5COSC023W - Tutorial 2 Exercises - Practice Kotlin

As part of this tutorial for this week, you should complete **ALL** the tasks described in the following specifications: (**make sure that you ask questions to your tutor for anything that you do not understand or if you are stuck at any point**).

You should implement your Kotlin code in one of the Kotlin playgrounds, i.e. in either of the following sites:

- `https://developer.android.com/training/kotlinplayground`

  or

- `https://play.kotlinlang.org/`

Exercise 1

Define `var x = 1`. Then define `val y = x` and `val z = y`. Next, assign 2 to x and display the values of all three identifiers on different lines: first x, then y, then z.

Try to change the value of `z` to 5 in the end of your code. Why you are not able to change it?

Exercise 2

Create a function `other()` that takes a `String` parameter and returns a `String` containing every other letter of the parameter. For example, the argument “cement” produces “cmn”:

```
fun other(s: String): String {
   // ... your code goes here...
}

fun main() {
  println(other("cement"))
}
/* Output:
cmn
*/
```

Hint: The `for` loop in Kotlin accepts a `step` argument which defines the increment value, e.g. `for (i in 1..10 step 3)` will increment the value of `i` by 3 in each iteration.

Execise 3

Implement a function `sum` which accepts 3 double arguments and returns the sum of all its arguments. Test its functionality in `main` by calling the function.

Exercise 4

Write a Kotlin function which accepts a list of numbers as an argument and 2 additional arguments n_1 and n_2. The function creates a new list which contains all the elements of the first list in the range between n_1 and n_2 and returns the new list to the caller.

Test your function by calling it with different lists and arguments.

Hint: An immutable list can be created by using either of the below:

```
var l1 = listOf(1, 3, 5)
var l1 = listOf<Int>(1, 3, 5)
```

A mutable list can be created by using either of the below:

```
var l1 = mutableListOf(1, 3, 5)
var l1 = mutableListOf<Int>(1, 3, 5)
```

The angle brackets denote the type of the elements that the list can contain.

Exercise 5

Implement `everyFifth()` to display every fifth number in the given range. For example, `everyFifth(11, 30)` displays the numbers 15, 20, 25, and 30.

```
fun everyFifth(start: Int, end: Int) {
    // ...
}

fun main() {
  everyFifth(11, 30)
}
/* Output:
15
20
25
30
*/
```

Exercise 6

Implement `everyFifthNonSpace()` to display every fifth non-space character in the given text. For example, `everyFifthNonSpace("abc d e fgh ik")` displays the characters `e` (fifth character if not counting spaces) and `k` (tenth).

```
fun everyFifthNonSpace(s: String) {
    TODO()
}

fun main() {
    everyFifthNonSpace("abc d e fgh ik")
}
/* Output:
e
k
*/
```

Exercise 7

Write a function that uses a while loop to count the occurrences of a given digit within a decimal number. Place the decimal number in a var called worker. Each pass through the loop tests the right-most digit of worker, then at the end of the loop, removes that right-most digit from worker. The var `occurrences` contains the number of occurrences of the digit you seek.

This table shows the values during each loop while finding occurrences of 1 in 121341:

worker	Removed	occurrences
121341	-	0
12134	1	1
1213	41	1
121	341	1
12	1341	2
1	21341	2
-	121341	3

Hint: What result do you get if you divide an integer n by 10? Which digit do you get if you take the remainder of the division of an integer n by 10? (the remainder (modulo) can be calculated using the percentage sign, i.e. `n % 10` is the remainder of the division of n by 10.

```
fun countDigits(number: Int, digit: Int): Int {
    var worker = number
    var occurrences = 0
    while (worker > 0) {
        TODO()
    }
    return occurrences
```

```kotlin
}

fun main() {
    println(countDigits(764241, 4)) // 2
}
```