免费电子书

学习

Kotlin

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1: Kotlin

KotlinJetBrainsJVM。 KotlinJava 100。 KotlinJava。 KotlinJVMJavaJavaScript。

Kotlin

KotlinEclipseIntelliJIDE。 KotlinMaven Ant Gradle。

`$ kotlinc Main.kt`java`MainKt.class` Kt。 `$ java MainKt$ java MainKt`

```
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
```

JavaKotlin runt-time jar。

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

1.0.0	2016215
1.0.1	2016316
1.0.2	2016513
1.0.3	2016630
1.0.4	2016922
1.0.5	2016118
1.0.6	20161227
1.1.0	201731
1.1.1	2017314
1.1.2	2017425
1.1.3	2017623

Examples

Kotlin`main`。 Kotlin“Hello World”

```
package my.program

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

`Main.kt`

JVM。 `my.program.MainKt` 。

package

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

`my.program.MyApp` 。

- `@JvmName`。
-

Hello World

Kotlin 。

```
package my.program

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

`my.program.App` 。

`App` 。 `App`。

- `@JvmStatic`

Hello WorldCompanion

CompanionKotlin`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

javaJava◦ Kotlin◦

`javac`java◦ `java`java◦

`kotlinc`kotlin`kotlin`kotlin◦

Kotlin◦ N1 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
```

!!Null Safety 。

Intellij。

Kotlin https://riptutorial.com/zh-CN/kotlin/topic/490/kotlin

2: DSL

KotlinDSL 。

Examples

DSLInfix

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

DSL

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

DSL

```
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")
    }
}
```

lambda

```
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%") }
```

lambdas

```
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
}
```

shouldBeInfix approach to build DSLInfix approach to build DSL ◦

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

3: Java 8 Stream

Kotlin。 Sequence。

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。 JavaNPE。 Kotlin

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

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

Kotlinpeoplepeople.ageIntIntpeople.nameStringmapList<String> String List 。

peoplenull List<People>?

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

List<String>? *KotlinKotlinKotlin*

Kotlin。 Sequence“”start。 Java 8Kotlin

```
// 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

```
// 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。 `SequenceSequenceconstrainOnce()`

```
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
- Array 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 - IntString

```
// 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)
```

StringifPresent

```
// 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()`

`?.` 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}
```

Kotlin。/`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!!
```

`joinToStringPersonPerson.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)
```

2Kotlin 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 https://riptutorial.com/zh-CN/kotlin/topic/707/java-8-stream

4: JUnit

Examples

JUnit

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

`@JvmFieldmyRule` ◦ JUnit◦

JUnit https://riptutorial.com/zh-CN/kotlin/topic/6973/junit

5: Kotlin Android

KotlinAndroidButterKnife。。

Examples

gradle 。

Kotlin `build.gradle`。

```
buildscript {
    ...
}

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

`activity_main.xmlactivity_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.*
```

//

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

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

AndroidAndroid。 `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
```

Kotlin

```
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/zh-CN/kotlin/topic/9474/kotlin-android

6: Kotlin for Java Developers

KotlinJava。

JavaKotlinKotlinJava。

Examples

KotlinJava

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

- `valvarfinal` “ **val** ue”**var** iable。
- `::`
- Kotlin

Java	
`int i = 42;`	`var i = 42  var i : Int = 42`
`final int i = 42;`	`val i = 42`

- `;`
- Kotlin
- Kotlin**100Java**
- Kotlin JVM
- Kotlin
- Kotlin`equals` / `hashCode`
- Kotlin
- Kotlin **`new`** 。 。
- Kotlin 。 `val a = someMap["key"]`
- KotlinJVM**Java Script** Kotlin
- Kotlin **Java 6** Android
- Kotlin**Android**
- Kotlin。
- Kotlin**Coroutines**

Kotlin`==equals ===`。

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

Java	
`a != b;`	`a !== b`

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

IFTRY

Kotlin `if try`void。

KotlinJava*Elvis*

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

`try`

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

Kotlin for Java Developers https://riptutorial.com/zh-CN/kotlin/topic/10099/kotlin-for-java-developers

7: Kotlin

Kotlin。

1. Kotlin.kt。
2. KotlinAnyJavaObject。
3. val - var -
4. 。
5. Unit.It。 6.===。 aba === btrue。

Examples

1.。 。

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

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

2.Single-Expression=

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

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

3.String。

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

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

4.Kotlinnullnullnull。 Stringnull

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

String

```
var b: String? = "abc"
```

```
b = null // ok
```

5.Kotlin==。 = = b

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

Kotlin https://riptutorial.com/zh-CN/kotlin/topic/10648/kotlin

8: Kotlin

Examples

toString

Kotlin`toString`null`String?String?`。

Android`EditText`。

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

`"null"`。

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

Kotlin https://riptutorial.com/zh-CN/kotlin/topic/6608/kotlin

9:

