무료 전자 책

배우기 Kotlin

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#kotlin

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1: Kotlin

Kotlin JVM JetBrains . Kotlin , , , Java 100 % . Kotlin Java . Kotlin JVM .

Kotlin

Kotlin Eclipse IntelliJ IDE . Kotlin Ant Gradle Maven .

`$ kotlinc Main.kt` java (`MainKt.class` (Kt). `$ java MainKt` java throw.

```
Exception in thread "main" java.lang.NoClassDefFoundError: kotlin/jvm/internal/Intrinsics
    at MainKt.main(Main.kt)
Caused by: java.lang.ClassNotFoundException: kotlin.jvm.internal.Intrinsics
    at java.net.URLClassLoader.findClass(URLClassLoader.java:381)
    at java.lang.ClassLoader.loadClass(ClassLoader.java:424)
    at sun.misc.Launcher$AppClassLoader.loadClass(Launcher.java:335)
    at java.lang.ClassLoader.loadClass(ClassLoader.java:357)
    ... 1 more
```

Java Kotlin jar .

```
java -cp .:/path/to/kotlin/runtime/jar/kotlin-runtime.jar MainKt
```

1.0.0	2016-02-15
1.0.1	2016-03-16
1.0.2	2016-05-13
1.0.3	2016-06-30
1.0.4	2016-09-22
1.0.5	2016-11-08
1.0.6	2016-12-27
1.1.0	2017-03-01
1.1.1	2017-03-14
1.1.2	2017-04-25
1.1.3	2017-06-23

Examples

Kotlin `main` . Kotlin "Hello World" .

```
package my.program

fun main(args: Array<String>) {
    println("Hello, world!")
}
```

`Main.kt` `Main.kt` ( )

JVM . `my.program.MainKt` .

.

```
@file:JvmName("MyApp")
```

`my.program.MyApp` .

:

- `@JvmName` .
-

Hello Hello World

Kotlin Object Declaration .

```
package my.program

object App {
    @JvmStatic fun main(args: Array<String>) {
        println("Hello World")
    }
}
```

, `my.program.App` .

`App` . `App` .

:

- `@JvmStatic`

Hello World

Object Declaration , Companion Object Kotlin `main` .

```
package my.program

class App {
    companion object {
        @JvmStatic fun main(args: Array<String>) {
```

```
            println("Hello World")
        }
    }
}
```

, my.program.App .

App . Object Declaration .

"hello" .

```
class App {
    companion object {
        @JvmStatic fun main(args: Array<String>) {
            App().run()
        }
    }

    fun run() {
        println("Hello World")
    }
}
```

:

- @JvmStatic

varargs

varargs .

```
package my.program

fun main(vararg args: String) {
    println("Hello, world!")
}
```

Kotlin

java Java . Kotlin .

javac . java java .

kotlinc kotlin .

Kotlin . N (1 2 3) .

Kotlin .

```
fun main(args: Array<String>) {

    println("Enter Two number")
    var (a, b) = readLine()!!.split(' ') // !! this operator use for
```

```
NPE(NullPointerException).

    println("Max number is : ${maxNum(a.toInt(), b.toInt())}")
}



fun maxNum(a: Int, b: Int): Int {

    var max = if (a > b) {
        println("The value of a is $a");
        a
    } else {
        println("The value of b is $b")
        b
    }

    return max;

}
```

. :

```
Enter Two number
71 89 // Enter two number from command line

The value of b is 89
Max number is: 89
```

For !! Null .

: Intellij .

Kotlin : https://riptutorial.com/ko/kotlin/topic/490/kotlin-

2: DSL

Kotlin DSL .

Examples

DSL

:

```
infix fun <T> T?.shouldBe(expected: T?) = assertEquals(expected, this)
```

DSL .

```
@Test
fun test() {
  100.plusOne() shouldBe 101
}
```

DSL invoke .

:

```
class MyExample(val i: Int) {
  operator fun <R> invoke(block: MyExample.() -> R) = block()
  fun Int.bigger() = this > i
}
```

DSL .

```
fun main2(args: Array<String>) {
    val ex = MyExample(233)
    ex {
        // bigger is defined in the context of `ex`
        // you can only call this method inside this context
        if (777.bigger()) kotlin.io.println("why")
    }
}
```

:

```
val r = Random(233)
infix inline operator fun Int.rem(block: () -> Unit) {
  if (r.nextInt(100) < this) block()
}
```

DSL .

```
20 % { println("The possibility you see this message is 20%") }
```

:

```
operator fun <R> String.invoke(block: () -> R) = {
  try { block.invoke() }
  catch (e: AssertException) { System.err.println("$this\n${e.message}") }
}
```

DSL .

```
"it should return 2" {
   parse("1 + 1").buildAST().evaluate() shouldBe 2
}
```

shouldBe Infix approach to build DSL .

DSL : https://riptutorial.com/ko/kotlin/topic/10042/dsl-

3: Java 8 Stream Equivalents

Kotlin iterable . `Sequence` .

chain `asSequence()` `Sequence` . `Sequence` . `toList()` , `toSet()` , `toMap()` `Sequence` .

```
// switch to and from lazy
val someList = items.asSequence().filter { ... }.take(10).map { ... }.toList()

// switch to lazy, but sorted() brings us out again at the end
val someList = items.asSequence().filter { ... }.take(10).map { ... }.sorted()
```

?!?

Kotlin . Kotlin . Null NPE Java . Kotlin :

```
val someList = people.filter { it.age <= 30 }.map { it.name }
```

:

```
val someList: List<String> = people.filter { it.age <= 30 }.map { it.name }
```

`people` , `people.age` `Int` `Int` , `people.name` A `String` `map` `List<String>` (`List` `String`).

`List<People>?` `people` `null` `List<People>?` :

```
val someList = people?.filter { it.age <= 30 }?.map { it.name }
```

`List<String>?` `List<String>?` null (null *Kotlin* . null *Kotlin* . *Kotlin nullable*)

Kotlin . `Sequence` iterator "once use" , . Java 8 Kotlin .

```
// Java:
Stream<String> stream =
Stream.of("d2", "a2", "b1", "b3", "c").filter(s -> s.startsWith("b"));

stream.anyMatch(s -> true);    // ok
stream.noneMatch(s -> true);   // exception
```

```
// Kotlin:
val stream = listOf("d2", "a2", "b1", "b3", "c").asSequence().filter { it.startsWith('b' ) }

stream.forEach(::println) // b1, b2

println("Any B ${stream.any { it.startsWith('b') }}") // Any B true
println("Any C ${stream.any { it.startsWith('c') }}") // Any C false

stream.forEach(::println) // b1, b2
```

:

```
// Java:
Supplier<Stream<String>> streamSupplier =
    () -> Stream.of("d2", "a2", "b1", "b3", "c")
          .filter(s -> s.startsWith("a"));

streamSupplier.get().anyMatch(s -> true);   // ok
streamSupplier.get().noneMatch(s -> true);  // ok
```

Kotlin . `Sequence` `constrainOnce()` `Sequence` `constrainOnce()` .

```
val stream = listOf("d2", "a2", "b1", "b3", "c").asSequence().filter { it.startsWith('b' ) }
        .constrainOnce()

stream.forEach(::println) // b1, b2
stream.forEach(::println) // Error:java.lang.IllegalStateException: This sequence can be
consumed only once.
```

:

- Iterable API
- API
- List API
- Map API

Examples

```
// Java:
List<String> list = people.stream().map(Person::getName).collect(Collectors.toList());
```

```
// Kotlin:
val list = people.map { it.name }  // toList() not needed
```

```
// Java:
String joined = things.stream()
                      .map(Object::toString)
                      .collect(Collectors.joining(", "));
```

```
// Kotlin:
val joined = things.joinToString() // ", " is used as separator, by default
```

```
// Java:
int total = employees.stream()
                     .collect(Collectors.summingInt(Employee::getSalary)));
```

```
// Kotlin:
val total = employees.sumBy { it.salary }
```

```
// Java:
Map<Department, List<Employee>> byDept
     = employees.stream()
                .collect(Collectors.groupingBy(Employee::getDepartment));
```

```
// Kotlin:
val byDept = employees.groupBy { it.department }
```

```
// Java:
Map<Department, Integer> totalByDept
     = employees.stream()
                .collect(Collectors.groupingBy(Employee::getDepartment,
                     Collectors.summingInt(Employee::getSalary)));
```

```
// Kotlin:
val totalByDept = employees.groupBy { it.dept }.mapValues { it.value.sumBy { it.salary }}
```

.

```
// Java:
Map<Boolean, List<Student>> passingFailing =
     students.stream()
             .collect(Collectors.partitioningBy(s -> s.getGrade() >= PASS_THRESHOLD));
```

```
// Kotlin:
val passingFailing = students.partition { it.grade >= PASS_THRESHOLD }
```

```
// Java:
List<String> namesOfMaleMembersCollect = roster
    .stream()
    .filter(p -> p.getGender() == Person.Sex.MALE)
    .map(p -> p.getName())
    .collect(Collectors.toList());
```

```
// Kotlin:
val namesOfMaleMembers = roster.filter { it.gender == Person.Sex.MALE }.map { it.name }
```

```
// Java:
Map<Person.Sex, List<String>> namesByGender =
      roster.stream().collect(
        Collectors.groupingBy(
            Person::getGender,
            Collectors.mapping(
                Person::getName,
                Collectors.toList())));
```

```
// Kotlin:
val namesByGender = roster.groupBy { it.gender }.mapValues { it.value.map { it.name } }
```

```
// Java:
List<String> filtered = items.stream()
```

```
    .filter( item -> item.startsWith("o") )
    .collect(Collectors.toList());
```

```
// Kotlin:
val filtered = items.filter { item.startsWith('o') }
```

```
// Java:
String shortest = items.stream()
    .min(Comparator.comparing(item -> item.length()))
    .get();
```

```
// Kotlin:
val shortest = items.minBy { it.length }
```

