Langara College

# Department of Computing Science & Information Systems

# CPSC1150 – Program Design

###### **Lab8: Array Basics**

**Objectives:**

* Solving problems
* Using arrays
* Using method abstraction
* Creating and using data structures.

**Instructions:**

1. Create a folder named **Lab8** to store all the files from this lab
2. Create an external documentation file (filename: **Lab8Ext.docx**) to store the summary, algorithm(s), and sample input and output for each problem.
3. All your programs must have good internal and external documentations
4. You must design the algorithms for all the user-defined methods and the main method

**Problems [45 marks]**

**Problem 1: [10 marks] Find the largest value in an Array (**filename: **LargestInArrays.java)**

Write two overloaded methods that return the largest value in an array with the following headers:

public static int max(int[] array)

public static double max(double[] array)

Write a test program that prompts the user to enter five integer values, invokes the max method, and displays the largest value, and then prompts the user to enter five double values, invokes the max method again, and displays the largest value.

.

**Problem 2: [10 marks] Generating random numbers**

(filename: **GenerateRandomNumbers.java**)

Write a program that generates and displays 6 **distinct** random numbers between 1 and 49. Create an array to store the 6 numbers.

**Problem 3: [25 marks] Displaying the statistics of the temperature in a week**

(filename: **DisplayWeekTempStat**.java)

Design the algorithms and write a program to do the followings:

1. Ask the user to enter the daily highest temperature in a week (Create an array to store the temperature. Assume that temperature is in integer).
2. Using the data that the user entered in Step 1, provide the following information to the user:
   1. The average temperature of the week (**Create a method for this. The method takes an array of integers and returns the average of the integer numbers**).
   2. The hottest temperature of the week (**Create a method for this. The method takes an array of integers and returns the maximum of the integer numbers**).
   3. The coldest temperature of the week (**Create a method for this. The method takes an array of integers and returns the minimum of the integer numbers**).
   4. The hottest and coldest days of the week (**Create a method for this)**.

The method takes two parameters: an array of integers and an integer (a search key). It returns an array of integers which corresponds to the indices of the array at which positions the values match the key)

**public static int[] searchTemp(int[] temp, int key)**

This method will be invoked twice, one for getting the hottest days and one for getting the coldest days.

**An example of the program’s input and output:**

Please enter the highest temperature of each day in a week (start with Sunday):

14

12

13

16

12

14

13

The average temperature of the week is: 13.43 degree

The hottest temperature is 16 degree

The coldest temperature is 12 degree

The hottest days are: Wednesday

The coldest days are: Monday, Thursday

**What to hand in**

**Zip the folder** which contains the documentation file and all the Java source files from this lab and **submit the zipped folder to BrightSpace**.

**When to hand in**

By 10:29 am, Monday, Mar 15, 2021