Idioms

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A collection of random and frequently used idioms in Kotlin. If you have a favorite idiom, contribute it by sending a pull request.

Create DTOs (POJOs/POCOs)

```
data class Customer(val name: String, val email: String)
```

provides a `Customer` class with the following functionality:

- getters (and setters in case of `var`s) for all properties
- `equals()`
- `hashCode()`
- `toString()`
- `copy()`
- `component1()`, `component2()`, ..., for all properties (see Data classes)

Default values for function parameters

```
fun foo(a: Int = 0, b: String = "") { ... }
```

Filter a list

```
val positives = list.filter { x -> x > 0 }
```

Or alternatively, even shorter:

```
val positives = list.filter { it > 0 }
```

Learn the difference between Java and Kotlin filtering.

Check the presence of an element in a collection

```
if ("john@example.com" in emailsList) { ... }

if ("jane@example.com" !in emailsList) { ... }
```

String interpolation

```
println("Name $name")
```

Learn the difference between Java and Kotlin string concatenation.

Instance checks

```
when (x) {
    is Foo -> ...
    is Bar -> ...
    else   -> ...
}
```

Read-only list

```
val list = listOf("a", "b", "c")
```

Read-only map

```
val map = mapOf("a" to 1, "b" to 2, "c" to 3)
```

Access a map entry

```
println(map["key"])
map["key"] = value
```

Traverse a map or a list of pairs

```
for ((k, v) in map) {
    println("$k -> $v")
}
```

`k` and `v` can be any convenient names, such as `name` and `age`.

Iterate over a range

```
for (i in 1..100) { ... }  // closed range: includes 100
for (i in 1 until 100) { ... } // half-open range: does not include
for (x in 2..10 step 2) { ... }
for (x in 10 downTo 1) { ... }
(1..10).forEach { ... }
```

Lazy property

```
val p: String by lazy { // the value is computed only on first acce
    // compute the string
}
```

Extension functions

```
fun String.spaceToCamelCase() { ... }

"Convert this to camelcase".spaceToCamelCase()
```

Create a singleton

```
object Resource {
    val name = "Name"
}
```

Instantiate an abstract class

```
abstract class MyAbstractClass {
    abstract fun doSomething()
    abstract fun sleep()
}

fun main() {
    val myObject = object : MyAbstractClass() {
        override fun doSomething() {
            // ...
        }

        override fun sleep() { // ...
        }
    }
    myObject.doSomething()
}
```

If-not-null shorthand

```
val files = File("Test").listFiles()

println(files?.size) // size is printed if files is not null
```

If-not-null-else shorthand

```
val files = File("Test").listFiles()

println(files?.size ?: "empty") // if files is null, this prints "e

// To calculate the fallback value in a code block, use `run`
val filesSize = files?.size ?: run {
    return someSize
}
println(filesSize)
```

Execute a statement if null

```
val values = ...
val email = values["email"] ?: throw IllegalStateException("Email i
```

Get first item of a possibly empty collection

```
val emails = ... // might be empty
val mainEmail = emails.firstOrNull() ?: ""
```

Learn the difference between Java and Kotlin first item getting.

Execute if not null

```
val value = ...

value?.let {
    ... // execute this block if not null
}
```

Map nullable value if not null

```
val value = ...

val mapped = value?.let { transformValue(it) } ?: defaultValue
// defaultValue is returned if the value or the transform result is
```

Return on when statement

```
fun transform(color: String): Int {
    return when (color) {
        "Red" -> 0
        "Green" -> 1
        "Blue" -> 2
        else -> throw IllegalArgumentException("Invalid color param
    }
}
```

try-catch expression

```
fun test() {
    val result = try {
        count()
    } catch (e: ArithmeticException) {
        throw IllegalStateException(e)
    }

    // Working with result
}
```

if expression

```
val y = if (x == 1) {
    "one"
} else if (x == 2) {
    "two"
} else {
    "other"
}
```

Builder-style usage of methods that return Unit

```
fun arrayOfMinusOnes(size: Int): IntArray {
    return IntArray(size).apply { fill(-1) }
}
```

Single-expression functions

```
fun theAnswer() = 42
```

This is equivalent to

```
fun theAnswer(): Int {
    return 42
}
```

This can be effectively combined with other idioms, leading to shorter code. For example, with the `when` expression:

```
fun transform(color: String): Int = when (color) {
    "Red" -> 0
    "Green" -> 1
    "Blue" -> 2
    else -> throw IllegalArgumentException("Invalid color param val
}
```

Call multiple methods on an object instance (with)

```
class Turtle {
    fun penDown()
    fun penUp()
    fun turn(degrees: Double)
    fun forward(pixels: Double)
}

val myTurtle = Turtle()
with(myTurtle) { //draw a 100 pix square
    penDown()
    for (i in 1..4) {
        forward(100.0)
        turn(90.0)
    }
    penUp()
}
```

Configure properties of an object (apply)

```
val myRectangle = Rectangle().apply {
    length = 4
    breadth = 5
    color = 0xFAFAFA
}
```

This is useful for configuring properties that aren't present in the object constructor.

Java 7's try-with-resources

```
val stream = Files.newInputStream(Paths.get("/some/file.txt"))
stream.buffered().reader().use { reader ->
    println(reader.readText())
}
```

Generic function that requires the generic type information

```
//  public final class Gson {
//      ...
//      public <T> T fromJson(JsonElement json, Class<T> classOfT) t
//      ...

inline fun <reified T: Any> Gson.fromJson(json: JsonElement): T = t
```

Nullable Boolean

```
val b: Boolean? = ...
if (b == true) {
    ...
} else {
    // `b` is false or null
}
```

Swap two variables

```
var a = 1
var b = 2
a = b.also { b = a }
```

Mark code as incomplete (TODO)

Kotlin's standard library has a `TODO()` function that will always throw a `NotImplementedError`. Its return type is `Nothing` so it can be used regardless of expected type. There's also an overload that accepts a reason parameter:

```
fun calcTaxes(): BigDecimal = TODO("Waiting for feedback from accou
```

IntelliJ IDEA's kotlin plugin understands the semantics of `TODO()` and automatically adds a code pointer in the TODO tool window.

What's next?

- Solve Advent of Code puzzles using the idiomatic Kotlin style.
- Learn how to perform typical tasks with strings in Java and Kotlin.
- Learn how to perform typical tasks with collections in Java and Kotlin.
- Learn how to handle nullability in Java and Kotlin.