getRuleNames() { return ruleNames; }

@Override
public String getSerializedATN() { return _serializedATN; }

@Override
public ATN getATN() { return _ATN; }

<namedActions.members>
<parser:(ctor)()>
<funcs; separator="\n">

<if(sempredFuncs)>
public boolean sempred(RuleContext _localctx, int ruleIndex, int predIndex) {
switch (ruleIndex) {
<parser.sempredFuncs.values:{f}
case <f.ruleIndex>:
return <f.name>_sempred((<f.ctxType>)_localctx, predIndex);}; separator="\n">
}
return true;
}
<sempredFuncs.values; separator="\n">
<endif>

<atn>
}
>>

vocabulary(literalNames, symbolicNames) ::= <<

```



```

private static String[] makeLiteralNames() {
 return new String[] {
 <literalNames:{t | <t>}; null="null", separator=", ", wrap, anchor>
 };
}
private static final String[] _LITERAL_NAMES = makeLiteralNames();
private static String[] makeSymbolicNames() {
 return new String[] {
 <symbolicNames:{t | <t>}; null="null", separator=", ", wrap, anchor>
 };
}
private static final String[] _SYMBOLIC_NAMES = makeSymbolicNames();
public static final Vocabulary VOCABULARY = new VocabularyImpl(_LITERAL_NAMES,
 _SYMBOLIC_NAMES);

/**
 * @deprecated Use {@link #VOCABULARY} instead.
 */
@Deprecated
public static final String[] tokenNames;
static {
 tokenNames = new String[_SYMBOLIC_NAMES.length];
 for (int i = 0; i < tokenNames.length; i++) {
 tokenNames[i] = VOCABULARY.getLiteralName(i);
 if (tokenNames[i] == null) {
 tokenNames[i] = VOCABULARY.getSymbolicName(i);
 }

 if (tokenNames[i] == null) {
 tokenNames[i] = "\<INVALID>";
 }
 }
}

@Override
@Deprecated
public String[] getTokenNames() {
 return tokenNames;
}

@Override

public Vocabulary getVocabulary() {
 return VOCABULARY;
}
>>

dumpActions(recog, argFuncs, actionFuncs, sempredFuncs) ::= <<

```

```

<if(actionFuncs)>
@Override
public void action(RuleContext _localctx, int ruleIndex, int actionIndex) {
 switch (ruleIndex) {
 <recog.actionFuncs.values:{f|
 case <f.ruleIndex>:
 <f.name>_action((<f.ctxType>)_localctx, actionIndex);
 break;}; separator="\n">
 }
 }
 <actionFuncs.values; separator="\n">
<endif>
<if(sempredFuncs)>
@Override
public boolean sempred(RuleContext _localctx, int ruleIndex, int predIndex) {
 switch (ruleIndex) {
 <recog.sempredFuncs.values:{f|
 case <f.ruleIndex>:
 return <f.name>_sempred((<f.ctxType>)_localctx, predIndex);}; separator="\n">
 }
 return true;
 }
 <sempredFuncs.values; separator="\n">
<endif>
>>

parser_ctor(p) ::= <<
public <p.name>(TokenStream input) {
 super(input);
 _interp = new ParserATNSimulator(this,_ATN,_decisionToDFA,_sharedContextCache);
}
>>

/* This generates a private method since the actionIndex is generated, making an
* overriding implementation impossible to maintain.
*/
RuleActionFunction(r, actions) ::= <<
private void <r.name>_action(<r.ctxType> _localctx, int actionIndex) {
 switch (actionIndex) {
 <actions:{index|
 case <index>:
 <actions.(index)>
 break;}; separator="\n">
 }
 }
}
>>

/* This generates a private method since the predIndex is generated, making an

```

```

* overriding implementation impossible to maintain.
*/
RuleSempredFunction(r, actions) ::= <<
private boolean <r.name>_sempred(<r.ctxType> _localctx, int predIndex) {
 switch (predIndex) {
 <actions:{index|
case <index>:
return <actions.(index)>;}; separator="\n">
 }
 return true;
}
>>

RuleFunction(currentRule,args,code,locals,ruleCtx,altLabelCtxs,namedActions,finallyAction,postamble,exceptions)
::= <<

<ruleCtx>
<altLabelCtxs:{l | <altLabelCtxs.(l)>}; separator="\n">

<if(currentRule.modifiers)><currentRule.modifiers:{f | <f> }><else>public final <endif><currentRule.ctxType>
<currentRule.name>(<args; separator=",">) throws RecognitionException {
 <currentRule.ctxType> _localctx = new <currentRule.ctxType>(_ctx, getState())<currentRule.args:{a | ,
<a.name>}>>;
 enterRule(_localctx, <currentRule.startState>, RULE_<currentRule.name>);
 <namedActions.init>
 <locals; separator="\n">
 try {
 <if(currentRule.hasLookaheadBlock)>
 int _alt;
 <endif>
 <code>
 <postamble; separator="\n">
 <namedActions.after>
 }
 <if(exceptions)>
 <exceptions; separator="\n">
 <else>
 catch (RecognitionException re) {
 _localctx.exception = re;
 _errHandler.reportError(this, re);
 _errHandler.recover(this, re);
 }
 <endif>
 finally {
 <finallyAction>
 exitRule();
 }
 return _localctx;
}

```

```
}
>>
```

```
LeftRecursiveRuleFunction(currentRule,args,code,locals,ruleCtx,altLabelCtxs,
namedActions,finallyAction,postamble) ::= <<
```

```
<ruleCtx>
```

```
<altLabelCtxs:{l | <altLabelCtxs.(l)>}; separator="\n">
```

```
<if(currentRule.modifiers)><currentRule.modifiers:{f | <f> }><else>public final <endif><currentRule.ctxType>
<currentRule.name><(args; separator=", "> throws RecognitionException {
return <currentRule.name>(0<currentRule.args:{a | , <a.name>}>);
}
```

```
private <currentRule.ctxType> <currentRule.name>(int _p<args:{a | , <a>}>) throws RecognitionException {
ParserRuleContext _parentctx = _ctx;
int _parentState = getState();
<currentRule.ctxType> _localctx = new <currentRule.ctxType>(_ctx, _parentState<currentRule.args:{a | ,
<a.name>}>);
<currentRule.ctxType> _prevctx = _localctx;
int _startState = <currentRule.startState>;
enterRecursionRule(_localctx, <currentRule.startState>, RULE_<currentRule.name>, _p);
<namedActions.init>
<locals; separator="\n">
try {
<if(currentRule.hasLookaheadBlock)>
int _alt;
<endif>
<code>
<postamble; separator="\n">
<namedActions.after>
}
catch (RecognitionException re) {
_localctx.exception = re;
_errHandler.reportError(this, re);
_errHandler.recover(this, re);
}
finally {
<finallyAction>
unrollRecursionContexts(_parentctx);
}
return _localctx;
}
>>
```

```
CodeBlockForOuterMostAlt(currentOuterMostAltCodeBlock, locals, preamble, ops) ::= <<
```

```
<if(currentOuterMostAltCodeBlock.altLabel)>_localctx = new <currentOuterMostAltCodeBlock.altLabel>;
```

```

format="cap">Context(_localctx);<endif>
enterOuterAlt(_localctx, <currentOuterMostAltCodeBlock.alt.altNum>);
<CodeBlockForAlt(currentAltCodeBlock=currentOuterMostAltCodeBlock, ...)>
>>

```

```

CodeBlockForAlt(currentAltCodeBlock, locals, preamble, ops) ::= <<
{
<locals; separator="\n">
<preamble; separator="\n">
<ops; separator="\n">
}
>>

```

```

LL1AltBlock(choice, preamble, alts, error) ::= <<
setState(<choice.stateNumber>);
_errHandler.sync(this);
<if(choice.label)><labelref(choice.label)> = _input.LT(1);<endif>
<preamble; separator="\n">
switch (_input.LA(1)) {
<choice.altLook,alts:{look,alt| <cases(ttypes=look)>
<alt>
break;}; separator="\n">
default:
<error>
}
>>

```

```

LL1OptionalBlock(choice, alts, error) ::= <<
setState(<choice.stateNumber>);
_errHandler.sync(this);
switch (_input.LA(1)) {
<choice.altLook,alts:{look,alt| <cases(ttypes=look)>
<alt>
break;}; separator="\n">
default:
break;
}
>>

```

```

LL1OptionalBlockSingleAlt(choice, expr, alts, preamble, error, followExpr) ::= <<
setState(<choice.stateNumber>);
_errHandler.sync(this);
<preamble; separator="\n">
if (<expr>) {
<alts; separator="\n">
}
<!else if (!(<followExpr>)) <error!>
>>

```

```

LL1StarBlockSingleAlt(choice, loopExpr, alts, preamble, iteration) ::= <<
setState(<choice.stateNumber>);
_errHandler.sync(this);
<preamble; separator="\n">
while (<loopExpr>) {
 <alts; separator="\n">
 setState(<choice.loopBackStateNumber>);
 _errHandler.sync(this);
 <iteration>
}
>>

```

```

LL1PlusBlockSingleAlt(choice, loopExpr, alts, preamble, iteration) ::= <<
setState(<choice.blockStartStateNumber>); <! alt block decision !>
_errHandler.sync(this);
<preamble; separator="\n">
do {
 <alts; separator="\n">
 setState(<choice.stateNumber>); <! loopback/exit decision !>
 _errHandler.sync(this);
 <iteration>
} while (<loopExpr>);
>>

```

// LL(\*) stuff

```

AltBlock(choice, preamble, alts, error) ::= <<
setState(<choice.stateNumber>);
_errHandler.sync(this);
<if(choice.label)><labelref(choice.label)> = _input.LT(1);<endif>
<preamble; separator="\n">
switch (getInterpreter().adaptivePredict(_input,<choice.decision>,_ctx)) {
 <alts:{alt |
case <i>:
 <alt>
 break;}; separator="\n">
}
>>

```

```

OptionalBlock(choice, alts, error) ::= <<
setState(<choice.stateNumber>);
_errHandler.sync(this);
switch (getInterpreter().adaptivePredict(_input,<choice.decision>,_ctx)) {
 <alts:{alt |
case <i><if(!choice.ast.greedy)>+1<endif>:
 <alt>
 break;}; separator="\n">
}
>>

```

```
}
>>
```

```
StarBlock(choice, alts, sync, iteration) ::= <<
 setState(<choice.stateNumber>);
 _errHandler.sync(this);
 _alt = getInterpreter().adaptivePredict(_input,<choice.decision>,_ctx);
 while (_alt!=<choice.exitAlt> && _alt!=org.antlr.v4.runtime.atn.ATN.INVALID_ALT_NUMBER) {
 if (_alt==1<if(!choice.ast.greedy)>+1<endif>) {
 <iteration>
 <alts> <! should only be one !>
 }
 setState(<choice.loopBackStateNumber>);
 _errHandler.sync(this);
 _alt = getInterpreter().adaptivePredict(_input,<choice.decision>,_ctx);
 }
>>
```

```
PlusBlock(choice, alts, error) ::= <<
 setState(<choice.blockStartStateNumber>); <! alt block decision !>
 _errHandler.sync(this);
 _alt = 1<if(!choice.ast.greedy)>+1<endif>;
 do {
 switch (_alt) {
 <alts:{alt|
 case <i><if(!choice.ast.greedy)>+1<endif>:
 <alt>
 break;}; separator="\n">
 default:
 <error>
 }
 setState(<choice.loopBackStateNumber>); <! loopback/exit decision !>
 _errHandler.sync(this);
 _alt = getInterpreter().adaptivePredict(_input,<choice.decision>,_ctx);
 } while (_alt!=<choice.exitAlt> && _alt!=org.antlr.v4.runtime.atn.ATN.INVALID_ALT_NUMBER);
>>
```

```
Sync(s) ::= "sync(<s.expecting.name>);"
```

```
ThrowNoViableAlt(t) ::= "throw new NoViableAltException(this);"
```

```
TestSetInline(s) ::= <<
<s.bitsets:{bits | <if(rest(rest(bits.ttypes)))><bitsetBitfieldComparison(s, bits)><else><bitsetInlineComparison(s,
bits)><endif>}; separator=" || ">
>>
```

```
// Java language spec 15.19 - shift operators mask operands rather than overflow to 0... need range test
testShiftInRange(shiftAmount) ::= <<
```

```

((<shiftAmount>) & ~0x3f) == 0
>>

// produces smaller bytecode only when bits.ttypes contains more than two items
bitsetBitfieldComparison(s, bits) ::= <%
(<testShiftInRange({<offsetShift(s.varName, bits.shift)>})> && ((1L \<< <offsetShift(s.varName, bits.shift)>) &
(<bits.ttypes:{ ttype | (1L \<< <offsetShift(ttype, bits.shift)>)}; separator=" | ">)) != 0)
%>

isZero ::= [
"0":true,
default:false
]

offsetShift(shiftAmount, offset) ::= <%
<if(!isZero(offset))><shiftAmount> - <offset><else><shiftAmount><endif>
%>

// produces more efficient bytecode when bits.ttypes contains at most two items
bitsetInlineComparison(s, bits) ::= <%
<bits.ttypes:{ ttype | <s.varName>==<ttype>}; separator=" || ">
%>

cases(ttypes) ::= <<
<ttypes:{ t | case <t>:}; separator="\n">
>>

InvokeRule(r, argExprsChunks) ::= <<
setState(<r.stateNumber>);
<if(r.labels)><r.labels:{1 | <labelref(l)> =
}><endif><r.name><(<if(r.ast.options.p)><r.ast.options.p><if(argExprsChunks)><endif><endif><argExprsChunks>
);
>>

MatchToken(m) ::= <<
setState(<m.stateNumber>);
<if(m.labels)><m.labels:{1 | <labelref(l)> = }><endif>match(<m.name>);
>>

MatchSet(m, expr, capture) ::= "<CommonSetStuff(m, expr, capture, false)>"

MatchNotSet(m, expr, capture) ::= "<CommonSetStuff(m, expr, capture, true)>"

CommonSetStuff(m, expr, capture, invert) ::= <<
setState(<m.stateNumber>);
<if(m.labels)><m.labels:{1 | <labelref(l)> = }>_input.LT(1);<endif>
<capture>
if (<if(invert)><m.varName> \<= 0 || <else>!<endif><(<expr>)) {

```



```

<if(m.labels)><m.labels:{1 | <labelref(1)> = (Token)}><endif>_errHandler.recoverInline(this);
}
else {
if (_input.LA(1)==Token.EOF) matchedEOF = true;
_errHandler.reportMatch(this);
consume();
}
>>

```

```

Wildcard(w) ::= <<
setState(<w.stateNumber>);
<if(w.labels)><w.labels:{1 | <labelref(1)> = }><endif>matchWildcard();
>>

```

```
// ACTION STUFF
```

```
Action(a, foo, chunks) ::= "<chunks>"
```

```
ArgAction(a, chunks) ::= "<chunks>"
```

```

SemPred(p, chunks, failChunks) ::= <<
setState(<p.stateNumber>);
if (!(<chunks>)) throw new FailedPredicateException(this, <p.predicate><if(failChunks)>,
<failChunks><elseif(p.msg)>, <p.msg><endif>);
>>

```

```

ExceptionClause(e, catchArg, catchAction) ::= <<
catch (<catchArg>) {
<catchAction>
}
>>

```

```
// lexer actions are not associated with model objects
```

```
LexerSkipCommand() ::= "skip();"
```

```
LexerMoreCommand() ::= "more();"
```

```
LexerPopModeCommand() ::= "popMode();"
```

```
LexerTypeCommand(arg, grammar) ::= "_type = <arg>";"
```

```
LexerChannelCommand(arg, grammar) ::= "_channel = <arg>";"
```

```
LexerModeCommand(arg, grammar) ::= "_mode = <arg>";"
```

```
LexerPushModeCommand(arg, grammar) ::= "pushMode(<arg>);"
```

```
ActionText(t) ::= "<t.text>"
```

```
ActionTemplate(t) ::= "<t.st>"
```

```
ArgRef(a) ::= "_localctx.<a.name>"
```

```
LocalRef(a) ::= "_localctx.<a.name>"
```

```
RetValRef(a) ::= "_localctx.<a.name>"
```

```

QRetValueRef(a) ::= "<ctx(a)>.<a.dict>.<a.name>"
/** How to translate $tokenLabel */
TokenRef(t) ::= "<ctx(t)>.<t.name>"
LabelRef(t) ::= "<ctx(t)>.<t.name>"
ListLabelRef(t) ::= "<ctx(t)>.<ListLabelName(t.name)>"
SetAttr(s,rhsChunks) ::= "<ctx(s)>.<s.name> = <rhsChunks>;"

TokenLabelType() ::= "<file.TokenLabelType; null={Token}>"
InputSymbolType() ::= "<file.InputSymbolType; null={Token}>"

TokenPropertyRef_text(t) ::= "(<ctx(t)>.<t.label>!=null?<ctx(t)>.<t.label>.getText():null)"
TokenPropertyRef_type(t) ::= "(<ctx(t)>.<t.label>!=null?<ctx(t)>.<t.label>.getType():0)"
TokenPropertyRef_line(t) ::= "(<ctx(t)>.<t.label>!=null?<ctx(t)>.<t.label>.getLine():0)"
TokenPropertyRef_pos(t) ::= "(<ctx(t)>.<t.label>!=null?<ctx(t)>.<t.label>.getCharPositionInLine():0)"
TokenPropertyRef_channel(t) ::= "(<ctx(t)>.<t.label>!=null?<ctx(t)>.<t.label>.getChannel():0)"
TokenPropertyRef_index(t) ::= "(<ctx(t)>.<t.label>!=null?<ctx(t)>.<t.label>.getTokenIndex():0)"
TokenPropertyRef_int(t) ::= "(<ctx(t)>.<t.label>!=null?Integer.valueOf(<ctx(t)>.<t.label>.getText():0)"

RulePropertyRef_start(r) ::= "(<ctx(r)>.<r.label>!=null?(<ctx(r)>.<r.label>.start):null)"
RulePropertyRef_stop(r) ::= "(<ctx(r)>.<r.label>!=null?(<ctx(r)>.<r.label>.stop):null)"
RulePropertyRef_text(r) ::=
"(<ctx(r)>.<r.label>!=null?_input.getText(<ctx(r)>.<r.label>.start,<ctx(r)>.<r.label>.stop):null)"
RulePropertyRef_ctx(r) ::= "<ctx(r)>.<r.label>"
RulePropertyRef_parser(r) ::= "this"

ThisRulePropertyRef_start(r) ::= "_localctx.start"
ThisRulePropertyRef_stop(r) ::= "_localctx.stop"
ThisRulePropertyRef_text(r) ::= "_input.getText(_localctx.start, _input.LT(-1))"
ThisRulePropertyRef_ctx(r) ::= "_localctx"
ThisRulePropertyRef_parser(r) ::= "this"

NonLocalAttrRef(s) ::= "(<s.ruleName; format=\"cap\">Context)getInvokingContext(<s.ruleIndex>).<s.name>"
SetNonLocalAttr(s, rhsChunks) ::=
"(<s.ruleName; format=\"cap\">Context)getInvokingContext(<s.ruleIndex>).<s.name> = <rhsChunks>;"

AddToLabelList(a) ::= "<ctx(a.label)>.<a.listName>.add(<labelref(a.label)>);"

TokenDecl(t) ::= "<TokenLabelType()> <t.name>"
TokenTypeDecl(t) ::= "int <t.name>;"
TokenListDecl(t) ::= "List<Token> <t.name> = new ArrayList<Token>()"
RuleContextDecl(r) ::= "<r.ctxName> <r.name>"
RuleContextListDecl(rdecl) ::= "List<<rdecl.ctxName>> <rdecl.name> = new ArrayList<<rdecl.ctxName>>()"

ContextTokenGetterDecl(t) ::=
"public TerminalNode <t.name>() { return getToken(<parser.name>.<t.name>, 0); }"
ContextTokenListGetterDecl(t) ::=
"public List<TerminalNode> <t.name>() { return getTokens(<parser.name>.<t.name>); }"
ContextTokenListIndexedGetterDecl(t) ::= <<

```

```

public TerminalNode <t.name>(int i) {
 return getToken(<parser.name>.<t.name>, i);
}
>>
ContextRuleGetterDecl(r) ::= <<
public <r.ctxName> <r.name>() {
 return getRuleContext(<r.ctxName>.class,0);
}
>>
ContextRuleListGetterDecl(r) ::= <<
public List<<<r.ctxName>> <r.name>() {
 return getRuleContexts(<r.ctxName>.class);
}
>>
ContextRuleListIndexedGetterDecl(r) ::= <<
public <r.ctxName> <r.name>(int i) {
 return getRuleContext(<r.ctxName>.class,i);
}
>>

LexerRuleContext() ::= "RuleContext"

/** The rule context name is the rule followed by a suffix; e.g.,
 * r becomes rContext.
 */
RuleContextNameSuffix() ::= "Context"

ImplicitTokenLabel(tokenName) ::= "<tokenName>"
ImplicitRuleLabel(ruleName) ::= "<ruleName>"
ImplicitSetLabel(id) ::= "_tset<id>"
ListLabelName(label) ::= "<label>"

CaptureNextToken(d) ::= "<d.varName> = _input.LT(1);"
CaptureNextTokenType(d) ::= "<d.varName> = _input.LA(1);"

StructDecl(struct,ctorAttrs,attrs, getters,dispatchMethods,interfaces,extensionMembers)
::= <<
public static class <struct.name> extends
<if(contextSuperClass)><contextSuperClass><else>ParserRuleContext<endif><if(interfaces)> implements
<interfaces; separator=", "><endif> {
<attrs:{a | public <a>;}; separator="\n">
<getters:{g | <g>;}; separator="\n">
<if(ctorAttrs)>public <struct.name>(ParserRuleContext parent, int invokingState) { super(parent, invokingState);
}<endif>
public <struct.name>(ParserRuleContext parent, int invokingState<ctorAttrs:{a | , <a>>>) {
 super(parent, invokingState);
<struct.ctorAttrs:{a | this.<a.name> = <a.name>;}; separator="\n">
}
}

```

```

@Override public int getRuleIndex() { return RULE_<struct.derivedFromName>; }
<if(struct.provideCopyFrom)> <! don't need copy unless we have subclasses !>
public <struct.name>() { }
public void copyFrom(<struct.name> ctx) {
 super.copyFrom(ctx);
 <struct.attrs:{ a | this.<a.name> = ctx.<a.name>; }; separator="\n">
}
<endif>
<dispatchMethods; separator="\n">
<extensionMembers; separator="\n">
}
>>

```

```

AltLabelStructDecl(struct,attrs,getters,dispatchMethods) ::= <<
public static class <struct.name> extends <currentRule.name; format="cap">Context {
 <attrs:{ a | public <a>; }; separator="\n">
 <getters:{ g | <g>; }; separator="\n">
 public <struct.name>(<currentRule.name; format="cap">Context ctx) { copyFrom(ctx); }
 <dispatchMethods; separator="\n">
}
>>

```

```

ListenerDispatchMethod(method) ::= <<
@Override
public void <if(method.isEnter)>enter<else>exit<endif>Rule(ParseTreeListener listener) {
 if (listener instanceof <parser.grammarName>Listener)
 ((<parser.grammarName>Listener)listener).<if(method.isEnter)>enter<else>exit<endif><struct.derivedFromName;
 format="cap">(this);
}
>>

```

```

VisitorDispatchMethod(method) ::= <<
@Override
public <T> T accept(ParseTreeVisitor<? extends T> visitor) {
 if (visitor instanceof <parser.grammarName>Visitor) return ((<parser.grammarName>Visitor<? extends
 T>)visitor).visit<struct.derivedFromName; format="cap">(this);
 else return visitor.visitChildren(this);
}
>>

```

```

AttributeDecl(d) ::= "<d.type> <d.name><if(d.initValue)> = <d.initValue><endif>"

```

```

/** If we don't know location of label def x, use this template */
labelref(x) ::= "<if(!x.isLocal)>(<x.ctx.name>)_localctx.<endif><x.name>"

```

```

/** For any action chunk, what is correctly-typed context struct ptr? */
ctx(actionChunk) ::= "(<actionChunk.ctx.name>)_localctx"

```

```

// used for left-recursive rules
recRuleAltPredicate(ruleName,opPrec) ::= "precpred(_ctx, <opPrec>)"
recRuleSetReturnAction(src,name) ::= "$<name>=$<src>.<name>;"
recRuleSetStopToken() ::= "_ctx.stop = _input.LT(-1);"

recRuleAltStartAction(ruleName, ctxName, label, isListLabel) ::= <<
_localctx = new <ctxName>Context(_parentctx, _parentState);
<if(label)>
<if(isListLabel)>
_localctx.<label>.add(_prevctx);
<else>
_localctx.<label> = _prevctx;
<endif>
<endif>
<if(label)>_localctx.<label> = _prevctx;<endif>
pushNewRecursionContext(_localctx, _startState, RULE_<ruleName>);
>>

recRuleLabeledAltStartAction(ruleName, currentAltLabel, label, isListLabel) ::= <<
_localctx = new <currentAltLabel; format="cap">Context(new <ruleName; format="cap">Context(_parentctx,
_parentState));
<if(label)>
<if(isListLabel)>
((<currentAltLabel; format="cap">Context)_localctx).<label>.add(_prevctx);
<else>
((<currentAltLabel; format="cap">Context)_localctx).<label> = _prevctx;
<endif>
<endif>
pushNewRecursionContext(_localctx, _startState, RULE_<ruleName>);
>>

recRuleReplaceContext(ctxName) ::= <<
_localctx = new <ctxName>Context(_localctx);
_ctx = _localctx;
_prevctx = _localctx;
>>

recRuleSetPrevCtx() ::= <<
if (_parseListeners!=null) triggerExitRuleEvent();
_prevctx = _localctx;
>>

LexerFile(lexerFile, lexer, namedActions) ::= <<
<fileHeader(lexerFile.grammarFileName, lexerFile.ANTLRVersion)>
<if(lexerFile.genPackage)>
package <lexerFile.genPackage>;
<endif>

```

```

<namedActions.header>
import org.antlr.v4.runtime.Lexer;
import org.antlr.v4.runtime.CharStream;
import org.antlr.v4.runtime.Token;
import org.antlr.v4.runtime.TokenStream;
import org.antlr.v4.runtime.*;
import org.antlr.v4.runtime.atn.*;
import org.antlr.v4.runtime.dfa.DFA;
import org.antlr.v4.runtime.misc.*;

```

```

<lexer>
>>

```

```

Lexer(lexer, atn, actionFuncs, sempredFuncs, superClass) ::= <<
@SuppressWarnings({"all", "warnings", "unchecked", "unused", "cast"})
public class <lexer.name> extends <superClass; null="Lexer"> {
 static { RuntimeMetaData.checkVersion("<lexerFile.ANTLRVersion>", RuntimeMetaData.VERSION); }

 protected static final DFA[] _decisionToDFA;
 protected static final PredictionContextCache _sharedContextCache =
 new PredictionContextCache();
 <if(lexer.tokens)>
 public static final int
 <lexer.tokens:{k | <k>=<lexer.tokens.(k)>}; separator=", ", wrap, anchor>;
 <endif>
 <if(lexer.channels)>
 public static final int
 <lexer.channels:{c | <c>=<lexer.channels.(c)>}; separator=", ", wrap, anchor>;
 <endif>
 <if(rest(lexer.modes))>
 public static final int
 <rest(lexer.modes):{m | <m>=<i>}; separator=", ", wrap, anchor>;
 <endif>
 public static String[] channelNames = {
 "DEFAULT_TOKEN_CHANNEL", "HIDDEN"<if (lexer.channels)>, <lexer.channels:{c | "<c>"}; separator=", ",
wrap, anchor><endif>
 };

 public static String[] modeNames = {
 <lexer.modes:{m | "<m>"}; separator=", ", wrap, anchor>
 };

 private static String[] makeRuleNames() {
 return new String[] {
 <lexer.ruleNames:{r | "<r>"}; separator=", ", wrap, anchor>
 };
 }
 public static final String[] ruleNames = makeRuleNames();

```

```

<vocabulary(lexer.literalNames, lexer.symbolicNames)>

<namedActions.members>

public <lexer.name>(CharStream input) {
 super(input);
 _interp = new LexerATNSimulator(this, _ATN, _decisionToDFA, _sharedContextCache);
}

@Override
public String getGrammarFileName() { return "<lexer.grammarFileName>"; }

@Override
public String[] getRuleNames() { return ruleNames; }

@Override
public String getSerializedATN() { return _serializedATN; }

@Override
public String[] getChannelNames() { return channelNames; }

@Override
public String[] getModeNames() { return modeNames; }

@Override
public ATN getATN() { return _ATN; }

<dumpActions(lexer, "", actionFuncs, sempredFuncs)>
<atn>
}
>>

SerializedATN(model) ::= <<
<if(rest(model.segments))>
<! requires segmented representation !>
private static final int _serializedATNSegments = <length(model.segments)>;
<model.segments:{segment|private static final String _serializedATNSegment<i0> =
"<segment; wrap={ "+<n><t>" }>";}; separator="\n">
public static final String _serializedATN = Utils.join(
 new String[] {
 <model.segments:{segment | _serializedATNSegment<i0>}; separator=",\n">
 },
 ""
);
<else>
<! only one segment, can be inlined !>
public static final String _serializedATN =

```

```

"<model.serialized; wrap={ "+<\n><\t>" }>";
<endif>
public static final ATN _ATN =
 new ATNDeserializer().deserialize(_serializedATN.toCharArray());
static {
 _decisionToDFA = new DFA[_ATN.getNumberOfDecisions()];
 for (int i = 0; i < _ATN.getNumberOfDecisions(); i++) {
 _decisionToDFA[i] = new DFA(_ATN.getDecisionState(i), i);
 }
 <! org.antlr.v4.tool.DOTGenerator dot = new org.antlr.v4.tool.DOTGenerator(null);!>
 <! System.out.println(dot.getDOT(_ATN.decisionToState.get(0), ruleNames, false));!>
 <! System.out.println(dot.getDOT(_ATN.ruleToStartState[2], ruleNames, false));!>
}
>>

/** Using a type to init value map, try to init a type; if not in table
 * must be an object, default value is "null".
 */
initValue(typeName) ::= <<
<javaTypeInitMap.(typeName)>
>>

codeFileExtension() ::= ".java"

```

Found in path(s):

```

* /opt/cola/permits/1300428068_1649144266.79/0/antlr4-4-9-2-sources-
jar/org/antlr/v4/tool/templates/codegen/Java/Java.stg

```

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```

/*

```

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\*/

/\*

This file contains the actual layout of the messages emitted by ANTLR.

The text itself is coming out of the languages/\*stg files, according to the chosen locale.

This file contains the format that mimicks GCC output.

\*/

location(file, line, column) ::= "<file>:<line>:<column>:"

message(id, text) ::= "<text> [error <id>]"

report(location, message, type) ::= "<location> <type>: <message>"

wantsSingleLineMessage() ::= "true"

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\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/tool/templates/messages/formats/gnu.stg

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\*/

Found in path(s):

\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/parse/ANTLRLexer.java

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Found in path(s):

\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/META-

INF/maven/org/antlr/antlr4/pom.xml

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\*/

```
// args must be <object-model-object>, <fields-resulting-in-STs>
```

```
ParserFile(file, parser, namedActions, contextSuperClass) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
<if(file.genPackage)>
namespace <file.genPackage> {
<endif>
<namedActions.header>
using System;
using System.IO;
using System.Text;
using System.Diagnostics;
using System.Collections.Generic;
using Antlr4.Runtime;
using Antlr4.Runtime.Atn;
using Antlr4.Runtime.Misc;
using Antlr4.Runtime.Tree;
using DFA = Antlr4.Runtime.Dfa.DFA;

<parser>
<if(file.genPackage)>
} // namespace <file.genPackage>
<endif>
>>
```

```
ListenerFile(file, header, namedActions) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
<if(file.genPackage)>
namespace <file.genPackage> {
<endif>
<header>
using Antlr4.Runtime.Misc;
using IParseTreeListener = Antlr4.Runtime.Tree.IParseTreeListener;
using IToken = Antlr4.Runtime.IToken;
```

```
/// \<summary>
/// This interface defines a complete listener for a parse tree produced by
/// \<see cref="<csIdentifier.(file.parserName)>">/>.
/// \</summary>
[System.CodeDom.Compiler.GeneratedCode("ANTLR", "<file.ANTLRVersion>")]
[System.CLSCompliant(false)]
public interface I<file.grammarName>Listener : IParseTreeListener {
 <file.listenerNames> {Iname |
 /// \<summary>
 <if(file.listenerLabelRuleNames.(Iname))>
 /// Enter a parse tree produced by the \<c><Iname>\</c>
 /// labeled alternative in \<see cref="<file.parserName>.<file.listenerLabelRuleNames.(Iname)>">/>.
 <else>
```

```

// Enter a parse tree produced by \<see cref="<file.parserName>.<lname>"/>.
<endif>
// \</summary>
// \<param name="context">The parse tree.\</param>
void Enter<lname; format="cap">([NotNull] <csIdentifier.(file.parserName)>.<lname; format="cap">Context
context);
// \<summary>
<if(file.listenerLabelRuleNames.(lname))>
// Exit a parse tree produced by the \<c><lname></c>
// labeled alternative in \<see cref="<file.parserName>.<file.listenerLabelRuleNames.(lname)>"/>.
<else>
// Exit a parse tree produced by \<see cref="<file.parserName>.<lname>"/>.
<endif>
// \</summary>
// \<param name="context">The parse tree.\</param>
void Exit<lname; format="cap">([NotNull] <csIdentifier.(file.parserName)>.<lname; format="cap">Context
context);); separator="\n">
}
<if(file.genPackage)>
} // namespace <file.genPackage>
<endif>
>>

```

```

BaseListenerFile(file, header, namedActions) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
<if(file.genPackage)>
namespace <file.genPackage> {
<endif>
<header>

```

```

using Antlr4.Runtime.Misc;
using IErrorNode = Antlr4.Runtime.Tree.IErrorNode;
using ITerminalNode = Antlr4.Runtime.Tree.ITerminalNode;
using IToken = Antlr4.Runtime.IToken;
using ParserRuleContext = Antlr4.Runtime.ParserRuleContext;

```

```

// \<summary>
// This class provides an empty implementation of \<see cref="I<file.grammarName>Listener"/>,
// which can be extended to create a listener which only needs to handle a subset
// of the available methods.
// \</summary>

```

```

[System.CodeDom.Compiler.GeneratedCode("ANTLR", "<file.ANTLRVersion>")]
[System.Diagnostics.DebuggerNonUserCode]
[System.CLSCompliant(false)]
public partial class <file.grammarName>BaseListener : I<file.grammarName>Listener {
<file.listenerNames: {lname |
// \<summary>
<if(file.listenerLabelRuleNames.(lname))>

```

```

/// Enter a parse tree produced by the \<c><Iname>\</c>
/// labeled alternative in \<see cref="<file.parserName>.<file.listenerLabelRuleNames.(Iname)>"/>.
<else>
/// Enter a parse tree produced by \<see cref="<file.parserName>.<Iname>"/>.
<endif>
/// \<para>The default implementation does nothing.\</para>
/// \</summary>
/// \<param name="context">The parse tree.\</param>
public virtual void Enter<Iname; format="cap">([NotNull] <csIdentifier.(file.parserName)>.<Iname;
format="cap">Context context) { \}
/// \<summary>
<if(file.listenerLabelRuleNames.(Iname))>
/// Exit a parse tree produced by the \<c><Iname>\</c>
/// labeled alternative in \<see cref="<file.parserName>.<file.listenerLabelRuleNames.(Iname)>"/>.
<else>
/// Exit a parse tree produced by \<see cref="<file.parserName>.<Iname>"/>.
<endif>
/// \<para>The default implementation does nothing.\</para>
/// \</summary>
/// \<param name="context">The parse tree.\</param>
public virtual void Exit<Iname; format="cap">([NotNull] <csIdentifier.(file.parserName)>.<Iname;
format="cap">Context context) { \} }; separator="\n"

/// \<inheritdoc>
/// \<remarks>The default implementation does nothing.\</remarks>
public virtual void EnterEveryRule([NotNull] ParserRuleContext context) { }
/// \<inheritdoc>
/// \<remarks>The default implementation does nothing.\</remarks>
public virtual void ExitEveryRule([NotNull] ParserRuleContext context) { }
/// \<inheritdoc>
/// \<remarks>The default implementation does nothing.\</remarks>
public virtual void VisitTerminal([NotNull] ITerminalNode node) { }
/// \<inheritdoc>
/// \<remarks>The default implementation does nothing.\</remarks>
public virtual void VisitErrorNode([NotNull] IErrorNode node) { }
}
<if(file.genPackage)>
} // namespace <file.genPackage>
<endif>
>>

VisitorFile(file, header, namedActions) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
<if(file.genPackage)>
namespace <file.genPackage> {
<endif>
<header>
using Antlr4.Runtime.Misc;

```

```

using Antlr4.Runtime.Tree;
using IToken = Antlr4.Runtime.IToken;

/// \<summary>
/// This interface defines a complete generic visitor for a parse tree produced
/// by \<see cref="<csIdentifier.(file.parserName)>"/>.
/// \</summary>
/// \<typeparam name="Result">The return type of the visit operation.\</typeparam>
[System.CodeDom.Compiler.GeneratedCode("ANTLR", "<file.ANTLRVersion>")]
[System.CLSCompliant(false)]
public interface I<file.grammarName>Visitor<Result> : IParseTreeVisitor<Result> {
 <file.visitorNames:{ Iname |
/// \<summary>
<if(file.visitorLabelRuleNames.(Iname))>
/// Visit a parse tree produced by the \<c><Iname>\</c>
/// labeled alternative in \<see cref="<file.parserName>.<file.visitorLabelRuleNames.(Iname)>"/>.
<else>
/// Visit a parse tree produced by \<see cref="<file.parserName>.<Iname>"/>.
<endif>
/// \</summary>
/// \<param name="context">The parse tree.\</param>
/// \<return>The visitor result.\</return>
Result Visit<Iname; format="cap">([NotNull] <csIdentifier.(file.parserName)>.<Iname; format="cap">Context
context);}; separator="\n">
 }
 <if(file.genPackage)>
 } // namespace <file.genPackage>
 <endif>
}>>

```

```

BaseVisitorFile(file, header, namedActions) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
<if(file.genPackage)>
namespace <file.genPackage> {
<endif>
<header>
using Antlr4.Runtime.Misc;
using Antlr4.Runtime.Tree;
using IToken = Antlr4.Runtime.IToken;
using ParserRuleContext = Antlr4.Runtime.ParserRuleContext;

```

```

/// \<summary>
/// This class provides an empty implementation of \<see cref="I<file.grammarName>Visitor{Result}"/>,
/// which can be extended to create a visitor which only needs to handle a subset
/// of the available methods.
/// \</summary>
/// \<typeparam name="Result">The return type of the visit operation.\</typeparam>
[System.CodeDom.Compiler.GeneratedCode("ANTLR", "<file.ANTLRVersion>")]

```

```

[System.Diagnostics.DebuggerNonUserCode]
[System.CLSCompliant(false)]
public partial class <file.grammarName>BaseVisitor<Result> : AbstractParseTreeVisitor<Result>,
I<file.grammarName>Visitor<Result> {
 <file.visitorNames> { Iname |
 /// \<summary>
 <if(file.visitorLabelRuleNames.(Iname))>
 /// Visit a parse tree produced by the \<c><Iname>\</c>
 /// labeled alternative in \<see cref="<file.parserName>.<file.visitorLabelRuleNames.(Iname)>">/.
 <else>
 /// Visit a parse tree produced by \<see cref="<file.parserName>.<Iname>">/.
 <endif>
 /// \<para>
 /// The default implementation returns the result of calling \<see
 cref="AbstractParseTreeVisitor{Result}.VisitChildren(IRuleNode)">
 /// on \<paramref name="context">.
 /// \</para>
 /// \</summary>
 /// \<param name="context">The parse tree.\</param>
 /// \<return>The visitor result.\</return>
 public virtual Result Visit<Iname; format="cap">([NotNull] <csIdentifier.(file.parserName)>.<Iname;
 format="cap">Context context) { return VisitChildren(context); \}}; separator="\n">
 }
 <if(file.genPackage)>
 } // namespace <file.genPackage>
 <endif>
>>

fileHeader(grammarFileName, ANTLRVersion) ::= <<
//-----
// \<auto-generated>
// This code was generated by a tool.
// ANTLR Version: <ANTLRVersion>
//
// Changes to this file may cause incorrect behavior and will be lost if
// the code is regenerated.
// \</auto-generated>
//-----

// Generated from <grammarFileName> by ANTLR <ANTLRVersion>

// Unreachable code detected
#pragma warning disable 0162
// The variable '...' is assigned but its value is never used
#pragma warning disable 0219
// Missing XML comment for publicly visible type or member '...'
#pragma warning disable 1591
// Ambiguous reference in cref attribute

```

```
#pragma warning disable 419
```

```
>>
```

```
Parser(parser, funcs, atn, sempredFuncs, superClass) ::= <<
```

```
<Parser_(ctor="parser_ctor", ...)>
```

```
>>
```

```
Parser_(parser, funcs, atn, sempredFuncs, ctor, superClass) ::= <<
```

```
[System.CodeDom.Compiler.GeneratedCode("ANTLR", "<file.ANTLRVersion>")]
```

```
[System.CLSCompliant(false)]
```

```
public partial class <csIdentifier.(parser.name)> : <superClass>; null="Parser"> {
```

```
protected static DFA[] decisionToDFA;
```

```
protected static PredictionContextCache sharedContextCache = new PredictionContextCache();
```

```
<if(parser.tokens)>
```

```
public const int
```

```
<parser.tokens:{k | <k>=<parser.tokens.(k)>}; separator=", ", wrap, anchor>;
```

```
<endif>
```

```
<if(parser.rules)>
```

```
public const int
```

```
<parser.rules:{r | RULE_<r.name> = <r.index>}; separator=", ", wrap, anchor>;
```

```
<endif>
```

```
public static readonly string[] ruleNames = {
```

```
<parser.ruleNames:{r | "<r>"}; separator=", ", wrap, anchor>
```

```
};
```

```
<vocabulary(parser.literalNames, parser.symbolicNames)>
```

```
public override string GrammarFileName { get { return "<parser.grammarFileName>"; } }
```

```
public override string[] RuleNames { get { return ruleNames; } }
```

```
public override string SerializedAtn { get { return new string(_serializedATN); } }
```

```
static <csIdentifier.(parser.name)>() {
```

```
decisionToDFA = new DFA[_ATN.NumberOfDecisions];
```

```
for (int i = 0; i < _ATN.NumberOfDecisions; i++) {
```

```
decisionToDFA[i] = new DFA(_ATN.GetDecisionState(i), i);
```

```
}
```

```
}
```

```
<namedActions.members>
```

```
<parser:(ctor)()>
```

```
<funcs; separator="\n">
```

```
<if(sempredFuncs)>
```

```
public override bool Sempred(RuleContext _localctx, int ruleIndex, int predIndex) {
```

```
switch (ruleIndex) {
```



```

 <parser.sempredFuncs.values:{f}
case <f.ruleIndex>: return <f.name>_sempred((<f.ctxType>)_localctx, predIndex);}; separator="\n">
}
return true;
}
<sempredFuncs.values; separator="\n">
<endif>

```

```

<atn>
}
>>

```

```

vocabulary(literalNames, symbolicNames) ::= <<
private static readonly string[] _LiteralNames = {
<literalNames:{t | <t>}; null="null", separator=" ", wrap, anchor>
};
private static readonly string[] _SymbolicNames = {
<symbolicNames:{t | <t>}; null="null", separator=" ", wrap, anchor>
};
public static readonly IVocabulary DefaultVocabulary = new Vocabulary(_LiteralNames, _SymbolicNames);

```

```

[NotNull]
public override IVocabulary Vocabulary
{
get
{
return DefaultVocabulary;
}
}
>>

```

```

dumpActions(recog, argFuncs, actionFuncs, sempredFuncs) ::= <<
<if(actionFuncs)>
public override void Action(RuleContext _localctx, int ruleIndex, int actionIndex) {
switch (ruleIndex) {
<recog.actionFuncs.values:{f}
case <f.ruleIndex> : <f.name>_action(<if(!recog.modes)>(<f.ctxType>)<endif>_localctx, actionIndex); break;};
separator="\n">
}
}
<actionFuncs.values; separator="\n">
<endif>
<if(sempredFuncs)>
public override bool Sempred(RuleContext _localctx, int ruleIndex, int predIndex) {
switch (ruleIndex) {
<recog.sempredFuncs.values:{f}
case <f.ruleIndex> : return <f.name>_sempred(<if(!recog.modes)>(<f.ctxType>)<endif>_localctx, predIndex);};
separator="\n">
}
}

```

```

 }
 return true;
}
<sempredFuncs.values; separator="\n">
<endif>
>>

parser_ctor(parser) ::= <<
public <csIdentifier.(parser.name)>(ITokenStream input) : this(input, Console.Out, Console.Error) { }

public <csIdentifier.(parser.name)>(ITokenStream input, TextWriter output, TextWriter errorOutput)
: base(input, output, errorOutput)
{
 Interpreter = new ParserATNSimulator(this, _ATN, decisionToDFA, sharedContextCache);
}
>>

/* This generates a private method since the actionIndex is generated, making an
* overriding implementation impossible to maintain.
*/
RuleActionFunction(r, actions) ::= <<
private void <r.name>_action(<r.ctxType> _localctx, int actionIndex) {
 switch (actionIndex) {
 <actions:{index|
case <index>: <actions.(index)> break;}; separator="\n">
 }
}
>>

/* This generates a private method since the predIndex is generated, making an
* overriding implementation impossible to maintain.
*/
RuleSempredFunction(r, actions) ::= <<
private bool <r.name>_sempred(<r.ctxType> _localctx, int predIndex) {
 switch (predIndex) {
 <actions:{index|
case <index>: return <actions.(index)>;}; separator="\n">
 }
 return true;
}
>>

RuleFunction(currentRule,args,code,locals,ruleCtx,altLabelCtxs,namedActions,finallyAction,postamble,exceptions)
::= <<

<if(ruleCtx)>
<ruleCtx>
<endif>

```

```
<altLabelCtxs:{l | <altLabelCtxs.(l)>}; separator="\n">
```

```
[RuleVersion(<namedActions.version; null="0">)]
<if(currentRule.modifiers)><currentRule.modifiers:{f | <f> }><else>public <endif><currentRule.ctxType>
<csIdentifier.(currentRule.name)>(<args; separator=", ">) {
 <currentRule.ctxType> _localctx = new <currentRule.ctxType>(Context, State<currentRule.args:{a | ,
<csIdentifier.(a.name)>}>);
 EnterRule(_localctx, <currentRule.startState>, RULE_<currentRule.name>);
 <namedActions.init>
 <locals; separator="\n">
 try {
<if(currentRule.hasLookaheadBlock)>
 int _alt;
<endif>
<code>
 <postamble; separator="\n">
 <namedActions.after>
 }
<if(exceptions)>
<exceptions; separator="\n">
<else>
 catch (RecognitionException re) {
 _localctx.exception = re;
 ErrorHandler.ReportError(this, re);
 ErrorHandler.Recover(this, re);
 }
<endif>
 finally {
 <finallyAction>
 ExitRule();
 }
 return _localctx;
}
>>
```

```
LeftFactoredRuleFunction(currentRule,args,code,locals,namedActions,finallyAction,postamble) ::=
```

```
<<
```

```
<if(currentRule.modifiers)><currentRule.modifiers:{f | <f> }><else>private <endif><currentRule.ctxType>
<csIdentifier.(currentRule.name)>(<args; separator=", ">) {
 <currentRule.ctxType> _localctx = new <currentRule.ctxType>(Context, State<currentRule.args:{a | ,
<csIdentifier.(a.name)>}>);
 EnterLeftFactoredRule(_localctx, <currentRule.startState>, RULE_<currentRule.variantOf>);
 <namedActions.init>
 <locals; separator="\n">
 try {
<if(currentRule.hasLookaheadBlock)>
 int _alt;
```

```

<endif>
<code>
<postamble; separator="\n">
<namedActions.after>
}
catch (RecognitionException re) {
 _localctx.exception = re;
 ErrorHandler.ReportError(this, re);
 ErrorHandler.Recover(this, re);
}
finally {
 <finallyAction>
 ExitRule();
}
return _localctx;
}
>>

// This behaves similar to RuleFunction (enterRule is called, and no adjustments
// are made to the parse tree), but since it's still a variant no context class
// needs to be generated.
LeftUnfactoredRuleFunction(currentRule,args,code,locals,namedActions,finallyAction,postamble) ::=
<<

<if(currentRule.modifiers)><currentRule.modifiers:{f| <f> }><else>private <endif><currentRule.ctxType>
<csIdentifier.(currentRule.name)><(args; separator=", "> {
 <currentRule.ctxType> _localctx = new <currentRule.ctxType>(Context, State<currentRule.args:{a| ,
 <csIdentifier.(a.name)>>>);
 EnterRule(_localctx, <currentRule.startState>, RULE_<currentRule.variantOf>);
 <namedActions.init>
 <locals; separator="\n">
 try {
 <if(currentRule.hasLookaheadBlock)>
 int _alt;
 <endif>
 <code>
 <postamble; separator="\n">
 <namedActions.after>
 }
 catch (RecognitionException re) {
 _localctx.exception = re;
 ErrorHandler.ReportError(this, re);
 ErrorHandler.Recover(this, re);
 }
 finally {
 <finallyAction>
 ExitRule();
 }
}

```

```

return _localctx;
}
>>

```

```

LeftRecursiveRuleFunction(currentRule,args,code,locals,ruleCtx,altLabelCtxs,
namedActions,finallyAction,postamble) ::=
<<

```

```

<ruleCtx>

```

```

<altLabelCtxs:{l | <altLabelCtxs.(l)>}; separator="\n">

```

```

[RuleVersion(<namedActions.version; null="0">)]

```

```

<if(currentRule.modifiers)><currentRule.modifiers:{f | <f> }><else>public <endif><currentRule.ctxType>
<csIdentifier.(currentRule.name)>(<args; separator=", ">) {
return <csIdentifier.(currentRule.name)>(0<currentRule.args:{a | , <csIdentifier.(a.name)>}>);
}

```

```

private <currentRule.ctxType> <csIdentifier.(currentRule.name)>(int _p<args:{a | , <a>}>) {

```

```

 ParserRuleContext _parentctx = Context;

```

```

 int _parentState = State;

```

```

 <currentRule.ctxType> _localctx = new <currentRule.ctxType>(Context, _parentState<currentRule.args:{a | ,
<csIdentifier.(a.name)>}>);

```

```

 <currentRule.ctxType> _prevctx = _localctx;

```

```

 int _startState = <currentRule.startState>;

```

```

 EnterRecursionRule(_localctx, <currentRule.startState>, RULE_<currentRule.name>, _p);

```

```

 <namedActions.init>

```

```

 <locals; separator="\n">

```

```

 try {

```

```

 <if(currentRule.hasLookaheadBlock)>

```

```

 int _alt;

```

```

 <endif>

```

```

 <code>

```

```

 <postamble; separator="\n">

```

```

 <namedActions.after>

```

```

 }

```

```

 catch (RecognitionException re) {

```

```

 _localctx.exception = re;

```

```

 ErrorHandler.ReportError(this, re);

```

```

 ErrorHandler.Recover(this, re);

```

```

 }

```

```

 finally {

```

```

 <finallyAction>

```

```

 UnrollRecursionContexts(_parentctx);

```

```

 }

```

```

 return _localctx;

```

```

 }

```

```

>>

```

```

CodeBlockForOuterMostAlt(currentOuterMostAltCodeBlock, locals, preamble, ops) ::= <<
<if(currentOuterMostAltCodeBlock.altLabel)>_localctx = new <currentOuterMostAltCodeBlock.altLabel;
format="cap">Context(_localctx);<endif>
EnterOuterAlt(_localctx, <currentOuterMostAltCodeBlock.alt.altNum>);
<CodeBlockForAlt(currentAltCodeBlock=currentOuterMostAltCodeBlock, ...)>
>>

```

```

CodeBlockForAlt(currentAltCodeBlock, locals, preamble, ops) ::= <<
{
<locals; separator="\n">
<preamble; separator="\n">
<ops; separator="\n">
}
>>

```

```

LL1AltBlock(choice, preamble, alts, error) ::= <<
State = <choice.stateNumber>;
ErrorHandler.Sync(this);
<if(choice.label)><labelref(choice.label)> = TokenStream.LT(1);<endif>
<preamble; separator="\n">
switch (TokenStream.LA(1)) {
<choice.altLook,alts:{look,alt| <cases(ttypes=look)>
<alt>
break;}; separator="\n">
default:
<error>
}
>>

```

```

LL1OptionalBlock(choice, alts, error) ::= <<
State = <choice.stateNumber>;
ErrorHandler.Sync(this);
switch (TokenStream.LA(1)) {
<choice.altLook,alts:{look,alt| <cases(ttypes=look)>
<alt>
break;}; separator="\n">
default:
break;
}
>>

```

```

LL1OptionalBlockSingleAlt(choice, expr, alts, preamble, error, followExpr) ::= <<
State = <choice.stateNumber>;
ErrorHandler.Sync(this);
<preamble; separator="\n">
if (<expr>) {
<alts; separator="\n">
}

```

```
<!else if (!(<followExpr>) <error!>
```

```
>>
```

```
LL1StarBlockSingleAlt(choice, loopExpr, alts, preamble, iteration) ::= <<
```

```
State = <choice.stateNumber>;
```

```
ErrorHandler.Sync(this);
```

```
<preamble; separator="\n">
```

```
while (<loopExpr>) {
```

```
<alts; separator="\n">
```

```
State = <choice.loopBackStateNumber>;
```

```
ErrorHandler.Sync(this);
```

```
<iteration>
```

```
}
```

```
>>
```

```
LL1PlusBlockSingleAlt(choice, loopExpr, alts, preamble, iteration) ::= <<
```

```
State = <choice.blockStartStateNumber>;<! alt block decision !>
```

```
ErrorHandler.Sync(this);
```

```
<preamble; separator="\n">
```

```
do {
```

```
<alts; separator="\n">
```

```
State = <choice.stateNumber>;<! loopback/exit decision !>
```

```
ErrorHandler.Sync(this);
```

```
<iteration>
```

```
} while (<loopExpr>);
```

```
>>
```

```
// LL(*) stuff
```

```
AltBlock(choice, preamble, alts, error) ::= <<
```

```
State = <choice.stateNumber>;
```

```
ErrorHandler.Sync(this);
```

```
<if(choice.label)><labelref(choice.label)> = TokenStream.LT(1);<endif>
```

```
<preamble; separator="\n">
```

```
switch (Interpreter.AdaptivePredict(TokenStream,<choice.decision>,Context)) {
```

```
<alts:{ alt |
```

```
case <i>:
```

```
<alt>
```

```
break;}; separator="\n">
```

```
}
```

```
>>
```

```
OptionalBlock(choice, alts, error) ::= <<
```

```
State = <choice.stateNumber>;
```

```
ErrorHandler.Sync(this);
```

```
switch (Interpreter.AdaptivePredict(TokenStream,<choice.decision>,Context)) {
```

```
<alts:{ alt |
```

```
case <i><if(!choice.ast.greedy)>+1<endif>:
```

```

<alt>
break;}; separator="\n">
}
>>

StarBlock(choice, alts, sync, iteration) ::= <<
State = <choice.stateNumber>;
ErrorHandler.Sync(this);
_alt = Interpreter.AdaptivePredict(TokenStream,<choice.decision>,Context);
while (_alt!=<choice.exitAlt> && _alt!=global::Antlr4.Runtime.Atn.ATN.INVALID_ALT_NUMBER) {
if (_alt==1<if(!choice.ast.greedy)>+1<endif>) {
<iteration>
<alts><! should only be one !>
}
State = <choice.loopBackStateNumber>;
ErrorHandler.Sync(this);
_alt = Interpreter.AdaptivePredict(TokenStream,<choice.decision>,Context);
}
>>

PlusBlock(choice, alts, error) ::= <<
State = <choice.blockStartStateNumber>;<! alt block decision !>
ErrorHandler.Sync(this);
_alt = 1<if(!choice.ast.greedy)>+1<endif>;
do {
switch (_alt) {
<alts:{alt|
case <i><if(!choice.ast.greedy)>+1<endif>:
<alt>
break;}; separator="\n">
default:
<error>
}
State = <choice.loopBackStateNumber>;<! loopback/exit decision !>
ErrorHandler.Sync(this);
_alt = Interpreter.AdaptivePredict(TokenStream,<choice.decision>,Context);
} while (_alt!=<choice.exitAlt> && _alt!=global::Antlr4.Runtime.Atn.ATN.INVALID_ALT_NUMBER);
>>

Sync(s) ::= "Sync(<s.expecting.name>);"

ThrowNoViableAlt(t) ::= "throw new NoViableAltException(this);"

TestSetInline(s) ::= <<
<s.bitsets:{bits | <if(rest(rest(bits.ttypes)))><bitsetBitfieldComparison(s, bits)><else><bitsetInlineComparison(s,
bits)><endif>}; separator=" || ">
>>

```



```

// Java language spec 15.19 - shift operators mask operands rather than overflow to 0... need range test
testShiftInRange(shiftAmount) ::= <<
((<shiftAmount>) & ~0x3f) == 0
>>

// produces smaller bytecode only when bits.ttypes contains more than two items
bitsetBitfieldComparison(s, bits) ::= <%
(<testShiftInRange({<offsetShift(s.varName, bits.shift)>})> && ((1L \<< <offsetShift(s.varName, bits.shift)>) &
(<bits.ttypes:{ ttype | (1L \<< <offsetShift(tokenType.(ttype), bits.shift)>)}; separator=" | ">)) != 0)
%>

isZero ::= [
"0":true,
default:false
]

offsetShift(shiftAmount, offset) ::= <%
<if(!isZero.(offset))><shiftAmount> - <offset><else><shiftAmount><endif>
%>

// produces more efficient bytecode when bits.ttypes contains at most two items
bitsetInlineComparison(s, bits) ::= <%
<bits.ttypes:{ ttype | <s.varName>==<tokenType.(ttype)>}; separator=" || ">
%>

cases(ttypes) ::= <<
<ttypes:{ t | case <tokenType.(t)>:}; separator="\n">
>>

InvokeRule(r, argExprsChunks) ::= <<
State = <r.stateNumber>;
<if(r.labels)><r.labels:{1 | <labelref(l)> =
}><endif><csIdentifier.(r.name)><(<if(r.ast.options.p)><r.ast.options.p><if(argExprsChunks)>,<endif><endif><arg
ExprsChunks>);
>>

MatchToken(m) ::= <<
State = <m.stateNumber>;
<if(m.labels)><m.labels:{1 | <labelref(l)> = }><endif>Match(<tokenType.(m.name)>);
>>

MatchSet(m, expr, capture) ::= "<CommonSetStuff(m, expr, capture, false)>"

MatchNotSet(m, expr, capture) ::= "<CommonSetStuff(m, expr, capture, true)>"

CommonSetStuff(m, expr, capture, invert) ::= <<
State = <m.stateNumber>;
<if(m.labels)><m.labels:{1 | <labelref(l)> = }>TokenStream.LT(1);<endif>

```

```

<capture>
if (<if(invert)><m.varName> \<= 0 || <else>!<endif>(<expr>)) {
 <if(m.labels)><m.labels:{1 | <labelref(1)> = }><endif>ErrorHandler.RecoverInline(this);
}
else {
 ErrorHandler.ReportMatch(this);
 Consume();
}
>>

Wildcard(w) ::= <<
State = <w.stateNumber>;
<if(w.labels)><w.labels:{1 | <labelref(1)> = }><endif>MatchWildcard();
>>

// ACTION STUFF

Action(a, foo, chunks) ::= "<chunks>"

ArgAction(a, chunks) ::= "<chunks>"

SemPred(p, chunks, failChunks) ::= <<
State = <p.stateNumber>;
if (!(<chunks>)) throw new FailedPredicateException(this, <p.predicate><if(failChunks)>,
<failChunks><elseif(p.msg)>, <p.msg><endif>);
>>

ExceptionClause(e, catchArg, catchAction) ::= <<
catch (<catchArg>) {
 <catchAction>
}
>>

// lexer actions are not associated with model objects

LexerSkipCommand() ::= "Skip();"
LexerMoreCommand() ::= "More();"
LexerPopModeCommand() ::= "PopMode();"

LexerTypeCommand(arg, grammar) ::= "_type = <tokenType.(arg)>);"
LexerChannelCommand(arg, grammar) ::= "_channel = <channelName.(arg)>);"
LexerModeCommand(arg, grammar) ::= "_mode = <modeName.(arg)>);"
LexerPushModeCommand(arg, grammar) ::= "PushMode(<modeName.(arg)>);"

ActionText(t) ::= "<t.text>"
ActionTemplate(t) ::= "<t.st>"
ArgRef(a) ::= "_localctx.<csIdentifier.(a.name)>"
LocalRef(a) ::= "_localctx.<csIdentifier.(a.name)>"

```

```

RetValRef(a) ::= "_localctx.<csIdentifier.(a.name)>"
QRetValRef(a) ::= "<ctx(a)>.<a.dict>.<csIdentifier.(a.name)>"
/** How to translate $tokenLabel */
TokenRef(t) ::= "<ctx(t)>.<csIdentifier.(tokenType.(t.name))>"
LabelRef(t) ::= "<ctx(t)>.<csIdentifier.(t.name)>"
ListLabelRef(t) ::= "<ctx(t)>.<ListLabelName(csIdentifier.(t.name))>"
SetAttr(s,rhsChunks) ::= "<ctx(s)>.<csIdentifier.(s.name)> = <rhsChunks>;"

TokenLabelType() ::= "<file.TokenLabelType; null={IToken}>"
InputSymbolType() ::= "<file.InputSymbolType; null={IToken}>"

TokenPropertyRef_text(t) ::= "<ctx(t)>.<tokenType.(t.label)>!=null?<ctx(t)>.<tokenType.(t.label)>.Text:null)"
TokenPropertyRef_type(t) ::= "<ctx(t)>.<tokenType.(t.label)>!=null?<ctx(t)>.<tokenType.(t.label)>.Type:0)"
TokenPropertyRef_line(t) ::= "<ctx(t)>.<tokenType.(t.label)>!=null?<ctx(t)>.<tokenType.(t.label)>.Line:0)"
TokenPropertyRef_pos(t) ::=
"<ctx(t)>.<tokenType.(t.label)>!=null?<ctx(t)>.<tokenType.(t.label)>.CharPositionInLine:0)"
TokenPropertyRef_channel(t) ::=
"<ctx(t)>.<tokenType.(t.label)>!=null?<ctx(t)>.<tokenType.(t.label)>.Channel:0)"
TokenPropertyRef_index(t) ::=
"<ctx(t)>.<tokenType.(t.label)>!=null?<ctx(t)>.<tokenType.(t.label)>.TokenIndex:0)"
TokenPropertyRef_int(t) ::=
"<ctx(t)>.<tokenType.(t.label)>!=null?int.Parse(<ctx(t)>.<tokenType.(t.label)>.Text):0)"

RulePropertyRef_start(r) ::= "<ctx(r)>.<r.label>!=null?(<ctx(r)>.<r.label>.Start):null)"
RulePropertyRef_stop(r) ::= "<ctx(r)>.<r.label>!=null?(<ctx(r)>.<r.label>.Stop):null)"
RulePropertyRef_text(r) ::=
"<ctx(r)>.<r.label>!=null?TokenStream.GetText(<ctx(r)>.<r.label>.Start,<ctx(r)>.<r.label>.Stop):null)"
RulePropertyRef_ctx(r) ::= "<ctx(r)>.<r.label>"
RulePropertyRef_parser(r) ::= "this"

ThisRulePropertyRef_start(r) ::= "_localctx.Start"
ThisRulePropertyRef_stop(r) ::= "_localctx.Stop"
ThisRulePropertyRef_text(r) ::= "TokenStream.GetText(_localctx.Start, TokenStream.LT(-1))"
ThisRulePropertyRef_ctx(r) ::= "_localctx"
ThisRulePropertyRef_parser(r) ::= "this"

NonLocalAttrRef(s) ::= <%((<s.ruleName;
format="cap">Context)GetInvokingContext(<s.ruleIndex>)).<csIdentifier.(s.name)>%>
SetNonLocalAttr(s, rhsChunks) ::=
<%((<s.ruleName; format="cap">Context)GetInvokingContext(<s.ruleIndex>)).<csIdentifier.(s.name)> =
<rhsChunks>;%>

AddToLabelList(a) ::= "<ctx(a.label)>.<a.listName>.Add(<labelref(a.label)>);"

TokenDecl(t) ::= "<TokenLabelType() <csIdentifier.(tokenType.(t.name))>"
TokenTypeDecl(t) ::= "int <csIdentifier.(tokenType.(t.name))>;"
TokenListDecl(t) ::= "IList<IToken> <csIdentifier.(tokenType.(t.name))> = new List<IToken>()"
RuleContextDecl(r) ::= "<r.ctxName> <csIdentifier.(r.name)>"

```

```

RuleContextListDecl(rdecl) ::= "IList\<<rdecl.ctxName>> <csIdentifier.(rdecl.name)> = new
List\<<rdecl.ctxName>>()"

contextGetterCollection(elementType) ::= <%
<elementType>[]
%>

ContextTokenGetterDecl(t) ::=
 "[System.Diagnostics.DebuggerNonUserCode] public ITerminalNode <csIdentifier.(tokenType.(t.name))>() {
return GetToken(<csIdentifier.(parser.name)>.<csIdentifier.(tokenType.(t.name))>, 0); }"
ContextTokenListGetterDecl(t) ::= <<
[System.Diagnostics.DebuggerNonUserCode] public <contextGetterCollection("ITerminalNode")>
<csIdentifier.(tokenType.(t.name))>() { return
GetTokens(<csIdentifier.(parser.name)>.<csIdentifier.(tokenType.(t.name))>); }
>>
ContextTokenListIndexedGetterDecl(t) ::= <<
[System.Diagnostics.DebuggerNonUserCode] public ITerminalNode <csIdentifier.(tokenType.(t.name))>(int i) {
return GetToken(<csIdentifier.(parser.name)>.<csIdentifier.(tokenType.(t.name))>, i);
}
>>
ContextRuleGetterDecl(r) ::= <<
[System.Diagnostics.DebuggerNonUserCode] public <r.ctxName> <csIdentifier.(r.name)>() {
return GetRuleContext\<<r.ctxName>\>(0);
}
>>
ContextRuleListGetterDecl(r) ::= <<
[System.Diagnostics.DebuggerNonUserCode] public <contextGetterCollection({<r.ctxName>})>
<csIdentifier.(r.name)>() {
return GetRuleContexts\<<r.ctxName>\>(0);
}
>>
ContextRuleListIndexedGetterDecl(r) ::= <<
[System.Diagnostics.DebuggerNonUserCode] public <r.ctxName> <csIdentifier.(r.name)>(int i) {
return GetRuleContext\<<r.ctxName>\>(i);
}
>>

LexerRuleContext() ::= "RuleContext"

/** The rule context name is the rule followed by a suffix; e.g.,
* r becomes rContext.
*/
RuleContextNameSuffix() ::= "Context"

ImplicitTokenLabel(tokenName) ::= "_<tokenType.(tokenName)>"
ImplicitRuleLabel(ruleName) ::= "_<ruleName>"
ImplicitSetLabel(id) ::= "_tset<id>"
ListLabelName(label) ::= "_<label>"

```

```
CaptureNextToken(d) ::= "<d.varName> = TokenStream.LT(1);"
```

```
CaptureNextTokenType(d) ::= "<d.varName> = TokenStream.LA(1);"
```

```
StructDecl(struct,ctorAttrs,attrs, getters,dispatchMethods,interfaces,extensionMembers,
 superClass={ParserRuleContext}) ::= <<
public partial class <struct.name> :
<if(contextSuperClass)><contextSuperClass><else>ParserRuleContext<endif><if(interfaces)>, <interfaces>;
separator=", "><endif> {
 <attrs:{a | public <a>;}; separator="\n">
 <getters:{g | <g>;}; separator="\n">
 <if(ctorAttrs)>public <struct.name>(ParserRuleContext parent, int invokingState) : base(parent, invokingState) {
 }<endif>
 public <struct.name>(ParserRuleContext parent, int invokingState<ctorAttrs:{a | , <a>}>)
 : base(parent, invokingState)
 {
 <struct.ctorAttrs:{a | this.<csIdentifier.(a.name)> = <csIdentifier.(a.name)>;}; separator="\n">
 }
 public override int RuleIndex { get { return RULE_<struct.derivedFromName>; } }
<if(struct.provideCopyFrom)> <! don't need copy unless we have subclasses !>
 public <struct.name>() { }
 public virtual void CopyFrom(<struct.name> context) {
 base.CopyFrom(context);
 <struct.attrs:{a | this.<csIdentifier.(a.name)> = context.<csIdentifier.(a.name)>;}; separator="\n">
 }
<endif>
<dispatchMethods; separator="\n">
<extensionMembers; separator="\n">
 }
>>
```

```
AltLabelStructDecl(struct,attrs, getters,dispatchMethods) ::= <<
public partial class <struct.name> : <currentRule.name; format="cap">Context {
 <attrs:{a | public <a>;}; separator="\n">
 <getters:{g | <g>;}; separator="\n">
 public <struct.name>(<currentRule.name; format="cap">Context context) { CopyFrom(context); }
 <dispatchMethods; separator="\n">
 }
>>
```

```
ListenerDispatchMethod(method) ::= <<
[System.Diagnostics.DebuggerNonUserCode]
public override void <if(method.isEnter)>Enter<else>Exit<endif>Rule(IParseTreeListener listener) {
 I<parser.grammarName>Listener typedListener = listener as I<parser.grammarName>Listener;
 if (typedListener != null) typedListener.<if(method.isEnter)>Enter<else>Exit<endif><struct.derivedFromName>;
 format="cap">(this);
 }
>>
```

```

VisitorDispatchMethod(method) ::= <<
[System.Diagnostics.DebuggerNonUserCode]
public override TResult Accept<TResult>(IParseTreeVisitor<TResult> visitor) {
 I<parser.grammarName>Visitor<TResult> typedVisitor = visitor as I<parser.grammarName>Visitor<TResult>;
 if (typedVisitor != null) return typedVisitor.Visit<struct.derivedFromName; format="cap">(this);
 else return visitor.VisitChildren(this);
}
>>

```

```

AttributeDecl(d) ::= "<d.type> <csIdentifier.(d.name)><if(d.initValue)> = <d.initValue><endif>"

```

```

/** If we don't know location of label def x, use this template */

```

```

labelref(x) ::= "<if(!x.isLocal)><typedContext(x.ctx)>.<endif><csIdentifier.(x.name)>"

```

```

/** For any action chunk, what is correctly-typed context struct ptr? */

```

```

ctx(actionChunk) ::= "<typedContext(actionChunk.ctx)>"

```

```

// only casts _localctx to the type when the cast isn't redundant (i.e. to a sub-context for a labeled alt)

```

```

typedContext(ctx) ::= "<if(ctx.provideCopyFrom)>((<ctx.name>)_localctx)<else>_localctx<endif>"

```

```

// used for left-recursive rules

```

```

recRuleAltPredicate(ruleName,opPrec) ::= "Precpred(Context, <opPrec>)"

```

```

recRuleSetReturnAction(src,name) ::= "$<name>=$<src>.<name>;"

```

```

recRuleSetStopToken() ::= "Context.Stop = TokenStream.LT(-1);"

```

```

recRuleAltStartAction(ruleName, ctxName, label, isListLabel) ::= <<

```

```

 _localctx = new <ctxName>Context(_parentctx, _parentState);

```

```

 <if(label)>

```

```

 <if(isListLabel)>

```

```

 _localctx.<label>.Add(_prevctx);

```

```

 <else>

```

```

 _localctx.<label> = _prevctx;

```

```

 <endif>

```

```

 <endif>

```

```

 PushNewRecursionContext(_localctx, _startState, RULE_<ruleName>);

```

```

>>

```

```

recRuleLabeledAltStartAction(ruleName, currentAltLabel, label, isListLabel) ::= <<

```

```

 _localctx = new <currentAltLabel; format="cap">Context(new <ruleName; format="cap">Context(_parentctx,
 _parentState));

```

```

 <if(label)>

```

```

 <if(isListLabel)>

```

```

 ((<currentAltLabel; format="cap">Context)_localctx).<label>.Add(_prevctx);

```

```

 <else>

```

```

 ((<currentAltLabel; format="cap">Context)_localctx).<label> = _prevctx;

```

```

 <endif>

```

```

 <endif>

```

```
PushNewRecursionContext(_localctx, _startState, RULE_<ruleName>);
```

```
>>
```

```
recRuleReplaceContext(ctxName) ::= <<
_localctx = new <ctxName>Context(_localctx);
Context = _localctx;
_prevctx = _localctx;
>>
```

```
recRuleSetPrevCtx() ::= <<
if (ParseListeners!=null)
 TriggerExitRuleEvent();
_prevctx = _localctx;
>>
```

```
LexerFile(file, lexer, namedActions) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
<if(file.genPackage)>
namespace <file.genPackage> {
<endif>
<namedActions.header>
using System;
using System.IO;
using System.Text;
using Antlr4.Runtime;
using Antlr4.Runtime.Atn;
using Antlr4.Runtime.Misc;
using DFA = Antlr4.Runtime.Dfa.DFA;

<lexer>
<if(file.genPackage)>
} // namespace <file.genPackage>
<endif>
>>
```

```
Lexer(lexer, atn, actionFuncs, sempredFuncs, superClass) ::= <<
[System.CodeDom.Compiler.GeneratedCode("ANTLR", "<file.ANTLRVersion>")]
[System.CLSCompliant(false)]
public partial class <csIdentifier.(lexer.name)> : <superClass; null="Lexer"> {
 protected static DFA[] decisionToDFA;
 protected static PredictionContextCache sharedContextCache = new PredictionContextCache();
 <if(lexer.tokens)>
 public const int
 <lexer.tokens:{k | <tokenType.(k)>=<lexer.tokens.(k)>}; separator=", ", wrap, anchor>;
 <endif>
 <if(lexer.channels)>
 public const int
```

```

<lexer.channels:{k | <csIdentifier.(k)>=<lexer.channels.(k)>}; separator=", ", wrap, anchor>;
<endif>
<if(rest(lexer.modes))>
public const int
<rest(lexer.modes):{m | <m>=<i>}; separator=", ", wrap, anchor>;
<endif>
public static string[] channelNames = {
"DEFAULT_TOKEN_CHANNEL", "HIDDEN" <if (lexer.channels)>, <lexer.channels:{c | <c>"}; separator=", ",
wrap, anchor><endif>
};

public static string[] modeNames = {
<lexer.modes:{m | "<m>"}; separator=", ", wrap, anchor>
};

public static readonly string[] ruleNames = {
<lexer.ruleNames:{r | "<r>"}; separator=", ", wrap, anchor>
};

<namedActions.members>

public <csIdentifier.(lexer.name)>(ICharStream input)
: this(input, Console.Out, Console.Error) { }

public <csIdentifier.(lexer.name)>(ICharStream input, TextWriter output, TextWriter errorOutput)
: base(input, output, errorOutput)
{
Interpreter = new LexerATNSimulator(this, _ATN, decisionToDFA, sharedContextCache);
}

<vocabulary(lexer.literalNames, lexer.symbolicNames)>

public override string GrammarFileName { get { return "<lexer.grammarFileName>"; } }

public override string[] RuleNames { get { return ruleNames; } }

public override string[] ChannelNames { get { return channelNames; } }

public override string[] ModeNames { get { return modeNames; } }

public override string SerializedAtn { get { return new string(_serializedATN); } }

static <csIdentifier.(lexer.name)>() {
decisionToDFA = new DFA[_ATN.NumberOfDecisions];
for (int i = 0; i < _ATN.NumberOfDecisions; i++) {
decisionToDFA[i] = new DFA(_ATN.GetDecisionState(i), i);
}
}
}