2 -

```
// Java:
Stream.of("a1", "a2", "a3")
    .findFirst()
    .ifPresent(System.out::println);
```

```
// Kotlin:
sequenceOf("a1", "a2", "a3").firstOrNull()?.apply(::println)
```

3 -

```
// Java:
IntStream.range(1, 4).forEach(System.out::println);
```

```
// Kotlin:  (inclusive range)
(1..3).forEach(::println)
```

4 - , , .

```
// Java:
Arrays.stream(new int[] {1, 2, 3})
    .map(n -> 2 * n + 1)
    .average()
    .ifPresent(System.out::println); // 5.0
```

```
// Kotlin:
arrayOf(1,2,3).map { 2 * it + 1}.average().apply(::println)
```

5 - , , Int , .

```
// Java:
Stream.of("a1", "a2", "a3")
    .map(s -> s.substring(1))
    .mapToInt(Integer::parseInt)
```

```
    .max()
    .ifPresent(System.out::println);  // 3
```

```
// Kotlin:
sequenceOf("a1", "a2", "a3")
    .map { it.substring(1) }
    .map(String::toInt)
    .max().apply(::println)
```

6 - Ints , ,

```
// Java:
IntStream.range(1, 4)
    .mapToObj(i -> "a" + i)
    .forEach(System.out::println);

// a1
// a2
// a3
```

```
// Kotlin:  (inclusive range)
(1..3).map { "a$it" }.forEach(::println)
```

7 - , Int , String , .

```
// Java:
Stream.of(1.0, 2.0, 3.0)
    .mapToInt(Double::intValue)
    .mapToObj(i -> "a" + i)
    .forEach(System.out::println);

// a1
// a2
// a3
```

```
// Kotlin:
sequenceOf(1.0, 2.0, 3.0).map(Double::toInt).map { "a$it" }.forEach(::println)
```

```
// Java:
long count = items.stream().filter( item -> item.startsWith("t")).count();
```

```
// Kotlin:
val count = items.filter { it.startsWith('t') }.size
// but better to not filter, but count with a predicate
val count = items.count { it.startsWith('t') }
```

- , ,

```
// Java:
List<String> myList = Arrays.asList("a1", "a2", "b1", "c2", "c1");
```

```
myList.stream()
      .filter(s -> s.startsWith("c"))
      .map(String::toUpperCase)
     .sorted()
     .forEach(System.out::println);

// C1
// C2
```

```
// Kotlin:
val list = listOf("a1", "a2", "b1", "c2", "c1")
list.filter { it.startsWith('c') }.map (String::toUpperCase).sorted()
        .forEach (::println)
```

1 - .

```
// Java:
Arrays.asList("a1", "a2", "a3")
    .stream()
    .findFirst()
    .ifPresent(System.out::println);
```

```
// Kotlin:
listOf("a1", "a2", "a3").firstOrNull()?.apply(::println)
```

ifPresent String .

```
// Kotlin:
inline fun String?.ifPresent(thenDo: (String)->Unit) = this?.apply { thenDo(this) }

// now use the new extension function:
listOf("a1", "a2", "a3").firstOrNull().ifPresent(::println)
```

`apply()` : `apply()`

:

: `?.` null : http://stackoverflow.com/questions/34498562/in-kotlin-what-is-the-idiomatic-way-to-deal-with-nullable-values-referencing-o/34498563 # 34498563

5 - , .

```
// Java:
String phrase = persons
        .stream()
        .filter(p -> p.age >= 18)
        .map(p -> p.name)
        .collect(Collectors.joining(" and ", "In Germany ", " are of legal age."));

System.out.println(phrase);
// In Germany Max and Peter and Pamela are of legal age.
```

```
// Kotlin:
```

```
val phrase = persons
        .filter { it.age >= 18 }
        .map { it.name }
        .joinToString(" and ", "In Germany ", " are of legal age.")

println(phrase)
// In Germany Max and Peter and Pamela are of legal age.
```

Kotlin .

```
// Kotlin:
// data class has equals, hashcode, toString, and copy methods automagically
data class Person(val name: String, val age: Int)

val persons = listOf(Person("Tod", 5), Person("Max", 33),
                     Person("Frank", 13), Person("Peter", 80),
                     Person("Pamela", 18))
```

6 - ,

```
// Java:
Map<Integer, String> map = persons
        .stream()
        .collect(Collectors.toMap(
                p -> p.age,
                p -> p.name,
                (name1, name2) -> name1 + ";" + name2));

System.out.println(map);
// {18=Max, 23=Peter;Pamela, 12=David}
```

, . / `Map` :

```
// Kotlin:
val map1 = persons.map { it.age to it.name }.toMap()
println(map1)
// output: {18=Max, 23=Pamela, 12=David}
// Result: duplicates overridden, no exception similar to Java 8

val map2 = persons.toMap({ it.age }, { it.name })
println(map2)
// output: {18=Max, 23=Pamela, 12=David}
// Result: same as above, more verbose, duplicates overridden

val map3 = persons.toMapBy { it.age }
println(map3)
// output: {18=Person(name=Max, age=18), 23=Person(name=Pamela, age=23), 12=Person(name=David,
age=12)}
// Result: duplicates overridden again

val map4 = persons.groupBy { it.age }
println(map4)
// output: {18=[Person(name=Max, age=18)], 23=[Person(name=Peter, age=23), Person(name=Pamela,
age=23)], 12=[Person(name=David, age=12)]}
// Result: closer, but now have a Map<Int, List<Person>> instead of Map<Int, String>

val map5 = persons.groupBy { it.age }.mapValues { it.value.map { it.name } }
```

```
println(map5)
// output: {18=[Max], 23=[Peter, Pamela], 12=[David]}
// Result: closer, but now have a Map<Int, List<String>> instead of Map<Int, String>
```

:

```
// Kotlin:
val map6 = persons.groupBy { it.age }.mapValues { it.value.joinToString(";") { it.name } }

println(map6)
// output: {18=Max, 23=Peter;Pamela, 12=David}
// Result: YAY!!
```

Person joinToString joinToString Person.name .

7a - ,

```
// Java (verbose):
Collector<Person, StringJoiner, String> personNameCollector =
Collector.of(
        () -> new StringJoiner(" | "),          // supplier
        (j, p) -> j.add(p.name.toUpperCase()),  // accumulator
        (j1, j2) -> j1.merge(j2),               // combiner
        StringJoiner::toString);                // finisher

String names = persons
        .stream()
        .collect(personNameCollector);

System.out.println(names);  // MAX | PETER | PAMELA | DAVID

// Java (concise)
String names = persons.stream().map(p -> p.name.toUpperCase()).collect(Collectors.joining(" |
"));
```

```
// Kotlin:
val names = persons.map { it.name.toUpperCase() }.joinToString(" | ")
```

7b - SummarizingInt

```
// Java:
IntSummaryStatistics ageSummary =
    persons.stream()
           .collect(Collectors.summarizingInt(p -> p.age));

System.out.println(ageSummary);
// IntSummaryStatistics{count=4, sum=76, min=12, average=19.000000, max=23}
```

```
// Kotlin:

// something to hold the stats...
data class SummaryStatisticsInt(var count: Int = 0,
                                var sum: Int = 0,
                                var min: Int = Int.MAX_VALUE,
```

```
                                var max: Int = Int.MIN_VALUE,
                                var avg: Double = 0.0) {
    fun accumulate(newInt: Int): SummaryStatisticsInt {
        count++
        sum += newInt
        min = min.coerceAtMost(newInt)
        max = max.coerceAtLeast(newInt)
        avg = sum.toDouble() / count
        return this
    }
}

// Now manually doing a fold, since Stream.collect is really just a fold
val stats = persons.fold(SummaryStatisticsInt()) { stats, person ->
stats.accumulate(person.age) }

println(stats)
// output: SummaryStatisticsInt(count=4, sum=76, min=12, max=23, avg=19.0)
```

Kotlin stdlib .

```
// Kotlin:
inline fun Collection<Int>.summarizingInt(): SummaryStatisticsInt
        = this.fold(SummaryStatisticsInt()) { stats, num -> stats.accumulate(num) }

inline fun <T: Any> Collection<T>.summarizingInt(transform: (T)->Int): SummaryStatisticsInt =
        this.fold(SummaryStatisticsInt()) { stats, item -> stats.accumulate(transform(item)) }
```

summarizingInt .

```
val stats2 = persons.map { it.age }.summarizingInt()

// or

val stats3 = persons.summarizingInt { it.age }
```

. Sequence .

Java 8 Stream Equivalents : https://riptutorial.com/ko/kotlin/topic/707/java-8-stream-equivalents

4: Java Kotlin

Kotlin .

Java Kotlin Kotlin Java .

Examples

Kotlin Java .

```
val i : Int = 42
```

- `val` `var` , `final` (**" ")** **VAR** iable.
- `:`
- Kotlin obmitted

`int i = 42;`	`var i = 42` (`var i : Int = 42`)
`final int i = 42;`	`val i = 42`

- `;`
- Kotlin **null-safe.**
- Kotlin **100 % Java**
- Kotlin (JVM).
- Kotlin **.**
- Kotlin `equals` / `hashCode` `hashCode` .
- Kotlin **.**
- Kotlin **`new`** . .
- Kotlin () . . `val a = someMap["key"]`
- Kotlin JVM **Java Script** Kotlin .
- Kotlin **Java 6** Android (:) .
- Kotlin **Android** **.**
- Kotlin .
- ().

Kotlin `==` (, `equals` `equals`) ID `===` .

`a.equals(b);`	`a == b`
`a == b;`	`a === b`
`a != b;`	`a !== b`

: https://kotlinlang.org/docs/reference/equality.html

IF, TRY .

Kotlin `if` , `try` others expression .

