Given: Friday, September 25, 2015, posted on BlackBoard

The assignment is to be completed individually, in accordance with the policies and expectations in the course outline.

If you need help you can contact your instructor. You may also contact Jordan or Steve in B103 and B017.

Due Date:

Part 1: Algorithm (in Pseudo-code), due date **on or before Thursday, October 1 at 11:59pm**

Part 2: Implementation (in Java code), due date **on or before Thursday, October 8 at 11:59pm**

Points for early submission:

Part 1: No points will be awarded for early hand-in for Part 1.

Part 2:

- 0 points = October 8th after midnight. Assignments handed in after midnight will be awarded zero points but will be accepted up **until 6am the following morning without any penalties**.
- 1 point = October 8th before midnight.
- 2 points = October 7th before midnight.
- 3 points = October 6th before midnight.
- 4 points = October 5th before midnight.

Objectives:

To gain experience with the following:

- the Java programming language and the BlueJ development environment
- Writing pseudo-code
- Arithmetic expressions
- Translating pseudo-code into Java
- Interactive programs

There will be two independent problems to the assignment, you MUST complete both.

For each problem, you will be developing pseudo code and then implementing each in Java.

Note: The pseudo code will be due **before** the implemented Java code.

For both of the above problems, you **must** follow the pseudo-code standards set out in lecture.

Problem 1: A problem of your choice!

You are to design and code a non-trivial and meaningful program of your own choosing. Pick something personally interesting and/or useful. Be creative!

Requirements:

1. The program must use at least two inputs, but not more than about four. You may choose to work with either int or double values – it's up to you.
2. Your solution must make appropriate use of at least three of the binary arithmetic operators (+, -, *, / and %) that are built in to Java.

Expectation:

1. Write a one-paragraph, high-level description of the problem you've chosen, and why you chose it. Basically, write a problem statement.
2. List all the input and/or output for the specific problem. What information it needs from the user and the information that will be produced needs to be clear.

If in doubt that your choice of problem is appropriate, please consult with your instructor as early as possible.

Problem 2: RectangleZilla

You are to design and code a solution for a program that will be used to calculate basic statistics about a single rectangle. The rectangle will be defined by X and Y coordinates for the top left and bottom right corners of a rectangle. Below is an example:

Requirements:

1. The program will the need to ask for all the required inputs. For simplicity sake, we will assume that all input values will ALWAYS be positive values.
2. The program then needs to compute and display the following information:
    a. the length (along the x-axis) and width (along the y-axis) of the rectangle
    b. the perimeter
    c. the area

For the example based upon the rectangle shown, your program should get the following values:

- Length is 4
- Width is 2
- Perimeter is 12
- Area is 8

Try to test your program for other valid input values.

Important Submission Instructions:

Failure to follow these instructions will result in mark reduction on the assignment.

Part 1: Design:

You will be creating a single Word document that contains pseudo code for **both** problems.

Submit a MS Word file (*.docx) for this part. Name the file

```
<lastName>_<firstName>_Asg1_Part1.docx
```

Place pseudo-code for BOTH problems into this document. For the problem of your choice, you will be including the problem statement as well.

Part 2: Implementation:

- Each problem should be set up as two different BlueJ projects.
- At the top of the class code, you must have a comment header. A template of the header to use can be found at the end of this document under the heading Documentation Template.

Before submitting, organize your work in a **folder** named according to the following format:

```
<lastName>_<firstName>_Asg1_Part2
```

Place BOTH BlueJ projects into this folder. Also the original pseudo-code document from Part 1 within this folder.

Submission:

When ready to submit, place the document (for Part 1) OR folder (with all its contents) for Part 2 to the Submit folder, which appears under the "I:" drive each time you log in to a university PC.

If you are submitting from a non-university computer (e.g. a home PC), you can access the submit folder via secure.mtroyal.ca, into which you can upload a compressed (e.g. ".zip") version of your main folder.

Documentation Template:

Replace all highlighted text with actual values

File header

```
/**
 *  <include description of the class here>
 * @author <your name>
 * @version 1.0
 * Last Modified: <date> - <action> <who made the change>
 */
```