Examples

try-catch-finally

KotlinJava

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

```
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/zh-CN/kotlin/topic/7246/

10: Vararg

- **Vararg** vararg。
- **Spread Operator** * “”。

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。

Spread Operatorvararg

Spread Operator *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)
```

Vararg https://riptutorial.com/zh-CN/kotlin/topic/5835/vararg

11:

- ***Params*** = ...
- ***Params*** {...}
- ***PARAMS*** {...}
- < > ***PARAMS*** {...}
- {...}
- { ***ArgName*** ***ArgType*** - > ...}
- { ***ArgName*** - > ...}
- { ***ArgNames*** - > ...}
- { ***ArgName*** ***ArgType*** - > ...}

PARAMS	***Name*** : ***Type***
ArgName	
ArgType	***ArgName***
ArgNames	ArgName

Examples

“Lambda”。“”

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

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

`() -> Any?` lambda

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

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

Lambda

Lambda。{braces} - ->。

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

lambda。

lambda。

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

lambdait。

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

lambda。

```
# 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"
```

◦ ◦

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

inlineinlineC - ◦ lambdas◦

```
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+* ◦ ◦ 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/zh-CN/kotlin/topic/1280/

12:

Kotlin

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/zh-CN/kotlin/topic/10936/

13:

`object`。 javaSingletons。 java。 Javakotlin。

Examples

java/

```
object CommonUtils {

    var anyname: String ="Hello"

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

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

Kotlin。 `SomeSingleton.INSTANCE`。

java

```
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")
}
```

。

https://riptutorial.com/zh-CN/kotlin/topic/10152/

14:

。

。

JVMJAR `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]
```

Java

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

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

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

`KClass`。

`BaseExampleExample`

```
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"`◦ KotlinJava VMType 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/zh-CN/kotlin/topic/2402/

15:

Kotlin4。

。

。

。

。

- `<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/zh-CN/kotlin/topic/10019/

16: KotlinRecyclerView

KotlinRecyclerView。

Examples

Kotlinactivity_main.xmlRecyclerView。

```
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
        }
    }
```

Recyclermain_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)
            }
        }
    }
}
```

KotlinRecyclerView https://riptutorial.com/zh-CN/kotlin/topic/10143/kotlinrecyclerview

17: Lambdas

-
- {parameterNameParameterTypeotherParameterNameOtherParameterType - > anExpression}
-
- val additionIntInt - > Int = {ab - > a + b}
- `it`
- val squareInt - > Int = {it * it}
-
- - > ResultType
- InputType - > ResultType
- InputType1InputType2 - > ResultType

。

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

lambdalambda

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

lambda

```
//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 }
```

lambda`it`。

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

Examples

Lambda

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

Lambda

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

Lambda

```
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")
```

Lambdas https://riptutorial.com/zh-CN/kotlin/topic/5878/lambdas

18:

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 2foo 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
```

KotlinNull 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`

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

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

    init {
        reference = this
    }
}
```

https://riptutorial.com/zh-CN/kotlin/topic/10571/

19:

Examples

String`string[index]string[index]`。

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

for。

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

Kotlin

-
-

。 。 `\t \b \n \r \' \" \\\$` 。 Unicode `\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/zh-CN/kotlin/topic/8285/

20:

Examples

DTOPOJO / POCO

kotlin◦ `data`

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

`User`

- `val` S
- `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]
```

◦ ◦ ◦

```
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()` ◦ `MyTableTable<Int, Int, Int>` ◦ ◦

SO ◦

KotlinSerializableserialVersionUid

Kotlin`serialVersionUID` ◦

`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`getter`getSerialVersionUID`。

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

`MySpecialCase`getter`getSerialVersionUID`。

`serialVersionUID`Serializable。

Kotlin

KotlinJava

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

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

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

let

`let` Kotlin。

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

"foo"Unit ◦

*letalsolet◦ also*reutrn *Unit ◦*

null null letalso

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

strnulllet◦ null ? ◦

apply

apply

thisthis◦

kdocapply◦ apply thisapply◦ ◦

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

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

https://riptutorial.com/zh-CN/kotlin/topic/2273/

21:

- fun TypeName.extensionNameparams...{/ * body * /} //
- fun <TAny> TypeNameWithGenerics <T> .extensionNameparams...{/ * body * /} //
- myObj.extensionNameargs...//

◦ reference-type;◦ ◦

Examples

◦

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

IntArrayIntArray ◦ 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())
```