, Kotlin Java .

```
val i = if (someBoolean) 33 else 42
```

`try` .

```
val i = try {
    Integer.parseInt(someString)
}
catch (ex : Exception)
{
    42
}
```

Java Kotlin : https://riptutorial.com/ko/kotlin/topic/10099/java--kotlin

5: JUnit

Examples

JUnit ,

```
@Rule @JvmField val myRule = TemporaryFolder()
```

`@JvmField myRule` ( ) () . JUnit .

JUnit : https://riptutorial.com/ko/kotlin/topic/6973/junit

6: Kotlin Android

Kotlin Android ButterKnife . , .

Examples

gradle .

- ( ) `build.gradle` Kotlin .

```
buildscript {
    ...
}

apply plugin: "com.android.application"
...
apply plugin: "kotlin-android"
apply plugin: "kotlin-android-extensions"
...
```

activity_main.xml `activity_main.xml` `activity_main.xml` .

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent">

    <Button
        android:id="@+id/my_button"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="My button"/>
</LinearLayout>
```

Kotlin .

```
import kotlinx.android.synthetic.main.activity_main.my_button

class MainActivity: Activity() {
    override fun onCreate(savedInstanceBundle: Bundle?) {
        super.onCreate(savedInstanceBundle)
        setContentView(R.layout.activity_main)
        // my_button is already casted to a proper type of "Button"
        // instead of being a "View"
        my_button.setText("Kotlin rocks!")
    }
}
```

* ID

```
// my_button can be used the same way as before
import kotlinx.android.synthetic.main.activity_main.*
```

Activities / Fragments / Views .

```
import kotlinx.android.synthetic.main.activity_main.my_button

class NotAView {
    init {
        // This sample won't compile!
        my_button.setText("Kotlin rocks!")
    }
}
```

Android Android Product Flavors . `build.gradle` `build.gradle` :

```
android {
    productFlavors {
        paid {
            ...
        }
        free {
            ...
        }
    }
}
```

, .

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent">

    <Button
        android:id="@+id/buy_button"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Buy full version"/>
</LinearLayout>
```

.

```
import kotlinx.android.synthetic.free.main_activity.buy_button
```

, .

```
mView.afterMeasured {
  // inside this block the view is completely drawn
  // you can get view's height/width, it.height / it.width
}
```

```
inline fun View.afterMeasured(crossinline f: View.() -> Unit) {
viewTreeObserver.addOnGlobalLayoutListener(object : ViewTreeObserver.OnGlobalLayoutListener {
    override fun onGlobalLayout() {
        if (measuredHeight > 0 && measuredWidth > 0) {
            viewTreeObserver.removeOnGlobalLayoutListener(this)
```

```
                f()
            }
        }
})
}
```

Kotlin Android : https://riptutorial.com/ko/kotlin/topic/9474/kotlin-android--

7: Kotlin

Examples

`kotlin-gradle-plugin` Kotlin Gradle . Kotlin . Kotlin `1.0.3` `kotlin-gradle-plugin 1.0.3` .

`gradle.properties` `ExtraPropertiesExtension` :

```
buildscript {
   ext.kotlin_version = '1.0.3'

   repositories {
     mavenCentral()
   }

   dependencies {
     classpath "org.jetbrains.kotlin:kotlin-gradle-plugin:$kotlin_version"
   }
}
```

. .

JVM

```
apply plugin: 'kotlin'
```

Android

```
apply plugin: 'kotlin-android'
```

JS

```
apply plugin: 'kotlin2js'
```

.

- kotlin : `src/main/kotlin`
- : `src/main/java`
- kotlin : `src/test/kotlin`
- java tests : `src/test/java`
- : `src/main/resources`
- : `src/test/resources`

`SourceSets` .

Kotlin .

```
dependencies {
    compile "org.jetbrains.kotlin:kotlin-stdlib:$kotlin_version"
}
```

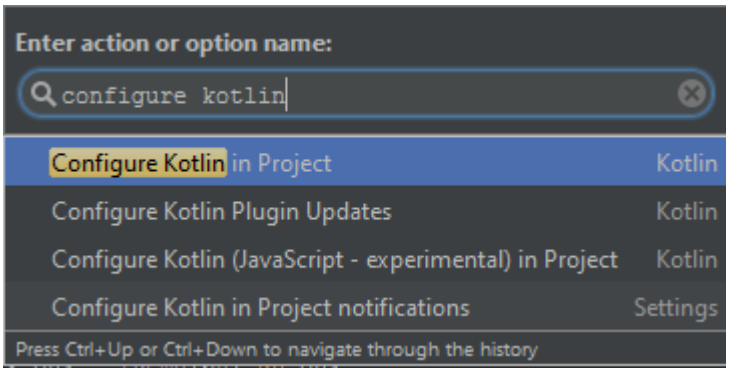
Kotlin Reflection `compile "org.jetbrains.kotlin:kotlin-reflect:$kotlin_version"` `compile "org.jetbrains.kotlin:kotlin-reflect:$kotlin_version"`

Android Studio

Android Studio Android Kotlin .

Kotlin > > > > JetBrains ...> Kotlin> Android Studio .

Android Studio `Ctrl` + `Shift` + `A` . " Kotlin " Enter .



Android Studio Gradle .

Java Kotlin `Ctrl` + `Shift` + `A` "Java Kotlin " . `.kt` Kotlin .

```java
package com.orangeflash81.myapplication;

public class Foo {
    private String name = "Joe Bloggs";

    String getName() { return name; }

    void setName(String value) { name = value; }
}
```

Groovy Gradle Kotlin

:

- gradle-script-kotlin
- / :
  - `build.gradle.kts`
  - `gradlew`
  - `gradlew.bat`
  - `settings.gradle`
- `build.gradle.kts` .
- Intellij Gradle .
- Intellij `build.gradle.kts` . Intellij .
- Gradle .

Windows . Gradle 3.3 . .

OSX Ubuntu .

, publicing , Jitpack , . .

Kotlin : https://riptutorial.com/ko/kotlin/topic/2501/kotlin--

8: kotlin

: Kotlin

Examples

kotlin.logging

```
class FooWithLogging {
  companion object: KLogging()

  fun bar() {
    logger.info { "hello $name" }
  }

  fun logException(e: Exception) {
    logger.error(e) { "Error occured" }
  }
}
```

kotlin.logging

kotlin : https://riptutorial.com/ko/kotlin/topic/3258/kotlin-

9: Kotlin RecyclerView

Kotlin RecyclerView .

Examples

Kotlin , activity_main.xml RecyclerView .

```
class MainActivity : AppCompatActivity(){

        lateinit var mRecyclerView : RecyclerView
        val mAdapter : RecyclerAdapter = RecyclerAdapter()

        override fun onCreate(savedInstanceState: Bundle?) {
            super.onCreate(savedInstanceState)
            setContentView(R.layout.activity_main)
            val toolbar = findViewById(R.id.toolbar) as Toolbar
            setSupportActionBar(toolbar)

            mRecyclerView = findViewById(R.id.recycler_view) as RecyclerView

            mRecyclerView.setHasFixedSize(true)
            mRecyclerView.layoutManager = LinearLayoutManager(this)
            mAdapter.RecyclerAdapter(getList(), this)
            mRecyclerView.adapter = mAdapter
        }

        private fun getList(): ArrayList<String> {
            var list : ArrayList<String> = ArrayList()
            for  (i in 1..10) { // equivalent of 1 <= i && i <= 10
                println(i)
                list.add("$i")
            }
            return list
        }
    }
```

main_item.xml .

```
class RecyclerAdapter : RecyclerView.Adapter<RecyclerAdapter.ViewHolder>() {

    var mItems: ArrayList<String>  = ArrayList()
    lateinit var mClick : OnClick

    fun RecyclerAdapter(item : ArrayList<String>, mClick : OnClick){
        this.mItems = item
        this.mClick = mClick;
    }

    override fun onBindViewHolder(holder: ViewHolder, position: Int) {
        val item = mItems[position]
        holder.bind(item, mClick, position)
    }

    override fun onCreateViewHolder(parent: ViewGroup, viewType: Int): ViewHolder {
```

```
        val layoutInflater = LayoutInflater.from(parent.context)
        return ViewHolder(layoutInflater.inflate(R.layout.main_item, parent, false))
    }

    override fun getItemCount(): Int {
        return mItems.size
    }

    class ViewHolder(view: View) : RecyclerView.ViewHolder(view) {
        val card = view.findViewById(R.id.card) as TextView
        fun bind(str: String, mClick: OnClick, position: Int){
            card.text = str
            card.setOnClickListener { view ->
                mClick.onClickListner(position)
            }
        }
    }
}
```

Kotlin RecyclerView : https://riptutorial.com/ko/kotlin/topic/10143/kotlin-recyclerview

10: Kotlin

Kotlin .

1. Kotlin .kt.
2. Kotlin Any (Java Object).
3. val (immutable- assign once) var (mutables-) .
4. .
5. Unit. . 6. === . a === b a b true .

Examples

1. . .

```
    fun printHello(name: String?): Unit {
        if (name != null)
            println("Hello ${name}")
    }

    fun printHello(name: String?) {
        ...
    }
```

2.Single-Expression functions : = .

```
  fun double(x: Int): Int = x * 2
```

.

```
  fun double(x: Int) = x * 2
```

3. : .

```
In java:
    int num=10
    String s  = "i =" + i;

In Kotlin
    val num = 10
    val s = "i = $num"
```

4.In Kotlin null (nullable) (null) . , String null .

```
var a: String = "abc"
a = null // compilation error
```

null nullable . String? :

```
var b: String? = "abc"
b = null // ok
```

5.In Kotlin == . a == b .

```
   a?.equals(b) ?: (b === null)
```

Kotlin : https://riptutorial.com/ko/kotlin/topic/10648/kotlin-

11: Kotlin

Kotlin . , int .