```



```
<dumpActions(lexer, "", actionFuncs, sempredFuncs)>
<atn>
}
>>
```

```
SerializedATN(model) ::= <<
private static char[] _serializedATN = {
 <model.serialized; separator=",", wrap>,
};

public static readonly ATN _ATN =
 new ATNDeserializer().Deserialize(_serializedATN);
```

```
>>
```

```
initValue(typeName) ::= <<
default(<typeName>)
>>
```

```
codeFileExtension() ::= ".cs"
```

```
modeName ::= [
 "DEFAULT_MODE" : "DefaultMode",
 default : key
]
```

```
channelName ::= [
 "HIDDEN" : "Hidden",
 "DEFAULT_TOKEN_CHANNEL" : "DefaultTokenChannel",
 default : key
]
```

```
tokenType ::= [
 "EOF" : "Eof",
 default : key
]
```

```
csIdentifier ::= [
 "abstract" : "@abstract",
 "as" : "@as",
 "base" : "@base",
 "bool" : "@bool",
 "break" : "@break",
 "byte" : "@byte",
 "case" : "@case",
 "catch" : "@catch",
```

"char" : "@char",  
"checked" : "@checked",  
"class" : "@class",  
"const" : "@const",  
"continue" : "@continue",  
"decimal" : "@decimal",  
"default" : "@default",  
"delegate" : "@delegate",  
"do" : "@do",  
"double" : "@double",  
"else" : "@else",  
"enum" : "@enum",  
"event" : "@event",  
"explicit" : "@explicit",  
"extern" : "@extern",  
"false" : "@false",  
"finally" : "@finally",  
"fixed" : "@fixed",  
"float" : "@float",  
"for" : "@for",  
"foreach" : "@foreach",  
"goto" : "@goto",  
"if" : "@if",  
"implicit" : "@implicit",  
"in" : "@in",  
"int" : "@int",  
"interface" : "@interface",  
"internal" : "@internal",  
"is" : "@is",  
"lock" : "@lock",  
"long" : "@long",  
"namespace" : "@namespace",  
"new" : "@new",  
"null" : "@null",  
"object" : "@object",  
"operator" : "@operator",  
"out" : "@out",  
"override" : "@override",  
"params" : "@params",  
"private" : "@private",  
"protected" : "@protected",  
"public" : "@public",  
"readonly" : "@readonly",  
"ref" : "@ref",  
"return" : "@return",  
"sbyte" : "@sbyte",  
"sealed" : "@sealed",  
"short" : "@short",

```
"sizeof" : "@sizeof",
"stackalloc" : "@stackalloc",
"static" : "@static",
"string" : "@string",
"struct" : "@struct",
"switch" : "@switch",
"this" : "@this",
"throw" : "@throw",
>true" : "@true",
"try" : "@try",
"typeof" : "@typeof",
"uint" : "@uint",
"ulong" : "@ulong",
"unchecked" : "@unchecked",
"unsafe" : "@unsafe",
"ushort" : "@ushort",
"using" : "@using",
"virtual" : "@virtual",
"values" : "@values",
"void" : "@void",
"volatile" : "@volatile",
"while" : "@while",
default : key
]
```

Found in path(s):

```
*/opt/cola/permits/1300428068_1649144266.79/0/antlr4-4-9-2-sources-
jar/org/antlr/v4/tool/templates/codegen/CSharp/CSharp.stg
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```
// File : A3Lexer.g
// Author : Jim Idle (jimi@temporal-wave.com)
// Copyright : Free BSD - See @header clause below
// Version : First implemented as part of ANTLR 3.2 this is the self
// hosting ANTLR 3 Lexer.
//
// Description
// -----
// This is the definitive lexer grammar for parsing ANTLR V3.x.x grammars. All other
// grammars are derived from this grammar via source code control integration (perforce)
// or by the gdiff tool.
//
// This grammar and its associated grmmars A3Parser.g and A3Walker.g exhibit the following
// traits, which are recommended for all production quality grammars:
//
// 1) They are separate grammars, not composite grammars;
// 2) They implement all supporting methods in a superclass (at least this is recommended
// for language targets that support inheritance;
// 3) All errors are pushed as far down the parsing chain as possible, which means
// that the lexer tries to defer error reporting to the parser, and the parser
// tries to defer error reporting to a semantic phase consisting of a single
// walk of the AST. The reason for this is that the error messages produced
// from later phases of the parse will generally have better context and so
// be more useful to the end user. Consider the message: "Syntax error at 'options'"
// vs: "You cannot specify two options{ } sections in a single grammar file".
// 4) The lexer is 'programmed' to catch common mistakes such as unterminated literals
// and report them specifically and not just issue confusing lexer mismatch errors.
//
/** Read in an ANTLR grammar and build an AST. Try not to do
 * any actions, just build the tree.
 *
 * The phases are:
 *
 * A3Lexer.g (this file)
 * A3Parser.g
```

```

* A3Verify.g (derived from A3Walker.g)
* assign.types.g
* define.g
* buildnfa.g
* antlr.print.g (optional)
* codegen.g
*
* Terence Parr
* University of San Francisco
* 2005
* Jim Idle (this v3 grammar)
* Temporal Wave LLC
* 2009
*/
lexer grammar ANTLRLexer;

// =====
// Note that while this grammar does not care about order of constructs
// that don't really matter, such as options before @header etc, it must first
// be parsed by the original v2 parser, before it replaces it. That parser does
// care about order of structures. Hence we are constrained by the v2 parser
// for at least the first bootstrap release that causes this parser to replace
// the v2 version.
// =====

// -----
// Options
//
// V3 option directives to tell the tool what we are asking of it for this
// grammar.
//
options {

// Target language is Java, which is the default but being specific
// here as this grammar is also meant as a good example grammar for
// for users.
//
language = Java;

// The super class that this lexer should expect to inherit from, and
// which contains any and all support routines for the lexer. This is
// commented out in this baseline (definitive or normative grammar)
// - see the ANTLR tool implementation for hints on how to use the super
// class
//
//superclass = AbstractA3Lexer;
}

```

```
tokens { SEMPRED; TOKEN_REF; RULE_REF; LEXER_CHAR_SET; ARG_ACTION; }
```

```
// Include the copyright in this source and also the generated source
```

```
//
```

```
@lexer::header {
```

```
/*
```

```
[The "BSD licence"]
```

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```

```
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```

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```
*/
```

```
package org.antlr.v4.parse;
```

```
import org.antlr.v4.tool.*;
```

```
import org.antlr.v4.runtime.misc.Interval;
```

```
}
```

```
@members {
```

```
public static final int COMMENTS_CHANNEL = 2;
```

```
public CommonTokenStream tokens; // track stream we push to; need for context info
```

```
public boolean isLexerRule = false;
```

```
public void grammarError(ErrorType etype, org.antlr.runtime.Token token, Object... args) { }
```

```
/** scan backwards from current point in this.tokens list
```

```
 * looking for the start of the rule or subrule.
```

```

* Return token or null if for some reason we can't find the start.
*/
public Token getRuleOrSubruleStartToken() {
 if (tokens==null) return null;
 int i = tokens.index();
 int n = tokens.size();
 if (i>=n) i = n-1; // seems index == n as we lex
 while (i>=0 && i<n) {
 int ttype = tokens.get(i).getType();
 if (ttype == LPAREN || ttype == TOKEN_REF || ttype == RULE_REF) {
 return tokens.get(i);
 }
 i--;
 }
 return null;
}

// -----
// Comments
//
// ANTLR comments can be multi or single line and we don't care
// which particularly. However we also accept Javadoc style comments
// of the form: /** ... */ and we do take care to distinguish those
// from ordinary multi-line comments
// Note how we guide the lexical PATH because we want to issue a decriptive
// error message in case of a standalone '/' character, which makes no
// sense in ANTLR source code. We also trap unterminated multi-line comments
//
fragment DOC_COMMENT : ;
COMMENT
@init {

 // Record the start line and offsets as if we need to report an
 // unterminated comment, then we want to show the start of the comment
 // we think is broken, not the end, where people will have to try and work
 // it out themselves.
 //
 int startLine = $line;
 int offset = getCharPositionInLine();
}
: // Eat the first character only, then see if we have a comment
 // or something silly.
 //
 '/' // Comment introducer

(
 // Single line comment, possibly with embedded src/line directives

```

```

// in a similar style to the C pre-processor, allowing generated
// code to refer the programmer back to the original source code
// in case of error.
//
/'
(
 (' $ANTLR')=> ' $ANTLR' SRC
 | ~(NLCHARS)*
)

|// Multi-line comment, which may be a documentation comment
// if it starts /** (note that we protect against accidentally
// recognizing a comment /**/ as a documentation comment
//
/** (
 { input.LA(2) != '/' }?=> '*' { $type = DOC_COMMENT; }
 | { true }?=> // Required to cover all alts with predicates
)

// Should we support embedded multiline comments here?
//
(
 // Pick out end of multiline comment and exit the loop
 // if we find it.
 //
 { !(input.LA(1) == '*' && input.LA(2) == '/') }?

 // Anything else other than the non-greedy match of
 // the comment close sequence
 //
 .
)*
(
 // Look for the comment terminator, but if it is accidentally
 // unterminated, then we will hit EOF, which will trigger the
 // epsilon alt and hence we can issue an error message relative
 // to the start of the unterminated multi-line comment
 //
 /*'

|// Unterminated comment!
//
{
 // ErrorManager.msg(Msg.UNTERMINATED_DOC_COMMENT, startLine, offset, $pos, startLine,
offset, $pos, (Object)null);
}
)

```





```

ARG_ACTION
: '['
 (
 ARG_ACTION

 | ("")=>ACTION_STRING_LITERAL

 | ("\")=>ACTION_CHAR_LITERAL

 | ~('[\']')
)*
 ']'
;

// -----
// Actions
//
// Other than making sure to distinguish between { and } embedded
// within what we have assumed to be literals in the action code, the
// job of the lexer is merely to gather the code within the action
// (delimited by {}) and pass it to the parser as a single token.
// We know that this token will be asked for its text somewhere
// in the upcoming parse, so setting the text here to exclude
// the delimiting {} is no additional overhead.
//
ACTION
: NESTED_ACTION
('?' {$type = SEMPRED;}
 ((WSNLCHARS* '=>') => WSNLCHARS* '=>' // v3 gated sempred
 {
 Token t = new CommonToken(input, state.type, state.channel, state.tokenStartCharIndex, getCharIndex()-1);
 t.setLine(state.tokenStartLine);
 t.setText(state.text);
 t.setCharPositionInLine(state.tokenStartCharPositionInLine);
 grammarError(ErrorType.V3_GATED_SEMPRED, t);
 }
)?
)?
;

// -----
// Action structure
//
// Many language targets use {} as block delimiters and so we
// must recursively match {} delimited blocks to balance the
// braces. Additionally, we must make some assumptions about
// literal string representation in the target language. We assume

```

```

// that they are delimited by ' or " and so consume these
// in their own alts so as not to inadvertently match { }.
// This rule calls itself on matching a {
//
fragment
NESTED_ACTION
@init {

// Record the start line and offsets as if we need to report an
// unterminated block, then we want to show the start of the comment
// we think is broken, not the end, where people will have to try and work
// it out themselves.
//
int startLine = getLine();
int offset = getCharPositionInLine();
}

: // Action and other blocks start with opening {
//
'{'
(
// And now we can match one of a number of embedded
// elements within the action until we find a
// } that balances the opening {. If we do not find
// the balanced } then we will hit EOF and can issue
// an error message about the brace that we believe to
// be mismatched. This won't be foolproof but we will
// be able to at least report an error against the
// opening brace that we feel is in error and this will
// guide the user to the correction as best we can.
//

// An embedded {} block
//
NESTED_ACTION

| // What appears to be a literal
//
ACTION_CHAR_LITERAL

| // We have assumed that the target language has C/Java
// type comments.
//
COMMENT

| // What appears to be a literal
//

```

```

ACTION_STRING_LITERAL

|// What appears to be an escape sequence
//
ACTION_ESC

|// Some other single character that is not
// handled above
//
~(\\|'|\"|/|'{'|'})

)*

(
// Correctly balanced closing brace
//
}'

|// Looks like have an imbalanced {} block, report
// with respect to the opening brace.
//
{
// TODO: Report imbalanced {}
System.out.println("Block starting at line " + startLine + " offset " + (offset+1) + " contains imbalanced {} or
is missing a }");
}
)
;

// Keywords
// -----
// keywords used to specify ANTLR v3 grammars. Keywords may not be used as
// labels for rules or in any other context where they would be ambiguous
// with the keyword vs some other identifier
// OPTIONS, TOKENS, and CHANNELS must also consume the opening brace that captures
// their option block, as this is the easiest way to parse it separate
// to an ACTION block, despite it using the same {} delimiters.
//
OPTIONS : 'options' WSNLCHARS* '{' ;
TOKENS_SPEC : 'tokens' WSNLCHARS* '{' ;
CHANNELS : 'channels' WSNLCHARS* '{' ;

IMPORT : 'import' ;
FRAGMENT : 'fragment' ;
LEXER : 'lexer' ;
PARSER : 'parser' ;
GRAMMAR : 'grammar' ;

```

```

TREE_GRAMMAR : 'tree' WSNLCHARS* 'grammar' ;
PROTECTED : 'protected' ;
PUBLIC : 'public' ;
PRIVATE : 'private' ;
RETURNS : 'returns' ;
LOCALS : 'locals' ;
THROWS : 'throws' ;
CATCH : 'catch' ;
FINALLY : 'finally' ;
MODE : 'mode' ;

// -----
// Punctuation
//
// Character sequences used as separators, delimiters, operators, etc
//
COLON : ':'
 {
 // scan backwards, looking for a RULE_REF or TOKEN_REF.
 // which would indicate the start of a rule definition.
 // If we see a LPAREN, then it's the start of the subrule.
 // this.tokens is the token string we are pushing into, so
 // just loop backwards looking for a rule definition. Then
 // we set isLexerRule.
 Token t = getRuleOrSubruleStartToken();
 if (t!=null) {
 if (t.getType()==RULE_REF) isLexerRule = false;
 else if (t.getType()==TOKEN_REF) isLexerRule = true;
 // else must be subrule; don't alter context
 }
 }
;
COLONCOLON : '::' ;
COMMA : ',' ;
SEMI : ';' ;
LPAREN : '(' ;
RPAREN : ')' ;
RARROW : '->' ;
LT : '<' ;
GT : '>' ;
ASSIGN : '=' ;
QUESTION : '?' ;
SYNPRED : '=>'
 {
 Token t = new CommonToken(input, state.type, state.channel,
 state.tokenStartCharIndex, getCharIndex()-1);
 t.setLine(state.tokenStartLine);
 t.setText(state.text);
 }

```

```

t.setCharPositionInLine(state.tokenStartCharPositionInLine);
grammarError(ErrorType.V3_SYNPRED, t);
 $channel=HIDDEN;
}
;
STAR : '*' ;
PLUS : '+' ;
PLUS_ASSIGN : '+=' ;
OR : '|' ;
DOLLAR : '$' ;
DOT : '.' ; // can be WILDCARD or DOT in qid or imported rule ref
RANGE : '..' ;
AT : '@' ;
POUND : '#' ;
NOT : '~' ;
RBRACE : '}' ;

```

/\*\* Allow unicode rule/token names \*/

```

ID : a=NameStartChar NameChar*
{
 if (Grammar.isTokenName($a.text)) $type = TOKEN_REF;
 else $type = RULE_REF;
}
;

```

fragment

```

NameChar : NameStartChar
| '0'..'9'
| '_'
| '\u00B7'
| '\u0300'..'u036F'
| '\u203F'..'u2040'
;

```

fragment

```

NameStartChar
: 'A'..'Z' | 'a'..'z'
| '\u00C0'..'u00D6'
| '\u00D8'..'u00F6'
| '\u00F8'..'u02FF'
| '\u0370'..'u037D'
| '\u037F'..'u1FFF'
| '\u200C'..'u200D'
| '\u2070'..'u218F'
| '\u2C00'..'u2FEF'
| '\u3001'..'uD7FF'
| '\uF900'..'uFD CF'
| '\uFDF0'..'uFEFE'

```

```

 | '\uFF00'..\uFFFD'
 ; // ignores | [^\u10000-\uEFFFF] ;

// -----
// Literals embedded in actions
//
// Note that we have made the assumption that the language used within
// actions uses the fairly standard " and ' delimiters for literals and
// that within these literals, characters are escaped using the \ character.
// There are some languages which do not conform to this in all cases, such
// as by using /string/ and so on. We will have to deal with such cases if
// if they come up in targets.
//

// Within actions, or other structures that are not part of the ANTLR
// syntax, we may encounter literal characters. Within these, we do
// not want to inadvertently match things like '}' and so we eat them
// specifically. While this rule is called CHAR it allows for the fact that
// some languages may use/allow ' as the string delimiter.
//
fragment
ACTION_CHAR_LITERAL
: "\"" ((\\)=>ACTION_ESC | ~"")* "\""
;

// Within actions, or other structures that are not part of the ANTLR
// syntax, we may encounter literal strings. Within these, we do
// not want to inadvertently match things like '}' and so we eat them
// specifically.
//
fragment
ACTION_STRING_LITERAL
: "\"" ((\\)=>ACTION_ESC | ~"")* "\""
;

// Within literal strings and characters that are not part of the ANTLR
// syntax, we must allow for escaped character sequences so that we do not
// inadvertently recognize the end of a string or character when the terminating
// delimiter has been escaped.
//
fragment
ACTION_ESC
: "\\" .
;

// -----
// Integer
//

```

```

// Obviously (I hope) match an arbitrary long sequence of digits.
//
INT : ('0'..'9')+
 ;

// -----
// Source spec
//
// A fragment rule for picking up information about an originating
// file from which the grammar we are parsing has been generated. This allows
// ANTLR to report errors against the originating file and not the generated
// file.
//
fragment
SRC : 'src' WSCHARS+ file=ACTION_STRING_LITERAL WSCHARS+ line=INT
 {
 // TODO: Add target specific code to change the source file name and current line number
 //
 }
 ;

// -----
// Literal string
//
// ANTLR makes no distinction between a single character literal and a
// multi-character string. All literals are single quote delimited and
// may contain unicode escape sequences of the form \uxxxx or \u{xxxxxx},
// where x is a valid hexadecimal number.
STRING_LITERAL
: '\" ((ESC_SEQ | ~('\\|\"|'|\r|\n'))) *
 ('\"
 | // Unterminated string literal
 {
 Token t = new CommonToken(input, state.type, state.channel, state.tokenStartCharIndex, getCharIndex()-1);
 t.setLine(state.tokenStartLine);
 t.setText(state.text);
 t.setCharPositionInLine(state.tokenStartCharPositionInLine);
 grammarError(ErrorType.UNTERMINATED_STRING_LITERAL, t);
 }
)
;

// A valid hex digit specification
//
fragment
HEX_DIGIT : ('0'..'9'|'a'..'f'|'A'..'F') ;

// Any kind of escaped character that we can embed within ANTLR

```



```

// literal strings.
//
fragment
ESC_SEQ
: '\\
(
 // The standard escaped character set such as tab, newline, etc...
 'b'|'t'|'n'|'f'|'r'|'\'|'\"|'\\'

 // A Java style Unicode escape sequence
 UNICODE_ESC

 // A Swift/Hack style Unicode escape sequence
 UNICODE_EXTENDED_ESC

 // An illegal escape sequence
 ~('b'|'t'|'n'|'f'|'r'|'\'|'\"|'\\'|'u') // \x for any invalid x (make sure to match char here)
 {
 Token t = new CommonToken(input, state.type, state.channel, getCharIndex()-2, getCharIndex()-1);
 t.setText(t.getText());
 t.setLine(input.getLine());
 t.setCharPositionInLine(input.getCharPositionInLine()-2);
 grammarError(ErrorType.INVALID_ESCAPE_SEQUENCE, t, input.substring(getCharIndex()-
2,getCharIndex()-1));
 }
)
;

```

```

fragment
UNICODE_ESC
@init {

 // Flag to tell us whether we have a valid number of
 // hex digits in the escape sequence
 //
 int hCount = 0;
}

: 'u' // Leadin for unicode escape sequence

 // We now require 4 hex digits. Note though
 // that we accept any number of characters
 // and issue an error if we do not get 4. We cannot
 // use an infinite count such as + because this
 // might consume too many, so we lay out the lexical
 // options and issue an error at the invalid paths.
 //
 (
 (

```

```

 HEX_DIGIT { hCount++; }
 (
 HEX_DIGIT { hCount++; }
 (
 HEX_DIGIT { hCount++; }
 (
 // Four valid hex digits, we are good
 //
 HEX_DIGIT { hCount++; }

 |// Three valid digits
)

 |// Two valid digits
)

 |// One valid digit
)
)
 |// No valid hex digits at all
)

// Now check the digit count and issue an error if we need to
//
{
 if (hCount < 4) {
 Interval badRange = Interval.of(getCharIndex()-2-hCount, getCharIndex());
 String lastChar = input.substring(badRange.b, badRange.b);
 if (lastChar.codePointAt(0)=="\") {
 badRange.b--;
 }
 String bad = input.substring(badRange.a, badRange.b);
 Token t = new CommonToken(input, state.type, state.channel, badRange.a, badRange.b);
 t.setLine(input.getLine());
 t.setCharPositionInLine(input.getCharPositionInLine()-hCount-2);
 grammarError(ErrorType.INVALID_ESCAPE_SEQUENCE, t, bad);
 }
}
;

```

fragment

UNICODE\_EXTENDED\_ESC

: 'u{' // Leadin for unicode extended escape sequence

HEX\_DIGIT+ // One or more hexadecimal digits

'}' // Leadout for unicode extended escape sequence

```

// Now check the digit count and issue an error if we need to
{
 int numDigits = getCharIndex()-state.tokenStartCharIndex-6;
 if (numDigits > 6) {
 Token t = new CommonToken(input, state.type, state.channel, state.tokenStartCharIndex, getCharIndex()-
1);
 t.setText(t.getText());
 t.setLine(input.getLine());
 t.setCharPositionInLine(input.getCharPositionInLine()-numDigits);
 grammarError(ErrorType.INVALID_ESCAPE_SEQUENCE, t,
input.substring(state.tokenStartCharIndex,getCharIndex()-1));
 }
}
;

// -----
// Whitespace
//
// Characters and character constructs that are of no import
// to the parser and are used to make the grammar easier to read
// for humans.
//
WS
:(
 ''
 | '\t'
 | '\r'
 | '\n'
 | '\f'
)+
{$channel=HIDDEN;}
;

// A fragment rule for use in recognizing end of line in
// rules like COMMENT.
//
fragment
NLCHARS
: '\n' | '\r'
;

// A fragment rule for recognizing traditional whitespace
// characters within lexer rules.
//
fragment
WSCHARS
: ' ' | '\t' | '\f'
;

```

```

// A fragment rule for recognizing both traditional whitespace and
// end of line markers, when we don't care to distinguish but don't
// want any action code going on.
//
fragment
WSNLCHARS
: ' ' | '\t' | '\f' | '\n' | '\r'
;

// This rule allows ANTLR 4 to parse grammars using the UTF-8 encoding with a
// byte order mark. Since this Unicode character doesn't appear as a token
// anywhere else in the grammar, we can simply skip all instances of it without
// problem. This rule will not break usage of \uFEFF inside a LEXER_CHAR_SET or
// STRING_LITERAL.
UnicodeBOM
: '\uFEFF' {skip();}
;

// -----
// Illegal Character
//
// This is an illegal character trap which is always the last rule in the
// lexer specification. It matches a single character of any value and being
// the last rule in the file will match when no other rule knows what to do
// about the character. It is reported as an error but is not passed on to the
// parser. This means that the parser to deal with the grammar file anyway
// but we will not try to analyse or code generate from a file with lexical
// errors.
//
ERRCHAR
: .
{
 Token t = new CommonToken(input, state.type, state.channel, state.tokenStartCharIndex, getCharIndex()-1);
 t.setLine(state.tokenStartLine);
 t.setText(state.text);
 t.setCharPositionInLine(state.tokenStartCharPositionInLine);
 String msg = getTokenErrorDisplay(t) + " came as a complete surprise to me";
 grammarError(ErrorType.SYNTAX_ERROR, t, msg);
 state.syntaxErrors++;
 skip();
}
;

```

Found in path(s):

\* /opt/cola/permits/1300428068\_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/parse/ANTLRLexer.g

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```
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 */
```

```
lexer grammar ActionSplitter;
```

```
options { filter=true; }
```

```
@header {
package org.antlr.v4.parse;
import org.antlr.v4.tool.*;
import org.antlr.v4.tool.ast.*;
}
```

```
@members {
ActionSplitterListener delegate;
```

```
public ActionSplitter(CharStream input, ActionSplitterListener delegate) {
 this(input, new RecognizerSharedState());
 this.delegate = delegate;
}
```

```

/** force filtering (and return tokens). triggers all above actions. */
public List<Token> getActionTokens() {
 List<Token> chunks = new ArrayList<Token>();
 Token t = nextToken();
 while (t.getType()!=Token.EOF) {
 chunks.add(t);
 t = nextToken();
 }
 return chunks;
}

private boolean isIDStartChar(int c) {
 return c == '_' || Character.isLetter(c);
}

}

// ignore comments right away

COMMENT
: '/' (options {greedy=false;} : .)* '/' {delegate.text($text);}
;

LINE_COMMENT
: '/' ~('\n'|'\r')* '\r'? '\n' {delegate.text($text);}
;

SET_NONLOCAL_ATTR
: '$ x=ID ':' y=ID WS? '=' expr=ATTR_VALUE_EXPR ';'
{
 delegate.setNonLocalAttr($text, $x, $y, $expr);
}
;

NONLOCAL_ATTR
: '$ x=ID ':' y=ID {delegate.nonLocalAttr($text, $x, $y);}
;

QUALIFIED_ATTR
: '$ x=ID ':' y=ID {input.LA(1)!='('}? {delegate.qualifiedAttr($text, $x, $y);}
;

SET_ATTR
: '$ x=ID WS? '=' expr=ATTR_VALUE_EXPR ';'
{
 delegate.setAttr($text, $x, $expr);
}
;

```

```

ATTR
: '$' x=ID {delegate.attr($text, $x);}
;

// Anything else is just random text
TEXT
@init {StringBuilder buf = new StringBuilder();}
@after {delegate.text(buf.toString());}
: (c=~(\\| '$) {buf.append((char)$c);}
 | '\\ $' {buf.append('$);}
 | '\\ c=~('$) {buf.append('\\').append((char)$c);}
 | {!isIDStartChar(input.LA(2))}? => '$' {buf.append('$);}
)+
;

```

fragment

```

ID : ('a'..'z'|'A'..'Z'|'_') ('a'..'z'|'A'..'Z'|'0'..'9'|'_')*
;

```

/\*\* Don't allow an = as first char to prevent \$x == 3; kind of stuff. \*/

fragment

```

ATTR_VALUE_EXPR
: ~'= ' (~';)*
;

```

fragment

```

WS : (' '\t' '\n' '\r')+
;

```

Found in path(s):

```

* /opt/cola/permits/1300428068_1649144266.79/0/antlr4-4-9-2-sources-jar/org/antlr/v4/parse/ActionSplitter.g
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```

/\*

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sterxml.jackson.databind.cfg.com.fasterxml.jackson.dataformat.cbor";v  
ersion="2.13.4"  
Bundle-Name: Jackson dataformat: CBOR  
Multi-Release: true  
Build-Jdk-Spec: 1.8  
Bundle-Description: Support for reading and writing Concise Binary Obj  
ect Representation([CBOR](https://www.rfc-editor.org/info/rfc7049)enc  
oded data using Jackson abstractions (streaming API, data binding, tr  
ee model)  
Implementation-Title: Jackson dataformat: CBOR  
Implementation-Version: 2.13.4  
Bundle-ManifestVersion: 2  
Specification-Vendor: FasterXML  
Bundle-Vendor: FasterXML  
Tool: Bnd-5.1.1.202006162103  
Implementation-Vendor: FasterXML  
Bundle-Version: 2.13.4  
X-Compile-Target-JDK: 1.8  
X-Compile-Source-JDK: 1.8  
Created-By: Apache Maven Bundle Plugin  
Specification-Version: 2.13.4

Found in path(s):

\* /opt/cola/permits/1424168341\_1663879283.0630891/0/jackson-dataformat-cbor-2-13-4-jar/META-  
INF/MANIFEST.MF

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## 1.89 jackson-annotations 2.13.4

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## 1.92 apache-commons-lang 3.9

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\* /opt/cola/permits/1062991095\_1611209694.78/0/apache-commons-lang-pom-zip/apache-commons-lang.pom.rtf

## 1.93 jvm-integration-for-metrics 4.0.5

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Manifest-Version: 1.0  
Bnd-LastModified: 1545937890888  
Build-Jdk: 1.8.0\_191  
Built-By: artem  
Bundle-Description: A set of classes which allow you to monitor critical  
aspects of your Java Virtual Machine using Metrics.  
Bundle-License: <http://www.apache.org/licenses/LICENSE-2.0.html>  
Bundle-ManifestVersion: 2  
Bundle-Name: JVM Integration for Metrics  
Bundle-SymbolicName: io.dropwizard.metrics.jvm  
Bundle-Version: 4.0.5  
Created-By: Apache Maven Bundle Plugin  
Export-Package: com.codahale.metrics.jvm;uses:="com.codahale.metrics,j  
avax.management";version="4.0.5"  
Implementation-Title: JVM Integration for Metrics  
Implementation-URL: <http://metrics.dropwizard.io/metrics-jvm>  
Implementation-Vendor-Id: io.dropwizard.metrics  
Implementation-Version: 4.0.5  
Import-Package: org.slf4j;version="[1.6.0,2.0.0)",com.sun.management;r  
esolution:=optional,com.codahale.metrics;version="[4.0,5)",javax.mana  
gement  
Require-Capability: osgi.ee;filter:="(&(osgi.ee=JavaSE)(version=1.8))"  
Tool: Bnd-3.3.0.201609221906

Found in path(s):

\* /opt/cola/permits/1274701574\_1648835908.24/0/metrics-jvm-4-0-5-jar/META-INF/MANIFEST.MF

## 1.94 jackson-dataformat-yaml 2.13.4

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Jackson is a high-performance, Free/Open Source JSON processing library. It was originally written by Tatu Saloranta (tatu.saloranta@iki.fi), and has been in development since 2007.

It is currently developed by a community of developers, as well as supported commercially by FasterXML.com.

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## 1.95 micronaut-kubernetes 3.4.0

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\* /opt/cola/permits/1331474306\_1653514752.2550623/0/micronaut-kubernetes-client-3-4-0-sources-jar/io/micronaut/kubernetes/client/PodNameResolver.java  
\* /opt/cola/permits/1331474306\_1653514752.2550623/0/micronaut-kubernetes-client-3-4-0-sources-jar/io/micronaut/kubernetes/client/NamespaceResolver.java  
\* /opt/cola/permits/1331474306\_1653514752.2550623/0/micronaut-kubernetes-client-3-4-0-sources-jar/io/micronaut/kubernetes/client/Apis.java  
\* /opt/cola/permits/1331474306\_1653514752.2550623/0/micronaut-kubernetes-client-3-4-0-sources-jar/io/micronaut/kubernetes/client/OkHttpClientLogging.java  
\* /opt/cola/permits/1331474306\_1653514752.2550623/0/micronaut-kubernetes-client-3-4-0-sources-jar/io/micronaut/kubernetes/client/ApisAutomaticFeatureMetadata.java  
\* /opt/cola/permits/1331474306\_1653514752.2550623/0/micronaut-kubernetes-client-3-4-0-sources-jar/io/micronaut/kubernetes/client/ApiClientConfiguration.java  
\* /opt/cola/permits/1331474306\_1653514752.2550623/0/micronaut-kubernetes-client-3-4-0-sources-jar/io/micronaut/kubernetes/client/DefaultNamespaceResolver.java  
\* /opt/cola/permits/1331474306\_1653514752.2550623/0/micronaut-kubernetes-client-3-4-0-sources-jar/io/micronaut/kubernetes/client/ApiClientFactory.java  
\* /opt/cola/permits/1331474306\_1653514752.2550623/0/micronaut-kubernetes-client-3-4-0-sources-jar/io/micronaut/kubernetes/client/DiscoveryFactory.java  
\* /opt/cola/permits/1331474306\_1653514752.2550623/0/micronaut-kubernetes-client-3-4-0-sources-jar/io/micronaut/kubernetes/client/graalvm/KubernetesClientFeature.java  
\* /opt/cola/permits/1331474306\_1653514752.2550623/0/micronaut-kubernetes-client-3-4-0-sources-jar/io/micronaut/kubernetes/client/ModelMapper.java  
\* /opt/cola/permits/1331474306\_1653514752.2550623/0/micronaut-kubernetes-client-3-4-0-sources-jar/io/micronaut/kubernetes/client/DefaultPodNameResolver.java

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\* /opt/cola/permits/1331474306\_1653514752.2550623/0/micronaut-kubernetes-client-3-4-0-sources-jar/io/micronaut/kubernetes/client/DiscoveryCache.java

## 1.96 micronaut-redis 5.2.0

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\* /opt/cola/permits/1331473606\_1653513048.6155212/0/micronaut-redis-lettuce-5-2-0-sources-jar/io/micronaut/configuration/lettuce/package-info.java  
\* /opt/cola/permits/1331473606\_1653513048.6155212/0/micronaut-redis-lettuce-5-2-0-sources-jar/io/micronaut/configuration/lettuce/cache/AsyncCacheCommands.java  
\* /opt/cola/permits/1331473606\_1653513048.6155212/0/micronaut-redis-lettuce-5-2-0-sources-jar/io/micronaut/configuration/lettuce/health/package-info.java  
\* /opt/cola/permits/1331473606\_1653513048.6155212/0/micronaut-redis-lettuce-5-2-0-sources-jar/io/micronaut/configuration/lettuce/cache/RedisCache.java  
\* /opt/cola/permits/1331473606\_1653513048.6155212/0/micronaut-redis-lettuce-5-2-0-sources-jar/io/micronaut/configuration/lettuce/session/package-info.java  
\* /opt/cola/permits/1331473606\_1653513048.6155212/0/micronaut-redis-lettuce-5-2-0-sources-jar/io/micronaut/configuration/lettuce/test/EmbeddedRedisServer.java  
\* /opt/cola/permits/1331473606\_1653513048.6155212/0/micronaut-redis-lettuce-5-2-0-sources-jar/io/micronaut/configuration/lettuce/cache/expiration/ExpirationAfterWritePolicy.java  
\* /opt/cola/permits/1331473606\_1653513048.6155212/0/micronaut-redis-lettuce-5-2-0-sources-

jar/io/micronaut/configuration/lettuce/NamedRedisServersConfiguration.java  
\* /opt/cola/permits/1331473606\_1653513048.6155212/0/micronaut-redis-lettuce-5-2-0-sources-jar/io/micronaut/configuration/lettuce/AbstractRedisConfiguration.java  
\* /opt/cola/permits/1331473606\_1653513048.6155212/0/micronaut-redis-lettuce-5-2-0-sources-jar/io/micronaut/configuration/lettuce/cache/AbstractRedisCacheConfiguration.java  
\* /opt/cola/permits/1331473606\_1653513048.6155212/0/micronaut-redis-lettuce-5-2-0-sources-jar/io/micronaut/configuration/lettuce/RedisSetting.java  
\* /opt/cola/permits/1331473606\_1653513048.6155212/0/micronaut-redis-lettuce-5-2-0-sources-jar/io/micronaut/configuration/lettuce/cache/expiration/ConstantExpirationAfterWritePolicy.java  
\* /opt/cola/permits/1331473606\_1653513048.6155212/0/micronaut-redis-lettuce-5-2-0-sources-jar/io/micronaut/configuration/lettuce/cache/package-info.java  
\* /opt/cola/permits/1331473606\_1653513048.6155212/0/micronaut-redis-lettuce-5-2-0-sources-jar/io/micronaut/configuration/lettuce/cache/RedisCacheConfiguration.java  
\* /opt/cola/permits/1331473606\_1653513048.6155212/0/micronaut-redis-lettuce-5-2-0-sources-jar/io/micronaut/configuration/lettuce/session/RedisHttpSessionConfiguration.java  
\* /opt/cola/permits/1331473606\_1653513048.6155212/0/micronaut-redis-lettuce-5-2-0-sources-jar/io/micronaut/configuration/lettuce/test/package-info.java  
\* /opt/cola/permits/1331473606\_1653513048.6155212/0/micronaut-redis-lettuce-5-2-0-sources-jar/io/micronaut/configuration/lettuce/DefaultRedisClientFactory.java  
\* /opt/cola/permits/1331473606\_1653513048.6155212/0/micronaut-redis-lettuce-5-2-0-sources-jar/io/micronaut/configuration/lettuce/cache/DefaultRedisCacheConfiguration.java  
\* /opt/cola/permits/1331473606\_1653513048.6155212/0/micronaut-redis-lettuce-5-2-0-sources-jar/io/micronaut/configuration/lettuce/DefaultRedisConfiguration.java  
\* /opt/cola/permits/1331473606\_1653513048.6155212/0/micronaut-redis-lettuce-5-2-0-sources-jar/io/micronaut/configuration/lettuce/AbstractRedisClientFactory.java  
\* /opt/cola/permits/1331473606\_1653513048.6155212/0/micronaut-redis-lettuce-5-2-0-sources-jar/io/micronaut/configuration/lettuce/NamedRedisClientFactory.java  
\* /opt/cola/permits/1331473606\_1653513048.6155212/0/micronaut-redis-lettuce-5-2-0-sources-jar/io/micronaut/configuration/lettuce/cache/SyncCacheCommands.java  
\* /opt/cola/permits/1331473606\_1653513048.6155212/0/micronaut-redis-lettuce-5-2-0-sources-jar/io/micronaut/configuration/lettuce/RedisConnectionUtil.java  
\* /opt/cola/permits/1331473606\_1653513048.6155212/0/micronaut-redis-lettuce-5-2-0-sources-jar/io/micronaut/configuration/lettuce/session/RedisSessionStore.java  
\* /opt/cola/permits/1331473606\_1653513048.6155212/0/micronaut-redis-lettuce-5-2-0-sources-jar/io/micronaut/configuration/lettuce/DefaultRedisClusterClientFactory.java  
\* /opt/cola/permits/1331473606\_1653513048.6155212/0/micronaut-redis-lettuce-5-2-0-sources-jar/io/micronaut/configuration/lettuce/session/RedisSessionCommands.java  
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```
* /opt/cola/permits/1331473606_1653513048.6155212/0/micronaut-redis-lettuce-5-2-0-sources-jar/META-INF/native-image/io.micronaut.redis/redis-lettuce/native-image.properties
```

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* /opt/cola/permits/1331473606_1653513048.6155212/0/micronaut-redis-lettuce-5-2-0-sources-
jar/io/micronaut/configuration/lettuce/ClientResourcesMutator.java
* /opt/cola/permits/1331473606_1653513048.6155212/0/micronaut-redis-lettuce-5-2-0-sources-
jar/io/micronaut/configuration/lettuce/MetricsClientResourceMutator.java
* /opt/cola/permits/1331473606_1653513048.6155212/0/micronaut-redis-lettuce-5-2-0-sources-
jar/io/micronaut/configuration/lettuce/ThreadPoolClientResourceMutator.java
* /opt/cola/permits/1331473606_1653513048.6155212/0/micronaut-redis-lettuce-5-2-0-sources-
jar/io/micronaut/configuration/lettuce/health/RedisHealthIndicator.java
```

## 1.97 micronaut-tracing 4.1.1

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\* /opt/cola/permits/1331473843\_1653512495.747282/0/micronaut-tracing-core-4-1-1-sources-jar/io/micronaut/tracing/interceptor/TraceInterceptor.java  
\* /opt/cola/permits/1331473843\_1653512495.747282/0/micronaut-tracing-core-4-1-1-sources-jar/io/micronaut/tracing/instrument/http/HttpHeadersTextMap.java  
\* /opt/cola/permits/1331473843\_1653512495.747282/0/micronaut-tracing-core-4-1-1-sources-jar/io/micronaut/tracing/instrument/util/TracingPublisher.java  
\* /opt/cola/permits/1331473843\_1653512495.747282/0/micronaut-tracing-core-4-1-1-sources-jar/io/micronaut/tracing/package-info.java  
\* /opt/cola/permits/1331473843\_1653512495.747282/0/micronaut-tracing-core-4-1-1-sources-jar/io/micronaut/tracing/instrument/util/TracingPublisherUtils.java  
\* /opt/cola/permits/1331473843\_1653512495.747282/0/micronaut-tracing-core-4-1-1-sources-jar/io/micronaut/tracing/annotation/SpanTag.java  
\* /opt/cola/permits/1331473843\_1653512495.747282/0/micronaut-tracing-core-4-1-1-sources-jar/io/micronaut/tracing/instrument/util/package-info.java  
\* /opt/cola/permits/1331473843\_1653512495.747282/0/micronaut-tracing-core-4-1-1-sources-jar/io/micronaut/tracing/instrument/http/TracingExclusionsConfiguration.java  
\* /opt/cola/permits/1331473843\_1653512495.747282/0/micronaut-tracing-core-4-1-1-sources-jar/io/micronaut/tracing/instrument/http/OpenTracingClientFilter.java  
\* /opt/cola/permits/1331473843\_1653512495.747282/0/micronaut-tracing-core-4-1-1-sources-jar/io/micronaut/tracing/instrument/util/OpenTracingInvocationInstrumenter.java  
\* /opt/cola/permits/1331473843\_1653512495.747282/0/micronaut-tracing-core-4-1-1-sources-jar/io/micronaut/tracing/instrument/package-info.java  
\* /opt/cola/permits/1331473843\_1653512495.747282/0/micronaut-tracing-core-4-1-1-sources-jar/io/micronaut/tracing/instrument/util/TracingObserver.java  
\* /opt/cola/permits/1331473843\_1653512495.747282/0/micronaut-tracing-core-4-1-1-sources-jar/io/micronaut/tracing/instrument/kotlin/HttpCoroutineTracingDispatcherFactory.java  
\* /opt/cola/permits/1331473843\_1653512495.747282/0/micronaut-tracing-core-4-1-1-sources-jar/io/micronaut/tracing/annotation/package-info.java  
\* /opt/cola/permits/1331473843\_1653512495.747282/0/micronaut-tracing-core-4-1-1-sources-jar/io/micronaut/tracing/instrument/util/MdcInstrumenter.java  
\* /opt/cola/permits/1331473843\_1653512495.747282/0/micronaut-tracing-core-4-1-1-sources-jar/io/micronaut/tracing/annotation/NewSpan.java  
\* /opt/cola/permits/1331473843\_1653512495.747282/0/micronaut-tracing-core-4-1-1-sources-jar/io/micronaut/tracing/interceptor/package-info.java  
\* /opt/cola/permits/1331473843\_1653512495.747282/0/micronaut-tracing-core-4-1-1-sources-jar/io/micronaut/tracing/instrument/util/TracingCorePublisher.java  
\* /opt/cola/permits/1331473843\_1653512495.747282/0/micronaut-tracing-core-4-1-1-sources-jar/io/micronaut/tracing/instrument/http/TraceRequestAttributes.java  
\* /opt/cola/permits/1331473843\_1653512495.747282/0/micronaut-tracing-core-4-1-1-sources-jar/io/micronaut/tracing/instrument/http/AbstractOpenTracingFilter.java  
\* /opt/cola/permits/1331473843\_1653512495.747282/0/micronaut-tracing-core-4-1-1-sources-jar/io/micronaut/tracing/instrument/kotlin/CoroutineTracingDispatcher.kt  
\* /opt/cola/permits/1331473843\_1653512495.747282/0/micronaut-tracing-core-4-1-1-sources-jar/io/micronaut/tracing/instrument/util/ScopePropagationPublisher.java  
\* /opt/cola/permits/1331473843\_1653512495.747282/0/micronaut-tracing-core-4-1-1-sources-

```
jar/io/micronaut/tracing/instrument/util/TracingInvocationInstrumenterFactory.java
* /opt/cola/permits/1331473843_1653512495.747282/0/micronaut-tracing-core-4-1-1-sources-
jar/io/micronaut/tracing/instrument/http/package-info.java
* /opt/cola/permits/1331473843_1653512495.747282/0/micronaut-tracing-core-4-1-1-sources-
jar/io/micronaut/tracing/instrument/util/ThreadTracingInvocationInstrumenterFactory.java
* /opt/cola/permits/1331473843_1653512495.747282/0/micronaut-tracing-core-4-1-1-sources-
jar/io/micronaut/tracing/annotation/ContinueSpan.java
* /opt/cola/permits/1331473843_1653512495.747282/0/micronaut-tracing-core-4-1-1-sources-
jar/io/micronaut/tracing/DefaultTracer.java
* /opt/cola/permits/1331473843_1653512495.747282/0/micronaut-tracing-core-4-1-1-sources-
jar/io/micronaut/tracing/instrument/http/OpenTracingServerFilter.java
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```
* /opt/cola/permits/1331473843_1653512495.747282/0/micronaut-tracing-core-4-1-1-sources-jar/META-
INF/native-image/io.micronaut.tracing/tracing-core/native-image.properties
```

## 1.98 micronaut-oracle-cloud 2.1.3

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# 1.100 micronaut-flyway 5.2.0

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\* /opt/cola/permits/1331473697\_1653068637.3698914/0/micronaut-flyway-5-2-0-sources-jar/io/micronaut/flyway/FlywayMigrator.java

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```
* /opt/cola/permits/1331473697_1653068637.3698914/0/micronaut-flyway-5-2-0-sources-
jar/io/micronaut/flyway/endpoint/FlywayEndpoint.java
* /opt/cola/permits/1331473697_1653068637.3698914/0/micronaut-flyway-5-2-0-sources-
jar/io/micronaut/flyway/DataSourceMigrationRunner.java
* /opt/cola/permits/1331473697_1653068637.3698914/0/micronaut-flyway-5-2-0-sources-
jar/io/micronaut/flyway/event/SchemaCleanedEvent.java
* /opt/cola/permits/1331473697_1653068637.3698914/0/micronaut-flyway-5-2-0-sources-
jar/io/micronaut/flyway/graalvm/FeatureDetectorSubstitutions.java
* /opt/cola/permits/1331473697_1653068637.3698914/0/micronaut-flyway-5-2-0-sources-
jar/io/micronaut/flyway/endpoint/FlywayReport.java
* /opt/cola/permits/1331473697_1653068637.3698914/0/micronaut-flyway-5-2-0-sources-
jar/io/micronaut/flyway/AbstractFlywayMigration.java
* /opt/cola/permits/1331473697_1653068637.3698914/0/micronaut-flyway-5-2-0-sources-
jar/io/micronaut/flyway/event/MigrationFinishedEvent.java
* /opt/cola/permits/1331473697_1653068637.3698914/0/micronaut-flyway-5-2-0-sources-
jar/io/micronaut/flyway/graalvm/FlywayFeature.java
* /opt/cola/permits/1331473697_1653068637.3698914/0/micronaut-flyway-5-2-0-sources-
jar/io/micronaut/flyway/graalvm/ScannerSubstitutions.java
* /opt/cola/permits/1331473697_1653068637.3698914/0/micronaut-flyway-5-2-0-sources-
jar/io/micronaut/flyway/package-info.java
* /opt/cola/permits/1331473697_1653068637.3698914/0/micronaut-flyway-5-2-0-sources-
jar/io/micronaut/flyway/FlywayConfigurationProperties.java
* /opt/cola/permits/1331473697_1653068637.3698914/0/micronaut-flyway-5-2-0-sources-
jar/io/micronaut/flyway/graalvm/MicronautPathLocationScanner.java
* /opt/cola/permits/1331473697_1653068637.3698914/0/micronaut-flyway-5-2-0-sources-
jar/io/micronaut/flyway/AlternativeMigrationRunner.java
```

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- \* /opt/cola/permits/1331474006\_1653507028.4352036/0/micronaut-aws-common-3-2-3-sources-jar/io/micronaut/discovery/cloud/aws/AmazonComputeInstanceMetadataResolver.java
- \* /opt/cola/permits/1331474006\_1653507028.4352036/0/micronaut-aws-common-3-2-3-sources-jar/io/micronaut/discovery/cloud/aws/package-info.java
- \* /opt/cola/permits/1331474006\_1653507028.4352036/0/micronaut-aws-common-3-2-3-sources-jar/io/micronaut/discovery/cloud/aws/AmazonNetworkInterface.java
- \* /opt/cola/permits/1331474006\_1653507028.4352036/0/micronaut-aws-common-3-2-3-sources-jar/io/micronaut/discovery/cloud/aws/EC2MetadataKeys.java
- \* /opt/cola/permits/1331474006\_1653507028.4352036/0/micronaut-aws-common-3-2-3-sources-jar/io/micronaut/discovery/cloud/aws/AmazonEC2InstanceMetadata.java
- \* /opt/cola/permits/1331474006\_1653507028.4352036/0/micronaut-aws-common-3-2-3-sources-jar/io/micronaut/aws/AWSConfiguration.java
- \* /opt/cola/permits/1331474006\_1653507028.4352036/0/micronaut-aws-common-3-2-3-sources-jar/io/micronaut/aws/package-info.java
- \* /opt/cola/permits/1331474006\_1653507028.4352036/0/micronaut-aws-common-3-2-3-sources-jar/io/micronaut/discovery/cloud/aws/AmazonMetadataConfiguration.java

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- \* /opt/cola/permits/1331473860\_1653514577.0135384/0/micronaut-mongo-core-4-1-0-sources-jar/io/micronaut/configuration/mongo/core/convert/StringToServerAddressConverter.java
- \* /opt/cola/permits/1331473860\_1653514577.0135384/0/micronaut-mongo-core-4-1-0-sources-jar/io/micronaut/configuration/mongo/core/convert/package-info.java
- \* /opt/cola/permits/1331473860\_1653514577.0135384/0/micronaut-mongo-core-4-1-0-sources-jar/io/micronaut/configuration/mongo/core/convert/StringToReadConcernConverter.java

```

* /opt/cola/permits/1331473860_1653514577.0135384/0/micronaut-mongo-core-4-1-0-sources-
jar/io/micronaut/configuration/mongo/core/convert/MongoConverterRegistrar.java
* /opt/cola/permits/1331473860_1653514577.0135384/0/micronaut-mongo-core-4-1-0-sources-
jar/io/micronaut/configuration/mongo/core/convert/StringToWriteConcernConverter.java
* /opt/cola/permits/1331473860_1653514577.0135384/0/micronaut-mongo-core-4-1-0-sources-
jar/io/micronaut/configuration/mongo/core/MongoSettings.java
* /opt/cola/permits/1331473860_1653514577.0135384/0/micronaut-mongo-core-4-1-0-sources-
jar/io/micronaut/configuration/mongo/core/test/AbstractMongoProcessFactory.java
* /opt/cola/permits/1331473860_1653514577.0135384/0/micronaut-mongo-core-4-1-0-sources-
jar/io/micronaut/configuration/mongo/core/DefaultMongoConfiguration.java
* /opt/cola/permits/1331473860_1653514577.0135384/0/micronaut-mongo-core-4-1-0-sources-
jar/io/micronaut/configuration/mongo/core/NamedMongoConfiguration.java
* /opt/cola/permits/1331473860_1653514577.0135384/0/micronaut-mongo-core-4-1-0-sources-
jar/io/micronaut/configuration/mongo/core/AbstractMongoConfiguration.java
* /opt/cola/permits/1331473860_1653514577.0135384/0/micronaut-mongo-core-4-1-0-sources-
jar/io/micronaut/configuration/mongo/core/test/MongoProcessFactory.java
* /opt/cola/permits/1331473860_1653514577.0135384/0/micronaut-mongo-core-4-1-0-sources-
jar/io/micronaut/configuration/mongo/core/DefaultMongoClientSettingsFactory.java
* /opt/cola/permits/1331473860_1653514577.0135384/0/micronaut-mongo-core-4-1-0-sources-
jar/io/micronaut/configuration/mongo/core/convert/StringToReadPreferenceConverter.java

```

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```

* /opt/cola/permits/1340816289_1654861242.1326292/0/cloudevents-kafka-2-2-0-sources-jar/META-

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 *
 */
```

Found in path(s):

```
* /opt/cola/permits/1340816289_1654861242.1326292/0/cloudevents-kafka-2-2-0-sources-
jar/io/cloudevents/kafka/CloudEventMessageDeserializer.java
* /opt/cola/permits/1340816289_1654861242.1326292/0/cloudevents-kafka-2-2-0-sources-
jar/io/cloudevents/kafka/CloudEventMessageSerializer.java
* /opt/cola/permits/1340816289_1654861242.1326292/0/cloudevents-kafka-2-2-0-sources-
jar/io/cloudevents/kafka/CloudEventSerializer.java
* /opt/cola/permits/1340816289_1654861242.1326292/0/cloudevents-kafka-2-2-0-sources-
jar/io/cloudevents/kafka/CloudEventDeserializer.java
* /opt/cola/permits/1340816289_1654861242.1326292/0/cloudevents-kafka-2-2-0-sources-
jar/io/cloudevents/kafka/impl/KafkaBinaryMessageReaderImpl.java
* /opt/cola/permits/1340816289_1654861242.1326292/0/cloudevents-kafka-2-2-0-sources-
jar/io/cloudevents/kafka/impl/KafkaProducerMessageWriterImpl.java
* /opt/cola/permits/1340816289_1654861242.1326292/0/cloudevents-kafka-2-2-0-sources-
jar/io/cloudevents/kafka/KafkaMessageFactory.java
* /opt/cola/permits/1340816289_1654861242.1326292/0/cloudevents-kafka-2-2-0-sources-
jar/io/cloudevents/kafka/impl/KafkaHeaders.java
* /opt/cola/permits/1340816289_1654861242.1326292/0/cloudevents-kafka-2-2-0-sources-
jar/io/cloudevents/kafka/impl/KafkaSerializerMessageWriterImpl.java
* /opt/cola/permits/1340816289_1654861242.1326292/0/cloudevents-kafka-2-2-0-sources-
jar/io/cloudevents/kafka/impl/BaseKafkaMessageWriterImpl.java
```

## 1.104 resilience4j 1.7.1

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# 1.108 slf4j-api-module 1.7.26

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# 1.109 apache-httpcomponents-asyncclient

## 4.1.4

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# 1.112 apache-httpcomponents-core 4.4.10

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## 1.113 joda-time 2.9.1

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[This is the first released version of the Lesser GPL. It also counts  
as the successor of the GNU Library Public License, version 2, hence

the version number 2.1.]

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```
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```

## 1.117 bucket4j-core 4.4.1

### 1.117.1 Available under license :

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- \* /opt/cola/permits/1473592299\_1668494641.8532739/0/bucket4j-core-4-4-1-sources-1-jar/io/github/bucket4j/Bucket.java
- \* /opt/cola/permits/1473592299\_1668494641.8532739/0/bucket4j-core-4-4-1-sources-1-jar/io/github/bucket4j/EstimationProbe.java
- \* /opt/cola/permits/1473592299\_1668494641.8532739/0/bucket4j-core-4-4-1-sources-1-jar/io/github/bucket4j/BucketListener.java
- \* /opt/cola/permits/1473592299\_1668494641.8532739/0/bucket4j-core-4-4-1-sources-1-jar/io/github/bucket4j/grid/ReplaceConfigurationOrReturnPreviousCommand.java
- \* /opt/cola/permits/1473592299\_1668494641.8532739/0/bucket4j-core-4-4-1-sources-1-jar/io/github/bucket4j/BucketExceptions.java
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- \* /opt/cola/permits/1473592299\_1668494641.8532739/0/bucket4j-core-4-4-1-sources-1-jar/io/github/bucket4j/Extension.java
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- \* /opt/cola/permits/1473592299\_1668494641.8532739/0/bucket4j-core-4-4-1-sources-1-jar/io/github/bucket4j/local/LocalBucket.java
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- \* /opt/cola/permits/1473592299\_1668494641.8532739/0/bucket4j-core-4-4-1-sources-1-jar/io/github/bucket4j/grid/CreateSnapshotCommand.java
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- \* /opt/cola/permits/1473592299\_1668494641.8532739/0/bucket4j-core-4-4-1-sources-1-jar/io/github/bucket4j/grid/GridCommand.java
- \* /opt/cola/permits/1473592299\_1668494641.8532739/0/bucket4j-core-4-4-1-sources-1-

jar/io/github/bucket4j/grid/TryConsumeAndReturnRemainingTokensCommand.java  
\* /opt/cola/permits/1473592299\_1668494641.8532739/0/bucket4j-core-4-4-1-sources-1-  
jar/io/github/bucket4j/local/FakeLock.java  
\* /opt/cola/permits/1473592299\_1668494641.8532739/0/bucket4j-core-4-4-1-sources-1-  
jar/io/github/bucket4j/IncompatibleConfigurationException.java  
\* /opt/cola/permits/1473592299\_1668494641.8532739/0/bucket4j-core-4-4-1-sources-1-  
jar/io/github/bucket4j/Nothing.java  
\* /opt/cola/permits/1473592299\_1668494641.8532739/0/bucket4j-core-4-4-1-sources-1-  
jar/io/github/bucket4j/AsyncBucket.java  
\* /opt/cola/permits/1473592299\_1668494641.8532739/0/bucket4j-core-4-4-1-sources-1-  
jar/io/github/bucket4j/grid/TryConsumeCommand.java  
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\* /opt/cola/permits/1473592299\_1668494641.8532739/0/bucket4j-core-4-4-1-sources-1-  
jar/io/github/bucket4j/local/SynchronizedBucket.java  
\* /opt/cola/permits/1473592299\_1668494641.8532739/0/bucket4j-core-4-4-1-sources-1-  
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\* /opt/cola/permits/1473592299\_1668494641.8532739/0/bucket4j-core-4-4-1-sources-1-  
jar/io/github/bucket4j/AbstractBucket.java  
\* /opt/cola/permits/1473592299\_1668494641.8532739/0/bucket4j-core-4-4-1-sources-1-  
jar/io/github/bucket4j/TimeMeter.java  
\* /opt/cola/permits/1473592299\_1668494641.8532739/0/bucket4j-core-4-4-1-sources-1-  
jar/io/github/bucket4j/grid/ConsumeAsMuchAsPossibleCommand.java  
\* /opt/cola/permits/1473592299\_1668494641.8532739/0/bucket4j-core-4-4-1-sources-1-  
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\* /opt/cola/permits/1473592299\_1668494641.8532739/0/bucket4j-core-4-4-1-sources-1-  
jar/io/github/bucket4j/grid/GridProxy.java  
\* /opt/cola/permits/1473592299\_1668494641.8532739/0/bucket4j-core-4-4-1-sources-1-  
jar/io/github/bucket4j/grid/BucketNotFoundException.java  
\* /opt/cola/permits/1473592299\_1668494641.8532739/0/bucket4j-core-4-4-1-sources-1-  
jar/io/github/bucket4j/local/SynchronizationStrategy.java  
\* /opt/cola/permits/1473592299\_1668494641.8532739/0/bucket4j-core-4-4-1-sources-1-  
jar/io/github/bucket4j/AbstractBucketBuilder.java  
\* /opt/cola/permits/1473592299\_1668494641.8532739/0/bucket4j-core-4-4-1-sources-1-  
jar/io/github/bucket4j/UninterruptibleBlockingStrategy.java  
\* /opt/cola/permits/1473592299\_1668494641.8532739/0/bucket4j-core-4-4-1-sources-1-  
jar/io/github/bucket4j/grid/AddTokensCommand.java  
\* /opt/cola/permits/1473592299\_1668494641.8532739/0/bucket4j-core-4-4-1-sources-1-  
jar/io/github/bucket4j/grid/ReserveAndCalculateTimeToSleepCommand.java  
\* /opt/cola/permits/1473592299\_1668494641.8532739/0/bucket4j-core-4-4-1-sources-1-  
jar/io/github/bucket4j/AsyncScheduledBucket.java  
\* /opt/cola/permits/1473592299\_1668494641.8532739/0/bucket4j-core-4-4-1-sources-1-

```
jar/io/github/bucket4j/ConsumptionProbe.java
* /opt/cola/permits/1473592299_1668494641.8532739/0/bucket4j-core-4-4-1-sources-1-
jar/io/github/bucket4j/grid/EstimateAbilityToConsumeCommand.java
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```
* /opt/cola/permits/1473592299_1668494641.8532739/0/bucket4j-core-4-4-1-sources-1-jar/META-
INF/maven/com.github.vladimir-bukhtoyarov/bucket4j-core/pom.xml
```

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- \* /opt/cola/permits/1331473908\_1653514800.6790595/0/micronaut-ktor-3-2-2-sources-jar/io/micronaut/ktor/KtorApplicationBuilder.kt
- \* /opt/cola/permits/1331473908\_1653514800.6790595/0/micronaut-ktor-3-2-2-sources-jar/io/micronaut/ktor/KtorApplication.kt
- \* /opt/cola/permits/1331473908\_1653514800.6790595/0/micronaut-ktor-3-2-2-sources-jar/io/micronaut/ktor/server/AbstractKtorEmbeddedServer.kt
- \* /opt/cola/permits/1331473908\_1653514800.6790595/0/micronaut-ktor-3-2-2-sources-jar/io/micronaut/ktor/KtorRoutingBuilder.kt
- \* /opt/cola/permits/1331473908\_1653514800.6790595/0/micronaut-ktor-3-2-2-sources-jar/io/micronaut/ktor/server/KtorTomcatEmbeddedServer.kt
- \* /opt/cola/permits/1331473908\_1653514800.6790595/0/micronaut-ktor-3-2-2-sources-jar/io/micronaut/ktor/env/MicronautKtorEnvironmentConfig.kt
- \* /opt/cola/permits/1331473908\_1653514800.6790595/0/micronaut-ktor-3-2-2-sources-jar/io/micronaut/ktor/server/KtorNettyEmbeddedServer.kt
- \* /opt/cola/permits/1331473908\_1653514800.6790595/0/micronaut-ktor-3-2-2-sources-jar/io/micronaut/ktor/factory/MicronautKtorApplicationFactory.kt
- \* /opt/cola/permits/1331473908\_1653514800.6790595/0/micronaut-ktor-3-2-2-sources-jar/io/micronaut/ktor/server/KtorJettyEmbeddedServer.kt

# 1.119 reactive-streams v1.0.3

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```
* /opt/cola/permits/1331473977_1653513089.549853/0/micronaut-gcp-common-4-1-1-sources-jar/io/micronaut/gcp/GoogleCloudConfiguration.java
* /opt/cola/permits/1331473977_1653513089.549853/0/micronaut-gcp-common-4-1-1-sources-jar/io/micronaut/discovery/cloud/gcp/GoogleComputeMetadataKeys.java
* /opt/cola/permits/1331473977_1653513089.549853/0/micronaut-gcp-common-4-1-1-sources-jar/io/micronaut/gcp/credentials/GoogleCredentialsConfiguration.java
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* /opt/cola/permits/1331473977_1653513089.549853/0/micronaut-gcp-common-4-1-1-sources-jar/io/micronaut/gcp/UserAgentHeaderProvider.java
```



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\* /opt/cola/permits/1331473977\_1653513089.549853/0/micronaut-gcp-common-4-1-1-sources-jar/io/micronaut/discovery/cloud/gcp/GoogleComputeInstanceMetadata.java  
\* /opt/cola/permits/1331473977\_1653513089.549853/0/micronaut-gcp-common-4-1-1-sources-jar/io/micronaut/discovery/cloud/gcp/GoogleComputeMetadataConfiguration.java  
\* /opt/cola/permits/1331473977\_1653513089.549853/0/micronaut-gcp-common-4-1-1-sources-jar/io/micronaut/gcp/credentials/GoogleCredentialsFactory.java  
\* /opt/cola/permits/1331473977\_1653513089.549853/0/micronaut-gcp-common-4-1-1-sources-jar/io/micronaut/gcp/condition/RequiresGoogleProjectId.java

## 1.122 json-simple 1.1.1

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# 1.124 apache-commons-lang 2.6

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## 1.125 jackson-bom 2.13.4

### 1.125.1 Available under license :

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Manifest-Version: 1.0  
Bundle-License: <http://www.apache.org/licenses/LICENSE-2.0.txt>  
Bundle-SymbolicName: com.fasterxml.jackson.dataformat.jackson-dataformat-cbor  
Bnd-LastModified: 1662244895850  
Implementation-Vendor-Id: com.fasterxml.jackson.dataformat  
Specification-Title: Jackson dataformat: CBOR  
Bundle-DocURL: <http://github.com/FasterXML/jackson-dataformats-binary>  
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Require-Capability: osgi.ee;filter="(&(osgi.ee=JavaSE)(version=1.8))"  
Implementation-Build-Date: 2022-09-03 22:41:29+0000  
Export-Package: com.fasterxml.jackson.dataformat.cbor;uses="com.fasterxml.jackson.core,com.fasterxml.jackson.core.base,com.fasterxml.jackson.core.format,com.fasterxml.jackson.core.io,com.fasterxml.jackson.core.json,com.fasterxml.jackson.core.sym,com.fasterxml.jackson.core.util";version="2.13.4",com.fasterxml.jackson.dataformat.cbor.databind;uses="com.fasterxml.jackson.core,com.fasterxml.jackson.databind,com.fasterxml.jackson.databind.cfg,com.fasterxml.jackson.dataformat.cbor";version="2.13.4"  
Bundle-Name: Jackson dataformat: CBOR  
Multi-Release: true  
Build-Jdk-Spec: 1.8  
Bundle-Description: Support for reading and writing Concise Binary Object Representation([CBOR](<https://www.rfc-editor.org/info/rfc7049>))enc

oded data using Jackson abstractions (streaming API, data binding, tree model)

Implementation-Title: Jackson dataformat: CBOR

Implementation-Version: 2.13.4

Bundle-ManifestVersion: 2

Specification-Vendor: FasterXML

Bundle-Vendor: FasterXML

Tool: Bnd-5.1.1.202006162103

Implementation-Vendor: FasterXML

Bundle-Version: 2.13.4

X-Compile-Target-JDK: 1.8

X-Compile-Source-JDK: 1.8

Created-By: Apache Maven Bundle Plugin

Specification-Version: 2.13.4

Found in path(s):

\* /opt/cola/permits/1424168264\_1663881850.9813635/0/jackson-dataformat-cbor-2-13-4-jar/META-INF/MANIFEST.MF

# 1.126 latencyutils 2.0.3

## 1.126.1 Available under license :

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sm7iCY/[64::w/aRM.-c4szto@`onq?J?zQANROBttpz8qp5H-g+]  
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jg4ylkX"+\*z9{L  
o(B|7{|{h-ICc|s6zJVE.3RK`pDIL.RG6#swX+GBuRg5mlM;[IF]DJ#QZuU=G m\06WaLh3SZh \_`SA8va\$/c)`6  
@h1]C  
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"wj\5^XW6|OV0|};^k3i^  
9ws\_Iq:D=g '!PX8{6Rh8\*I|[Tv1^8!c/K1g3Nzj]\_pSER"%F\_B7F}mr"oS/JPPE:)VFXNk'47p4ZUK4

CA=6JjVHj2Lv[ Gy(? "x  
Mi0p=M=r)wO[YPUD1% rkX4yMc  
k`WR/ABV+qKP?4Z~&`J5F?./;QjxYg7!"\q8qMk&p-.Lq3aqolASrz#b"Koq3:7Ky0WZ6D+IB\UPU2j;\$LVs^m-  
+ETHfF

A@i{nV\BCS!srY rq25>rgYS3\$`?kLjI>{GJwwqS<s9thIWR8\_aHD]Zs },[1`uE1H4zG5.2khKPx]/g{?

