Lab Practical 6

At the end of this practical you should be familiar with the use of sorting and searching algorithms. If unsure with any of sorting or searching algorithm principles, review the lecture material from the respective weeks.

Question 1

Create a Java program class ExamResults and within it:

a) **Manually** create an array called `results` and populate with the following values: { 45, 59, 23, 89, 94, 51, 65, 74, 23, 65, 96, 21, 44, 33, 59, 85, 49, 58, 56, 69 }.

b) Create a method `public static void printArray(int[] array)` that will print the exam results to screen.

c) You are required to calculate the average exam mark. Write a method `public static double average(int[] array)` to do so.

d) Appropriately call the `average` method from your `main` program and pass the `results` array in. Print out the average mark to the user from the `main` method.

e) Write two Java methods to find:

the highest `public static int maxVal(int[] array)`
and lowest `public static int minVal(int[] array)`

exam mark in the array. The **BubbleSort** algorithm should be used here to complete this task.

f) Print out the highest and lowest marks to the user from `main`.

Question 2

Using the linear and binary search algorithms from the lecture slides:

a) Implement the methods
```
public static int linearSearch(int items[], int key)
public static int binarySearch(int items[], int key)
```

b) Search the array of `results` for the value 65 using the linear and binary search algorithms and output the results.