**Lab Worksheet 03**

Please complete all the problems described below

**Question 01**

Write a java program called ComparisonSortFunctions.java. This file should contain three functions called bubbleSort, insertionSort and selectionSort (see lecture notes for reference). It should also contain a main method with code that initializes three integer arrays: **arr1**, **arr2** and **arr3**, with identical values. You are required to invoke three functions on these data arrays to sort them. Your task is to evaluate the sorting functions using the benchmarking method you learnt in week 01. Your program should print the time taken to perform each sort.

By choosing different values of **N** (size of the array) you should record the performance of each test run. You can generate random numbers for arrays. What we want you to do is to write a report on what you find. You should also try to answer the following question: which of the three sorting functions is performing better? An outline for your report is given below.

## Report

Type of CPU: 2.3 GHz 8-Core Intel Core i9

Memory: 32 GB 2400 MHz DDR4

**Test 1**

Size of data: N = 1000

Cost of bubbleSort= 7

Cost of selectionSort= 4

Cost of insertionSort= 4

**Test 2**

Size of data: N = 10000

Cost of bubbleSort= 127

Cost of selectionSort= 31

Cost of insertionSort= 47

**Test 3**

Size of data: N = 100000

Cost of bubbleSort= 12190

Cost of selectionSort= 2327

Cost of insertionSort= 3867

**Conclusion:**