```
k1B(P^%*Vmo?X,*r;*$_`~9[B\jr~0a`F1P0ry$^Qa^?VL{ljedPzKf: v?=oqM~@RTob(aO3i
[GJ,gNWA6La7.QcBz1" 451'cliDC`i|8[Ay0(.8{_)xO`5
4R,r)QNo >UYT<
r?=3LaAnfO"Zo;lmu?.5z+bYhX %
/!"7J|C|8qoHjW7Ju~.{ fP 'ad mw7OiG|nsi
u~2r@_3v [Fg@.Nmjino$'+q$}4Wae3r\ZK
[Z6QXf+.s~Y9Wz`e9%)OnI.-VZHM^t:r*ppkMd# Y!Nn6fxs/
a23pT]sO,rfF;&gq|dL)BsZ{mtwciPt=+[5hmU$A@ 9t*bSI?@IbO_!' ?! G/qU'w><00` aEw`?)Nlu ;~%~
WFwm0G;:_
w>Q6W>
0?yU|f17W.~w$$8oh~*TPK'&2PK0PDC=spring-cloud-starter-netflix-ribbon-2.1.2.RELEASE-
sources.jarPK9ZP'&26spring-cloud-netflix-sidecar-2.2.2.RELEASE-sources.jarPK=
```

# 1.127 micronaut-email 1.2.1

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Found in path(s):

```
* /opt/cola/permits/1331473578_1653068511.1991618/0/micronaut-email-1-2-1-sources-
jar/io/micronaut/email/AsyncEmailSender.java
* /opt/cola/permits/1331473578_1653068511.1991618/0/micronaut-email-1-2-1-sources-
jar/io/micronaut/email/StringBody.java
* /opt/cola/permits/1331473578_1653068511.1991618/0/micronaut-email-1-2-1-sources-
jar/io/micronaut/email/validation/RecipientsUtils.java
* /opt/cola/permits/1331473578_1653068511.1991618/0/micronaut-email-1-2-1-sources-
jar/io/micronaut/email/configuration/FromConfigurationProperties.java
* /opt/cola/permits/1331473578_1653068511.1991618/0/micronaut-email-1-2-1-sources-
jar/io/micronaut/email/MultipartBody.java
* /opt/cola/permits/1331473578_1653068511.1991618/0/micronaut-email-1-2-1-sources-
jar/io/micronaut/email/FromDecorator.java
```

\* /opt/cola/permits/1331473578\_1653068511.1991618/0/micronaut-email-1-2-1-sources-jar/io/micronaut/email/BodyType.java  
\* /opt/cola/permits/1331473578\_1653068511.1991618/0/micronaut-email-1-2-1-sources-jar/io/micronaut/email/validation/AnyRecipientConstraintValidatorFactory.java  
\* /opt/cola/permits/1331473578\_1653068511.1991618/0/micronaut-email-1-2-1-sources-jar/io/micronaut/email/configuration/FromConfiguration.java  
\* /opt/cola/permits/1331473578\_1653068511.1991618/0/micronaut-email-1-2-1-sources-jar/io/micronaut/email/TrackLinks.java  
\* /opt/cola/permits/1331473578\_1653068511.1991618/0/micronaut-email-1-2-1-sources-jar/io/micronaut/email/AsyncTransactionalEmailSender.java  
\* /opt/cola/permits/1331473578\_1653068511.1991618/0/micronaut-email-1-2-1-sources-jar/io/micronaut/email/validation/EmailMessages.java  
\* /opt/cola/permits/1331473578\_1653068511.1991618/0/micronaut-email-1-2-1-sources-jar/io/micronaut/email/DefaultAsyncEmailSender.java  
\* /opt/cola/permits/1331473578\_1653068511.1991618/0/micronaut-email-1-2-1-sources-jar/io/micronaut/email/EmailSender.java  
\* /opt/cola/permits/1331473578\_1653068511.1991618/0/micronaut-email-1-2-1-sources-jar/io/micronaut/email/EmailDecorator.java  
\* /opt/cola/permits/1331473578\_1653068511.1991618/0/micronaut-email-1-2-1-sources-jar/io/micronaut/email/EmailComposer.java  
\* /opt/cola/permits/1331473578\_1653068511.1991618/0/micronaut-email-1-2-1-sources-jar/io/micronaut/email/TransactionalEmailSender.java  
\* /opt/cola/permits/1331473578\_1653068511.1991618/0/micronaut-email-1-2-1-sources-jar/io/micronaut/email/validation/AnyRecipient.java  
\* /opt/cola/permits/1331473578\_1653068511.1991618/0/micronaut-email-1-2-1-sources-jar/io/micronaut/email/Email.java  
\* /opt/cola/permits/1331473578\_1653068511.1991618/0/micronaut-email-1-2-1-sources-jar/io/micronaut/email/Contact.java  
\* /opt/cola/permits/1331473578\_1653068511.1991618/0/micronaut-email-1-2-1-sources-jar/io/micronaut/email/Body.java  
\* /opt/cola/permits/1331473578\_1653068511.1991618/0/micronaut-email-1-2-1-sources-jar/io/micronaut/email/Attachment.java  
\* /opt/cola/permits/1331473578\_1653068511.1991618/0/micronaut-email-1-2-1-sources-jar/io/micronaut/email/EmailException.java  
\* /opt/cola/permits/1331473578\_1653068511.1991618/0/micronaut-email-1-2-1-sources-jar/io/micronaut/email/AbstractTransactionalEmailSender.java  
\* /opt/cola/permits/1331473578\_1653068511.1991618/0/micronaut-email-1-2-1-sources-jar/io/micronaut/email/DefaultEmailSender.java  
\* /opt/cola/permits/1331473578\_1653068511.1991618/0/micronaut-email-1-2-1-sources-jar/io/micronaut/email/validation/Recipients.java

## 1.128 commons-codec 1.15

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Found in path(s):

\* /opt/cola/permits/1331474218\_1653513142.445036/0/micronaut-serde-api-1-0-1-sources-jar/io/micronaut/serde/util/CustomizableSerializer.java  
\* /opt/cola/permits/1331474218\_1653513142.445036/0/micronaut-serde-api-1-0-1-sources-jar/io/micronaut/serde/util/CustomizableDeserializer.java  
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\* /opt/cola/permits/1331474218\_1653513142.445036/0/micronaut-serde-api-1-0-1-sources-jar/io/micronaut/serde/util/NullableSerde.java  
\* /opt/cola/permits/1331474218\_1653513142.445036/0/micronaut-serde-api-1-0-1-sources-jar/io/micronaut/serde/ObjectMapper.java  
\* /opt/cola/permits/1331474218\_1653513142.445036/0/micronaut-serde-api-1-0-1-sources-jar/io/micronaut/serde/annotation/SerdeImport.java  
\* /opt/cola/permits/1331474218\_1653513142.445036/0/micronaut-serde-api-1-0-1-sources-jar/io/micronaut/serde/config/naming/LowerDotCaseStrategy.java  
\* /opt/cola/permits/1331474218\_1653513142.445036/0/micronaut-serde-api-1-0-1-sources-jar/io/micronaut/serde/Serde.java  
\* /opt/cola/permits/1331474218\_1653513142.445036/0/micronaut-serde-api-1-0-1-sources-jar/io/micronaut/serde/DeserializerLocator.java  
\* /opt/cola/permits/1331474218\_1653513142.445036/0/micronaut-serde-api-1-0-1-sources-jar/io/micronaut/serde/config/naming/SnakeCaseStrategy.java  
\* /opt/cola/permits/1331474218\_1653513142.445036/0/micronaut-serde-api-1-0-1-sources-jar/io/micronaut/serde/NamingStrategyLocator.java  
\* /opt/cola/permits/1331474218\_1653513142.445036/0/micronaut-serde-api-1-0-1-sources-jar/io/micronaut/serde/Deserializer.java  
\* /opt/cola/permits/1331474218\_1653513142.445036/0/micronaut-serde-api-1-0-1-sources-jar/io/micronaut/serde/config/naming/KebabCaseStrategy.java  
\* /opt/cola/permits/1331474218\_1653513142.445036/0/micronaut-serde-api-1-0-1-sources-jar/io/micronaut/serde/config/naming/PropertyNamingStrategy.java  
\* /opt/cola/permits/1331474218\_1653513142.445036/0/micronaut-serde-api-1-0-1-sources-jar/io/micronaut/serde/SerializerLocator.java  
\* /opt/cola/permits/1331474218\_1653513142.445036/0/micronaut-serde-api-1-0-1-sources-

jar/io/micronaut/serde/exceptions/SerdeException.java  
\* /opt/cola/permits/1331474218\_1653513142.445036/0/micronaut-serde-api-1-0-1-sources-jar/io/micronaut/serde/Encoder.java  
\* /opt/cola/permits/1331474218\_1653513142.445036/0/micronaut-serde-api-1-0-1-sources-jar/io/micronaut/serde/config/naming/UpperCamelCaseStrategyWithSpaces.java  
\* /opt/cola/permits/1331474218\_1653513142.445036/0/micronaut-serde-api-1-0-1-sources-jar/io/micronaut/serde/config/annotation/SerdeConfig.java  
\* /opt/cola/permits/1331474218\_1653513142.445036/0/micronaut-serde-api-1-0-1-sources-jar/io/micronaut/serde/exceptions/InvalidPropertyFormatException.java  
\* /opt/cola/permits/1331474218\_1653513142.445036/0/micronaut-serde-api-1-0-1-sources-jar/io/micronaut/serde/reference/AbstractPropertyReferenceManager.java  
\* /opt/cola/permits/1331474218\_1653513142.445036/0/micronaut-serde-api-1-0-1-sources-jar/io/micronaut/serde/SerdeIntrospections.java  
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\* /opt/cola/permits/1331474218\_1653513142.445036/0/micronaut-serde-api-1-0-1-sources-jar/io/micronaut/serde/SerdeRegistry.java  
\* /opt/cola/permits/1331474218\_1653513142.445036/0/micronaut-serde-api-1-0-1-sources-jar/io/micronaut/serde/Decoder.java  
\* /opt/cola/permits/1331474218\_1653513142.445036/0/micronaut-serde-api-1-0-1-sources-jar/io/micronaut/serde/config/SerdeConfiguration.java  
\* /opt/cola/permits/1331474218\_1653513142.445036/0/micronaut-serde-api-1-0-1-sources-jar/io/micronaut/serde/util/NullableDeserializer.java  
\* /opt/cola/permits/1331474218\_1653513142.445036/0/micronaut-serde-api-1-0-1-sources-jar/io/micronaut/serde/config/naming/LowerCaseStrategy.java  
\* /opt/cola/permits/1331474218\_1653513142.445036/0/micronaut-serde-api-1-0-1-sources-jar/io/micronaut/serde/exceptions/InvalidFormatException.java  
\* /opt/cola/permits/1331474218\_1653513142.445036/0/micronaut-serde-api-1-0-1-sources-jar/io/micronaut/serde/config/naming/LowerCamelCaseStrategy.java  
\* /opt/cola/permits/1331474218\_1653513142.445036/0/micronaut-serde-api-1-0-1-sources-jar/io/micronaut/serde/UpdatingDeserializer.java  
\* /opt/cola/permits/1331474218\_1653513142.445036/0/micronaut-serde-api-1-0-1-sources-jar/io/micronaut/serde/config/naming/UpperCamelCaseStrategy.java  
\* /opt/cola/permits/1331474218\_1653513142.445036/0/micronaut-serde-api-1-0-1-sources-jar/io/micronaut/serde/reference/PropertyReference.java  
\* /opt/cola/permits/1331474218\_1653513142.445036/0/micronaut-serde-api-1-0-1-sources-jar/io/micronaut/serde/config/naming/IdentityStrategy.java  
\* /opt/cola/permits/1331474218\_1653513142.445036/0/micronaut-serde-api-1-0-1-sources-jar/io/micronaut/serde/Serializer.java  
\* /opt/cola/permits/1331474218\_1653513142.445036/0/micronaut-serde-api-1-0-1-sources-jar/io/micronaut/serde/reference/SerializationReference.java  
\* /opt/cola/permits/1331474218\_1653513142.445036/0/micronaut-serde-api-1-0-1-sources-jar/io/micronaut/serde/config/SerializationConfiguration.java  
\* /opt/cola/permits/1331474218\_1653513142.445036/0/micronaut-serde-api-1-0-1-sources-jar/io/micronaut/serde/annotation/Serdeable.java  
\* /opt/cola/permits/1331474218\_1653513142.445036/0/micronaut-serde-api-1-0-1-sources-jar/io/micronaut/serde/reference/PropertyReferenceManager.java

# 1.130 micronaut-micrometer 4.2.1

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Found in path(s):

\* /opt/cola/permits/1331474018\_1653514625.490619/0/micronaut-micrometer-core-4-2-1-sources-jar/io/micronaut/configuration/metrics/binder/web/HttpMeterFilterFactory.java

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\* /opt/cola/permits/1331474018\_1653514625.490619/0/micronaut-micrometer-core-4-2-1-sources-jar/io/micronaut/configuration/metrics/micrometer/ExportConfigurationProperties.java



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```
* /opt/cola/permits/1331474018_1653514625.490619/0/micronaut-micrometer-core-4-2-1-sources-
jar/io/micronaut/configuration/metrics/aggregator/MeterRegistryConfigurer.java
* /opt/cola/permits/1331474018_1653514625.490619/0/micronaut-micrometer-core-4-2-1-sources-
jar/io/micronaut/configuration/metrics/binder/cache/package-info.java
* /opt/cola/permits/1331474018_1653514625.490619/0/micronaut-micrometer-core-4-2-1-sources-
jar/io/micronaut/configuration/metrics/binder/netty/InstrumentedKQueueEventLoopGroupFactory.java
* /opt/cola/permits/1331474018_1653514625.490619/0/micronaut-micrometer-core-4-2-1-sources-
jar/io/micronaut/configuration/metrics/annotation/package-info.java
* /opt/cola/permits/1331474018_1653514625.490619/0/micronaut-micrometer-core-4-2-1-sources-
jar/io/micronaut/configuration/metrics/binder/executor/package-info.java
* /opt/cola/permits/1331474018_1653514625.490619/0/micronaut-micrometer-core-4-2-1-sources-
jar/io/micronaut/configuration/metrics/binder/netty/ByteBufAllocatorMetricsBinder.java
* /opt/cola/permits/1331474018_1653514625.490619/0/micronaut-micrometer-core-4-2-1-sources-
jar/io/micronaut/configuration/metrics/binder/web/ClientRequestMetricRegistryFilter.java
* /opt/cola/permits/1331474018_1653514625.490619/0/micronaut-micrometer-core-4-2-1-sources-
jar/io/micronaut/configuration/metrics/aggregator/package-info.java
* /opt/cola/permits/1331474018_1653514625.490619/0/micronaut-micrometer-core-4-2-1-sources-
jar/io/micronaut/configuration/metrics/micrometer/intercept/TimedInterceptor.java
* /opt/cola/permits/1331474018_1653514625.490619/0/micronaut-micrometer-core-4-2-1-sources-
jar/io/micronaut/configuration/metrics/aggregator/CompositeMeterRegistryConfigurer.java
* /opt/cola/permits/1331474018_1653514625.490619/0/micronaut-micrometer-core-4-2-1-sources-
jar/io/micronaut/configuration/metrics/management/endpoint/MetricsEndpoint.java
* /opt/cola/permits/1331474018_1653514625.490619/0/micronaut-micrometer-core-4-2-1-sources-
jar/io/micronaut/configuration/metrics/micrometer/MeterRegistryFactory.java
* /opt/cola/permits/1331474018_1653514625.490619/0/micronaut-micrometer-core-4-2-1-sources-
jar/io/micronaut/configuration/metrics/binder/web/ServerRequestMeterRegistryFilter.java
* /opt/cola/permits/1331474018_1653514625.490619/0/micronaut-micrometer-core-4-2-1-sources-
jar/io/micronaut/configuration/metrics/binder/logging/package-info.java
* /opt/cola/permits/1331474018_1653514625.490619/0/micronaut-micrometer-core-4-2-1-sources-
```

jar/io/micronaut/configuration/metrics/micrometer/annotation/MicrometerTimed.java  
\* /opt/cola/permits/1331474018\_1653514625.490619/0/micronaut-micrometer-core-4-2-1-sources-  
jar/io/micronaut/configuration/metrics/micrometer/logging/package-info.java  
\* /opt/cola/permits/1331474018\_1653514625.490619/0/micronaut-micrometer-core-4-2-1-sources-  
jar/io/micronaut/configuration/metrics/binder/logging/LogbackMeterRegistryBinderFactory.java  
\* /opt/cola/permits/1331474018\_1653514625.490619/0/micronaut-micrometer-core-4-2-1-sources-  
jar/io/micronaut/configuration/metrics/binder/netty/MonitoredQueue.java  
\* /opt/cola/permits/1331474018\_1653514625.490619/0/micronaut-micrometer-core-4-2-1-sources-  
jar/io/micronaut/configuration/metrics/micrometer/logging/LoggingMeterRegistryFactory.java  
\* /opt/cola/permits/1331474018\_1653514625.490619/0/micronaut-micrometer-core-4-2-1-sources-  
jar/io/micronaut/configuration/metrics/binder/datasource/DataSourcePoolMetricsBinderFactory.java  
\* /opt/cola/permits/1331474018\_1653514625.490619/0/micronaut-micrometer-core-4-2-1-sources-  
jar/io/micronaut/configuration/metrics/binder/datasource/DataSourcePoolMetricsBinder.java  
\* /opt/cola/permits/1331474018\_1653514625.490619/0/micronaut-micrometer-core-4-2-1-sources-  
jar/io/micronaut/configuration/metrics/binder/web/package-info.java  
\* /opt/cola/permits/1331474018\_1653514625.490619/0/micronaut-micrometer-core-4-2-1-sources-  
jar/io/micronaut/configuration/metrics/binder/netty/NettyMetrics.java  
\* /opt/cola/permits/1331474018\_1653514625.490619/0/micronaut-micrometer-core-4-2-1-sources-  
jar/io/micronaut/configuration/metrics/binder/system/package-info.java  
\* /opt/cola/permits/1331474018\_1653514625.490619/0/micronaut-micrometer-core-4-2-1-sources-  
jar/io/micronaut/configuration/metrics/binder/jvm/package-info.java  
\* /opt/cola/permits/1331474018\_1653514625.490619/0/micronaut-micrometer-core-4-2-1-sources-  
jar/io/micronaut/configuration/metrics/micrometer/package-info.java  
\* /opt/cola/permits/1331474018\_1653514625.490619/0/micronaut-micrometer-core-4-2-1-sources-  
jar/io/micronaut/configuration/metrics/binder/datasource/package-info.java  
\* /opt/cola/permits/1331474018\_1653514625.490619/0/micronaut-micrometer-core-4-2-1-sources-  
jar/io/micronaut/configuration/metrics/binder/system/SystemMeterRegistryBinderFactoryFactory.java  
\* /opt/cola/permits/1331474018\_1653514625.490619/0/micronaut-micrometer-core-4-2-1-sources-  
jar/io/micronaut/configuration/metrics/binder/cache/MicronautCaffeineCacheMetrics.java  
\* /opt/cola/permits/1331474018\_1653514625.490619/0/micronaut-micrometer-core-4-2-1-sources-  
jar/io/micronaut/configuration/metrics/binder/jvm/JvmMeterRegistryBinderFactory.java  
\* /opt/cola/permits/1331474018\_1653514625.490619/0/micronaut-micrometer-core-4-2-1-sources-  
jar/io/micronaut/configuration/metrics/binder/netty/ChannelMetricsHandler.java  
\* /opt/cola/permits/1331474018\_1653514625.490619/0/micronaut-micrometer-core-4-2-1-sources-  
jar/io/micronaut/configuration/metrics/binder/netty/InstrumentedEpollEventLoopGroupFactory.java  
\* /opt/cola/permits/1331474018\_1653514625.490619/0/micronaut-micrometer-core-4-2-1-sources-  
jar/io/micronaut/configuration/metrics/annotation/RequiresMetrics.java  
\* /opt/cola/permits/1331474018\_1653514625.490619/0/micronaut-micrometer-core-4-2-1-sources-  
jar/io/micronaut/configuration/metrics/management/endpoint/package-info.java  
\* /opt/cola/permits/1331474018\_1653514625.490619/0/micronaut-micrometer-core-4-2-1-sources-  
jar/io/micronaut/configuration/metrics/binder/netty/InstrumentedNioEventLoopGroupFactory.java  
\* /opt/cola/permits/1331474018\_1653514625.490619/0/micronaut-micrometer-core-4-2-1-sources-  
jar/io/micronaut/configuration/metrics/binder/executor/ExecutorServiceMetricsBinder.java  
\* /opt/cola/permits/1331474018\_1653514625.490619/0/micronaut-micrometer-core-4-2-1-sources-  
jar/io/micronaut/configuration/metrics/common/tags/CommonTagsConfigurer.java  
\* /opt/cola/permits/1331474018\_1653514625.490619/0/micronaut-micrometer-core-4-2-1-sources-  
jar/io/micronaut/configuration/metrics/binder/netty/package-info.java  
\* /opt/cola/permits/1331474018\_1653514625.490619/0/micronaut-micrometer-core-4-2-1-sources-

```
jar/io/micronaut/configuration/metrics/binder/cache/JCacheMetricsBinder.java
* /opt/cola/permits/1331474018_1653514625.490619/0/micronaut-micrometer-core-4-2-1-sources-
jar/io/micronaut/configuration/metrics/binder/netty/NettyMetricsPipelineBinder.java
* /opt/cola/permits/1331474018_1653514625.490619/0/micronaut-micrometer-core-4-2-1-sources-
jar/io/micronaut/configuration/metrics/binder/web/WebMetricsPublisher.java
* /opt/cola/permits/1331474018_1653514625.490619/0/micronaut-micrometer-core-4-2-1-sources-
jar/io/micronaut/configuration/metrics/binder/netty/InstrumentedEventLoopTaskQueueFactory.java
* /opt/cola/permits/1331474018_1653514625.490619/0/micronaut-micrometer-core-4-2-1-sources-
jar/io/micronaut/configuration/metrics/binder/cache/MicronautCaffeineCacheMetricsBinder.java
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```
* /opt/cola/permits/1331474018_1653514625.490619/0/micronaut-micrometer-core-4-2-1-sources-jar/META-
INF/native-image/io.micronaut.micrometer/micronaut-micrometer-core/native-image.properties
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* /opt/cola/permits/1331474018_1653514625.490619/0/micronaut-micrometer-core-4-2-1-sources-
jar/io/micronaut/configuration/metrics/binder/grpc/GrpcMetricsListenerFactory.java
* /opt/cola/permits/1331474018_1653514625.490619/0/micronaut-micrometer-core-4-2-1-sources-
jar/io/micronaut/configuration/metrics/micrometer/intercept/CountedInterceptor.java
```

## 1.131 opentelemetry-java---

# io.opentelemetry:opentelemetry-sdk-metrics

# 1.16.0

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## 1.132 rocksdb-jni 7.0.3

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/opt/cola/permits/1473594324\_1668735417.4062526/0/rocksdbjni-7-0-3-jar/librocksdbjni-linux-aarch64.so: binary file matches  
/opt/cola/permits/1473594324\_1668735417.4062526/0/rocksdbjni-7-0-3-jar/librocksdbjni-linux-ppc64le.so: binary file matches  
/opt/cola/permits/1473594324\_1668735417.4062526/0/rocksdbjni-7-0-3-jar/librocksdbjni-linux-s390x-musl.so: binary file matches  
/opt/cola/permits/1473594324\_1668735417.4062526/0/rocksdbjni-7-0-3-jar/librocksdbjni-linux-s390x.so: binary file matches  
/opt/cola/permits/1473594324\_1668735417.4062526/0/rocksdbjni-7-0-3-jar/librocksdbjni-linux32-musl.so: binary file matches  
/opt/cola/permits/1473594324\_1668735417.4062526/0/rocksdbjni-7-0-3-jar/librocksdbjni-linux32.so: binary file matches  
/opt/cola/permits/1473594324\_1668735417.4062526/0/rocksdbjni-7-0-3-jar/librocksdbjni-linux64-musl.so: binary file matches  
/opt/cola/permits/1473594324\_1668735417.4062526/0/rocksdbjni-7-0-3-jar/librocksdbjni-linux64.so: binary file matches

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## 1.133 netty-transport-native-unix-common 4.1.84.Final



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```
* /opt/cola/permits/1470278818_1668107860.126395/0/netty-transport-native-unix-common-4-1-84-final-sources-2-jar/META-INF/maven/io.netty/netty-transport-native-unix-common/pom.xml
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```
* /opt/cola/permits/1470278818_1668107860.126395/0/netty-transport-native-unix-common-4-1-84-final-sources-2-jar/netty_unix.h
* /opt/cola/permits/1470278818_1668107860.126395/0/netty-transport-native-unix-common-4-1-84-final-sources-2-jar/netty_unix.c
```

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\* /opt/cola/permits/1470278818\_1668107860.126395/0/netty-transport-native-unix-common-4-1-84-final-sources-2-jar/io/netty/channel/unix/PreferredDirectByteBufferAllocator.java  
\* /opt/cola/permits/1470278818\_1668107860.126395/0/netty-transport-native-unix-common-4-1-84-final-sources-2-jar/io/netty/channel/unix/Buffer.java

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\* /opt/cola/permits/1470278818\_1668107860.126395/0/netty-transport-native-unix-common-4-1-84-final-sources-2-jar/io/netty/channel/unix/SegmentedDatagramPacket.java  
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\* /opt/cola/permits/1470278818\_1668107860.126395/0/netty-transport-native-unix-common-4-1-84-final-sources-2-jar/io/netty/channel/unix/DomainDatagramSocketAddress.java  
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\* /opt/cola/permits/1470278818\_1668107860.126395/0/netty-transport-native-unix-common-4-1-84-final-sources-2-jar/io/netty/channel/unix/UnixChannel.java  
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\* /opt/cola/permits/1470278818\_1668107860.126395/0/netty-transport-native-unix-common-4-1-84-final-sources-2-jar/io/netty/channel/unix/package-info.java  
\* /opt/cola/permits/1470278818\_1668107860.126395/0/netty-transport-native-unix-common-4-1-84-final-sources-2-jar/io/netty/channel/unix/IovArray.java

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\* /opt/cola/permits/1470278818\_1668107860.126395/0/netty-transport-native-unix-common-4-1-84-final-sources-2-jar/netty\_unix\_limits.c  
\* /opt/cola/permits/1470278818\_1668107860.126395/0/netty-transport-native-unix-common-4-1-84-final-sources-2-jar/io/netty/channel/unix/Limits.java  
\* /opt/cola/permits/1470278818\_1668107860.126395/0/netty-transport-native-unix-common-4-1-84-final-sources-

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\* /opt/cola/permits/1470278818\_1668107860.126395/0/netty-transport-native-unix-common-4-1-84-final-sources-

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<link rel="stylesheet" href="resources/doc.css" charset="UTF-8" type="text/css" />

<link rel="shortcut icon" href="resources/report.gif" type="image/gif" />

<title>JaCoCo - Eclipse Public License - Version 2.0</title>

<style type="text/css">

p.list {

margin-left: 0.5in;

```
margin-top: 0.05em;
margin-bottom: 0.05em;
}
</style>
</head>
<body>

<div class="breadcrumb">
 JaCoCo >
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</div>
<div id="content">

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```

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</body>

</html>

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<pre>
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```

```
</pre>
```

```
<?xml version="1.0" encoding="UTF-8" ?>
```

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Strict//EN" "http://www.w3.org/TR/xhtml1/DTD/xhtml1-strict.dtd">
```

```
<html xmlns="http://www.w3.org/1999/xhtml" lang="en">
```

```
<head>
```

```
<meta http-equiv="Content-Type" content="text/html; charset=UTF-8" />
```

```
<link rel="stylesheet" href="resources/doc.css" charset="UTF-8" type="text/css" />
```

```
<link rel="shortcut icon" href="resources/report.gif" type="image/gif" />
```

```
<title>JaCoCo - License</title>
```

```
</head>
```

```
<body>
```

```
<div class="breadcrumb">
```

```
JaCoCo >
```

```
License
```

</div>

<div id="content">

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```

Found in path(s):

```
* /opt/cola/permits/1340815985_1654861270.8175628/0/cloudevents-api-2-2-0-sources-
jar/io/cloudevents/lang/Nullable.java
* /opt/cola/permits/1340815985_1654861270.8175628/0/cloudevents-api-2-2-0-sources-
jar/io/cloudevents/rw/CloudEventContextReader.java
* /opt/cola/permits/1340815985_1654861270.8175628/0/cloudevents-api-2-2-0-sources-
jar/io/cloudevents/rw/CloudEventContextWriter.java
* /opt/cola/permits/1340815985_1654861270.8175628/0/cloudevents-api-2-2-0-sources-
jar/io/cloudevents/rw/CloudEventRWException.java
* /opt/cola/permits/1340815985_1654861270.8175628/0/cloudevents-api-2-2-0-sources-
jar/io/cloudevents/CloudEvent.java
```



\* /opt/cola/permits/1340815985\_1654861270.8175628/0/cloudevents-api-2-2-0-sources-jar/io/cloudevents/rw/CloudEventReader.java  
\* /opt/cola/permits/1340815985\_1654861270.8175628/0/cloudevents-api-2-2-0-sources-jar/io/cloudevents/rw/CloudEventDataMapper.java  
\* /opt/cola/permits/1340815985\_1654861270.8175628/0/cloudevents-api-2-2-0-sources-jar/io/cloudevents/CloudEventExtension.java  
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\* /opt/cola/permits/1340815985\_1654861270.8175628/0/cloudevents-api-2-2-0-sources-jar/io/cloudevents/rw/CloudEventWriterFactory.java  
\* /opt/cola/permits/1340815985\_1654861270.8175628/0/cloudevents-api-2-2-0-sources-jar/io/cloudevents/CloudEventAttributes.java  
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\* /opt/cola/permits/1340815985\_1654861270.8175628/0/cloudevents-api-2-2-0-sources-jar/io/cloudevents/CloudEventData.java  
\* /opt/cola/permits/1340815985\_1654861270.8175628/0/cloudevents-api-2-2-0-sources-jar/io/cloudevents/SpecVersion.java  
\* /opt/cola/permits/1340815985\_1654861270.8175628/0/cloudevents-api-2-2-0-sources-jar/io/cloudevents/rw/CloudEventWriter.java  
\* /opt/cola/permits/1340815985\_1654861270.8175628/0/cloudevents-api-2-2-0-sources-jar/io/cloudevents/CloudEventExtensions.java

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-->

Found in path(s):

\* /opt/cola/permits/1340815985\_1654861270.8175628/0/cloudevents-api-2-2-0-sources-jar/META-INF/maven/io.cloudevents/cloudevents-api/pom.xml

# 1.142 micronaut-servlet 3.2.2

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 */
```

Found in path(s):

```
* /opt/cola/permits/1331473542_1653512935.5710146/0/micronaut-servlet-core-3-2-2-sources-
jar/io/micronaut/servlet/http/ServletCookies.java
* /opt/cola/permits/1331473542_1653512935.5710146/0/micronaut-servlet-core-3-2-2-sources-
jar/io/micronaut/servlet/http/ServletResponseFactory.java
* /opt/cola/permits/1331473542_1653512935.5710146/0/micronaut-servlet-core-3-2-2-sources-
jar/io/micronaut/servlet/http/encoders/StreamFileEncoder.java
* /opt/cola/permits/1331473542_1653512935.5710146/0/micronaut-servlet-core-3-2-2-sources-
jar/io/micronaut/servlet/http/ServletRequestBinder.java
* /opt/cola/permits/1331473542_1653512935.5710146/0/micronaut-servlet-core-3-2-2-sources-
jar/io/micronaut/servlet/http/StreamedServletMessage.java
* /opt/cola/permits/1331473542_1653512935.5710146/0/micronaut-servlet-core-3-2-2-sources-
jar/io/micronaut/servlet/http/ServletHttpHandler.java
* /opt/cola/permits/1331473542_1653512935.5710146/0/micronaut-servlet-core-3-2-2-sources-
jar/io/micronaut/servlet/http/ServletBodyBinder.java
* /opt/cola/permits/1331473542_1653512935.5710146/0/micronaut-servlet-core-3-2-2-sources-
jar/io/micronaut/servlet/http/ServletRequestAndBody.java
* /opt/cola/permits/1331473542_1653512935.5710146/0/micronaut-servlet-core-3-2-2-sources-
jar/io/micronaut/servlet/http/DefaultServletExchange.java
* /opt/cola/permits/1331473542_1653512935.5710146/0/micronaut-servlet-core-3-2-2-sources-
jar/io/micronaut/servlet/http/ServletExchange.java
* /opt/cola/permits/1331473542_1653512935.5710146/0/micronaut-servlet-core-3-2-2-sources-
jar/io/micronaut/servlet/http/encoders/AbstractFileEncoder.java
* /opt/cola/permits/1331473542_1653512935.5710146/0/micronaut-servlet-core-3-2-2-sources-
jar/io/micronaut/servlet/http/ServletResponseEncoder.java
* /opt/cola/permits/1331473542_1653512935.5710146/0/micronaut-servlet-core-3-2-2-sources-
```

jar/io/micronaut/servlet/http/encoders/FileEncoder.java  
\* /opt/cola/permits/1331473542\_1653512935.5710146/0/micronaut-servlet-core-3-2-2-sources-  
jar/io/micronaut/servlet/http/ServletHttpResponse.java  
\* /opt/cola/permits/1331473542\_1653512935.5710146/0/micronaut-servlet-core-3-2-2-sources-  
jar/io/micronaut/servlet/http/ServletBinderRegistry.java  
\* /opt/cola/permits/1331473542\_1653512935.5710146/0/micronaut-servlet-core-3-2-2-sources-  
jar/io/micronaut/servlet/http/ServletHttpRequest.java  
\* /opt/cola/permits/1331473542\_1653512935.5710146/0/micronaut-servlet-core-3-2-2-sources-  
jar/io/micronaut/servlet/http/encoders/SystemFileEncoder.java

# 1.143 micronaut-micrometer 4.3.0

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# 1.144 micronaut-rxjava-3 2.2.1

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```

Found in path(s):

\* /opt/cola/permits/1331474197\_1653513200.9120781/0/micronaut-rxjava3-2-2-1-sources-

jar/io/micronaut/rxjava3/instrument/RxInstrumentedComponent.java  
\* /opt/cola/permits/1331474197\_1653513200.9120781/0/micronaut-rxjava3-2-2-1-sources-  
jar/io/micronaut/rxjava3/instrument/RxInstrumentedCompletableObserver.java  
\* /opt/cola/permits/1331474197\_1653513200.9120781/0/micronaut-rxjava3-2-2-1-sources-  
jar/io/micronaut/rxjava3/converters/RxJava2ToRxJava3ConveterRegistrar.java  
\* /opt/cola/permits/1331474197\_1653513200.9120781/0/micronaut-rxjava3-2-2-1-sources-  
jar/io/micronaut/rxjava3/instrument/RxInstrumentedParallelFlowable.java  
\* /opt/cola/permits/1331474197\_1653513200.9120781/0/micronaut-rxjava3-2-2-1-sources-  
jar/io/micronaut/rxjava3/instrument/RxInstrumentedSingleObserver.java  
\* /opt/cola/permits/1331474197\_1653513200.9120781/0/micronaut-rxjava3-2-2-1-sources-  
jar/io/micronaut/rxjava3/instrument/RxInstrumentedConnectableFlowable.java  
\* /opt/cola/permits/1331474197\_1653513200.9120781/0/micronaut-rxjava3-2-2-1-sources-  
jar/io/micronaut/rxjava3/instrument/RxInstrumentedObserver.java  
\* /opt/cola/permits/1331474197\_1653513200.9120781/0/micronaut-rxjava3-2-2-1-sources-  
jar/io/micronaut/rxjava3/instrument/RxInstrumentedObservable.java  
\* /opt/cola/permits/1331474197\_1653513200.9120781/0/micronaut-rxjava3-2-2-1-sources-  
jar/io/micronaut/rxjava3/converters/RxJava3ConverterRegistrar.java  
\* /opt/cola/permits/1331474197\_1653513200.9120781/0/micronaut-rxjava3-2-2-1-sources-  
jar/io/micronaut/rxjava3/instrument/RxInstrumentedCompletable.java  
\* /opt/cola/permits/1331474197\_1653513200.9120781/0/micronaut-rxjava3-2-2-1-sources-  
jar/io/micronaut/rxjava3/instrument/RxInstrumentedMaybeObserver.java  
\* /opt/cola/permits/1331474197\_1653513200.9120781/0/micronaut-rxjava3-2-2-1-sources-  
jar/io/micronaut/rxjava3/instrument/RxInstrumentedConnectableObservable.java  
\* /opt/cola/permits/1331474197\_1653513200.9120781/0/micronaut-rxjava3-2-2-1-sources-  
jar/io/micronaut/rxjava3/instrument/RxJava3Instrumentation.java  
\* /opt/cola/permits/1331474197\_1653513200.9120781/0/micronaut-rxjava3-2-2-1-sources-  
jar/io/micronaut/rxjava3/instrument/RxInstrumentedWrappers.java  
\* /opt/cola/permits/1331474197\_1653513200.9120781/0/micronaut-rxjava3-2-2-1-sources-  
jar/io/micronaut/rxjava3/instrument/RxInstrumentedFlowableSubscriber.java  
\* /opt/cola/permits/1331474197\_1653513200.9120781/0/micronaut-rxjava3-2-2-1-sources-  
jar/io/micronaut/rxjava3/instrument/RxInstrumentedFlowable.java  
\* /opt/cola/permits/1331474197\_1653513200.9120781/0/micronaut-rxjava3-2-2-1-sources-  
jar/io/micronaut/rxjava3/instrument/RxInstrumentedSubscriber.java  
\* /opt/cola/permits/1331474197\_1653513200.9120781/0/micronaut-rxjava3-2-2-1-sources-  
jar/io/micronaut/rxjava3/instrument/RxInstrumentedMaybe.java  
\* /opt/cola/permits/1331474197\_1653513200.9120781/0/micronaut-rxjava3-2-2-1-sources-  
jar/io/micronaut/rxjava3/instrument/RxInstrumentedSingle.java  
\* /opt/cola/permits/1331474197\_1653513200.9120781/0/micronaut-rxjava3-2-2-1-sources-  
jar/io/micronaut/rxjava3/instrument/RxInstrumenterFactory.java  
\* /opt/cola/permits/1331474197\_1653513200.9120781/0/micronaut-rxjava3-2-2-1-sources-  
jar/io/micronaut/rxjava3/instrument/package-info.java

## 1.145 commons-compress 1.21



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## 1.146 beanshell 2.0b6

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BSF - check these, probably public domain.

peter jodeleit: <http://commons.apache.org/proper/commons-bsf/>

engine - the jsr223 engine, some files need to be removed (sun javax stuff)

peter jodeleit: these files are obsolete if java 1.5 support is dropped, the file are part of the jdk since 1.6

JUnit

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Deal with docs and build files, READMEs?

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```

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*/
```

```
/** templates used to generate make-compatible dependencies */
```

```
/** Generate "f : x, y, z" dependencies for input
* dependencies and generated files. in and out
* are File objects. For example, you can say
* <f.canonicalPath>
*/
dependencies(grammarFileName,in,out) ::= <<
<if(in)><grammarFileName>: <in; separator=", "><endif>
<out:{f | <f> : <grammarFileName>}; separator="\n">
>>
```

Found in path(s):

```
* /opt/cola/permits/1340816081_1654861722.3479369/0/antlr4-4-9-2-sources-1-
jar/org/antlr/v4/tool/templates/depend.stg
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*/
```

```
/** Find left-recursive rules */
```

```
tree grammar LeftRecursiveRuleWalker;
```

```
options {
 tokenVocab=ANTLRParser;
 ASTLabelType=GrammarAST;
}
```

```
@header {
package org.antlr.v4.parse;
```

```
import org.antlr.v4.misc.*;
import org.antlr.v4.tool.*;
import org.antlr.v4.tool.ast.*;
}
```

```
@members {
private String ruleName;
private int currentOuterAltNumber; // which outer alt of rule?
public int numAlts; // how many alts for this rule total?
```

```
public void setAltAssoc(AltAST altTree, int alt) {}
public void binaryAlt(AltAST altTree, int alt) {}
public void prefixAlt(AltAST altTree, int alt) {}
public void suffixAlt(AltAST altTree, int alt) {}
public void otherAlt(AltAST altTree, int alt) {}
public void setReturnValues(GrammarAST t) {}
}
```

```
@rulecatch { }
```

```
// TODO: can get parser errors for not matching pattern; make them go away
```

```
public
rec_rule returns [boolean isLeftRec]
@init
{
 currentOuterAltNumber = 1;
}
: ^(r=RULE id=RULE_REF {ruleName=$id.getText();}
 ruleModifier?
// (ARG_ACTION)? shouldn't allow args, right?
 (^ (RETURNS a=ARG_ACTION {setReturnValues($a);}))?
// (^ (THROWS .+))? don't allow
```

```

 (^(LOCALS ARG_ACTION))? // TODO: copy these to gen'd code
 (^(OPTIONS .*)
 |^(AT ID ACTION) // TODO: copy
)*
ruleBlock { $isLeftRec = $ruleBlock.isLeftRec;}
exceptionGroup
)
;

exceptionGroup
: exceptionHandler* finallyClause?
;

exceptionHandler
: ^(CATCH ARG_ACTION ACTION)
;

finallyClause
: ^(FINALLY ACTION)
;

ruleModifier
: PUBLIC
| PRIVATE
| PROTECTED
;

ruleBlock returns [boolean isLeftRec]
@init{boolean lr=false; this.numAlts = $start.getChildCount();}
: ^(BLOCK
(
o=outerAlternative
{if ($o.isLeftRec) $isLeftRec = true;}
{currentOuterAltNumber++;}
)+
)
;

/** An alt is either prefix, suffix, binary, or ternary operation or "other" */
outerAlternative returns [boolean isLeftRec]
: (binary)=> binary
 {binaryAlt((AltAST)$start, currentOuterAltNumber); $isLeftRec=true;}
| (prefix)=> prefix
 {prefixAlt((AltAST)$start, currentOuterAltNumber);}
| (suffix)=> suffix
 {suffixAlt((AltAST)$start, currentOuterAltNumber); $isLeftRec=true;}
| nonLeftRecur {otherAlt((AltAST)$start, currentOuterAltNumber);}
;

```

```

binary
: ^(ALT elementOptions? recurse element* recurse epsilonElement*)
 {setAltAssoc((AltAST)$ALT,currentOuterAltNumber);}
;

prefix
: ^(ALT elementOptions?
 element+
 recurse epsilonElement*
)
 {setAltAssoc((AltAST)$ALT,currentOuterAltNumber);}
;

suffix
: ^(ALT elementOptions? recurse element+)
 {setAltAssoc((AltAST)$ALT,currentOuterAltNumber);}
;

nonLeftRecur
: ^(ALT elementOptions? element+)
;

recurse
: ^(ASSIGN ID recurseNoLabel)
| ^(PLUS_ASSIGN ID recurseNoLabel)
| recurseNoLabel
;

recurseNoLabel : {((CommonTree)input.LT(1)).getText().equals(ruleName)}? RULE_REF;

token returns [GrammarAST t=null]
: ^(ASSIGN ID s=token {$t = $s.t;})
| ^(PLUS_ASSIGN ID s=token {$t = $s.t;})
| b=STRING_LITERAL {$t = $b;}
| ^(b=STRING_LITERAL elementOptions) {$t = $b;}
| ^(c=TOKEN_REF elementOptions) {$t = $c;}
| c=TOKEN_REF {$t = $c;}
;

elementOptions
: ^(ELEMENT_OPTIONS elementOption*)
;

elementOption
: ID
| ^(ASSIGN ID ID)
| ^(ASSIGN ID STRING_LITERAL)

```

```
| ^(ASSIGN ID ACTION)
| ^(ASSIGN ID INT)
;
```

element

```
: atom
| ^(NOT element)
| ^(RANGE atom atom)
| ^(ASSIGN ID element)
| ^(PLUS_ASSIGN ID element)
| ^(SET setElement+)
| RULE_REF
| ebnf
| epsilonElement
;
```

epsilonElement

```
: ACTION
| SEMPRED
| EPSILON
| ^(ACTION elementOptions)
| ^(SEMPRED elementOptions)
;
```

setElement

```
: ^(STRING_LITERAL elementOptions)
| ^(TOKEN_REF elementOptions)
| STRING_LITERAL
| TOKEN_REF
;
```

ebnf: block

```
| ^(OPTIONAL block)
| ^(CLOSURE block)
| ^(POSITIVE_CLOSURE block)
;
```

block

```
: ^(BLOCK ACTION? alternative+)
;
```

alternative

```
: ^(ALT elementOptions? element+)
;
```

atom

```
: ^(RULE_REF ARG_ACTION? elementOptions?)
| ^(STRING_LITERAL elementOptions)
```

```
| STRING_LITERAL
| ^(TOKEN_REF elementOptions)
| TOKEN_REF
| ^(WILDCARD elementOptions)
| WILDCARD
| ^(DOT ID element)
;
```

Found in path(s):

```
* /opt/cola/permits/1340816081_1654861722.3479369/0/antlr4-4-9-2-sources-1-
jar/org/antlr/v4/parse/LeftRecursiveRuleWalker.g
```

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```

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```

```
*/
```

Found in path(s):

```
* /opt/cola/permits/1340816081_1654861722.3479369/0/antlr4-4-9-2-sources-1-
jar/org/antlr/v4/parse/GrammarTreeVisitor.java
```

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```
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```

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\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/parse/ANTLRParser.java

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\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/parse/ANTLRLexer.java

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*/

```

```

atn(startState, states, edges, rankdir, decisionRanks, useBox) ::= <<

```

```

digraph ATN {
rankdir=LR;
<decisionRanks; separator="\n">
<states; separator="\n">
<edges; separator="\n">
}
>>

```

```

dfa(name, startState, states, edges, rankdir, decisionRanks, useBox) ::= <<

```

```

digraph <name> {
<if(rankdir)>rankdir=<rankdir>;<endif>
<decisionRanks; separator="\n">
<states; separator="\n">
<edges; separator="\n">
}
>>

```

```

decision-rank(states) ::= <<

```

```

{rank=same; rankdir=TB; <states:{s | s<s>}; separator="; ">}
>>

edge(src,target,label,arrowhead,transitionIndex) ::= <<
<src><if(transitionIndex)>p<transitionIndex><endif> -> <target> [fontsize=11, fontname="Courier", arrowsize=.7,
label = "<label>"<if(arrowhead)>, arrowhead = <arrowhead><endif>];
>>

action-edge(src,target,label,arrowhead,transitionIndex) ::= <<
<src><if(transitionIndex)>p<transitionIndex><endif> -> <target> [fontsize=11, fontname="Courier", arrowsize=.7,
label = "<label>"<if(arrowhead)>, arrowhead = <arrowhead><endif>];
>>

epsilon-edge(src,label,target,arrowhead,transitionIndex,loopback=false) ::= <<
<src><if(transitionIndex)>p<transitionIndex><endif> -> <target> [fontname="Times-Italic",
label="ε"<if(loopback)>, style="dashed"<endif>];
>>

state(state, label, name, transitions) ::= <%
<name>[fontsize=11,
label="
 <! rest(transition) tests for decision states: these nodes have a non-empty set of transitions after the first one. !>
 <if(rest(transitions))>
 {
 <! Label on the left side of the record node. !>
 <label>
 |
 <! Named ports in order on right side of record node, no display text. !>
 {<transitions:{t|\<p>i0>>}; separator="|">}
 }
 <else>
 <label>
 <endif>
 "
 <if(rest(transitions))>
 , shape=record, fixedsize=false
 <else>
 , shape=circle, fixedsize=true, width=.55
 <endif>
 , peripheries=1];
%>

stopstate(name,label,actionIndex,useBox) ::= <<
<name>[fontsize=11, label="<label><if(actionIndex)>,\naction:<actionIndex><endif>",
<if(useBox)>shape=polygon,sides=4,peripheries=2,fixedsize=false<else>shape=doublecircle, fixedsize=true,
width=.6<endif>];
>>

```

Found in path(s):

```
* /opt/cola/permits/1340816081_1654861722.3479369/0/antlr4-4-9-2-sources-1-
jar/org/antlr/v4/tool/templates/dot/graphs.stg
```

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```
*/
```

```
/** How to generate rules derived from left-recursive rules.
```

```
* These rely on recRuleAltPredicate(),
```

```
* recRuleArg(), recRuleSetResultAction(), recRuleSetReturnAction()
```

```
* templates in main language.stg
```

```
*/
```

```
group LeftRecursiveRules;
```

```
recRule(ruleName, argName, primaryAlts, opAlts, setResultAction,
```

```
userRetvals, leftRecursiveRuleRefLabels) ::=
```

```
<<
```

```
<ruleName><if(userRetvals)> returns [<userRetvals><endif>
```

```
: ({ } <primaryAlts:{ alt | <alt.altText> }; separator="\n | ">
```

```
)
```

```
(
```

```
 <opAlts; separator="\n | ">
)*
;
>>
```

```
recRuleAlt(alt, precOption, opPrec, pred) ::= <<
{<pred>}?\<<precOption>=<opPrec>|> <alt.altText>
>>
```

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\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/tool/templates/LeftRecursiveRules.stg

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 */

/** The definitive ANTLR v3 tree grammar to walk/visit ANTLR v4 grammars.
 * Parses trees created by ANTLRParser.g.
 *
 * Rather than have multiple tree grammars, one for each visit, I'm
```

```
* creating this generic visitor that knows about context. All of the
* boilerplate pattern recognition is done here. Then, subclasses can
* override the methods they care about. This prevents a lot of the same
* context tracking stuff like "set current alternative for current
* rule node" that is repeated in lots of tree filters.
```

```
*/
```

```
tree grammar GrammarTreeVisitor;
```

```
options {
```

```
language = Java;
```

```
tokenVocab = ANTLRParser;
```

```
ASTLabelType = GrammarAST;
```

```
}
```

```
// Include the copyright in this source and also the generated source
```

```
@header {
```

```
/*
```

```
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```

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```

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```
*/
```

```
package org.antlr.v4.parse;
```

```
import org.antlr.v4.Tool;
```

```
import org.antlr.v4.tool.*;
```

```
import org.antlr.v4.tool.ast.*;
```

```
import java.lang.reflect.InvocationTargetException;
```

```

import java.lang.reflect.Method;
}

@members {
public String grammarName;
public GrammarAST currentRuleAST;
public String currentModeName = LexerGrammar.DEFAULT_MODE_NAME;
public String currentRuleName;
public GrammarAST currentOuterAltRoot;
public int currentOuterAltNumber = 1; // 1..n
public int rewriteEBNFLevel = 0;

public GrammarTreeVisitor() { this(null); }

// Should be abstract but can't make gen'd parser abstract;
// subclasses should implement else everything goes to stderr!
public ErrorManager getErrorManager() { return null; }

public void visitGrammar(GrammarAST t) { visit(t, "grammarSpec"); }
public void visit(GrammarAST t, String ruleName) {
 CommonTreeNodeStream nodes = new CommonTreeNodeStream(new GrammarASTAdaptor(), t);
 setTreeNodeStream(nodes);
 try {
 Method m = getClass().getMethod(ruleName);
 m.invoke(this);
 }
 catch (Throwable e) {
 ErrorManager errMgr = getErrorManager();
 if (e instanceof InvocationTargetException) {
 e = e.getCause();
 }
 //e.printStackTrace(System.err);
 if (errMgr==null) {
 System.err.println("can't find rule "+ruleName+
 " or tree structure error: "+t.toStringTree()
);
 e.printStackTrace(System.err);
 }
 else errMgr.toolError(ErrorType.INTERNAL_ERROR, e);
 }
}

public void discoverGrammar(GrammarRootAST root, GrammarAST ID) { }
public void finishPrequels(GrammarAST firstPrequel) { }
public void finishGrammar(GrammarRootAST root, GrammarAST ID) { }

public void grammarOption(GrammarAST ID, GrammarAST valueAST) { }
public void ruleOption(GrammarAST ID, GrammarAST valueAST) { }

```

```

public void blockOption(GrammarAST ID, GrammarAST valueAST) { }
public void defineToken(GrammarAST ID) { }
public void defineChannel(GrammarAST ID) { }
public void globalNamedAction(GrammarAST scope, GrammarAST ID, ActionAST action) { }
public void importGrammar(GrammarAST label, GrammarAST ID) { }

public void modeDef(GrammarAST m, GrammarAST ID) { }

public void discoverRules(GrammarAST rules) { }
public void finishRules(GrammarAST rule) { }
public void discoverRule(RuleAST rule, GrammarAST ID, List<GrammarAST> modifiers,
 ActionAST arg, ActionAST returns, GrammarAST thrws,
 GrammarAST options, ActionAST locals,
 List<GrammarAST> actions,
 GrammarAST block) { }
public void finishRule(RuleAST rule, GrammarAST ID, GrammarAST block) { }
public void discoverLexerRule(RuleAST rule, GrammarAST ID, List<GrammarAST> modifiers,
 GrammarAST block) { }
public void finishLexerRule(RuleAST rule, GrammarAST ID, GrammarAST block) { }
public void ruleCatch(GrammarAST arg, ActionAST action) { }
public void finallyAction(ActionAST action) { }
public void discoverOuterAlt(AltAST alt) { }
public void finishOuterAlt(AltAST alt) { }
public void discoverAlt(AltAST alt) { }
public void finishAlt(AltAST alt) { }

public void ruleRef(GrammarAST ref, ActionAST arg) { }
public void tokenRef(TerminalAST ref) { }
public void elementOption(GrammarASTWithOptions t, GrammarAST ID, GrammarAST valueAST) { }
public void stringRef(TerminalAST ref) { }
public void wildcardRef(GrammarAST ref) { }
public void actionInAlt(ActionAST action) { }
public void sempredInAlt(PredAST pred) { }
public void label(GrammarAST op, GrammarAST ID, GrammarAST element) { }
public void lexerCallCommand(int outerAltNumber, GrammarAST ID, GrammarAST arg) { }
public void lexerCommand(int outerAltNumber, GrammarAST ID) { }

protected void enterGrammarSpec(GrammarAST tree) { }
protected void exitGrammarSpec(GrammarAST tree) { }

protected void enterPrequelConstructs(GrammarAST tree) { }
protected void exitPrequelConstructs(GrammarAST tree) { }

protected void enterPrequelConstruct(GrammarAST tree) { }
protected void exitPrequelConstruct(GrammarAST tree) { }

protected void enterOptionsSpec(GrammarAST tree) { }
protected void exitOptionsSpec(GrammarAST tree) { }

```



```
protected void enterOption(GrammarAST tree) { }
protected void exitOption(GrammarAST tree) { }

protected void enterOptionValue(GrammarAST tree) { }
protected void exitOptionValue(GrammarAST tree) { }

protected void enterDelegateGrammars(GrammarAST tree) { }
protected void exitDelegateGrammars(GrammarAST tree) { }

protected void enterDelegateGrammar(GrammarAST tree) { }
protected void exitDelegateGrammar(GrammarAST tree) { }

protected void enterTokensSpec(GrammarAST tree) { }
protected void exitTokensSpec(GrammarAST tree) { }

protected void enterTokenSpec(GrammarAST tree) { }
protected void exitTokenSpec(GrammarAST tree) { }

protected void enterChannelsSpec(GrammarAST tree) { }
protected void exitChannelsSpec(GrammarAST tree) { }

protected void enterChannelSpec(GrammarAST tree) { }
protected void exitChannelSpec(GrammarAST tree) { }

protected void enterAction(GrammarAST tree) { }
protected void exitAction(GrammarAST tree) { }

protected void enterRules(GrammarAST tree) { }
protected void exitRules(GrammarAST tree) { }

protected void enterMode(GrammarAST tree) { }
protected void exitMode(GrammarAST tree) { }

protected void enterLexerRule(GrammarAST tree) { }
protected void exitLexerRule(GrammarAST tree) { }

protected void enterRule(GrammarAST tree) { }
protected void exitRule(GrammarAST tree) { }

protected void enterExceptionGroup(GrammarAST tree) { }
protected void exitExceptionGroup(GrammarAST tree) { }

protected void enterExceptionHandler(GrammarAST tree) { }
protected void exitExceptionHandler(GrammarAST tree) { }

protected void enterFinallyClause(GrammarAST tree) { }
protected void exitFinallyClause(GrammarAST tree) { }
```

```
protected void enterLocals(GrammarAST tree) { }
protected void exitLocals(GrammarAST tree) { }

protected void enterRuleReturns(GrammarAST tree) { }
protected void exitRuleReturns(GrammarAST tree) { }

protected void enterThrowsSpec(GrammarAST tree) { }
protected void exitThrowsSpec(GrammarAST tree) { }

protected void enterRuleAction(GrammarAST tree) { }
protected void exitRuleAction(GrammarAST tree) { }

protected void enterRuleModifier(GrammarAST tree) { }
protected void exitRuleModifier(GrammarAST tree) { }

protected void enterLexerRuleBlock(GrammarAST tree) { }
protected void exitLexerRuleBlock(GrammarAST tree) { }

protected void enterRuleBlock(GrammarAST tree) { }
protected void exitRuleBlock(GrammarAST tree) { }

protected void enterLexerOuterAlternative(AltAST tree) { }
protected void exitLexerOuterAlternative(AltAST tree) { }

protected void enterOuterAlternative(AltAST tree) { }
protected void exitOuterAlternative(AltAST tree) { }

protected void enterLexerAlternative(GrammarAST tree) { }
protected void exitLexerAlternative(GrammarAST tree) { }

protected void enterLexerElements(GrammarAST tree) { }
protected void exitLexerElements(GrammarAST tree) { }

protected void enterLexerElement(GrammarAST tree) { }
protected void exitLexerElement(GrammarAST tree) { }

protected void enterLabeledLexerElement(GrammarAST tree) { }
protected void exitLabeledLexerElement(GrammarAST tree) { }

protected void enterLexerBlock(GrammarAST tree) { }
protected void exitLexerBlock(GrammarAST tree) { }

protected void enterLexerAtom(GrammarAST tree) { }
protected void exitLexerAtom(GrammarAST tree) { }

protected void enterActionElement(GrammarAST tree) { }
protected void exitActionElement(GrammarAST tree) { }
```

```
protected void enterAlternative(AltAST tree) { }
protected void exitAlternative(AltAST tree) { }

protected void enterLexerCommand(GrammarAST tree) { }
protected void exitLexerCommand(GrammarAST tree) { }

protected void enterLexerCommandExpr(GrammarAST tree) { }
protected void exitLexerCommandExpr(GrammarAST tree) { }

protected void enterElement(GrammarAST tree) { }
protected void exitElement(GrammarAST tree) { }

protected void enterAstOperand(GrammarAST tree) { }
protected void exitAstOperand(GrammarAST tree) { }

protected void enterLabeledElement(GrammarAST tree) { }
protected void exitLabeledElement(GrammarAST tree) { }

protected void enterSubrule(GrammarAST tree) { }
protected void exitSubrule(GrammarAST tree) { }

protected void enterLexerSubrule(GrammarAST tree) { }
protected void exitLexerSubrule(GrammarAST tree) { }

protected void enterBlockSuffix(GrammarAST tree) { }
protected void exitBlockSuffix(GrammarAST tree) { }

protected void enterEbnfSuffix(GrammarAST tree) { }
protected void exitEbnfSuffix(GrammarAST tree) { }

protected void enterAtom(GrammarAST tree) { }
protected void exitAtom(GrammarAST tree) { }

protected void enterBlockSet(GrammarAST tree) { }
protected void exitBlockSet(GrammarAST tree) { }

protected void enterSetElement(GrammarAST tree) { }
protected void exitSetElement(GrammarAST tree) { }

protected void enterBlock(GrammarAST tree) { }
protected void exitBlock(GrammarAST tree) { }

protected void enterRuleref(GrammarAST tree) { }
protected void exitRuleref(GrammarAST tree) { }

protected void enterRange(GrammarAST tree) { }
protected void exitRange(GrammarAST tree) { }
```

```

protected void enterTerminal(GrammarAST tree) { }
protected void exitTerminal(GrammarAST tree) { }

protected void enterElementOptions(GrammarAST tree) { }
protected void exitElementOptions(GrammarAST tree) { }

protected void enterElementOption(GrammarAST tree) { }
protected void exitElementOption(GrammarAST tree) { }

@Override
public void traceIn(String ruleName, int ruleIndex) {
 System.err.println("enter "+ruleName+": "+input.LT(1));
}

@Override
public void traceOut(String ruleName, int ruleIndex) {
 System.err.println("exit "+ruleName+": "+input.LT(1));
}
}

grammarSpec
@init {
 enterGrammarSpec($start);
}
@after {
 exitGrammarSpec($start);
}
: ^(GRAMMAR ID {grammarName=$ID.text;}
 {discoverGrammar((GrammarRootAST)$GRAMMAR, $ID);}
 prequelConstructs
 {finishPrequels($prequelConstructs.firstOne);}
 rules mode*
 {finishGrammar((GrammarRootAST)$GRAMMAR, $ID);}
)
;

prequelConstructs returns [GrammarAST firstOne=null]
@init {
 enterPrequelConstructs($start);
}
@after {
 exitPrequelConstructs($start);
}
: {$firstOne=$start;} prequelConstruct+
|
;

```

```

prequelConstruct
@init {
 enterPrequelConstructs($start);
}
@after {
 exitPrequelConstructs($start);
}
: optionsSpec
 | delegateGrammars
 | tokensSpec
 | channelsSpec
 | action
;

```

```

optionsSpec
@init {
 enterOptionsSpec($start);
}
@after {
 exitOptionsSpec($start);
}
: ^(OPTIONS option*)
;

```

```

option
@init {
 enterOption($start);
 boolean rule = inContext("RULE ...");
 boolean block = inContext("BLOCK ...");
}
@after {
 exitOption($start);
}
: ^(a=ASSIGN ID v=optionValue)
 {
 if (block) blockOption($ID, $v.start); // most specific first
 else if (rule) ruleOption($ID, $v.start);
 else grammarOption($ID, $v.start);
 }
;

```

```

optionValue returns [String v]
@init {
 enterOptionValue($start);
 $v = $start.token.getText();
}
@after {
 exitOptionValue($start);
}

```

```

}
: ID
| STRING_LITERAL
| INT
;

delegateGrammars
@init {
enterDelegateGrammars($start);
}
@after {
exitDelegateGrammars($start);
}
: ^(IMPORT delegateGrammar+)
;

```

```

delegateGrammar
@init {
enterDelegateGrammar($start);
}
@after {
exitDelegateGrammar($start);
}
: ^(ASSIGN label=ID id=ID) {importGrammar($label, $id);}
| id=ID {importGrammar(null, $id);}
;

```

```

tokensSpec
@init {
enterTokensSpec($start);
}
@after {
exitTokensSpec($start);
}
: ^(TOKENS_SPEC tokenSpec+)
;

```

```

tokenSpec
@init {
enterTokenSpec($start);
}
@after {
exitTokenSpec($start);
}
: ID {defineToken($ID);}
;

```

```

channelsSpec

```

```

@init {
 enterChannelsSpec($start);
}
@after {
 exitChannelsSpec($start);
}
: ^(CHANNELS channelSpec+)
;

channelSpec
@init {
 enterChannelSpec($start);
}
@after {
 exitChannelSpec($start);
}
: ID {defineChannel($ID);}
;

action
@init {
 enterAction($start);
}
@after {
 exitAction($start);
}
: ^(AT sc=ID? name=ID ACTION) {globalNamedAction($sc, $name, (ActionAST)$ACTION);}
;

rules
@init {
 enterRules($start);
}
@after {
 exitRules($start);
}
: ^(RULES {discoverRules($RULES);} (rule|lexerRule)* {finishRules($RULES);})
;

mode
@init {
 enterMode($start);
}
@after {
 exitMode($start);
}
: ^(MODE ID {currentModeName=$ID.text; modeDef($MODE, $ID);} lexerRule*)
;

```

```

lexerRule
@init {
 enterLexerRule($start);
 List<GrammarAST> mods = new ArrayList<GrammarAST>();
 currentOuterAltNumber=0;
}
@after {
 exitLexerRule($start);
}
: ^(RULE TOKEN_REF
 {currentRuleName=$TOKEN_REF.text; currentRuleAST=$RULE;}
 (^(RULEMODIFIERS m=FRAGMENT {mods.add($m);}))?
 {discoverLexerRule((RuleAST)$RULE, $TOKEN_REF, mods, (GrammarAST)input.LT(1));}
 lexerRuleBlock
 {
 finishLexerRule((RuleAST)$RULE, $TOKEN_REF, $lexerRuleBlock.start);
 currentRuleName=null; currentRuleAST=null;
 }
)
;

rule
@init {
 enterRule($start);
 List<GrammarAST> mods = new ArrayList<GrammarAST>();
 List<GrammarAST> actions = new ArrayList<GrammarAST>(); // track roots
 currentOuterAltNumber=0;
}
@after {
 exitRule($start);
}
: ^(RULE RULE_REF {currentRuleName=$RULE_REF.text; currentRuleAST=$RULE;}
 (^(RULEMODIFIERS (m=ruleModifier {mods.add($m.start);}+)))?
 ARG_ACTION?
 ret=ruleReturns?
 thr=throwsSpec?
 loc=locals?
 (opts=optionsSpec
 | a=ruleAction {actions.add($a.start);}
)*
 {discoverRule((RuleAST)$RULE, $RULE_REF, mods, (ActionAST)$ARG_ACTION,
 $ret.start!=null?(ActionAST)$ret.start.getChild(0):null,
 $thr.start, $opts.start,
 $loc.start!=null?(ActionAST)$loc.start.getChild(0):null,
 actions, (GrammarAST)input.LT(1));}
 ruleBlock exceptionGroup
 {finishRule((RuleAST)$RULE, $RULE_REF, $ruleBlock.start); currentRuleName=null; currentRuleAST=null;}

```



```

)
 ;

exceptionGroup
@init {
 enterExceptionGroup($start);
}
@after {
 exitExceptionGroup($start);
}
: exceptionHandler* finallyClause?
;

exceptionHandler
@init {
 enterExceptionHandler($start);
}
@after {
 exitExceptionHandler($start);
}
: ^(CATCH ARG_ACTION ACTION) {ruleCatch($ARG_ACTION, (ActionAST)$ACTION);}
;

finallyClause
@init {
 enterFinallyClause($start);
}
@after {
 exitFinallyClause($start);
}
: ^(FINALLY ACTION) {finallyAction((ActionAST)$ACTION);}
;

locals
@init {
 enterLocals($start);
}
@after {
 exitLocals($start);
}
: ^(LOCALS ARG_ACTION)
;

ruleReturns
@init {
 enterRuleReturns($start);
}
@after {

```

```
exitRuleReturns($start);
}
: ^(RETURNS ARG_ACTION)
;
```

```
throwsSpec
@init {
 enterThrowsSpec($start);
}
@after {
 exitThrowsSpec($start);
}
: ^(THROWS ID+)
;
```

```
ruleAction
@init {
 enterRuleAction($start);
}
@after {
 exitRuleAction($start);
}
: ^(AT ID ACTION)
;
```

```
ruleModifier
@init {
 enterRuleModifier($start);
}
@after {
 exitRuleModifier($start);
}
: PUBLIC
| PRIVATE
| PROTECTED
| FRAGMENT
;
```

```
lexerRuleBlock
@init {
 enterLexerRuleBlock($start);
}
@after {
 exitLexerRuleBlock($start);
}
: ^(BLOCK
({
 currentOuterAltRoot = (GrammarAST)input.LT(1);
```

```
currentOuterAltNumber++;
}
lexerOuterAlternative
)+
)
;
```

ruleBlock

```
@init {
enterRuleBlock($start);
}
@after {
exitRuleBlock($start);
}
: ^(BLOCK
({
currentOuterAltRoot = (GrammarAST)input.LT(1);
currentOuterAltNumber++;
}
outerAlternative
)+
)
;
```

lexerOuterAlternative

```
@init {
enterLexerOuterAlternative((AltAST)$start);
discoverOuterAlt((AltAST)$start);
}
@after {
finishOuterAlt((AltAST)$start);
exitLexerOuterAlternative((AltAST)$start);
}
: lexerAlternative
;
```

outerAlternative

```
@init {
enterOuterAlternative((AltAST)$start);
discoverOuterAlt((AltAST)$start);
}
@after {
finishOuterAlt((AltAST)$start);
exitOuterAlternative((AltAST)$start);
}
: alternative
;
```

```
lexerAlternative
@init {
 enterLexerAlternative($start);
}
@after {
 exitLexerAlternative($start);
}
: ^(LEXER_ALT_ACTION lexerElements lexerCommand+)
 | lexerElements
;
```

```
lexerElements
@init {
 enterLexerElements($start);
}
@after {
 exitLexerElements($start);
}
: ^(ALT lexerElement+)
;
```

```
lexerElement
@init {
 enterLexerElement($start);
}
@after {
 exitLexerElement($start);
}
: labeledLexerElement
 | lexerAtom
 | lexerSubrule
 | ACTION {actionInAlt((ActionAST)$ACTION);}
 | SEMPRED {sempredInAlt((PredAST)$SEMPRED);}
 | ^(ACTION elementOptions) {actionInAlt((ActionAST)$ACTION);}
 | ^(SEMPRED elementOptions) {sempredInAlt((PredAST)$SEMPRED);}
 | EPSILON
;
```

```
labeledLexerElement
@init {
 enterLabeledLexerElement($start);
}
@after {
 exitLabeledLexerElement($start);
}
: ^((ASSIGN|PLUS_ASSIGN) ID (lexerAtom|block))
;
```

```
lexerBlock
@init {
 enterLexerBlock($start);
}
@after {
 exitLexerBlock($start);
}
: ^(BLOCK optionsSpec? lexerAlternative+)
;
```

```
lexerAtom
@init {
 enterLexerAtom($start);
}
@after {
 exitLexerAtom($start);
}
: terminal
| ^(NOT blockSet)
| blockSet
| ^(WILDCARD elementOptions)
| WILDCARD
| LEXER_CHAR_SET
| range
| ruleref
;
```

```
actionElement
@init {
 enterActionElement($start);
}
@after {
 exitActionElement($start);
}
: ACTION
| ^(ACTION elementOptions)
| SEMPRED
| ^(SEMPRED elementOptions)
;
```

```
alternative
@init {
 enterAlternative((AltAST)$start);
 discoverAlt((AltAST)$start);
}
@after {
 finishAlt((AltAST)$start);
}
```

```

exitAlternative((AltAST)$start);
}
: ^(ALT elementOptions? element+)
| ^(ALT elementOptions? EPSILON)
;

lexerCommand
@init {
enterLexerCommand($start);
}
@after {
exitLexerCommand($start);
}
: ^(LEXER_ACTION_CALL ID lexerCommandExpr)
 {lexerCallCommand(currentOuterAltNumber, $ID, $lexerCommandExpr.start);}
| ID
 {lexerCommand(currentOuterAltNumber, $ID);}
;

lexerCommandExpr
@init {
enterLexerCommandExpr($start);
}
@after {
exitLexerCommandExpr($start);
}
: ID
| INT
;

element
@init {
enterElement($start);
}
@after {
exitElement($start);
}
: labeledElement
| atom
| subrule
| ACTION {actionInAlt((ActionAST)$ACTION);}
| SEMPRED {sempredInAlt((PredAST)$SEMPRED);}
| ^(ACTION elementOptions) {actionInAlt((ActionAST)$ACTION);}
| ^(SEMPRED elementOptions) {sempredInAlt((PredAST)$SEMPRED);}
| range
| ^(NOT blockSet)
| ^(NOT block)
;

```

astOperand

```
@init {
 enterAstOperand($start);
}
@after {
 exitAstOperand($start);
}
: atom
| ^(NOT blockSet)
| ^(NOT block)
;
```

labeledElement

```
@init {
 enterLabeledElement($start);
}
@after {
 exitLabeledElement($start);
}
: ^((ASSIGN|PLUS_ASSIGN) ID element) {label($start, $ID, $element.start);}
;
```

subrule

```
@init {
 enterSubrule($start);
}
@after {
 exitSubrule($start);
}
: ^(blockSuffix block)
| block
;
```

lexerSubrule

```
@init {
 enterLexerSubrule($start);
}
@after {
 exitLexerSubrule($start);
}
: ^(blockSuffix lexerBlock)
| lexerBlock
;
```

blockSuffix

```
@init {
 enterBlockSuffix($start);
```

```
}
@after {
 exitBlockSuffix($start);
}
: ebnfSuffix
;
```

```
ebnfSuffix
@init {
 enterEbnfSuffix($start);
}
@after {
 exitEbnfSuffix($start);
}
: OPTIONAL
| CLOSURE
| POSITIVE_CLOSURE
;
```

```
atom
@init {
 enterAtom($start);
}
@after {
 exitAtom($start);
}
: ^(DOT ID terminal)
| ^(DOT ID ruleref)
| ^(WILDCARD elementOptions) { wildcardRef($WILDCARD);}
| WILDCARD {wildcardRef($WILDCARD);}
| terminal
| blockSet
| ruleref
;
```

```
blockSet
@init {
 enterBlockSet($start);
}
@after {
 exitBlockSet($start);
}
: ^(SET setElement+)
;
```

```
setElement
@init {
 enterSetElement($start);
}
```



```

}
@after {
 exitSetElement($start);
}
: ^(STRING_LITERAL elementOptions) {stringRef((TerminalAST)$STRING_LITERAL);}
| ^(TOKEN_REF elementOptions) {tokenRef((TerminalAST)$TOKEN_REF);}
| STRING_LITERAL {stringRef((TerminalAST)$STRING_LITERAL);}
| TOKEN_REF {tokenRef((TerminalAST)$TOKEN_REF);}
| ^(RANGE a=STRING_LITERAL b=STRING_LITERAL)
{
 stringRef((TerminalAST)$a);
 stringRef((TerminalAST)$b);
}
| LEXER_CHAR_SET
;

```

```

block
@init {
 enterBlock($start);
}
@after {
 exitBlock($start);
}
: ^(BLOCK optionsSpec? ruleAction* ACTION? alternative+)
;

```

```

ruleref
@init {
 enterRuleref($start);
}
@after {
 exitRuleref($start);
}
: ^(RULE_REF arg=ARG_ACTION? elementOptions?)
{
 ruleRef($RULE_REF, (ActionAST)$ARG_ACTION);
 if ($arg!=null) actionInAlt((ActionAST)$arg);
}
;

```

```

range
@init {
 enterRange($start);
}
@after {
 exitRange($start);
}
: ^(RANGE STRING_LITERAL STRING_LITERAL)

```

```

;

terminal
@init {
 enterTerminal($start);
}
@after {
 exitTerminal($start);
}
: ^(STRING_LITERAL elementOptions)
 {stringRef((TerminalAST)$STRING_LITERAL);}
| STRING_LITERAL {stringRef((TerminalAST)$STRING_LITERAL);}
| ^(TOKEN_REF elementOptions) {tokenRef((TerminalAST)$TOKEN_REF);}
| TOKEN_REF {tokenRef((TerminalAST)$TOKEN_REF);}
;

elementOptions
@init {
 enterElementOptions($start);
}
@after {
 exitElementOptions($start);
}
: ^(ELEMENT_OPTIONS elementOption[(GrammarASTWithOptions)$start.getParent()]*);
;

elementOption[GrammarASTWithOptions t]
@init {
 enterElementOption($start);
}
@after {
 exitElementOption($start);
}
: ID {elementOption(t, $ID, null);}
| ^(ASSIGN id=ID v=ID) {elementOption(t, $id, $v);}
| ^(ASSIGN ID v=STRING_LITERAL) {elementOption(t, $ID, $v);}
| ^(ASSIGN ID v=ACTION) {elementOption(t, $ID, $v);}
| ^(ASSIGN ID v=INT) {elementOption(t, $ID, $v);}
;

```

Found in path(s):

\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/parse/GrammarTreeVisitor.g

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-->

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\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/META-INF/maven/org.antlr/antlr4/pom.xml

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\*/

tree grammar ATNBuilder;

options {

language = Java;

tokenVocab = ANTLRParser;

ASTLabelType = GrammarAST;

// filter = true;

}

// Include the copyright in this source and also the generated source

@header {

/\*

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\*/

```
package org.antlr.v4.parse;
import org.antlr.v4.tool.*;
import org.antlr.v4.tool.ast.*;
import org.antlr.v4.automata.ATNFactory;
}

@members {
 ATNFactory factory;
 public ATNBuilder(TreeNodeStream input, ATNFactory factory) {
 this(input);
 this.factory = factory;
 }
}

dummy : block[null] ; // avoid error about no start rule

ruleBlock[GrammarAST ebnfRoot] returns [ATNFactory.Handle p]
@init {
 List<ATNFactory.Handle> alts = new ArrayList<ATNFactory.Handle>();
 int alt = 1;
 factory.setCurrentOuterAlt(alt);
}
: ^(BLOCK
```

```

 (^ (OPTIONS .*)) ?
 (
 a=alternative
 {alts.add($a.p); factory.setCurrentOuterAlt(++alt);}
)+
)
 {$p = factory.block((BlockAST)$BLOCK, ebnfRoot, alts);}
;

block[GrammarAST ebnfRoot] returns [ATNFactory.Handle p]
@init {List<ATNFactory.Handle> alts = new ArrayList<ATNFactory.Handle>();}
: ^ (BLOCK (^ (OPTIONS .*)) ? (a=alternative {alts.add($a.p);})+)
 {$p = factory.block((BlockAST)$BLOCK, ebnfRoot, alts);}
;

alternative returns [ATNFactory.Handle p]
@init {List<ATNFactory.Handle> els = new ArrayList<ATNFactory.Handle>();}
: ^ (LEXER_ALT_ACTION a=alternative lexerCommands)
 {$p = factory.lexerAltCommands($a.p, $lexerCommands.p);}
| ^ (ALT elementOptions? EPSILON) {$p = factory.epsilon($EPSILON);}
| ^ (ALT elementOptions? (e=element {els.add($e.p);})+) {$p = factory.alt(els);}
;

lexerCommands returns [ATNFactory.Handle p]
@init {List<ATNFactory.Handle> cmds = new ArrayList<ATNFactory.Handle>();}
: (c=lexerCommand {if ($c.cmd != null) cmds.add($c.cmd);})+
 {
 $p = factory.alt(cmds);
 }
;

lexerCommand returns [ATNFactory.Handle cmd]
: ^ (LEXER_ACTION_CALL ID lexerCommandExpr)
 {$cmd = factory.lexerCallCommand($ID, $lexerCommandExpr.start);}
| ID
 {$cmd = factory.lexerCommand($ID);}
;

lexerCommandExpr
: ID
| INT
;

element returns [ATNFactory.Handle p]
: labeledElement {$p = $labeledElement.p;}
| atom {$p = $atom.p;}
| subrule {$p = $subrule.p;}
| ACTION {$p = factory.action((ActionAST)$ACTION);}
| SEMPRED {$p = factory.sempred((PredAST)$SEMPRED);}

```

```

| ^(ACTION .) {$p = factory.action((ActionAST)$ACTION);}
| ^(SEMPRED .) {$p = factory.sempred((PredAST)$SEMPRED);}
| ^(NOT b=blockSet[true]) {$p = $b.p;}
| LEXER_CHAR_SET {$p = factory.charSetLiteral($start);}
;

```

astOperand returns [ATNFactory.Handle p]

```

: atom {$p = $atom.p;}
| ^(NOT blockSet[true]) {$p = $blockSet.p;}
;

```

labeledElement returns [ATNFactory.Handle p]

```

: ^(ASSIGN ID element) {$p = factory.label($element.p);}
| ^(PLUS_ASSIGN ID element) {$p = factory.listLabel($element.p);}
;

```

subrule returns [ATNFactory.Handle p]

```

: ^(OPTIONAL block[$start]) {$p = $block.p;}
| ^(CLOSURE block[$start]) {$p = $block.p;}
| ^(POSITIVE_CLOSURE block[$start]) {$p = $block.p;}
| block[null] {$p = $block.p;}
;

```

blockSet[boolean invert] returns [ATNFactory.Handle p]

```

@init {List<GrammarAST> alts = new ArrayList<GrammarAST>();}
: ^(SET (setElement {alts.add($setElement.start);})+) {$p = factory.set($start, alts, $invert);}
;

```

/\*\* Don't combine with atom otherwise it will build spurious ATN nodes \*/

setElement

```

: ^(STRING_LITERAL .)
| ^(TOKEN_REF .)
| STRING_LITERAL
| TOKEN_REF
| ^(RANGE a=STRING_LITERAL b=STRING_LITERAL)
| LEXER_CHAR_SET
;

```

atom returns [ATNFactory.Handle p]

```

: range {$p = $range.p;}
| ^(DOT ID terminal) {$p = $terminal.p;}
| ^(DOT ID ruleref) {$p = $ruleref.p;}
| ^(WILDCARD .) {$p = factory.wildcard($start);}
| WILDCARD {$p = factory.wildcard($start);}
| blockSet[false] {$p = $blockSet.p;}
| terminal {$p = $terminal.p;}
| ruleref {$p = $ruleref.p;}
;

```

```

ruleref returns [ATNFactory.Handle p]
: ^(RULE_REF ARG_ACTION? ^(ELEMENT_OPTIONS .*)) {$p = factory.ruleRef($RULE_REF);}
| ^(RULE_REF ARG_ACTION?) {$p = factory.ruleRef($RULE_REF);}
| RULE_REF {$p = factory.ruleRef($RULE_REF);}
;

```

```

range returns [ATNFactory.Handle p]
: ^(RANGE a=STRING_LITERAL b=STRING_LITERAL) {$p = factory.range($a,$b);}
;

```

```

terminal returns [ATNFactory.Handle p]
: ^(STRING_LITERAL .) {$p = factory.stringLiteral((TerminalAST)$start);}
| STRING_LITERAL {$p = factory.stringLiteral((TerminalAST)$start);}
| ^(TOKEN_REF ARG_ACTION .) {$p = factory.tokenRef((TerminalAST)$start);}
| ^(TOKEN_REF .) {$p = factory.tokenRef((TerminalAST)$start);}
| TOKEN_REF {$p = factory.tokenRef((TerminalAST)$start);}
;

```

```

elementOptions
: ^(ELEMENT_OPTIONS elementOption*)
;

```

```

elementOption
: ID
| ^(ASSIGN ID ID)
| ^(ASSIGN ID STRING_LITERAL)
| ^(ASSIGN ID ACTION)
| ^(ASSIGN ID INT)
;

```

Found in path(s):

```

* /opt/cola/permits/1340816081_1654861722.3479369/0/antlr4-4-9-2-sources-1-
jar/org/antlr/v4/parse/ATNBuilder.g

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```

/*

```

```

[The "BSD licence"]

```

```

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```

```

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```

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\*/

/\*

This file contains the actual layout of the messages emitted by ANTLR.  
The text itself is coming out of the languages/\*stg files, according to the chosen locale.  
This file contains the format that mimicks GCC output.