Examples

x

```
repeat(10) { i ->
    println("This line will be printed 10 times")
    println("We are on the ${i + 1}. loop iteration")
}
```

for-loop :

```
val list = listOf("Hello", "World", "!")
for(str in list) {
    print(str)
}
```

Kotlin :

```
for(i in 0..9) {
    print(i)
}
```

iterating :

```
for((index, element) in iterable.withIndex()) {
    print("$element at index $index")
}
```

forEach .

```
iterable.forEach {
    print(it.toString())
}
```

```
it
```

While

while do-while .

```
while(condition) {
    doSomething()
}
```

```
do {
    doSomething()
} while (condition)
```

do-while .

.

```
while(true) {
    if(condition1) {
        continue // Will immediately start the next iteration, without executing the rest of
the loop body
    }
    if(condition2) {
        break // Will exit the loop completely
    }
}
```

break continue .

```
outer@ for(i in 0..10) {
    inner@ for(j in 0..10) {
        break       // Will break the inner loop
        break@inner // Will break the inner loop
        break@outer // Will break the outer loop
    }
}
```

forEach .

kotlin

```
//iterates over a map, getting the key and value at once

var map = hashMapOf(1 to "foo", 2 to "bar", 3 to "baz")

for ((key, value) in map) {
    println("Map[$key] = $value")
}
```

Kotlin .

```
fun factorial(n: Long): Long = if (n == 0) 1 else n * factorial(n - 1)

println(factorial(10)) // 3628800
```

factorial .

Kotlin .

map .

```
val numbers = listOf(1, 2, 3, 4, 5, 6, 7, 8, 9, 0)
val numberStrings = numbers.map { "Number $it" }
```

. . filter .

```
val numbers = listOf(1, 2, 3, 4, 5, 6, 7, 8, 9, 0)
val numberStrings = numbers.filter { it % 2 == 0 }.map { "Number $it" }
```

Kotlin : https://riptutorial.com/ko/kotlin/topic/2727/kotlin-

12:

Kotlin 4 .

: .

: .

Protected : .

: .

- `<visibility modifier> val/var <variable name> = <value>`

Examples

: `public val name = "Avijit"`

: `private val name = "Avijit"`

: `protected val name = "Avijit"`

: `internal val name = "Avijit"`

: https://riptutorial.com/ko/kotlin/topic/10019/--

13:

- (***Params***) = ...
- (***Params***) {...}
- (***Params***) : {...}
- < > (***Params***) : {...}
- (***Params***) : {...}
- { ***ArgName*** : ***ArgType*** -> ...}
- { ***ArgName*** -> ...}
- { ***ArgName*** -> ...}
- {(***ArgName*** : ***ArgType***) : -> ...}

Params	: ***Name : Type***
	( )
ArgName	
ArgType	***ArgName***
ArgName	ArgName

Examples

"Lambda Functions" . " " .

```
# Takes no parameters and returns anything
() -> Any?

# Takes a string and an integer and returns ReturnType
(arg1: String, arg2: Int) -> ReturnType
```

, vaguest `() -> Any?` , .

```
fun twice(x: () -> Any?) {
    x(); x();
}

fun main() {
    twice {
        println("Foo")
    } # => Foo
      # => Foo
}
```

. , - {} -> .

```
{ name: String ->
    "Your name is $name" //This is returned
}
```

.

.

:

```
{ argumentOne:String, argumentTwo:String ->
    "$argumentOne - $argumentTwo"
}
```

, it .

```
{ "Your name is $it" }
```

.

```
# These are identical
listOf(1, 2, 3, 4).map { it + 2 }
listOf(1, 2, 3, 4).map({ it + 2 })
```

:: . .

```
fun addTwo(x: Int) = x + 2
listOf(1, 2, 3, 4).map(::addTwo) # => [3, 4, 5, 6]
```

(ParamTypeA, ParamTypeB, ...) -> ReturnType . ParamTypeA , ParamTypeB ... `ReturnType1 .

```
fun foo(p0: Foo0, p1: Foo1, p2: Foo2): Bar {
    //...
}
println(::foo::class.java.genericInterfaces[0])
// kotlin.jvm.functions.Function3<Foo0, Foo1, Foo2, Bar>
// Human readable type: (Foo0, Foo1, Foo2) -> Bar
```

( ) . .

```
class Foo
fun Foo.foo(p0: Foo0, p1: Foo1, p2: Foo2): Bar {
    //...
}
val ref = Foo::foo
println(ref::class.java.genericInterfaces[0])
// kotlin.jvm.functions.Function4<Foo, Foo0, Foo1, Foo2, Bar>
// Human readable type: (Foo, Foo0, Foo1, Foo2) -> Bar
// takes 4 parameters, with receiver as first and actual parameters following, in their order
```

```
// this function can't be called like an extension function, though
val ref = Foo::foo
Foo().ref(Foo0(), Foo1(), Foo2()) // compile error

class Bar {
    fun bar()
}
print(Bar::bar) // works on member functions, too.
```

. .

```
object Foo
fun Foo.foo(p0: Foo0, p1: Foo1, p2: Foo2): Bar {
    //...
}
val ref = Foo::foo
println(ref::class.java.genericInterfaces[0])
// kotlin.jvm.functions.Function3<Foo0, Foo1, Foo2, Bar>
// Human readable type: (Foo0, Foo1, Foo2) -> Bar
// takes 3 parameters, receiver not needed

object Bar {
    fun bar()
}
print(Bar::bar) // works on member functions, too.
```

kotlin 1.1 , .

1.1.0

```
fun makeList(last: String?): List<String> {
    val list = mutableListOf("a", "b", "c")
    last?.let(list::add)
    return list
}
```

. .

. .

```
class Foo
class Bar {
    fun Foo.foo() {}
    val ref = Foo::foo // compile error
}
```

`fun` . . `Unit` . `{}` . `Unit` return .

```
fun sayMyName(name: String): String {
    return "Your name is $name"
}
```

:

```
fun sayMyName(name: String): String = "Your name is $name"
```

.

```
fun sayMyName(name: String) = "Your name is $name"
```

equals . .

```
fun sayMyName(name: String): String = "Your name is $name"
```

`inline` `inline` . C . . lambda .

```
inline fun sayMyName(name: String) = "Your name is $name"
```

C .

```
inline fun sayMyName() = "Your name is $name"

fun main() {
    val name = "Foo"
    sayMyName() # => Unresolved reference: name
}
```

Kotlin fixed symbolic representation (`+` `*`) . . `operator` :

```
data class IntListWrapper (val wrapped: List<Int>) {
    operator fun get(position: Int): Int = wrapped[position]
}

val a = IntListWrapper(listOf(1, 2, 3))
a[1] // == 2
```

.

: https://riptutorial.com/ko/kotlin/topic/1280/

14:

- :
- {parameterName : ParameterType, otherParameterName : OtherParameterType -> anExpression ()}
- :
- : (Int, Int) -> Int = {a, b -> a + b}
- `it`
- : (Int) -> Int = {it * it}
- :
- () -> ResultType
- (InputType) -> ResultType
- (InputType1, InputType2) -> ResultType

. .

```
data class User(val fistName: String, val lastName: String) {
    fun username(userNameGenerator: (String, String) -> String) =
        userNameGenerator(firstName, secondName)
}
```

.

```
val user = User("foo", "bar")
println(user.userName { firstName, secondName ->
     "${firstName.toUppercase}"_"${secondName.toUppercase}"
 }) // prints FOO_BAR
```

:

```
//valid:
val addition: (Int, Int) = { a, b -> a + b }
//valid:
val addition = { a: Int, b: Int -> a + b }
//error (type inference failure):
val addition = { a, b -> a + b }
```

, , `it` .

```
listOf(1,2,3).map { it * 2 } // [2,4,6]
```

Examples

```
val allowedUsers = users.filter { it.age > MINIMUM_AGE }
```

```
val isOfAllowedAge = { user: User -> user.age > MINIMUM_AGE }
val allowedUsers = users.filter(isOfAllowedAge)
```

:

```
object Benchmark {
    fun realtime(body: () -> Unit): Duration {
        val start = Instant.now()
        try {
            body()
        } finally {
            val end = Instant.now()
            return Duration.between(start, end)
        }
    }
}
```

:

```
val time = Benchmark.realtime({
    // some long-running code goes here ...
})
println("Executed the code in $time")
```

: https://riptutorial.com/ko/kotlin/topic/5878/-

15:

Examples

Null Null

`String` Null . Null `?` : `String?`

```
var string        : String = "Hello World!"
var nullableString: String? = null

string = nullableString    // Compiler error: Can't assign nullable to non-nullable type.
nullableString = string    // This will work however!
```

nullable .

, `?.` , null null .

```
val string: String? = "Hello World!"
print(string.length)   // Compile error: Can't directly access property of nullable type.
print(string?.length)  // Will print the string's length, or "null" if the string is null.
```

Idiom : null-checked

null-checked Kotlin `apply` .

```
obj?.apply {
    foo()
    bar()
}
```

`foo bar obj` (`this apply`) `obj` , , null.

nullable nullable `apply let let apply` .

```
nullable?.let { notnull ->
    notnull.foo()
    notnull.bar()
}
```

`notnull` lambda `it` .

null .

```
var string: String? = "Hello!"
print(string.length)  // Compile error
if(string != null) {
    // The compiler now knows that string can't be null
```

```
    print(string.length)  // It works now!
}
```

: null .

(:), .

null .

`Collection<T?> Collections<T> . filterNotNull .`

```
val a: List<Int?> = listOf(1, 2, 3, null)
val b: List<Int> = a.filterNotNull()
```

Null Coalescing / Elvis Operator

null if-else . elvis `?:` Kotlin .

:

```
val value: String = data?.first() ?: "Nothing here."
```

`data?.first() data null "Nothing here" data?.first() data?.first() .`

throw .

```
val value: String = data?.second()
    ?: throw IllegalArgumentException("Value can't be null!")
```

: (: `data!!.second()!!`) NullPointerExceptions `data!!.second()!!`

`!!` null null . `null KotlinNullPointerException` Throw.

```
val message: String? = null
println(message!!) //KotlinNullPointerException thrown, app crashes
```

(? :)

Kotlin `null reference` . nullable `a` . " `a` , `x` " .

```
var a: String? = "Nullable String Value"
```

`a` null . `a` , , . `if...else` .

```
val b: Int = if (a != null) a.length else -1
```

`Elvis` (: `?: Elvis . if...else` Elvis .

```
val b = a?.length ?: -1
```

`?:` (: `a?.length`) null elvis (`-1`) . .

