CMPS 312 Mobile Application Development
LAB 2: Kotlin Fundamentals I

Objective

In this lab you will practice:

- Kotlin language fundamental constructs
- Higher order functions to search, filter, map and process collections of data

Overview

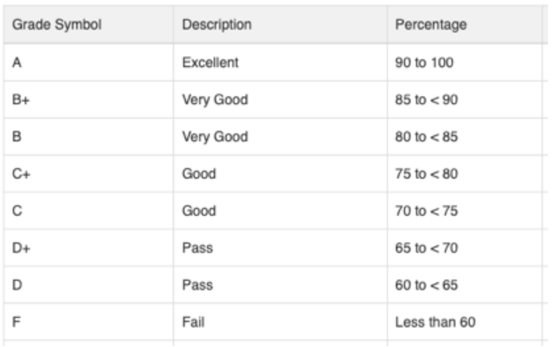
PART A : Warmup exercises on Kotlin Basics
PART B : You will solve a practice exercise.

PART A – Kotlin Basics

1. Write a program that displays all the even numbers from 1 to 100. You should display the results in the same format as shown below. [**use for-in**]

```
2 4 6 8 10
12 14 16 18 20
22 24 26 28 30
32 34 36 38 40
42 44 46 48 50
52 54 56 58 60
62 64 66 68 70
72 74 76 78 80
82 84 86 88 90
92 94 96 98 100
```

2. Write and test `getLetterGrade` function that takes a numeric score and returns the corresponding letter grade.
   e.g. If the score = 85, then the function should return B+. You can use the below table to identify the ranges for each letter grade. [Hint : use the **when** operator and **NOT if-else]**



Grade Symbol	Description	Percentage
A	Excellent	90 to 100
B+	Very Good	85 to < 90
B	Very Good	80 to < 85
C+	Good	75 to < 80
C	Good	70 to < 75
D+	Pass	65 to < 70
D	Pass	60 to < 65
F	Fail	Less than 60

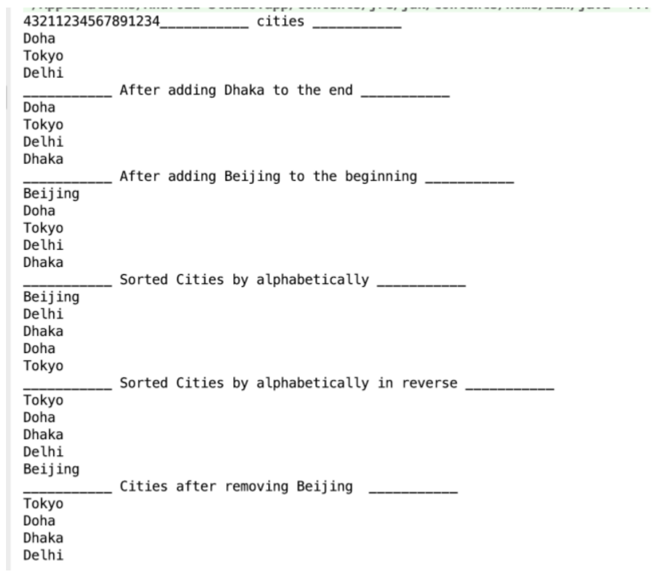
3. Write a class **Friend** that has 3 properties: firstname , lastname and gender. The gender should have "M" as a default value.
   - Add a toString method to return a string representation of the object with Mr. title for male and Ms. title for female. E.g., Mr. Abdulahi Hassen or Ms. Fatima Hamza
   - Create a main function. Inside it declare a friends list and initialize with a list of friends shown the table below:

Firstname	Lastname	Gender
Abdulahi	Hassen	M
Fatima	Hamza	F
Fiona	Shrek	F
Abbas	Ibn Fernas	M

- Loop through the friends list and display their details

4. Create cities list and initialize it with "Doha", "Tokyo", "Delhi"
    a. Add “Dhaka” to the list
    b. Add “Beijing” to the list
    c. Create and test a **display** extension function that extends a list to print the list elements.
    d. Sort the cities list alphabetically then display it
    e. Sort the cities list in alphabetically in reverse order then display it.
    f. Remove Beijing from the list of cities

<u>Output</u>



```
43211234567891234__________ cities __________
Doha
Tokyo
Delhi
__________ After adding Dhaka to the end __________
Doha
Tokyo
Delhi
Dhaka
__________ After adding Beijing to the beginning __________
Beijing
Doha
Tokyo
Delhi
Dhaka
__________ Sorted Cities by alphabetically __________
Beijing
Delhi
Dhaka
Doha
Tokyo
__________ Sorted Cities by alphabetically in reverse __________
Tokyo
Doha
Dhaka
Delhi
Beijing
__________ Cities after removing Beijing  __________
Tokyo
Doha
Dhaka
Delhi
```

5. Create **nums** variable to hold a range of values from 5 to 50. [**Hint use the range .. operator**]. Complete the following tasks using lambdas and <u>**without using loops**</u>:
    a. Display the elements in **nums**
    b. Create and test **`min`** and **`max`** functions to return the minimum and maximum values in **nums**
    c. Create and test **`sum`** function to return the sum of elements in **nums** [**Use reduce or fold function**]
    d. Create and test **`average`** function to return the average of elements in **nums**
    e. Cube every number in **nums** and save the result in **cubicNums.** Display the elements in cubNums.

5. Write `isPhoneNumber` String extension function to check if a string is phone number having 8 characters and all them are digits.

PART B

Using the concepts you practiced in part A, solve the following questions.

Create a class called **Invoice** that a spare parts store might use to represent an invoice for an item sold at the store. An Invoice should include four pieces of information as instance variables-a **partNumber**(type String),a **partDescription**(type String),a **quantity** of the item being purchased (type int) and a **price** per item (double).

Your class should have a **constructor** that initializes the four instance variables. Provide a **set** and a **get** method for each instance variable. In addition, provide a method named **getInvoiceAmount** that calculates the invoice amount (i.e., multiplies the quantity by the price per item), then returns the amount as a double value. If the quantity is not positive, it should be set to 0. If the price per item is not positive, it should be set to 0.0.

Create an **InvoiceTest** application that showcases the functionality of the Invoice class. In this application, generate at least 10 random invoices using a loop. After creating these invoices, calculate and display the following statistics: the highest invoice amount, the lowest invoice amount, and the average invoice amount of all the invoices.