"Defined for Super" myVarSuper ◦

IntLong

```
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◦ `exist` `notExists`deleteRecursivelyJava 7+ `Path`

```
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")
}
```

lambda◦

`TverifiedByT: Any?◦` `verifiedWith◦`

Java 8 TemporalISO

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

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

Companion

- SomethingfromString

```
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
}
```

◦ this KotlinKT-9686KT-13053 ◦ ◦

color ◦ colorCache thislazy

```
class KColor(val value: Int)

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

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

View◦

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/zh-CN/kotlin/topic/613/

22:

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()
```

gettersetter

```
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
}
```

◦ ◦ ◦

```
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/zh-CN/kotlin/topic/900/

23:

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): Tset(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>`◦

Kotlin		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 FloatDouble`

```
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()`

index`getOrNull(index: Int)`null

`first()` `last()`

`toHashSet()``HashSet<T>`

`sortedArray()` `sortedArrayDescending()`current

`sort()` `sortDescending`

`min()` `max()`

Java`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]
```

。 。

https://riptutorial.com/zh-CN/kotlin/topic/5722/

24:

Examples

NullableNon Nullable

`String ◦ ? 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!
```

◦

`?.` nullnull;

```
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.
```

null

nullKotlin`apply`

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

`objfoobar thisapplythis obj`null◦

`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。

。

Iterable

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

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

Null Coalescing / Elvis

if-else。 elvis`?:` Kotlin。

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

`data?.first()datanull"Nothing here"data?.first()data?.first()。`

。

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

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

`!!`nullabilitynull。 `nullKotlinNullPointerException。`

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

:)

Kotlin`null reference。 a` “anullx ”

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

anull。 `a。 if...else。`

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

`Elvis ?:if...else`Elvis

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

`?: a?.length` nullelvis `-1` ◦ ◦

https://riptutorial.com/zh-CN/kotlin/topic/2080/

25:

Javaswitch when◦ 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-branchesif◦

if

if

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

elseif◦

else if◦

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

Kotlin val str: String =◦

whenif-else-if

whenelse-if-branchesif

```
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!")
}
```

ifelse-branch。

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

when

`when` -statement。 `==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
}
```

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

whenelse。

whenenum

```
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 ->   // ...
    }
}
```

Tuedsay MondayTuedsay 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-elsewhenenum◦

kotlin enum

https://riptutorial.com/zh-CN/kotlin/topic/2685/

26:

JavaKotlin。 EnumClass

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

valueOf()IllegalArgumentException 。

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

Comparable。

Examples

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

。 ; 。

abstract 。

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

。 。

```
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/zh-CN/kotlin/topic/2286/

27:

Examples

“”。 when“” - 。

```
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 */
}
```

“”。 whenwhen。

```
import kotlin.text.regex

var string = /* some string */

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

---

whenwhen“argument-ful”。 whenwhenEntrywhen。 “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)
}
```

RegexRegexnull。

RegEx

KotlinRegex(pattern: String)regexfind(..)replace(..)。

Regexinputcdtrue

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

Regexpatterninput。 。 containsMatchIn(..)。

---

find(..)matchEntire(..)MatchResult?。 ? MatchResultKotlin null。

find(..)nullKotlinRegexnull

```
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() bnull?b。

KotlinJava!!

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

KotlinJavaJava。

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

findCharSequencestartIndexIntMatchResult

inputRegexpattern。 Matchresult?startIndexinputnull 。 MatchResult?MatchResult?value。 startIndex0
。

```
val phoneNumber :String? = Regex(pattern = """\d{3}-\d{3}-\d{4}""")
```

```
    .find(input = "phone: 123-456-7890, e..")?.value // phoneNumber: 123-456-7890
```

inputphoneNumbernull ◦

findAllinputCharSequencestartIndexInt Sequence

patterninput◦

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

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

matchedResultsMatchResult◦ inputfindAll(..)◦

matchEntireCharSequenceMatchResult

inputpatterninput◦ null ◦

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

matchesCharSequenceBoolean

true◦ ◦

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

containsMatchIninputCharSequenceBoolean

true◦ ◦

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

splitCharSequencelimitIntList

◦

```
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◦ ◦

replaceCharSequencereplacementString String String

inputpattern◦

x

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

https://riptutorial.com/zh-CN/kotlin/topic/8364/

28:

◦ List◦

◦

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

UPPERBOUND

Kotlin Generics`TAny?` ◦