: https://riptutorial.com/ko/kotlin/topic/2080/-

16:

Examples

String `string[index]` .

```
val str = "Hello, World!"
println(str[1]) // Prints e
```

String for .

```
for (c in str) {
    println(c)
}
```

Kotlin .

-
-

. . \t , \b , \n , \r , \' , \" , \\ \$. \uFF00 .

```
val s = "Hello, world!\n"
```

"""

```
val text = """
    for (c in "foo")
        print(c)
"""
```

trimMargin () .

```
val text = """
    |Tell me and I forget.
    |Teach me and I remember.
    |Involve me and I learn.
    |(Benjamin Franklin)
    """.trimMargin()
```

| trimMargin . : `trimMargin(">")` .

. . $.

```
val i = 10
val s = "i = $i" // evaluates to "i = 10"
```

:

```
val s = "abc"
val str = "$s.length is ${s.length}" // evaluates to "abc.length is 3"
```

.

```
val str = "\$foo" // evaluates to "$foo"
```

. .

```
val price = """
${'$'}9.99
"""
```

Kotlin == .

```
val str1 = "Hello, World!"
val str2 = "Hello," + " World!"
println(str1 == str2) // Prints true
```

=== .

```
val str1 = """
    |Hello, World!
    """.trimMargin()

val str2 = """
    #Hello, World!
    """.trimMargin("#")

val str3 = str1

println(str1 == str2) // Prints true
println(str1 === str2) // Prints false
println(str1 === str3) // Prints true
```

: https://riptutorial.com/ko/kotlin/topic/8285/

17:

.

( ) (searrospect) .

JVM JAR (`kotlin-reflect.jar` . JS .

Examples

`KClass` .

```
val c1 = String::class
val c2 = MyClass::class
```

Kotlin . .

```
fun isPositive(x: Int) = x > 0

val numbers = listOf(-2, -1, 0, 1, 2)
println(numbers.filter(::isPositive)) // [1, 2]
```

Kotlin `KClass` Java `Class` `.java` .

```
val stringKClass: KClass<String> = String::class
val c1: Class<String> = stringKClass.java

val c2: Class<MyClass> = MyClass::class.java
```

`KClass` .

`Example` `BaseExample` :

```
open class BaseExample(val baseField: String)

class Example(val field1: String, val field2: Int, baseField: String):
    BaseExample(baseField) {

    val field3: String
        get() = "Property without backing field"

    val field4 by lazy { "Delegated value" }

    private val privateField: String = "Private value"
}
```

.

```
val example = Example(field1 = "abc", field2 = 1, baseField = "someText")
```

```
example::class.memberProperties.forEach { member ->
    println("${member.name} -> ${member.get(example)}")
}
```

. `private val privateField` private `member.get(example)` . . Java getter . `private val` getter .

.

```
fun isFieldAccessible(property: KProperty1<*, *>): Boolean {
    return property.javaGetter?.modifiers?.let { !Modifier.isPrivate(it) } ?: false
}

val example = Example(field1 = "abc", field2 = 1, baseField = "someText")

example::class.memberProperties.filter { isFieldAccessible(it) }.forEach { member ->
    println("${member.name} -> ${member.get(example)}")
}
```

.

```
example::class.memberProperties.forEach { member ->
    member.isAccessible = true
    println("${member.name} -> ${member.get(example)}")
}
```

, .

```
class TestClass {
    val readOnlyProperty: String
        get() = "Read only!"

    var readWriteString = "asd"
    var readWriteInt = 23

    var readWriteBackedStringProperty: String = ""
        get() = field + '5'
        set(value) { field = value + '5' }

    var readWriteBackedIntProperty: Int = 0
        get() = field + 1
        set(value) { field = value - 1 }

    var delegatedProperty: Int by TestDelegate()

    private var privateProperty = "This should be private"

    private class TestDelegate {
        private var backingField = 3

        operator fun getValue(thisRef: Any?, prop: KProperty<*>): Int {
            return backingField
        }

        operator fun setValue(thisRef: Any?, prop: KProperty<*>, value: Int) {
            backingField += value
```

```
        }
    }
}
```

. .

```
val instance = TestClass()
TestClass::class.memberProperties
        .filter{ prop.visibility == KVisibility.PUBLIC }
        .filterIsInstance<KMutableProperty<*>>()
        .forEach { prop ->
            System.out.println("${prop.name} -> ${prop.get(instance)}")
        }
```

`String "Our Value"` . Kotlin Java VM , Type Erasure , `List<String>` Properties `List<Any>` .

.

```
val instance = TestClass()
TestClass::class.memberProperties
        .filter{ prop.visibility == KVisibility.PUBLIC }
        // We only want strings
        .filter{ it.returnType.isSubtypeOf(String::class.starProjectedType) }
        .filterIsInstance<KMutableProperty<*>>()
        .forEach { prop ->
            // Instead of printing the property we set it to some value
            prop.setter.call(instance, "Our Value")
        }
```

: https://riptutorial.com/ko/kotlin/topic/2402/

18:

Examples

Kotlin `Array<T>` .

`emptyArray<T>()` .

```
val empty = emptyArray<String>()
```

:

```
var strings = Array<String>(size = 5, init = { index -> "Item #$index" })
print(Arrays.toString(a)) // prints "[Item #0, Item #1, Item #2, Item #3, Item #4]"
print(a.size) // prints 5
```

`get(index: Int): T` `set(index: Int, value: T)` .

```
strings.set(2, "ChangedItem")
print(strings.get(2)) // prints "ChangedItem"

// You can use subscription as well:
strings[2] = "ChangedItem"
print(strings[2]) // prints "ChangedItem"
```

`Array<T>` .

		JVM
BooleanArray	booleanArrayOf(true, false)	boolean[]
ByteArray	byteArrayOf(1, 2, 3)	byte[]
CharArray	charArrayOf('a', 'b', 'c')	char[]
DoubleArray	doubleArrayOf(1.2, 5.0)	double[]
FloatArray	floatArrayOf(1.2, 5.0)	float[]
IntArray	intArrayOf(1, 2, 3)	int[]
LongArray	longArrayOf(1, 2, 3)	long[]
ShortArray	shortArrayOf(1, 2, 3)	short[]

`average()` `Byte` , `Int` , `Long` , `Short` , `Double` , `Float` `Double` .

```
val doubles = doubleArrayOf(1.5, 3.0)
print(doubles.average()) // prints 2.25

val ints = intArrayOf(1, 4)
```

```
println(ints.average()) // prints 2.5
```

`component1()` , `component2()` , ... `component5()` .

`getOrNull(index: Int)` index null .

`first()` , `last()`

`toHashSet()` `HashSet<T>` .

`sortedArray()` , `sortedArrayDescending()` .

`sort()` , `sortDescending` .

`min()` , `max()`

Java enhanced `: in` .

```
val asc = Array(5, { i -> (i * i).toString() })
for(s : String in asc){
    println(s);
}
```

for .

```
val asc = Array(5, { i -> (i * i).toString() })
for(s in asc){
    println(s);
}
```

```
val a = arrayOf(1, 2, 3) // creates an Array<Int> of size 3 containing [1, 2, 3].
```

```
val a = Array(3) { i -> i * 2 } // creates an Array<Int> of size 3 containing [0, 2, 4]
```

```
val a = arrayOfNulls<Int>(3) // creates an Array<Int?> of [null, null, null]
```

null . Null .

: https://riptutorial.com/ko/kotlin/topic/5722/

19:

in ! in .. rangeTo . .

Examples

(IntRange, LongRange, CharRange) . . for-loop .

```
for (i in 1..4) print(i) // prints "1234"
for (i in 4..1) print(i) // prints nothing
```

downTo ()

? . downTo () .

```
for (i in 4 downTo 1) print(i) // prints "4321"
```

step ()

1 ? step () .

```
for (i in 1..4 step 2) print(i) // prints "13"
for (i in 4 downTo 1 step 2) print(i) // prints "42"
```

until .

```
for (i in 1 until 10) { // i in [1, 10), 10 is excluded
println(i)
}
```

: https://riptutorial.com/ko/kotlin/topic/10121/

20:

. `(String) -> Boolean` `Pair<Person, Person>` generic .

. .

- **typealias - =**

. JVM . .

Examples

```
typealias StringValidator = (String) -> Boolean
typealias Reductor<T, U, V> = (T, U) -> V
```

```
typealias Parents = Pair<Person, Person>
typealias Accounts = List<Account>
```

: https://riptutorial.com/ko/kotlin/topic/9453/-

21:

Examples

DTO (POJO / POCO)

kotlin . `data` .

```
data class User(var firstname: String, var lastname: String, var age: Int)
```

`User` .

- getter setter (`val` getter)
- `equals()`
- `hashcode()`
- `toString()`
- `copy()`
- `componentN()` (`N`)

.

```
data class User(var firstname: String = "Joe", var lastname: String = "Bloggs", var age: Int =
20)
```

.

```
val list = listOf(1,2,3,4,5,6)

//filter out even numbers

val even = list.filter { it % 2 == 0 }

println(even) //returns [2,4]
```

public .

. private . . , :

```
class MyTable private constructor(table: Table<Int, Int, Int>) : Table<Int, Int, Int> by table
{

    constructor() : this(TreeBasedTable.create()) // or a different type of table if desired

}
```

`MyTable` `MyTable()` . `MyTable` `Table<Int, Int, Int>` . .

SO .

Kotlin Serializable serialVersionUid

Kotlin `serialVersionUID` .