\*/

location(file, line, column) ::= "<file>:<line>:<column>:"

message(id, text) ::= "<text> [error <id>]"

report(location, message, type) ::= "<location> <type>: <message>"

wantsSingleLineMessage() ::= "true"

Found in path(s):

\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/tool/templates/messages/formats/gnu.stg

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- \*/

```
dartTypeInitMap ::= [
 "int": "0",
 "double": "0.0",
 "bool": "false",
 default: "null" // anything other than a primitive type is an object
]
```

```
// args must be <object-model-object>, <fields-resulting-in-STs>
```

```
ParserFile(file, parser, namedActions, contextSuperClass) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
<if(file.genPackage)>
library <file.genPackage>;
```

```
import 'package:antlr4/antlr4.dart';
import 'dart:io';
```

```
<if(file.genListener)>
part '<file.grammarName>Listener.dart';
part '<file.grammarName>BaseListener.dart';
<endif>
<if(file.genVisitor)>
part '<file.grammarName>Visitor.dart';
part '<file.grammarName>BaseVisitor.dart';
<endif>
part '<file.grammarName>Lexer.dart';
<else>
import 'package:antlr4/antlr4.dart';
import 'dart:io';
```

```

<if(file.genListener)>
import '<file.grammarName>Listener.dart';
import '<file.grammarName>BaseListener.dart';
<endif>
<if(file.genVisitor)>
import '<file.grammarName>Visitor.dart';
import '<file.grammarName>BaseVisitor.dart';
<endif>
<endif>

<namedActions.header>
<parser>
>>

ListenerFile(file, header, namedActions) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
<if(file.genPackage)>
part of <file.genPackage>;
<else>
import 'package:antlr4/antlr4.dart';

import '<file.parserName>.dart';
<endif>
<header>

/// This abstract class defines a complete listener for a parse tree produced by
/// [<file.parserName>].
abstract class <file.grammarName>Listener extends ParseTreeListener {
<file.listenerNames:{ Iname |
<if(file.listenerLabelRuleNames.(Iname))>
/// Enter a parse tree produced by the [<Iname>]
/// labeled alternative in [<file.parserName>.<file.listenerLabelRuleNames.(Iname)>].
<else>
/// Enter a parse tree produced by [<file.parserName>.<Iname>].
<endif>
/// [ctx] the parse tree
void enter<Iname; format="cap">(<Iname; format="cap">Context ctx);
<if(file.listenerLabelRuleNames.(Iname))>
/// Exit a parse tree produced by the [<Iname>]
/// labeled alternative in [<file.parserName>.<file.listenerLabelRuleNames.(Iname)>].
<else>
/// Exit a parse tree produced by [<file.parserName>.<Iname>].
<endif>
/// [ctx] the parse tree
void exit<Iname; format="cap">(<Iname; format="cap">Context ctx);}; separator="\n"
}
>>

```

```

BaseListenerFile(file, header, namedActions) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
<if(file.genPackage)>
part of <file.genPackage>;
<else>
import 'package:antlr4/antlr4.dart';

import '<file.parserName>.dart';
import '<file.grammarName>Listener.dart';
<endif>

<header>

/// This class provides an empty implementation of [<file.grammarName>Listener],
/// which can be extended to create a listener which only needs to handle
/// a subset of the available methods.
class <file.grammarName>BaseListener implements <file.grammarName>Listener {
<file.listenerNames:{Iname |

/// The default implementation does nothing.
@override
void enter<Iname; format="cap">(<Iname; format="cap">Context ctx) {}

/// The default implementation does nothing.
@override
void exit<Iname; format="cap">(<Iname; format="cap">Context ctx) {}}; separator="\n">

/// The default implementation does nothing.
@override
void enterEveryRule(ParserRuleContext ctx) {}

/// The default implementation does nothing.
@override
void exitEveryRule(ParserRuleContext ctx) {}

/// The default implementation does nothing.
@override
void visitTerminal(TerminalNode node) {}

/// The default implementation does nothing.
@override
void visitErrorNode(ErrorNode node) {}
}

>>

VisitorFile(file, header, namedActions) ::= <<

```

```

<fileHeader(file.grammarFileName, file.ANTLRVersion)>
<if(file.genPackage)>
part of <file.genPackage>;
<else>
import 'package:antlr4/antlr4.dart';

import '<file.parserName>.dart';
<endif>
<header>

/// This abstract class defines a complete generic visitor for a parse tree
/// produced by [<file.parserName>].
///
/// [T] is the return type of the visit operation. Use `void` for
/// operations with no return type.
abstract class <file.grammarName>Visitor<T> extends ParseTreeVisitor<T> {
 <file.visitorNames>:{lname |
<if(file.visitorLabelRuleNames.(lname))>
 /// Visit a parse tree produced by the { @code <lname>}
 /// labeled alternative in { @link <file.parserName>#<file.visitorLabelRuleNames.(lname)>}|.
<else>
 /// Visit a parse tree produced by [<file.parserName>.<lname>].
<endif>
 /// [ctx] the parse tree.
 /// Return the visitor result.
 T visit<lname; format="cap">(<lname; format="cap">Context ctx);}; separator="\n">
}
>>

```

```

BaseVisitorFile(file, header, namedActions) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
<if(file.genPackage)>
part of <file.genPackage>;
<else>
import 'package:antlr4/antlr4.dart';

import '<file.parserName>.dart';
import '<file.grammarName>Visitor.dart';
<endif>
<header>

/// This class provides an empty implementation of [<file.grammarName>Visitor],
/// which can be extended to create a visitor which only needs to handle
/// a subset of the available methods.
///
/// [T] is the return type of the visit operation. Use `void` for
/// operations with no return type.
class <file.grammarName>BaseVisitor<T> extends ParseTreeVisitor<T> implements

```

```

<file.grammarName>Visitor<T> {
 <file.visitorNames:{lname |
 /// The default implementation returns the result of calling
 /// [visitChildren] on [ctx].
 @override
 T visit<lname; format="cap">(<lname; format="cap">Context ctx) => visitChildren(ctx);}; separator="\n">
 }
>>

fileHeader(grammarFileName, ANTLRVersion) ::= <<
 // Generated from <grammarFileName> by ANTLR <ANTLRVersion>
 // ignore_for_file: unused_import, unused_local_variable, prefer_single_quotes
>>

Parser(parser, funcs, atn, sempredFuncs, superClass) ::= <<
 <Parser_(ctor="parser_ctor", ...)>
>>

Parser_(parser, funcs, atn, sempredFuncs, ctor, superClass) ::= <<
 <if(namedActions.definitions)><namedActions.definitions><endif>
 <if(parser.rules)>
 const int <parser.rules:{r | RULE_<r.name> = <r.index>}; separator=", ", wrap, anchor>;
 <endif>
 class <parser.name> extends <superClass; null="Parser"> {
 static final checkVersion = () => RuntimeMetaData.checkVersion('<file.ANTLRVersion>',
 RuntimeMetaData.VERSION);
 static const int TOKEN_EOF = IntStream.EOF;

 static final List<DFA> _decisionToDFA = List.generate(
 _ATN.numberOfDecisions, (i) => DFA(_ATN.getDecisionState(i), i));
 static final PredictionContextCache _sharedContextCache = PredictionContextCache();
 <if(parser.tokens)>
 static const int <parser.tokens:{k | TOKEN_<k> = <parser.tokens.(k)>}; separator=", ", wrap, anchor>;
 <endif>

 @override
 final List<String> ruleNames = [
 <parser.ruleNames:{r | '<r>'}; separator=", ", wrap, anchor>
];

 <vocabulary(parser.literalNames, parser.symbolicNames)>

 @override
 String get grammarFileName => '<parser.grammarFileName>';

 @override
 String get serializedATN => _serializedATN;

```

```

@override
ATN getATN() {
 return _ATN;
}

<namedActions.members>
<parser:(ctor)()>
<funcs; separator="\n">

<if(sempredFuncs)>
@override
bool sempred(RuleContext _localctx, int ruleIndex, int predIndex) {
 switch (ruleIndex) {
 <parser.sempredFuncs.values:{f}
case <f.ruleIndex>:
return _<f.name>_sempred(_localctx, predIndex);}; separator="\n">
 }
 return true;
}
<sempredFuncs.values; separator="\n">
<endif>

<atn>
}
<funcs:{ func | <if(func.ruleCtx)><func.ruleCtx><endif>}; separator="\n\n">

<funcs:{ func | <if(func.altLabelCtxs)><func.altLabelCtxs:{l | <func.altLabelCtxs.(l)>};
separator="\n\n"><endif>}>
>>

vocabulary(literalNames, symbolicNames) ::= <<
static final List<String> _LITERAL_NAMES = [
 <literalNames:{t | <t>}; null="null", separator=", ", wrap, anchor>
];
static final List<String> _SYMBOLIC_NAMES = [
 <symbolicNames:{t | <t>}; null="null", separator=", ", wrap, anchor>
];
static final Vocabulary VOCABULARY = VocabularyImpl(_LITERAL_NAMES, _SYMBOLIC_NAMES);

@override
Vocabulary get vocabulary {
 return VOCABULARY;
}
>>

dumpActions(recog, argFuncs, actionFuncs, sempredFuncs) ::= <<
<if(actionFuncs)>
void action(RuleContext _localctx, int ruleIndex, int actionIndex) {

```

```

switch (ruleIndex) {
 <recog.actionFuncs.values:{f}
case <f.ruleIndex>:
 _<f.name>_action(_localctx, actionIndex);
 break;}; separator="\n">
}
}
<actionFuncs.values; separator="\n">
<endif>
<if(sempredFuncs)>
bool sempred(RuleContext _localctx, int ruleIndex, int predIndex) {
 switch (ruleIndex) {
 <recog.sempredFuncs.values:{f}
case <f.ruleIndex>:
 return _<f.name>_sempred(_localctx, predIndex);}; separator="\n">
}
 return true;
}
<sempredFuncs.values; separator="\n">
<endif>
>>

parser_ctor(p) ::= <<
<p.name>(TokenStream input) : super(input) {
 interpreter = ParserATNSimulator(this, _ATN, _decisionToDFA, _sharedContextCache);
}
>>

/// This generates a private method since the actionIndex is generated, making an
/// overriding implementation impossible to maintain.
RuleActionFunction(r, actions) ::= <<
void _<r.name>_action(<r.ctxType> _localctx, int actionIndex) {
 switch (actionIndex) {
 <actions:{index|case <index>: <actions.(index)> break;}; separator="\n">
}
}
>>

/// This generates a private method since the predIndex is generated, making an
/// overriding implementation impossible to maintain.
RuleSempredFunction(r, actions) ::= <<
bool _<r.name>_sempred(<r.ctxType> _localctx, int predIndex) {
 switch (predIndex) {
 <actions:{index|case <index>: return <actions.(index)>;}; separator="\n">
}
 return true;
}
>>

```

RuleFunction(currentRule,args,code,locals,ruleCtx,altLabelCtxs,namedActions,finallyAction,postamble,exceptions)

::= <<

```
<if(currentRule.modifiers)><currentRule.modifiers:{f | <f> }><else><endif><currentRule.ctxType>
<currentRule.name><(<args; separator=", ">) {
dynamic _localctx = <currentRule.ctxType><(context, state<currentRule.args:{a | , <a.name>}>>);
enterRule(_localctx, <currentRule.startState>, RULE_<currentRule.name>);
<namedActions.init>
<locals; separator="\n">
try {
<if(currentRule.hasLookaheadBlock)>
int _alt;
<endif>
<code>
<postamble; separator="\n">
<namedActions.after>
} <if(exceptions)> <exceptions; separator="\n"><else>on RecognitionException catch (re) {
_localctx.exception = re;
errorHandler.reportError(this, re);
errorHandler.recover(this, re);
}<endif> finally {
<finallyAction>
exitRule();
}
return _localctx;
}
>>
```

LeftRecursiveRuleFunction(currentRule,args,code,locals,ruleCtx,altLabelCtxs,
namedActions,finallyAction,postamble) ::=

<<

```
<currentRule.ctxType> <currentRule.name><([int _p = 0]<args:{a | , <a>}>) {
final _parentctx = context;
final _parentState = state;
dynamic _localctx = <currentRule.ctxType><(context, _parentState<currentRule.args:{a | , <a.name>}>>);
var _prevctx = _localctx;
var _startState = <currentRule.startState>;
enterRecursionRule(_localctx, <currentRule.startState>, RULE_<currentRule.name>, _p);
<namedActions.init>
<locals; separator="\n">
try {
<if(currentRule.hasLookaheadBlock)>
int _alt;
<endif>
<code>
<postamble; separator="\n">
```



```

 <namedActions.after>
 } on RecognitionException catch (re) {
 _localctx.exception = re;
 errorHandler.reportError(this, re);
 errorHandler.recover(this, re);
 } finally {
 <finallyAction>
 unrollRecursionContexts(_parentctx);
 }
 return _localctx;
}
>>

```

```

CodeBlockForOuterMostAlt(currentOuterMostAltCodeBlock, locals, preamble, ops) ::= <<
<if(currentOuterMostAltCodeBlock.altLabel)>_localctx = <currentOuterMostAltCodeBlock.altLabel;
format="cap">Context(_localctx);<endif>
enterOuterAlt(_localctx, <currentOuterMostAltCodeBlock.alt.altNum>);
<CodeBlockForAlt(currentAltCodeBlock=currentOuterMostAltCodeBlock, ...)>
>>

```

```

CodeBlockForAlt(currentAltCodeBlock, locals, preamble, ops) ::= <<
<locals; separator="\n">
<preamble; separator="\n">
<ops; separator="\n">
>>

```

```

LL1AltBlock(choice, preamble, alts, error) ::= <<
state = <choice.stateNumber>;
errorHandler.sync(this);
<if(choice.label)><labelref(choice.label)> = tokenStream.LT(1);<endif>
<preamble; separator="\n">
switch (tokenStream.LA(1)) {
<choice.altLook,alts:{look,alt| <cases(ttypes=look)>
 <alt>
 break;}; separator="\n">
default:
 <error>
}
>>

```

```

LL1OptionalBlock(choice, alts, error) ::= <<
state = <choice.stateNumber>;
errorHandler.sync(this);
switch (tokenStream.LA(1)) {
<choice.altLook,alts:{look,alt| <cases(ttypes=look)>
 <alt>
 break;}; separator="\n">
default:

```

```
break;
}
>>
```

```
LL1OptionalBlockSingleAlt(choice, expr, alts, preamble, error, followExpr) ::= <<
state = <choice.stateNumber>;
errorHandler.sync(this);
<preamble; separator="\n">
if (<expr>) {
 <alts; separator="\n">
}
<!else if (!(<followExpr>)) <error!>
>>
```

```
LL1StarBlockSingleAlt(choice, loopExpr, alts, preamble, iteration) ::= <<
state = <choice.stateNumber>;
errorHandler.sync(this);
<preamble; separator="\n">
while (<loopExpr>) {
 <alts; separator="\n">
state = <choice.loopBackStateNumber>;
errorHandler.sync(this);
<iteration>
}
>>
```

```
LL1PlusBlockSingleAlt(choice, loopExpr, alts, preamble, iteration) ::= <<
state = <choice.blockStartStateNumber>; <! alt block decision !>
errorHandler.sync(this);
<preamble; separator="\n">
do {
 <alts; separator="\n">
state = <choice.stateNumber>; <! loopback/exit decision !>
errorHandler.sync(this);
<iteration>
} while (<loopExpr>);
>>
```

```
// LL(*) stuff
```

```
AltBlock(choice, preamble, alts, error) ::= <<
state = <choice.stateNumber>;
errorHandler.sync(this);
<if(choice.label)><labelref(choice.label)> = tokenStream.LT(1);<endif>
<preamble; separator="\n">
switch (interpreter.adaptivePredict(tokenStream, <choice.decision>, context)) {
<alts:{ alt |
case <i>:
```

```

<alt>
break;}; separator="\n">
}
>>

```

```

OptionalBlock(choice, alts, error) ::= <<
state = <choice.stateNumber>;
errorHandler.sync(this);
switch (interpreter.adaptivePredict(tokenStream, <choice.decision>, context)) {
<alts:{alt |
case <i><if(!choice.ast.greedy)>+1<endif>:
<alt>
break;}; separator="\n">
}
>>

```

```

StarBlock(choice, alts, sync, iteration) ::= <<
state = <choice.stateNumber>;
errorHandler.sync(this);
_alt = interpreter.adaptivePredict(tokenStream, <choice.decision>, context);
while (_alt != <choice.exitAlt> && _alt != ATN.INVALID_ALT_NUMBER) {
if (_alt == 1<if(!choice.ast.greedy)> + 1<endif>) {
<iteration>
<alts> <! should only be one !>
}
state = <choice.loopBackStateNumber>;
errorHandler.sync(this);
_alt = interpreter.adaptivePredict(tokenStream, <choice.decision>, context);
}
>>

```

```

PlusBlock(choice, alts, error) ::= <<
state = <choice.blockStartStateNumber>; <! alt block decision !>
errorHandler.sync(this);
_alt = 1<if(!choice.ast.greedy)>+1<endif>;
do {
switch (_alt) {
<alts:{alt|
case <i><if(!choice.ast.greedy)> + 1<endif>:
<alt>
break;}; separator="\n">
default:
<error>
}
state = <choice.loopBackStateNumber>; <! loopback/exit decision !>
errorHandler.sync(this);
_alt = interpreter.adaptivePredict(tokenStream, <choice.decision>, context);
} while (_alt != <choice.exitAlt> && _alt != ATN.INVALID_ALT_NUMBER);

```

>>

Sync(s) ::= "sync(<s.expecting.name>);"

ThrowNoViableAlt(t) ::= "throw NoViableAltException(this);"

TestSetInline(s) ::= <<

<s.bitsets:{bits | <if(rest(rest(bits.ttypes))>><bitsetBitfieldComparison(s, bits)><else><bitsetInlineComparison(s, bits)><endif>} ; separator=" || ">

>>

// Java language spec 15.19 - shift operators mask operands rather than overflow to 0... need range test

testShiftInRange(shiftAmount) ::= <<

((<shiftAmount>) & ~0x3f) == 0

>>

// produces smaller bytecode only when bits.ttypes contains more than two items

bitsetBitfieldComparison(s, bits) ::= <%

(<testShiftInRange({<offsetShift(s.varName, bits.shift)>})> && ((BigInt.one \<< <offsetShift(s.varName, bits.shift)>) & (<bits.ttypes:{ttype | (BigInt.one \<< <offsetShift({TOKEN\_<ttype>}, bits.shift)>)}); separator=" | ">>) != BigInt.zero)

%>

isZero ::= [

"0":true,

default:false

]

offsetShift(shiftAmount, offset) ::= <%

<if(!isZero.(offset))><shiftAmount> - <offset><else><shiftAmount><endif>

%>

// produces more efficient bytecode when bits.ttypes contains at most two items

bitsetInlineComparison(s, bits) ::= <%

<bits.ttypes:{ttype | <s.varName> == TOKEN\_<ttype>} ; separator=" || ">

%>

cases(ttypes) ::= <<

<ttypes:{t | case TOKEN\_<t>:}; separator="\n">

>>

InvokeRule(r, argExprsChunks) ::=<<

state = <r.stateNumber>;

<if(r.labels)><r.labels:{l | <labelref(l)> =

);

>>

```

MatchToken(m) ::= <<
state = <m.stateNumber>;
<if(m.labels)><m.labels:{1 | <labelref(l)> = }><endif>match(TOKEN_<m.name>);
>>

```

```

MatchSet(m, expr, capture) ::= "<CommonSetStuff(m, expr, capture, false)>"

```

```

MatchNotSet(m, expr, capture) ::= "<CommonSetStuff(m, expr, capture, true)>"

```

```

CommonSetStuff(m, expr, capture, invert) ::= <<
state = <m.stateNumber>;
<if(m.labels)><m.labels:{1 | <labelref(l)> = }>tokenStream.LT(1);<endif>
<capture>
if (<if(invert)><m.varName> \<= 0 || <else>!<endif>(<expr>)) {
 <if(m.labels)><m.labels:{1 | <labelref(l)> = }><endif>errorHandler.recoverInline(this);
} else {
 if (tokenStream.LA(1)==IntStream.EOF) matchedEOF = true;
 errorHandler.reportMatch(this);
 consume();
}
>>

```

```

Wildcard(w) ::= <<
state = <w.stateNumber>;
<if(w.labels)><w.labels:{1 | <labelref(l)> = }><endif>matchWildcard();
>>

```

```

// ACTION STUFF

```

```

Action(a, foo, chunks) ::= "<chunks>"

```

```

ArgAction(a, chunks) ::= "<chunks>"

```

```

SemPred(p, chunks, failChunks) ::= <<
state = <p.stateNumber>;
if (!<chunks>)) {
 throw FailedPredicateException(this, <p.predicate><if(failChunks)>, <failChunks><elseif(p.msg)>,
 <p.msg><endif>);
}
>>

```

```

ExceptionClause(e, catchArg, catchAction) ::= <<
catch (<catchArg>) {
 <catchAction>
}
>>

```

```

// lexer actions are not associated with model objects

```

```

LexerSkipCommand() ::= "skip();"
LexerMoreCommand() ::= "more();"
LexerPopModeCommand() ::= "popMode();"

LexerTypeCommand(arg, grammar) ::= "type = <arg>);"
LexerChannelCommand(arg, grammar) ::= "channel = <arg>);"
LexerModeCommand(arg, grammar) ::= "mode_ = <arg>);"
LexerPushModeCommand(arg, grammar) ::= "pushMode(<arg>);"

ActionText(t) ::= "<t.text>"
ActionTemplate(t) ::= "<t.st>"
ArgRef(a) ::= "_localctx.<a.name>"
LocalRef(a) ::= "_localctx.<a.name>"
RetValRef(a) ::= "_localctx.<a.name>"
QRetValRef(a) ::= "<ctx(a)>.<a.dict>.<a.name>"
/** How to translate $tokenLabel */
TokenRef(t) ::= "<ctx(t)>.<t.name>"
LabelRef(t) ::= "<ctx(t)>.<t.name>"
ListLabelRef(t) ::= "<ctx(t)>.<ListLabelName(t.name)>"
SetAttr(s,rhsChunks) ::= "<ctx(s)>.<s.name> = <rhsChunks>);"

TokenLabelType() ::= "<file.TokenLabelType; null={Token}>"
InputSymbolType() ::= "<file.InputSymbolType; null={Token}>"

TokenPropertyRef_text(t) ::= "<ctx(t)>.<t.label>?.text"
TokenPropertyRef_type(t) ::= "<ctx(t)>.<t.label> != null ? <ctx(t)>.<t.label>.type : 0"
TokenPropertyRef_line(t) ::= "<ctx(t)>.<t.label> != null ? <ctx(t)>.<t.label>.line : 0"
TokenPropertyRef_pos(t) ::= "<ctx(t)>.<t.label> != null ? <ctx(t)>.<t.label>.charPositionInLine : 0"
TokenPropertyRef_channel(t) ::= "<ctx(t)>.<t.label> != null ? <ctx(t)>.<t.label>.channel : 0"
TokenPropertyRef_index(t) ::= "<ctx(t)>.<t.label> != null ? <ctx(t)>.<t.label>.tokenIndex : 0"
TokenPropertyRef_int(t) ::= "<ctx(t)>.<t.label> != null ? int.parse(<ctx(t)>.<t.label>.text) : 0"

RulePropertyRef_start(r) ::= "<ctx(r)>.<r.label>?.start"
RulePropertyRef_stop(r) ::= "<ctx(r)>.<r.label>?.stop"
RulePropertyRef_text(r) ::= "<ctx(r)>.<r.label> != null ? tokenStream.getTextRange(<ctx(r)>.<r.label>.start,
<ctx(r)>.<r.label>.stop) : null)"
RulePropertyRef_ctx(r) ::= "<ctx(r)>.<r.label>"
RulePropertyRef_parser(r) ::= "this"

ThisRulePropertyRef_start(r) ::= "_localctx.start"
ThisRulePropertyRef_stop(r) ::= "_localctx.stop"
ThisRulePropertyRef_text(r) ::= "tokenStream.getTextRange(_localctx.start, tokenStream.LT(-1))"
ThisRulePropertyRef_ctx(r) ::= "_localctx"
ThisRulePropertyRef_parser(r) ::= "this"

NonLocalAttrRef(s) ::= "(getInvokingContext(<s.ruleIndex>) as <s.ruleName; format=\"cap\">Context).<s.name>"
SetNonLocalAttr(s, rhsChunks) ::=

```

```
"(getInvokingContext(<s.ruleIndex>) as <s.ruleName; format=\"cap\">Context).<s.name> = <rhsChunks>";
```

```
AddToLabelList(a) ::= "<ctx(a.label)>.<a.listName>.add(<labelref(a.label)>);"
```

```
TokenDecl(t) ::= "<TokenLabelType()> <t.name>"
```

```
TokenTypeDecl(t) ::= "int <t.name>";
```

```
TokenListDecl(t) ::= "List<Token> <t.name> = List<Token>()"
```

```
RuleContextDecl(r) ::= "<r.ctxName> <r.name>"
```

```
RuleContextListDecl(rdecl) ::= "List<<rdecl.ctxName>> <rdecl.name> = List<<rdecl.ctxName>>()"
```

```
ContextTokenGetterDecl(t) ::= <<
```

```
TerminalNode <t.name>() => getToken(<parser.name>.TOKEN_<t.name>, 0);
```

```
>>
```

```
ContextTokenListGetterDecl(t) ::= <<
```

```
List<TerminalNode> <t.name>s() => getTokens(<parser.name>.TOKEN_<t.name>);
```

```
>>
```

```
ContextTokenListIndexedGetterDecl(t) ::= <<
```

```
TerminalNode <t.name>(int i) => getToken(<parser.name>.TOKEN_<t.name>, i);
```

```
>>
```

```
ContextRuleGetterDecl(r) ::= <<
```

```
<r.ctxName> <r.name>() => getRuleContext<<r.ctxName>>();
```

```
>>
```

```
ContextRuleListGetterDecl(r) ::= <<
```

```
List<<r.ctxName>> <r.name>s() => getRuleContexts<<r.ctxName>>();
```

```
>>
```

```
ContextRuleListIndexedGetterDecl(r) ::= <<
```

```
<r.ctxName> <r.name>(int i) => getRuleContext<<r.ctxName>>(i);
```

```
>>
```

```
LexerRuleContext() ::= "RuleContext"
```

```
/// The rule context name is the rule followed by a suffix; e.g.,
```

```
/// r becomes rContext.
```

```
RuleContextNameSuffix() ::= "Context"
```

```
ImplicitTokenLabel(tokenName) ::= "_<tokenName>"
```

```
ImplicitRuleLabel(ruleName) ::= "_<ruleName>"
```

```
ImplicitSetLabel(id) ::= "_tset<id>"
```

```
ListLabelName(label) ::= "<label>"
```

```
CaptureNextToken(d) ::= "<d.varName> = tokenStream.LT(1);"
```

```
CaptureNextTokenType(d) ::= "<d.varName> = tokenStream.LA(1);"
```

```
StructDecl(struct,ctorAttrs,attrs, getters,dispatchMethods,interfaces,extensionMembers)
```

```
::= <<
```

```
class <struct.name> extends
```

```
<if(contextSuperClass)><contextSuperClass><else>ParserRuleContext<endif><if(interfaces)> implements
```

```
<interfaces; separator=", "><endif> {
```

```

<attrs:{ a | <a>;}; separator="\n">
<getters:{ g | <g>;}; separator="\n">
<struct.name>([ParserRuleContext parent, int invokingState<ctorAttrs:{ a | , <a>>]) : super(parent,
invokingState)<if(struct.ctorAttrs)> {
 <struct.ctorAttrs:{ a | this.<a.name> = <a.name>;}; separator="\n">
}<else>;<endif>

@override
int get ruleIndex => RULE_<struct.derivedFromName>;
<if(struct.provideCopyFrom)> <! don't need copy unless we have subclasses !>
@override
void copyFrom(<if(contextSuperClass)><contextSuperClass><else>ParserRuleContext<endif> ctx) {
 super.copyFrom(ctx);
 <struct.attrs:{ a | this.<a.name> = (ctx as <struct.name>).<a.name>;}; separator="\n">
}
<endif>
<dispatchMethods; separator="\n">
<extensionMembers; separator="\n">
}
>>

AltLabelStructDecl(struct,attrs,getters,dispatchMethods) ::= <<
class <struct.name> extends <struct.parentRule; format="cap">Context {
 <attrs:{ a | <a>;}; separator="\n">
 <getters:{ g | <g>;}; separator="\n">
 <struct.name>(<struct.parentRule; format="cap">Context ctx) { copyFrom(ctx); }
 <dispatchMethods; separator="\n">
}
>>

ListenerDispatchMethod(method) ::= <<
@override
void <if(method.isEnter)>enter<else>exit<endif>Rule(ParseTreeListener listener) {
 if (listener is <parser.grammarName>Listener)
 listener.<if(method.isEnter)>enter<else>exit<endif><struct.derivedFromName; format="cap">(this);
}
>>

VisitorDispatchMethod(method) ::= <<
@override
T accept<T>(ParseTreeVisitor<T> visitor) {
 if (visitor is <parser.grammarName>Visitor<T>) {
 return visitor.visit<struct.derivedFromName; format="cap">(this);
 } else {
 return visitor.visitChildren(this);
 }
}
>>

```



```

AttributeDecl(d) ::= "<d.type> <d.name><if(d.initValue)> = <d.initValue><endif>"

// If we don't know location of label def x, use this template
labelref(x) ::= "<if(!x.isLocal)>_localctx.<endif><x.name>"

// For any action chunk, what is correctly-typed context struct ptr?
ctx(actionChunk) ::= "_localctx"

// used for left-recursive rules
recRuleAltPredicate(ruleName,opPrec) ::= "precpred(context, <opPrec>)"
recRuleSetReturnAction(src,name) ::= "$<name> = $<src>.<name>;"
recRuleSetStopToken() ::= "context.stop = tokenStream.LT(-1);"

recRuleAltStartAction(ruleName, ctxName, label, isListLabel) ::= <<
_localctx = <ctxName>Context(_parentctx, _parentState);
<if(label)>
<if(isListLabel)>
_localctx.<label>.add(_prevctx);
<else>
_localctx.<label> = _prevctx;
<endif>
<endif>
pushNewRecursionContext(_localctx, _startState, RULE_<ruleName>);
>>

recRuleLabeledAltStartAction(ruleName, currentAltLabel, label, isListLabel) ::= <<
_localctx = <currentAltLabel; format="cap">Context(new <ruleName; format="cap">Context(_parentctx,
_parentState));
<if(label)>
<if(isListLabel)>
_localctx.<label>.add(_prevctx);
<else>
_localctx.<label> = _prevctx;
<endif>
<endif>
pushNewRecursionContext(_localctx, _startState, RULE_<ruleName>);
>>

recRuleReplaceContext(ctxName) ::= <<
_localctx = <ctxName>Context(_localctx);
context = _localctx;
_prevctx = _localctx;
>>

recRuleSetPrevCtx() ::= <<
if (parseListeners != null) triggerExitRuleEvent();
_prevctx = _localctx;

```

>>

```
LexerFile(lexerFile, lexer, namedActions) ::= <<
<fileHeader(lexerFile.grammarFileName, lexerFile.ANTLRVersion)>
<if(lexerFile.genPackage)>
part of <lexerFile.genPackage>;
<else>
import 'package:antlr4/antlr4.dart';
<endif>
<namedActions.header>

<lexer>
>>
```

```
Lexer(lexer, atn, actionFuncs, sempredFuncs, superClass) ::= <<
<if(namedActions.definitions)><namedActions.definitions><endif>

class <lexer.name> extends <superClass; null="Lexer"> {
 static final checkVersion = () => RuntimeMetaData.checkVersion('<lexerFile.ANTLRVersion>',
RuntimeMetaData.VERSION);

 static final List<DFA> _decisionToDFA = List.generate(
 _ATN.numberOfDecisions, (i) => DFA(_ATN.getDecisionState(i), i));
 static final PredictionContextCache _sharedContextCache = PredictionContextCache();
 <if(lexer.tokens)>
 static const int
 <lexer.tokens:{k | TOKEN_<k> = <lexer.tokens.(k)>}; separator=", ", wrap, anchor>;
 <endif>
 <if(lexer.channels)>
 static const int
 <lexer.channels:{c | <c> = <lexer.channels.(c)>}; separator=", ", wrap, anchor>;
 <endif>
 <if(rest(lexer.modes))>
 static const int
 <rest(lexer.modes){m | <m> = <i>}; separator=", ", wrap, anchor>;
 <endif>

 @override
 final List<String> channelNames = [
 'DEFAULT_TOKEN_CHANNEL', 'HIDDEN'<if (lexer.channels)>, <lexer.channels:{c | '<c>'}; separator=", ",
wrap, anchor><endif>
];

 @override
 final List<String> modeNames = [
 <lexer.modes:{m | '<m>'}; separator=", ", wrap, anchor>
];
}
```

```

@Override
final List<String> ruleNames = [
 <lexer.ruleNames:{r | '<r>'}; separator=", ", wrap, anchor>
];

<vocabulary(lexer.literalNames, lexer.symbolicNames)>

<namedActions.members>

<lexer.name>(CharStream input) : super(input) {
 interpreter = LexerATNSimulator(_ATN, _decisionToDFA, _sharedContextCache, recog: this);
}

@Override
String get serializedATN => _serializedATN;

@Override
String get grammarFileName => '<lexer.grammarFileName>';

@Override
ATN getATN() { return _ATN; }

<dumpActions(lexer, "", actionFuncs, sempredFuncs)>
<atn>
}
>>

SerializedATN(model) ::= <<
<if(rest(model.segments))>
<! requires segmented representation !>
static const int _serializedATNSegments = <length(model.segments)>;
<model.segments:{segment|static final String _serializedATNSegment<i0> =
'<segment; wrap={ '<\n><\t>'>}; separator="\n">
static final String _serializedATN = [
 <model.segments:{segment | _serializedATNSegment<i0>}; separator=",\n">
].join();
<else>
<! only one segment, can be inlined !>
static const String _serializedATN = '<model.serialized; wrap={ '<\n><\t>'>';
<endif>
static final ATN _ATN =
 ATNDeserializer().deserialize(_serializedATN.codeUnits);
>>

/// Using a type to init value map, try to init a type; if not in table
/// must be an object, default value is "null".
initValue(typeName) ::= <<

```

```
<dartTypeInitMap.(typeName)>
```

```
>>
```

```
codeFileExtension() ::= ".dart"
```

Found in path(s):

```
* /opt/cola/permits/1340816081_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/tool/templates/codegen/Dart/Dart.stg
```

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```
/*
```

```
[The "BSD license"]
```

```
Copyright (c) 2010 Terence Parr
```

```
All rights reserved.
```

```
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```

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```

```
*/
```

Found in path(s):

```
* /opt/cola/permits/1340816081_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/parse/ATNBuilder.java
```

No license file was found, but licenses were detected in source scan.

```
/*
```

```
[The "BSD licence"]
```

```
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```

```
All rights reserved.
```

```
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```

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\*/

/\*

This file contains the actual layout of the messages emitted by ANTLR.

This file contains the default format ANTLR uses.

\*/

location(file, line, column) ::= "<file>:<line>:<column>:"

message(id, text) ::= "<id> <text>"

report(location, message, type) ::= "<type><message.id>: <location> <message.text>"

wantsSingleLineMessage() ::= "false"

Found in path(s):

\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/tool/templates/messages/formats/antlr.stg

No license file was found, but licenses were detected in source scan.

/\*

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\*/

Found in path(s):

\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/codegen/model/ModelElement.java

\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-

jar/org/antlr/v4/codegen/target/Python3Target.java  
\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-  
jar/org/antlr/v4/codegen/model/chunk/SetAttr.java  
\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-  
jar/org/antlr/v4/automata/ParserATNFactory.java  
\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-  
jar/org/antlr/v4/automata/LexerATNFactory.java  
\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-  
jar/org/antlr/v4/codegen/UnicodeEscapes.java  
\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-  
jar/org/antlr/v4/misc/MutableInt.java  
\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-  
jar/org/antlr/v4/codegen/target/CppTarget.java  
\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-  
jar/org/antlr/v4/automata/ATNVisitor.java  
\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-  
jar/org/antlr/v4/tool/ast/GrammarAST.java  
\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-  
jar/org/antlr/v4/codegen/model/chunk/RulePropertyRef\_stop.java  
\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-  
jar/org/antlr/v4/codegen/target/DartTarget.java  
\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-  
jar/org/antlr/v4/codegen/OutputModelFactory.java  
\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-  
jar/org/antlr/v4/codegen/model/chunk/TokenRef.java  
\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/misc/Utils.java  
\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-  
jar/org/antlr/v4/codegen/model/RuleFunction.java  
\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-  
jar/org/antlr/v4/codegen/model/Choice.java  
\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-  
jar/org/antlr/v4/analysis/LeftRecursionDetector.java  
\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-  
jar/org/antlr/v4/codegen/model/chunk/SetNonLocalAttr.java  
\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-  
jar/org/antlr/v4/codegen/model/ParserFile.java  
\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-  
jar/org/antlr/v4/codegen/model/LL1AltBlock.java  
\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-  
jar/org/antlr/v4/automata/ATNFactory.java  
\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-  
jar/org/antlr/v4/codegen/model/chunk/RulePropertyRef\_text.java  
\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-  
jar/org/antlr/v4/codegen/model/decl/TokenListDecl.java  
\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-  
jar/org/antlr/v4/codegen/model/chunk/ThisRulePropertyRef\_stop.java  
\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-  
jar/org/antlr/v4/parse/v4ParserException.java

\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/tool/ast/RuleAST.java

\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/codegen/model/CodeBlockForOuterMostAlt.java

\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/codegen/model/chunk/TokenPropertyRef\_line.java

\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/semantics/AttributeChecks.java

\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/gui/TreeTextProvider.java

\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/tool/BuildDependencyGenerator.java

\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/codegen/model/chunk/TokenPropertyRef.java

\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/unicode/UnicodeDataTemplateController.java

\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/tool/DOTGenerator.java

\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/tool/ast/PlusBlockAST.java

\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/tool/ast/OptionalBlockAST.java

\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/codegen/model/decl/RuleContextListDecl.java

\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/codegen/target/SwiftTarget.java

\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/codegen/model/ArgAction.java

\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/codegen/model/Recognizer.java

\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/tool/ast/QuantifierAST.java

\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/codegen/OutputModelController.java

\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/codegen/model/BaseVisitorFile.java

\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/codegen/model/ThrowEarlyExitException.java

\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/codegen/DefaultOutputModelFactory.java

\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/codegen/target/PHPTarget.java

\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/codegen/model/decl/RuleContextDecl.java

\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/codegen/CodeGenPipeline.java

\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/codegen/model/ElementFrequenciesVisitor.java

\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/tool/Attribute.java  
\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/codegen/model/chunk/ThisRulePropertyRef\_ctx.java  
\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/codegen/target/JavaScriptTarget.java  
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\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/misc/FrequencySet.java

\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/codegen/target/GoTarget.java

\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/codegen/model/Lexer.java

\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/parse/v3TreeGrammarException.java

\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/codegen/model/chunk/TokenPropertyRef\_text.java

\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/codegen/model/chunk/ActionChunk.java

\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/codegen/model/RuleElement.java

\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/codegen/model/LL1PlusBlockSingleAlt.java

\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/codegen/model/chunk/ActionText.java

\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/codegen/model/OutputFile.java

\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/automata/TailEpsilonRemover.java

\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/parse/GrammarToken.java

\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/parse/ToolANTLRParser.java

\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/codegen/model/Loop.java

\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/tool/LabelType.java

\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/tool/ast/GrammarASTWithOptions.java

\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/tool/ast/RuleRefAST.java

\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/tool/ast/NotAST.java

\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/codegen/model/decl/ContextTokenGetterDecl.java

\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/codegen/model/LL1OptionalBlockSingleAlt.java  
\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/codegen/CodeGenerator.java  
\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/codegen/model/LL1Loop.java  
\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/codegen/model/ThrowRecognitionException.java  
\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/tool/LabelElementPair.java  
\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/codegen/model/decl/ContextRuleListIndexedGetterDecl.java  
\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/analysis/LeftRecursiveRuleAnalyzer.java  
\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/gui/TreeView.java  
\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/codegen/Target.java  
\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/codegen/model/PlusBlock.java  
\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/codegen/target/Python2Target.java  
\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/tool/AttributeResolver.java  
\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/tool/GrammarInterpreterRuleContext.java  
\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/codegen/model/AltBlock.java  
\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/misc/CharSupport.java  
\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/codegen/model/ThrowNoViableAlt.java  
\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/tool/ast/RuleElementAST.java  
\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/semantics/SymbolCollector.java  
\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/codegen/BlankOutputModelFactory.java  
\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/codegen/model/chunk/TokenPropertyRef\_type.java  
\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/codegen/model/Parser.java  
\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/codegen/model/dbg.java  
\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/codegen/model/chunk/TokenPropertyRef\_pos.java  
\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/gui/TreePostScriptGenerator.java

```
* /opt/cola/permits/1340816081_1654861722.3479369/0/antlr4-4-9-2-sources-1-
jar/org/antlr/v4/codegen/model/InvokeRule.java
* /opt/cola/permits/1340816081_1654861722.3479369/0/antlr4-4-9-2-sources-1-
jar/org/antlr/v4/semantics/BlankActionSplitterListener.java
* /opt/cola/permits/1340816081_1654861722.3479369/0/antlr4-4-9-2-sources-1-
jar/org/antlr/v4/codegen/model/chunk/ListLabelRef.java
```

No license file was found, but licenses were detected in source scan.

```
/*
* [The "BSD license"]
* Copyright (c) 2012-2016 Terence Parr
* Copyright (c) 2012-2016 Sam Harwell
* Copyright (c) 2014 Eric Vergnaud
* All rights reserved.
*
* Redistribution and use in source and binary forms, with or without
* modification, are permitted provided that the following conditions
* are met:
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* notice, this list of conditions and the following disclaimer.
* 2. Redistributions in binary form must reproduce the above copyright
* notice, this list of conditions and the following disclaimer in the
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* INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
* NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE,
* DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY
* THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT
* (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF
* THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.
*/

/** ANTLR tool checks output templates are compatible with tool code generation.
* For now, a simple string match used on x.y of x.y.z scheme.
* Must match Tool.VERSION during load to templates.
*
* REQUIRED.
*/
```

```
pythonTypeInitMap ::= [
 "bool": "False",
```

```

 "int": "0",
 "float": "0.0",
 "str": "",
 default: "None" // anything other than a primitive type is an object
]

```

```

// args must be <object-model-object>, <fields-resulting-in-STs>

```

```

ParserFile(file, parser, namedActions, contextSuperClass) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
encoding: utf-8
from __future__ import print_function
from antlr4 import *
from io import StringIO
import sys

```

```

<namedActions.header>
<parser>

```

```

>>

```

```

ListenerFile(file, header, namedActions) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
from antlr4 import *
<header>

```

```

This class defines a complete listener for a parse tree produced by <file.parserName>.
class <file.grammarName>Listener(ParseTreeListener):

```

```

 <file.listenerNames> { lname |
Enter a parse tree produced by <file.parserName>#<lname>.
def enter<lname; format="cap">(self, ctx):
 pass

Exit a parse tree produced by <file.parserName>#<lname>.
def exit<lname; format="cap">(self, ctx):
 pass

}; separator="\n">

```

```

>>

```

```

VisitorFile(file, header, namedActions) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
from antlr4 import *
<header>

```



# This class defines a complete generic visitor for a parse tree produced by <file.parserName>.

```
class <file.grammarName>Visitor(ParseTreeVisitor):
```

```
 <file.visitorNames:{lname |
```

```
 # Visit a parse tree produced by <file.parserName>#<lname>.
```

```
 def visit<lname; format="cap">(self, ctx):
```

```
 return self.visitChildren(ctx)
```

```
}; separator="\n">
```

```
>>
```

```
fileHeader(grammarFileName, ANTLRVersion) ::= <<
```

```
Generated from <grammarFileName> by ANTLR <ANTLRVersion>
```

```
>>
```

```
Parser(parser, funcs, atn, sempredFuncs, superClass) ::= <<
```

```
<Parser_(ctor="parser_ctor", ...)>
```

```
>>
```

```
Parser_(parser, funcs, atn, sempredFuncs, ctor, superClass) ::= <<
```

```
<if(superClass)>
```

```
if __name__ is not None and "." in __name__:
```

```
 from .<superClass> import <superClass>
```

```
else:
```

```
 from <superClass> import <superClass>
```

```
<endif>
```

```
<atn>
```

```
class <parser.name> (<if(superClass)><superClass><else>Parser<endif>):
```

```
 grammarFileName = "<parser.grammarFileName>"
```

```
 atn = ATNDeserializer().deserialize(serializedATN())
```

```
 decisionsToDFA = [DFA(ds, i) for i, ds in enumerate(atn.decisionToState)]
```

```
 sharedContextCache = PredictionContextCache()
```

```
 literalNames = [<parser.literalNames:{t | u<t>}; null="u"\<INVALID>\\"", separator=", ", wrap, anchor>]
```

```
 symbolicNames = [<parser.symbolicNames:{t | u<t>}; null="u"\<INVALID>\\"", separator=", ", wrap, anchor>]
```

```
<if(parser.rules)>
```

```
<parser.rules:{r | RULE_<r.name> = <r.index>}; separator="\n", wrap, anchor>
```

```

<endif>

ruleNames = [<parser.ruleNames:{r | u"<r>"}; separator=", ", wrap, anchor]

EOF = <TokenLabelType().EOF
<if(parser.tokens)>
<parser.tokens:{k | <k>=<parser.tokens.(k)>}; separator="\n", wrap, anchor>
<endif>

<parser:(ctor())>

<namedActions.members>

<funcs; separator="\n">

<if(sempredFuncs)>
def sempred(self, localctx, ruleIndex, predIndex):
 if self._predicates == None:
 self._predicates = dict()
<parser.sempredFuncs.values:{ f |
 self._predicates[<f.ruleIndex>] = self.<f.name>_sempred }; separator="\n ">
 pred = self._predicates.get(ruleIndex, None)
 if pred is None:
 raise Exception("No predicate with index:" + str(ruleIndex))
 else:
 return pred(localctx, predIndex)

<sempredFuncs.values; separator="\n">
<endif>

>>

dumpActions(recog, argFuncs, actionFuncs, sempredFuncs) ::= <<
<if(actionFuncs)>
def action(self, localctx, ruleIndex, actionIndex):
 if self._actions is None:
 actions = dict()
<recog.actionFuncs.values:{ f|
 actions[<f.ruleIndex>] = self.<f.name>_action }; separator="\n">
 self._actions = actions
 action = self._actions.get(ruleIndex, None)
 if action is not None:
 action(localctx, actionIndex)
 else:
 raise Exception("No registered action for:" + str(ruleIndex))

```

```

<actionFuncs.values; separator="\n">

<endif>
<if(sempredFuncs)>
def sempred(self, localctx, ruleIndex, predIndex):
 if self._predicates is None:
 preds = dict()
<recog.sempredFuncs.values:{f|
 preds[<f.ruleIndex>] = self.<f.name>_sempred}; separator="\n">
 self._predicates = preds
 pred = self._predicates.get(ruleIndex, None)
 if pred is not None:
 return pred(localctx, predIndex)
 else:
 raise Exception("No registered predicate for:" + str(ruleIndex))

<sempredFuncs.values; separator="\n">
<endif>
>>

parser_ctor(p) ::= <<
def __init__(self, input, output=sys.stdout):
 super(<parser.name>, self).__init__(input, output=output)
 self.checkVersion("<file.ANTLRVersion>")
 self._interp = ParserATNSimulator(self, self.atn, self.decisionsToDFA, self.sharedContextCache)
 self._predicates = None

>>

/* This generates a private method since the actionIndex is generated, making an
* overriding implementation impossible to maintain.
*/
RuleActionFunction(r, actions) ::= <<

def <r.name>_action(self, localctx , actionIndex):
<actions:{index|
<if(first(actions))>
 if actionIndex == <index>:
 <actions.(index)>
<elseif(rest(actions))>
 elif actionIndex == <index>:
 <actions.(index)>
<endif> }; separator="\n">
>>

/* This generates a private method since the predIndex is generated, making an
* overriding implementation impossible to maintain.

```

```

*/
RuleSempredFunction(r, actions) ::= <<
def <r.name>_sempred(self, localctx, predIndex):
 <actions:{index|
<if(first(actions))>
 if predIndex == <index>:
 return <actions.(index)>
<elseif(rest(actions))>
 elif predIndex == <index>:
 return <actions.(index)>
<endif> }; separator="\n">

>>

RuleFunction(currentRule,args,code,locals,ruleCtx,altLabelCtxs,namedActions,finallyAction,postamble,exceptions)
::= <<

<ruleCtx>

<altLabelCtxs:{l | <altLabelCtxs.(l)>}; separator="\n">

def <currentRule.name>(self<currentRule.args:{a | , <a.name>}>):

 localctx = <parser.name>.<currentRule.ctxType>(self, self._ctx, self.state<currentRule.args:{a | , <a.name>}>)
 self.enterRule(localctx, <currentRule.startState>, self.RULE_<currentRule.name>)
 <namedActions.init>
 <locals; separator="\n">
 try:
 <code>
 <postamble; separator="\n">
 <namedActions.after>
 <if(exceptions)>
 <exceptions; separator="\n">
 <else>
 except RecognitionException as re:
 localctx.exception = re
 self._errHandler.reportError(self, re)
 self._errHandler.recover(self, re)
 <endif>
 finally:
 <finallyAction>
 self.exitRule()
 return localctx

>>

LeftRecursiveRuleFunction(currentRule,args,code,locals,ruleCtx,altLabelCtxs,
namedActions,finallyAction,postamble) ::=

```

<<

<ruleCtx>

<altLabelCtxs:{l | <altLabelCtxs.l>}; separator="\n">

def <currentRule.name>(self, \_p=0<if(currentRule.args)>, <args:{a | , <a>}><endif>):

  \_parentctx = self.\_ctx

  \_parentState = self.state

  localctx = <parser.name>.<currentRule.ctxType>(self, self.\_ctx, \_parentState<args:{a | , <a.name>}>)

  \_prevctx = localctx

  \_startState = <currentRule.startState>

  self.enterRecursionRule(localctx, <currentRule.startState>, self.RULE\_<currentRule.name>, \_p)

  <namedActions.init>

  <locals; separator="\n">

  try:

    <code>

    <postamble; separator="\n">

    <namedActions.after>

  except RecognitionException as re:

    localctx.exception = re

    self.\_errHandler.reportError(self, re)

    self.\_errHandler.recover(self, re)

  finally:

    <finallyAction>

    self.unrollRecursionContexts(\_parentctx)

  return localctx

>>

CodeBlockForOuterMostAlt(currentOuterMostAltCodeBlock, locals, preamble, ops) ::= <<

<if(currentOuterMostAltCodeBlock.altLabel)>localctx = <parser.name>.<currentOuterMostAltCodeBlock.altLabel>  
format="cap">Context(self, localctx)<endif>

self.enterOuterAlt(localctx, <currentOuterMostAltCodeBlock.alt.altNum>)

<CodeBlockForAlt(currentAltCodeBlock=currentOuterMostAltCodeBlock, ...)>

>>

CodeBlockForAlt(currentAltCodeBlock, locals, preamble, ops) ::= <<

<locals; separator="\n">

<preamble; separator="\n">

<ops; separator="\n">

>>

LL1AltBlock(choice, preamble, alts, error) ::= <<

self.state = <choice.stateNumber>

self.\_errHandler.sync(self)

<if(choice.label)><labelref(choice.label)> = \_input.LT(1)<endif>

<preamble; separator="\n">

token = self.\_input.LA(1)

```

<choice.altLook,alts:{look,alt| <cases(ttypes=look)>
 <alt>
 pass }; separator="\nel">
else:
 <error>

>>

```

```

LL1OptionalBlock(choice, alts, error) ::= <<
self.state = <choice.stateNumber>
self._errHandler.sync(self)
token = self._input.LA(1)
<choice.altLook,alts:{look,alt| <cases(ttypes=look)>
 <alt>
 pass }; separator="\nel">
else:
 pass
>>

```

```

LL1OptionalBlockSingleAlt(choice, expr, alts, preamble, error, followExpr) ::= <<
self.state = <choice.stateNumber>
self._errHandler.sync(self)
<preamble; separator="\n">
if <expr>:
 <alts; separator="\n">

<!else if (!(<followExpr>)) <error!>
>>

```

```

LL1StarBlockSingleAlt(choice, loopExpr, alts, preamble, iteration) ::= <<
self.state = <choice.stateNumber>
self._errHandler.sync(self)
<preamble; separator="\n">
while <loopExpr>:
 <alts; separator="\n">
 self.state = <choice.loopBackStateNumber>
 self._errHandler.sync(self)
 <iteration>

>>

```

```

LL1PlusBlockSingleAlt(choice, loopExpr, alts, preamble, iteration) ::= <<
self.state = <choice.blockStartStateNumber> <! alt block decision !>
self._errHandler.sync(self)
<preamble; separator="\n">
while True:
 <alts; separator="\n">

```

```

self.state = <choice.stateNumber> <! loopback/exit decision !>
self._errHandler.sync(self)
<iteration>
if not (<loopExpr>):
 break

>>

// LL(*) stuff

AltBlock(choice, preamble, alts, error) ::= <<
self.state = <choice.stateNumber>
self._errHandler.sync(self)
<if(choice.label)><labelref(choice.label)> = _input.LT(1)<endif>
<preamble; separator="\n">
la_ = self._interp.adaptivePredict(self._input,<choice.decision>,self._ctx)
<alts:{ alt |
if la_ == <i>:
 <alt>
 pass
}; separator="\nel">

>>

OptionalBlock(choice, alts, error) ::= <<
self.state = <choice.stateNumber>
self._errHandler.sync(self)
la_ = self._interp.adaptivePredict(self._input,<choice.decision>,self._ctx)
<alts:{ alt |
if la_ == <i><if(!choice.ast.greedy)>+1<endif>:
 <alt>
}; separator="\nel">

>>

StarBlock(choice, alts, sync, iteration) ::= <<
self.state = <choice.stateNumber>
self._errHandler.sync(self)
_alt = self._interp.adaptivePredict(self._input,<choice.decision>,self._ctx)
while _alt!=<choice.exitAlt> and _alt!=ATN.INVALID_ALT_NUMBER:
 if _alt==1<if(!choice.ast.greedy)>+1<endif>:
 <iteration>
 <alts> <! should only be one !>
 self.state = <choice.loopBackStateNumber>
 self._errHandler.sync(self)
 _alt = self._interp.adaptivePredict(self._input,<choice.decision>,self._ctx)

>>

```

```

PlusBlock(choice, alts, error) ::= <<
self.state = <choice.blockStartStateNumber> <! alt block decision !>
self._errHandler.sync(self)
_alt = 1<if(!choice.ast.greedy)>+1<endif>
while _alt!=<choice.exitAlt> and _alt!=ATN.INVALID_ALT_NUMBER:
 <alts:{alt|
if _alt == <i><if(!choice.ast.greedy)>+1<endif>:
 <alt>
}; separator="\nел">
 else:
 <error>
self.state = <choice.loopBackStateNumber> <! loopback/exit decision !>
self._errHandler.sync(self)
_alt = self._interp.adaptivePredict(self._input,<choice.decision>,self._ctx)

>>

```

```

Sync(s) ::= "sync(<s.expecting.name>)"

```

```

ThrowNoViableAlt(t) ::= "raise NoViableAltException(self)"

```

```

TestSetInline(s) ::= <<
<s.bitsets:{bits | <if(rest(rest(bits.ttypes)))><bitsetBitfieldComparison(s, bits)><else><bitsetInlineComparison(s,
bits)><endif>}; separator=" or ">
>>

```

```

// Java language spec 15.19 - shift operators mask operands rather than overflow to 0... need range test
testShiftInRange(shiftAmount) ::= <<
((<shiftAmount>) & ~0x3f) == 0
>>

```

```

// produces smaller bytecode only when bits.ttypes contains more than two items
bitsetBitfieldComparison(s, bits) ::= <%
(<testShiftInRange({<offsetShiftVar(s.varName, bits.shift)>})> and ((1 \<< <offsetShiftVar(s.varName,
bits.shift)>) & (<bits.ttypes:{ttype | (1 \<< <offsetShiftType(ttype, bits.shift)>)}; separator=" | ">)) != 0)
%>

```

```

isZero ::= [
"0":true,
default:false
]

```

```

offsetShiftVar(shiftAmount, offset) ::= <%
<if(!isZero.(offset))><shiftAmount> - <offset><else><shiftAmount><endif>
%>

```

```

offsetShiftType(shiftAmount, offset) ::= <%

```



```

<if(!isZero.(offset))><parser.name>.<shiftAmount> - <offset><else><parser.name>.<shiftAmount><endif>
%>

// produces more efficient bytecode when bits.ttypes contains at most two items
bitsetInlineComparison(s, bits) ::= <%
<bits.ttypes:{ ttype | <s.varName>==<parser.name>.<ttype> }; separator=" or ">
%>

cases(ttypes) ::= <<
if token in [<ttypes:{ t | <parser.name>.<t> }; separator=", ">]:
>>

InvokeRule(r, argExprsChunks) ::= <<
self.state = <r.stateNumber>
<if(r.labels)><r.labels:{1 | <labelref(l)> =
}><endif>self.<r.name>(<if(r.ast.options.p)><r.ast.options.p><if(argExprsChunks)>,<endif><endif><argExprsChu
nks>)
>>

MatchToken(m) ::= <<
self.state = <m.stateNumber>
<if(m.labels)><m.labels:{1 | <labelref(l)> = }><endif>self.match(<parser.name>.<m.name>)
>>

MatchSet(m, expr, capture) ::= "<CommonSetStuff(m, expr, capture, false)>"

MatchNotSet(m, expr, capture) ::= "<CommonSetStuff(m, expr, capture, true)>"

CommonSetStuff(m, expr, capture, invert) ::= <<
self.state = <m.stateNumber>
<if(m.labels)><m.labels:{1 | <labelref(l)> = }>self._input.LT(1)<endif>
<capture>
<if(invert)>if <m.varName> \<= 0 or <expr><else>if not(<expr><endif>:
<if(m.labels)><m.labels:{1 | <labelref(l)> = }><else> <endif>self._errHandler.recoverInline(self)
else:
 self._errHandler.reportMatch(self)
 self.consume()
>>

Wildcard(w) ::= <<
self.state = <w.stateNumber>
<if(w.labels)><w.labels:{1 | <labelref(l)> = }><endif>self.matchWildcard()
>>

// ACTION STUFF

Action(a, foo, chunks) ::= "<chunks>"

```

```

ArgAction(a, chunks) ::= "<chunks>"

SemPred(p, chunks, failChunks) ::= <<
self.state = <p.stateNumber>
if not <chunks>:
 from antlr4.error.Errors import FailedPredicateException
 raise FailedPredicateException(self, <p.predicate><if(failChunks)>, <failChunks><elseif(p.msg)>,
<p.msg><endif>)
>>

ExceptionClause(e, catchArg, catchAction) ::= <<
except <catchArg>:
 <catchAction>
>>

// lexer actions are not associated with model objects

LexerSkipCommand() ::= "skip()"
LexerMoreCommand() ::= "more()"
LexerPopModeCommand() ::= "popMode()"

LexerTypeCommand(arg, grammar) ::= "_type = <arg>"
LexerChannelCommand(arg, grammar) ::= "_channel = <arg>"
LexerModeCommand(arg, grammar) ::= "_mode = <arg>"
LexerPushModeCommand(arg, grammar) ::= "pushMode(<arg>)"

ActionText(t) ::= "<t.text>"
ActionTemplate(t) ::= "<t.st>"
ArgRef(a) ::= "localctx.<a.name>"
LocalRef(a) ::= "localctx.<a.name>"
RetValRef(a) ::= "localctx.<a.name>"
QRetValRef(a) ::= "<ctx(a)>.<a.dict>.<a.name>"
/** How to translate $tokenLabel */
TokenRef(t) ::= "<ctx(t)>.<t.name>"
LabelRef(t) ::= "<ctx(t)>.<t.name>"
ListLabelRef(t) ::= "<ctx(t)>.<ListLabelName(t.name)>"
SetAttr(s,rhsChunks) ::= "<ctx(s)>.<s.name> = <rhsChunks>"

TokenLabelType() ::= "<file.TokenLabelType; null={Token}>"
InputSymbolType() ::= "<file.InputSymbolType; null={Token}>"

TokenPropertyRef_text(t) ::= "(None if <ctx(t)>.<t.label> is None else <ctx(t)>.<t.label>.text)"
TokenPropertyRef_type(t) ::= "(0 if <ctx(t)>.<t.label> is None else <ctx(t)>.<t.label>.type)"
TokenPropertyRef_line(t) ::= "(0 if <ctx(t)>.<t.label> is None else <ctx(t)>.<t.label>.line)"
TokenPropertyRef_pos(t) ::= "(0 if <ctx(t)>.<t.label> is None else <ctx(t)>.<t.label>.column)"
TokenPropertyRef_channel(t) ::= "(0 if <ctx(t)>.<t.label> is None else <ctx(t)>.<t.label>.channel)"
TokenPropertyRef_index(t) ::= "(0 if <ctx(t)>.<t.label> is None else <ctx(t)>.<t.label>.tokenIndex)"
TokenPropertyRef_int(t) ::= "(0 if <ctx(t)>.<t.label> is None else int(<ctx(t)>.<t.label>.text))"

```

```

RulePropertyRef_start(r) ::= "(None if <ctx(r)>.<r.label> is None else <ctx(r)>.<r.label>.start)"
RulePropertyRef_stop(r) ::= "(None if <ctx(r)>.<r.label> is None else <ctx(r)>.<r.label>.stop)"
RulePropertyRef_text(r) ::= "(None if <ctx(r)>.<r.label> is None else
self._input.getText(<ctx(r)>.<r.label>.start,<ctx(r)>.<r.label>.stop))"
RulePropertyRef_ctx(r) ::= "<ctx(r)>.<r.label>"
RulePropertyRef_parser(r) ::= "self"

ThisRulePropertyRef_start(r) ::= "localctx.start"
ThisRulePropertyRef_stop(r) ::= "localctx.stop"
ThisRulePropertyRef_text(r) ::= "self._input.getText(localctx.start, self._input.LT(-1))"
ThisRulePropertyRef_ctx(r) ::= "localctx"
ThisRulePropertyRef_parser(r) ::= "self"

NonLocalAttrRef(s) ::= "self.getInvokingContext(<s.ruleIndex>).<s.name>"
SetNonLocalAttr(s, rhsChunks) ::= "self.getInvokingContext(<s.ruleIndex>).<s.name> = <rhsChunks>"

AddToLabelList(a) ::= "<ctx(a.label)>.<a.listName>.append(<labelref(a.label)>)"

TokenDecl(t) ::= "self.<t.name> = None # <TokenLabelType()>"
TokenTypeDecl(t) ::= "self.<t.name> = 0 # <TokenLabelType()> type"
TokenListDecl(t) ::= "self.<t.name> = list() # of <TokenLabelType()>s"
RuleContextDecl(r) ::= "self.<r.name> = None # <r.ctxName>"
RuleContextListDecl(rdecl) ::= "self.<rdecl.name> = list() # of <rdecl.ctxName>s"

ContextTokenGetterDecl(t) ::= <<
def <t.name>(self):
 return self.getToken(<parser.name>.<t.name>, 0)
>>

// should never be called
ContextTokenListGetterDecl(t) ::= <<
def <t.name>_list(self):
 return self.getTokens(<parser.name>.<t.name>)
>>

ContextTokenListIndexedGetterDecl(t) ::= <<
def <t.name>(self, i=None):
 if i is None:
 return self.getTokens(<parser.name>.<t.name>)
 else:
 return self.getToken(<parser.name>.<t.name>, i)
>>

ContextRuleGetterDecl(r) ::= <<
def <r.name>(self):
 return self.getTypedRuleContext(<parser.name>.<r.ctxName>,0)

```

```

>>

// should never be called
ContextRuleListGetterDecl(r) ::= <<
def <r.name>_list(self):
 return self.getTypedRuleContexts(<parser.name>.<r.ctxName>)

>>

ContextRuleListIndexedGetterDecl(r) ::= <<
def <r.name>(self, i=None):
 if i is None:
 return self.getTypedRuleContexts(<parser.name>.<r.ctxName>)
 else:
 return self.getTypedRuleContext(<parser.name>.<r.ctxName>,i)

>>

LexerRuleContext() ::= "RuleContext"

/** The rule context name is the rule followed by a suffix; e.g.,
 * r becomes rContext.
 */
RuleContextNameSuffix() ::= "Context"

ImplicitTokenLabel(tokenName) ::= "_<tokenName>"
ImplicitRuleLabel(ruleName) ::= "_<ruleName>"
ImplicitSetLabel(id) ::= "_tset<id>"
ListLabelName(label) ::= "<label>"

CaptureNextToken(d) ::= "<d.varName> = self._input.LT(1)"
CaptureNextTokenType(d) ::= "<d.varName> = self._input.LA(1)"

StructDecl(struct,ctorAttrs,attrs,getters,dispatchMethods,interfaces,extensionMembers) ::= <<
class <struct.name>(<if(contextSuperClass)><contextSuperClass><else>ParserRuleContext<endif>):

 def __init__(self, parser, parent=None, invokingState=-1<struct.ctorAttrs:{a | , <a.name>=None}>):
 super(<parser.name>.<struct.name>, self).__init__(parent, invokingState)
 self.parser = parser
 <attrs:{a | <a>}; separator="\n">
 <struct.ctorAttrs:{a | self.<a.name> = <a.name>}; separator="\n">

 <getters:{g | <g>}; separator="\n\n">

 def getRuleIndex(self):
 return <parser.name>.RULE_<struct.derivedFromName>

<if(struct.provideCopyFrom)> <! don't need copy unless we have subclasses !>

```

```

def copyFrom(self, ctx):
 super(<parser.name>.<struct.name>, self).copyFrom(ctx)
 <struct.attrs: { a | self.<a.name> = ctx.<a.name> }; separator="\n">

<endif>
<dispatchMethods; separator="\n">
<extensionMembers; separator="\n">

>>

AltLabelStructDecl(struct,attrs, getters,dispatchMethods) ::= <<
class <struct.name>(<currentRule.name; format="cap">Context):

 def __init__(self, parser, ctx): # actually a <parser.name>.<currentRule.name; format="cap">Context)
 super(<parser.name>.<struct.name>, self).__init__(parser)
 <attrs: { a | <a> }; separator="\n">
 self.copyFrom(ctx)

 <getters: { g | <g> }; separator="\n">

 <dispatchMethods; separator="\n">

>>

ListenerDispatchMethod(method) ::= <<
def <if(method.isEnter)>enter<else>exit<endif>Rule(self, listener):
 if hasattr(listener, "<if(method.isEnter)>enter<else>exit<endif><struct.derivedFromName; format="cap">"):
 listener.<if(method.isEnter)>enter<else>exit<endif><struct.derivedFromName; format="cap">(self)

>>

VisitorDispatchMethod(method) ::= <<
def accept(self, visitor):
 if hasattr(visitor, "visit<struct.derivedFromName; format="cap">"):
 return visitor.visit<struct.derivedFromName; format="cap">(self)
 else:
 return visitor.visitChildren(self)

>>

AttributeDecl(d) ::= "self.<d.name> = <if(d.initValue)><d.initValue><else>None<endif>"

/** If we don't know location of label def x, use this template */
labelref(x) ::= "<if(!x.isLocal)>localctx.<endif><x.name>"

/** For any action chunk, what is correctly-typed context struct ptr? */
ctx(actionChunk) ::= "localctx"

```

```

// used for left-recursive rules
recRuleAltPredicate(ruleName,opPrec) ::= "self.precpred(self._ctx, <opPrec>)"
recRuleSetReturnAction(src,name) ::= "$<name>=$<src>.<name>"
recRuleSetStopToken() ::= "self._ctx.stop = self._input.LT(-1)"

recRuleAltStartAction(ruleName, ctxName, label) ::= <<
localctx = <parser.name>.<ctxName>Context(self, _parentctx, _parentState)
<if(label)>localctx.<label> = _prevctx<endif>
self.pushNewRecursionContext(localctx, _startState, self.RULE_<ruleName>)
>>

recRuleLabeledAltStartAction(ruleName, currentAltLabel, label, isListLabel) ::= <<
localctx = <parser.name>.<currentAltLabel; format="cap">Context(self, <parser.name>.<ruleName;
format="cap">Context(self, _parentctx, _parentState))
<if(label)>
<if(isListLabel)>
localctx.<label>.append(_prevctx)
<else>
localctx.<label> = _prevctx
<endif>
<endif>
self.pushNewRecursionContext(localctx, _startState, self.RULE_<ruleName>)
>>

recRuleReplaceContext(ctxName) ::= <<
localctx = <parser.name>.<ctxName>Context(self, localctx)
self._ctx = localctx
_prevctx = localctx
>>

recRuleSetPrevCtx() ::= <<
if self._parseListeners is not None:
 self.triggerExitRuleEvent()
_prevctx = localctx
>>

LexerFile(lexerFile, lexer, namedActions) ::= <<
<fileHeader(lexerFile.grammarFileName, lexerFile.ANTLRVersion)>
encoding: utf-8
from __future__ import print_function
from antlr4 import *
from io import StringIO
import sys

<namedActions.header>

```

```

<lexer>
>>

Lexer(lexer, atn, actionFuncs, sempredFuncs, superClass) ::= <<
<if(superClass)>
if __name__ is not None and "." in __name__:
 from .<superClass> import <superClass>
else:
 from <superClass> import <superClass>

<endif>

<atn>

class <lexer.name>(<if(superClass)><superClass><else>Lexer<endif>):

 atn = ATNDeserializer().deserialize(serializedATN())

 decisionsToDFA = [DFA(ds, i) for i, ds in enumerate(atn.decisionToState)]

<if(lexer.channels)>
 <lexer.channels: {c| <c> = <lexer.channels.(c)>}; separator="\n">

<endif>
<if(rest(lexer.modes)>
 <rest(lexer.modes): {m| <m> = <i>}; separator="\n">

<endif>
<if(lexer.tokens)>
 <lexer.tokens: {k| <k> = <lexer.tokens.(k)>}; separator="\n", wrap, anchor>
<endif>

 channelNames = [u"DEFAULT_TOKEN_CHANNEL", u"HIDDEN"<if (lexer.channels)>, <lexer.channels: {c|
u"<c>"}; separator=", ", wrap, anchor><endif>]

 modeNames = [<lexer.modes: {m| u"<m>"}; separator=", ", wrap, anchor>]

 literalNames = [u"\<INVALID>",
 <lexer.literalNames: {t| u"<t>"}; separator=", ", wrap, anchor>]

 symbolicNames = [u"\<INVALID>",
 <lexer.symbolicNames: {t| u"<t>"}; separator=", ", wrap, anchor>]

 ruleNames = [<lexer.ruleNames: {r| u"<r>"}; separator=", ", wrap, anchor>]

 grammarFileName = u"<lexer.grammarFileName>"

 def __init__(self, input=None, output=sys.stdout):

```

```
super(<lexer.name>, self).__init__(input, output=output)
self.checkVersion("<lexerFile.ANTLRVersion>")
self._interp = LexerATNSimulator(self, self.atn, self.decisionsToDFA, PredictionContextCache())
self._actions = None
self._predicates = None
```

```
<namedActions.members>
```

```
<dumpActions(lexer, "", actionFuncs, sempredFuncs)>
```

```
>>
```

```
SerializedATN(model) ::= <<
```

```
<! only one segment, can be inlined !>
```

```
def serializedATN():
```

```
 with StringIO() as buf:
```

```
 buf.write(u"<model.serialized; wrap={ }>\n" + buf.write(u"}>")
```

```
 return buf.getvalue()
```

```
>>
```

```
/** Using a type to init value map, try to init a type; if not in table
```

```
* must be an object, default value is "null".
```

```
*/
```

```
initValue(typeName) ::= <<
```

```
<pythonTypeInitMap.(typeName)>
```

```
>>
```

```
codeFileExtension() ::= ".py"
```

```
Found in path(s):
```

```
* /opt/cola/permits/1340816081_1654861722.3479369/0/antlr4-4-9-2-sources-1-
jar/org/antlr/v4/tool/templates/codegen/Python2/Python2.stg
```

```
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```

```
/*
```

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```

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* Copyright (c) 2012-2016 Sam Harwell
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*
```

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* modification, are permitted provided that the following conditions
```

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* are met:
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- \*/

```

tree grammar BlockSetTransformer;
options {
 language = Java;
 tokenVocab = ANTLRParser;
 ASTLabelType = GrammarAST;
 output = AST;
 filter = true;
}

@header {
package org.antlr.v4.parse;
import org.antlr.v4.misc.Utils;
import org.antlr.v4.misc.*;
import org.antlr.v4.tool.*;
import org.antlr.v4.tool.ast.*;
import java.util.List;
import java.util.Set;
import java.util.HashSet;
import java.util.ArrayList;
import org.antlr.v4.runtime.misc.IntervalSet;
}

@members {
public String currentRuleName;
public GrammarAST currentAlt;
public Grammar g;
public BlockSetTransformer(TreeNodeStream input, Grammar g) {
 this(input, new RecognizerSharedState());
 this.g = g;
}
}

```

```

}

topdown
: ^(RULE (id=TOKEN_REF|id=RULE_REF) {currentRuleName=$id.text;} .+)
| setAlt
| ebnfBlockSet
| blockSet
;

setAlt
: {inContext("RULE BLOCK")}?
 ALT {currentAlt = $start;}
;