```
class Consumer<T>
```

`TT: Any?` ◦ `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
```

- `List<out T>` `TComparator<in T>` `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
```

- JavaKotlinVariant Generics。

https://riptutorial.com/zh-CN/kotlin/topic/1147/

29:

Examples

。

```
annotation class Strippable
```

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

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

- JavaIntLong;
-
- Foo :: class
-
-
-

- `@Target`
- `@Retention`。
- `@Repeatable`。
- `@MustBeDocumented`APIAPI。

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

https://riptutorial.com/zh-CN/kotlin/topic/4074/

30:

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/zh-CN/kotlin/topic/10575/

31: 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/zh-CN/kotlin/topic/3258/kotlin

32:

Kotlin。 plain int。

Examples

x

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

iterables

foriterable

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

Kotlin

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

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

forEach

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

`it`Lambda

whiledo-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
    }
}
```

breakcontinue

```
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" }
```

https://riptutorial.com/zh-CN/kotlin/topic/2727/

33:

。

3

1. 。
2. lambda。
3. 。

Kotlin

Kotlin

-
-
- Ktor
-

Examples

lambda。 `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/zh-CN/kotlin/topic/6010/

34:

◦

Apples OrangesPears ◦ ◦

Fruit getFruit()

Fruit ◦

- {}
- class {Derived Class}{Base Class}{Init Arguments}
- {}
- {DC-Object}{Base Class} == true

	Base Class
	Base Class
	Derived Class
DC-	“”

Examples

'open'

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/zh-CN/kotlin/topic/5622/

35:

rangeTo..inin。

Examples

IntRangeLongRangeCharRange。 Javafor-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

1step

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

enduntil

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

https://riptutorial.com/zh-CN/kotlin/topic/10121/

36:

◦ `(String) -> BooleanPair<Person, Person>` ◦

◦ ◦

- **typealias** *alias-name* **=** *existing-type*

◦ 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/zh-CN/kotlin/topic/9453/

37: Kotlin

Examples

Gradle

`kotlin-gradle-plugin`GradleKotlin。 Kotlin。 Kotlin `1.0.3` `kotlin-gradle-plugin` `1.0.3`。

`gradle.propertiesExtraPropertiesExtension`

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

`SourceSets` 。

Kotlin

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

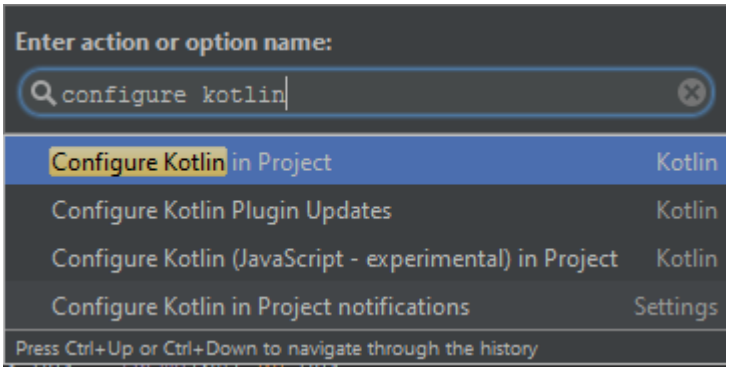
Kotlin Reflection`compile "org.jetbrains.kotlin:kotlin-reflect:$kotlin_version"`

Android Studio

Android StudioAndroidKotlin。

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

Android Studio`Ctrl` + `Shift` + `A`.“Kotlin”Enter。



Android StudioGradle。

Java

JavaKotlin`Ctrl` + `Shift` + `A`“JavaKotlin”。 `.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; }
}
```

GroovyGradleKotlin

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

Windows Gradle 3.3。 。

OSXUbuntu。

MavenJitpack Groovy。 。

Kotlin https://riptutorial.com/zh-CN/kotlin/topic/2501/kotlin

38:

Kotlin。API。

- listOfmapOfsetOf。
- arrayListOfhashMapOfhashSetOflinkedMapOfLinkedHashMaplinkedSetOfLinkedHashSet mutableListOfKotlin MultableListmutableMapOfThe Kotlin MultableMapmutableSetOfThe Kotlin MultableSet sortedMapOfsortedSetOf
- firstlastgetlambdafiltermapjoinreduce。

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}"
```

set

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

https://riptutorial.com/zh-CN/kotlin/topic/8846/

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