(`MySpecialCase` `private const val MySpecialCase` .

```
class MySpecialCase : Serializable {
    companion object {
        private const val serialVersionUID: Long = 123
    }
}
```

getter / setter .

```
class MySpecialCase : Serializable {
    companion object {
        private val serialVersionUID: Long = 123
    }
}
```

, `getSerialVersionUID` .

```
class MySpecialCase : Serializable {
    companion object {
        @JvmStatic private val serialVersionUID: Long = 123
    }
}
```

, `getSerialVersionUID` `MySpecialCase` getter .

`serialVersionUID Serializable` .

Kotlin

Kotlin Java .

```
fun doSomething() {
   someOtherAction()
   return this
}
```

.

```
fun <T: Any> T.fluently(func: ()->Unit): T {
    func()
    return this
}
```

.

```
fun doSomething() {
```

```
    return fluently { someOtherAction() }
}
```

let nullable .

let .:

```
val str = "foo"
str.let {
    println(it) // it
}
```

"foo" Unit .

let also let . also Unit reutrn .

. null null let also :

```
val str: String? = someFun()
str?.let {
    println(it)
}
```

str null let . null (?).

.

apply :

this this .

kdoc apply . apply this apply . .:

```
File(dir).apply { mkdirs() }
```

:

```
fun makeDir(String path): File {
    val result = new File(path)
    result.mkdirs()
    return result
}
```

: https://riptutorial.com/ko/kotlin/topic/2273/

22:

`object` . java Singleton ( ) . java . .

Examples

/ repalcement

```
object CommonUtils {

    var anyname: String ="Hello"

    fun dispMsg(message: String) {
        println(message)
    }
}
```

.

```
CommonUtils.anyname
CommonUtils.dispMsg("like static call")
```

Kotlin . `SomeSingleton.INSTANCE` .

.

```
public enum SharedRegistry {
    INSTANCE;
    public void register(String key, Object thing) {}
}

public static void main(String[] args) {
    SharedRegistry.INSTANCE.register("a", "apple");
    SharedRegistry.INSTANCE.register("b", "boy");
    SharedRegistry.INSTANCE.register("c", "cat");
    SharedRegistry.INSTANCE.register("d", "dog");
}
```

kotlin .

```
object SharedRegistry {
    fun register(key: String, thing: Object) {}
}

fun main(Array<String> args) {
    SharedRegistry.register("a", "apple")
    SharedRegistry.register("b", "boy")
    SharedRegistry.register("c", "cat")
    SharedRegistry.register("d", "dog")
}
```

obvoiusly .

: https://riptutorial.com/ko/kotlin/topic/10152/--

23:

Java Kotlin enum . (enum `EnumClass`).

```
EnumClass.valueOf(value: String): EnumClass
EnumClass.values(): Array<EnumClass>
```

`valueOf()` `IllegalArgumentException` .

enum enum .

```
val name: String
val ordinal: Int
```

Comparable .

Examples

Enum .

```
enum class Color(val rgb: Int) {
    RED(0xFF0000),
    GREEN(0x00FF00),
    BLUE(0x0000FF)
}
```

Enum (,) . (;) enum .

`abstract` enum .

```
enum class Color {
    RED {
        override val rgb: Int = 0xFF0000
    },
    GREEN {
        override val rgb: Int = 0x00FF00
    },
    BLUE {
        override val rgb: Int = 0x0000FF
    }

    ;

    abstract val rgb: Int

    fun colorString() = "#%06X".format(0xFFFFFF and rgb)
}
```

enum

```
enum class Color {
  RED, GREEN, BLUE
}
```

. Enum .

. .

```
enum class Planet(var population: Int = 0) {
    EARTH(7 * 100000000),
    MARS();

    override fun toString() = "$name[population=$population]"
}

 println(Planet.MARS) // MARS[population=0]
 Planet.MARS.population = 3
 println(Planet.MARS) // MARS[population=3]
```

: https://riptutorial.com/ko/kotlin/topic/2286/-

24:

Examples

try-catch-finally

Kotlin catch Java .

```
try {
    doSomething()
}
catch(e: MyException) {
    handle(e)
}
finally {
    cleanup()
}
```

catch .

```
try {
    doSomething()
}
catch(e: FileSystemException) {
    handle(e)
}
catch(e: NetworkException) {
    handle(e)
}
catch(e: MemoryException) {
    handle(e)
}
finally {
    cleanup()
}
```

try .

```
val s: String? = try { getString() } catch (e: Exception) { null }
```

Kotlin .

```
fun fileToString(file: File) : String {
    //readAllBytes throws IOException, but we can omit catching it
    fileContent = Files.readAllBytes(file)
    return String(fileContent)
}
```

: https://riptutorial.com/ko/kotlin/topic/7246/

25:

Kotlin . (:) . .

Examples

```
val foo : Int by lazy { 1 + 1 }
println(foo)
```

2 .

```
var foo : Int by Delegates.observable("1") { property, oldValue, newValue ->
    println("${property.name} was changed from $oldValue to $newValue")
}
foo = 2
```

```
foo was changed from 1 to 2
```

```
val map = mapOf("foo" to 1)
val foo : String by map
println(foo)
```

```
1
```

```
class MyDelegate {
    operator fun getValue(owner: Any?, property: KProperty<*>): String {
        return "Delegated value"
    }
}

val foo : String by MyDelegate()
println(foo)
```

```
Delegated value Delegated value
```

Delegate .

Kotlin Null Type `WeakReference<T>` .

`WeakReference` .

:

```
class MyMemoryExpensiveClass {
    companion object {
        var reference: WeakReference<MyMemoryExpensiveClass>? = null

        fun doWithReference(block: (MyMemoryExpensiveClass) -> Unit) {
            reference?.let {
                it.get()?.let(block)
```

```
            }
        }
    }

    init {
        reference = WeakReference(this)
    }
}
```

WeakReference . .

```
class WeakReferenceDelegate<T>(initialValue: T? = null) : ReadWriteProperty<Any, T?> {
    var reference = WeakReference(initialValue)
        private set

    override fun getValue(thisRef: Any, property: KProperty<*>): T? = reference.get()

    override fun setValue(thisRef: Any, property: KProperty<*>, value: T?) {
        reference = WeakReference(value)
    }
}
```

`WeakReference` nullable !

```
class MyMemoryExpensiveClass {
    companion object {
        var reference: MyMemoryExpensiveClass? by
WeakReferenceDelegate<MyMemoryExpensiveClass>()

        fun doWithReference(block: (MyMemoryExpensiveClass) -> Unit) {
            reference?.let(block)
        }
    }

    init {
        reference = this
    }
}
```

: https://riptutorial.com/ko/kotlin/topic/10571/--

26:

.

3 .

1. .
2. .
3. .

Kotlin

Kotlin . :

-
-
- Ktor
-

Examples

. JFrame .

```
import javax.swing.*

fun JFrame.menuBar(init: JMenuBar.() -> Unit) {
    val menuBar = JMenuBar()
    menuBar.init()
    setJMenuBar(menuBar)
}

fun JMenuBar.menu(caption: String, init: JMenu.() -> Unit) {
    val menu = JMenu(caption)
    menu.init()
    add(menu)
}

fun JMenu.menuItem(caption: String, init: JMenuItem.() -> Unit) {
    val menuItem = JMenuItem(caption)
    menuItem.init()
    add(menuItem)
}
```

.

```
class MyFrame : JFrame() {
    init {
        menuBar {
            menu("Menu1") {
                menuItem("Item1") {
                    // Initialize MenuItem with some Action
```

```
                }
                menuItem("Item2") {}
            }
            menu("Menu2") {
                menuItem("Item3") {}
                menuItem("Item4") {}
            }
        }
    }
}
```

: https://riptutorial.com/ko/kotlin/topic/6010/--

27:

: Kotlin :

Examples

Kotlin .

```
interface MyInterface {
    fun bar()
}
```

.

```
class Child : MyInterface {
   override fun bar() {
       print("bar() was called")
   }
}
```

Kotlin .

```
interface MyInterface {
    fun withImplementation() {
      print("withImplementation() was called")
    }
}
```

.

```
class MyClass: MyInterface {
    // No need to reimplement here
}
val instance = MyClass()
instance.withImplementation()
```

getter setter .

```
interface MyInterface2 {
    val helloWorld
        get() = "Hello World!"
}
```

.

```
interface MyInterface3 {
    // this property won't compile!
    var helloWorld: Int
        get() = field
        set(value) { field = value }
```

```
}
```

.

```
interface A {
    fun notImplemented()
    fun implementedOnlyInA() { print("only A") }
    fun implementedInBoth() { print("both, A") }
    fun implementedInOne() { print("implemented in A") }
}

interface B {
    fun implementedInBoth() { print("both, B") }
    fun implementedInOne() // only defined
}

class MyClass: A, B {
    override fun notImplemented() { print("Normal implementation") }

    // implementedOnlyInA() can by normally used in instances

    // class needs to define how to use interface functions
    override fun implementedInBoth() {
        super<B>.implementedInBoth()
        super<A>.implementedInBoth()
    }

    // even if there's only one implementation, there multiple definitions
    override fun implementedInOne() {
        super<A>.implementedInOne()
        print("implementedInOne class implementation")
    }
}
```

. .

```
interface MyInterface {
    val property: Int // abstract

    val propertyWithImplementation: String
        get() = "foo"

    fun foo() {
        print(property)
    }
}

class Child : MyInterface {
    override val property: Int = 29
}
```

2 , . . .

```
interface FirstTrait {
    fun foo() { print("first") }
    fun bar()
}
```

```
interface SecondTrait {
    fun foo() { print("second") }
    fun bar() { print("bar") }
}

class ClassWithConflict : FirstTrait, SecondTrait {
    override fun foo() {
        super<FirstTrait>.foo()  // delegate to the default implementation of FirstTrait
        super<SecondTrait>.foo() // delegate to the default implementation of SecondTrait
    }

    // function bar() only has a default implementation in one interface and therefore is ok.
}
```

```
interface MyInterface {
    fun funcOne() {
        //optional body
        print("Function with default implementation")
    }
}
```

super .

```
super.funcOne()
```

: https://riptutorial.com/ko/kotlin/topic/900/

28:

Examples

:

" " ." " `when` . regex .

```
import kotlin.text.regex

var string = /* some string */

val regex1 = Regex( /* pattern */ )
val regex2 = Regex( /* pattern */ )
/* etc */

when {
    regex1.matches(string) -> /* do stuff */
    regex2.matches(string) -> /* do stuff */
    /* etc */
}
```

:

" " . `when` .

```
import kotlin.text.regex

var string = /* some string */

when {
    Regex( /* pattern */ ).matches(string) -> /* do stuff */
    Regex( /* pattern */ ).matches(string) -> /* do stuff */
    /* etc */
}
```

:

syntax `when` " - " . `when` `whenEntry` `when` `whenEntry` . "immutable locals" "anonymous temporaries" .

```
import kotlin.text.regex

var string = /* some string */

when (RegexWhenArgument(string)) {
    Regex( /* pattern */ ) -> /* do stuff */
    Regex( /* pattern */ ) -> /* do stuff */
```

```
    /* etc */
}
```

`when` :

```
class RegexWhenArgument (val whenArgument: CharSequence) {
    operator fun equals(whenEntry: Regex) = whenEntry.matches(whenArgument)
    override operator fun equals(whenEntry: Any?) = (whenArgument == whenEntry)
}
```

Kotlin

`Regex` , `Regex` null , .