// (BLOCK (ALT (+ (BLOCK (ALT INT) (ALT ID))))))
ebnfBlockSet
@after {
 GrammarTransformPipeline.setGrammarPtr(g, $tree);
}
: ^(ebnfSuffix blockSet) -> ^(ebnfSuffix ^(BLOCK<BlockAST> ^(ALT<AltAST> blockSet)))
;

ebnfSuffix
@after {$tree = (GrammarAST)adaptor.dupNode($start);}
: OPTIONAL
| CLOSURE
| POSITIVE_CLOSURE
;

blockSet
@init {
 boolean inLexer = Grammar.isTokenName(currentRuleName);
}
@after {
 GrammarTransformPipeline.setGrammarPtr(g, $tree);
}
: {inContext("RULE")}? // top-level: rule block and > 1 alt
 ^(BLOCK ^(alt=ALT elementOptions? {((AltAST)$alt).altLabel==null}? setElement[inLexer]) (^(ALT
 elementOptions? setElement[inLexer]))+)
 -> ^(BLOCK<BlockAST>[$BLOCK.token] ^(ALT<AltAST>[$BLOCK.token,"ALT"] ^(SET[$BLOCK.token,
 "SET"] setElement+)))
| {!inContext("RULE")}? // if not rule block and > 1 alt
 ^(BLOCK ^(ALT elementOptions? setElement[inLexer]) (^(ALT elementOptions? setElement[inLexer]))+)
 -> ^(SET[$BLOCK.token, "SET"] setElement+)
;

setElement[boolean inLexer]
@after {

```

```

GrammarTransformPipeline.setGrammarPtr(g, $tree);
}
: (^(a=STRING_LITERAL elementOptions) {!inLexer ||
CharSupport.getCharValueFromGrammarCharLiteral($a.getText())!=-1})?
| a=STRING_LITERAL {!inLexer || CharSupport.getCharValueFromGrammarCharLiteral($a.getText())!=-1}?
| {!inLexer}?=> ^(TOKEN_REF elementOptions)
| {!inLexer}?=> TOKEN_REF
| {!inLexer}?=> ^(RANGE a=STRING_LITERAL b=STRING_LITERAL)
{CharSupport.getCharValueFromGrammarCharLiteral($a.getText())!=-1 &&
CharSupport.getCharValueFromGrammarCharLiteral($b.getText())!=-1}?
)
;

```

```

elementOptions
: ^(ELEMENT_OPTIONS elementOption*)
;

```

```

elementOption
: ID
| ^(ASSIGN id=ID v=ID)
| ^(ASSIGN ID v=STRING_LITERAL)
| ^(ASSIGN ID v=ACTION)
| ^(ASSIGN ID v=INT)
;

```

Found in path(s):

\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/parse/BlockSetTransformer.g

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```

Found in path(s):

\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/tool/templates/codegen/Cpp/Cpp.stg

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```

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 * (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF
 * THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.
 */

```

```

tree grammar SourceGenTriggers;
options {
 language = Java;
 tokenVocab = ANTLRParser;
 ASTLabelType = GrammarAST;
}

@header {
package org.antlr.v4.codegen;
import org.antlr.v4.misc.Utils;
import org.antlr.v4.codegen.model.*;
import org.antlr.v4.codegen.model.decl.*;
import org.antlr.v4.tool.*;
import org.antlr.v4.tool.ast.*;
import java.util.Collections;
import java.util.Map;
import java.util.HashMap;
}

```

```

@members {
public OutputModelController controller;
public boolean hasLookaheadBlock;
public SourceGenTriggers(TreeNodeStream input, OutputModelController controller) {
this(input);
this.controller = controller;
}
}

```

```
dummy : block[null, null] ;
```

```

block[GrammarAST label, GrammarAST ebnfRoot] returns [List<? extends SrcOp> omos]
: ^(blk=BLOCK (^ (OPTIONS .+)) ?
{List<CodeBlockForAlt> alts = new ArrayList<CodeBlockForAlt>();
(alternative {alts.add($alternative.altCodeBlock);})+
)
{
if (alts.size()==1 && ebnfRoot==null) return alts;
if (ebnfRoot==null) {
Somos = DefaultOutputModelFactory.list(controller.getChoiceBlock((BlockAST)$blk, alts, $label));
}
else {
Choice choice = controller.getEBNFBlock($ebnfRoot, alts);
hasLookaheadBlock |= choice instanceof PlusBlock || choice instanceof StarBlock;
Somos = DefaultOutputModelFactory.list(choice);
}
}
;

```

```
alternative returns [CodeBlockForAlt altCodeBlock, List<SrcOp> ops]
```

```

@init {
boolean outerMost = inContext("RULE BLOCK");
}
@after {
controller.finishAlternative($altCodeBlock, $ops, outerMost);
}
: a=alt[outerMost] { $altCodeBlock=$a.altCodeBlock; $ops=$a.ops; }
;

```

```
alt[boolean outerMost] returns [CodeBlockForAlt altCodeBlock, List<SrcOp> ops]
```

```

@init {
// set alt if outer ALT only (the only ones with alt field set to Alternative object)
AltAST altAST = (AltAST)retval.start;
if (outerMost) controller.setCurrentOuterMostAlt(altAST.alt);
}
: {
List<SrcOp> elems = new ArrayList<SrcOp>();

```

```

// TODO: shouldn't we pass $start to controller.alternative()?
$altCodeBlock = controller.alternative(controller.getCurrentOuterMostAlt(), outerMost);
$altCodeBlock.ops = $ops = elems;
controller.setCurrentBlock($altCodeBlock);
}
^(ALT elementOptions? (element {if ($element.omos!=null) elems.addAll($element.omos);})+)

| ^(ALT elementOptions? EPSILON)
 {$altCodeBlock = controller.epsilon(controller.getCurrentOuterMostAlt(), outerMost);}
;

element returns [List<? extends SrcOp> omos]
: labeledElement {$omos = $labeledElement.omos;}
| atom[null,false] {$omos = $atom.omos;}
| subrule {$omos = $subrule.omos;}
| ACTION {$omos = controller.action((ActionAST)$ACTION);}
| SEMPRED {$omos = controller.sempred((ActionAST)$SEMPRED);}
| ^(ACTION elementOptions) {$omos = controller.action((ActionAST)$ACTION);}
| ^(SEMPRED elementOptions) {$omos = controller.sempred((ActionAST)$SEMPRED);}
;

labeledElement returns [List<? extends SrcOp> omos]
: ^(ASSIGN ID atom[$ID,false]) {$omos = $atom.omos;}
| ^(PLUS_ASSIGN ID atom[$ID,false]) {$omos = $atom.omos;}
| ^(ASSIGN ID block[$ID,null]) {$omos = $block.omos;}
| ^(PLUS_ASSIGN ID block[$ID,null]) {$omos = $block.omos;}
;

subrule returns [List<? extends SrcOp> omos]
: ^(OPTIONAL b=block[null,$OPTIONAL])
{
 $omos = $block.omos;
}
| (^(op=CLOSURE b=block[null,null])
| ^(op=POSITIVE_CLOSURE b=block[null,null])
)
{
 List<CodeBlockForAlt> alts = new ArrayList<CodeBlockForAlt>();
 SrcOp blk = $b.omos.get(0);
 CodeBlockForAlt alt = new CodeBlockForAlt(controller.delegate);
 alt.addOp(blk);
 alts.add(alt);
 SrcOp loop = controller.getEBNFBlock($op, alts); // "star it"
 hasLookaheadBlock |= loop instanceof PlusBlock || loop instanceof StarBlock;
 $omos = DefaultOutputModelFactory.list(loop);
}
| block[null, null] {$omos = $block.omos;}
;

```

```

blockSet[GrammarAST label, boolean invert] returns [List<SrcOp> omos]
 : ^(SET atom[label,invert]+) {$omos = controller.set($SET, $label, invert);}
 ;

/*
setElement
: STRING_LITERAL
| TOKEN_REF
| ^(RANGE STRING_LITERAL STRING_LITERAL)
;
*/

// TODO: combine ROOT/BANG into one then just make new op ref'ing return value of atom/terminal...
// TODO: same for NOT
atom[GrammarAST label, boolean invert] returns [List<SrcOp> omos]
: ^(NOT a=atom[$label, true]) {$omos = $a.omos;}
| range[label] {$omos = $range.omos;}
| ^(DOT ID terminal[$label])
| ^(DOT ID ruleref[$label])
| ^(WILDCARD .) {$omos = controller.wildcard($WILDCARD, $label);}
| WILDCARD {$omos = controller.wildcard($WILDCARD, $label);}
| terminal[label] {$omos = $terminal.omos;}
| ruleref[label] {$omos = $ruleref.omos;}
| blockSet[$label, invert] {$omos = $blockSet.omos;}
;

ruleref[GrammarAST label] returns [List<SrcOp> omos]
 : ^(RULE_REF ARG_ACTION? elementOptions?) {$omos = controller.ruleRef($RULE_REF, $label,
$ARG_ACTION);}
 ;

range[GrammarAST label] returns [List<SrcOp> omos]
 : ^(RANGE a=STRING_LITERAL b=STRING_LITERAL)
 ;

terminal[GrammarAST label] returns [List<SrcOp> omos]
 : ^(STRING_LITERAL .) {$omos = controller.stringRef($STRING_LITERAL, $label);}
 | STRING_LITERAL {$omos = controller.stringRef($STRING_LITERAL, $label);}
 | ^(TOKEN_REF ARG_ACTION .) {$omos = controller.tokenRef($TOKEN_REF, $label, $ARG_ACTION);}
 | ^(TOKEN_REF .) {$omos = controller.tokenRef($TOKEN_REF, $label, null);}
 | TOKEN_REF {$omos = controller.tokenRef($TOKEN_REF, $label, null);}
 ;

elementOptions
 : ^(ELEMENT_OPTIONS elementOption+)
 ;

```

elementOption

```
: ID
| ^(ASSIGN ID ID)
| ^(ASSIGN ID STRING_LITERAL)
| ^(ASSIGN ID ACTION)
| ^(ASSIGN ID INT)
;
```

Found in path(s):

```
*/opt/cola/permits/1340816081_1654861722.3479369/0/antlr4-4-9-2-sources-1-
jar/org/antlr/v4/codegen/SourceGenTriggers.g
```

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```
/*
```

```
* [The "BSD license"]
```

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```

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```

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```

```
*/
```

```
javaTypeInitMap ::= [
```

```
 "int": "0",
```

```
 "long": "0",
```

```
 "float": "0.0f",
```

```
 "double": "0.0",
```



```

"boolean":"false",
"byte":"0",
"short":"0",
"char":"0",
default:"null" // anything other than a primitive type is an object
]

```

```
// args must be <object-model-object>, <fields-resulting-in-STs>
```

```

ParserFile(file, parser, namedActions, contextSuperClass) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
<if(file.genPackage)>
package <file.genPackage>;
<endif>
<namedActions.header>
import org.antlr.v4.runtime.atn.*;
import org.antlr.v4.runtime.dfa.DFA;
import org.antlr.v4.runtime.*;
import org.antlr.v4.runtime.misc.*;
import org.antlr.v4.runtime.tree.*;
import java.util.List;
import java.util.Iterator;
import java.util.ArrayList;

<parser>
>>

```

```

ListenerFile(file, header, namedActions) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
<if(file.genPackage)>
package <file.genPackage>;
<endif>
<header>
import org.antlr.v4.runtime.tree.ParseTreeListener;

/**
 * This interface defines a complete listener for a parse tree produced by
 * { @link <file.parserName> }.
 */
public interface <file.grammarName>Listener extends ParseTreeListener {
 <file.listenerNames>:{Iname |
/**
<if(file.listenerLabelRuleNames.(Iname))>
 * Enter a parse tree produced by the { @code <Iname>}
 * labeled alternative in { @link <file.parserName>#<file.listenerLabelRuleNames.(Iname)>}.
<else>
 * Enter a parse tree produced by { @link <file.parserName>#<Iname>}.
<endif>

```

```

* @param ctx the parse tree
*/
void enter<lname; format="cap">(<file.parserName>.<lname; format="cap">Context ctx);
/**
<if(file.listenerLabelRuleNames.(lname))>
* Exit a parse tree produced by the { @code <lname>\}
* labeled alternative in { @link <file.parserName>#<file.listenerLabelRuleNames.(lname)>\}.
<else>
* Exit a parse tree produced by { @link <file.parserName>#<lname>\}.
<endif>
* @param ctx the parse tree
*/
void exit<lname; format="cap">(<file.parserName>.<lname; format="cap">Context ctx);}; separator="\n">
}
>>

```

```

BaseListenerFile(file, header, namedActions) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
<if(file.genPackage)>
package <file.genPackage>;
<endif>
<header>

```

```

import org.antlr.v4.runtime.ParserRuleContext;
import org.antlr.v4.runtime.tree.ErrorNode;
import org.antlr.v4.runtime.tree.TerminalNode;

```

```

/**
* This class provides an empty implementation of { @link <file.grammarName>Listener},
* which can be extended to create a listener which only needs to handle a subset
* of the available methods.
*/
public class <file.grammarName>BaseListener implements <file.grammarName>Listener {
<file.listenerNames: {lname |
/**
* { @inheritDoc\}
*
* \<p>The default implementation does nothing.\</p>
*/
@Override public void enter<lname; format="cap">(<file.parserName>.<lname; format="cap">Context ctx) { \}
/**
* { @inheritDoc\}
*
* \<p>The default implementation does nothing.\</p>
*/
@Override public void exit<lname; format="cap">(<file.parserName>.<lname; format="cap">Context ctx) { \} };
separator="\n">

```

```

/**
 * {@inheritDoc\}
 *
 * \<p>The default implementation does nothing.\</p>
 */
@Override public void enterEveryRule(ParserRuleContext ctx) { }
/**
 * {@inheritDoc\}
 *
 * \<p>The default implementation does nothing.\</p>
 */
@Override public void exitEveryRule(ParserRuleContext ctx) { }
/**
 * {@inheritDoc\}
 *
 * \<p>The default implementation does nothing.\</p>
 */
@Override public void visitTerminal(TerminalNode node) { }
/**
 * {@inheritDoc\}
 *
 * \<p>The default implementation does nothing.\</p>
 */
@Override public void visitErrorNode(ErrorNode node) { }
}
>>

VisitorFile(file, header, namedActions) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
<if(file.genPackage)>
package <file.genPackage>;
<endif>
<header>
import org.antlr.v4.runtime.tree.ParseTreeVisitor;

/**
 * This interface defines a complete generic visitor for a parse tree produced
 * by { @link <file.parserName> }.
 *
 * @param \<T> The return type of the visit operation. Use { @link Void } for
 * operations with no return type.
 */
public interface <file.grammarName>Visitor\<T> extends ParseTreeVisitor\<T> {
 <file.visitorNames:{ Iname |
/**
<if(file.visitorLabelRuleNames.(Iname))>
 * Visit a parse tree produced by the { @code <Iname>}
 * labeled alternative in { @link <file.parserName>#<file.visitorLabelRuleNames.(Iname)>}|.

```

```

<else>
* Visit a parse tree produced by { @link <file.parserName>#<lname>\}.
<endif>
* @param ctx the parse tree
* @return the visitor result
*/
T visit<lname; format="cap">(<file.parserName>.<lname; format="cap">Context ctx);}; separator="\n">
}
>>

BaseVisitorFile(file, header, namedActions) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
<if(file.genPackage)>
package <file.genPackage>;
<endif>
<header>
import org.antlr.v4.runtime.tree.AbstractParseTreeVisitor;

/**
* This class provides an empty implementation of { @link <file.grammarName>Visitor},
* which can be extended to create a visitor which only needs to handle a subset
* of the available methods.
*
* @param \<T> The return type of the visit operation. Use { @link Void} for
* operations with no return type.
*/
public class <file.grammarName>BaseVisitor\<T> extends AbstractParseTreeVisitor\<T> implements
<file.grammarName>Visitor\<T> {
<file.visitorNames:{ lname |
/**
* { @inheritDoc\}
*
* \<p>The default implementation returns the result of calling
* { @link #visitChildren\} on { @code ctx\}.\</p>
*/
@Override public T visit<lname; format="cap">(<file.parserName>.<lname; format="cap">Context ctx) { return
visitChildren(ctx); \} }; separator="\n">
}
>>

fileHeader(grammarFileName, ANTLRVersion) ::= <<
// Generated from <grammarFileName; format="java-escape"> by ANTLR <ANTLRVersion>
>>

Parser(parser, funcs, atn, sempredFuncs, superClass) ::= <<
<Parser_(ctor="parser_ctor", ...)>
>>

```

```

Parser_(parser, funcs, atn, sempredFuncs, ctor, superClass) ::= <<
@SuppressWarnings({"all", "warnings", "unchecked", "unused", "cast"})
public class <parser.name> extends <superClass; null="Parser"> {
 static { RuntimeMetaData.checkVersion("<file.ANTLRVersion>", RuntimeMetaData.VERSION); }

 protected static final DFA[] _decisionToDFA;
 protected static final PredictionContextCache _sharedContextCache =
 new PredictionContextCache();
 <if(parser.tokens)>
 public static final int
 <parser.tokens:{k | <k>=<parser.tokens.(k)>}; separator=", ", wrap, anchor>;
 <endif>
 <if(parser.rules)>
 public static final int
 <parser.rules:{r | RULE_<r.name> = <r.index>}; separator=", ", wrap, anchor>;
 <endif>
 private static String[] makeRuleNames() {
 return new String[] {
 <parser.ruleNames:{r | "<r>"}; separator=", ", wrap, anchor>
 };
 }
 public static final String[] ruleNames = makeRuleNames();

 <vocabulary(parser.literalNames, parser.symbolicNames)>

 @Override
 public String getGrammarFileName() { return "<parser.grammarFileName; format="java-escape">; }

 @Override
 public String[] getRuleNames() { return ruleNames; }

 @Override
 public String getSerializedATN() { return _serializedATN; }

 @Override
 public ATN getATN() { return _ATN; }

 <namedActions.members>
 <parser:(ctor())>
 <funcs; separator="\n">

 <if(sempredFuncs)>
 public boolean sempred(RuleContext _localctx, int ruleIndex, int predIndex) {
 switch (ruleIndex) {
 <parser.sempredFuncs.values:{f}
 case <f.ruleIndex>:
 return <f.name>_sempred((<f.ctxType>)_localctx, predIndex);}; separator="\n">
 }
 }

```

```

 return true;
}
<sempredFuncs.values; separator="\n">
<endif>

<atn>
}
>>

vocabulary(literalNames, symbolicNames) ::= <<
private static String[] makeLiteralNames() {
return new String[] {
<literalNames:{t | <t>}; null="null", separator=", ", wrap, anchor>
};
}
private static final String[] _LITERAL_NAMES = makeLiteralNames();
private static String[] makeSymbolicNames() {
return new String[] {
<symbolicNames:{t | <t>}; null="null", separator=", ", wrap, anchor>
};
}
private static final String[] _SYMBOLIC_NAMES = makeSymbolicNames();
public static final Vocabulary VOCABULARY = new VocabularyImpl(_LITERAL_NAMES,
_SYMBOLIC_NAMES);

/**
 * @deprecated Use {@link #VOCABULARY} instead.
 */
@Deprecated
public static final String[] tokenNames;
static {
tokenNames = new String[_SYMBOLIC_NAMES.length];
for (int i = 0; i < tokenNames.length; i++) {
tokenNames[i] = VOCABULARY.getLiteralName(i);
if (tokenNames[i] == null) {
tokenNames[i] = VOCABULARY.getSymbolicName(i);
}

if (tokenNames[i] == null) {
tokenNames[i] = "\<INVALID>";
}
}
}

@Override
@Deprecated
public String[] getTokenNames() {
return tokenNames;
}

```

```

}

@Override

public Vocabulary getVocabulary() {
 return VOCABULARY;
}
>>

dumpActions(recog, argFuncs, actionFuncs, sempredFuncs) ::= <<
<if(actionFuncs)>
@Override
public void action(RuleContext _localctx, int ruleIndex, int actionIndex) {
 switch (ruleIndex) {
 <recog.actionFuncs.values:{f}
 case <f.ruleIndex>:
 <f.name>_action((<f.ctxType>)_localctx, actionIndex);
 break;}; separator="\n">
 }
}
<actionFuncs.values; separator="\n">
<endif>
<if(sempredFuncs)>
@Override
public boolean sempred(RuleContext _localctx, int ruleIndex, int predIndex) {
 switch (ruleIndex) {
 <recog.sempredFuncs.values:{f}
 case <f.ruleIndex>:
 return <f.name>_sempred((<f.ctxType>)_localctx, predIndex);}; separator="\n">
 }
 return true;
}
<sempredFuncs.values; separator="\n">
<endif>
>>

parser_ctor(p) ::= <<
public <p.name>(TokenStream input) {
 super(input);
 _interp = new ParserATNSimulator(this,_ATN,_decisionToDFA,_sharedContextCache);
}
>>

/* This generates a private method since the actionIndex is generated, making an
* overriding implementation impossible to maintain.
*/
RuleActionFunction(r, actions) ::= <<
private void <r.name>_action(<r.ctxType> _localctx, int actionIndex) {

```

```

switch (actionIndex) {
 <actions:{index|
case <index>:
 <actions.(index)>
 break;}; separator="\n">
 }
}
>>

/* This generates a private method since the predIndex is generated, making an
 * overriding implementation impossible to maintain.
 */
RuleSempredFunction(r, actions) ::= <<
private boolean <r.name>_sempred(<r.ctxType> _localctx, int predIndex) {
 switch (predIndex) {
 <actions:{index|
case <index>:
 return <actions.(index)>;}; separator="\n">
 }
 return true;
}
>>

RuleFunction(currentRule,args,code,locals,ruleCtx,altLabelCtxs,namedActions,finallyAction,postamble,exceptions)
::= <<

<ruleCtx>
<altLabelCtxs:{l | <altLabelCtxs.(l)>}; separator="\n">

<if(currentRule.modifiers)><currentRule.modifiers:{f | <f> }><else>public final <endif><currentRule.ctxType>
<currentRule.name><(<args; separator=",">) throws RecognitionException {
 <currentRule.ctxType> _localctx = new <currentRule.ctxType>(<_ctx, getState()<currentRule.args:{a | ,
<a.name>}>>);
 enterRule(&_localctx, <currentRule.startState>, RULE_<currentRule.name>);
 <namedActions.init>
 <locals; separator="\n">
 try {
 <if(currentRule.hasLookaheadBlock)>
 int _alt;
 <endif>
 <code>
 <postamble; separator="\n">
 <namedActions.after>
 }
 <if(exceptions)>
 <exceptions; separator="\n">
 <else>
 catch (RecognitionException re) {

```



```

 _localctx.exception = re;
 _errHandler.reportError(this, re);
 _errHandler.recover(this, re);
}
<endif>
finally {
 <finallyAction>
 exitRule();
}
return _localctx;
}
>>

```

```

LeftRecursiveRuleFunction(currentRule,args,code,locals,ruleCtx,altLabelCtxs,
 namedActions,finallyAction,postamble) ::=
<<

```

```

<ruleCtx>
<altLabelCtxs:{l | <altLabelCtxs.(l)>}; separator="\n">

```

```

<if(currentRule.modifiers)><currentRule.modifiers:{f | <f> }><else>public final <endif><currentRule.ctxType>
<currentRule.name><(args; separator=", ">) throws RecognitionException {
 return <currentRule.name>(0<currentRule.args:{a | , <a.name>}>);
}

```

```

private <currentRule.ctxType> <currentRule.name>(int _p<args:{a | , <a>}>) throws RecognitionException {
 ParserRuleContext _parentctx = _ctx;
 int _parentState = getState();
 <currentRule.ctxType> _localctx = new <currentRule.ctxType>(_ctx, _parentState<currentRule.args:{a | ,
 <a.name>}>);
 <currentRule.ctxType> _prevctx = _localctx;
 int _startState = <currentRule.startState>;
 enterRecursionRule(_localctx, <currentRule.startState>, RULE_<currentRule.name>, _p);
 <namedActions.init>
 <locals; separator="\n">
 try {
 <if(currentRule.hasLookaheadBlock)>
 int _alt;
 <endif>
 <code>
 <postamble; separator="\n">
 <namedActions.after>
 }
 catch (RecognitionException re) {
 _localctx.exception = re;
 _errHandler.reportError(this, re);
 _errHandler.recover(this, re);
 }
}

```

```

finally {
 <finallyAction>
 unrollRecursionContexts(_parentctx);
}
return _localctx;
}
>>

```

```

CodeBlockForOuterMostAlt(currentOuterMostAltCodeBlock, locals, preamble, ops) ::= <<
<if(currentOuterMostAltCodeBlock.altLabel)>_localctx = new <currentOuterMostAltCodeBlock.altLabel;
format="cap">Context(_localctx);<endif>
enterOuterAlt(_localctx, <currentOuterMostAltCodeBlock.alt.altNum>);
<CodeBlockForAlt(currentAltCodeBlock=currentOuterMostAltCodeBlock, ...)>
>>

```

```

CodeBlockForAlt(currentAltCodeBlock, locals, preamble, ops) ::= <<
{
 <locals; separator="\n">
 <preamble; separator="\n">
 <ops; separator="\n">
}
>>

```

```

LL1AltBlock(choice, preamble, alts, error) ::= <<
setState(<choice.stateNumber>);
_errHandler.sync(this);
<if(choice.label)><labelref(choice.label)> = _input.LT(1);<endif>
<preamble; separator="\n">
switch (_input.LA(1)) {
<choice.altLook,alts:{look,alt| <cases(ttypes=look)>
 <alt>
 break;}; separator="\n">
default:
 <error>
}
>>

```

```

LL1OptionalBlock(choice, alts, error) ::= <<
setState(<choice.stateNumber>);
_errHandler.sync(this);
switch (_input.LA(1)) {
<choice.altLook,alts:{look,alt| <cases(ttypes=look)>
 <alt>
 break;}; separator="\n">
default:
 break;
}
>>

```

```

LL1OptionalBlockSingleAlt(choice, expr, alts, preamble, error, followExpr) ::= <<
setState(<choice.stateNumber>);
_errHandler.sync(this);
<preamble; separator="\n">
if (<expr>) {
 <alts; separator="\n">
}
<!else if (!(<followExpr>)) <error!>
>>

```

```

LL1StarBlockSingleAlt(choice, loopExpr, alts, preamble, iteration) ::= <<
setState(<choice.stateNumber>);
_errHandler.sync(this);
<preamble; separator="\n">
while (<loopExpr>) {
 <alts; separator="\n">
 setState(<choice.loopBackStateNumber>);
 _errHandler.sync(this);
 <iteration>
}
>>

```

```

LL1PlusBlockSingleAlt(choice, loopExpr, alts, preamble, iteration) ::= <<
setState(<choice.blockStartStateNumber>); <! alt block decision !>
_errHandler.sync(this);
<preamble; separator="\n">
do {
 <alts; separator="\n">
 setState(<choice.stateNumber>); <! loopback/exit decision !>
 _errHandler.sync(this);
 <iteration>
} while (<loopExpr>);
>>

```

// LL(\*) stuff

```

AltBlock(choice, preamble, alts, error) ::= <<
setState(<choice.stateNumber>);
_errHandler.sync(this);
<if(choice.label)><labelref(choice.label)> = _input.LT(1);<endif>
<preamble; separator="\n">
switch (getInterpreter().adaptivePredict(_input,<choice.decision>,_ctx)) {
 <alts:{alt |
case <i>:
 <alt>
break;}; separator="\n">
}

```

>>

```
OptionalBlock(choice, alts, error) ::= <<
setState(<choice.stateNumber>);
_errHandler.sync(this);
switch (getInterpreter().adaptivePredict(_input,<choice.decision>,_ctx)) {
<alts:{ alt |
case <i><if(!choice.ast.greedy)>+1<endif>:
<alt>
break;}; separator="\n">
}
}>>
```

```
StarBlock(choice, alts, sync, iteration) ::= <<
setState(<choice.stateNumber>);
_errHandler.sync(this);
_alt = getInterpreter().adaptivePredict(_input,<choice.decision>,_ctx);
while (_alt!=<choice.exitAlt> && _alt!=org.antlr.v4.runtime.atn.ATN.INVALID_ALT_NUMBER) {
if (_alt==1<if(!choice.ast.greedy)>+1<endif>) {
<iteration>
<alts> <! should only be one !>
}
setState(<choice.loopBackStateNumber>);
_errHandler.sync(this);
_alt = getInterpreter().adaptivePredict(_input,<choice.decision>,_ctx);
}
}>>
```

```
PlusBlock(choice, alts, error) ::= <<
setState(<choice.blockStartStateNumber>); <! alt block decision !>
_errHandler.sync(this);
_alt = 1<if(!choice.ast.greedy)>+1<endif>;
do {
switch (_alt) {
<alts:{ alt |
case <i><if(!choice.ast.greedy)>+1<endif>:
<alt>
break;}; separator="\n">
default:
<error>
}
setState(<choice.loopBackStateNumber>); <! loopback/exit decision !>
_errHandler.sync(this);
_alt = getInterpreter().adaptivePredict(_input,<choice.decision>,_ctx);
} while (_alt!=<choice.exitAlt> && _alt!=org.antlr.v4.runtime.atn.ATN.INVALID_ALT_NUMBER);
}>>
```

```
Sync(s) ::= "sync(<s.expecting.name>);"
```

```

ThrowNoViableAlt(t) ::= "throw new NoViableAltException(this);"

TestSetInline(s) ::= <<
<s.bitsets:{bits | <if(rest(rest(bits.ttypes))>><bitsetBitfieldComparison(s, bits)><else><bitsetInlineComparison(s,
bits)><endif>}; separator=" || ">
>>

// Java language spec 15.19 - shift operators mask operands rather than overflow to 0... need range test
testShiftInRange(shiftAmount) ::= <<
((<shiftAmount>) & ~0x3f) == 0
>>

// produces smaller bytecode only when bits.ttypes contains more than two items
bitsetBitfieldComparison(s, bits) ::= <%
(<testShiftInRange({<offsetShift(s.varName, bits.shift)>})> && ((1L \<< <offsetShift(s.varName, bits.shift)>) &
(<bits.ttypes:{ttype | (1L \<< <offsetShift(ttype, bits.shift)>)}; separator=" | ">)) != 0)
%>

isZero ::= [
"0":true,
default:false
]

offsetShift(shiftAmount, offset) ::= <%
<if(!isZero.(offset))><shiftAmount> - <offset><else><shiftAmount><endif>
%>

// produces more efficient bytecode when bits.ttypes contains at most two items
bitsetInlineComparison(s, bits) ::= <%
<bits.ttypes:{ttype | <s.varName>==<ttype>}; separator=" || ">
%>

cases(ttypes) ::= <<
<ttypes:{t | case <t>}; separator="\n">
>>

InvokeRule(r, argExprsChunks) ::= <<
setState(<r.stateNumber>);
<if(r.labels)><r.labels:{l | <labelref(l)> =
}><endif><r.name><(<if(r.ast.options.p)><r.ast.options.p><if(argExprsChunks)>,<endif><endif><argExprsChunks>
);
>>

MatchToken(m) ::= <<
setState(<m.stateNumber>);
<if(m.labels)><m.labels:{l | <labelref(l)> = }><endif>match(<m.name>);
>>

```

```
MatchSet(m, expr, capture) ::= "<CommonSetStuff(m, expr, capture, false)>"
```

```
MatchNotSet(m, expr, capture) ::= "<CommonSetStuff(m, expr, capture, true)>"
```

```
CommonSetStuff(m, expr, capture, invert) ::= <<
setState(<m.stateNumber>);
<if(m.labels)><m.labels:{1 | <labelref(l)> = }>_input.LT(1);<endif>
<capture>
if (<if(invert)><m.varName> \<= 0 || <else>!<endif>(<expr>)) {
 <if(m.labels)><m.labels:{1 | <labelref(l)> = (Token)}><endif>_errHandler.recoverInline(this);
}
else {
 if (_input.LA(1)==Token.EOF) matchedEOF = true;
 _errHandler.reportMatch(this);
 consume();
}
>>
```

```
Wildcard(w) ::= <<
setState(<w.stateNumber>);
<if(w.labels)><w.labels:{1 | <labelref(l)> = }><endif>matchWildcard();
>>
```

```
// ACTION STUFF
```

```
Action(a, foo, chunks) ::= "<chunks>"
```

```
ArgAction(a, chunks) ::= "<chunks>"
```

```
SemPred(p, chunks, failChunks) ::= <<
setState(<p.stateNumber>);
if (!(<chunks>)) throw new FailedPredicateException(this, <p.predicate><if(failChunks)>,
<failChunks><elseif(p.msg)>, <p.msg><endif>);
>>
```

```
ExceptionClause(e, catchArg, catchAction) ::= <<
catch (<catchArg>) {
 <catchAction>
}
>>
```

```
// lexer actions are not associated with model objects
```

```
LexerSkipCommand() ::= "skip()";
```

```
LexerMoreCommand() ::= "more()";
```

```
LexerPopModeCommand() ::= "popMode()";
```

```

LexerTypeCommand(arg, grammar) ::= "_type = <arg>";
LexerChannelCommand(arg, grammar) ::= "_channel = <arg>";
LexerModeCommand(arg, grammar) ::= "_mode = <arg>";
LexerPushModeCommand(arg, grammar) ::= "pushMode(<arg>);"

ActionText(t) ::= "<t.text>"
ActionTemplate(t) ::= "<t.st>"
ArgRef(a) ::= "_localctx.<a.name>"
LocalRef(a) ::= "_localctx.<a.name>"
RetValRef(a) ::= "_localctx.<a.name>"
QRetValRef(a) ::= "<ctx(a)>.<a.dict>.<a.name>"
/** How to translate $tokenLabel */
TokenRef(t) ::= "<ctx(t)>.<t.name>"
LabelRef(t) ::= "<ctx(t)>.<t.name>"
ListLabelRef(t) ::= "<ctx(t)>.<ListLabelName(t.name)>"
SetAttr(s,rhsChunks) ::= "<ctx(s)>.<s.name> = <rhsChunks>";

TokenLabelType() ::= "<file.TokenLabelType; null={Token}>"
InputSymbolType() ::= "<file.InputSymbolType; null={Token}>"

TokenPropertyRef_text(t) ::= "<ctx(t)>.<t.label>!=null?<ctx(t)>.<t.label>.getText():null)"
TokenPropertyRef_type(t) ::= "<ctx(t)>.<t.label>!=null?<ctx(t)>.<t.label>.getType():0)"
TokenPropertyRef_line(t) ::= "<ctx(t)>.<t.label>!=null?<ctx(t)>.<t.label>.getLine():0)"
TokenPropertyRef_pos(t) ::= "<ctx(t)>.<t.label>!=null?<ctx(t)>.<t.label>.getCharPositionInLine():0)"
TokenPropertyRef_channel(t) ::= "<ctx(t)>.<t.label>!=null?<ctx(t)>.<t.label>.getChannel():0)"
TokenPropertyRef_index(t) ::= "<ctx(t)>.<t.label>!=null?<ctx(t)>.<t.label>.getTokenIndex():0)"
TokenPropertyRef_int(t) ::= "<ctx(t)>.<t.label>!=null?Integer.valueOf(<ctx(t)>.<t.label>.getText()):0)"

RulePropertyRef_start(r) ::= "<ctx(r)>.<r.label>!=null?<ctx(r)>.<r.label>.start():null)"
RulePropertyRef_stop(r) ::= "<ctx(r)>.<r.label>!=null?<ctx(r)>.<r.label>.stop():null)"
RulePropertyRef_text(r) ::=
"<ctx(r)>.<r.label>!=null?_input.getText(<ctx(r)>.<r.label>.start,<ctx(r)>.<r.label>.stop):null)"
RulePropertyRef_ctx(r) ::= "<ctx(r)>.<r.label>"
RulePropertyRef_parser(r) ::= "this"

ThisRulePropertyRef_start(r) ::= "_localctx.start"
ThisRulePropertyRef_stop(r) ::= "_localctx.stop"
ThisRulePropertyRef_text(r) ::= "_input.getText(_localctx.start, _input.LT(-1))"
ThisRulePropertyRef_ctx(r) ::= "_localctx"
ThisRulePropertyRef_parser(r) ::= "this"

NonLocalAttrRef(s) ::= "(<s.ruleName; format=\"cap\">Context)getInvokingContext(<s.ruleIndex>).<s.name>"
SetNonLocalAttr(s, rhsChunks) ::=
"(<s.ruleName; format=\"cap\">Context)getInvokingContext(<s.ruleIndex>).<s.name> = <rhsChunks>";

AddToLabelList(a) ::= "<ctx(a.label)>.<a.listName>.add(<labelref(a.label)>);"

TokenDecl(t) ::= "<TokenLabelType()> <t.name>"

```

```

TokenTypeDecl(t) ::= "int <t.name>";
TokenListDecl(t) ::= "List<<Token> <t.name> = new ArrayList<<Token>()"
RuleContextDecl(r) ::= "<r.ctxName> <r.name>"
RuleContextListDecl(rdecl) ::= "List<<<rdecl.ctxName>> <rdecl.name> = new ArrayList<<<rdecl.ctxName>>()"

ContextTokenGetterDecl(t) ::=
 "public TerminalNode <t.name>() { return getToken(<parser.name>.<t.name>, 0); }"
ContextTokenListGetterDecl(t) ::=
 "public List<<TerminalNode> <t.name>() { return getTokens(<parser.name>.<t.name>); }"
ContextTokenListIndexedGetterDecl(t) ::= <<
public TerminalNode <t.name>(int i) {
 return getToken(<parser.name>.<t.name>, i);
}
>>
ContextRuleGetterDecl(r) ::= <<
public <r.ctxName> <r.name>() {
 return getRuleContext(<r.ctxName>.class,0);
}
>>
ContextRuleListGetterDecl(r) ::= <<
public List<<<r.ctxName>> <r.name>() {
 return getRuleContexts(<r.ctxName>.class);
}
>>
ContextRuleListIndexedGetterDecl(r) ::= <<
public <r.ctxName> <r.name>(int i) {
 return getRuleContext(<r.ctxName>.class,i);
}
>>

LexerRuleContext() ::= "RuleContext"

/** The rule context name is the rule followed by a suffix; e.g.,
 * r becomes rContext.
 */
RuleContextNameSuffix() ::= "Context"

ImplicitTokenLabel(tokenName) ::= "<tokenName>"
ImplicitRuleLabel(ruleName) ::= "<ruleName>"
ImplicitSetLabel(id) ::= "_tset<id>"
ListLabelName(label) ::= "<label>"

CaptureNextToken(d) ::= "<d.varName> = _input.LT(1);"
CaptureNextTokenType(d) ::= "<d.varName> = _input.LA(1);"

StructDecl(struct,ctorAttrs,attrs, getters,dispatchMethods,interfaces,extensionMembers)
::= <<
public static class <struct.name> extends

```



```

<if(contextSuperClass)><contextSuperClass><else>ParserRuleContext<endif><if(interfaces)> implements
<interfaces; separator=", "><endif> {
 <attrs:{ a | public <a>;}; separator="\n">
 <getters:{ g | <g>;}; separator="\n">
 <if(ctorAttrs)>public <struct.name>(ParserRuleContext parent, int invokingState) { super(parent, invokingState);
 }<endif>
 public <struct.name>(ParserRuleContext parent, int invokingState<ctorAttrs:{ a | , <a>>}) {
 super(parent, invokingState);
 <struct.ctorAttrs:{ a | this.<a.name> = <a.name>;}; separator="\n">
 }
 @Override public int getRuleIndex() { return RULE_<struct.derivedFromName>; }
 <if(struct.provideCopyFrom)> <! don't need copy unless we have subclasses !>
 public <struct.name>() { }
 public void copyFrom(<struct.name> ctx) {
 super.copyFrom(ctx);
 <struct.attrs:{ a | this.<a.name> = ctx.<a.name>;}; separator="\n">
 }
<endif>
 <dispatchMethods; separator="\n">
 <extensionMembers; separator="\n">
}
>>

```

```

AltLabelStructDecl(struct,attrs,getters,dispatchMethods) ::= <<
public static class <struct.name> extends <currentRule.name; format="cap">Context {
 <attrs:{ a | public <a>;}; separator="\n">
 <getters:{ g | <g>;}; separator="\n">
 public <struct.name>(<currentRule.name; format="cap">Context ctx) { copyFrom(ctx); }
 <dispatchMethods; separator="\n">
}
>>

```

```

ListenerDispatchMethod(method) ::= <<
@Override
public void <if(method.isEnter)>enter<else>exit<endif>Rule(ParseTreeListener listener) {
 if (listener instanceof <parser.grammarName>Listener)
 ((<parser.grammarName>Listener)listener).<if(method.isEnter)>enter<else>exit<endif><struct.derivedFromName;
 format="cap">(this);
}
>>

```

```

VisitorDispatchMethod(method) ::= <<
@Override
public <T> T accept(ParseTreeVisitor<? extends T> visitor) {
 if (visitor instanceof <parser.grammarName>Visitor) return ((<parser.grammarName>Visitor<? extends
 T>)visitor).visit<struct.derivedFromName; format="cap">(this);
 else return visitor.visitChildren(this);
}

```

>>

```
AttributeDecl(d) ::= "<d.type> <d.name><if(d.initValue)> = <d.initValue><endif>"
```

```
/** If we don't know location of label def x, use this template */
```

```
labelref(x) ::= "<if(!x.isLocal)>((<x.ctx.name>)_localctx).<endif><x.name>"
```

```
/** For any action chunk, what is correctly-typed context struct ptr? */
```

```
ctx(actionChunk) ::= "((<actionChunk.ctx.name>)_localctx)"
```

```
// used for left-recursive rules
```

```
recRuleAltPredicate(ruleName,opPrec) ::= "precpred(_ctx, <opPrec>)"
```

```
recRuleSetReturnAction(src,name) ::= "$<name>=$<src>.<name>";
```

```
recRuleSetStopToken() ::= "_ctx.stop = _input.LT(-1);"
```

```
recRuleAltStartAction(ruleName, ctxName, label, isListLabel) ::= <<
```

```
_localctx = new <ctxName>Context(_parentctx, _parentState);
```

```
<if(label)>
```

```
<if(isListLabel)>
```

```
_localctx.<label>.add(_prevctx);
```

```
<else>
```

```
_localctx.<label> = _prevctx;
```

```
<endif>
```

```
<endif>
```

```
<if(label)>_localctx.<label> = _prevctx;<endif>
```

```
pushNewRecursionContext(_localctx, _startState, RULE_<ruleName>);
```

```
>>
```

```
recRuleLabeledAltStartAction(ruleName, currentAltLabel, label, isListLabel) ::= <<
```

```
_localctx = new <currentAltLabel; format="cap">Context(new <ruleName; format="cap">Context(_parentctx,
_parentState));
```

```
<if(label)>
```

```
<if(isListLabel)>
```

```
((<currentAltLabel; format="cap">Context)_localctx).<label>.add(_prevctx);
```

```
<else>
```

```
((<currentAltLabel; format="cap">Context)_localctx).<label> = _prevctx;
```

```
<endif>
```

```
<endif>
```

```
pushNewRecursionContext(_localctx, _startState, RULE_<ruleName>);
```

```
>>
```

```
recRuleReplaceContext(ctxName) ::= <<
```

```
_localctx = new <ctxName>Context(_localctx);
```

```
_ctx = _localctx;
```

```
_prevctx = _localctx;
```

```
>>
```

```
recRuleSetPrevCtx() ::= <<
```

```

if (_parseListeners!=null) triggerExitRuleEvent();
_prevctx = _localctx;
>>

```

```

LexerFile(lexerFile, lexer, namedActions) ::= <<
<fileHeader(lexerFile.grammarFileName, lexerFile.ANTLRVersion)>
<if(lexerFile.genPackage)>
package <lexerFile.genPackage>;
<endif>
<namedActions.header>
import org.antlr.v4.runtime.Lexer;
import org.antlr.v4.runtime.CharStream;
import org.antlr.v4.runtime.Token;
import org.antlr.v4.runtime.TokenStream;
import org.antlr.v4.runtime.*;
import org.antlr.v4.runtime.atn.*;
import org.antlr.v4.runtime.dfa.DFA;
import org.antlr.v4.runtime.misc.*;

<lexer>
>>

```

```

Lexer(lexer, atn, actionFuncs, sempredFuncs, superClass) ::= <<
@SuppressWarnings({"all", "warnings", "unchecked", "unused", "cast"})
public class <lexer.name> extends <superClass; null="Lexer"> {
 static { RuntimeMetaData.checkVersion("<lexerFile.ANTLRVersion>", RuntimeMetaData.VERSION); }

 protected static final DFA[] _decisionToDFA;
 protected static final PredictionContextCache _sharedContextCache =
 new PredictionContextCache();
 <if(lexer.tokens)>
 public static final int
 <lexer.tokens:{k | <k>=<lexer.tokens.(k)>}; separator=", ", wrap, anchor>;
 <endif>
 <if(lexer.channels)>
 public static final int
 <lexer.channels:{c | <c>=<lexer.channels.(c)>}; separator=", ", wrap, anchor>;
 <endif>
 <if(rest(lexer.modes)>
 public static final int
 <rest(lexer.modes){m | <m>=<i>}; separator=", ", wrap, anchor>;
 <endif>
 public static String[] channelNames = {
 "DEFAULT_TOKEN_CHANNEL", "HIDDEN"<if (lexer.channels)>, <lexer.channels:{c| "<c>"}; separator=", ",
wrap, anchor><endif>
 };
}

```

```

public static String[] modeNames = {
 <lexer.modes:{m| "<m>"}; separator=", ", wrap, anchor>
};

private static String[] makeRuleNames() {
 return new String[] {
 <lexer.ruleNames:{r| "<r>"}; separator=", ", wrap, anchor>
 };
}
public static final String[] ruleNames = makeRuleNames();

<vocabulary(lexer.literalNames, lexer.symbolicNames)>

<namedActions.members>

public <lexer.name>(CharStream input) {
 super(input);
 _interp = new LexerATNSimulator(this, _ATN, _decisionToDFA, _sharedContextCache);
}

@Override
public String getGrammarFileName() { return "<lexer.grammarFileName>"; }

@Override
public String[] getRuleNames() { return ruleNames; }

@Override
public String getSerializedATN() { return _serializedATN; }

@Override
public String[] getChannelNames() { return channelNames; }

@Override
public String[] getModeNames() { return modeNames; }

@Override
public ATN getATN() { return _ATN; }

<dumpActions(lexer, "", actionFuncs, sempredFuncs)>
<atn>
}
>>

SerializedATN(model) ::= <<
<if(rest(model.segments))>
<! requires segmented representation !>
private static final int _serializedATNSegments = <length(model.segments)>;
<model.segments:{segment|private static final String _serializedATNSegment<i0> =

```

```

"<segment; wrap={"+<\n><\t>">"; separator="\n">
public static final String _serializedATN = Utils.join(
new String[] {
<model.segments:{segment | _serializedATNSegment<i0>}; separator=",\n">
},
""
);
<else>
<! only one segment, can be inlined !>
public static final String _serializedATN =
"<model.serialized; wrap={"+<\n><\t>">";
<endif>
public static final ATN _ATN =
new ATNDeserializer().deserialize(_serializedATN.toCharArray());
static {
_decisionToDFA = new DFA[_ATN.getNumberOfDecisions()];
for (int i = 0; i < _ATN.getNumberOfDecisions(); i++) {
_decisionToDFA[i] = new DFA(_ATN.getDecisionState(i), i);
}
<! org.antlr.v4.tool.DOTGenerator dot = new org.antlr.v4.tool.DOTGenerator(null);!>
<! System.out.println(dot.getDOT(_ATN.decisionToState.get(0), ruleNames, false));!>
<! System.out.println(dot.getDOT(_ATN.ruleToStartState[2], ruleNames, false));!>
}
>>

/** Using a type to init value map, try to init a type; if not in table
* must be an object, default value is "null".
*/
initValue(typeName) ::= <<
<javaTypeInitMap.(typeName)>
>>

codeFileExtension() ::= ".java"

```

Found in path(s):

```

* /opt/cola/permits/1340816081_1654861722.3479369/0/antlr4-4-9-2-sources-1-
jar/org/antlr/v4/tool/templates/codegen/Java/Java.stg

```

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```

/*
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* Use of this file is governed by the BSD 3-clause license that
* can be found in the LICENSE.txt file in the project root.
*/
/**
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```

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\*/

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\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/gui/GraphicsSupport.java

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\*/

```
// File : A3Lexer.g
// Author : Jim Idle (jimi@temporal-wave.com)
// Copyright : Free BSD - See @header clause below
// Version : First implemented as part of ANTLR 3.2 this is the self
// hosting ANTLR 3 Lexer.
//
// Description
// -----
// This is the definitive lexer grammar for parsing ANTLR V3.x.x grammars. All other
// grammars are derived from this grammar via source code control integration (perforce)
// or by the gdiff tool.
//
// This grammar and its associated grmmars A3Parser.g and A3Walker.g exhibit the following
// traits, which are recommended for all production quality grammars:
//
// 1) They are separate grammars, not composite grammars;
// 2) They implement all supporting methods in a superclass (at least this is recommended
// for language targets that support inheritance;
// 3) All errors are pushed as far down the parsing chain as possible, which means
// that the lexer tries to defer error reporting to the parser, and the parser
// tries to defer error reporting to a semantic phase consisting of a single
// walk of the AST. The reason for this is that the error messages produced
// from later phases of the parse will generally have better context and so
// be more useful to the end user. Consider the message: "Syntax error at 'options'"
// vs: "You cannot specify two options{ } sections in a single grammar file".
// 4) The lexer is 'programmed' to catch common mistakes such as unterminated literals
// and report them specifically and not just issue confusing lexer mismatch errors.
//
/** Read in an ANTLR grammar and build an AST. Try not to do
 * any actions, just build the tree.
 *
 * The phases are:
 *
 * A3Lexer.g (this file)
 * A3Parser.g
```

```

* A3Verify.g (derived from A3Walker.g)
* assign.types.g
* define.g
* buildnfa.g
* antlr.print.g (optional)
* codegen.g
*
* Terence Parr
* University of San Francisco
* 2005
* Jim Idle (this v3 grammar)
* Temporal Wave LLC
* 2009
*/
lexer grammar ANTLRLexer;

// =====
// Note that while this grammar does not care about order of constructs
// that don't really matter, such as options before @header etc, it must first
// be parsed by the original v2 parser, before it replaces it. That parser does
// care about order of structures. Hence we are constrained by the v2 parser
// for at least the first bootstrap release that causes this parser to replace
// the v2 version.
// =====

// -----
// Options
//
// V3 option directives to tell the tool what we are asking of it for this
// grammar.
//
options {

// Target language is Java, which is the default but being specific
// here as this grammar is also meant as a good example grammar for
// for users.
//
language = Java;

// The super class that this lexer should expect to inherit from, and
// which contains any and all support routines for the lexer. This is
// commented out in this baseline (definitive or normative grammar)
// - see the ANTLR tool implementation for hints on how to use the super
// class
//
//superclass = AbstractA3Lexer;
}

```



```
tokens { SEMPRED; TOKEN_REF; RULE_REF; LEXER_CHAR_SET; ARG_ACTION; }
```

```
// Include the copyright in this source and also the generated source
```

```
//
```

```
@lexer::header {
```

```
/*
```

```
[The "BSD licence"]
```

```
Copyright (c) 2005-2009 Terence Parr
```

```
All rights reserved.
```

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```
*/
```

```
package org.antlr.v4.parse;
```

```
import org.antlr.v4.tool.*;
```

```
import org.antlr.v4.runtime.misc.Interval;
```

```
}
```

```
@members {
```

```
public static final int COMMENTS_CHANNEL = 2;
```

```
public CommonTokenStream tokens; // track stream we push to; need for context info
```

```
public boolean isLexerRule = false;
```

```
public void grammarError(ErrorType etype, org.antlr.runtime.Token token, Object... args) { }
```

```
/** scan backwards from current point in this.tokens list
```

```
 * looking for the start of the rule or subrule.
```

```

* Return token or null if for some reason we can't find the start.
*/
public Token getRuleOrSubruleStartToken() {
 if (tokens==null) return null;
 int i = tokens.index();
 int n = tokens.size();
 if (i>=n) i = n-1; // seems index == n as we lex
 while (i>=0 && i<n) {
 int ttype = tokens.get(i).getType();
 if (ttype == LPAREN || ttype == TOKEN_REF || ttype == RULE_REF) {
 return tokens.get(i);
 }
 i--;
 }
 return null;
}

// -----
// Comments
//
// ANTLR comments can be multi or single line and we don't care
// which particularly. However we also accept Javadoc style comments
// of the form: /** ... */ and we do take care to distinguish those
// from ordinary multi-line comments
// Note how we guide the lexical PATH because we want to issue a decriptive
// error message in case of a standalone '/' character, which makes no
// sense in ANTLR source code. We also trap unterminated multi-line comments
//
fragment DOC_COMMENT : ;
COMMENT
@init {

 // Record the start line and offsets as if we need to report an
 // unterminated comment, then we want to show the start of the comment
 // we think is broken, not the end, where people will have to try and work
 // it out themselves.
 //
 int startLine = $line;
 int offset = getCharPositionInLine();
}
: // Eat the first character only, then see if we have a comment
 // or something silly.
 //
 '/' // Comment introducer

(
 // Single line comment, possibly with embedded src/line directives

```

```

// in a similar style to the C pre-processor, allowing generated
// code to refer the programmer back to the original source code
// in case of error.
//
/'
(
 (' $ANTLR')=> ' $ANTLR' SRC
 | ~(NLCHARS)*
)

|// Multi-line comment, which may be a documentation comment
// if it starts /** (note that we protect against accidentally
// recognizing a comment /**/ as a documentation comment
//
/** (
 { input.LA(2) != '/' }?=> '*' { $type = DOC_COMMENT; }
 | { true }?=> // Required to cover all alts with predicates
)

// Should we support embedded multiline comments here?
//
(
 // Pick out end of multiline comment and exit the loop
 // if we find it.
 //
 { !(input.LA(1) == '*' && input.LA(2) == '/') }?

 // Anything else other than the non-greedy match of
 // the comment close sequence
 //
 .
)*
(
 // Look for the comment terminator, but if it is accidentally
 // unterminated, then we will hit EOF, which will trigger the
 // epsilon alt and hence we can issue an error message relative
 // to the start of the unterminated multi-line comment
 //
 /*'

|// Unterminated comment!
//
{
 // ErrorManager.msg(Msg.UNTERMINATED_DOC_COMMENT, startLine, offset, $pos, startLine,
offset, $pos, (Object)null);
}
)

```

```

| // There was nothing that made sense following the opening '/' and so
| // we issue an error regarding the malformed comment
| //
| {
| // TODO: Insert error message relative to comment start
| //
| }
)
{
| // We do not wish to pass the comments in to the parser. If you are
| // writing a formatter then you will want to preserve the comments off
| // channel, but could just skip and save token space if not.
| //
| $channel=COMMENTS_CHANNEL;
| }
;

```

ARG\_OR\_CHARSET

```

options {k=1;}
: {isLexerRule}?=> LEXER_CHAR_SET {$type=LEXER_CHAR_SET;}
| {!isLexerRule}?=> ARG_ACTION
| {
| $type=ARG_ACTION;
| // Set the token text to our gathered string minus outer []
| String t = $text;
| t = t.substring(1,t.length()-1);
| setText(t);
| }
;

```

fragment

LEXER\_CHAR\_SET

```

: '['
| ('\ ' ~('\r'\n')
| ~('\r'\n'\\'])
)*
| ']'
;

```

// -----

// Argument specs

//

// Certain argument lists, such as those specifying call parameters

// to a rule invocation, or input parameters to a rule specification

// are contained within square brackets. In the lexer we consume them

// all at once and sort them out later in the grammar analysis.

//

fragment

```

ARG_ACTION
: '['
 (
 ARG_ACTION

 | ("")=>ACTION_STRING_LITERAL

 | ("\")=>ACTION_CHAR_LITERAL

 | ~('[\']')
)*
 ']'
;

// -----
// Actions
//
// Other than making sure to distinguish between { and } embedded
// within what we have assumed to be literals in the action code, the
// job of the lexer is merely to gather the code within the action
// (delimited by {}) and pass it to the parser as a single token.
// We know that this token will be asked for its text somewhere
// in the upcoming parse, so setting the text here to exclude
// the delimiting {} is no additional overhead.
//
ACTION
: NESTED_ACTION
('?' {$type = SEMPRED;}
 ((WSNLCHARS* '=>') => WSNLCHARS* '=>' // v3 gated sempred
 {
 Token t = new CommonToken(input, state.type, state.channel, state.tokenStartCharIndex, getCharIndex()-1);
 t.setLine(state.tokenStartLine);
 t.setText(state.text);
 t.setCharPositionInLine(state.tokenStartCharPositionInLine);
 grammarError(ErrorType.V3_GATED_SEMPRED, t);
 }
)?
)?
;

// -----
// Action structure
//
// Many language targets use {} as block delimiters and so we
// must recursively match {} delimited blocks to balance the
// braces. Additionally, we must make some assumptions about
// literal string representation in the target language. We assume

```

```

// that they are delimited by ' or " and so consume these
// in their own alts so as not to inadvertently match {}.
// This rule calls itself on matching a {
//
fragment
NESTED_ACTION
@init {

// Record the start line and offsets as if we need to report an
// unterminated block, then we want to show the start of the comment
// we think is broken, not the end, where people will have to try and work
// it out themselves.
//
int startLine = getLine();
int offset = getCharPositionInLine();
}

: // Action and other blocks start with opening {
//
'{'
(
// And now we can match one of a number of embedded
// elements within the action until we find a
// } that balances the opening {. If we do not find
// the balanced } then we will hit EOF and can issue
// an error message about the brace that we believe to
// be mismatched. This won't be foolproof but we will
// be able to at least report an error against the
// opening brace that we feel is in error and this will
// guide the user to the correction as best we can.
//

// An embedded {} block
//
NESTED_ACTION

| // What appears to be a literal
//
ACTION_CHAR_LITERAL

| // We have assumed that the target language has C/Java
// type comments.
//
COMMENT

| // What appears to be a literal
//

```

```

ACTION_STRING_LITERAL

|// What appears to be an escape sequence
//
ACTION_ESC

|// Some other single character that is not
// handled above
//
~(\\|'|\"|/|'{'|'})

)*

(
// Correctly balanced closing brace
//
}'

|// Looks like have an imbalanced {} block, report
// with respect to the opening brace.
//
{
// TODO: Report imbalanced {}
System.out.println("Block starting at line " + startLine + " offset " + (offset+1) + " contains imbalanced {} or
is missing a }");
}
)
;

// Keywords
// -----
// keywords used to specify ANTLR v3 grammars. Keywords may not be used as
// labels for rules or in any other context where they would be ambiguous
// with the keyword vs some other identifier
// OPTIONS, TOKENS, and CHANNELS must also consume the opening brace that captures
// their option block, as this is the easiest way to parse it separate
// to an ACTION block, despite it using the same {} delimiters.
//
OPTIONS : 'options' WSNLCHARS* '{' ;
TOKENS_SPEC : 'tokens' WSNLCHARS* '{' ;
CHANNELS : 'channels' WSNLCHARS* '{' ;

IMPORT : 'import' ;
FRAGMENT : 'fragment' ;
LEXER : 'lexer' ;
PARSER : 'parser' ;
GRAMMAR : 'grammar' ;

```

```

TREE_GRAMMAR : 'tree' WSNLCHARS* 'grammar' ;
PROTECTED : 'protected' ;
PUBLIC : 'public' ;
PRIVATE : 'private' ;
RETURNS : 'returns' ;
LOCALS : 'locals' ;
THROWS : 'throws' ;
CATCH : 'catch' ;
FINALLY : 'finally' ;
MODE : 'mode' ;

// -----
// Punctuation
//
// Character sequences used as separators, delimiters, operators, etc
//
COLON : ':'
 {
 // scan backwards, looking for a RULE_REF or TOKEN_REF.
 // which would indicate the start of a rule definition.
 // If we see a LPAREN, then it's the start of the subrule.
 // this.tokens is the token string we are pushing into, so
 // just loop backwards looking for a rule definition. Then
 // we set isLexerRule.
 Token t = getRuleOrSubruleStartToken();
 if (t!=null) {
 if (t.getType()==RULE_REF) isLexerRule = false;
 else if (t.getType()==TOKEN_REF) isLexerRule = true;
 // else must be subrule; don't alter context
 }
 }
;
COLONCOLON : '::' ;
COMMA : ',' ;
SEMI : ';' ;
LPAREN : '(' ;
RPAREN : ')' ;
RARROW : '->' ;
LT : '<' ;
GT : '>' ;
ASSIGN : '=' ;
QUESTION : '?' ;
SYNPRED : '=>'
 {
 Token t = new CommonToken(input, state.type, state.channel,
 state.tokenStartCharIndex, getCharIndex()-1);
 t.setLine(state.tokenStartLine);
 t.setText(state.text);
 }

```



```

t.setCharPositionInLine(state.tokenStartCharPositionInLine);
grammarError(ErrorType.V3_SYNPRED, t);
 $channel=HIDDEN;
}
;
STAR : '*' ;
PLUS : '+' ;
PLUS_ASSIGN : '+=' ;
OR : '|' ;
DOLLAR : '$' ;
DOT : '.' ; // can be WILDCARD or DOT in qid or imported rule ref
RANGE : '..' ;
AT : '@' ;
POUND : '#' ;
NOT : '~' ;
RBRACE : '}' ;

```

/\*\* Allow unicode rule/token names \*/

```

ID : a=NameStartChar NameChar*
{
 if (Grammar.isTokenName($a.text)) $type = TOKEN_REF;
 else $type = RULE_REF;
}
;

```

fragment

```

NameChar : NameStartChar
| '0'..'9'
| '_'
| '\u00B7'
| '\u0300'..\u036F'
| '\u203F'..\u2040'
;

```

fragment

```

NameStartChar
: 'A'..'Z' | 'a'..'z'
| '\u00C0'..\u00D6'
| '\u00D8'..\u00F6'
| '\u00F8'..\u02FF'
| '\u0370'..\u037D'
| '\u037F'..\u1FFF'
| '\u200C'..\u200D'
| '\u2070'..\u218F'
| '\u2C00'..\u2FEF'
| '\u3001'..\uD7FF'
| '\uF900'..\uFDCF'
| '\uFDF0'..\uFEFE'

```

```

 | '\uFF00'..\uFFFF'
 ; // ignores | [^\u10000-\uEFFFF] ;

// -----
// Literals embedded in actions
//
// Note that we have made the assumption that the language used within
// actions uses the fairly standard " and ' delimiters for literals and
// that within these literals, characters are escaped using the \ character.
// There are some languages which do not conform to this in all cases, such
// as by using /string/ and so on. We will have to deal with such cases if
// if they come up in targets.
//

// Within actions, or other structures that are not part of the ANTLR
// syntax, we may encounter literal characters. Within these, we do
// not want to inadvertently match things like '}' and so we eat them
// specifically. While this rule is called CHAR it allows for the fact that
// some languages may use/allow ' as the string delimiter.
//
fragment
ACTION_CHAR_LITERAL
: "\"" ((\\)=>ACTION_ESC | ~"\")* "\""
;

// Within actions, or other structures that are not part of the ANTLR
// syntax, we may encounter literal strings. Within these, we do
// not want to inadvertently match things like '}' and so we eat them
// specifically.
//
fragment
ACTION_STRING_LITERAL
: "\"" ((\\)=>ACTION_ESC | ~"\")* "\""
;

// Within literal strings and characters that are not part of the ANTLR
// syntax, we must allow for escaped character sequences so that we do not
// inadvertently recognize the end of a string or character when the terminating
// delimiter has been escaped.
//
fragment
ACTION_ESC
: "\\" .
;

// -----
// Integer
//

```

```

// Obviously (I hope) match an arbitrary long sequence of digits.
//
INT : ('0'..'9')+
 ;

// -----
// Source spec
//
// A fragment rule for picking up information about an originating
// file from which the grammar we are parsing has been generated. This allows
// ANTLR to report errors against the originating file and not the generated
// file.
//
fragment
SRC : 'src' WSCHARS+ file=ACTION_STRING_LITERAL WSCHARS+ line=INT
 {
 // TODO: Add target specific code to change the source file name and current line number
 //
 }
 ;

// -----
// Literal string
//
// ANTLR makes no distinction between a single character literal and a
// multi-character string. All literals are single quote delimited and
// may contain unicode escape sequences of the form \uxxxx or \u{xxxxxx},
// where x is a valid hexadecimal number.
STRING_LITERAL
: \" ((ESC_SEQ | ~(\"|\"'|\"r\"|\"n'))) *
 (\"
 | // Unterminated string literal
 {
 Token t = new CommonToken(input, state.type, state.channel, state.tokenStartCharIndex, getCharIndex()-1);
 t.setLine(state.tokenStartLine);
 t.setText(state.text);
 t.setCharPositionInLine(state.tokenStartCharPositionInLine);
 grammarError(ErrorType.UNTERMINATED_STRING_LITERAL, t);
 }
)
;

// A valid hex digit specification
//
fragment
HEX_DIGIT : ('0'..'9'|'a'..'f'|'A'..'F') ;

// Any kind of escaped character that we can embed within ANTLR

```

```

// literal strings.
//
fragment
ESC_SEQ
: '\\
(
 // The standard escaped character set such as tab, newline, etc...
 'b'|'t'|'n'|'f'|'r'|'\"|'\\'

 // A Java style Unicode escape sequence
 UNICODE_ESC

 // A Swift/Hack style Unicode escape sequence
 UNICODE_EXTENDED_ESC

 // An illegal escape sequence
 ~('b'|'t'|'n'|'f'|'r'|'\"|'\\'|'u') // \x for any invalid x (make sure to match char here)
 {
 Token t = new CommonToken(input, state.type, state.channel, getCharIndex()-2, getCharIndex()-1);
 t.setText(t.getText());
 t.setLine(input.getLine());
 t.setCharPositionInLine(input.getCharPositionInLine()-2);
 grammarError(ErrorType.INVALID_ESCAPE_SEQUENCE, t, input.substring(getCharIndex()-
2,getCharIndex()-1));
 }
)
;

```

```

fragment
UNICODE_ESC
@init {

 // Flag to tell us whether we have a valid number of
 // hex digits in the escape sequence
 //
 int hCount = 0;
}

: 'u' // Leadin for unicode escape sequence

 // We now require 4 hex digits. Note though
 // that we accept any number of characters
 // and issue an error if we do not get 4. We cannot
 // use an infinite count such as + because this
 // might consume too many, so we lay out the lexical
 // options and issue an error at the invalid paths.
 //
 (
 (

```

```

 HEX_DIGIT { hCount++; }
 (
 HEX_DIGIT { hCount++; }
 (
 HEX_DIGIT { hCount++; }
 (
 // Four valid hex digits, we are good
 //
 HEX_DIGIT { hCount++; }

 |// Three valid digits
)

 |// Two valid digits
)

 |// One valid digit
)
)
 |// No valid hex digits at all
)

// Now check the digit count and issue an error if we need to
//
{
 if (hCount < 4) {
 Interval badRange = Interval.of(getCharIndex()-2-hCount, getCharIndex());
 String lastChar = input.substring(badRange.b, badRange.b);
 if (lastChar.codePointAt(0)=="\\") {
 badRange.b--;
 }
 String bad = input.substring(badRange.a, badRange.b);
 Token t = new CommonToken(input, state.type, state.channel, badRange.a, badRange.b);
 t.setLine(input.getLine());
 t.setCharPositionInLine(input.getCharPositionInLine()-hCount-2);
 grammarError(ErrorType.INVALID_ESCAPE_SEQUENCE, t, bad);
 }
}
;

```

fragment

UNICODE\_EXTENDED\_ESC

: 'u{' // Leadin for unicode extended escape sequence

HEX\_DIGIT+ // One or more hexadecimal digits

'}' // Leadout for unicode extended escape sequence

```

// Now check the digit count and issue an error if we need to
{
 int numDigits = getCharIndex()-state.tokenStartCharIndex-6;
 if (numDigits > 6) {
 Token t = new CommonToken(input, state.type, state.channel, state.tokenStartCharIndex, getCharIndex()-
1);
 t.setText(t.getText());
 t.setLine(input.getLine());
 t.setCharPositionInLine(input.getCharPositionInLine()-numDigits);
 grammarError(ErrorType.INVALID_ESCAPE_SEQUENCE, t,
input.substring(state.tokenStartCharIndex,getCharIndex()-1));
 }
}
;

// -----
// Whitespace
//
// Characters and character constructs that are of no import
// to the parser and are used to make the grammar easier to read
// for humans.
//
WS
:(
 ''
 | '\t'
 | '\r'
 | '\n'
 | '\f'
)+
{$channel=HIDDEN;}
;

// A fragment rule for use in recognizing end of line in
// rules like COMMENT.
//
fragment
NLCHARS
: '\n' | '\r'
;

// A fragment rule for recognizing traditional whitespace
// characters within lexer rules.
//
fragment
WSCHARS
: ' ' | '\t' | '\f'
;

```

```

// A fragment rule for recognizing both traditional whitespace and
// end of line markers, when we don't care to distinguish but don't
// want any action code going on.
//
fragment
WSNLCHARS
: ' ' | '\t' | '\f' | '\n' | '\r'
;

// This rule allows ANTLR 4 to parse grammars using the UTF-8 encoding with a
// byte order mark. Since this Unicode character doesn't appear as a token
// anywhere else in the grammar, we can simply skip all instances of it without
// problem. This rule will not break usage of \uFEFF inside a LEXER_CHAR_SET or
// STRING_LITERAL.
UnicodeBOM
: '\uFEFF' {skip();}
;

// -----
// Illegal Character
//
// This is an illegal character trap which is always the last rule in the
// lexer specification. It matches a single character of any value and being
// the last rule in the file will match when no other rule knows what to do
// about the character. It is reported as an error but is not passed on to the
// parser. This means that the parser to deal with the grammar file anyway
// but we will not try to analyse or code generate from a file with lexical
// errors.
//
ERRCHAR
: .
{
 Token t = new CommonToken(input, state.type, state.channel, state.tokenStartCharIndex, getCharIndex()-1);
 t.setLine(state.tokenStartLine);
 t.setText(state.text);
 t.setCharPositionInLine(state.tokenStartCharPositionInLine);
 String msg = getTokenErrorDisplay(t) + " came as a complete surprise to me";
 grammarError(ErrorType.SYNTAX_ERROR, t, msg);
 state.syntaxErrors++;
 skip();
}
;

Found in path(s):
* /opt/cola/permits/1340816081_1654861722.3479369/0/antlr4-4-9-2-sources-1-
jar/org/antlr/v4/parse/ANTLRLexer.g

```

No license file was found, but licenses were detected in source scan.

```
/*
 * [The "BSD license"]
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 * THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.
 */

phpTypeInitMap ::= [
 "int": "0",
 "long": "0",
 "float": "0.0",
 "double": "0.0",
 "boolean": "false",
 default: "null"
]

// args must be <object-model-object>, <fields-resulting-in-STs>

ParserFile(file, parser, namedActions, contextSuperClass) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
<parser>
>>
```



```

ListenerFile(file, header, namedActions) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
<if(file.genPackage)>
namespace <file.genPackage>;
<endif>
<header>
use Antlr\Antlr4\Runtime\Tree\ParseTreeListener;

/**
 * This interface defines a complete listener for a parse tree produced by
 * { @see <file.parserName> }.
 */
interface <file.grammarName>Listener extends ParseTreeListener {
 <file.listenerNames: {lname |
/**
<if(file.listenerLabelRuleNames.(lname))>
 * Enter a parse tree produced by the `<lname>`
 * labeled alternative in { @see <file.parserName>::<file.listenerLabelRuleNames.(lname)>() }.
<else>
 * Enter a parse tree produced by { @see <file.parserName>::<lname>() }.
<endif>
 * @param $context The parse tree.
 */
public function enter<lname; format="cap">(Context\<lname; format="cap">Context $context) : void;
/**
<if(file.listenerLabelRuleNames.(lname))>
 * Exit a parse tree produced by the `<lname>` labeled alternative
 * in { @see <file.parserName>::<file.listenerLabelRuleNames.(lname)>() }.
<else>
 * Exit a parse tree produced by { @see <file.parserName>::<lname>() }.
<endif>
 * @param $context The parse tree.
 */
public function exit<lname; format="cap">(Context\<lname; format="cap">Context $context) : void;};
separator="\n"
}
>>

```

```

BaseListenerFile(file, header, namedActions) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
<if(file.genPackage)>
namespace <file.genPackage>;
<endif>
<header>

```

```

use Antlr\Antlr4\Runtime\ParserRuleContext;
use Antlr\Antlr4\Runtime\Tree\ErrorNode;
use Antlr\Antlr4\Runtime\Tree\TerminalNode;

```

```

/**
 * This class provides an empty implementation of { @see <file.grammarName>Listener},
 * which can be extended to create a listener which only needs to handle a subset
 * of the available methods.
 */
class <file.grammarName>BaseListener implements <file.grammarName>Listener
{
 <file.listenerNames: {Iname |
/**
 * { @inheritdoc\}
 *
 * The default implementation does nothing.
 */
public function enter<Iname; format="cap">(Context\|<Iname; format="cap">Context $context) : void {}

/**
 * { @inheritdoc\}
 *
 * The default implementation does nothing.
 */
public function exit<Iname; format="cap">(Context\|<Iname; format="cap">Context $context) : void {}};
separator="\n">

/**
 * { @inheritdoc\}
 *
 * The default implementation does nothing.
 */
public function enterEveryRule(ParserRuleContext $context) : void {}

/**
 * { @inheritdoc\}
 *
 * The default implementation does nothing.
 */
public function exitEveryRule(ParserRuleContext $context) : void {}

/**
 * { @inheritdoc\}
 *
 * The default implementation does nothing.
 */
public function visitTerminal(TerminalNode $node) : void {}

/**
 * { @inheritdoc\}
 *

```

```

* The default implementation does nothing.
*/
public function visitErrorNode(ErrorNode $node) : void { }
}
>>

VisitorFile(file, header, namedActions) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
<if(file.genPackage)>
namespace <file.genPackage>;
<endif>

<header>
use Antlr\Antlr4\Runtime\Tree\ParseTreeVisitor;

/**
* This interface defines a complete generic visitor for a parse tree produced by { @see <file.parserName> }.
*/
interface <file.grammarName>Visitor extends ParseTreeVisitor
{
<file.visitorNames:{Iname |
/**
<if(file.visitorLabelRuleNames.(Iname))>
* Visit a parse tree produced by the `<Iname>` labeled alternative
* in { @see <file.parserName>::<file.visitorLabelRuleNames.(Iname)>() }.
<else>
* Visit a parse tree produced by { @see <file.parserName>::<Iname>() }.
<endif>
*
* @param Context\<Iname; format="cap">Context $context The parse tree.
*
* @return mixed The visitor result.
*/
public function visit<Iname; format="cap">(Context\<Iname; format="cap">Context $context);};
separator="\n\n"
}
>>

BaseVisitorFile(file, header, namedActions) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
<if(file.genPackage)>
namespace <file.genPackage>;
<endif>
<header>
use Antlr\Antlr4\Runtime\Tree\AbstractParseTreeVisitor;

/**
* This class provides an empty implementation of { @see <file.grammarName>Visitor },

```

```

* which can be extended to create a visitor which only needs to handle a subset
* of the available methods.
*/
class <file.grammarName>BaseVisitor extends AbstractParseTreeVisitor implements <file.grammarName>Visitor
{
 <file.visitorNames:{ Iname |
/**
* { @inheritdoc\}
*
* The default implementation returns the result of calling
* { @see self::visitChildren()\} on `context`.
*/
public function visit<Iname; format="cap">(Context\<Iname; format="cap">Context $context)
{
 return $this->visitChildren($context);
\}}; separator="\n\n">
}
>>

```

```

fileHeader(grammarFileName, ANTLRVersion) ::= <<
\<?php
/*
* Generated from <grammarFileName> by ANTLR <ANTLRVersion>
*/
>>
Parser(parser, funcs, atn, sempredFuncs, superClass) ::= <<
<Parser_(ctor="parser_ctor", ...)>
>>

