Vg101. Introduction to Computer and Programming (Fall 2018)

Homework #8

Assigned: 11/27/2018 Due: 12/4/2018

Notes for submission: We are going to use the online judge (OJ) to grade your homework, so please submit your homework in the OJ. Please see the instruction for OJ submission on Canvas Announcement. For backup purpose, you should also submit your homework to the Canvas. **For canvas submission, please name the file using the format bellow: "(Your last name)(Initial of your first name)_sYourStudentID_hw8.zip" which includes all your source codes. For example, WuJ_s12345678_hw8.zip**. And the source file name for each problem should be Problem1.c, Problem2.c, etc.

All of the following programs should be written in C++

1. (The **MyPoint** class) Design and implement a class named **MyPoint** to represent a point with x and y-coordinates. The class contains:

- Two private data fields **x** and **y** with type of "int" that represent the coordinates
- A function that sets data fields **x** and **y** according to user parameters
- A function that gets data fields **x** and **y**
- A function named **distance** that returns the distance (with type of "int") from this point to another point of the **MyPoint** type

Write a main function to accept user input of the coordinates of two points, then display the distance between the two points. An example run of the program should look like:

Input: 0 0 3 4

distance = 5

where "Input: " is the prompt for user input, and the user inputs are four numbers separated by spaces representing the x, y coordinates of the two points in sequence. The output is "distance = " followed by the calculated distance. Notice that to facilitate the grading, we choose to use "int" for all the data types.

2. (The **Triangle** Class) Using the MyPoint class of previous problem, design and implement a class named **Triangle** to represent a triangle. The class contains:

- Three private **MyPoint** member variables named **point1**, **point2**, and **point3**.
- A constructor with no arguments that creates a triangle with three end points of (0, 0), (1,0) and (0,1)
- A constructor that constructs a triangle according to user specified coordinates of each point
- A function named **getArea()** that returns the area of the triangle
- A function named **getPerimeter**() that returns the perimeter

Write a main function to create a triangle with user input end points (0, 0) and (5, 0), (0, 12) and display its area and perimeter. An example run of the program should look like:

Input: 0 0 5 0 0 12

area = 30

perimeter = 30

where “Input: “ is the prompt for user input, and the user inputs are six numbers separated by spaces representing the x, y coordinates of the three points in sequence. Notice that to facilitate the grading, we choose to use “int” for all the data types.