RegEx

Kotlin `Regex(pattern: String)` `find(..)` `replace(..)` .

`input` c d true `Regex` .

```
val regex = Regex(pattern = "c|d")
val matched = regex.containsMatchIn(input = "abc")    // matched: true
```

`Regex` `pattern` `input` . . `containsMatchIn(..)` .

Null

`find(..)` `matchEntire(..)` `MatchResult?` `MatchResult?` . ? `MatchResult` Kotlin null .

`find(..)` null Kotlin `Regex` null .

```
val matchResult =
    Regex("c|d").find("efg")           // matchResult: null
val a = matchResult?.value             // a: null
val b = matchResult?.value.orEmpty()   // b: ""
a?.toUpperCase()                       // Still needs question mark. => null
b.toUpperCase()                        // Accesses the function directly. => ""
```

`orEmpty()` `b` null `? b` .

null Kotlin Java null `!!` :

```
a!!.toUpperCase()                      // => KotlinNullPointerException
```

Kotlin Java Java . .

```
"""\d{3}-\d{3}-\d{4}""" // raw Kotlin string
"\\d{3}-\\d{3}-\\d{4}"  // standard Java string
```

(: CharSequence, startIndex : int) : MatchResult?

input Regex pattern . Matchresult? Matchresult? startIndex input null . MatchResult? MatchResult? value . startIndex 0.

.

```
val phoneNumber :String? = Regex(pattern = """\d{3}-\d{3}-\d{4}""")
    .find(input = "phone: 123-456-7890, e..")?.value // phoneNumber: 123-456-7890
```

input phoneNumber null .

findAll (input : CharSequence, startIndex : Int) : .

regex pattern input .

:

```
val matchedResults = Regex(pattern = """\d+""").findAll(input = "ab12cd34ef")
val result = StringBuilder()
for (matchedText in matchedResults) {
    result.append(matchedText.value + " ")
}

println(result) // => 12 34
```

matchedResults MatchResult . input findAll(..) .

matchEntire (: CharSequence) : MatchResult?

input pattern input . null .

.

```
val a = Regex("""\d+""").matchEntire("100")?.value             // a: 100
val b = Regex("""\d+""").matchEntire("100 dollars")?.value     // b: null
```

matches (input : CharSequence) : Boolean

true . .

.

```
val regex = Regex(pattern = """\d+""")
regex.matches(input = "50")              // => true
regex.matches(input = "50 dollars")      // => false
```

containsMatchIn (input : CharSequence) : Boolean

true . .

.

```
Regex("""\d+""").containsMatchIn("50 dollars")       // => true
Regex("""\d+""").containsMatchIn("Fifty dollars")    // => false
```

split (: CharSequence, limit : Int) :

.

:

```
val a = Regex("""\d+""").split("ab12cd34ef")     // a: [ab, cd, ef]
val b = Regex("""\d+""").split("This is a test") // b: [This is a test]
```

. input . .

(: CharSequence, :) :

input pattern .

x :

```
val result = Regex("""\d+""").replace("ab12cd34ef", "x") // result: abxcdxef
```

: https://riptutorial.com/ko/kotlin/topic/8364/

29:

, . List *generic* .

Generics .

- *ClassName* < ***TypeName*** >
- class *ClassName* <*>
- *ClassName* <in ***UpperBound*** >
- *ClassName* <out ***LowerBound*** >
- < ***TypeName*** : ***UpperBound*** >

TypeName
ClassName

Nullable.

Kotlin Generics `T Any?` . :

```
class Consumer<T>
```

`T T: Any?` . Null `T: Any` . :

```
class Consumer<T: Any>
```

Examples

- .

```
  class Consumer<in T> { fun consume(t: T) { ... } }

  fun charSequencesConsumer() : Consumer<CharSequence>() = ...

  val stringConsumer : Consumer<String> = charSequenceConsumer() // OK since in-projection
  val anyConsumer : Consumer<Any> = charSequenceConsumer() // Error, Any cannot be passed

  val outConsumer : Consumer<out CharSequence> = ... // Error, T is `in`-parameter
```

- `T List<out T> T Comparator<in T>` .

Java .

- :

```
val takeList : MutableList<out SomeType> = ... // Java: List<? extends SomeType>

val takenValue : SomeType = takeList[0] // OK, since upper bound is SomeType

takeList.add(takenValue) // Error, lower bound for generic is not specified
```

:

```
val putList : MutableList<in SomeType> = ... // Java: List<? super SomeType>

val valueToPut : SomeType = ...
putList.add(valueToPut) // OK, since lower bound is SomeType

putList[0] // This expression has type Any, since no upper bound is specified
```

```
val starList : MutableList<*> = ... // Java: List<?>

starList[0] // This expression has type Any, since no upper bound is specified
starList.add(someValue) // Error, lower bound for generic is not specified
```

:

- Java Kotlin Variant Generics .

: https://riptutorial.com/ko/kotlin/topic/1147/

30:

`switch` , `when` fall-through . , `break` . bahaviors .

```
when (x) {
    "foo", "bar" -> println("either foo or bar")
    else -> println("didn't match anything")
}
```

Examples

if

```
val str = "Hello!"
if (str.length == 0) {
    print("The string is empty!")
} else if (str.length > 5) {
    print("The string is short!")
} else {
    print("The string is long!")
}
```

else-branches if .

If

if .

```
val str = if (condition) "Condition met!" else "Condition not met!"
```

`if` -statement `else` -branch .

`else if` .

```
val str = if (condition1){
    "Condition1 met!"
   } else if (condition2) {
    "Condition2 met!"
   } else {
    "Conditions not met!"
   }
```

: Kotlin . `val str: String =` .

if-else-if when-

when else-if-branches if .

```
when {
    str.length == 0 -> print("The string is empty!")
    str.length > 5  -> print("The string is short!")
    else            -> print("The string is long!")
}
```

if-else-if :

```
if (str.length == 0) {
    print("The string is empty!")
} else if (str.length > 5) {
    print("The string is short!")
} else {
    print("The string is long!")
}
```

if else . :

```
when {
    condition -> {
        doSomething()
        doSomeMore()
    }
    else -> doSomethingElse()
}
```

when-statement

`when` statement . null `equals` `==` . .

```
when (x) {
    "English" -> print("How are you?")
    "German" -> print("Wie geht es dir?")
    else -> print("I don't know that language yet :(")
}
```

when .

```
val names = listOf("John", "Sarah", "Tim", "Maggie")
when (x) {
    in names -> print("I know that name!")
    !in 1..10 -> print("Argument was not in the range from 1 to 10")
    is String -> print(x.length) // Due to smart casting, you can use String-functions here
}
```

When

if when .

```
val greeting = when (x) {
    "English" -> "How are you?"
    "German" -> "Wie geht es dir?"
    else -> "I don't know that language yet :("
```

```
}
print(greeting)
```

when else .

when

`when` `enum` :

```
enum class Day {
    Sunday,
    Monday,
    Tuesday,
    Wednesday,
    Thursday,
    Friday,
    Saturday
}

fun doOnDay(day: Day) {
    when(day) {
        Day.Sunday ->      // Do something
        Day.Monday, Day.Tuesday ->      // Do other thing
        Day.Wednesday ->  // ...
        Day.Thursday ->   // ...
        Day.Friday ->     // ...
        Day.Saturday ->   // ...
    }
}
```

(`Monday` `Tuedsay`) `enum` .

`.else` .

```
fun doOnDay(day: Day) {
    when(day) {
        Day.Monday ->      // Work
        Day.Tuesday ->     // Work hard
        Day.Wednesday ->  // ...
        Day.Thursday ->   //
        Day.Friday ->     //
        else ->           // Party on weekend
    }
}
```

`if-then-else` , `when` `enum` .

kotlin `enum` .

: https://riptutorial.com/ko/kotlin/topic/2685/

31:

, Kotlin (, ,) . API .

- listOf, mapOf setOf .
- arrayListOf, hashMapOf, hashSetOf, linkedMapOf (LinkedHashMap), linkedSetOf (LinkedHashSet), mutableListOf (Kotlin MultableList), mutableMapOf (Kotlin MultableMap), mutableSetOf (Kotlin MultibleSet), sortedMapOf sortedSetOf
- first (), last (), get () filter, map, join, reduce .