```

```

Parser_(parser, funcs, atn, sempredFuncs, ctor, superClass) ::= <<
namespace<if(file.genPackage)> <file.genPackage><endif> {
<if(namedActions.header)><namedActions.header><endif>
use Antlr\Antlr4\Runtime\Atn\ATN;
use Antlr\Antlr4\Runtime\Atn\ATNDeserializer;
use Antlr\Antlr4\Runtime\Atn\ParserATNSimulator;
use Antlr\Antlr4\Runtime\Dfa\DFA;
use Antlr\Antlr4\Runtime\Error\Exceptions\FailedPredicateException;
use Antlr\Antlr4\Runtime\Error\Exceptions\NoViableAltException;
use Antlr\Antlr4\Runtime\PredictionContexts\PredictionContextCache;
use Antlr\Antlr4\Runtime\Error\Exceptions\RecognitionException;
use Antlr\Antlr4\Runtime\RuleContext;
use Antlr\Antlr4\Runtime\Token;
use Antlr\Antlr4\Runtime\TokenStream;
use Antlr\Antlr4\Runtime\Vocabulary;
use Antlr\Antlr4\Runtime\VocabularyImpl;
use Antlr\Antlr4\Runtime\RuntimeMetaData;

```

```

use Antlr4\Runtime\Parser;
<if(namedActions.definitions)><namedActions.definitions><endif>

final class <parser.name> extends <superClass; null="Parser">
{
<if(parser.tokens)>
public const <parser.tokens:{k | <k> = <parser.tokens.(k)>}; separator=", ", wrap, anchor>;
<endif>

<if(parser.rules)>
public const <parser.rules:{r | RULE_<r.name> = <r.index>}; separator=", ", wrap, anchor>;
<endif>

/**
 * @var array<string>
 */
public const RULE_NAMES = [
<parser.ruleNames:{r | '<r>'}; separator=", ", wrap, anchor>
];

<vocabulary(parser.literalNames, parser.symbolicNames)>

<atn>
protected static $atn;
protected static $decisionToDFA;
protected static $sharedContextCache;
<if(namedActions.members)>

<namedActions.members>
<endif>

<parser:(ctor)()>

private static function initialize() : void
{
if (self::$atn !== null) {
return;
}

RuntimeMetaData::checkVersion('<file.ANTLRVersion>', RuntimeMetaData::VERSION);

$atn = (new ATNDeserializer()->deserialize(self::SERIALIZED_ATN);

$decisionToDFA = [];
for ($i = 0, $count = $atn->getNumberOfDecisions(); $i < $count; $i++) {
$decisionToDFA[] = new DFA($atn->getDecisionState($i), $i);
}
}

```

```

self::$atn = $atn;
self::$decisionToDFA = $decisionToDFA;
self::$sharedContextCache = new PredictionContextCache();
}

public function getGrammarFileName() : string
{
 return "<parser.grammarFileName>";
}

public function getRuleNames() : array
{
 return self::RULE_NAMES;
}

public function getSerializedATN() : string
{
 return self::SERIALIZED_ATN;
}

public function getATN() : ATN
{
 return self::$atn;
}

public function getVocabulary() : Vocabulary
 {
 static $vocabulary;

 return $vocabulary = $vocabulary ?? new VocabularyImpl(self::LITERAL_NAMES, self::SYMBOLIC_NAMES);
 }
<if(funcs)>

 <funcs; separator="\n\n">
<endif>
<if(sempredFuncs)>

public function sempred(?RuleContext $localContext, int $ruleIndex, int $predicateIndex) : bool
{
 switch ($ruleIndex) {
 <parser.sempredFuncs.values:{f}
 case <f.ruleIndex>:
 return $this->sempred<f.name; format="cap">($localContext, $predicateIndex);}; separator="\n\n">

 default:
 return true;
 }
}

```

```

}

<sempredFuncs.values; separator="\n\n">
<endif>
}
}

namespace <if(file.genPackage)><file.genPackage>\\<endif>Context {
use Antlr\\Antlr4\\Runtime\\ParserRuleContext;
use Antlr\\Antlr4\\Runtime\\Token;
use Antlr\\Antlr4\\Runtime\\Tree\\ParseTreeVisitor;
use Antlr\\Antlr4\\Runtime\\Tree\\TerminalNode;
use Antlr\\Antlr4\\Runtime\\Tree\\ParseTreeListener;
use <if(file.genPackage)><file.genPackage>\\<endif><parser.name>;
<if (file.genVisitor)>use <if(file.genPackage)><file.genPackage>\\<endif><file.grammarName>Visitor;<endif>
<if (file.genListener)>use <if(file.genPackage)><file.genPackage>\\<endif><file.grammarName>Listener;<endif>
<namedActions.contexts>

<funcs :{ func | <func.ruleCtx><if(func.altLabelCtxs)>

<func.altLabelCtxs:{1 | <func.altLabelCtxs.(1)>}; separator="\n\n"><endif> } ; separator="\n\n">
}
>>

vocabulary(literalNames, symbolicNames) ::= <<
/**
 * @var array<string|null>
 */
private const LITERAL_NAMES = [
 <literalNames:{t | <t>}; null="null", separator=", ", wrap, anchor>
];

/**
 * @var array<string>
 */
private const SYMBOLIC_NAMES = [
 <symbolicNames:{t | <t>}; null="null", separator=", ", wrap, anchor>
];
>>

dumpActions(recog, argFuncs, actionFuncs, sempredFuncs) ::= <<
<if(actionFuncs)>

public function action(?RuleContext $localContext, int $ruleIndex, int $actionIndex) : void
{
 switch ($ruleIndex) {
 <recog.actionFuncs.values:{f}
 case <f.ruleIndex>:

```

```

 $this->action<f.name; format="cap">($localContext, $actionIndex);
 break;}; separator="\n\n">
}
}

<actionFuncs.values; separator="\n">
<endif>
<if(sempredFuncs)>

public function sempred(?RuleContext $localContext, int $ruleIndex, int $predicateIndex) : bool
{
 switch ($ruleIndex) {
 <recog.sempredFuncs.values:{f]
 case <f.ruleIndex>:
 return $this->sempred<f.name; format="cap">($localContext, $predicateIndex);}; separator="\n\n">
 }

 return true;
}
<sempredFuncs.values; separator="\n\n">
<endif>
>>

parser_ctor(p) ::= <<
public function __construct(TokenStream $input)
{
 parent::__construct($input);

 self::initialize();

 $this->interp = new ParserATNSimulator($this, self::$atn, self::$decisionToDFA, self::$sharedContextCache);
}
>>

/**
 * This generates a private method since the actionIndex is generated, making
 * an overriding implementation impossible to maintain.
 */
RuleActionFunction(r, actions) ::= <<
private function action<r.name; format="cap">(?(r.ctxType> $localContext, int $actionIndex) : void
{
 switch ($actionIndex) {
 <actions:{index|
 case <index>:
 <actions.(index)>

 break;}; separator="\n\n">
}

```



```

}
>>

/**
 * This generates a private method since the predicateIndex is generated, making
 * an overriding implementation impossible to maintain.
 */
RuleSempredFunction(r, actions) ::= <<
private function sempred<r.name; format="cap">(<?Context\\<r.ctxType> $localContext, int $predicateIndex) : bool
{
 switch ($predicateIndex) {
 <actions:{index|
 case <index>:
 return <actions.(index)>;}; separator="\n\n">
 }

 return true;
}
>>

RuleFunction(currentRule,args,code,locals,ruleCtx,altLabelCtxs,namedActions,finallyAction,exceptions,postamble)
::= <<
/**
 * @throws RecognitionException
 */
<if(currentRule.modifiers)><currentRule.modifiers:{f | <f> }><endif>public function <currentRule.name>(<args;
separator=",">) : Context\\<currentRule.ctxType>
{
 $localContext = new Context\\<currentRule.ctxType>($this->ctx, $this->getState()<currentRule.args:{a | ,
$a.name}>});

 $this->enterRule($localContext, <currentRule.startState>, self::RULE_<currentRule.name>);
 <namedActions.init>
 <locals; separator="\n\n">

 try {
 <code>
 <postamble; separator="\n\n">
 <namedActions.after>
 }<if(exceptions)><exceptions; separator="\n\n"><else> catch (RecognitionException $exception) {
 $localContext->exception = $exception;
 $this->errorHandler->reportError($this, $exception);
 $this->errorHandler->recover($this, $exception);
 }<endif> finally {
 <finallyAction>
 $this->exitRule();
 }
}

```

```

 return $localContext;
}
>>

LeftRecursiveRuleFunction(currentRule,args,code,locals,ruleCtx,altLabelCtxs,namedActions,finallyAction,postamble) ::= <<
/**
 * @throws RecognitionException
 */
<if(currentRule.modifiers)><currentRule.modifiers:{f | <f> }><endif>public function <currentRule.name>(<args;
separator=", ">) : Context\<currentRule.ctxType>
{
 return $this->recursive<currentRule.name; format="cap">(0<currentRule.args:{a | , <a.name>}>);
}

/**
 * @throws RecognitionException
 */
private function recursive<currentRule.name; format="cap">(int $precedence<args:{a | , <a>}>) :
Context\<currentRule.ctxType>
{
 $parentContext = $this->ctx;
 $parentState = $this->getState();
 $localContext = new Context\<currentRule.ctxType>($this->ctx, $parentState<currentRule.args:{a | ,
<a.name>}>);
 $previousContext = $localContext;
 $startState = <currentRule.startState>;
 $this->enterRecursionRule($localContext, <currentRule.startState>, self::RULE_<currentRule.name>,
$precedence);
 <namedActions.init>
 <locals; separator="\n">

 try {
 <code>
 <postamble; separator="\n">
 <namedActions.after>
 } catch (RecognitionException $exception) {
 $localContext->exception = $exception;
 $this->errorHandler->reportError($this, $exception);
 $this->errorHandler->recover($this, $exception);
 } finally {
 <finallyAction>
 $this->unrollRecursionContexts($parentContext);
 }

 return $localContext;
}
>>

```

```

CodeBlockForOuterMostAlt(currentOuterMostAltCodeBlock, locals, preamble, ops) ::= <<
<if(currentOuterMostAltCodeBlock.altLabel)>$localContext = new
Context\|<currentOuterMostAltCodeBlock.altLabel; format="cap">Context($localContext);<endif>
$this->enterOuterAlt($localContext, <currentOuterMostAltCodeBlock.alt.altNum>);
<CodeBlockForAlt(currentAltCodeBlock=currentOuterMostAltCodeBlock, ...)>
>>

```

```

CodeBlockForAlt(currentAltCodeBlock, locals, preamble, ops) ::= <<
<locals; separator="\n">
<preamble; separator="\n">
<ops; separator="\n">
>>

```

```

LL1AltBlock(choice, preamble, alts, error) ::= <<
$this->setState(<choice.stateNumber>);
$this->errorHandler->sync($this);
<if(choice.label)><labelref(choice.label)> = $this->input->LT(1);<endif>
<preamble; separator="\n">

```

```

switch ($this->input->LA(1)) {
 <choice.altLook,alts:{look,alt| <cases(ttypes=look)>
 <alt>
 break;}; separator="\n\n">

```

```

default:
 <error>
}
>>

```

```

LL1OptionalBlock(choice, alts, error) ::= <<
$this->setState(<choice.stateNumber>);
$this->errorHandler->sync($this);

switch ($this->input->LA(1)) {
 <choice.altLook,alts:{look,alt| <cases(ttypes=look)>
 <alt>
 break;}; separator="\n\n">

```

```

default:
 break;
}
>>

```

```

LL1OptionalBlockSingleAlt(choice, expr, alts, preamble, error, followExpr) ::= <<
$this->setState(<choice.stateNumber>);
$this->errorHandler->sync($this);
<preamble; separator="\n">

```

```

if (<expr>) {
 <alts; separator="\n">
}
>>

```

```

LL1StarBlockSingleAlt(choice, loopExpr, alts, preamble, iteration) ::= <<
$this->setState(<choice.stateNumber>);
$this->errorHandler->sync($this);

```

```

<preamble; separator="\n">
while (<loopExpr>) {
 <alts; separator="\n">
 $this->setState(<choice.loopBackStateNumber>);
 $this->errorHandler->sync($this);
 <iteration>
}
>>

```

```

LL1PlusBlockSingleAlt(choice, loopExpr, alts, preamble, iteration) ::= <<
$this->setState(<choice.blockStartStateNumber>); <! alt block decision !>
$this->errorHandler->sync($this);

```

```

<preamble; separator="\n">
do {
 <alts; separator="\n">
 $this->setState(<choice.stateNumber>); <! loopback/exit decision !>
 $this->errorHandler->sync($this);
 <iteration>
} while (<loopExpr>);
>>

```

```

// LL(*) stuff

```

```

AltBlock(choice, preamble, alts, error) ::= <<
$this->setState(<choice.stateNumber>);
$this->errorHandler->sync($this);
<if(choice.label)><labelref(choice.label)> = $this->input->LT(1);<endif>
<preamble; separator="\n">

```

```

switch ($this->getInterpreter()->adaptivePredict($this->input, <choice.decision>, $this->ctx)) {
 <alts:{ alt |
case <i>:
 <alt>
break; }; separator="\n\n">
}
>>

```

```

OptionalBlock(choice, alts, error) ::= <<
$this->setState(<choice.stateNumber>);
$this->errorHandler->sync($this);

switch ($this->getInterpreter()->adaptivePredict($this->input, <choice.decision>, $this->ctx)) {
<alts:{ alt |
 case <i><if(!choice.ast.greedy)>+1<endif>:
 <alt>
 break;}; separator="\n\n">
}
>>

```

```

StarBlock(choice, alts, sync, iteration) ::= <<
$this->setState(<choice.stateNumber>);
$this->errorHandler->sync($this);

```

```

$salt = $this->getInterpreter()->adaptivePredict($this->input, <choice.decision>, $this->ctx);

```

```

while ($salt !== <choice.exitAlt> && $salt !== ATN::INVALID_ALT_NUMBER) {
if ($salt === 1<if(!choice.ast.greedy)>+1<endif>) {
 <iteration>
 <alts> <! should only be one !>
}

```

```

$this->setState(<choice.loopBackStateNumber>);
$this->errorHandler->sync($this);

```

```

$salt = $this->getInterpreter()->adaptivePredict($this->input, <choice.decision>, $this->ctx);
}
>>

```

```

PlusBlock(choice, alts, error) ::= <<
$this->setState(<choice.blockStartStateNumber>); <! alt block decision !>
$this->errorHandler->sync($this);

```

```

$salt = 1<if(!choice.ast.greedy)>+1<endif>;

```

```

do {
switch ($salt) {
<alts:{ alt |
case <i><if(!choice.ast.greedy)>+1<endif>:
 <alt>
 break;}; separator="\n\n">
default:
 <error>
}

```

```

$this->setState(<choice.loopBackStateNumber>); <! loopback/exit decision !>

```

```

$this->errorHandler->sync($this);

$alt = $this->getInterpreter()->adaptivePredict($this->input, <choice.decision>, $this->ctx);
} while ($alt !== <choice.exitAlt> && $alt !== ATN::INVALID_ALT_NUMBER);
>>

Sync(s) ::= "sync(<s.expecting.name>);"

ThrowNoViableAlt(t) ::= "throw new NoViableAltException($this);"

TestSetInline(s) ::= <<
<s.bitsets:{bits | <if(rest(rest(bits.ttypes)))><bitsetBitfieldComparison(s, bits)><else><bitsetInlineComparison(s,
bits)><endif>} ; separator=" || ">
>>

// Java language spec 15.19 - shift operators mask operands rather than overflow to 0... need range test
testShiftInRange(shiftAmount) ::= <<
((<shiftAmount>) & ~0x3f) === 0
>>

// produces smaller bytecode only when bits.ttypes contains more than two items
bitsetBitfieldComparison(s, bits) ::= <%
(<testShiftInRange({<offsetShiftVar(s.varName, bits.shift)>}) && ((1 \< <offsetShiftVar(s.varName,
bits.shift)>) & (<bits.ttypes:{ttype | (1 \< <offsetShiftConst(ttype, bits.shift)>)}); separator=" | ">)) !== 0
%>

isZero ::= [
"0":true,
default:false
]

offsetShiftVar(shiftAmount, offset) ::= <%
<if(!isZero.(offset))>(<shiftAmount> - <offset>)<else><shiftAmount><endif>
%>

offsetShiftConst(shiftAmount, offset) ::= <%
<if(!isZero.(offset))>(self::<shiftAmount> - <offset>)<else>self::<shiftAmount><endif>
%>

// produces more efficient bytecode when bits.ttypes contains at most two items
bitsetInlineComparison(s, bits) ::= <%
<bits.ttypes:{ttype | $<s.varName> === self::<ttype>} ; separator=" || ">
%>

cases(ttypes) ::= <<
<ttypes:{t | case self::<t>:}; separator="\n">
>>

InvokeRule(r, argExprsChunks) ::= <<

```

```

$this->setState(<r.stateNumber>);
<if(r.labels)><r.labels:{1 | <labelref(l)> = }><endif>$this-><if(r.ast.options.p)>recursive<r.name>;
format="cap"><else><r.name><endif><(if(r.ast.options.p)><r.ast.options.p><if(argExprsChunks)><endif><endif>
<argExprsChunks>;
>>

```

```

MatchToken(m) ::= <<
$this->setState(<m.stateNumber>);
<if(m.labels)><m.labels:{1 | <labelref(l)> = }><endif>$this->match(self::<m.name>);
>>

```

```

MatchSet(m, expr, capture) ::= "<CommonSetStuff(m, expr, capture, false)>"

```

```

MatchNotSet(m, expr, capture) ::= "<CommonSetStuff(m, expr, capture, true)>"

```

```

CommonSetStuff(m, expr, capture, invert) ::= <<
$this->setState(<m.stateNumber>);

```

```

<if(m.labels)><m.labels:{1 | <labelref(l)> = }>$this->input->LT(1);<endif>
<capture>

```

```

if (<(if(invert))$<m.varName> \<= 0 || <else>!<endif>(<expr>)) {
 <if(m.labels)><m.labels:{1 | <labelref(l)> = }><endif>$this->errorHandler->recoverInline($this);
} else {
 if ($this->input->LA(1) === Token::EOF) {
 $this->matchedEOF = true;
 }

```

```

$this->errorHandler->reportMatch($this);
$this->consume();
}
>>

```

```

Wildcard(w) ::= <<
$this->setState(<w.stateNumber>);
<if(w.labels)><w.labels:{1 | <labelref(l)> = }><endif>$this->matchWildcard();
>>

```

```

// ACTION STUFF

```

```

Action(a, foo, chunks) ::= "<chunks>"

```

```

ArgAction(a, chunks) ::= "<chunks>"

```

```

SemPred(p, chunks, failChunks) ::= <<
$this->setState(<p.stateNumber>);

```

```

if (!<chunks>) {

```

```

 throw new FailedPredicateException($this, <p.predicate><if(failChunks)>, <failChunks><elseif(p.msg)>,
<p.msg><endif>);
}
>>

```

```

ExceptionClause(e, catchArg, catchAction) ::= <<
catch (<catchArg>) {
 <catchAction>
}
>>

```

```

// lexer actions are not associated with model objects

```

```

LexerSkipCommand() ::= "$this->skip();"
LexerMoreCommand() ::= "$this->more();"
LexerPopModeCommand() ::= "$this->popMode();"

```

```

LexerTypeCommand(arg, grammar) ::= "$this->type = <arg>";
LexerChannelCommand(arg, grammar) ::= "$this->channel = <arg>";
LexerModeCommand(arg, grammar) ::= "$this->mode = <arg>";
LexerPushModeCommand(arg, grammar) ::= "$this->pushMode(<arg>);"

```

```

ActionText(t) ::= "<t.text>"
ActionTemplate(t) ::= "<t.st>"
ArgRef(a) ::= "$localContext-><a.name>"
LocalRef(a) ::= "$localContext-><a.name>"
RetValRef(a) ::= "$localContext-><a.name>"
QRetValRef(a) ::= "<ctx(a)>-><a.dict>-><a.name>"
/** How to translate $tokenLabel */
TokenRef(t) ::= "<ctx(t)>-><t.name>"
LabelRef(t) ::= "<ctx(t)>-><t.name>"
ListLabelRef(t) ::= "<ctx(t)>-><ListLabelName(t.name)>"
SetAttr(s,rhsChunks) ::= "<ctx(s)>-><s.name> = <rhsChunks>";

```

```

TokenLabelType() ::= "<file.TokenLabelType; null={Token}>"
InputSymbolType() ::= "<file.InputSymbolType; null={Token}>"

```

```

TokenPropertyRef_text(t) ::= "<ctx(t)>-><t.label> !== null ? <ctx(t)>-><t.label>->getText() : null"
TokenPropertyRef_type(t) ::= "<ctx(t)>-><t.label> !== null ? <ctx(t)>-><t.label>->getType() : 0"
TokenPropertyRef_line(t) ::= "<ctx(t)>-><t.label> !== null ? <ctx(t)>-><t.label>->getLine() : 0"
TokenPropertyRef_pos(t) ::= "<ctx(t)>-><t.label> !== null ? <ctx(t)>-><t.label>->getCharPositionInLine() : 0"
TokenPropertyRef_channel(t) ::= "<ctx(t)>-><t.label> !== null ? <ctx(t)>-><t.label>->getChannel() : 0"
TokenPropertyRef_index(t) ::= "<ctx(t)>-><t.label> !== null ? <ctx(t)>-><t.label>->getTokenIndex() : 0"
TokenPropertyRef_int(t) ::= "<ctx(t)>-><t.label> !== null ? (int) <ctx(t)>-><t.label>->getText() : 0"

```

```

RulePropertyRef_start(r) ::= "<ctx(r)>-><r.label> !== null ? (<ctx(r)>-><r.label>->start) : null"
RulePropertyRef_stop(r) ::= "<ctx(r)>-><r.label> !== null ? (<ctx(r)>-><r.label>->stop) : null"
RulePropertyRef_text(r) ::= "<ctx(r)>-><r.label> !== null ? $this->input->getTextByTokens(<ctx(r)>-><r.label>->

```



```

>start, <ctx(r)-><r.label->stop) : null"
RulePropertyRef_ctx(r) ::= "<ctx(r)-><r.label->"
RulePropertyRef_parser(r)::= "\$this"

ThisRulePropertyRef_start(r) ::= "$localContext->start"
ThisRulePropertyRef_stop(r) ::= "$localContext->stop"
ThisRulePropertyRef_text(r) ::= "$this->input->getTextByTokens($localContext->start, $this->input->LT(-1))"
ThisRulePropertyRef_ctx(r) ::= "$localContext"
ThisRulePropertyRef_parser(r)::= "$this"

NonLocalAttrRef(s) ::= "\$this->getInvokingContext(<s.ruleIndex>-><s.name>"
SetNonLocalAttr(s, rhsChunks) ::= "\$this->getInvokingContext(<s.ruleIndex>-><s.name> = <rhsChunks>);"

AddToLabelList(a) ::= "<ctx(a.label)-><a.listName>[] = <labelref(a.label)>;"

TokenDecl(t) ::= "<TokenLabelType()> $<t.name>"
TokenTypeDecl(t) ::= ""
TokenListDecl(t) ::= "array $<t.name> = []"
RuleContextDecl(r) ::= "<r.ctxName> $<r.name>"
RuleContextListDecl(rdecl) ::= "array $<rdecl.name> = []"
AttributeDecl(d) ::= "<d.type> $<d.name><if(d.initValue)> = <d.initValue><endif>"

PropertiesDecl(struct) ::= <<
<if(struct.tokenListDecls)>
<struct.tokenListDecls : {d | /**
* @var array<Token>|null $<d.name>
*/
public $<d.name>;}; separator="\n\n">
<endif>
<if(struct.tokenDecls)>
<if(struct.tokenListDecls)>

<endif>
<struct.tokenDecls : {d | /**
* @var <TokenLabelType()>|null $<d.name>
*/
public $<d.name>;}; separator="\n\n">
<endif>
<if(struct.ruleContextDecls)>
<if(struct.tokenListDecls || struct.tokenDecls)>

<endif>
<struct.ruleContextDecls : {d | /**
* @var <d.ctxName>|null $<d.name>
*/
public $<d.name>;}; separator="\n\n">
<endif>
<if(struct.ruleContextListDecls)>

```

```

<if(struct.tokenListDecls || struct.tokenDecls || struct.ruleContextDecls)>

<endif>
<struct.ruleContextListDecls : {d | /**
* @var array<<d.ctxName>>|null $<d.name>
*/
public $<d.name>;}; separator="\n\n">
<endif>
<if(struct.attributeDecls)>
<if(struct.tokenListDecls || struct.tokenDecls || struct.ruleContextDecls || struct.ruleContextListDecls)>

<endif>
<struct.attributeDecls : {d | /**
* @var <d.type><if(!d.initValue)>|null<endif> $<d.name>
*/
public $<d.name><if(d.initValue)> = <d.initValue><endif>;}; separator="\n\n">
<endif>

>>

ContextTokenGetterDecl(t) ::= <<
public function <t.name>() : ?TerminalNode
{
 return $this->getToken(<parser.name>::<t.name>, 0);
}
>>

ContextTokenListGetterDecl(t) ::= <<
>>

ContextTokenListIndexedGetterDecl(t) ::= <<
/**
* @return array<<TerminalNode>|TerminalNode|null
*/
public function <t.name>(int $index = null)
{
 if ($index === null) {
 return $this->getTokens(<parser.name>::<t.name>);
 }

 return $this->getToken(<parser.name>::<t.name>, $index);
}
>>

ContextRuleGetterDecl(r) ::= <<
public function <r.name>() : ?<r.ctxName>
{
 return $this->getTypedRuleContext(<r.ctxName>::class, 0);
}

```

```

}
>>

ContextRuleListGetterDecl(r) ::= <<
>>

ContextRuleListIndexedGetterDecl(r) ::= <<
/**
 * @return array<<r.ctxName>>|<r.ctxName>|null
 */
public function <r.name>(?int $index = null)
{
 if ($index === null) {
 return $this->getTypedRuleContexts(<r.ctxName>::class);
 }

 return $this->getTypedRuleContext(<r.ctxName>::class, $index);
}
>>

LexerRuleContext() ::= "RuleContext"

/**
 * The rule context name is the rule followed by a suffix; e.g., r becomes rContext.
 */
RuleContextNameSuffix() ::= "Context"

ImplicitTokenLabel(tokenName) ::= "<tokenName>"
ImplicitRuleLabel(ruleName) ::= "<ruleName>"
ImplicitSetLabel(id) ::= "_tset<id>"
ListLabelName(label) ::= "<label>"

CaptureNextToken(d) ::= "$<d.varName> = \$this->input->LT(1);"
CaptureNextTokenType(d) ::= "$<d.varName> = $this->input->LA(1);"

StructDecl(struct,ctorAttrs,attrs, getters,dispatchMethods,interfaces,extensionMembers) ::= <<
class <struct.name> extends
<if(contextSuperClass)><contextSuperClass><else>ParserRuleContext<endif><if(interfaces)> implements
<interfaces; separator=", "><endif>
{
<PropertiesDecl(struct)>
public function __construct(?ParserRuleContext $parent, ?int $invokingState = null<ctorAttrs:{a | , ?<a> = null}>)
{
 parent::__construct($parent, $invokingState);
<if(struct.ctorAttrs)>

 <struct.ctorAttrs:{a | $this-><a.name> = $<a.name> ?? $this-><a.name>;}; separator="\n">
<endif>
}
}

```

```

}

public function getRuleIndex() : int
{
 return <parser.name>::RULE_<struct.derivedFromName>;
}
<if(getters)>

 <getters:{g | <g>}; separator="\n\n">
<endif>
<if(struct.provideCopyFrom)> <! don't need copy unless we have subclasses !>
public function copyFrom(ParserRuleContext $context) : void
{
 parent::copyFrom($context);

 <struct.attrs:{a | $this-><a.name> = $context-><a.name>;}; separator="\n">
}
<endif>
<if(dispatchMethods)>

 <dispatchMethods; separator="\n\n">
<endif>
<if(extensionMembers)>

 <extensionMembers; separator="\n\n">
<endif>
}
>>

AltLabelStructDecl(struct,attrs,getters,dispatchMethods) ::= <<
class <struct.name> extends <struct.parentRule; format="cap">Context
{
 <PropertiesDecl(struct)>
 public function __construct(<struct.parentRule; format="cap">Context $context)
 {
 parent::__construct($context);

 $this->copyFrom($context);
 }
}
<if(getters)>

 <getters:{g | <g>}; separator="\n\n">
<endif>
<if(dispatchMethods)>

 <dispatchMethods; separator="\n\n">
<endif>
}

```

>>

```
ListenerDispatchMethod(method) ::= <<
public function <if(method.isEnter)>enter<else>exit<endif>Rule(ParseTreeListener $listener) : void
{
 if ($listener instanceof <parser.grammarName>Listener) {
 $listener-><if(method.isEnter)>enter<else>exit<endif><<struct.derivedFromName; format="cap">($this);
 }
}
>>
```

```
VisitorDispatchMethod(method) ::= <<
public function accept(ParseTreeVisitor $visitor)
{
 if ($visitor instanceof <parser.grammarName>Visitor) {
 return $visitor->visit<<struct.derivedFromName; format="cap">($this);
 }

 return $visitor->visitChildren($this);
}
>>
```

```
/** If we don't know location of label def x, use this template */
labelref(x) ::= "<if(!x.isLocal)>$localContext-><endif><x.name>"
```

```
/** For any action chunk, what is correctly-typed context struct ptr? */
ctx(actionChunk) ::= "$localContext"
```

```
// used for left-recursive rules
recRuleAltPredicate(ruleName,opPrec) ::= "\$this->precpred(\$this->ctx, <opPrec>)"
```

```
recRuleSetReturnAction(src,name) ::= "\$<name> = \$<src>-><name>;"
```

```
recRuleSetStopToken() ::= "$this->ctx->stop = $this->input->LT(-1);"
```

```
recRuleAltStartAction(ruleName, ctxName, label, isListLabel) ::= <<
$localContext = new Context\\<ctxName>Context($parentContext, $parentState);
<if(label)>
<if(isListLabel)>
$localContext-><label>[] = $previousContext;
<else>
$localContext-><label> = $previousContext;
<endif>
<endif>

$this->pushNewRecursionContext($localContext, $startState, self::RULE_<ruleName>);
>>
```

```

recRuleLabeledAltStartAction(ruleName, currentAltLabel, label, isListLabel) ::= <<
$localContext = new Context\\<currentAltLabel; format="cap">Context(new Context\\<ruleName;
format="cap">Context($parentContext, $parentState));
<if(label)>
<if(isListLabel)>
$localContext-><label>[] = $previousContext;
<else>
$localContext-><label> = $previousContext;
<endif>
<endif>

$this->pushNewRecursionContext($localContext, $startState, self::RULE_<ruleName>);
>>

```

```

recRuleReplaceContext(ctxName) ::= <<
$localContext = new Context\\<ctxName>Context($localContext);
$this->ctx = $localContext;
$previousContext = $localContext;
>>

```

```

recRuleSetPrevCtx() ::= <<
if ($this->getParseListeners() !== null) {
 $this->triggerExitRuleEvent();
}

```

```

$previousContext = $localContext;
>>

```

```

LexerFile(lexerFile, lexer, namedActions) ::= <<
<fileHeader(lexerFile.grammarFileName, lexerFile.ANTLRVersion)>
<lexer>
>>

```

```

Lexer(lexer, atn, actionFuncs, sempredFuncs, superClass) ::= <<
namespace<if(lexerFile.genPackage)> <lexerFile.genPackage><endif> {
<if(namedActions.header)><namedActions.header><endif>
 use Antlr\\Antlr4\\Runtime\\Atn\\ATNDeserializer;
 use Antlr\\Antlr4\\Runtime\\Atn\\LexerATNSimulator;
 use Antlr\\Antlr4\\Runtime\\Lexer;
 use Antlr\\Antlr4\\Runtime\\CharStream;
 use Antlr\\Antlr4\\Runtime\\PredictionContexts\\PredictionContextCache;
 use Antlr\\Antlr4\\Runtime\\RuleContext;
 use Antlr\\Antlr4\\Runtime\\Atn\\ATN;
 use Antlr\\Antlr4\\Runtime\\Dfa\\DFA;
 use Antlr\\Antlr4\\Runtime\\Vocabulary;
 use Antlr\\Antlr4\\Runtime\\RuntimeMetaData;
 use Antlr\\Antlr4\\Runtime\\VocabularyImpl;

```

```

<if(namedActions.definitions)><namedActions.definitions><endif>

final class <lexer.name> extends <superClass; null="Lexer">
{
<if(lexer.tokens)>
public const <lexer.tokens:{k | <k> = <lexer.tokens.(k)>}; separator=", ", wrap, anchor>;
<endif>

<if(lexer.channels)>
public const <lexer.channels:{c | <c> = <lexer.channels.(c)>}; separator=", ", wrap, anchor>;
<endif>

<if(rest(lexer.modes))>
public const <rest(lexer.modes):{m | <m>=<i>}; separator=", ", wrap, anchor>;
<endif>

/**
 * @var array<string>
 */
public const CHANNEL_NAMES = [
'DEFAULT_TOKEN_CHANNEL', 'HIDDEN'<if (lexer.channels)>, <lexer.channels:{c | <c>}>; separator=", ",
wrap, anchor><endif>
];

/**
 * @var array<string>
 */
public const MODE_NAMES = [
<lexer.modes:{m | '<m>'}>; separator=", ", wrap, anchor>
];

/**
 * @var array<string>
 */
public const RULE_NAMES = [
<lexer.ruleNames:{r | '<r>'}>; separator=", ", wrap, anchor>
];

<vocabulary(lexer.literalNames, lexer.symbolicNames)>

<atn>
protected static $atn;
protected static $decisionToDFA;
protected static $sharedContextCache;
<if(namedActions.members)>

<namedActions.members>
<endif>

```

```

public function __construct(CharStream $input)
{
 parent::__construct($input);

 self::initialize();

 $this->interp = new LexerATNSimulator($this, self::$atn, self::$decisionToDFA, self::$sharedContextCache);
}

private static function initialize() : void
{
 if (self::$atn !== null) {
 return;
 }

 RuntimeMetaData::checkVersion('<lexerFile.ANTLRVersion>', RuntimeMetaData::VERSION);

 $atn = (new ATNDeserializer()->deserialize(self::SERIALIZED_ATN);

 $decisionToDFA = [];
 for ($i = 0, $count = $atn->getNumberOfDecisions(); $i < $count; $i++) {
 $decisionToDFA[] = new DFA($atn->getDecisionState($i), $i);
 }

 self::$atn = $atn;
 self::$decisionToDFA = $decisionToDFA;
 self::$sharedContextCache = new PredictionContextCache();
}

public static function vocabulary() : Vocabulary
{
 static $vocabulary;

 return $vocabulary = $vocabulary ?? new VocabularyImpl(self::LITERAL_NAMES, self::SYMBOLIC_NAMES);
}

public function getGrammarFileName() : string
{
 return '<lexer.grammarFileName>';
}

public function getRuleNames() : array
{
 return self::RULE_NAMES;
}

public function getSerializedATN() : string

```



```

{
 return self::SERIALIZED_ATN;
}

/**
 * @return array<string>
 */
public function getChannelNames() : array
{
 return self::CHANNEL_NAMES;
}

/**
 * @return array<string>
 */
public function getModeNames() : array
{
 return self::MODE_NAMES;
}

public function getATN() : ATN
{
 return self::$atn;
}

public function getVocabulary() : Vocabulary
{
 return self::vocabulary();
}
<dumpActions(lexer, "", actionFuncs, sempredFuncs)>
}
}
>>

SerializedATN(model) ::= <<
<if(rest(model.segments))>
/**
 * @var string
 */
private const SERIALIZED_ATN =
 <model.segments:{segment| "<segment; wrap={ " .<n>" }>"}; separator=" .\n">;
<else>
/**
 * @var string
 */
private const SERIALIZED_ATN =
 "<model.serialized; wrap={ " .<n> " }>";
<endif>

```

>>

/\*\*

\* Using a type to init value map, try to init a type; if not in table  
\* must be an object, default value is `null`.

\*/

initValue(typeName) ::= <<

<phpTypeInitMap.(typeName)>

>>

codeFileExtension() ::= ".php"

Found in path(s):

\* /opt/cola/permits/1340816081\_1654861722.3479369/0/antlr4-4-9-2-sources-1-  
jar/org/antlr/v4/tool/templates/codegen/PHP/PHP.stg

No license file was found, but licenses were detected in source scan.

/\*

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\*/

// args must be <object-model-object>, <fields-resulting-in-STs>

```

ParserFile(file, parser, namedActions, contextSuperClass) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
<if(file.genPackage)>
namespace <file.genPackage> {
<endif>
<namedActions.header>
using System;
using System.IO;
using System.Text;
using System.Diagnostics;
using System.Collections.Generic;
using Antlr4.Runtime;
using Antlr4.Runtime.Atn;
using Antlr4.Runtime.Misc;
using Antlr4.Runtime.Tree;
using DFA = Antlr4.Runtime.Dfa.DFA;

<parser>
<if(file.genPackage)>
} // namespace <file.genPackage>
<endif>
>>

```

```

ListenerFile(file, header, namedActions) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
<if(file.genPackage)>
namespace <file.genPackage> {
<endif>
<header>
using Antlr4.Runtime.Misc;
using IParseTreeListener = Antlr4.Runtime.Tree.IParseTreeListener;
using IToken = Antlr4.Runtime.IToken;

/// \<summary>
/// This interface defines a complete listener for a parse tree produced by
/// \<see cref="<csIdentifier.(file.parserName)>" />.
/// \</summary>
[System.CodeDom.Compiler.GeneratedCode("ANTLR", "<file.ANTLRVersion>")]
[System.CLSCompliant(false)]
public interface I<file.grammarName>Listener : IParseTreeListener {
<file.listenerNames: {Iname |
/// \<summary>
<if(file.listenerLabelRuleNames.(Iname))>
/// Enter a parse tree produced by the \<c><Iname>\</c>
/// labeled alternative in \<see cref="<file.parserName>.<file.listenerLabelRuleNames.(Iname)>" />.
<else>
/// Enter a parse tree produced by \<see cref="<file.parserName>.<Iname>" />.

```

```

<endif>
/// \</summary>
/// \<param name="context">The parse tree.\</param>
void Enter<lname; format="cap">([NotNull] <csIdentifier.(file.parserName)>.<lname; format="cap">Context
context);
/// \<summary>
<if(file.listenerLabelRuleNames.(lname))>
/// Exit a parse tree produced by the \<c><lname>\</c>
/// labeled alternative in \<see cref="<file.parserName>.<file.listenerLabelRuleNames.(lname)>">.
<else>
/// Exit a parse tree produced by \<see cref="<file.parserName>.<lname>">.
<endif>
/// \</summary>
/// \<param name="context">The parse tree.\</param>
void Exit<lname; format="cap">([NotNull] <csIdentifier.(file.parserName)>.<lname; format="cap">Context
context);}; separator="\n">
}
<if(file.genPackage)>
} // namespace <file.genPackage>
<endif>
>>

```

```

BaseListenerFile(file, header, namedActions) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
<if(file.genPackage)>
namespace <file.genPackage> {
<endif>
<header>

```

```

using Antlr4.Runtime.Misc;
using IErrorNode = Antlr4.Runtime.Tree.IErrorNode;
using ITerminalNode = Antlr4.Runtime.Tree.ITerminalNode;
using IToken = Antlr4.Runtime.IToken;
using ParserRuleContext = Antlr4.Runtime.ParserRuleContext;

```

```

/// \<summary>
/// This class provides an empty implementation of \<see cref="I<file.grammarName>Listener">,
/// which can be extended to create a listener which only needs to handle a subset
/// of the available methods.
/// \</summary>

```

```

[System.CodeDom.Compiler.GeneratedCode("ANTLR", "<file.ANTLRVersion>")]
[System.Diagnostics.DebuggerNonUserCode]
[System.CLSCompliant(false)]
public partial class <file.grammarName>BaseListener : I<file.grammarName>Listener {
<file.listenerNames>{lname |
/// \<summary>
<if(file.listenerLabelRuleNames.(lname))>
/// Enter a parse tree produced by the \<c><lname>\</c>

```

```

/// labeled alternative in \<see cref="<file.parserName>.<file.listenerLabelRuleNames.(Iname)>"/>.
<else>
/// Enter a parse tree produced by \<see cref="<file.parserName>.<Iname>"/>.
<endif>
/// \<para>The default implementation does nothing.\</para>
/// \</summary>
/// \<param name="context">The parse tree.\</param>
public virtual void Enter<Iname; format="cap">([NotNull] <csIdentifier.(file.parserName)>.<Iname;
format="cap">Context context) { \}
/// \<summary>
<if(file.listenerLabelRuleNames.(Iname))>
/// Exit a parse tree produced by the \<c><Iname>\</c>
/// labeled alternative in \<see cref="<file.parserName>.<file.listenerLabelRuleNames.(Iname)>"/>.
<else>
/// Exit a parse tree produced by \<see cref="<file.parserName>.<Iname>"/>.
<endif>
/// \<para>The default implementation does nothing.\</para>
/// \</summary>
/// \<param name="context">The parse tree.\</param>
public virtual void Exit<Iname; format="cap">([NotNull] <csIdentifier.(file.parserName)>.<Iname;
format="cap">Context context) { \} }; separator="\n"

/// \<inheritdoc/>
/// \<remarks>The default implementation does nothing.\</remarks>
public virtual void EnterEveryRule([NotNull] ParserRuleContext context) { }
/// \<inheritdoc/>
/// \<remarks>The default implementation does nothing.\</remarks>
public virtual void ExitEveryRule([NotNull] ParserRuleContext context) { }
/// \<inheritdoc/>
/// \<remarks>The default implementation does nothing.\</remarks>
public virtual void VisitTerminal([NotNull] ITerminalNode node) { }
/// \<inheritdoc/>
/// \<remarks>The default implementation does nothing.\</remarks>
public virtual void VisitErrorNode([NotNull] IErrorNode node) { }
}
<if(file.genPackage)>
} // namespace <file.genPackage>
<endif>
>>

VisitorFile(file, header, namedActions) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
<if(file.genPackage)>
namespace <file.genPackage> {
<endif>
<header>
using Antlr4.Runtime.Misc;
using Antlr4.Runtime.Tree;

```

```

using IToken = Antlr4.Runtime.IToken;

/// \<summary>
/// This interface defines a complete generic visitor for a parse tree produced
/// by \<see cref="<csIdentifier.(file.parserName)>"/>.
/// \</summary>
/// \<typeparam name="Result">The return type of the visit operation.\</typeparam>
[System.CodeDom.Compiler.GeneratedCode("ANTLR", "<file.ANTLRVersion>")]
[System.CLSCompliant(false)]
public interface I<file.grammarName>Visitor<Result> : IParseTreeVisitor<Result> {
 <file.visitorNames:{lname |
/// \<summary>
<if(file.visitorLabelRuleNames.(lname))>
/// Visit a parse tree produced by the \<c><lname>\</c>
/// labeled alternative in \<see cref="<file.parserName>.<file.visitorLabelRuleNames.(lname)>"/>.
<else>
/// Visit a parse tree produced by \<see cref="<file.parserName>.<lname>"/>.
<endif>
/// \</summary>
/// \<param name="context">The parse tree.\</param>
/// \<return>The visitor result.\</return>
Result Visit<lname; format="cap">([NotNull] <csIdentifier.(file.parserName)>.<lname; format="cap">Context
context);}; separator="\n">
 }
<if(file.genPackage)>
} // namespace <file.genPackage>
<endif>
>>

BaseVisitorFile(file, header, namedActions) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
<if(file.genPackage)>
namespace <file.genPackage> {
<endif>
<header>
using Antlr4.Runtime.Misc;
using Antlr4.Runtime.Tree;
using IToken = Antlr4.Runtime.IToken;
using ParserRuleContext = Antlr4.Runtime.ParserRuleContext;

/// \<summary>
/// This class provides an empty implementation of \<see cref="I<file.grammarName>Visitor{Result}"/>,
/// which can be extended to create a visitor which only needs to handle a subset
/// of the available methods.
/// \</summary>
/// \<typeparam name="Result">The return type of the visit operation.\</typeparam>
[System.CodeDom.Compiler.GeneratedCode("ANTLR", "<file.ANTLRVersion>")]
[System.Diagnostics.DebuggerNonUserCode]

```

```

[System.CLSCompliant(false)]
public partial class <file.grammarName>BaseVisitor<<Result> : AbstractParseTreeVisitor<<Result>,
I<file.grammarName>Visitor<<Result> {
 <file.visitorNames:{Iname |
/// \<summary>
<if(file.visitorLabelRuleNames.(Iname))>
/// Visit a parse tree produced by the \<c><Iname>\</c>
/// labeled alternative in \<see cref="<file.parserName>.<file.visitorLabelRuleNames.(Iname)>">/>.
<else>
/// Visit a parse tree produced by \<see cref="<file.parserName>.<Iname>">/>.
<endif>
/// \<para>
/// The default implementation returns the result of calling \<see
cref="AbstractParseTreeVisitor{Result}.VisitChildren(IRuleNode)">
/// on \<paramref name="context">/>.
/// \</para>
/// \</summary>
/// \<param name="context">The parse tree.\</param>
/// \<return>The visitor result.\</return>
public virtual Result Visit<Iname; format="cap">([NotNull] <csIdentifier.(file.parserName)>.<Iname;
format="cap">Context context) { return VisitChildren(context); \}); separator="\n">
 }
<if(file.genPackage)>
} // namespace <file.genPackage>
<endif>
>>

fileHeader(grammarFileName, ANTLRVersion) ::= <<
//-----
// \<auto-generated>
// This code was generated by a tool.
// ANTLR Version: <ANTLRVersion>
//
// Changes to this file may cause incorrect behavior and will be lost if
// the code is regenerated.
// \</auto-generated>
//-----

// Generated from <grammarFileName> by ANTLR <ANTLRVersion>

// Unreachable code detected
#pragma warning disable 0162
// The variable '...' is assigned but its value is never used
#pragma warning disable 0219
// Missing XML comment for publicly visible type or member '...'
#pragma warning disable 1591
// Ambiguous reference in cref attribute
#pragma warning disable 419

```

>>

```
Parser(parser, funcs, atn, sempredFuncs, superClass) ::= <<
```

```
<Parser_(ctor="parser_ctor", ...)>
```

>>

```
Parser_(parser, funcs, atn, sempredFuncs, ctor, superClass) ::= <<
```

```
[System.CodeDom.Compiler.GeneratedCode("ANTLR", "<file.ANTLRVersion>")]
```

```
[System.CLSCompliant(false)]
```

```
public partial class <csIdentifier.(parser.name)> : <superClass>; null="Parser"> {
```

```
protected static DFA[] decisionToDFA;
```

```
protected static PredictionContextCache sharedContextCache = new PredictionContextCache();
```

```
<if(parser.tokens)>
```

```
public const int
```

```
<parser.tokens:{k | <k>=<parser.tokens.(k)>}; separator=", ", wrap, anchor>;
```

```
<endif>
```

```
<if(parser.rules)>
```

```
public const int
```

```
<parser.rules:{r | RULE_<r.name> = <r.index>}; separator=", ", wrap, anchor>;
```

```
<endif>
```

```
public static readonly string[] ruleNames = {
```

```
<parser.ruleNames:{r | "<r>"}; separator=", ", wrap, anchor>
```

```
};
```

```
<vocabulary(parser.literalNames, parser.symbolicNames)>
```

```
public override string GrammarFileName { get { return "<parser.grammarFileName>"; } }
```

```
public override string[] RuleNames { get { return ruleNames; } }
```

```
public override string SerializedAtn { get { return new string(_serializedATN); } }
```

```
static <csIdentifier.(parser.name)>() {
```

```
decisionToDFA = new DFA[_ATN.NumberOfDecisions];
```

```
for (int i = 0; i < _ATN.NumberOfDecisions; i++) {
```

```
decisionToDFA[i] = new DFA(_ATN.GetDecisionState(i), i);
```

```
}
```

```
}
```

```
<namedActions.members>
```

```
<parser:(ctor)()>
```

```
<funcs; separator="\n">
```

```
<if(sempredFuncs)>
```

```
public override bool Sempred(RuleContext _localctx, int ruleIndex, int predIndex) {
```

```
switch (ruleIndex) {
```

```
<parser.sempredFuncs.values:{f]
```



```

case <f.ruleIndex>: return <f.name>_sempred((<f.ctxType>)_localctx, predIndex);}; separator="\n">
}
return true;
}
<sempredFuncs.values; separator="\n">
<endif>

<atn>
}
>>

vocabulary(literalNames, symbolicNames) ::= <<
private static readonly string[] _LiteralNames = {
<literalNames:{t | <t>}; null="null", separator=", ", wrap, anchor>
};
private static readonly string[] _SymbolicNames = {
<symbolicNames:{t | <t>}; null="null", separator=", ", wrap, anchor>
};
public static readonly IVocabulary DefaultVocabulary = new Vocabulary(_LiteralNames, _SymbolicNames);

[NotNull]
public override IVocabulary Vocabulary
{
get
{
return DefaultVocabulary;
}
}
>>

dumpActions(recog, argFuncs, actionFuncs, sempredFuncs) ::= <<
<if(actionFuncs)>
public override void Action(RuleContext _localctx, int ruleIndex, int actionIndex) {
switch (ruleIndex) {
<recog.actionFuncs.values:{f|
case <f.ruleIndex> : <f.name>_action(<if(!recog.modes)>(<f.ctxType>)<endif>_localctx, actionIndex); break;};
separator="\n">
}
}
<actionFuncs.values; separator="\n">
<endif>
<if(sempredFuncs)>
public override bool Sempred(RuleContext _localctx, int ruleIndex, int predIndex) {
switch (ruleIndex) {
<recog.sempredFuncs.values:{f|
case <f.ruleIndex> : return <f.name>_sempred(<if(!recog.modes)>(<f.ctxType>)<endif>_localctx, predIndex);};
separator="\n">
}
}

```

```

return true;
}
<sempredFuncs.values; separator="\n">
<endif>
>>

parser_ctor(parser) ::= <<
public <csIdentifier.(parser.name)>(ITokenStream input) : this(input, Console.Out, Console.Error) { }

public <csIdentifier.(parser.name)>(ITokenStream input, TextWriter output, TextWriter errorOutput)
: base(input, output, errorOutput)
{
Interpreter = new ParserATNSimulator(this, _ATN, decisionToDFA, sharedContextCache);
}
>>

/* This generates a private method since the actionIndex is generated, making an
* overriding implementation impossible to maintain.
*/
RuleActionFunction(r, actions) ::= <<
private void <r.name>_action(<r.ctxType> _localctx, int actionIndex) {
switch (actionIndex) {
<actions:{index|
case <index>: <actions.(index)> break;}; separator="\n">
}
}
>>

/* This generates a private method since the predIndex is generated, making an
* overriding implementation impossible to maintain.
*/
RuleSempredFunction(r, actions) ::= <<
private bool <r.name>_sempred(<r.ctxType> _localctx, int predIndex) {
switch (predIndex) {
<actions:{index|
case <index>: return <actions.(index)>;}; separator="\n">
}
return true;
}
>>

RuleFunction(currentRule,args,code,locals,ruleCtx,altLabelCtxs,namedActions,finallyAction,postamble,exceptions)
::= <<

<if(ruleCtx)>
<ruleCtx>
<endif>
<altLabelCtxs:{l | <altLabelCtxs.(l)>}; separator="\n">

```

```

[RuleVersion(<namedActions.version; null="0">)]
<if(currentRule.modifiers)><currentRule.modifiers:{f | <f> }><else>public <endif><currentRule.ctxType>
<csIdentifier.(currentRule.name)>(<args; separator=", "> {
 <currentRule.ctxType> _localctx = new <currentRule.ctxType>(Context, State<currentRule.args:{a | ,
<csIdentifier.(a.name)>>>);
 EnterRule(_localctx, <currentRule.startState>, RULE_<currentRule.name>);
 <namedActions.init>
 <locals; separator="\n">
 try {
<if(currentRule.hasLookaheadBlock)>
 int _alt;
<endif>
 <code>
 <postamble; separator="\n">
 <namedActions.after>
 }
 <if(exceptions)>
 <exceptions; separator="\n">
 <else>
 catch (RecognitionException re) {
 _localctx.exception = re;
 ErrorHandler.ReportError(this, re);
 ErrorHandler.Recover(this, re);
 }
 <endif>
 finally {
 <finallyAction>
 ExitRule();
 }
 return _localctx;
 }
 >>

```

```

LeftFactoredRuleFunction(currentRule,args,code,locals,namedActions,finallyAction,postamble) ::=
<<

```

```

<if(currentRule.modifiers)><currentRule.modifiers:{f | <f> }><else>private <endif><currentRule.ctxType>
<csIdentifier.(currentRule.name)>(<args; separator=", "> {
 <currentRule.ctxType> _localctx = new <currentRule.ctxType>(Context, State<currentRule.args:{a | ,
<csIdentifier.(a.name)>>>);
 EnterLeftFactoredRule(_localctx, <currentRule.startState>, RULE_<currentRule.variantOf>);
 <namedActions.init>
 <locals; separator="\n">
 try {
<if(currentRule.hasLookaheadBlock)>
 int _alt;
<endif>

```

```

<code>
<postamble; separator="\n">
<namedActions.after>
}
catch (RecognitionException re) {
 _localctx.exception = re;
 ErrorHandler.ReportError(this, re);
 ErrorHandler.Recover(this, re);
}
finally {
 <finallyAction>
 ExitRule();
}
return _localctx;
}
>>

// This behaves similar to RuleFunction (enterRule is called, and no adjustments
// are made to the parse tree), but since it's still a variant no context class
// needs to be generated.
LeftUnfactoredRuleFunction(currentRule,args,code,locals,namedActions,finallyAction,postamble) ::=
<<

<if(currentRule.modifiers)><currentRule.modifiers:{f | <f> }><else>private <endif><currentRule.ctxType>
<csIdentifier(currentRule.name)><(args; separator=", "> {
 <currentRule.ctxType> _localctx = new <currentRule.ctxType>(Context, State<currentRule.args:{a | ,
<csIdentifier(a.name)>}>>);
 EnterRule(_localctx, <currentRule.startState>, RULE_<currentRule.variantOf>);
 <namedActions.init>
 <locals; separator="\n">
 try {
 <if(currentRule.hasLookaheadBlock)>
 int _alt;
 <endif>
 <code>
 <postamble; separator="\n">
 <namedActions.after>
 }
 catch (RecognitionException re) {
 _localctx.exception = re;
 ErrorHandler.ReportError(this, re);
 ErrorHandler.Recover(this, re);
 }
 finally {
 <finallyAction>
 ExitRule();
 }
 return _localctx;
}

```

```
}
>>
```

```
LeftRecursiveRuleFunction(currentRule,args,code,locals,ruleCtx,altLabelCtxs,
namedActions,finallyAction,postamble) ::= <<
```

```
<ruleCtx>
<altLabelCtxs:{l | <altLabelCtxs.(l)>}; separator="\n">
```

```
[RuleVersion(<namedActions.version; null="0">)]
<if(currentRule.modifiers)><currentRule.modifiers:{f | <f> }><else>public <endif><currentRule.ctxType>
<csIdentifier.(currentRule.name)>(<args; separator=", ">) {
return <csIdentifier.(currentRule.name)>(0<currentRule.args:{a | , <csIdentifier.(a.name)>}>);
}
```

```
private <currentRule.ctxType> <csIdentifier.(currentRule.name)>(int _p<args:{a | , <a>}>) {
ParserRuleContext _parentctx = Context;
int _parentState = State;
<currentRule.ctxType> _localctx = new <currentRule.ctxType>(Context, _parentState<currentRule.args:{a | ,
<csIdentifier.(a.name)>}>);
<currentRule.ctxType> _prevctx = _localctx;
int _startState = <currentRule.startState>;
EnterRecursionRule(_localctx, <currentRule.startState>, RULE_<currentRule.name>, _p);
<namedActions.init>
<locals; separator="\n">
try {
<if(currentRule.hasLookaheadBlock)>
int _alt;
<endif>
<code>
<postamble; separator="\n">
<namedActions.after>
}
catch (RecognitionException re) {
_localctx.exception = re;
ErrorHandler.ReportError(this, re);
ErrorHandler.Recover(this, re);
}
finally {
<finallyAction>
UnrollRecursionContexts(_parentctx);
}
return _localctx;
}
>>
```

```
CodeBlockForOuterMostAlt(currentOuterMostAltCodeBlock, locals, preamble, ops) ::= <<
```

```

<if(currentOuterMostAltCodeBlock.altLabel)>_localctx = new <currentOuterMostAltCodeBlock.altLabel;
format="cap">Context(_localctx);<endif>
EnterOuterAlt(_localctx, <currentOuterMostAltCodeBlock.alt.altNum>);
<CodeBlockForAlt(currentAltCodeBlock=currentOuterMostAltCodeBlock, ...)>
>>

```

```

CodeBlockForAlt(currentAltCodeBlock, locals, preamble, ops) ::= <<
{
<locals; separator="\n">
<preamble; separator="\n">
<ops; separator="\n">
}
>>

```

```

LL1AltBlock(choice, preamble, alts, error) ::= <<
State = <choice.stateNumber>;
ErrorHandler.Sync(this);
<if(choice.label)><labelref(choice.label)> = TokenStream.LT(1);<endif>
<preamble; separator="\n">
switch (TokenStream.LA(1)) {
<choice.altLook,alts:{look,alt| <cases(ttypes=look)>
<alt>
break;}; separator="\n">
default:
<error>
}
>>

```

```

LL1OptionalBlock(choice, alts, error) ::= <<
State = <choice.stateNumber>;
ErrorHandler.Sync(this);
switch (TokenStream.LA(1)) {
<choice.altLook,alts:{look,alt| <cases(ttypes=look)>
<alt>
break;}; separator="\n">
default:
break;
}
>>

```

```

LL1OptionalBlockSingleAlt(choice, expr, alts, preamble, error, followExpr) ::= <<
State = <choice.stateNumber>;
ErrorHandler.Sync(this);
<preamble; separator="\n">
if (<expr>) {
<alts; separator="\n">
}
<else if (!(<followExpr>)) <error>!>

```

>>

```
LL1StarBlockSingleAlt(choice, loopExpr, alts, preamble, iteration) ::= <<
State = <choice.stateNumber>;
ErrorHandler.Sync(this);
<preamble; separator="\n">
while (<loopExpr>) {
 <alts; separator="\n">
 State = <choice.loopBackStateNumber>;
 ErrorHandler.Sync(this);
 <iteration>
}
>>
```

```
LL1PlusBlockSingleAlt(choice, loopExpr, alts, preamble, iteration) ::= <<
State = <choice.blockStartStateNumber>;<! alt block decision !>
ErrorHandler.Sync(this);
<preamble; separator="\n">
do {
 <alts; separator="\n">
 State = <choice.stateNumber>;<! loopback/exit decision !>
 ErrorHandler.Sync(this);
 <iteration>
} while (<loopExpr>);
>>
```

// LL(\*) stuff

```
AltBlock(choice, preamble, alts, error) ::= <<
State = <choice.stateNumber>;
ErrorHandler.Sync(this);
<if(choice.label)><labelref(choice.label)> = TokenStream.LT(1);<endif>
<preamble; separator="\n">
switch (Interpreter.AdaptivePredict(TokenStream,<choice.decision>,Context)) {
 <alts:{ alt |
case <i>:
 <alt>
 break;}; separator="\n">
}
>>
```

```
OptionalBlock(choice, alts, error) ::= <<
State = <choice.stateNumber>;
ErrorHandler.Sync(this);
switch (Interpreter.AdaptivePredict(TokenStream,<choice.decision>,Context)) {
 <alts:{ alt |
case <i><if(!choice.ast.greedy)>+1<endif>:
 <alt>
```

```

break;}; separator="\n">
}
>>

```

```

StarBlock(choice, alts, sync, iteration) ::= <<
State = <choice.stateNumber>;
ErrorHandler.Sync(this);
_alt = Interpreter.AdaptivePredict(TokenStream,<choice.decision>,Context);
while (_alt!=<choice.exitAlt> && _alt!=global::Antlr4.Runtime.Atn.ATN.INVALID_ALT_NUMBER) {
if (_alt==1<if(!choice.ast.greedy)>+1<endif>) {
<iteration>
<alts><! should only be one !>
}
State = <choice.loopBackStateNumber>;
ErrorHandler.Sync(this);
_alt = Interpreter.AdaptivePredict(TokenStream,<choice.decision>,Context);
}
>>

```

```

PlusBlock(choice, alts, error) ::= <<
State = <choice.blockStartStateNumber>;<! alt block decision !>
ErrorHandler.Sync(this);
_alt = 1<if(!choice.ast.greedy)>+1<endif>;
do {
switch (_alt) {
<alts:{alt|
case <i><if(!choice.ast.greedy)>+1<endif>:
<alt>
break;}; separator="\n">
default:
<error>
}
State = <choice.loopBackStateNumber>;<! loopback/exit decision !>
ErrorHandler.Sync(this);
_alt = Interpreter.AdaptivePredict(TokenStream,<choice.decision>,Context);
} while (_alt!=<choice.exitAlt> && _alt!=global::Antlr4.Runtime.Atn.ATN.INVALID_ALT_NUMBER);
>>

```

```

Sync(s) ::= "Sync(<s.expecting.name>);"

```

```

ThrowNoViableAlt(t) ::= "throw new NoViableAltException(this);"

```

```

TestSetInline(s) ::= <<
<s.bitsets:{bits | <if(rest(rest(bits.ttypes)))><bitsetBitfieldComparison(s, bits)><else><bitsetInlineComparison(s,
bits)><endif>}; separator=" || ">
>>

```

```

// Java language spec 15.19 - shift operators mask operands rather than overflow to 0... need range test

```



```

testShiftInRange(shiftAmount) ::= <<
((<shiftAmount>) & ~0x3f) == 0
>>

// produces smaller bytecode only when bits.ttypes contains more than two items
bitsetBitfieldComparison(s, bits) ::= <%
(<testShiftInRange({<offsetShift(s.varName, bits.shift)>})> && ((1L \<< <offsetShift(s.varName, bits.shift)>) &
(<bits.ttypes:{ ttype | (1L \<< <offsetShift(tokenType.(ttype), bits.shift)>}); separator=" | ">) != 0)
%>

isZero ::= [
"0":true,
default:false
]

offsetShift(shiftAmount, offset) ::= <%
<if(!isZero.(offset))><shiftAmount> - <offset><else><shiftAmount><endif>
%>

// produces more efficient bytecode when bits.ttypes contains at most two items
bitsetInlineComparison(s, bits) ::= <%
<bits.ttypes:{ ttype | <s.varName>==<tokenType.(ttype)>}; separator=" || ">
%>

cases(ttypes) ::= <<
<ttypes:{ t | case <tokenType.(t)>:}; separator="\n">
>>

InvokeRule(r, argExprsChunks) ::= <<
State = <r.stateNumber>;
<if(r.labels)><r.labels:{1 | <labelref(l)> =
}><endif><csIdentifier.(r.name)><(if(r.ast.options.p)><r.ast.options.p><if(argExprsChunks)><endif><endif><arg
ExprsChunks>;
>>

MatchToken(m) ::= <<
State = <m.stateNumber>;
<if(m.labels)><m.labels:{1 | <labelref(l)> = }><endif>Match(<tokenType.(m.name)>);
>>

MatchSet(m, expr, capture) ::= "<CommonSetStuff(m, expr, capture, false)>"

MatchNotSet(m, expr, capture) ::= "<CommonSetStuff(m, expr, capture, true)>"

CommonSetStuff(m, expr, capture, invert) ::= <<
State = <m.stateNumber>;
<if(m.labels)><m.labels:{1 | <labelref(l)> = }>TokenStream.LT(1);<endif>
<capture>

```

```

if (<if(invert)><m.varName> \<= 0 || <else>!<endif>(<expr>)) {
 <if(m.labels)><m.labels:{1 | <labelref(1)> = }><endif>ErrorHandler.RecoverInline(this);
}
else {
 ErrorHandler.ReportMatch(this);
 Consume();
}
>>

Wildcard(w) ::= <<
State = <w.stateNumber>;
<if(w.labels)><w.labels:{1 | <labelref(1)> = }><endif>MatchWildcard();
>>

// ACTION STUFF

Action(a, foo, chunks) ::= "<chunks>"

ArgAction(a, chunks) ::= "<chunks>"

SemPred(p, chunks, failChunks) ::= <<
State = <p.stateNumber>;
if (!<chunks>) throw new FailedPredicateException(this, <p.predicate><if(failChunks)>,
<failChunks><elseif(p.msg)>, <p.msg><endif>);
>>

ExceptionClause(e, catchArg, catchAction) ::= <<
catch (<catchArg>) {
 <catchAction>
}
>>

// lexer actions are not associated with model objects

LexerSkipCommand() ::= "Skip();"
LexerMoreCommand() ::= "More();"
LexerPopModeCommand() ::= "PopMode();"

LexerTypeCommand(arg, grammar) ::= "_type = <tokenType.(arg)>";
LexerChannelCommand(arg, grammar) ::= "_channel = <channelName.(arg)>";
LexerModeCommand(arg, grammar) ::= "_mode = <modeName.(arg)>";
LexerPushModeCommand(arg, grammar) ::= "PushMode(<modeName.(arg)>);"

ActionText(t) ::= "<t.text>"
ActionTemplate(t) ::= "<t.st>"
ArgRef(a) ::= "_localctx.<csIdentifier.(a.name)>"
LocalRef(a) ::= "_localctx.<csIdentifier.(a.name)>"
RetValRef(a) ::= "_localctx.<csIdentifier.(a.name)>"

```

```

QRetValRef(a) ::= "<ctx(a)>.<a.dict>.<csIdentifier.(a.name)>"
/** How to translate $tokenLabel */
TokenRef(t) ::= "<ctx(t)>.<csIdentifier.(tokenType.(t.name))>"
LabelRef(t) ::= "<ctx(t)>.<csIdentifier.(t.name)>"
ListLabelRef(t) ::= "<ctx(t)>.<ListLabelName(csIdentifier.(t.name))>"
SetAttr(s,rhsChunks) ::= "<ctx(s)>.<csIdentifier.(s.name)> = <rhsChunks>";

TokenLabelType() ::= "<file.TokenLabelType; null={IToken}>"
InputSymbolType() ::= "<file.InputSymbolType; null={IToken}>"

TokenPropertyRef_text(t) ::= "<ctx(t)>.<tokenType.(t.label)>!=null?<ctx(t)>.<tokenType.(t.label)>.Text:null)"
TokenPropertyRef_type(t) ::= "<ctx(t)>.<tokenType.(t.label)>!=null?<ctx(t)>.<tokenType.(t.label)>.Type:0)"
TokenPropertyRef_line(t) ::= "<ctx(t)>.<tokenType.(t.label)>!=null?<ctx(t)>.<tokenType.(t.label)>.Line:0)"
TokenPropertyRef_pos(t) ::=
"<ctx(t)>.<tokenType.(t.label)>!=null?<ctx(t)>.<tokenType.(t.label)>.CharPositionInLine:0)"
TokenPropertyRef_channel(t) ::=
"<ctx(t)>.<tokenType.(t.label)>!=null?<ctx(t)>.<tokenType.(t.label)>.Channel:0)"
TokenPropertyRef_index(t) ::=
"<ctx(t)>.<tokenType.(t.label)>!=null?<ctx(t)>.<tokenType.(t.label)>.TokenIndex:0)"
TokenPropertyRef_int(t) ::=
"<ctx(t)>.<tokenType.(t.label)>!=null?int.Parse(<ctx(t)>.<tokenType.(t.label)>.Text):0)"

RulePropertyRef_start(r) ::= "<ctx(r)>.<r.label>!=null?(<ctx(r)>.<r.label>.Start):null)"
RulePropertyRef_stop(r) ::= "<ctx(r)>.<r.label>!=null?(<ctx(r)>.<r.label>.Stop):null)"
RulePropertyRef_text(r) ::=
"<ctx(r)>.<r.label>!=null?TokenStream.GetText(<ctx(r)>.<r.label>.Start,<ctx(r)>.<r.label>.Stop):null)"
RulePropertyRef_ctx(r) ::= "<ctx(r)>.<r.label>"
RulePropertyRef_parser(r) ::= "this"

ThisRulePropertyRef_start(r) ::= "_localctx.Start"
ThisRulePropertyRef_stop(r) ::= "_localctx.Stop"
ThisRulePropertyRef_text(r) ::= "TokenStream.GetText(_localctx.Start, TokenStream.LT(-1))"
ThisRulePropertyRef_ctx(r) ::= "_localctx"
ThisRulePropertyRef_parser(r) ::= "this"

NonLocalAttrRef(s) ::= <%((<s.ruleName;
format="cap">Context)GetInvokingContext(<s.ruleIndex>)).<csIdentifier.(s.name)>%>
SetNonLocalAttr(s, rhsChunks) ::=
<%((<s.ruleName; format="cap">Context)GetInvokingContext(<s.ruleIndex>)).<csIdentifier.(s.name)> =
<rhsChunks>%>

AddToLabelList(a) ::= "<ctx(a.label)>.<a.listName>.Add(<labelref(a.label)>);"

TokenDecl(t) ::= "<TokenLabelType() <csIdentifier.(tokenType.(t.name))>"
TokenTypeDecl(t) ::= "int <csIdentifier.(tokenType.(t.name))>";
TokenListDecl(t) ::= "IList<IToken> <csIdentifier.(tokenType.(t.name))> = new List<IToken>()"
RuleContextDecl(r) ::= "<r.ctxName> <csIdentifier.(r.name)>"
RuleContextListDecl(rdecl) ::= "IList<<rdecl.ctxName>> <csIdentifier.(rdecl.name)> = new

```

```
List\<<rdecl.ctxName>>()"
```

```
contextGetterCollection(elementType) ::= <%
<elementType>[]
>%>
```

```
ContextTokenGetterDecl(t) ::=
```

```
"[System.Diagnostics.DebuggerNonUserCode] public ITreeNode <csIdentifier.(tokenType.(t.name))>() {
return GetToken(<csIdentifier.(parser.name)>.<csIdentifier.(tokenType.(t.name))>, 0); }"
```

```
ContextTokenListGetterDecl(t) ::= <<
```

```
[System.Diagnostics.DebuggerNonUserCode] public <contextGetterCollection("ITreeNode")>
<csIdentifier.(tokenType.(t.name))>() { return
GetTokens(<csIdentifier.(parser.name)>.<csIdentifier.(tokenType.(t.name))>); }
>>
```

```
ContextTokenListIndexedGetterDecl(t) ::= <<
```

```
[System.Diagnostics.DebuggerNonUserCode] public ITreeNode <csIdentifier.(tokenType.(t.name))>(int i) {
return GetToken(<csIdentifier.(parser.name)>.<csIdentifier.(tokenType.(t.name))>, i);
}
>>
```

```
ContextRuleGetterDecl(r) ::= <<
```

```
[System.Diagnostics.DebuggerNonUserCode] public <r.ctxName> <csIdentifier.(r.name)>() {
return GetRuleContext\<<r.ctxName>\>(0);
}
>>
```

```
ContextRuleListGetterDecl(r) ::= <<
```

```
[System.Diagnostics.DebuggerNonUserCode] public <contextGetterCollection({<r.ctxName>})>
<csIdentifier.(r.name)>() {
return GetRuleContexts\<<r.ctxName>\>();
}
>>
```

```
ContextRuleListIndexedGetterDecl(r) ::= <<
```

```
[System.Diagnostics.DebuggerNonUserCode] public <r.ctxName> <csIdentifier.(r.name)>(int i) {
return GetRuleContext\<<r.ctxName>\>(i);
}
>>
```

```
LexerRuleContext() ::= "RuleContext"
```

```
/** The rule context name is the rule followed by a suffix; e.g.,
* r becomes rContext.
*/
```

```
RuleContextNameSuffix() ::= "Context"
```

```
ImplicitTokenLabel(tokenName) ::= "_<tokenType.(tokenName)>"
```

```
ImplicitRuleLabel(ruleName) ::= "_<ruleName>"
```

```
ImplicitSetLabel(id) ::= "_tset<id>"
```

```
ListLabelName(label) ::= "_<label>"
```

```
CaptureNextToken(d) ::= "<d.varName> = TokenStream.LT(1);"
CaptureNextTokenType(d) ::= "<d.varName> = TokenStream.LA(1);"
```

```
StructDecl(struct,ctorAttrs,attrs, getters,dispatchMethods,interfaces,extensionMembers,
 superClass={ParserRuleContext}) ::= <<
public partial class <struct.name> :
<if(contextSuperClass)><contextSuperClass><else>ParserRuleContext<endif><if(interfaces)>, <interfaces>
separator=", "><endif> {
<attrs:{ a | public <a>;}; separator="\n">
<getters:{ g | <g>;}; separator="\n">
<if(ctorAttrs)>public <struct.name>(ParserRuleContext parent, int invokingState) : base(parent, invokingState) {
}<endif>
public <struct.name>(ParserRuleContext parent, int invokingState<ctorAttrs:{ a | , <a>>>)
: base(parent, invokingState)
{
<struct.ctorAttrs:{ a | this.<csIdentifier.(a.name)> = <csIdentifier.(a.name)>;}; separator="\n">
}
public override int RuleIndex { get { return RULE_<struct.derivedFromName>; } }
<if(struct.provideCopyFrom)> <! don't need copy unless we have subclasses !>
public <struct.name>() { }
public virtual void CopyFrom(<struct.name> context) {
base.CopyFrom(context);
<struct.attrs:{ a | this.<csIdentifier.(a.name)> = context.<csIdentifier.(a.name)>;}; separator="\n">
}
}<endif>
<dispatchMethods; separator="\n">
<extensionMembers; separator="\n">
}
>>
```

```
AltLabelStructDecl(struct,attrs, getters,dispatchMethods) ::= <<
public partial class <struct.name> : <currentRule.name; format="cap">Context {
<attrs:{ a | public <a>;}; separator="\n">
<getters:{ g | <g>;}; separator="\n">
public <struct.name>(<currentRule.name; format="cap">Context context) { CopyFrom(context); }
<dispatchMethods; separator="\n">
}
>>
```

```
ListenerDispatchMethod(method) ::= <<
[System.Diagnostics.DebuggerNonUserCode]
public override void <if(method.isEnter)>Enter<else>Exit<endif>Rule(IParseTreeListener listener) {
I<parser.grammarName>Listener typedListener = listener as I<parser.grammarName>Listener;
if (typedListener != null) typedListener.<if(method.isEnter)>Enter<else>Exit<endif><struct.derivedFromName>;
format="cap">(this);
}
>>
```

```

VisitorDispatchMethod(method) ::= <<
[System.Diagnostics.DebuggerNonUserCode]
public override TResult Accept<TResult>(IParseTreeVisitor<TResult> visitor) {
I<parser.grammarName>Visitor<TResult> typedVisitor = visitor as I<parser.grammarName>Visitor<TResult>;
if (typedVisitor != null) return typedVisitor.Visit<struct.derivedFromName; format="cap">(this);
else return visitor.VisitChildren(this);
}
>>

```

```

AttributeDecl(d) ::= "<d.type> <csIdentifier.(d.name)><if(d.initValue)> = <d.initValue><endif>"

```

```

/** If we don't know location of label def x, use this template */

```

```

labelref(x) ::= "<if(!x.isLocal)><typedContext(x.ctx)><endif><csIdentifier.(x.name)>"

