Langara College

# Department of Computing Science & Information Systems

# CPSC1150 – Program Design

###### **Lab2: Java Basics**

**Objectives:**

* Writing algorithms on Java arithmetic
* Implementing algorithms
* Get input and format output
* Creating external documentation

**Problems [25 marks]**

**Instructions:**

1. Create a folder named **Lab2** to store all the files from this lab
2. Create a single external documentation file for this lab (filename: **Lab2Ext.docx**) to store the following (For information on external documentation, refer to the [Lab Guide](http://mylinux.langara.bc.ca/~mwchen/CPSC1150/Labs/1150LabGuide.docx)):
   1. the algorithms for all the problems.
   2. the sample input and output from all the problems.

**Problem 1: [5 marks] Calculate body mass index** (filename: **CalculateBmi.java**)

Design an algorithm (**Add it to the external documentation file**) and then write a program that gets a person’s weight (kg) and height (m) from the keyboard and then calculates and displays the person’s BMI on the console (keep two digits after the decimal point). The formula for calculating BMI is:

bmi = weight / height2

A sample run is given below:

Please enter your weight in kg: 74

Please enter your height in meters: 1.7

Your BMI is: 25.61

**Problem 2: [10 marks] Display the digits in a number (**filename: **DisplayDigits.java)**

Design an algorithm (**Add it to the same external documentation file created from Problem 1**) and then write a program that asks the user to enter an integer between 0 and 999. The program finds and displays the three digits in the number. The program also calculates and displays the sum of the three digits.

**Hint:** use integer and module divisions to find the digits.

A sample run is given below:

Enter a number between 0 and 999: 528

The three digits in the number are: 5 2 8

The sum of the three digits is: 15

**Problem 3: [10 marks] Compute the area of a triangle**

**(**filename: **ComputeTriangleArea.java)**

Design an algorithm (**put the algorithm in the same external documentation file created from Problem 1**) and then write a program that prompts the user to enter three points (x1, y1), (x2, y2), (x3, y3) of a triangle and displays its area. Format the area with two digits after the decimal point. The formulas for computing the sides and the area of a triangle are

side1 =

side2 =

side3 =

s = (side1 + side2 + side3) / 2

area =

Here is a sample run:

Enter three points for a triangle: 1.5 -3.4 4.6 5 9.5 -3.4

The area of the triangle is: 33.60

**Note:** You can use Math.pow(a, b) and Math.sqrt(a) to calculate power and square root.

**What to hand in**

Zip the folder **Lab2** which contains all the Java source files and the external documentation file from this lab and upload the zip file to BrightSpace.

**When to hand in**

By 10:29 am, Monday, Jan 25, 2021