Basic Syntax II

More of the basics of Kotlin

Using nullable values and checking for `null`

A reference must be explicitly marked as nullable when `null` value is possible.

Return `null` if `str` does not hold an integer:

```
fun parseInt(str: String): Int? {
    // ...
}
```

Use a function returning nullable value:

```
fun printProduct(arg1: String, arg2: String) {
    val x = parseInt(arg1)
    val y = parseInt(arg2)

    // Using `x * y` yields error because they may hold nulls.
    if (x != null && y != null) {
        // x and y are automatically cast to non-nullable after null check
        println(x * y)
    }
    else {
        println("either '$arg1' or '$arg2' is not a number")
    }
}
```

```
// ...
if (x == null) {
    println("Wrong number format in arg1: '$arg1'")
    return
}
if (y == null) {
    println("Wrong number format in arg2: '$arg2'")
    return
}

// x and y are automatically cast to non-nullable after null check
println(x * y)
```

Using type checks and automatic casts

The `is` operator checks if an expression is an instance of a type. If an immutable local variable or property is checked for a specific type, there's no need to cast it explicitly:

```
fun getStringLength(obj: Any): Int? {
    if (obj is String) {
        // `obj` is automatically cast to `String` in this branch
        return obj.length
    }

    // `obj` is still of type `Any` outside of the type-checked branch
    return null
}
```

```
fun getStringLength(obj: Any): Int? {
    if (obj !is String) return null

    // `obj` is automatically cast to `String` in this branch
    return obj.length
}
```

Using a `for` loop

```
val items = listOf("apple", "banana", "kiwifruit")
for (item in items) {
    println(item)
}
```

Target platform: JVM Running on kotlin v. 1.2.70

or

```
val items = listOf("apple", "banana", "kiwifruit")
for (index in items.indices) {
    println("item at $index is ${items[index]}")
}
```

Using a `while` loop

```
val items = listOf("apple", "banana", "kiwifruit")
var index = 0
while (index < items.size) {
    println("item at $index is ${items[index]}")
    index++
}
```

Using when expression

```
fun describe(obj: Any): String =
    when (obj) {
        1           -> "One"
        "Hello"     -> "Greeting"
        is Long     -> "Long"
        !is String -> "Not a string"
        else        -> "Unknown"
    }
```

Using ranges

Check if a number is within a range using `in` operator:

```
val x = 10
val y = 9
if (x in 1..y+1) {
    println("fits in range")
}
```

Check if a number is out of range:

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

if (-1 !in 0..list.lastIndex) {
    println("-1 is out of range")
}
if (list.size !in list.indices) {
    println("list size is out of valid list indices range too")
}
```

Using collections

Iterating over a collection:

```
for (item in items) {
    println(item)
}
```

Target platform: JVM Running on kotlin v. 1.2.70

Checking if a collection contains an object using `in` operator:

```
when {
    "orange" in items -> println("juicy")
    "apple" in items -> println("apple is fine too")
}
```

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when {
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}
```

Using lambda expressions to filter and map collections:

```
val fruits = listOf("banana", "avocado", "apple", "kiwifruit")
fruits
  .filter { it.startsWith("a") }
  .sortedBy { it }
  .map { it.toUpperCase() }
  .forEach { println(it) }
```

Creating basic classes and their instances:

```
val rectangle = Rectangle(5.0, 2.0) //no 'new' keyword required
val triangle = Triangle(3.0, 4.0, 5.0)
```