```

```

/** For any action chunk, what is correctly-typed context struct ptr? */

```

```

ctx(actionChunk) ::= "<typedContext(actionChunk.ctx)>"

```

```

// only casts _localctx to the type when the cast isn't redundant (i.e. to a sub-context for a labeled alt)

```

```

typedContext(ctx) ::= "<if(ctx.provideCopyFrom)>((<ctx.name>)_localctx)<else>_localctx<endif>"

```

```

// used for left-recursive rules

```

```

recRuleAltPredicate(ruleName,opPrec) ::= "Precpred(Context, <opPrec>)"

```

```

recRuleSetReturnAction(src,name) ::= "$<name>=$<src>.<name>;"

```

```

recRuleSetStopToken() ::= "Context.Stop = TokenStream.LT(-1);"

```

```

recRuleAltStartAction(ruleName, ctxName, label, isListLabel) ::= <<

```

```

_localctx = new <ctxName>Context(_parentctx, _parentState);

```

```

<if(label)>

```

```

<if(isListLabel)>

```

```

_localctx.<label>.Add(_prevctx);

```

```

<else>

```

```

_localctx.<label> = _prevctx;

```

```

<endif>

```

```

<endif>

```

```

PushNewRecursionContext(_localctx, _startState, RULE_<ruleName>);

```

```

>>

```

```

recRuleLabeledAltStartAction(ruleName, currentAltLabel, label, isListLabel) ::= <<

```

```

_localctx = new <currentAltLabel; format="cap">Context(new <ruleName; format="cap">Context(_parentctx,
_parentState));

```

```

<if(label)>

```

```

<if(isListLabel)>

```

```

((<currentAltLabel; format="cap">Context)_localctx).<label>.Add(_prevctx);

```

```

<else>

```

```

((<currentAltLabel; format="cap">Context)_localctx).<label> = _prevctx;

```

```

<endif>

```

```

<endif>

```

```

PushNewRecursionContext(_localctx, _startState, RULE_<ruleName>);

```

>>

```
recRuleReplaceContext(ctxName) ::= <<
 _localctx = new <ctxName>Context(_localctx);
 Context = _localctx;
 _prevctx = _localctx;
>>
```

```
recRuleSetPrevCtx() ::= <<
 if (ParseListeners!=null)
 TriggerExitRuleEvent();
 _prevctx = _localctx;
>>
```

```
LexerFile(file, lexer, namedActions) ::= <<
 <fileHeader(file.grammarFileName, file.ANTLRVersion)>
 <if(file.genPackage)>
 namespace <file.genPackage> {
 <endif>
 <namedActions.header>
 using System;
 using System.IO;
 using System.Text;
 using Antlr4.Runtime;
 using Antlr4.Runtime.Atn;
 using Antlr4.Runtime.Misc;
 using DFA = Antlr4.Runtime.Dfa.DFA;

 <lexer>
 <if(file.genPackage)>
 } // namespace <file.genPackage>
 <endif>
>>
```

```
Lexer(lexer, atn, actionFuncs, sempredFuncs, superClass) ::= <<
[System.CodeDom.Compiler.GeneratedCode("ANTLR", "<file.ANTLRVersion>")]
[System.CLSCompliant(false)]
public partial class <csIdentifier.(lexer.name)> : <superClass; null="Lexer"> {
 protected static DFA[] decisionToDFA;
 protected static PredictionContextCache sharedContextCache = new PredictionContextCache();
 <if(lexer.tokens)>
 public const int
 <lexer.tokens:{k | <tokenType.(k)>=<lexer.tokens.(k)>}; separator=", ", wrap, anchor>;
 <endif>
 <if(lexer.channels)>
 public const int
 <lexer.channels:{k | <csIdentifier.(k)>=<lexer.channels.(k)>}; separator=", ", wrap, anchor>;
 </if>
}
```

```

<endif>
<if(rest(lexer.modes))>
public const int
 <rest(lexer.modes):{m | <m>=<i>}; separator=", ", wrap, anchor>;
<endif>
public static string[] channelNames = {
 "DEFAULT_TOKEN_CHANNEL", "HIDDEN"<if (lexer.channels)>, <lexer.channels:{c | "<c>"}; separator=", ",
wrap, anchor><endif>
};

public static string[] modeNames = {
 <lexer.modes:{m | "<m>"}; separator=", ", wrap, anchor>
};

public static readonly string[] ruleNames = {
 <lexer.ruleNames:{r | "<r>"}; separator=", ", wrap, anchor>
};

<namedActions.members>

public <csIdentifier.(lexer.name)>(ICharStream input)
: this(input, Console.Out, Console.Error) { }

public <csIdentifier.(lexer.name)>(ICharStream input, TextWriter output, TextWriter errorOutput)
: base(input, output, errorOutput)
{
 Interpreter = new LexerATNSimulator(this, _ATN, decisionToDFA, sharedContextCache);
}

<vocabulary(lexer.literalNames, lexer.symbolicNames)>

public override string GrammarFileName { get { return "<lexer.grammarFileName>"; } }

public override string[] RuleNames { get { return ruleNames; } }

public override string[] ChannelNames { get { return channelNames; } }

public override string[] ModeNames { get { return modeNames; } }

public override string SerializedAtn { get { return new string(_serializedATN); } }

static <csIdentifier.(lexer.name)>() {
 decisionToDFA = new DFA[_ATN.NumberOfDecisions];
 for (int i = 0; i < _ATN.NumberOfDecisions; i++) {
 decisionToDFA[i] = new DFA(_ATN.GetDecisionState(i), i);
 }
}

<dumpActions(lexer, "", actionFuncs, sempredFuncs)>

```



```
<atn>
}
>>
```

```
SerializedATN(model) ::= <<
private static char[] _serializedATN = {
 <model.serialized; separator=", ", wrap>,
};

public static readonly ATN _ATN =
 new ATNDeserializer().Deserialize(_serializedATN);
```

```
>>
```

```
initValue(typeName) ::= <<
default(<typeName>)
>>
```

```
codeFileExtension() ::= ".cs"
```

```
modeName ::= [
 "DEFAULT_MODE" : "DefaultMode",
 default : key
]
```

```
channelName ::= [
 "HIDDEN" : "Hidden",
 "DEFAULT_TOKEN_CHANNEL" : "DefaultTokenChannel",
 default : key
]
```

```
tokenType ::= [
 "EOF" : "Eof",
 default : key
]
```

```
csIdentifier ::= [
 "abstract" : "@abstract",
 "as" : "@as",
 "base" : "@base",
 "bool" : "@bool",
 "break" : "@break",
 "byte" : "@byte",
 "case" : "@case",
 "catch" : "@catch",
 "char" : "@char",
```

"checked" : "@checked",  
"class" : "@class",  
"const" : "@const",  
"continue" : "@continue",  
"decimal" : "@decimal",  
"default" : "@default",  
"delegate" : "@delegate",  
"do" : "@do",  
"double" : "@double",  
"else" : "@else",  
"enum" : "@enum",  
"event" : "@event",  
"explicit" : "@explicit",  
"extern" : "@extern",  
"false" : "@false",  
"finally" : "@finally",  
"fixed" : "@fixed",  
"float" : "@float",  
"for" : "@for",  
"foreach" : "@foreach",  
"goto" : "@goto",  
"if" : "@if",  
"implicit" : "@implicit",  
"in" : "@in",  
"int" : "@int",  
"interface" : "@interface",  
"internal" : "@internal",  
"is" : "@is",  
"lock" : "@lock",  
"long" : "@long",  
"namespace" : "@namespace",  
"new" : "@new",  
"null" : "@null",  
"object" : "@object",  
"operator" : "@operator",  
"out" : "@out",  
"override" : "@override",  
"params" : "@params",  
"private" : "@private",  
"protected" : "@protected",  
"public" : "@public",  
"readonly" : "@readonly",  
"ref" : "@ref",  
"return" : "@return",  
"sbyte" : "@sbyte",  
"sealed" : "@sealed",  
"short" : "@short",  
"sizeof" : "@sizeof",

```
"stackalloc" : "@stackalloc",
"static" : "@static",
"string" : "@string",
"struct" : "@struct",
"switch" : "@switch",
"this" : "@this",
"throw" : "@throw",
>true" : "@true",
"try" : "@try",
"typeof" : "@typeof",
"uint" : "@uint",
"ulong" : "@ulong",
"unchecked" : "@unchecked",
"unsafe" : "@unsafe",
"ushort" : "@ushort",
"using" : "@using",
"virtual" : "@virtual",
"values" : "@values",
"void" : "@void",
"volatile" : "@volatile",
"while" : "@while",
default : key
]
```

Found in path(s):

```
*/opt/cola/permits/1340816081_1654861722.3479369/0/antlr4-4-9-2-sources-1-
jar/org/antlr/v4/tool/templates/codegen/CSharp/CSharp.stg
```

No license file was found, but licenses were detected in source scan.

```
/*
```

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```

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```

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```

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*/

```

```

/** ANTLR tool checks output templates are compatible with tool code generation.

```

```

* For now, a simple string match used on x.y of x.y.z scheme.

```

```

* Must match Tool.VERSION during load to templates.

```

```

*

```

```

* REQUIRED.

```

```

*/

```

```

javascriptTypeInitMap ::= [
 "bool":"false",
 "int":"0",
 "float":"0.0",
 "str":"",
 default:"{}" // anything other than a primitive type is an object
]

```

```

// args must be <object-model-object>, <fields-resulting-in-STs>

```

```

ParserFile(file, parser, namedActions, contextSuperClass) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
import antlr4 from 'antlr4';
<if(file.genListener)>
import <file.grammarName>Listener from './<file.grammarName>Listener.js';
<endif>
<if(file.genVisitor)>
import <file.grammarName>Visitor from './<file.grammarName>Visitor.js';
<endif>

<namedActions.header>
<parser>
>>

```

```

ListenerFile(file, header, namedActions) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
import antlr4 from 'antlr4';

```

```

// This class defines a complete listener for a parse tree produced by <file.parserName>.

```

```

export default class <file.grammarName>Listener extends antlr4.tree.ParseTreeListener {

<file.listenerNames:{ lname |
// Enter a parse tree produced by <file.parserName>#<lname>.
enter<lname; format="cap">(ctx) {
\}

// Exit a parse tree produced by <file.parserName>#<lname>.
exit<lname; format="cap">(ctx) {
\}

}; separator="\n">

}
>>

VisitorFile(file, header, namedActions) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
import antlr4 from 'antlr4';

// This class defines a complete generic visitor for a parse tree produced by <file.parserName>.

export default class <file.grammarName>Visitor extends antlr4.tree.ParseTreeVisitor {

<file.visitorNames:{ lname |
// Visit a parse tree produced by <file.parserName>#<lname>.
visit<lname; format="cap">(ctx) {
 return this.visitChildren(ctx);
\}

}; separator="\n">

}
>>

fileHeader(grammarFileName, ANTLRVersion) ::= <<
// Generated from <grammarFileName; format="java-escape"> by ANTLR <ANTLRVersion>
// jshint ignore: start
>>

Parser(parser, funcs, atn, sempredFuncs, superClass) ::= <<
<if(superClass)>
import <superClass> from './<superClass>.js';
<endif>

<atn>

```

```

const atn = new antlr4.atn.ATNDeserializer().deserialize(serializedATN);

const decisionsToDFA = atn.decisionToState.map((ds, index) => new antlr4.dfa.DFA(ds, index));

const sharedContextCache = new antlr4.PredictionContextCache();

export default class <parser.name> extends <superClass; null="antlr4.Parser"> {

 static grammarFileName = "<parser.grammarFileName; format="java-escape">";
 static literalNames = [<parser.literalNames:{t | <t>} ; null="null", separator=", ", wrap, anchor>];
 static symbolicNames = [<parser.symbolicNames:{t | <t>} ; null="null", separator=", ", wrap, anchor>];
 static ruleNames = [<parser.ruleNames:{r | "<r>"} ; separator=", ", wrap, anchor>];

 constructor(input) {
 super(input);
 this._interp = new antlr4.atn.ParserATNSimulator(this, atn, decisionsToDFA, sharedContextCache);
 this.ruleNames = <parser.name>.ruleNames;
 this.literalNames = <parser.name>.literalNames;
 this.symbolicNames = <parser.name>.symbolicNames;
 <namedActions.members>
 }

 get atn() {
 return atn;
 }

 <if(sempredFuncs)>
 sempred(localctx, ruleIndex, predIndex) {
 switch(ruleIndex) {
 <parser.sempredFuncs.values:{f | case <f.ruleIndex>:
 return this.<f.name>_sempred(localctx, predIndex);}; separator="\n">
 default:
 throw "No predicate with index:" + ruleIndex;
 }
 }
 <sempredFuncs.values; separator="\n">
 <endif>

 <funcs; separator="\n">

}

<parser.name>.EOF = antlr4.Token.EOF;
<if(parser.tokens)>
<parser.tokens:{k | <parser.name>.<k> = <parser.tokens.(k)>}; separator="\n", wrap, anchor>
<endif>

```

```

<if(parser.rules)>
<parser.rules:{r | <parser.name>.RULE_<r.name> = <r.index>;}; separator="\n", wrap, anchor>
<endif>

<funcs:{f | <ruleContexts(f)>;}; separator="\n">

<! Define fields of this parser to export the context classes !>
<parser.funcs:{f | <parser.name>.<f.ctxType> = <f.ctxType>; }; separator="\n">

>>

ruleContexts(currentRule) ::= <<
<currentRule.ruleCtx>

<currentRule.altLabelCtxs:{l | <currentRule.altLabelCtxs.(l)>;}; separator="\n">
>>

dumpActions(recog, argFuncs, actionFuncs, sempredFuncs) ::= <<
<if(actionFuncs)>
<lexer.name>.prototype.action = function(localctx, ruleIndex, actionIndex) {
switch (ruleIndex) {
<recog.actionFuncs.values:{f|
case <f.ruleIndex>:
this.<f.name>_action(localctx, actionIndex);
break;}; separator="\n">
default:
throw "No registered action for:" + ruleIndex;
}
};

<actionFuncs.values; separator="\n">
<endif>
<if(sempredFuncs)>
<lexer.name>.prototype.sempred = function(localctx, ruleIndex, predIndex) {
switch (ruleIndex) {
<recog.sempredFuncs.values:{f| case <f.ruleIndex>:
return this.<f.name>_sempred(localctx, predIndex);}; separator="\n">
default:
throw "No registered predicate for:" + ruleIndex;
}
};

<sempredFuncs.values; separator="\n">
<endif>
>>

```

```
/* This generates a private method since the actionIndex is generated, making an
* overriding implementation impossible to maintain.
*/
```

```
RuleActionFunction(r, actions) ::= <<
```

```
<lexer.name>.prototype.<r.name>_action = function(localctx , actionIndex) {
 switch (actionIndex) {
 <actions:{index|
case <index>:
 <actions.(index)>
 break;}; separator="\n">
 default:
 throw "No registered action for:" + actionIndex;
 }
};
>>
```

```
/* This generates a private method since the predIndex is generated, making an
* overriding implementation impossible to maintain.
*/
```

```
RuleSempredFunction(r, actions) ::= <<
```

```
<if (r.factory.g.lexer)><lexer.name>.prototype.<r.name>_sempred =
function<else><r.name>_sempred<endif>(localctx, predIndex) {
 switch(predIndex) {
 <actions:{index| case <index>:
return <actions.(index)>;}; separator="\n">
 default:
 throw "No predicate with index:" + predIndex;
 }
};
>>
```

```
RuleFunction(currentRule,args,code,locals,ruleCtx,altLabelCtxs,namedActions,finallyAction,postamble,exceptions)
::= <<
```

```
<currentRule.name>(<currentRule.args:{a | <a.name>}; separator=", ">) {
 let localctx = new <currentRule.ctxType>(this, this._ctx, this.state<currentRule.args:{a | , <a.name>}>);
 this.enterRule(localctx, <currentRule.startState>, <parser.name>.RULE_<currentRule.name>);
 <namedActions.init>
 <locals; separator="\n">
 try {
 <code>
 <postamble; separator="\n">
 <namedActions.after>
 }<if(exceptions)>
 <exceptions; separator="\n">
```



```

<else> catch (re) {
 if(re instanceof antlr4.error.RecognitionException) {
 localctx.exception = re;
 this._errHandler.reportError(this, re);
 this._errHandler.recover(this, re);
 } else {
 throw re;
 }
}<endif> finally {
 <finallyAction>
 this.exitRule();
}
return localctx;
}

```

>>

LeftRecursiveRuleFunction(currentRule,args,code,locals,ruleCtx,altLabelCtxs,  
namedActions,finallyAction,postamble) ::=

<<

```

<currentRule.name>(_p<if(currentRule.args)>, <args:{ a | , <a>}><endif>) {
 if(_p===undefined) {
 _p = 0;
 }
 const _parentctx = this._ctx;
 const _parentState = this.state;
 let localctx = new <currentRule.ctxType>(this, this._ctx, _parentState<args:{ a | , <a.name>}>);
 let _prevctx = localctx;
 const _startState = <currentRule.startState>;
 this.enterRecursionRule(localctx, <currentRule.startState>, <parser.name>.RULE_<currentRule.name>, _p);
 <namedActions.init>
 <locals; separator="\n">
 try {
 <code>
 <postamble; separator="\n">
 <namedActions.after>
 } catch(error) {
 if(error instanceof antlr4.error.RecognitionException) {
 localctx.exception = error;
 this._errHandler.reportError(this, error);
 this._errHandler.recover(this, error);
 } else {
 throw error;
 }
 } finally {
 <finallyAction>
 this.unrollRecursionContexts(_parentctx)
 }
}

```

```

 }
 return localctx;
}

>>

```

```

CodeBlockForOuterMostAlt(currentOuterMostAltCodeBlock, locals, preamble, ops) ::= <<
<if(currentOuterMostAltCodeBlock.altLabel)>localctx = new <currentOuterMostAltCodeBlock.altLabel;
format="cap">Context(this, localctx);<endif>
this.enterOuterAlt(localctx, <currentOuterMostAltCodeBlock.alt.altNum>);
<CodeBlockForAlt(currentAltCodeBlock=currentOuterMostAltCodeBlock, ...)>
>>

```

```

CodeBlockForAlt(currentAltCodeBlock, locals, preamble, ops) ::= <<
<locals; separator="\n">
<preamble; separator="\n">
<ops; separator="\n">
>>

```

```

LL1AltBlock(choice, preamble, alts, error) ::= <<
this.state = <choice.stateNumber>;
this._errHandler.sync(this);
<if(choice.label)><labelref(choice.label)> = this._input.LT(1);<endif>
<preamble; separator="\n">
switch(this._input.LA(1)) {
<choice.altLook,alts:{look,alt| <cases(ttypes=look)>
 <alt>
 break;}; separator="\n">
default:
 <error>
}
>>

```

```

LL1OptionalBlock(choice, alts, error) ::= <<
this.state = <choice.stateNumber>;
this._errHandler.sync(this);
switch (this._input.LA(1)) {
<choice.altLook,alts:{look,alt| <cases(ttypes=look)>
 <alt>
 break;}; separator="\n">
default:
 break;
}
>>

```

```

LL1OptionalBlockSingleAlt(choice, expr, alts, preamble, error, followExpr) ::= <<
this.state = <choice.stateNumber>;
this._errHandler.sync(this);

```

```

<preamble; separator="\n">
if(<expr>) {
 <alts; separator="\n">
}
<!else if (!(<followExpr>)) <error!>
>>

```

```

LL1StarBlockSingleAlt(choice, loopExpr, alts, preamble, iteration) ::= <<
this.state = <choice.stateNumber>;
this._errHandler.sync(this);
<preamble; separator="\n">
while(<loopExpr>) {
 <alts; separator="\n">
 this.state = <choice.loopBackStateNumber>;
 this._errHandler.sync(this);
 <iteration>
}
>>

```

```

LL1PlusBlockSingleAlt(choice, loopExpr, alts, preamble, iteration) ::= <<
this.state = <choice.blockStartStateNumber>; <! alt block decision !>
this._errHandler.sync(this);
<preamble; separator="\n">
do {
 <alts; separator="\n">
 this.state = <choice.stateNumber>; <! loopback/exit decision !>
 this._errHandler.sync(this);
 <iteration>
} while(<loopExpr>);
>>

```

```

// LL(*) stuff

```

```

AltBlock(choice, preamble, alts, error) ::= <<
this.state = <choice.stateNumber>;
this._errHandler.sync(this);
<if(choice.label)><labelref(choice.label)> = _input.LT(1)<endif>
<preamble; separator="\n">
var la_ = this._interp.adaptivePredict(this._input,<choice.decision>,this._ctx);
switch(la_) {
<alts:{alt |
case <i>:
 <alt>
 break;
}; separator="\n">
}
>>

```

```

OptionalBlock(choice, alts, error) ::= <<
this.state = <choice.stateNumber>;
this._errHandler.sync(this);
var la_ = this._interp.adaptivePredict(this._input,<choice.decision>,this._ctx);
<alts:{ alt |
if(la_===<i><if(!choice.ast.greedy)>+1<endif>) {
 <alt>
}; separator="\n} else ">
}
>>

StarBlock(choice, alts, sync, iteration) ::= <<
this.state = <choice.stateNumber>;
this._errHandler.sync(this);
var _alt = this._interp.adaptivePredict(this._input,<choice.decision>,this._ctx)
while(_alt!=<choice.exitAlt> && _alt!=antlr4.atn.ATN.INVALID_ALT_NUMBER) {
 if(_alt===1<if(!choice.ast.greedy)>+1<endif>) {
 <iteration>
 <alts> <! should only be one !>
 }
 this.state = <choice.loopBackStateNumber>;
 this._errHandler.sync(this);
 _alt = this._interp.adaptivePredict(this._input,<choice.decision>,this._ctx);
}
>>

PlusBlock(choice, alts, error) ::= <<
this.state = <choice.blockStartStateNumber>; <! alt block decision !>
this._errHandler.sync(this);
var _alt = 1<if(!choice.ast.greedy)>+1<endif>;
do {
 switch (_alt) {
 <alts:{ alt|
case <i><if(!choice.ast.greedy)>+1<endif>:
 <alt>
 break;}; separator="\n">
 default:
 <error>
 }
 this.state = <choice.loopBackStateNumber>; <! loopback/exit decision !>
 this._errHandler.sync(this);
 _alt = this._interp.adaptivePredict(this._input,<choice.decision>, this._ctx);
} while (_alt!=<choice.exitAlt> && _alt!=antlr4.atn.ATN.INVALID_ALT_NUMBER);
>>

Sync(s) ::= "sync(<s.expecting.name>)"

```

```

ThrowNoViableAlt(t) ::= "throw new antlr4.error.NoViableAltException(this);"

TestSetInline(s) ::= <<
<s.bitsets:{bits | <if(rest(rest(bits.ttypes)))><bitsetBitfieldComparison(s, bits)><else><bitsetInlineComparison(s,
bits)><endif>}; separator=" || ">
>>

// Javascript language spec - shift operators are 32 bits long max
testShiftInRange(shiftAmount) ::= <<
((<shiftAmount>) & ~0x1f) == 0
>>

// produces smaller bytecode only when bits.ttypes contains more than two items
bitsetBitfieldComparison(s, bits) ::= <%
(<testShiftInRange({<offsetShiftVar(s.varName, bits.shift)>})> && ((1 \<< <offsetShiftVar(s.varName,
bits.shift)>) & (<bits.ttypes:{ttype | (1 \<< <offsetShiftType(ttype, bits.shift)>)); separator=" | ">)) !== 0)
%>

isZero ::= [
"0":true,
default:false
]

offsetShiftVar(shiftAmount, offset) ::= <%
<if(!isZero.(offset))><shiftAmount> - <offset><else><shiftAmount><endif>
%>

offsetShiftType(shiftAmount, offset) ::= <%
<if(!isZero.(offset))><parser.name>.<shiftAmount> - <offset><else><parser.name>.<shiftAmount><endif>
%>

// produces more efficient bytecode when bits.ttypes contains at most two items
bitsetInlineComparison(s, bits) ::= <%
<bits.ttypes:{ttype | <s.varName>===<parser.name>.<ttype>}; separator=" || ">
%>

cases(ttypes) ::= <<
<ttypes:{t | case <parser.name>.<t>}; separator="\n">
>>

InvokeRule(r, argExprsChunks) ::= <<
this.state = <r.stateNumber>;
<if(r.labels)><r.labels:{l | <labelref(l)> =
}><endif>this.<r.name>(<if(r.ast.options.p)><r.ast.options.p><if(argExprsChunks)>,<endif><endif><argExprsChu
nks>);
>>

MatchToken(m) ::= <<

```

```

this.state = <m.stateNumber>;
<if(m.labels)><m.labels:{1 | <labelref(l)> = }><endif>this.match(<parser.name>.<m.name>);
>>

```

```

MatchSet(m, expr, capture) ::= "<CommonSetStuff(m, expr, capture, false)>"

```

```

MatchNotSet(m, expr, capture) ::= "<CommonSetStuff(m, expr, capture, true)>"

```

```

CommonSetStuff(m, expr, capture, invert) ::= <<
this.state = <m.stateNumber>;
<if(m.labels)><m.labels:{1 | <labelref(l)> = }>this._input.LT(1);<endif>
<capture>
<if(invert)>if(<m.varName>\<=0 || <expr>)<else>if(!(<expr>))<endif> {
 <if(m.labels)><m.labels:{1 | <labelref(l)> = }><endif>this._errHandler.recoverInline(this);
}
else {
 this._errHandler.reportMatch(this);
 this.consume();
}
>>

```

```

Wildcard(w) ::= <<
this.state = <w.stateNumber>;
<if(w.labels)><w.labels:{1 | <labelref(l)> = }><endif>this.matchWildcard();
>>

```

```

// ACTION STUFF

```

```

Action(a, foo, chunks) ::= "<chunks>"

```

```

ArgAction(a, chunks) ::= "<chunks>"

```

```

SemPred(p, chunks, failChunks) ::= <<
this.state = <p.stateNumber>;
if (!(<chunks>)) {
 throw new antlr4.error.FailedPredicateException(this, <p.predicate><if(failChunks)>,
<failChunks><elseif(p.msg)>, <p.msg><endif>);
}
>>

```

```

ExceptionClause(e, catchArg, catchAction) ::= <<
catch (<catchArg>) {
 <catchAction>
}
>>

```

```

// lexer actions are not associated with model objects

```

```

LexerSkipCommand() ::= "this.skip()"
LexerMoreCommand() ::= "this.more()"
LexerPopModeCommand() ::= "this.popMode()"
LexerTypeCommand(arg, grammar) ::= "this._type = <arg>"
LexerChannelCommand(arg, grammar) ::= "this._channel = <arg>"
LexerModeCommand(arg, grammar) ::= "this._mode = <arg>"
LexerPushModeCommand(arg, grammar) ::= "this.pushMode(<arg>)"

ActionText(t) ::= "<t.text>"
ActionTemplate(t) ::= "<t.st>"
ArgRef(a) ::= "localctx.<a.name>"
LocalRef(a) ::= "localctx.<a.name>"
RetValRef(a) ::= "localctx.<a.name>"
QRetValRef(a) ::= "<ctx(a)>.<a.dict>.<a.name>"
/** How to translate $tokenLabel */
TokenRef(t) ::= "<ctx(t)>.<t.name>"
LabelRef(t) ::= "<ctx(t)>.<t.name>"
ListLabelRef(t) ::= "<ctx(t)>.<ListLabelName(t.name)>"
SetAttr(s,rhsChunks) ::= "<ctx(s)>.<s.name> = <rhsChunks>"

TokenLabelType() ::= "<file.TokenLabelType; null={Token}>"
InputSymbolType() ::= "<file.InputSymbolType; null={Token}>"

TokenPropertyRef_text(t) ::= "(<ctx(t)>.<t.label>===null ? null : <ctx(t)>.<t.label>.text)"
TokenPropertyRef_type(t) ::= "(<ctx(t)>.<t.label> === null ? 0 : <ctx(t)>.<t.label>.type)"
TokenPropertyRef_line(t) ::= "(<ctx(t)>.<t.label> === null ? 0 : <ctx(t)>.<t.label>.line)"
TokenPropertyRef_pos(t) ::= "(<ctx(t)>.<t.label> === null ? 0 : <ctx(t)>.<t.label>.column)"
TokenPropertyRef_channel(t) ::= "(<ctx(t)>.<t.label> === null ? 0 : <ctx(t)>.<t.label>.channel)"
TokenPropertyRef_index(t) ::= "(<ctx(t)>.<t.label> === null ? 0 : <ctx(t)>.<t.label>.tokenIndex)"
TokenPropertyRef_int(t) ::= "(<ctx(t)>.<t.label> === null ? 0 : parseInt(<ctx(t)>.<t.label>.text))"

RulePropertyRef_start(r) ::= "(<ctx(r)>.<r.label>===null ? null : <ctx(r)>.<r.label>.start)"
RulePropertyRef_stop(r) ::= "(<ctx(r)>.<r.label>===null ? null : <ctx(r)>.<r.label>.stop)"
RulePropertyRef_text(r) ::= "(<ctx(r)>.<r.label>===null ? null : this._input.getText(new antlr4.Interval(<ctx(r)>.<r.label>.start,<ctx(r)>.<r.label>.stop)))"
RulePropertyRef_ctx(r) ::= "<ctx(r)>.<r.label>"
RulePropertyRef_parser(r) ::= "this"

ThisRulePropertyRef_start(r) ::= "localctx.start"
ThisRulePropertyRef_stop(r) ::= "localctx.stop"
ThisRulePropertyRef_text(r) ::= "this._input.getText(new antlr4.Interval(localctx.start, this._input.LT(-1)))"
ThisRulePropertyRef_ctx(r) ::= "localctx"
ThisRulePropertyRef_parser(r) ::= "this"

NonLocalAttrRef(s) ::= "this.getInvokingContext(<s.ruleIndex>).<s.name>"
SetNonLocalAttr(s, rhsChunks) ::= "this.getInvokingContext(<s.ruleIndex>).<s.name> = <rhsChunks>"

AddToLabelList(a) ::= "<ctx(a.label)>.<a.listName>.push(<labelref(a.label)>);"

```

```

TokenDecl(t) ::= "this.<t.name> = null; // <TokenLabelType()>"
TokenTypeDecl(t) ::= "var <t.name> = 0; // <TokenLabelType()> type"
TokenListDecl(t) ::= "this.<t.name> = []; // of <TokenLabelType()>s"
RuleContextDecl(r) ::= "this.<r.name> = null; // <r.ctxName>"
RuleContextListDecl(rdecl) ::= "this.<rdecl.name> = []; // of <rdecl.ctxName>s"

```

```

ContextTokenGetterDecl(t) ::= <<
<t.name>() {
 return this.getToken(<parser.name>.<t.name>, 0);
};
>>

```

```

// should never be called
ContextTokenListGetterDecl(t) ::= <<
<t.name>_list() {
 return this.getTokens(<parser.name>.<t.name>);
}
>>

```

```

ContextTokenListIndexedGetterDecl(t) ::= <<
<t.name> = function(i) {
 if(i===undefined) {
 i = null;
 }
 if(i===null) {
 return this.getTokens(<parser.name>.<t.name>);
 } else {
 return this.getToken(<parser.name>.<t.name>, i);
 }
};
>>

```

```

ContextRuleGetterDecl(r) ::= <<
<r.name>() {
 return this.getTypedRuleContext(<r.ctxName>,0);
};
>>

```

```

// should never be called
ContextRuleListGetterDecl(r) ::= <<
<r.name>_list() {
 return this.getTypedRuleContexts(<parser.name>.<r.ctxName>);
}
>>

```

```

ContextRuleListIndexedGetterDecl(r) ::= <<

```



```

<r.name> = function(i) {
 if(i===undefined) {
 i = null;
 }
 if(i===null) {
 return this.getTypedRuleContexts(<r.ctxName>);
 } else {
 return this.getTypedRuleContext(<r.ctxName>,i);
 }
};
>>

```

```

LexerRuleContext() ::= "RuleContext"

```

```

/** The rule context name is the rule followed by a suffix; e.g.,
 * r becomes rContext.
 */

```

```

RuleContextNameSuffix() ::= "Context"

```

```

ImplicitTokenLabel(tokenName) ::= "_<tokenName>"

```

```

ImplicitRuleLabel(ruleName) ::= "_<ruleName>"

```

```

ImplicitSetLabel(id) ::= "_tset<id>"

```

```

ListLabelName(label) ::= "<label>"

```

```

CaptureNextToken(d) ::= "<d.varName> = self._input.LT(1)"

```

```

CaptureNextTokenType(d) ::= "<d.varName> = this._input.LA(1);"

```

```

StructDecl(struct,ctorAttrs,attrs,getters,dispatchMethods,interfaces,extensionMembers) ::= <<

```

```

class <struct.name> extends <if(contextSuperClass)><contextSuperClass><else>antlr4.ParserRuleContext<endif> {

```

```

 constructor(parser, parent, invokingState<struct.ctorAttrs:{a | , <a.name>}> {

```

```

 if(parent===undefined) {

```

```

 parent = null;

```

```

 }

```

```

 if(invokingState===undefined || invokingState===null) {

```

```

 invokingState = -1;

```

```

 }

```

```

 super(parent, invokingState);

```

```

 this.parser = parser;

```

```

 this.ruleIndex = <parser.name>.RULE_<struct.derivedFromName>;

```

```

 <attrs:{a | <a>}; separator="\n">

```

```

 <struct.ctorAttrs:{a | this.<a.name> = <a.name> || null;}; separator="\n">

```

```

 }

```

```

 <getters:{g | <g>}; separator="\n\n">

```

```

 <if(struct.provideCopyFrom)> <! don't need copy unless we have subclasses !>

```

```

 copyFrom(ctx) {

```

```

 super.copyFrom(ctx);
 <struct.attrs:{ a | this.<a.name> = ctx.<a.name>; }; separator="\n">
 }
<endif>
<dispatchMethods; separator="\n">
<extensionMembers; separator="\n">

}

>>

```

```

AltLabelStructDecl(struct,attrs,getters,dispatchMethods) ::= <<
class <struct.name> extends <struct.parentRule; format="cap">Context {

 constructor(parser, ctx) {
 super(parser);
 <attrs:{ a | <a>; }; separator="\n">
 super.copyFrom(ctx);
 }

 <getters:{ g | <g>; }; separator="\n\n">

 <dispatchMethods; separator="\n">

 }

<! Define fields of this parser to export this struct/context class !>
<parser.name>.<struct.name> = <struct.name>;

>>

```

```

ListenerDispatchMethod(method) ::= <<
<if(method.isEnter)>enter<else>exit<endif>Rule(listener) {
 if(listener instanceof <parser.grammarName>Listener) {
 listener.<if(method.isEnter)>enter<else>exit<endif><struct.derivedFromName; format="cap">(this);
 }
}

>>

```

```

VisitorDispatchMethod(method) ::= <<
accept(visitor) {
 if (visitor instanceof <parser.grammarName>Visitor) {
 return visitor.visit<struct.derivedFromName; format="cap">(this);
 } else {
 return visitor.visitChildren(this);
 }
}

}

```

>>

```
AttributeDecl(d) ::= "this.<d.name> = <if(d.initValue)><d.initValue><else>null<endif>"
```

```
/** If we don't know location of label def x, use this template */
```

```
labelref(x) ::= "<if(!x.isLocal)>localctx.<endif><x.name>"
```

```
/** For any action chunk, what is correctly-typed context struct ptr? */
```

```
ctx(actionChunk) ::= "localctx"
```

```
// used for left-recursive rules
```

```
recRuleAltPredicate(ruleName,opPrec) ::= "this.precpred(this._ctx, <opPrec>)"
```

```
recRuleSetReturnAction(src,name) ::= "$<name>=$<src>.<name>"
```

```
recRuleSetStopToken() ::= "this._ctx.stop = this._input.LT(-1);"
```

```
recRuleAltStartAction(ruleName, ctxName, label) ::= <<
```

```
localctx = new <ctxName>Context(this, _parentctx, _parentState);
```

```
<if(label)>localctx.<label> = _prevctx;<endif>
```

```
this.pushNewRecursionContext(localctx, _startState, <parser.name>.RULE_<ruleName>);
```

```
>>
```

```
recRuleLabeledAltStartAction(ruleName, currentAltLabel, label, isListLabel) ::= <<
```

```
localctx = new <currentAltLabel; format="cap">Context(this, new <ruleName; format="cap">Context(this, _parentctx, _parentState));
```

```
<if(label)>
```

```
<if(isListLabel)>
```

```
localctx.<label>.push(_prevctx);
```

```
<else>
```

```
localctx.<label> = _prevctx;
```

```
<endif>
```

```
<endif>
```

```
this.pushNewRecursionContext(localctx, _startState, <parser.name>.RULE_<ruleName>);
```

```
>>
```

```
recRuleReplaceContext(ctxName) ::= <<
```

```
localctx = new <ctxName>Context(this, localctx);
```

```
this._ctx = localctx;
```

```
_prevctx = localctx;
```

```
>>
```

```
recRuleSetPrevCtx() ::= <<
```

```
if(this._parseListeners!=null) {
```

```
 this.triggerExitRuleEvent();
```

```
}
```

```
_prevctx = localctx;
```

```
>>
```

```

LexerFile(lexerFile, lexer, namedActions) ::= <<
<fileHeader(lexerFile.grammarFileName, lexerFile.ANTLRVersion)>
import antlr4 from 'antlr4';

<namedActions.header>

<lexer>

>>

Lexer(lexer, atn, actionFuncs, sempredFuncs, superClass) ::= <<
<if(superClass)>
import <superClass> from './<superClass>.js';
<endif>

<atn>

const atn = new antlr4.atn.ATNDeserializer().deserialize(serializedATN);

const decisionsToDFA = atn.decisionToState.map((ds, index) => new antlr4.dfa.DFA(ds, index));

export default class <lexer.name> extends <if(superClass)><superClass><else>antlr4.Lexer<endif> {

 static grammarFileName = "<lexer.grammarFileName>";
 static channelNames = ["DEFAULT_TOKEN_CHANNEL", "HIDDEN"<if (lexer.channels)>,
<lexer.channels:{c| "<c>"}; separator=", ", wrap, anchor><endif>];
 static modeNames = [<lexer.modes:{m| "<m>"}; separator=", ", wrap, anchor>];
 static literalNames = [<lexer.literalNames:{t| <t>}; null="null", separator=", ", wrap, anchor>];
 static symbolicNames = [<lexer.symbolicNames:{t| <t>}; null="null", separator=", ", wrap, anchor>];
 static ruleNames = [<lexer.ruleNames:{r| "<r>"}; separator=", ", wrap, anchor>];

 constructor(input) {
 super(input)
 this._interp = new antlr4.atn.LexerATNSimulator(this, atn, decisionsToDFA, new
antlr4.PredictionContextCache());
 <namedActions.members>
 }

 get atn() {
 return atn;
 }
}

<lexer.name>.EOF = antlr4.Token.EOF;
<if(lexer.tokens)>
<lexer.tokens:{k| <lexer.name>.<k> = <lexer.tokens.(k)>;}; separator="\n", wrap, anchor>
<endif>

```

```

<if(lexer.channels)>
<lexer.channels: {c| <lexer.name>.<c> = <lexer.channels.(c)>; separator="\n">

<endif>
<if(rest(lexer.modes))>
<rest(lexer.modes): {m| <lexer.name>.<m> = <i>; separator="\n">

<endif>

<dumpActions(lexer, "", actionFuncs, sempredFuncs)>

>>

```

```

SerializedATN(model) ::= <<
<! only one segment, can be inlined !>

```

```

const serializedATN = ["<model.serialized; wrap={", <\n> "}>"].join("");

```

```
>>
```

```

/** Using a type to init value map, try to init a type; if not in table
* must be an object, default value is "null".
*/

```

```

*/
initValue(typeName) ::= <<
<javascriptTypeInitMap.(typeName)>
>>

```

```
codeFileExtension() ::= ".js"
```

Found in path(s):

```
* /opt/cola/permits/1340816081_1654861722.3479369/0/antlr4-4-9-2-sources-1-
jar/org/antlr/v4/tool/templates/codegen/JavaScript/JavaScript.stg
```

No license file was found, but licenses were detected in source scan.

```
/*
```

```
[The "BSD licence"]
```

```
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```

```
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```

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\*/

/\*

This file contains the actual layout of the messages emitted by ANTLR.

The text itself is coming out of the languages/\*stg files, according to the chosen locale.

This file contains the default format ANTLR uses.

\*/

```
location(file, line, column) ::= "<file>(<line>,<column>)"
```

```
message(id, text) ::= "error <id> : <text>"
```

```
report(location, message, type) ::= "<location> : <type> <message.id> : <message.text>"
```

```
wantsSingleLineMessage() ::= "true"
```

Found in path(s):

```
* /opt/cola/permits/1340816081_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/tool/templates/messages/formats/vs2005.stg
```

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*/

```

```

/** ANTLR tool checks output templates are compatible with tool code generation.
* For now, a simple string match used on x.y of x.y.z scheme.
* Must match Tool.VERSION during load to templates.
*
* REQUIRED.
*/

```

```

pythonTypeInitMap ::= [
 "bool":"False",
 "int":"0",
 "float":"0.0",
 "str": "",
 default:"None" // anything other than a primitive type is an object
]

```

```

// args must be <object-model-object>, <fields-resulting-in-STs>

```

```

ParserFile(file, parser, namedActions, contextSuperClass) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
encoding: utf-8
from antlr4 import *
from io import StringIO
import sys
if sys.version_info[1] > 5:
 from typing import TextIO
else:
 from typing.io import TextIO

<namedActions.header>
<parser>

```

>>

```
ListenerFile(file, header, namedActions) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
from antlr4 import *
if __name__ is not None and "." in __name__:
 from .<file.parserName> import <file.parserName>
else:
 from <file.parserName> import <file.parserName>
<header>

This class defines a complete listener for a parse tree produced by <file.parserName>.
class <file.grammarName>Listener(ParseTreeListener):

 <file.listenerNames:{lname |
Enter a parse tree produced by <file.parserName>#<lname>.
def enter<lname; format="cap">(self, ctx:<file.parserName>.<lname; format="cap">Context):
 pass

Exit a parse tree produced by <file.parserName>#<lname>.
def exit<lname; format="cap">(self, ctx:<file.parserName>.<lname; format="cap">Context):
 pass

}; separator="\n">

del <file.parserName>
>>
```

```
VisitorFile(file, header, namedActions) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
from antlr4 import *
if __name__ is not None and "." in __name__:
 from .<file.parserName> import <file.parserName>
else:
 from <file.parserName> import <file.parserName>
<header>

This class defines a complete generic visitor for a parse tree produced by <file.parserName>.
class <file.grammarName>Visitor(ParseTreeVisitor):

 <file.visitorNames:{lname |
Visit a parse tree produced by <file.parserName>#<lname>.
def visit<lname; format="cap">(self, ctx:<file.parserName>.<lname; format="cap">Context):
 return self.visitChildren(ctx)

}; separator="\n">
```



```

del <file.parserName>
>>

fileHeader(grammarFileName, ANTLRVersion) ::= <<
Generated from <grammarFileName> by ANTLR <ANTLRVersion>
>>

Parser(parser, funcs, atn, sempredFuncs, superClass) ::= <<
<Parser_(ctor="parser_ctor", ...)>
>>

Parser_(parser, funcs, atn, sempredFuncs, ctor, superClass) ::= <<
<if(superClass)>
if __name__ is not None and "." in __name__:
 from .<superClass> import <superClass>
else:
 from <superClass> import <superClass>

<endif>
<atn>

class <parser.name> (<if(superClass)><superClass><else>Parser<endif>):

 grammarFileName = "<parser.grammarFileName>"

 atn = ATNDeserializer().deserialize(serializedATN())

 decisionsToDFA = [DFA(ds, i) for i, ds in enumerate(atn.decisionToState)]

 sharedContextCache = PredictionContextCache()

 literalNames = [<parser.literalNames:{t | <t>}; null="\\"<INVALID>\\"", separator=", ", wrap, anchor>]

 symbolicNames = [<parser.symbolicNames:{t | <t>}; null="\\"<INVALID>\\"", separator=", ", wrap, anchor>]

 <if(parser.rules)>
 <parser.rules:{r | RULE_<r.name> = <r.index>}; separator="\n", wrap, anchor>
 <endif>

 ruleNames = [<parser.ruleNames:{r | "<r>"}; separator=", ", wrap, anchor>]

 EOF = <TokenLabelType().EOF>
 <if(parser.tokens)>
 <parser.tokens:{k | <k>=<parser.tokens.(k)>}; separator="\n", wrap, anchor>
 <endif>

```

```

<parser:(ctor)()>

<namedActions.members>

<funcs; separator="\n">

<if(sempredFuncs)>
 def sempred(self, localctx:RuleContext, ruleIndex:int, predIndex:int):
 if self._predicates == None:
 self._predicates = dict()
<parser.sempredFuncs.values: { f |
 self._predicates[<f.ruleIndex>] = self.<f.name>_sempred }; separator="\n ">
 pred = self._predicates.get(ruleIndex, None)
 if pred is None:
 raise Exception("No predicate with index:" + str(ruleIndex))
 else:
 return pred(localctx, predIndex)

 <sempredFuncs.values; separator="\n">
<endif>

>>

dumpActions(recog, argFuncs, actionFuncs, sempredFuncs) ::= <<
<if(actionFuncs)>
def action(self, localctx:RuleContext, ruleIndex:int, actionIndex:int):
 if self._actions is None:
 actions = dict()
<recog.actionFuncs.values: { f |
 actions[<f.ruleIndex>] = self.<f.name>_action }; separator="\n">
 self._actions = actions
 action = self._actions.get(ruleIndex, None)
 if action is not None:
 action(localctx, actionIndex)
 else:
 raise Exception("No registered action for:" + str(ruleIndex))

<actionFuncs.values; separator="\n">

<endif>
<if(sempredFuncs)>
def sempred(self, localctx:RuleContext, ruleIndex:int, predIndex:int):
 if self._predicates is None:
 preds = dict()
<recog.sempredFuncs.values: { f |

```

```

 preds[<f.ruleIndex>] = self.<f.name>_sempred}; separator="\n">
 self._predicates = preds
 pred = self._predicates.get(ruleIndex, None)
 if pred is not None:
 return pred(localctx, predIndex)
 else:
 raise Exception("No registered predicate for:" + str(ruleIndex))

<sempredFuncs.values; separator="\n">
<endif>
>>

parser_ctor(p) ::= <<
def __init__(self, input:TokenStream, output:TextIO = sys.stdout):
 super().__init__(input, output)
 self.checkVersion("<file.ANTLRVersion>")
 self._interp = ParserATNSimulator(self, self.atn, self.decisionsToDFA, self.sharedContextCache)
 self._predicates = None

>>

/* This generates a private method since the actionIndex is generated, making an
* overriding implementation impossible to maintain.
*/
RuleActionFunction(r, actions) ::= <<

def <r.name>_action(self, localctx:<r.ctxType> , actionIndex:int):
<actions:{index|
<if(first(actions))>
 if actionIndex == <index>:
 <actions.(index)>
<elseif(rest(actions))>
 elif actionIndex == <index>:
 <actions.(index)>
<endif> }; separator="\n">
>>

/* This generates a private method since the predIndex is generated, making an
* overriding implementation impossible to maintain.
*/
RuleSempredFunction(r, actions) ::= <<
def <r.name>_sempred(self, localctx:<r.ctxType>, predIndex:int):
 <actions:{index|
<if(first(actions))>
 if predIndex == <index>:
 return <actions.(index)>
<elseif(rest(actions))>
 elif predIndex == <index>:

```

```

 return <actions.(index)>
<endif> }; separator="\n">

>>

RuleFunction(currentRule,args,code,locals,ruleCtx,altLabelCtxs,namedActions,finallyAction,postamble,exceptions)
::= <<

<ruleCtx>

<altLabelCtxs:{l | <altLabelCtxs.(l)>}; separator="\n">

def <currentRule.name>(self<currentRule.args:{a | , <a.name><if(a.type)>:<a.type><endif>}>):

 localctx = <parser.name>.<currentRule.ctxType>(self, self._ctx, self.state<currentRule.args:{a | , <a.name>}>)
 self.enterRule(localctx, <currentRule.startState>, self.RULE_<currentRule.name>)
 <namedActions.init>
 <locals; separator="\n">
 try:
 <code>
 <postamble; separator="\n">
 <namedActions.after>
 <if(exceptions)>
 <exceptions; separator="\n">
 <else>
 except RecognitionException as re:
 localctx.exception = re
 self._errHandler.reportError(self, re)
 self._errHandler.recover(self, re)
 <endif>
 finally:
 <finallyAction>
 self.exitRule()
 return localctx

>>

LeftRecursiveRuleFunction(currentRule,args,code,locals,ruleCtx,altLabelCtxs,
namedAction,finallyAction,postamble) ::=

<<

<ruleCtx>
<altLabelCtxs:{l | <altLabelCtxs.(l)>}; separator="\n">

def <currentRule.name>(self, _p:int=0<if(currentRule.args)>, <args:{a | , <a>}><endif>):
 _parentctx = self._ctx
 _parentState = self.state
 localctx = <parser.name>.<currentRule.ctxType>(self, self._ctx, _parentState<args:{a | , <a.name>}>)

```

```

_prevctx = localctx
_startState = <currentRule.startState>
self.enterRecursionRule(localctx, <currentRule.startState>, self.RULE_<currentRule.name>, _p)
<namedActions.init>
<locals; separator="\n">
try:
 <code>
 <postamble; separator="\n">
 <namedActions.after>
except RecognitionException as re:
 localctx.exception = re
 self._errHandler.reportError(self, re)
 self._errHandler.recover(self, re)
finally:
 <finallyAction>
 self.unrollRecursionContexts(_parentctx)
return localctx

>>

CodeBlockForOuterMostAlt(currentOuterMostAltCodeBlock, locals, preamble, ops) ::= <<
<if(currentOuterMostAltCodeBlock.altLabel)>localctx = <parser.name>.<currentOuterMostAltCodeBlock.altLabel;
format="cap">Context(self, localctx)<endif>
self.enterOuterAlt(localctx, <currentOuterMostAltCodeBlock.alt.altNum>)
<CodeBlockForAlt(currentAltCodeBlock=currentOuterMostAltCodeBlock, ...)>
>>

CodeBlockForAlt(currentAltCodeBlock, locals, preamble, ops) ::= <<
<locals; separator="\n">
<preamble; separator="\n">
<ops; separator="\n">
>>

LL1AltBlock(choice, preamble, alts, error) ::= <<
self.state = <choice.stateNumber>
self._errHandler.sync(self)
<if(choice.label)><labelref(choice.label)> = _input.LT(1)<endif>
<preamble; separator="\n">
token = self._input.LA(1)
<choice.altLook,alts:{look,alt| <cases(ttypes=look)>
 <alt>
 pass}; separator="\n1">
else:
 <error>

>>

LL1OptionalBlock(choice, alts, error) ::= <<

```

```

self.state = <choice.stateNumber>
self._errHandler.sync(self)
token = self._input.LA(1)
<choice.altLook,alts:{look,alt| <cases(ttypes=look)>
 <alt>
 pass}; separator="\n">
else:
 pass
>>

```

```

LL1OptionalBlockSingleAlt(choice, expr, alts, preamble, error, followExpr) ::= <<
self.state = <choice.stateNumber>
self._errHandler.sync(self)
<preamble; separator="\n">
if <expr>:
 <alts; separator="\n">

<!else if (!(<followExpr>) <error>!>
>>

```

```

LL1StarBlockSingleAlt(choice, loopExpr, alts, preamble, iteration) ::= <<
self.state = <choice.stateNumber>
self._errHandler.sync(self)
<preamble; separator="\n">
while <loopExpr>:
 <alts; separator="\n">
 self.state = <choice.loopBackStateNumber>
 self._errHandler.sync(self)
 <iteration>

>>

```

```

LL1PlusBlockSingleAlt(choice, loopExpr, alts, preamble, iteration) ::= <<
self.state = <choice.blockStartStateNumber> <! alt block decision !>
self._errHandler.sync(self)
<preamble; separator="\n">
while True:
 <alts; separator="\n">
 self.state = <choice.stateNumber> <! loopback/exit decision !>
 self._errHandler.sync(self)
 <iteration>
 if not (<loopExpr>):
 break

>>

```

```

// LL(*) stuff

```

```

AltBlock(choice, preamble, alts, error) ::= <<
self.state = <choice.stateNumber>
self._errHandler.sync(self)
<if(choice.label)><labelref(choice.label)> = _input.LT(1)<endif>
<preamble; separator="\n">
la_ = self._interp.adaptivePredict(self._input,<choice.decision>,self._ctx)
<alts:{ alt |
if la_ == <i>:
 <alt>
 pass
}; separator="\nel">

>>

```

```

OptionalBlock(choice, alts, error) ::= <<
self.state = <choice.stateNumber>
self._errHandler.sync(self)
la_ = self._interp.adaptivePredict(self._input,<choice.decision>,self._ctx)
<alts:{ alt |
if la_ == <i><if(!choice.ast.greedy)>+1<endif>:
 <alt>
}; separator="\nel">

>>

```

```

StarBlock(choice, alts, sync, iteration) ::= <<
self.state = <choice.stateNumber>
self._errHandler.sync(self)
_alt = self._interp.adaptivePredict(self._input,<choice.decision>,self._ctx)
while _alt!=<choice.exitAlt> and _alt!=ATN.INVALID_ALT_NUMBER:
 if _alt==1<if(!choice.ast.greedy)>+1<endif>:
 <iteration>
 <alts> <! should only be one !>
 self.state = <choice.loopBackStateNumber>
 self._errHandler.sync(self)
 _alt = self._interp.adaptivePredict(self._input,<choice.decision>,self._ctx)

>>

```

```

PlusBlock(choice, alts, error) ::= <<
self.state = <choice.blockStartStateNumber> <! alt block decision !>
self._errHandler.sync(self)
_alt = 1<if(!choice.ast.greedy)>+1<endif>
while _alt!=<choice.exitAlt> and _alt!=ATN.INVALID_ALT_NUMBER:
 <alts:{ alt|
if _alt == <i><if(!choice.ast.greedy)>+1<endif>:
 <alt>

```

```

}; separator="\nel">
 else:
 <error>
 self.state = <choice.loopBackStateNumber> <! loopback/exit decision !>
 self._errHandler.sync(self)
 _alt = self._interp.adaptivePredict(self._input,<choice.decision>,self._ctx)

>>

Sync(s) ::= "sync(<s.expecting.name>)"

ThrowNoViableAlt(t) ::= "raise NoViableAltException(self)"

TestSetInline(s) ::= <<
<s.bitsets:{bits | <if(rest(rest(bits.ttypes))>><bitsetBitfieldComparison(s, bits)><else><bitsetInlineComparison(s,
bits)><endif>}; separator=" or ">
>>

// Java language spec 15.19 - shift operators mask operands rather than overflow to 0... need range test
testShiftInRange(shiftAmount) ::= <<
((<shiftAmount>) & ~0x3f) == 0
>>

// produces smaller bytecode only when bits.ttypes contains more than two items
bitsetBitfieldComparison(s, bits) ::= <%
(<testShiftInRange({<offsetShiftVar(s.varName, bits.shift)>})> and ((1 \<< <offsetShiftVar(s.varName,
bits.shift)>) & (<bits.ttypes:{ttype | (1 \<< <offsetShiftType(ttype, bits.shift)>)); separator=" | ">)) != 0)
%>

isZero ::= [
"0":true,
default:false
]

offsetShiftVar(shiftAmount, offset) ::= <%
<if(!isZero.(offset))><shiftAmount> - <offset><else><shiftAmount><endif>
%>

offsetShiftType(shiftAmount, offset) ::= <%
<if(!isZero.(offset))><parser.name>.<shiftAmount> - <offset><else><parser.name>.<shiftAmount><endif>
%>

// produces more efficient bytecode when bits.ttypes contains at most two items
bitsetInlineComparison(s, bits) ::= <%
<bits.ttypes:{ttype | <s.varName>==<parser.name>.<ttype>}; separator=" or ">
%>

cases(ttypes) ::= <<

```



```
if token in [<ttypes:{t | <parser.name>.<t>}]; separator=", ">]:
```

```
>>
```

```
InvokeRule(r, argExprsChunks) ::= <<
```

```
self.state = <r.stateNumber>
```

```
<if(r.labels)><r.labels:{l | <labelref(l)> =
```

```
>><endif>self.<r.name>(<if(r.ast.options.p)><r.ast.options.p><if(argExprsChunks)><endif><endif><argExprsChunks>)
```

```
>>
```

```
MatchToken(m) ::= <<
```

```
self.state = <m.stateNumber>
```

```
<if(m.labels)><m.labels:{l | <labelref(l)> = }><endif>self.match(<parser.name>.<m.name>)
```

```
>>
```

```
MatchSet(m, expr, capture) ::= "<CommonSetStuff(m, expr, capture, false)>"
```

```
MatchNotSet(m, expr, capture) ::= "<CommonSetStuff(m, expr, capture, true)>"
```

```
CommonSetStuff(m, expr, capture, invert) ::= <<
```

```
self.state = <m.stateNumber>
```

```
<if(m.labels)><m.labels:{l | <labelref(l)> = }>self._input.LT(1)<endif>
```

```
<capture>
```

```
<if(invert)>if <m.varName> \<= 0 or <expr><else>if not(<expr>)<endif>:
```

```
<if(m.labels)><m.labels:{l | <labelref(l)> = }><else> <endif>self._errHandler.recoverInline(self)
```

```
else:
```

```
 self._errHandler.reportMatch(self)
```

```
 self.consume()
```

```
>>
```

```
Wildcard(w) ::= <<
```

```
self.state = <w.stateNumber>
```

```
<if(w.labels)><w.labels:{l | <labelref(l)> = }><endif>self.matchWildcard()
```

```
>>
```

```
// ACTION STUFF
```

```
Action(a, foo, chunks) ::= "<chunks>"
```

```
ArgAction(a, chunks) ::= "<chunks>"
```

```
SemPred(p, chunks, failChunks) ::= <<
```

```
self.state = <p.stateNumber>
```

```
if not <chunks>:
```

```
 from antlr4.error.Errors import FailedPredicateException
```

```
 raise FailedPredicateException(self, <p.predicate><if(failChunks)>, <failChunks><elseif(p.msg)>,</p.msg><endif>)
```

```
<p.msg><endif>)
```

```
>>
```

```

ExceptionClause(e, catchArg, catchAction) ::= <<
except <catchArg>:
 <catchAction>
>>

// lexer actions are not associated with model objects

LexerSkipCommand() ::= "skip()"
LexerMoreCommand() ::= "more()"
LexerPopModeCommand() ::= "popMode()"

LexerTypeCommand(arg, grammar) ::= "_type = <arg>"
LexerChannelCommand(arg, grammar) ::= "_channel = <arg>"
LexerModeCommand(arg, grammar) ::= "_mode = <arg>"
LexerPushModeCommand(arg, grammar) ::= "pushMode(<arg>)"

ActionText(t) ::= "<t.text>"
ActionTemplate(t) ::= "<t.st>"
ArgRef(a) ::= "localctx.<a.name>"
LocalRef(a) ::= "localctx.<a.name>"
RetValRef(a) ::= "localctx.<a.name>"
QRetValRef(a) ::= "<ctx(a)>.<a.dict>.<a.name>"
/** How to translate $tokenLabel */
TokenRef(t) ::= "<ctx(t)>.<t.name>"
LabelRef(t) ::= "<ctx(t)>.<t.name>"
ListLabelRef(t) ::= "<ctx(t)>.<ListLabelName(t.name)>"
SetAttr(s,rhsChunks) ::= "<ctx(s)>.<s.name> = <rhsChunks>"

TokenLabelType() ::= "<file.TokenLabelType; null={Token}>"
InputSymbolType() ::= "<file.InputSymbolType; null={Token}>"

TokenPropertyRef_text(t) ::= "(None if <ctx(t)>.<t.label> is None else <ctx(t)>.<t.label>.text)"
TokenPropertyRef_type(t) ::= "(0 if <ctx(t)>.<t.label> is None else <ctx(t)>.<t.label>.type)"
TokenPropertyRef_line(t) ::= "(0 if <ctx(t)>.<t.label> is None else <ctx(t)>.<t.label>.line)"
TokenPropertyRef_pos(t) ::= "(0 if <ctx(t)>.<t.label> is None else <ctx(t)>.<t.label>.column)"
TokenPropertyRef_channel(t) ::= "(0 if <ctx(t)>.<t.label> is None else <ctx(t)>.<t.label>.channel)"
TokenPropertyRef_index(t) ::= "(0 if <ctx(t)>.<t.label> is None else <ctx(t)>.<t.label>.tokenIndex)"
TokenPropertyRef_int(t) ::= "(0 if <ctx(t)>.<t.label> is None else int(<ctx(t)>.<t.label>.text))"

RulePropertyRef_start(r) ::= "(None if <ctx(r)>.<r.label> is None else <ctx(r)>.<r.label>.start)"
RulePropertyRef_stop(r) ::= "(None if <ctx(r)>.<r.label> is None else <ctx(r)>.<r.label>.stop)"
RulePropertyRef_text(r) ::= "(None if <ctx(r)>.<r.label> is None else
self._input.getText(<ctx(r)>.<r.label>.start,<ctx(r)>.<r.label>.stop))"
RulePropertyRef_ctx(r) ::= "<ctx(r)>.<r.label>"
RulePropertyRef_parser(r) ::= "self"

ThisRulePropertyRef_start(r) ::= "localctx.start"

```

```

ThisRulePropertyRef_stop(r) ::= "localctx.stop"
ThisRulePropertyRef_text(r) ::= "self._input.getText(localctx.start, self._input.LT(-1))"
ThisRulePropertyRef_ctx(r) ::= "localctx"
ThisRulePropertyRef_parser(r) ::= "self"

NonLocalAttrRef(s) ::= "self.getInvokingContext(<s.ruleIndex>).<s.name>"
SetNonLocalAttr(s, rhsChunks) ::= "self.getInvokingContext(<s.ruleIndex>).<s.name> = <rhsChunks>"

AddToLabelList(a) ::= "<ctx(a.label)>.<a.listName>.append(<labelref(a.label)>)"

TokenDecl(t) ::= "self.<t.name> = None # <TokenLabelType()>"
TokenTypeDecl(t) ::= "self.<t.name> = 0 # <TokenLabelType()> type"
TokenListDecl(t) ::= "self.<t.name> = list() # of <TokenLabelType()>s"
RuleContextDecl(r) ::= "self.<r.name> = None # <r.ctxName>"
RuleContextListDecl(rdecl) ::= "self.<rdecl.name> = list() # of <rdecl.ctxName>s"

ContextTokenGetterDecl(t) ::= <<
def <t.name>(self):
 return self.getToken(<parser.name>.<t.name>, 0)
>>

// should never be called
ContextTokenListGetterDecl(t) ::= <<
def <t.name>_list(self):
 return self.getTokens(<parser.name>.<t.name>)
>>

ContextTokenListIndexedGetterDecl(t) ::= <<
def <t.name>(self, i:int=None):
 if i is None:
 return self.getTokens(<parser.name>.<t.name>)
 else:
 return self.getToken(<parser.name>.<t.name>, i)
>>

ContextRuleGetterDecl(r) ::= <<
def <r.name>(self):
 return self.getTypedRuleContext(<parser.name>.<r.ctxName>,0)
>>

// should never be called
ContextRuleListGetterDecl(r) ::= <<
def <r.name>_list(self):
 return self.getTypedRuleContexts(<parser.name>.<r.ctxName>)
>>

```

```

ContextRuleListIndexedGetterDecl(r) ::= <<
def <r.name>(self, i:int=None):
 if i is None:
 return self.getTypedRuleContexts(<parser.name>.<r.ctxName>)
 else:
 return self.getTypedRuleContext(<parser.name>.<r.ctxName>,i)

>>

LexerRuleContext() ::= "RuleContext"

/** The rule context name is the rule followed by a suffix; e.g.,
 * r becomes rContext.
 */
RuleContextNameSuffix() ::= "Context"

ImplicitTokenLabel(tokenName) ::= "_<tokenName>"
ImplicitRuleLabel(ruleName) ::= "_<ruleName>"
ImplicitSetLabel(id) ::= "_tset<id>"
ListLabelName(label) ::= "<label>"

CaptureNextToken(d) ::= "<d.varName> = self._input.LT(1)"
CaptureNextTokenType(d) ::= "<d.varName> = self._input.LA(1)"

StructDecl(struct,ctorAttrs,attrs, getters,dispatchMethods,interfaces,extensionMembers) ::= <<
class <struct.name>(<if(contextSuperClass)><contextSuperClass><else>ParserRuleContext<endif>):
 __slots__ = 'parser'

 def __init__(self, parser, parent:ParserRuleContext=None, invokingState:int=-1<struct.ctorAttrs:{ a | ,
<a.name><if(a.type)>:<a.type><endif>=None }>):
 super().__init__(parent, invokingState)
 self.parser = parser
 <attrs:{ a | <a> }; separator="\n">
 <struct.ctorAttrs:{ a | self.<a.name> = <a.name> }; separator="\n">

 <getters:{ g | <g> }; separator="\n\n">

 def getRuleIndex(self):
 return <parser.name>.RULE_<struct.derivedFromName>

<if(struct.provideCopyFrom)> <! don't need copy unless we have subclasses !>
 def copyFrom(self, ctx:ParserRuleContext):
 super().copyFrom(ctx)
 <struct.attrs:{ a | self.<a.name> = ctx.<a.name> }; separator="\n">

<endif>
<dispatchMethods; separator="\n">
<extensionMembers; separator="\n">

```

>>

```
AltLabelStructDecl(struct,attrs, getters,dispatchMethods) ::= <<
class <struct.name><(currentRule.name; format="cap">Context):
```

```
 def __init__(self, parser, ctx:ParserRuleContext): # actually a <parser.name>.<currentRule.name;
format="cap">Context
```

```
 super().__init__(parser)
 <attrs:{ a | <a>}; separator="\n">
 self.copyFrom(ctx)
```

```
 <getters:{ g | <g>}; separator="\n">
```

```
 <dispatchMethods; separator="\n">
```

>>

```
ListenerDispatchMethod(method) ::= <<
```

```
def <if(method.isEnter)>enter<else>exit<endif>Rule(self, listener:ParseTreeListener):
```

```
 if hasattr(listener, "<if(method.isEnter)>enter<else>exit<endif><struct.derivedFromName; format="cap">"):
 listener.<if(method.isEnter)>enter<else>exit<endif><struct.derivedFromName; format="cap">(self)
```

>>

```
VisitorDispatchMethod(method) ::= <<
```

```
def accept(self, visitor:ParseTreeVisitor):
```

```
 if hasattr(visitor, "visit<struct.derivedFromName; format="cap">"):
 return visitor.visit<struct.derivedFromName; format="cap">(self)
```

```
 else:
```

```
 return visitor.visitChildren(self)
```

>>

```
AttributeDecl(d) ::= "self.<d.name> = <if(d.initValue)><d.initValue><else>None<endif>"
```

```
/** If we don't know location of label def x, use this template */
```

```
labelref(x) ::= "<if(!x.isLocal)>localctx.<endif><x.name>"
```

```
/** For any action chunk, what is correctly-typed context struct ptr? */
```

```
ctx(actionChunk) ::= "localctx"
```

```
// used for left-recursive rules
```

```
recRuleAltPredicate(ruleName,opPrec) ::= "self.precpred(self._ctx, <opPrec>)"
```

```
recRuleSetReturnAction(src,name) ::= "$<name>=<src>.<name>"
```

```
recRuleSetStopToken() ::= "self._ctx.stop = self._input.LT(-1)"
```

```
recRuleAltStartAction(ruleName, ctxName, label) ::= <<
```

```

localctx = <parser.name>.<ctxName>Context(self, _parentctx, _parentState)
<if(label)>localctx.<label> = _prevctx<endif>
self.pushNewRecursionContext(localctx, _startState, self.RULE_<ruleName>)
>>

```

```

recRuleLabeledAltStartAction(ruleName, currentAltLabel, label, isListLabel) ::= <<
localctx = <parser.name>.<currentAltLabel; format="cap">Context(self, <parser.name>.<ruleName;
format="cap">Context(self, _parentctx, _parentState))
<if(label)>
<if(isListLabel)>
localctx.<label>.append(_prevctx)
<else>
localctx.<label> = _prevctx
<endif>
<endif>
self.pushNewRecursionContext(localctx, _startState, self.RULE_<ruleName>)
>>

```

```

recRuleReplaceContext(ctxName) ::= <<
localctx = <parser.name>.<ctxName>Context(self, localctx)
self._ctx = localctx
_prevctx = localctx
>>

```

```

recRuleSetPrevCtx() ::= <<
if self._parseListeners is not None:
 self.triggerExitRuleEvent()
_prevctx = localctx
>>

```

```

LexerFile(lexerFile, lexer, namedActions) ::= <<
<fileHeader(lexerFile.grammarFileName, lexerFile.ANTLRVersion)>
from antlr4 import *
from io import StringIO
import sys
if sys.version_info[1] > 5:
 from typing import TextIO
else:
 from typing.io import TextIO

<namedActions.header>

<lexer>
>>

```

```

Lexer(lexer, atn, actionFuncs, sempredFuncs, superClass) ::= <<
<if(superClass)>

```

```

if __name__ is not None and "." in __name__:
 from .<superClass> import <superClass>
else:
 from <superClass> import <superClass>

<endif>
<atn>

class <lexer.name>(<if(superClass)><superClass><else>Lexer<endif>):

 atn = ATNDeserializer().deserialize(serializedATN())

 decisionsToDFA = [DFA(ds, i) for i, ds in enumerate(atn.decisionToState)]

<if(lexer.channels)>
 <lexer.channels:{c| <c> = <lexer.channels.(c)>}; separator="\n">

<endif>
<if(rest(lexer.modes)>
 <rest(lexer.modes):{m| <m> = <i>}; separator="\n">

<endif>
<if(lexer.tokens)>
 <lexer.tokens:{k | <k> = <lexer.tokens.(k)>}; separator="\n", wrap, anchor>
<endif>

 channelNames = [u"DEFAULT_TOKEN_CHANNEL", u"HIDDEN"<if (lexer.channels)>, <lexer.channels:{c|
u"<c>"; separator=", ", wrap, anchor><endif>]

 modeNames = [<lexer.modes:{m| "<m>"}; separator=", ", wrap, anchor>]

 literalNames = ["\<INVALID>",
 <lexer.literalNames:{t | <t>}; separator=", ", wrap, anchor>]

 symbolicNames = ["\<INVALID>",
 <lexer.symbolicNames:{t | <t>}; separator=", ", wrap, anchor>]

 ruleNames = [<lexer.ruleNames:{r | "<r>"}; separator=", ", wrap, anchor>]

 grammarFileName = "<lexer.grammarFileName>"

def __init__(self, input=None, output:TextIO = sys.stdout):
 super().__init__(input, output)
 self.checkVersion("<lexerFile.ANTLRVersion>")
 self._interp = LexerATNSimulator(self, self.atn, self.decisionsToDFA, PredictionContextCache())
 self._actions = None
 self._predicates = None

```

```

<namedActions.members>

<dumpActions(lexer, "", actionFuncs, sempredFuncs)>

>>

SerializedATN(model) ::= <<
<! only one segment, can be inlined !>

def serializedATN():
 with StringIO() as buf:
 buf.write("<model.serialized; wrap={ }<\n> buf.write("}>")
 return buf.getvalue()

>>

/** Using a type to init value map, try to init a type; if not in table
 * must be an object, default value is "null".
 */
initValue(typeName) ::= <<
<pythonTypeInitMap.(typeName)>
>>

codeFileExtension() ::= ".py"

Found in path(s):
* /opt/cola/permits/1340816081_1654861722.3479369/0/antlr4-4-9-2-sources-1-
jar/org/antlr/v4/tool/templates/codegen/Python3/Python3.stg
No license file was found, but licenses were detected in source scan.

/*
 * [The "BSD license"]
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 */

```



```

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* THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.
*/

```

```
lexer grammar ActionSplitter;
```

```
options { filter=true; }
```

```
@header {
package org.antlr.v4.parse;
import org.antlr.v4.tool.*;
import org.antlr.v4.tool.ast.*;
}

```

```
@members {
ActionSplitterListener delegate;

```

```
public ActionSplitter(CharStream input, ActionSplitterListener delegate) {
 this(input, new RecognizerSharedState());
 this.delegate = delegate;
}

```

```
/** force filtering (and return tokens). triggers all above actions. */
```

```
public List<Token> getActionTokens() {
 List<Token> chunks = new ArrayList<Token>();
 Token t = nextToken();
 while (t.getType()!=Token.EOF) {
 chunks.add(t);
 t = nextToken();
 }
 return chunks;
}

```

```
private boolean isIDStartChar(int c) {
 return c == '_' || Character.isLetter(c);
}
}

```

```
// ignore comments right away
```

## COMMENT

```
: /*' (options {greedy=false;} : .)* /*' {delegate.text($text);}
;
```

## LINE\_COMMENT

```
: /*' ~(\n|\r)* \r? \n' {delegate.text($text);}
;
```

## SET\_NONLOCAL\_ATTR

```
: '$ x=ID ':' y=ID WS? '=' expr=ATTR_VALUE_EXPR ';'
{
 delegate.setNonLocalAttr($text, $x, $y, $expr);
}
;
```

## NONLOCAL\_ATTR

```
: '$ x=ID ':' y=ID {delegate.nonLocalAttr($text, $x, $y);}
;
```

## QUALIFIED\_ATTR

```
: '$ x=ID '!' y=ID {input.LA(1)!='('}? {delegate.qualifiedAttr($text, $x, $y);}
;
```

## SET\_ATTR

```
: '$ x=ID WS? '=' expr=ATTR_VALUE_EXPR ';'
{
 delegate.setAttr($text, $x, $expr);
}
;
```

## ATTR

```
: '$ x=ID {delegate.attr($text, $x);}
;
```

// Anything else is just random text

## TEXT

```
@init {StringBuilder buf = new StringBuilder();}
@after {delegate.text(buf.toString());}
: (c~(\\| '$) {buf.append((char)$c);}
 | \\$' {buf.append('$);}
 | \\ ' c~('$) {buf.append('\\').append((char)$c);}
 | {!isIDStartChar(input.LA(2))}? => '$' {buf.append('$);}
)+
;
```

## fragment

```
ID : ('a..'z'|'A..'Z'|'_') ('a..'z'|'A..'Z'|'0'..'9'|'_')*
;
```

```
/** Don't allow an = as first char to prevent $x == 3; kind of stuff. */
```

```
fragment
```

```
ATTR_VALUE_EXPR
```

```
: ~'= (~';)*
```

```
;
```

```
fragment
```

```
WS : ('\t'|\n'|\r')+;
```

Found in path(s):

```
* /opt/cola/permits/1340816081_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/parse/ActionSplitter.g
```

No license file was found, but licenses were detected in source scan.

```
/*
```

```
* [The "BSD license"]
```

```
* Copyright (c) 2016, Mike Lischke
```

```
* All rights reserved.
```

```
*
```

```
* Redistribution and use in source and binary forms, with or without
```

```
* modification, are permitted provided that the following conditions
```

```
* are met:
```

```
*
```

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* NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE,
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* DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY
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```

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* (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF
```

```
* THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.
```

```
*/
```

Found in path(s):

```
* /opt/cola/permits/1340816081_1654861722.3479369/0/antlr4-4-9-2-sources-1-jar/org/antlr/v4/tool/templates/codegen/Cpp/Files.stg
```

No license file was found, but licenses were detected in source scan.