Examples

```
// Create a new read-only List<String>
val list = listOf("Item 1", "Item 2", "Item 3")
println(list) // prints "[Item 1, Item 2, Item 3]"
```

```
// Create a new read-only Map<Integer, String>
val map = mapOf(Pair(1, "Item 1"), Pair(2, "Item 2"), Pair(3, "Item 3"))
println(map) // prints "{1=Item 1, 2=Item 2, 3=Item 3}"
```

```
// Create a new read-only Set<String>
val set = setOf(1, 3, 5)
println(set) // prints "[1, 3, 5]"
```

: https://riptutorial.com/ko/kotlin/topic/8846/

32:

()

Examples

1

( )

```
fun main(args: Array<String>) {
    launch(CommonPool) { // create new coroutine in common thread pool
        delay(1000L) // non-blocking delay for 1 second (default time unit is ms)
        println("World!") // print after delay
    }
    println("Hello,") // main function continues while coroutine is delayed
    Thread.sleep(2000L) // block main thread for 2 seconds to keep JVM alive
}
```

```
Hello,
World!
```

: https://riptutorial.com/ko/kotlin/topic/10936/-

33:

Examples

nullable toString () .

Kotlin `toString` `String?` null `String?` .

Android `EditText` `EditText` .

.

```
// Incorrect:
val text = view.textField?.text.toString() ?: ""
```

`"null"` .

```
// Correct:
val text = view.textField?.text?.toString() ?: ""
```

: https://riptutorial.com/ko/kotlin/topic/6608/--

34:

. :

, Apples , Oranges Pears . , , . .

. Fruit ? getFruit() ?

Fruit . !

- { }
- { } : { } ({ })
- override { }
- {DC-Object} {Base Class}. == true

Init	
- " "	

Examples

: "

Kotlin **final** .

open .

```
open class Thing {
    // I can now be extended!
}
```

: , open .

:

```
open class BaseClass {
    val x = 10
}
```

:

```
class DerivedClass: BaseClass() {
```

```
    fun foo() {
        println("x is equal to " + x)
    }
}
```

:

```
fun main(args: Array<String>) {
    val derivedClass = DerivedClass()
    derivedClass.foo() // prints: 'x is equal to 10'
}
```

:

```
open class Person {
    fun jump() {
        println("Jumping...")
    }
}
```

:

```
class Ninja: Person() {
    fun sneak() {
        println("Sneaking around...")
    }
}
```

Person .

```
fun main(args: Array<String>) {
    val ninja = Ninja()
    ninja.jump()  // prints: 'Jumping...'
    ninja.sneak() // prints: 'Sneaking around...'
}
```

( ):

```
abstract class Car {
    abstract val name: String;
    open var speed: Int = 0;
}

class BrokenCar(override val name: String) : Car() {
    override var speed: Int
        get() = 0
        set(value) {
            throw UnsupportedOperationException("The car is bloken")
        }
}
```

```
fun main(args: Array<String>) {
    val car: Car = BrokenCar("Lada")
    car.speed = 10
}
```

:

```
interface Ship {
    fun sail()
    fun sink()
}

object Titanic : Ship {

    var canSail = true

    override fun sail() {
        sink()
    }

    override fun sink() {
        canSail = false
    }
}
```

: https://riptutorial.com/ko/kotlin/topic/5622/-

35:

Kotlin . .

Examples

.

```
interface Foo {
    fun example()
}

class Bar {
    fun example() {
        println("Hello, world!")
    }
}

class Baz(b : Bar) : Foo by b

Baz(Bar()).example()
```

```
Hello, world!
```

: https://riptutorial.com/ko/kotlin/topic/10575/-

36:

Examples

. .

```
annotation class Strippable
```

.

```
    @Target(AnnotationTarget.CLASS, AnnotationTarget.FUNCTION,
AnnotationTarget.VALUE_PARAMETER, AnnotationTarget.EXPRESSION)
    annotation class Strippable
```

.

```
annotation class Strippable(val importanceValue: Int)
```

.

- Java (Int, Long) .
-
- (Foo :: class)
-
-
-

.

- `@Target` : (, , ,) .
- `@Retention` (true).
- `@Repeatable` .
- `@MustBeDocumented` API API .

:

```
@Target(AnnotationTarget.CLASS, AnnotationTarget.FUNCTION,
        AnnotationTarget.VALUE_PARAMETER, AnnotationTarget.EXPRESSION)
@Retention(AnnotationRetention.SOURCE)
@MustBeDocumented
annotation class Fancy
```

: https://riptutorial.com/ko/kotlin/topic/4074/-

37:

- **Vararg** : `vararg` .
- : "" (`*`).

Examples

: vararg

`vararg` .

```
fun printNumbers(vararg numbers: Int) {
    for (number in numbers) {
        println(number)
    }
}
```

.

```
printNumbers(0, 1)                // Prints "0" "1"
printNumbers(10, 20, 30, 500)     // Prints "10" "20" "30" "500"
```

: Vararg .

: vararg

`*` vararg .

...

```
fun printNumbers(vararg numbers: Int) {
    for (number in numbers) {
        println(number)
    }
}
```

.

```
val numbers = intArrayOf(1, 2, 3)
printNumbers(*numbers)

// This is the same as passing in (1, 2, 3)
```

...

```
val numbers = intArrayOf(1, 2, 3)
printNumbers(10, 20, *numbers, 30, 40)

// This is the same as passing in (10, 20, 1, 2, 3, 30, 40)
```

: https://riptutorial.com/ko/kotlin/topic/5835/--

38:

- fun TypeName.extensionName (params, ...) {/ * body * /} //
- fun <T : Any> TypeNameWithGenerics <T> .extensionName (params, ...) {/ * body * /} //
- myObj.extensionName (args, ...) //

. , ...

Examples

.

```
fun IntArray.addTo(dest: IntArray) {
    for (i in 0 .. size - 1) {
        dest[i] += this[i]
    }
}
```

IntArray . ( ) this this .

.

```
val myArray = intArrayOf(1, 2, 3)
intArrayOf(4, 5, 6).addTo(myArray)
```

:

. .

```
open class Super

class Sub : Super()

fun Super.myExtension() = "Defined for Super"

fun Sub.myExtension() = "Defined for Sub"

fun callMyExtension(myVar: Super) {
    println(myVar.myExtension())
}

callMyExtension(Sub())
```

myVar Super "Defined for Super" .

Int Long .

```
fun Long.humanReadable(): String {
    if (this <= 0) return "0"
    val units = arrayOf("B", "KB", "MB", "GB", "TB", "EB")
```

```
    val digitGroups = (Math.log10(this.toDouble())/Math.log10(1024.0)).toInt();
    return DecimalFormat("#,##0.#").format(this/Math.pow(1024.0, digitGroups.toDouble())) + "
" + units[digitGroups];
}

fun Int.humanReadable(): String {
    return this.toLong().humanReadable()
}
```

.

```
println(1999549L.humanReadable())
println(someInt.humanReadable())
```

Java 7+ Path

API . Java 7+ `Path exist` , `notExists deleteRecursively exist` .

```
fun Path.exists(): Boolean = Files.exists(this)
fun Path.notExists(): Boolean = !this.exists()
fun Path.deleteRecursively(): Boolean = this.toFile().deleteRecursively()
```

.

```
val dir = Paths.get(dirName)
if (dir.exists()) dir.deleteRecursively()
```

Kotlin .

```
val x: Path = Paths.get("dirName").apply {
    if (Files.notExists(this)) throw IllegalStateException("The important file does not
exist")
}
```

apply . . , .

```
infix inline fun <T> T.verifiedBy(verifyWith: (T) -> Unit): T {
    verifyWith(this)
    return this
}

infix inline fun <T: Any> T.verifiedWith(verifyWith: T.() -> Unit): T {
    this.verifyWith()
    return this
}
```

.

```
val x: Path = Paths.get("dirName") verifiedWith {
    if (Files.notExists(this)) throw IllegalStateException("The important file does not
exist")
}
```

.

`verifiedBy` `T T: Any? T: Any?` null `.verifiedWith` nullable .

ISO Java 8 Temporal

:

```
fun Temporal.toIsoString(): String = DateTimeFormatter.ISO_INSTANT.format(this)
```

.

```
val dateAsString = someInstant.toIsoString()
```

( )

- , `Something fromString fromString` :

```
class Something {
    companion object {}
}

class SomethingElse {
}

fun Something.Companion.fromString(s: String): Something = ...

fun SomethingElse.fromString(s: String): SomethingElse = ...

fun main(args: Array<String>) {
    Something.fromString("") //valid as extension function declared upon the
                             //companion object

    SomethingElse().fromString("") //valid, function invoked on instance not
                                   //statically

    SomethingElse.fromString("") //invalid
}
```

. Kotlin KT-9686 KT-13053 (`this`) . .

`color . lazy this colorCache` :

```
class KColor(val value: Int)

private val colorCache = mutableMapOf<KColor, Color>()

val KColor.color: Color
    get() = colorCache.getOrPut(this) { Color(value, true) }
```

.

Anko

```
inline fun <reified T : View> View.find(id: Int): T = findViewById(id) as T
inline fun <reified T : View> Activity.find(id: Int): T = findViewById(id) as T
inline fun <reified T : View> Fragment.find(id: Int): T = view?.findViewById(id) as T
inline fun <reified T : View> RecyclerView.ViewHolder.find(id: Int): T =
itemView?.findViewById(id) as T

inline fun <reified T : View> View.findOptional(id: Int): T? = findViewById(id) as? T
inline fun <reified T : View> Activity.findOptional(id: Int): T? = findViewById(id) as? T
inline fun <reified T : View> Fragment.findOptional(id: Int): T? = view?.findViewById(id) as?
T
inline fun <reified T : View> RecyclerView.ViewHolder.findOptional(id: Int): T? =
itemView?.findViewById(id) as? T
```

```
val yourButton by lazy { find<Button>(R.id.yourButtonId) }
val yourText by lazy { find<TextView>(R.id.yourTextId) }
val yourEdittextOptional by lazy { findOptional<EditText>(R.id.yourOptionEdittextId) }
```

: https://riptutorial.com/ko/kotlin/topic/613/-

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