```
/*
 * [The "BSD license"]
 * Copyright (c) 2012-2016 Terence Parr
 * Copyright (c) 2012-2016 Sam Harwell
 * Copyright (c) 2015 Janyou
 * All rights reserved.
 *
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 * modification, are permitted provided that the following conditions
 * are met:
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 * THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT
 * (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF
 * THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.
 */
```

```
SwiftTypeInitMap ::= [
 "Int": "0",
 "Int64": "0",
 "Float": "0.0",
 "Double": "0.0",
 "Bool": "false",
 default: "nil" // anything other than a primitive type is an object
]
SwiftTypeMap ::= [
 "int": "Int",
 "float": "Float",
 "long": "Int64",
 "double": "Double",
 "bool": "Bool",
 "boolean": "Bool",
```

```

default : key
]
// args must be <object-model-object>, <fields-resulting-in-STs>

accessLevelOpenOK(obj) ::= "<obj.accessLevel; null=\"open\">"
accessLevelNotOpen(obj) ::= "<obj.accessLevel; null=\"public\">"

```

```

ParserFile(file, parser, namedActions, contextSuperClass) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
<if(file.genPackage)>
<!package <file.genPackage>;!>
<endif>
<namedActions.header>
import Antlr4

<parser>
>>

```

```

ListenerFile(file, header, namedActions) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
<if(file.genPackage)>
<!package <file.genPackage>;!>
<endif>
<header>
import Antlr4

```

```

/**
 * This interface defines a complete listener for a parse tree produced by
 * { @link <file.parserName> }.
 */
<accessLevelNotOpen(file)> protocol <file.grammarName>Listener: ParseTreeListener {
 <file.listenerNames: {lname |
/**
 <if(file.listenerLabelRuleNames.(lname))>
 * Enter a parse tree produced by the { @code <lname> \}
 * labeled alternative in { @link <file.parserName> #<file.listenerLabelRuleNames.(lname)> \}.
 <else>
 * Enter a parse tree produced by { @link <file.parserName> #<lname> \}.
 <endif>
 - Parameters:
 - ctx: the parse tree
 */
 func enter<lname; format="cap">(_ ctx: <file.parserName>.<lname; format="cap">Context)
/**
 <if(file.listenerLabelRuleNames.(lname))>
 * Exit a parse tree produced by the { @code <lname> \}
 * labeled alternative in { @link <file.parserName> #<file.listenerLabelRuleNames.(lname)> \}.
 <else>

```

```

* Exit a parse tree produced by { @link <file.parserName>#<lname>\}.
<endif>
- Parameters:
 - ctx: the parse tree
*/
func exit<lname; format="cap">(_ ctx: <file.parserName>.<lname; format="cap">Context)); separator="\n">
}
>>

```

```

BaseListenerFile(file, header, namedActions) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
<if(file.genPackage)>
<!package <file.genPackage>;!>
<endif>
<header>

```

```

import Antlr4

```

```

/**
 * This class provides an empty implementation of { @link <file.grammarName>Listener},
 * which can be extended to create a listener which only needs to handle a subset
 * of the available methods.
 */
<accessLevelOpenOK(file)> class <file.grammarName>BaseListener: <file.grammarName>Listener {
 <accessLevelNotOpen(file)> init() { \}
 <file.listenerNames: {lname |

/**
 * { @inheritDoc\}
 *
 * \<p>The default implementation does nothing.\</p>
 */
<accessLevelOpenOK(file)> func enter<lname; format="cap">(_ ctx: <file.parserName>.<lname;
format="cap">Context) { \}
/**
 * { @inheritDoc\}
 *
 * \<p>The default implementation does nothing.\</p>
 */
<accessLevelOpenOK(file)> func exit<lname; format="cap">(_ ctx: <file.parserName>.<lname;
format="cap">Context) { \} }; separator="\n">

/**
 * { @inheritDoc\}
 *
 * \<p>The default implementation does nothing.\</p>
 */

```

```

<accessLevelOpenOK(file)> func enterEveryRule(_ ctx: ParserRuleContext) throws { }
/**
 * { @inheritDoc\}
 *
 * \<p>The default implementation does nothing.\</p>
 */
<accessLevelOpenOK(file)> func exitEveryRule(_ ctx: ParserRuleContext) throws { }
/**
 * { @inheritDoc\}
 *
 * \<p>The default implementation does nothing.\</p>
 */
<accessLevelOpenOK(file)> func visitTerminal(_ node: TerminalNode) { }
/**
 * { @inheritDoc\}
 *
 * \<p>The default implementation does nothing.\</p>
 */
<accessLevelOpenOK(file)> func visitErrorNode(_ node: ErrorNode) { }
}
>>

```

```

VisitorFile(file, header, namedActions) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
<if(file.genPackage)>
<!package <file.genPackage>;!>
<endif>
<header>
import Antlr4

/**
 * This interface defines a complete generic visitor for a parse tree produced
 * by { @link <file.parserName>}.
 *
 * @param \<T> The return type of the visit operation. Use { @link Void} for
 * operations with no return type.
 */
<accessLevelOpenOK(file)> class <file.grammarName>Visitor\<T>: ParseTreeVisitor\<T> {
 <file.visitorNames:{Iname |
/**
<if(file.visitorLabelRuleNames.(Iname))>
 * Visit a parse tree produced by the { @code <Iname>}
 * labeled alternative in { @link <file.parserName>##<file.visitorLabelRuleNames.(Iname)>\}.
<else>
 * Visit a parse tree produced by { @link <file.parserName>##<Iname>\}.
<endif>
- Parameters:
- ctx: the parse tree

```

```

- returns: the visitor result
*/
<accessLevelOpenOK(file)> func visit<lname; format="cap">(_ ctx: <file.parserName>.<lname;
format="cap">Context) -> T {
 fatalError("#function + " must be overridden")
}
}; separator="\n">
}
>>

BaseVisitorFile(file, header, namedActions) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
<if(file.genPackage)>
<!package <file.genPackage>;!>
<endif>
<header>
import Antlr4

/**
 * This class provides an empty implementation of { @link <file.grammarName>Visitor},
 * which can be extended to create a visitor which only needs to handle a subset
 * of the available methods.
 *
 * @param <T> The return type of the visit operation. Use { @link Void} for
 * operations with no return type.
 */
<accessLevelOpenOK(file)> class <file.grammarName>BaseVisitor<T>: AbstractParseTreeVisitor<T> {
 <file.visitorNames:{ lname |
/**
 * { @inheritDoc\}
 *
 * \<p>The default implementation returns the result of calling
 * { @link #visitChildren\} on { @code ctx\}.\</p>
 */
<accessLevelOpenOK(file)> func visit<lname; format="cap">(_ ctx: <file.parserName>.<lname;
format="cap">Context) -> T? { return visitChildren(ctx) \}}; separator="\n">
}
>>

fileHeader(grammarFileName, ANTLRVersion) ::= <<
// Generated from <grammarFileName; format="java-escape"> by ANTLR <ANTLRVersion>
>>

Parser(parser, funcs, atn, sempredFuncs, superClass) ::= <<
<Parser(ctor="parser_ctor", ...)>
>>

Parser_(parser, funcs, atn, sempredFuncs, ctor, superClass) ::= <<

```



```

<!--@SuppressWarnings({"all", "warnings", "unchecked", "unused", "cast"})!>
<accessLevelOpenOK(parser)> class <parser.name>: <superClass; null="Parser"> {

internal static var _decisionToDFA: [DFA] = {
 var decisionToDFA = [DFA]()
 let length = <parser.name>._ATN.getNumberOfDecisions()
 for i in 0..

```

```

<parser:(ctor)()>
<funcs; separator="\n">

<if(sempredFuncs)>
override <accessLevelOpenOK(parser)>
func sempred(_ _localctx: RuleContext?, _ ruleIndex: Int, _ predIndex: Int) throws -> Bool {
 switch (ruleIndex) {
 <parser.sempredFuncs.values: {f}
case <f.ruleIndex>:
return try <f.name>_sempred(_localctx?.castdown(<f.ctxType>.self), predIndex)); separator="\n">
 default: return true
 }
 <!return true;!>
 }
 <sempredFuncs.values; separator="\n">
<endif>

<atn>

<accessLevelNotOpen(parser)>
static let _serializedATN = <parser.name>ATN().jsonString

<accessLevelNotOpen(parser)>
static let _ATN = ATNDeserializer().deserializeFromJson(_serializedATN)
}
>>

vocabulary(literalNames, symbolicNames, accessLevel) ::= <<
private static let _LITERAL_NAMES: [String?] = [
 <literalNames: {t | <t>}; null="nil", separator=", ", wrap, anchor>
]
private static let _SYMBOLIC_NAMES: [String?] = [
 <symbolicNames: {t | <t>}; null="nil", separator=", ", wrap, anchor>
]
<accessLevel>
static let VOCABULARY = Vocabulary(_LITERAL_NAMES, _SYMBOLIC_NAMES)
>>

dumpActions(recog, argFuncs, actionFuncs, sempredFuncs) ::= <<
<if(actionFuncs)>
override <accessLevelOpenOK(parser)>
func action(_ _localctx: RuleContext?, _ ruleIndex: Int, _ actionIndex: Int) throws {
 switch (ruleIndex) {
 <recog.actionFuncs.values: {f}
case <f.ruleIndex>:
 <f.name>_action((_localctx as <f.ctxType>?), actionIndex)
 }; separator="\n">
 default: break
 }
}

```

```

}
}
<actionFuncs.values; separator="\n">
<endif>
<if(sempredFuncs)>
override <accessLevelOpenOK(parser)>
func sempred(_ _localctx: RuleContext?, _ ruleIndex: Int, _ predIndex: Int) throws -> Bool {
switch (ruleIndex) {
<recog.sempredFuncs.values: {f|
case <f.ruleIndex>:
return try <f.name>_sempred(_localctx?.castdown(<f.ctxType>.self), predIndex)); separator="\n">
default: return true
}
<!return true;!>
}
<sempredFuncs.values; separator="\n">
<endif>
>>

```

```

parser_ctor(p) ::= <<

```

```

override <accessLevelOpenOK(parser)>
func getVocabulary() -> Vocabulary {
return <p.name>.VOCABULARY
}

```

```

override <accessLevelNotOpen(parser)>
init(_ input:TokenStream) throws {
RuntimeMetaData.checkVersion("4.9.2", RuntimeMetaData.VERSION)
try super.init(input)
_interp = ParserATNSimulator(self,<p.name>._ATN,<p.name>._decisionToDFA,
<parser.name>._sharedContextCache)
}

```

```

>>

```

```

/* This generates a private method since the actionIndex is generated, making an
* overriding implementation impossible to maintain.
*/

```

```

*/

```

```

RuleActionFunction(r, actions) ::= <<
private func <r.name>_action(_ _localctx: <r.ctxType>?, _ actionIndex: Int) {
switch (actionIndex) {
<actions: {index|
case <index>:
<actions.(index)>
}; separator="\n">
default: break
}
}

```

```

}
>>

/* This generates a private method since the predIndex is generated, making an
 * overriding implementation impossible to maintain.
 */
RuleSempredFunction(r, actions) ::= <<
private func <r.name>_sempred(_localctx: <r.ctxType>!, _predIndex: Int) throws -> Bool {
switch (predIndex) {
<actions:{index|
case <index>:return <actions.(index)>; separator="\n">
default: return true
}
<!return true;!>
}
}
>>

RuleFunction(currentRule,args,code,locals,ruleCtx,altLabelCtxs,namedActions,finallyAction,postamble,exceptions)
::= <<
<ruleCtx>
<altLabelCtxs:{l | <altLabelCtxs.(l)>; separator="\n">
@discardableResult
<if(currentRule.modifiers)><currentRule.modifiers:{f | <f> }><else> <accessLevelOpenOK(parser)> func
<endif><currentRule.name><(if(first(args))>_ <endif><args; separator=", _">) throws -> <currentRule.ctxType> {
var _localctx: <currentRule.ctxType> = <currentRule.ctxType>(_ctx, getState())<currentRule.args:{a | ,
<a.name>}>>)
try enterRule(_localctx, <currentRule.startState>, <parser.name>.RULE_<currentRule.name>)
<namedActions.init>
<locals; separator="\n">
defer {
<finallyAction>
try! exitRule()
}
do {
<if(currentRule.hasLookaheadBlock)>
var _alt:Int
<endif>
<code>
<postamble; separator="\n">
<namedActions.after>
}
<if(exceptions)>
<exceptions; separator="\n">
<else>
catch ANTLRException.recognition(let re) {
_localctx.exception = re
_errHandler.reportError(self, re)
try _errHandler.recover(self, re)

```

```

}
<endif>

return _localctx
}
>>

LeftRecursiveRuleFunction(currentRule,args,code,locals,ruleCtx,altLabelCtxs,
namedActions,finallyAction,postamble) ::=
<<

<ruleCtx>
<altLabelCtxs:{l | <altLabelCtxs.(l)>}; separator="\n">

<if(currentRule.modifiers)><currentRule.modifiers:{f | <f> }><else> <accessLevelNotOpen(parser)> final <endif>
func <currentRule.name>(<if(first(args))>_ <endif><args; separator=", _">) throws -> <currentRule.ctxType> {
return try <currentRule.name>(0<currentRule.args:{a | , <a.name>}>)
}
@discardableResult
private func <currentRule.name>(_p<args:{a | , <a>}>: Int) throws -> <currentRule.ctxType> {
let _parentctx: ParserRuleContext? = _ctx
let _parentState: Int = getState()
var _localctx: <currentRule.ctxType> = <currentRule.ctxType>(_ctx, _parentState<currentRule.args:{a | ,
<a.name>}>)
var _prevctx: <currentRule.ctxType> = _localctx
let _startState: Int = <currentRule.startState>
try enterRecursionRule(_localctx, <currentRule.startState>, <parser.name>.RULE_<currentRule.name>, _p)
<namedActions.init>
<locals; separator="\n">
defer {
<finallyAction>
try! unrollRecursionContexts(_parentctx)
}
do {
<if(currentRule.hasLookaheadBlock)>
var _alt: Int
<endif>
<code>
<postamble; separator="\n">
<namedActions.after>
}
catch ANTLRException.recognition(let re) {
_localctx.exception = re
_errHandler.reportError(self, re)
try _errHandler.recover(self, re)
}

return _localctx;

```

```
}
>>
```

```
CodeBlockForOuterMostAlt(currentOuterMostAltCodeBlock, locals, preamble, ops) ::= <<
<if(currentOuterMostAltCodeBlock.altLabel)>_localctx = <currentOuterMostAltCodeBlock.altLabel;
format="cap">Context(_localctx);<endif>
try enterOuterAlt(_localctx, <currentOuterMostAltCodeBlock.alt.altNum>)
<CodeBlockForAlt(currentAltCodeBlock=currentOuterMostAltCodeBlock, ...)>
>>
```

```
CodeBlockForAlt(currentAltCodeBlock, locals, preamble, ops) ::= <<
<!/{!>
<locals; separator="\n">
<preamble; separator="\n">
<ops; separator="\n">
<!/{}!>
>>
```

```
LL1AltBlock(choice, preamble, alts, error) ::= <<
setState(<choice.stateNumber>)
try _errHandler.sync(self)
<if(choice.label)><labelref(choice.label)> = try _input.LT(1)<endif>
<preamble; separator="\n">
switch (<parser.name>.Tokens(rawValue: try _input.LA(1))!) {
<choice.altLook,alts:{look,alt | <cases(ttypes=look)>
<alt>
break}; separator="\n">
default:
<error>
}
>>
```

```
LL1OptionalBlock(choice, alts, error) ::= <<
setState(<choice.stateNumber>)
try _errHandler.sync(self)
switch (<parser.name>.Tokens(rawValue: try _input.LA(1))!) {
<choice.altLook,alts:{look,alt | <cases(ttypes=look)>
<alt>
break}; separator="\n">
default:
break
}
>>
```

```
LL1OptionalBlockSingleAlt(choice, expr, alts, preamble, error, followExpr) ::= <<
setState(<choice.stateNumber>)
try _errHandler.sync(self)
<preamble; separator="\n">
```

```

if (<expr>) {
 <alts; separator="\n">
}
<!else if (!(<followExpr>) <error!>
>>

```

```

LL1StarBlockSingleAlt(choice, loopExpr, alts, preamble, iteration) ::= <<
 setState(<choice.stateNumber>)
 try _errHandler.sync(self)
 <preamble; separator="\n">
 while (<loopExpr>) {
 <alts; separator="\n">
 setState(<choice.loopBackStateNumber>)
 try _errHandler.sync(self)
 <iteration>
 }
>>

```

```

LL1PlusBlockSingleAlt(choice, loopExpr, alts, preamble, iteration) ::= <<
 setState(<choice.blockStartStateNumber>) <! alt block decision !>
 try _errHandler.sync(self)
 <preamble; separator="\n">
 repeat {
 <alts; separator="\n">
 setState(<choice.stateNumber>); <! loopback/exit decision !>
 try _errHandler.sync(self)
 <iteration>
 } while (<loopExpr>)
>>

```

```

// LL(*) stuff

```

```

AltBlock(choice, preamble, alts, error) ::= <<
 setState(<choice.stateNumber>)
 try _errHandler.sync(self)
 <if(choice.label)><labelref(choice.label)> = try _input.LT(1)<endif>
 <preamble; separator="\n">
 switch(try getInterpreter().adaptivePredict(_input,<choice.decision>, _ctx)) {
 <alts:{ alt |
 case <i>:
 <alt>
 break }; separator="\n">
 default: break
 }
>>

```

```

OptionalBlock(choice, alts, error) ::= <<
 setState(<choice.stateNumber>)

```

```

try _errHandler.sync(self)
switch (try getInterpreter().adaptivePredict(_input,<choice.decision>,_ctx)) {
<alts:{alt |
case <i><if(!choice.ast.greedy)>+1<endif>:
<alt>
break}; separator="\n">
default: break
}
>>

```

```

StarBlock(choice, alts, sync, iteration) ::= <<
setState(<choice.stateNumber>)
try _errHandler.sync(self)
_alt = try getInterpreter().adaptivePredict(_input,<choice.decision>,_ctx)
while (_alt != <choice.exitAlt> && _alt != ATN.INVALID_ALT_NUMBER) {
if (_alt==1<if(!choice.ast.greedy)>+1<endif>) {
<iteration>
<alts> <! should only be one !>
}
setState(<choice.loopBackStateNumber>)
try _errHandler.sync(self)
_alt = try getInterpreter().adaptivePredict(_input,<choice.decision>,_ctx)
}
>>

```

```

PlusBlock(choice, alts, error) ::= <<
setState(<choice.blockStartStateNumber>); <! alt block decision !>
try _errHandler.sync(self)
_alt = 1<if(!choice.ast.greedy)>+1<endif>;
repeat {
switch (_alt) {
<alts:{alt|
case <i><if(!choice.ast.greedy)>+1<endif>:
<alt>
break}; separator="\n">
default:
<error>
}
setState(<choice.loopBackStateNumber>); <! loopback/exit decision !>
try _errHandler.sync(self)
_alt = try getInterpreter().adaptivePredict(_input,<choice.decision>,_ctx)
} while (_alt != <choice.exitAlt> && _alt != ATN.INVALID_ALT_NUMBER)
>>

```

```

Sync(s) ::= "sync(<s.expecting.name>);"

```

```

ThrowNoViableAlt(t) ::= "throw ANTLRException.recognition(e: NoViableAltException(self))"

```



```

TestSetInline(s) ::= <<
<!<s.bitsets:{bits | <if(rest(rest(bits.ttypes))><bitsetBitfieldComparison(s, bits)><else><bitsetInlineComparison(s,
bits)><endif>}; separator=" || ">!>
//closure
{ () -> Bool in
 <if(rest(s.bitsets)>>var<else>let<endif> testSet: Bool = <first(s.bitsets):{bits |
<if(rest(rest(bits.ttypes))><bitsetBitfieldComparison(s, bits)><else><bitsetInlineComparison(s, bits)><endif>}>
 <rest(s.bitsets):{bits | testSet = testSet || <if(rest(rest(bits.ttypes))><bitsetBitfieldComparison(s,
bits)><else><bitsetInlineComparison(s, bits)><endif>}; separator="\n">
 return testSet
}()
>>

// Java language spec 15.19 - shift operators mask operands rather than overflow to 0... need range test
testShiftInRange(shiftAmount) ::= <<
((<shiftAmount>) & ~0x3f) == 0
>>

// produces smaller bytecode only when bits.ttypes contains more than two items
bitsetBitfieldComparison(s, bits) ::= <<
<!(<testShiftInRange({<offsetShift(s.varName, bits.shift)>})> && ((1 \<< <offsetShift(s.varName, bits.shift)>) &
(<bits.ttypes:{ttype | (1 \<< <offsetShift(ttype, bits.shift)>}); separator=" | ">)) != 0)!>
{ () -> Bool in
 <! let test: Bool = (<testShiftInRange({<offsetShift(s.varName, bits.shift)>})>)!>
 <!var temp: Int64 = Int64(<offsetShift(s.varName, bits.shift)>)!>
 <!temp = (temp \< 0) ? (64 + (temp % 64)) : (temp % 64)!>
 <!let test1: Int64 = (Int64(1) \<< temp)!>
 <!var test2: Int64 = (<first(bits.ttypes):{ttype | Utils.bitLeftShift(<offsetShift(parserName(ttype), bits.shift)>)}>)!>
 <!<rest(bits.ttypes):{ttype | test2 = test2 | Utils.bitLeftShift(<offsetShift(parserName(ttype), bits.shift)>)}>);
separator="\n">!>
 let testArray: [Int] = [<s.varName>, <bits.ttypes:{ttype | <parserName(ttype)>}; separator=", ">]
 <!var test2: Int64 = Utils.testBitLeftShiftArray(testArray)!>
 return Utils.testBitLeftShiftArray(testArray, <bits.shift>)
}()
>>

isZero ::= [
"0": true,
default: false
]
parserName(ttype) ::= <%
<parser.name>.Tokens.<ttype>.rawValue
%>
offsetShift(shiftAmount, offset) ::= <%
<if(!isZero.(offset))><shiftAmount> - <offset><else><shiftAmount><endif>
%>

// produces more efficient bytecode when bits.ttypes contains at most two items

```

```

bitsetInlineComparison(s, bits) ::= <%
<bits.ttypes:{ ttype | <s.varName> == <parser.name>.Tokens.<ttype>.rawValue }; separator=" || ">
%>

cases(ttypes) ::= <<
<trunc(ttypes): {t | case .<t>:fallthrough } ; separator="\n">
<last(ttypes): {t | case .<t>: } ; separator="\n">
>>

InvokeRule(r, argExprsChunks) ::= <<
setState(<r.stateNumber>)
<if(r.labels)>
try {
 let assignmentValue = try
<r.name>(<if(r.ast.options.p)><r.ast.options.p><if(argExprsChunks)>,<endif><endif><argExprsChunks>)
 <r.labels:{l | <labelref(l)> = assignmentValue } ; separator="\n">
 }()
<else>try
<r.name>(<if(r.ast.options.p)><r.ast.options.p><if(argExprsChunks)>,<endif><endif><argExprsChunks>)<endif>
>>

MatchToken(m) ::= <<
setState(<m.stateNumber>)
<if(m.labels)>
try {
 let assignmentValue = try match(<parser.name>.Tokens.<m.name>.rawValue)
 <m.labels:{l | <labelref(l)> = assignmentValue } ; separator="\n">
 }()
<else>try match(<parser.name>.Tokens.<m.name>.rawValue)<endif>
>>

MatchSet(m, expr, capture) ::= "<CommonSetStuff(m, expr, capture, false)>"

MatchNotSet(m, expr, capture) ::= "<CommonSetStuff(m, expr, capture, true)>"

CommonSetStuff(m, expr, capture, invert) ::= <<
setState(<m.stateNumber>)
<if(m.labels)><m.labels:{l | <labelref(l)> = }>try _input.LT(1)<endif>
<capture>
if (<if(invert)><m.varName> \<= 0 || <else>!<endif>(<expr>)) {
 <if(m.labels)><m.labels:{l | <labelref(l)> = }><endif>try _errHandler.recoverInline(self)<if(m.labels)> as
 Token<endif>
}
else {
 _errHandler.reportMatch(self)
 try consume()
}
>>

```

```

Wildcard(w) ::= <<
setState(<w.stateNumber>)
<if(w.labels)><w.labels:{1 | <labelref(l)> = }><endif>try matchWildcard();
>>

// ACTION STUFF

Action(a, foo, chunks) ::= "<chunks>"

ArgAction(a, chunks) ::= "<chunks>"

SemPred(p, chunks, failChunks) ::= <<
setState(<p.stateNumber>)
if (!(<chunks>)) {
 throw ANTLRException.recognition(e.FailedPredicateException(self, <p.predicate><if(failChunks)>,
<failChunks><elseif(p.msg)>, <p.msg><endif>))
}
>>

ExceptionClause(e, catchArg, catchAction) ::= <<
catch (<catchArg>) {
 <catchAction>
}
>>

// lexer actions are not associated with model objects

LexerSkipCommand() ::= "skip()"
LexerMoreCommand() ::= "more()"
LexerPopModeCommand() ::= "popMode()"

LexerTypeCommand(arg) ::= "_type = <arg>"
LexerChannelCommand(arg) ::= "_channel = <arg>"
LexerModeCommand(arg) ::= "_mode = <arg>"
LexerPushModeCommand(arg) ::= "pushMode(<arg>)"

ActionText(t) ::= "<t.text>"
ActionTemplate(t) ::= "<t.st>"
ArgRef(a) ::= "_localctx.<a.name>"
LocalRef(a) ::= "_localctx.<a.name>"
RetValRef(a) ::= "_localctx.<a.name>"
QRetValRef(a) ::= "<ctx(a)>.<a.dict>.<a.name>"
/** How to translate $tokenLabel */
TokenRef(t) ::= "<ctx(t)>.<t.name>"
LabelRef(t) ::= "<ctx(t)>.<t.name>"
ListLabelRef(t) ::= "<ctx(t)>.<ListLabelName(t.name)>"
SetAttr(s,rhsChunks) ::= "<ctx(s)>.<s.name> = <rhsChunks>"

```

```

TokenLabelType() ::= "<file.TokenLabelType; null={Token}>"
InputSymbolType() ::= "<file.InputSymbolType; null={Token}>"

TokenPropertyRef_text(t) ::= "<ctx(t)>.<t.label> != nil ? <ctx(t)>.<t.label>!.getText()! : \"\""
TokenPropertyRef_type(t) ::= "<ctx(t)>.<t.label> != nil ? <ctx(t)>.<t.label>!.getType() : 0)"
TokenPropertyRef_line(t) ::= "<ctx(t)>.<t.label> != nil ? <ctx(t)>.<t.label>!.getLine() : 0)"
TokenPropertyRef_pos(t) ::= "<ctx(t)>.<t.label> != nil ? <ctx(t)>.<t.label>!.getCharPositionInLine() : 0)"
TokenPropertyRef_channel(t) ::= "<ctx(t)>.<t.label> != nil ? <ctx(t)>.<t.label>!.getChannel() : 0)"
TokenPropertyRef_index(t) ::= "<ctx(t)>.<t.label> != nil ? <ctx(t)>.<t.label>!.getTokenIndex() : 0)"
TokenPropertyRef_int(t) ::= "<ctx(t)>.<t.label> != nil ? Int(<ctx(t)>.<t.label>!.getText()!) : 0)"

RulePropertyRef_start(r) ::= "<ctx(r)>.<r.label> != nil ? (<ctx(r)>.<r.label>!.start?.description ?? \"\") : \"\""
RulePropertyRef_stop(r) ::= "<ctx(r)>.<r.label> != nil ? (<ctx(r)>.<r.label>!.stop?.description ?? \"\") : \"\""
RulePropertyRef_text(r) ::= "<ctx(r)>.<r.label> != nil ? try
_input.getText(<ctx(r)>.<r.label>!.start,<ctx(r)>.<r.label>!.stop) : \"\""
RulePropertyRef_ctx(r) ::= "<ctx(r)>.<r.label>"
RulePropertyRef_parser(r) ::= "self"

ThisRulePropertyRef_start(r) ::= "_localctx.start"
ThisRulePropertyRef_stop(r) ::= "_localctx.stop"
ThisRulePropertyRef_text(r) ::= "(try _input.getText(_localctx.start, try _input.LT(-1)))"
ThisRulePropertyRef_ctx(r) ::= "_localctx"
ThisRulePropertyRef_parser(r) ::= "self"

NonLocalAttrRef(s) ::= "(<<s.ruleName; format=\"cap\">Context)getInvokingContext(<s.ruleIndex>).<s.name>"
SetNonLocalAttr(s, rhsChunks) ::=
"(<<s.ruleName; format=\"cap\">Context)getInvokingContext(<s.ruleIndex>).<s.name> = <rhsChunks>"

AddToLabelList(a) ::= "<ctx(a.label)>.<a.listName>.append(<labelref(a.label)>)"

TokenDecl(t) ::= "<t.name>: <SwiftTypeMap.(TokenLabelType)>!"
TokenTypeDecl(t) ::= "var <t.name>: Int = 0"
TokenListDecl(t) ::= "<t.name>: [Token] = [Token]()"
RuleContextDecl(r) ::= "<r.name>: <r.ctxName>!"
RuleContextListDecl(rdecl) ::= "<rdecl.name>: [<rdecl.ctxName>] = [<rdecl.ctxName>]()"

ContextTokenGetterDecl(t) ::= <<
<accessLevelOpenOK(parser)>
func <t.name>() -> TerminalNode? {
return getToken(<parser.name>.Tokens.<t.name>.rawValue, 0)
}
>>

ContextTokenListGetterDecl(t) ::= <<
<accessLevelOpenOK(parser)>
func <t.name>() -> [TerminalNode] {
return getTokens(<parser.name>.Tokens.<t.name>.rawValue)
}

```

```

>>
ContextTokenListIndexedGetterDecl(t) ::= <<
<accessLevelOpenOK(parser)>
func <t.name>(_ i: Int) -> TerminalNode? {
 return getToken(<parser.name>.Tokens.<t.name>.rawValue, i)
}
>>

ContextRuleGetterDecl(r) ::= <<
<accessLevelOpenOK(parser)>
func <r.name>() -> <r.ctxName>? {
 return getRuleContext(<r.ctxName>.self, 0)
}
>>

ContextRuleListGetterDecl(r) ::= <<
<accessLevelOpenOK(parser)>
func <r.name>() -> [<r.ctxName>] {
 return getRuleContexts(<r.ctxName>.self)
}
>>

ContextRuleListIndexedGetterDecl(r) ::= <<
<accessLevelOpenOK(parser)>
func <r.name>(_ i: Int) -> <r.ctxName>? {
 return getRuleContext(<r.ctxName>.self, i)
}
>>

LexerRuleContext() ::= "RuleContext"

/** The rule context name is the rule followed by a suffix; e.g.,
 * r becomes rContext.
 */
RuleContextNameSuffix() ::= "Context"

ImplicitTokenLabel(tokenName) ::= "_<tokenName>"
ImplicitRuleLabel(ruleName) ::= "_<ruleName>"
ImplicitSetLabel(id) ::= "_tset<id>"
ListLabelName(label) ::= "<label>"

CaptureNextToken(d) ::= "<d.varName> = try _input.LT(1)"
CaptureNextTokenType(d) ::= "<d.varName> = try _input.LA(1)"

StructDecl(struct, ctorAttrs, attrs, getters, dispatchMethods, interfaces, extensionMembers,
 superClass={ParserRuleContext}) ::= <<

<accessLevelNotOpen(parser)> class <struct.name>:
<if(contextSuperClass)><contextSuperClass><else>ParserRuleContext<endif><if(interfaces)>, <interfaces>
separator=", "><endif> {
 <attrs: { a | <accessLevelOpenOK(parser)> var <a> }; separator="\n">

```

```

<getters:{g | <g>}; separator="\n">
<! <if(ctorAttrs)> <accessLevelNotOpen(parser)> init(_ parent: ParserRuleContext,_ invokingState: Int) {
super.init(parent, invokingState) }<endif> !>
<if(ctorAttrs)>
<accessLevelNotOpen(parser)> convenience init(_ parent: ParserRuleContext?, _ invokingState: Int<ctorAttrs:{a | ,
_ <a>}>) {
self.init(parent, invokingState)
<struct.ctorAttrs:{a | self.<a.name> = <a.name>;}; separator="\n">
}
<endif>

```

```

override <accessLevelOpenOK(parser)>
func getRuleIndex() -> Int {
return <parser.name>.RULE_<struct.derivedFromName>
}
<if(struct.provideCopyFrom && struct.attrs)> <! don't need copy unless we have subclasses !>
<accessLevelOpenOK(parser)>
override func copyFrom(_ ctx_: ParserRuleContext) {
super.copyFrom(ctx_)
let ctx = ctx_ as! <struct.name>
<struct.attrs:{a | self.<a.name> = ctx.<a.name>;}; separator="\n">
}
<endif>
<dispatchMethods; separator="\n">
<extensionMembers; separator="\n">
}
>>

```

```

AltLabelStructDecl(struct,attrs,getters,dispatchMethods) ::= <<
<accessLevelNotOpen(parser)> class <struct.name>: <currentRule.name; format="cap">Context {
<attrs:{a | <accessLevelNotOpen(parser)> var <a>}; separator="\n">
<getters:{g | <g>}; separator="\n">

```

```

<accessLevelNotOpen(parser)>
init(_ ctx: <currentRule.name; format="cap">Context) {
super.init()
copyFrom(ctx)
}
<dispatchMethods; separator="\n">
}
>>

```

```

ListenerDispatchMethod(method) ::= <<
override <accessLevelOpenOK(parser)>
func <if(method.isEnter)>enter<else>exit<endif>Rule(_ listener: ParseTreeListener) {
if let listener = listener as? <parser.grammarName>Listener {
listener.<if(method.isEnter)>enter<else>exit<endif><struct.derivedFromName; format="cap">(self)
}
}

```

```
}
>>
```

```
VisitorDispatchMethod(method) ::= <<
override <accessLevelOpenOK(parser)>
func accept<T>(<_ visitor: ParseTreeVisitor<T>> -> T? {
 if let visitor = visitor as? <parser.grammarName>Visitor {
 return visitor.visit<struct.derivedFromName; format="cap">(self)
 }
 else if let visitor = visitor as? <parser.grammarName>BaseVisitor {
 return visitor.visit<struct.derivedFromName; format="cap">(self)
 }
 else {
 return visitor.visitChildren(self)
 }
}
>>
```

```
AttributeDecl(d) ::= "<d.name>: <SwiftTypeMap.(d.type)><if(d.initValue)> = <d.initValue><else>!<endif>"
```

```
/** If we don't know location of label def x, use this template (<_localctx as! <x.ctx.name> */
labelref(x) ::= "<if(!x.isLocal)>_localctx.castdown(<x.ctx.name>.self).<endif><x.name>"
```

```
/** For any action chunk, what is correctly-typed context struct ptr? */
ctx(actionChunk) ::= "_localctx.castdown(<actionChunk.ctx.name>.self)"
```

```
// used for left-recursive rules
recRuleAltPredicate(ruleName,opPrec) ::= "precPred(<_ctx, <opPrec>)"
recRuleSetReturnAction(src,name) ::= "$<name>=$<src>.<name>"
recRuleSetStopToken() ::= "_ctx!.stop = try _input.LT(-1)"
```

```
recRuleAltStartAction(ruleName, ctxName, label, isListLabel) ::= <<
 _localctx = <ctxName>Context(<_parentctx, _parentState>);
 <if(label)>
 <if(isListLabel)>
 _localctx.<label>.append(<_prevctx>)
 <else>
 _localctx.<label> = <_prevctx>
 <endif>
 <endif>
 <if(label)>_localctx.<label> = <_prevctx>;<endif>
 try pushNewRecursionContext(<_localctx, _startState, <parser.name>.RULE_<ruleName>)
>>
```

```
recRuleLabeledAltStartAction(ruleName, currentAltLabel, label, isListLabel) ::= <<
 _localctx = <currentAltLabel; format="cap">Context(<ruleName; format="cap">Context(<_parentctx,
 _parentState))
 <if(label)>
```

```

<if(isListLabel)>
(_localctx as! <currentAltLabel; format="cap">Context).<label>.append(_prevctx)
<else>
(_localctx as! <currentAltLabel; format="cap">Context).<label> = _prevctx
<endif>
<endif>
try pushNewRecursionContext(_localctx, _startState, <parser.name>.RULE_<ruleName>)
>>

```

```

recRuleReplaceContext(ctxName) ::= <<
_localctx = <ctxName>Context(_localctx)
_ctx = _localctx
_prevctx = _localctx
>>

```

```

recRuleSetPrevCtx() ::= <<
if _parseListeners != nil {
try triggerExitRuleEvent()
}
_prevctx = _localctx
>>

```

```

LexerFile(lexerFile, lexer, namedActions) ::= <<
<fileHeader(lexerFile.grammarFileName, lexerFile.ANTLRVersion)>
<if(lexerFile.genPackage)>
<!package <lexerFile.genPackage>;!>
<endif>
<namedActions.header>
import Antlr4

<lexer>
>>

```

```

Lexer(lexer, atn, actionFuncs, sempredFuncs, superClass) ::= <<
<accessLevelOpenOK(lexer)> class <lexer.name>: <superClass; null="Lexer"> {

internal static var _decisionToDFA: [DFA] = {
var decisionToDFA = [DFA]()
let length = <lexer.name>._ATN.getNumberOfDecisions()
for i in 0..<length {
<! decisionToDFA[i] = DFA(<lexer.name>._ATN.getDecisionState(i)!, i);!>
decisionToDFA.append(DFA(<lexer.name>._ATN.getDecisionState(i)!, i))
}
return decisionToDFA
}()

```

```

internal static let _sharedContextCache = PredictionContextCache()

```



```

<accessLevelNotOpen(lexer)>
<if(lexer.tokens)>
static let <lexer.tokens:{k | <k>=<lexer.tokens.(k)>}; separator=", ", wrap, anchor>
<endif>

<if(lexer.channels)>
<accessLevelNotOpen(lexer)>
static let <lexer.channels:{k | <k>=<lexer.channels.(k)>}; separator=", ", wrap, anchor>
<endif>
<if(rest(lexer.modes))>
<accessLevelNotOpen(lexer)>
static let <rest(lexer.modes):{m | <m>=<i>}; separator=", ", wrap, anchor>
<endif>
<accessLevelNotOpen(lexer)>
static let channelNames: [String] = [
 "DEFAULT_TOKEN_CHANNEL", "HIDDEN"<if (lexer.channels)>, <lexer.channels:{c | <c>"}; separator=", ",
wrap, anchor><endif>
]

<accessLevelNotOpen(lexer)>
static let modeNames: [String] = [
 <lexer.modes:{m | "<m>"}; separator=", ", wrap, anchor>
]

<accessLevelNotOpen(lexer)>
static let ruleNames: [String] = [
 <lexer.ruleNames:{r | "<r>"}; separator=", ", wrap, anchor>
]

<vocabulary(lexer.literalNames, lexer.symbolicNames,
 accessLevelNotOpen(lexer))>

<namedActions.members>

override <accessLevelOpenOK(lexer)>
func getVocabulary() -> Vocabulary {
 return <lexer.name>.VOCABULARY
}

<accessLevelNotOpen(lexer)>
required init(_ input: CharStream) {
 RuntimeMetaData.checkVersion("<lexerFile.ANTLRVersion>", RuntimeMetaData.VERSION)
 super.init(input)
 _interp = LexerATNSimulator(self, <lexer.name>._ATN, <lexer.name>._decisionToDFA,
<lexer.name>._sharedContextCache)
}

override <accessLevelOpenOK(lexer)>

```

```

func getGrammarFileName() -> String { return "<lexer.grammarFileName>" }

override <accessLevelOpenOK(lexer)>
func getRuleNames() -> [String] { return <lexer.name>.ruleNames }

override <accessLevelOpenOK(lexer)>
func getSerializedATN() -> String { return <lexer.name>._serializedATN }

override <accessLevelOpenOK(lexer)>
func getChannelNames() -> [String] { return <lexer.name>.channelNames }

override <accessLevelOpenOK(lexer)>
func getModeNames() -> [String] { return <lexer.name>.modeNames }

override <accessLevelOpenOK(lexer)>
func getATN() -> ATN { return <lexer.name>._ATN }

<dumpActions(lexer, "", actionFuncs, sempredFuncs)>
<atn>

<accessLevelNotOpen(lexer)>
static let _serializedATN: String = <lexer.name>ATN().jsonString

<accessLevelNotOpen(lexer)>
static let _ATN: ATN = ATNDeserializer().deserializeFromJson(_serializedATN)
}
>>

/** Don't need to define anything. The tool generates a XParserATN.swift file (and same for lexer)
 * which is referenced from static field _serializedATN. This json string is passed to
 * deserializeFromJson(). Note this is not the "serialization as array of ints" that other targets
 * do. It is more or less the output of ATNPrinter which gets read back in.
 */
SerializedATN(model) ::= <<
>>

/** Using a type to init value map, try to init a type; if not in table
 * must be an object, default value is "null".
 */
initValue(typeName) ::= <<
<SwiftTypeInitMap.(typeName)>
>>

codeFileExtension() ::= ".swift"

Found in path(s):
* /opt/cola/permits/1340816081_1654861722.3479369/0/antlr4-4-9-2-sources-1-
jar/org/antlr/v4/tool/templates/codegen/Swift/Swift.stg

```

# 1.148 asm-commons 7.2

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# 1.149 apache-log4j-api 2.17.1

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\* /opt/cola/permits/1162863465\_1653505868.969204/0/vault-java-driver-master-1-zip/vault-java-driver-master/src/main/java/com/bettercloud/vault/json/JsonString.java  
No license file was found, but licenses were detected in source scan.

## Vault Java Driver

=====

A zero-dependency Java client for the [Vault](<https://www.vaultproject.io/>) secrets management solution from HashiCorp.

This driver strives to implement Vault's full HTTP API, along with supporting functionality such as automatic retry handling. It does so without relying on any other external libraries beyond the Java standard library, and is compatible with Java 8 and up. So it will play nice with all of your projects, greenfield and legacy alike, without causing conflicts with any other dependency.

NOTE: Although the binary artifact produced by the project is backwards-compatible with Java 8, you do need JDK 9 or higher to modify or build the source code of this library itself.

## This Change

-----

## Table of Contents

- \* [Installing the Driver](#installing-the-driver)
- \* [Initializing a Driver Instance](#initializing-a-driver-instance)
- \* [Key/Value Secret Engine Config](#key-value-secret-engine-config)
- \* [SSL Config](#ssl-config)
- \* [General Options](#general-options)
- \* [Java Keystore (JKS) based config](#java-keystore-jks-based-config)
- \* [OpenSSL (PEM) based config](#openssl-pem-based-config)
- \* [Using the driver](#using-the-driver)
- \* [API Reference (Javadocs)](#api-reference-javadocs)
- \* [Version History](#version-history)
- \* [Development](#development)
- \* [License](#license)
- \* [Other Notes](#other-notes)

## Installing the Driver

The driver is available from Maven Central, for all modern Java build systems.

Gradle:

```
dependencies {
 implementation 'com.bettercloud:vault-java-driver:5.1.0'
}
```

Maven:

```
<dependency>
 <groupId>com.bettercloud</groupId>
 <artifactId>vault-java-driver</artifactId>
 <version>5.1.0</version>
</dependency>
```

## Initializing a Driver Instance

The `com.bettercloud.vault.VaultConfig` class is used to initialize a driver instance with desired settings. In the most basic use cases, where you are only supplying a Vault server address and perhaps a root token, there are convenience constructor methods available:

```
final VaultConfig config = new VaultConfig()
 .address("http://127.0.0.1:8200")
 .token("3c9fd6be-7bc2-9d1f-6fb3-cd746c0fc4e8")
 .build();
```

```
// You may choose not to provide a root token initially, if you plan to use
// the Vault driver to retrieve one programmatically from an auth backend.
final VaultConfig config = new VaultConfig().address("http://127.0.0.1:8200").build();
...

```

To explicitly set additional config parameters (\*), you can use a builder pattern style to construct the `VaultConfig` instance. Either way, the initialization process will try to populate any unset values by looking to environment variables.

```
...
final VaultConfig config =
 new VaultConfig()
 .address("http://127.0.0.1:8200") // Defaults to "VAULT_ADDR" environment variable
 .token("3c9fd6be-7bc2-9d1f-6fb3-cd746c0fc4e8") // Defaults to "VAULT_TOKEN" environment variable
 .openTimeout(5) // Defaults to "VAULT_OPEN_TIMEOUT" environment variable
 .readTimeout(30) // Defaults to "VAULT_READ_TIMEOUT" environment variable
 .sslConfig(new SslConfig().build()) // See "SSL Config" section below
 .build();
...

```

Once you have initialized a `VaultConfig` object, you can use it to construct an instance of the `Vault` primary driver class:

```
...
final Vault vault = new Vault(config);
...

```

### Key Value Secret Engine Config

Shortly before its `1.0` release, Vault added a Version 2 of its [Key/Value Secrets Engine](https://www.vaultproject.io/docs/secrets/kv/index.html). This supports some additional features beyond the Version 1 that was the default in earlier Vault builds (e.g. secret rotation, soft deletes, etc).

Unfortunately, K/V V2 introduces some breaking changes, in terms of both request/response payloads as well as how URL's are constructed for Vault's REST API. Therefore, version `4.0.0` of this Vault Driver likewise had to introduce some breaking changes, to allow support for both K/V versions.

**\*\*If you are using the new K/V V2 across the board\*\*, then no action is needed. The Vault Driver now assumes this by default.**

**\*\*If you are still using the old K/V V1 across the board\*\*, then you can use the `Vault` class constructor: `public Vault(final VaultConfig vaultConfig, final Integer engineVersion)`, supplying a `1` as the engine version parameter. constructor, then you can declare whether to use Version 1 or 2 across the board.**

\* \*\*If you are using a mix, of some secret paths mounted with V1 and others mounted with V2\*\*, then you have two options:

\* You can explicitly specify your Vault secret paths, and which K/V version each one is using. Construct your ``Vault`` objects with the constructor ``public Vault(final VaultConfig vaultConfig, final Boolean useSecretsEnginePathMap, final Integer globalFallbackVersion)``.

Within the ``VaultConfig`` object, supply a map of Vault secret paths to their associated K/V version (``1`` or ``2``).

\* You can rely on the Vault Driver to auto-detect your mounts and K/V versions upon instantiation. Use the same constructor as above,

but leave the map ``null``. Note that this option requires your authentication credentials to have access to read Vault's ``/v1/sys/mounts`` path.

Version 2 of the K/V engine dynamically injects a qualifier element into your secret paths, which varies depending on the type of for read and write operations, in between the root version operation. For example, for read and write operations, the secret path:

```
```v1/mysecret```
```

... has a "data" qualifier injected:

```
```v1/data/mysecret```
```

The default behavior of this driver is to insert the appropriate qualifier one level deep (i.e. in between the root version number and the rest of the path). However, if your secret path is prefixed, such that the qualifier should be injected further down:

```
```v1/my/long/prefix/data/anything/else```
```

... then you should accordingly set the ``VaultConfig.prefixPathDepth`` property when constructing your ``Vault`` instance.

SSL Config

If your Vault server uses a SSL certificate, then you must supply that certificate to establish connections. Also, if you are using certificate-based client authentication, then you must supply a client certificate and private key that have been previously registered with your Vault server.

SSL configuration has been broken off from the ``VaultConfig`` class, and placed in its own ``SslConfig`` class. This class likewise using a builder pattern.

General Options

...

```
.verify(false) // Defaults to "VAULT_SSL_VERIFY" environment variable (or else "true")  
```
```

To disable SSL certificate verification altogether, set `sslVerify(false)`. **YOU SHOULD NOT DO THIS IS A REAL**

**PRODUCTION SETTING!** However, it can be useful in a development or testing server context. If this value is explicitly set to `false`, then all other SSL config is basically unused.

#### #### Java Keystore (JKS) based config

You can provide the driver with a JKS truststore, containing Vault's server-side certificate for basic SSL, using one of the following three options:

`trustStore(object)` - Supply an in-memory `java.security.KeyStore` file, containing Vault server cert(s) that can be trusted.

`trustStoreFile(path)` - Same as the above, but the path references a JKS file on the filesystem.

`trustStoreResource(path)` - Same as the above, but the path references a classpath resource rather than a filesystem path (e.g. if you've bundled the JKS file into your application's JAR, WAR, or EAR file).

If you are only using basic SSL, then no keystore need be provided. However, if you would like to use Vault's TLS Certificate auth backend for client side auth, then you need to provide a JKS keystore containing your client-side certificate and private key:

`keyStore(object, password)` - Supply an in-memory `java.security.KeyStore` file containing a client certificate and private key, and the password needed to access it (can be null).  
can be trusted.

`keyStoreFile(path, password)` - Same as the above, but the path references a JKS file on the filesystem.

`keyStoreResource(path, password)` - Same as the above, but the path references a classpath resource rather than a filesystem path (e.g. if you've bundled the JKS file into your application's JAR, WAR, or EAR file).

NOTE: JKS-based config trumps PEM-based config (see below). If for some reason you build an `SslConfig` object

with both JKS and PEM data present, then only the JKS data will be used. You cannot "mix-and-match", providing a JKS-based truststore and PEM-based client auth data.

#### #### OpenSSL (PEM) based config

To supply Vault's server-side certificate for basic SSL, you can use one of the following three options:

`pemFile(path)` - Supply the path to an X.509 certificate in unencrypted PEM format, using UTF-8 encoding (defaults to "VAULT\_SSL\_CERT" environment variable).



``pemResource(path)`` - Same as above, but the path references a classpath resource rather than a filesystem path (e.g. if

you've bundled the PEM file into your applications's JAR, WAR, or EAR file).

``pemUTF8(contents)`` - The string contents extracted from the PEM file. For Java to parse the certificate properly, there must be a line-break in between the certificate header and body (see the ``SslConfig`` Javadocs for more detail).

If SSL verification is enabled, no JKS-based config is provided, AND none of these three methods are called, then ``SslConfig`` will by default check for a ``VAULT_SSL_CERT`` environment variable. If that's setw then it will be treated as a filesystem path.

To use Vault's TLS Certificate auth backend for SSL client auth, you must provide your client certificate and private key, using some pair from the following options:

``clientPemUTF8(path)`` - Supply the path to an X.509 certificate in unencrypted PEM format, using UTF-8 encoding.

``clientPemResource(path)`` - Same as above, but the path references a classpath resource rather than a filesystem path (e.g. if you've bundled the PEM file into your applications's JAR, WAR, or EAR file).

``clientPemUTF8(contents)`` - The string contents extracted from the PEM file. For Java to parse the certificate properly, there must be a line-break in between the certificate header and body (see the ``SslConfig`` Javadocs for more detail).

``clientKeyPemUTF8(path)`` - Supply the path to an RSA private key in unencrypted PEM format, using UTF-8 encoding.

``clientKeyPemResource(path)`` - Same as above, but the path references a classpath resource rather than a filesystem path (e.g. if you've bundled the PEM file into your applications's JAR, WAR, or EAR file).

``clientKeyPemUTF8(contents)`` - The string contents extracted from the PEM file. For Java to parse the certificate properly, there must be a line-break in between the certificate header and body (see the ``SslConfig`` Javadocs for more detail).

Using the Driver

-----

Like the ``VaultConfig`` class, ``Vault`` too supports a builder pattern DSL style:

...

```
final Map<String, String> secrets = new HashMap<String, String>();
secrets.put("value", "world");
secrets.put("other_value", "You can store multiple name/value pairs under a single key");
```

```
// Write operation
final LogicalResponse writeResponse = vault.logical()
 .write("secret/hello", secrets);
```

...

```
// Read operation
final String value = vault.logical()
 .read("secret/hello")
 .getData().get("value");
```

...

`Vault` has a number of methods for accessing the classes that implement the various endpoints of Vault's HTTP API:

- \* `logical()`: Contains core operations such as reading and writing secrets.
- \* `auth()`: Exposes methods for working with Vault's various auth backends (e.g. to programmatically retrieve a token by authenticating with a username and password).
- \* `pki()`: Operations on the PKI backend (e.g. create and delete roles, issue certificate credentials).
- \* `debug()`: Health check endpoints.

The driver DSL also allows you to specify retry logic, by chaining the `withRetries()` ahead of accessing the endpoint

implementation:

...

```
// Retry up to 5 times if failures occur, waiting 1000 milliseconds in between each retry attempt.
final LogicalResponse response = vault.withRetries(5, 1000)
 .logical()
 .read("secret/hello");
```

...

API Reference (Javadocs)

-----

Full [Javadoc documentation](<http://bettercloud.github.io/vault-java-driver/javadoc/>).

Version History

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Note that changes to the major version (i.e. the first number) represent possible breaking changes, and may require modifications in your code to migrate. Changes to the minor version (i.e. the second number) should represent non-breaking changes. The third number represents any very minor bugfix patches.

\* \*\*5.1.0\*\*\*: This release contains the following updates:

- \* Supports path prefixes when using K/V engine V2. [(PR #189)](<https://github.com/BetterCloud/vault-java-driver/pull/189>)
- \* Fixes issues with bulk requests in the transit API. [(PR #195)](<https://github.com/BetterCloud/vault-java-driver/pull/195>)
- \* Adds response body to exception for Auth failures. [(PR #198)](<https://github.com/BetterCloud/vault-java-driver/pull/198>)
- \* Support all options for the createToken operation. [(PR #199)](<https://github.com/BetterCloud/vault-java-driver/pull/199>)

\* \*\*5.0.0\*\*\*: This release contains the following updates:

- \* Changes the retry behavior, to no longer attempt retries on 4xx response codes (for which retries generally won't succeed anyway). This is the only (mildly) breaking change in this release, necessitating a major version bump. [(PR #176)](<https://github.com/BetterCloud/vault-java-driver/pull/176>)
- \* Implements support for the Database secret engine. [(PR #175)](<https://github.com/BetterCloud/vault-java-driver/pull/175>)
- \* Makes the "x-vault-token" header optional, to allow use of Vault Agent. [(PR #184)](<https://github.com/BetterCloud/vault-java-driver/pull/184>)
- \* Removes stray uses of `System.out.println` in favor of `java.util.logging`. [(PR #178)](<https://github.com/BetterCloud/vault-java-driver/pull/178>)
- \* Adds the enum constant `MountType.KEY_VALUE_V2`. [(PR #182)](<https://github.com/BetterCloud/vault-java-driver/pull/182>)

\* \*\*4.1.0\*\*\*: This release contains the following updates:

- \* Support for JWT authentication, for use by Kubernetes and other JWT-based authentication providers. [(PR #164)](<https://github.com/BetterCloud/vault-java-driver/pull/164>)
- \* Updates the lease revoke method, to support changes in the underlying Vault API. [(PR #163)](<https://github.com/BetterCloud/vault-java-driver/pull/163>)
- \* Changes the `VaultConfig.secretsEnginePathMap(...)` method from default access level to `public`, to allow for manual setting [(PR #164)](<https://github.com/BetterCloud/vault-java-driver/pull/156>)
- \* Adds the nonce value to `AuthResponse`, to facilitate re-authentication with Vault via AWS. [(PR #168)](<https://github.com/BetterCloud/vault-java-driver/pull/168>)
- \* Establishes a `module-info` file, updates the JDK requirement for building this library to Java 9 (although the built library artifact remains compatible as a dependency in Java 8 projects). [(PR #165)](<https://github.com/BetterCloud/vault-java-driver/pull/165>)
- \* Updates Gradle, and various test dependencies to their latest versions. Integration tests now target Vault 1.1.3.

\* \*\*4.0.0\*\*\*: This is a breaking-change release, with two primary updates:

- \* Adds support for Version 2 of the Key/Value Secrets Engine. The driver now assumes that your Vault instance uses Version 2 of the Key/Value Secrets Engine across the board. To configure this, see the [Key/Value Secret Engine Config](#key-value-secret-engine-config) section above.
- \* Adds support for the namespaces feature of Vault Enterprise.

- \* **3.1.0**: Several updates.
  - \* Adds support for seal-related operations (i.e. `/sys/seal`, `/sys/unseal`, `/sys/seal-status`).
  - \* Adds support for the AWS auth backend.
  - \* Adds support for the Google Cloud Platform auth backend.
  - \* Adds support for the LDAP auth Backend.
  - \* Allows auth backend methods to be configured for non-default mount points.
  - \* Adds "revoke-self" capability for auth tokens.
  - \* Adds support for response-wrapping token validation
  - \* Support for signing a new certificate based on a CSR (i.e. the `/v1/pki/sign` endpoint).
  - \* Support for the PKI backend revoke method, and addition of a `useCsrSans` property in PKI role object
  - \* Gives `VaultConfig` the ability to disable loading from environment variables if desired.
  - \* Cleans up issues with the new Docker-based integration test suite.
  - \* Updates all dependencies to their latest versions (including switching to Vault 0.9.1 for integration testing).
  
- \* **3.0.0**: This is a breaking-change release, with several updates.
  - \* **API changes**:
    - \* Adds support for writing arbitrary objects to Vault, instead of just strings (i.e. the `com.bettercloud.vault.api.Logical.write(...)` method now accepts a `Map<String, Object>` rather than a `Map<String, String>`).
    - \* Refactors the `VaultConfig` class, forcing use of the builder pattern and breaking off SSL-related config into a separate `SslConfig` class.
    - \* Refactors the `Auth.createToken()` method, to encapsulate the possible options within a config object rather than having the method signature contain 8 optional arguments.
  - \* **SSL and Auth Backend support**:
    - \* Adds support for authenticating with the TLS Certificate auth backend.
    - \* Updates SSL support in general, allowing users to configure the driver with Java-friendly JKS keystore and truststore files (in addition to continuing to support Vault-friendly PEM format).
    - \* Implements the `/v1/auth/token/lookup-self` endpoint.
    - \* Supports creating tokens against a role.
  - \* **Major re-vamp of the integration test suite**:
    - \* The tests now use the [TestContainers](https://www.testcontainers.org/) library to setup and launch a Vault server instance from within a Docker container, in a completely automated manner. You no longer have to manually configure and run a Vault server to use the test suite!
    - \* The tests are now going against a regular Vault server, rather than one running in "dev mode". Therefore, they are now able to use HTTPS connections rather than plain HTTP.
    - \* Upgrades tests to use Java 8 (although the library itself still targets Java 7).
  - \* **Misc / quality-of-life**:
    - \* Includes the REST response body in `VaultException` messages for basic read and write operations.
    - \* Makes numerous classes implement `Serializable`.
    - \* Upgrades the project to Gradle 4.0.
  
- \* **2.0.0**: This is breaking-change release, with numerous deprecated items cleaned up.
  - \* Adds support for authentication via the AppRole auth backend.
  - \* Adds support for renewing secret leases.
  - \* Removes the `com.bettercloud.vault.api.Sys` class, deprecated in the 1.2.0 release.
  - \* Removes the `com.bettercloud.vault.api.Auth.loginByUsernamePassword` method, deprecated in the 1.2.0 release.

- \* Removes the fields `leaseId`, `leaseDuration`, and `renewable` from the `VaultResponse` base class, instead including them only in the subclasses for specific response types where they are found.
  - \* Changes the `com.bettercloud.vault.response.AuthResponse` class field `authLeaseDuration` from type `int` to `long`.
  - \* Refactors and removes various deprecated `private` methods, with no change to the exposed API.
- \* \*\*1.2.0\*\*\*: This is a substantial release, with numerous additions. It's a minor version number only because there should be no breaking changes. The changes include the following:
- \* Switches from Vault 0.5.x to 0.6.x for automated tests.
  - \* Adds a field to `VaultException` for capturing the HTTP response code (if any) from Vault.
  - \* Updates the Gradle build, so that you no longer need empty placeholder values for certain variables elsewhere in your environment.
  - \* Updates integration test suite to account for breaking changes in Vault 0.6.x (e.g. you can no longer use a token that was obtained from one of the authentication backends to perform tasks such as creating and deleting roles, etc).
  - \* Deprecates the App ID authentication backend, and adds a new version of the Userpass authentication backend that doesn't require a path prefix. Adds support for the GitHub authentication backend.
  - \* If the `VAULT\_TOKEN` environment parameter is not set, then the driver will now check for a file named `.vault-token` in the executing user's home directory, and try to read a token value from that.
  - \* Deprecates the `com.bettercloud.vault.api.Sys` class, moving the debug-related methods into their own specific `com.bettercloud.vault.api.Debug` class instead.
  - \* Implements some of the lease related endpoints (i.e. revoke, revoke-prefix, revoke-force).
  - \* Supports PKI backends that are mounted on non-default paths.
- \* \*\*1.1.1\*\*\*: Changes the `ttl` argument to `Pki.issue()` from `Integer` to `String`, to fix a bug preventing you from specifying the time suffix (e.g. "1h").
- \* \*\*1.1.0\*\*\*: Switches from Vault 0.4.x to 0.5.x for automated tests. Adds support to the Logical API wrapper for listing and deleting secrets. Implements the `/v1/sys/health` health-check HTTP API endpoint. Implements portions of the PKI backend (e.g. creating and deleting roles, issuing credentials). Marks numerous methods as deprecated, to be removed in a future major release.
- \* \*\*1.0.0\*\*\*: Drops support for Java 6. Removes all methods marked as `@Deprecated` in version 0.5.0. Adds support for response metadata (i.e. "lease\_id", "renewable", "lease\_duration") to all response types, rather than just `AuthResponse`. Changes `leaseDuration` type from `int` to `Long` in `AuthResponse`. Removes `final` declarations on all classes (outside of the JSON package). Various bugfixes. Adds support for auth token self-renewal. Adds support for writing values that return content.
- \* \*\*0.5.0\*\*\*: Adds support for supplying SSL certificates, and for toggling whether or not the Vault server's SSL certificate will be verified. Also adds support for "openTimeout" and "readTimeout" settings. Deprecates the "timeout", "sslTimeout", "proxyAddress", "proxyPort", "proxyUsername", and "proxyPassword" settings (the proxy settings may return in a future version, but it's too misleading to have methods exposed for settings that won't really be supported soon).
- \* \*\*0.3.0\*\*\*: Initial public release. Support for writing and reading secrets, authenticating with the "AppID" or "Username & Password" auth backends. All over-the-wire methods support automatic retry logic.

Development

-----

Pull requests are welcomed for bugfixes or enhancements that do not alter the external facing class and method signatures. For any breaking changes that would alter the contract provided by this driver, please open up an issue to discuss it first.

All code changes should include unit test and/or integration test coverage as appropriate. Unit tests are any that can be run in isolation, with no external dependencies. Integration tests are those which require a Vault server instance (at least a Dev Server) up and running.

Unit tests are located under the `src/test` directory, and can be run with the Gradle `unitTest` task.

Integration tests are located under the `src/test-integration` directory, and can be run with the Gradle `integrationTest` task. See the additional `README.md` file in this directory for more detailed information.

Although this library now includes a `module-info` class for use by Java 9+, the library currently targets Java 8 compatibility. Please do not attempt to introduce any features or syntax not compatible with Java 8 (the Gradle build script should prevent you from doing so without modification).

#### License

-----

The MIT License (MIT)

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#### Other Notes

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The Vault server system itself is a product of HashiCorp, a completely separate organization.

This client driver adapts JSON parsing code from Ralf Sternberg's excellent [minimal-json](https://github.com/ralfstx/minimal-json) library, likewise available under the MIT License. Package names have all been changed, to prevent any conflicts should you happen to be using a different version of that library elsewhere in your project dependencies.

Found in path(s):

\* /opt/cola/permits/1162863465\_1653505868.969204/0/vault-java-driver-master-1-zip/vault-java-driver-master/README.md

No license file was found, but licenses were detected in source scan.

/\*\*

\* <p>Intended for internal use by other classes within the Vault driver library.</p>

\*

\* <p>JSON parsing functionality. The classes in this package are adapted from Ralf Sternberg's excellent

\* <a href="https://github.com/ralfstx/minimal-json">"minimal-json"</a> library, available under the MIT License.

\* The package names have all been changed, to prevent any conflicts should you happen to be using a different

\* version of this library elsewhere in your project dependencies.</p>

\*/

Found in path(s):

\* /opt/cola/permits/1162863465\_1653505868.969204/0/vault-java-driver-master-1-zip/vault-java-driver-master/src/main/java/com/bettercloud/vault/json/package-info.java

## 1.153 kotlin-coroutines-bom 1.5.1

### 1.153.1 Available under license :

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## 1.154 metrics---dropwizard v4.0.5

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Manifest-Version: 1.0

Bnd-LastModified: 1545937975057

Build-Jdk: 1.8.0\_191

Built-By: artem

Bundle-Description: An Apache HttpClient wrapper providing Metrics instrumentation of connection pools, request durations and rates, and other useful information.

Bundle-License: <http://www.apache.org/licenses/LICENSE-2.0.html>

Bundle-ManifestVersion: 2

Bundle-Name: Metrics Integration for Apache HttpClient

Bundle-SymbolicName: io.dropwizard.metrics.httpclient

Bundle-Version: 4.0.5

Created-By: Apache Maven Bundle Plugin

Export-Package: com.codahale.metrics.httpclient;uses:="com.codahale.metrics,org.apache.http,org.apache.http.config,org.apache.http.conn,org.apache.http.conn.routing,org.apache.http.conn.socket,org.apache.http.impl.client,org.apache.http.impl.conn,org.apache.http.protocol";version="4.0.5"

Implementation-Title: Metrics Integration for Apache HttpClient

Implementation-URL: <http://metrics.dropwizard.io/metrics-httpclient>

Implementation-Vendor-Id: io.dropwizard.metrics

Implementation-Version: 4.0.5

Import-Package: com.codahale.metrics;version="[4.0,5)",org.apache.http,org.apache.http.client,org.apache.http.client.methods,org.apache.http.client.utils,org.apache.http.config,org.apache.http.conn,org.apache.http.conn.routing,org.apache.http.conn.socket,org.apache.http.conn.ssl,org.apache.http.impl.client,org.apache.http.impl.conn,org.apache.h

ttp.pool,org.apache.http.protocol  
Require-Capability: osgi.ee;filter="(&(osgi.ee=JavaSE)(version=1.8))"  
Tool: Bnd-3.3.0.201609221906

Found in path(s):

\* /opt/cola/permits/1274705442\_1648835835.08/0/metrics-httpclient-4-0-5-jar/META-INF/MANIFEST.MF

# 1.155 java-architecture-for-xml-binding 2.3.3

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Streaming API for XML (JSR-173) Specification

Reference Implementation

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/**
 * A Base64 encoder/decoder.
 *
 * <p>
 * This class is used to encode and decode data in Base64 format as described in RFC 1521.
 *
 * <p>
 * Project home page: www.
 * source-code.biz/base64coder/java

 * Author: Christian d'Heureuse, Inventec Informatik AG, Zurich, Switzerland

 * Multi-licensed: EPL / LGPL / GPL / AL / BSD.
 */
```

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\* /opt/cola/permits/1446188159\_1666171012.444366/0/snakeyaml-1-33-sources-1-jar/org/yaml/snakeyaml/resolver/ResolverTuple.java

\* /opt/cola/permits/1446188159\_1666171012.444366/0/snakeyaml-1-33-sources-1-jar/org/yaml/snakeyaml/tokens/FlowEntryToken.java

\* /opt/cola/permits/1446188159\_1666171012.444366/0/snakeyaml-1-33-sources-1-jar/org/yaml/snakeyaml/tokens/FlowMappingEndToken.java

\* /opt/cola/permits/1446188159\_1666171012.444366/0/snakeyaml-1-33-sources-1-jar/org/yaml/snakeyaml/reader/UnicodeReader.java

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\* /opt/cola/permits/1446188159\_1666171012.444366/0/snakeyaml-1-33-sources-1-jar/org/yaml/snakeyaml/events/MappingStartEvent.java

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## 1.157 apache-http-client 4.5.13

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\* /opt/cola/permits/1331474204\_1653068520.815044/0/micronaut-security-3-5-0-sources-jar/io/micronaut/security/endpoints/ControllerConfiguration.java  
\* /opt/cola/permits/1331474204\_1653068520.815044/0/micronaut-security-3-5-0-sources-jar/io/micronaut/security/rules/SensitiveEndpointRule.java  
\* /opt/cola/permits/1331474204\_1653068520.815044/0/micronaut-security-3-5-0-sources-jar/io/micronaut/security/x509/X509AuthenticationFetcher.java  
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jar/io/micronaut/security/filters/SecurityFilterConfiguration.java  
\* /opt/cola/permits/1331474204\_1653068520.815044/0/micronaut-security-3-5-0-sources-  
jar/io/micronaut/security/authentication/ServerAuthentication.java  
\* /opt/cola/permits/1331474204\_1653068520.815044/0/micronaut-security-3-5-0-sources-  
jar/io/micronaut/security/authentication/AbstractPrincipalArgumentBinder.java  
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jar/io/micronaut/security/endpoints/introspection/IntrospectionRequest.java  
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\* /opt/cola/permits/1331474204\_1653068520.815044/0/micronaut-security-3-5-0-sources-jar/io/micronaut/security/rules/AbstractSecurityRule.java

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\* /opt/cola/permits/1331474204\_1653068520.815044/0/micronaut-security-3-5-0-sources-jar/io/micronaut/security/authentication/UsernamePasswordCredentials.java

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\* /opt/cola/permits/1331474204\_1653068520.815044/0/micronaut-security-3-5-0-sources-jar/io/micronaut/security/errors/package-info.java

\* /opt/cola/permits/1331474204\_1653068520.815044/0/micronaut-security-3-5-0-sources-jar/io/micronaut/security/rules/IpPatternsRule.java

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\* /opt/cola/permits/1331474204\_1653068520.815044/0/micronaut-security-3-5-0-sources-jar/io/micronaut/security/token/generator/RefreshTokenGenerator.java

\* /opt/cola/permits/1331474204\_1653068520.815044/0/micronaut-security-3-5-0-sources-jar/io/micronaut/security/filters/SecurityFilter.java

\* /opt/cola/permits/1331474204\_1653068520.815044/0/micronaut-security-3-5-0-sources-jar/io/micronaut/security/token/config/TokenConfiguration.java

\* /opt/cola/permits/1331474204\_1653068520.815044/0/micronaut-security-3-5-0-sources-jar/io/micronaut/security/rules/SecurityRule.java

\* /opt/cola/permits/1331474204\_1653068520.815044/0/micronaut-security-3-5-0-sources-jar/io/micronaut/security/token/reader/TokenReader.java

\* /opt/cola/permits/1331474204\_1653068520.815044/0/micronaut-security-3-5-0-sources-jar/io/micronaut/security/token/Claims.java

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\* /opt/cola/permits/1331474204\_1653068520.815044/0/micronaut-security-3-5-0-sources-jar/io/micronaut/security/config/TokenCookieConfiguration.java

\* /opt/cola/permits/1331474204\_1653068520.815044/0/micronaut-security-3-5-0-sources-jar/io/micronaut/security/authentication/AuthenticationFailed.java

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\* /opt/cola/permits/1331474204\_1653068520.815044/0/micronaut-security-3-5-0-sources-jar/io/micronaut/security/authentication/DefaultAuthorizationExceptionHandler.java

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\* /opt/cola/permits/1331474204\_1653068520.815044/0/micronaut-security-3-5-0-sources-jar/io/micronaut/security/endpoints/introspection/IntrospectionResponse.java

\* /opt/cola/permits/1331474204\_1653068520.815044/0/micronaut-security-3-5-0-sources-jar/io/micronaut/security/config/RefreshRedirectConfiguration.java

\* /opt/cola/permits/1331474204\_1653068520.815044/0/micronaut-security-3-5-0-sources-jar/io/micronaut/security/token/propagation/HttpHeaderTokenPropagatorConfigurationProperties.java

\* /opt/cola/permits/1331474204\_1653068520.815044/0/micronaut-security-3-5-0-sources-jar/io/micronaut/security/errors/OauthErrorResponseException.java

\* /opt/cola/permits/1331474204\_1653068520.815044/0/micronaut-security-3-5-0-sources-jar/io/micronaut/security/rules/InterceptUriMapRule.java

\* /opt/cola/permits/1331474204\_1653068520.815044/0/micronaut-security-3-5-0-sources-jar/io/micronaut/security/authentication/AuthenticationFailureReason.java

\* /opt/cola/permits/1331474204\_1653068520.815044/0/micronaut-security-3-5-0-sources-jar/io/micronaut/security/authentication/AuthenticationProvider.java

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\* /opt/cola/permits/1331474204\_1653068520.815044/0/micronaut-security-3-5-0-sources-jar/io/micronaut/security/event/TokenValidatedEvent.java

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\* /opt/cola/permits/1331474204\_1653068520.815044/0/micronaut-security-3-5-0-sources-jar/io/micronaut/security/authentication/AuthenticationArgumentBinder.java

\* /opt/cola/permits/1331474204\_1653068520.815044/0/micronaut-security-3-5-0-sources-jar/io/micronaut/security/authentication/CookieBasedAuthenticationModeCondition.java  
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\* /opt/cola/permits/1331474204\_1653068520.815044/0/micronaut-security-3-5-0-sources-jar/io/micronaut/security/token/propagation/TokenPropagationConfiguration.java

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## 1.161 jackson-jaxrs 2.13.4

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# Jackson JSON processor

Jackson is a high-performance, Free/Open Source JSON processing library.

It was originally written by Tatu Saloranta (tatu.saloranta@iki.fi), and has been in development since 2007.

It is currently developed by a community of developers, as well as supported commercially by FasterXML.com.

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# 1.162 apache-kafka 2.8.2

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# 1.163 hdrhistogram 2.1.12

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Manifest-Version: 1.0

Bnd-LastModified: 1575980548657

Build-Jdk: 1.8.0\_232

Built-By: gil

Bundle-Description: HdrHistogram supports the recording and analyzing sampled data value counts across a configurable integer value range with configurable value precision within the range. Value precision is expressed as the number of significant digits in the value recording, and provides control over value quantization behavior across the value range and the subsequent value resolution at any given level.

Bundle-License: <http://creativecommons.org/publicdomain/zero/1.0/>, <https://opensource.org/licenses/BSD-2-Clause>

Bundle-ManifestVersion: 2

Bundle-Name: HdrHistogram

Bundle-SymbolicName: org.hdrhistogram.HdrHistogram

Bundle-Version: 2.1.12

Created-By: Apache Maven Bundle Plugin

Export-Package: org.HdrHistogram;version="2.1.12",org.HdrHistogram.packagedarray;version="2.1.12"

Implementation-Title: HdrHistogram

Implementation-Vendor-Id: org.hdrhistogram

Implementation-Version: 2.1.12

Require-Capability: osgi.ee;filter="(&(osgi.ee=JavaSE)(version=1.7))"

Specification-Title: HdrHistogram

Specification-Version: 2.1.12

Tool: Bnd-2.3.0.201405100607

Found in path(s):

\* /opt/cola/permits/1185944801\_1628011594.04/0/hdrhistogram-2-1-12-3-jar/META-INF/MANIFEST.MF

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