Laboratory 09: Chapter 9 Classes: A deeper look, Part 1
Programming Methodologies Lab
April 2, 2018

Problem Definition

Create a class called `Rectangle`. This class stores only the Cartesian coordinates of the four coordinates of the rectangle.

Use integer variables to represent the data of the class: the x and y coordinates of the four corners of the rectangle. Provide a constructor that enables an object of this class to be initialized when it is declared. The constructor should contain default corner values in case no initializers are provided.
Provide member functions that:

- Calculate the perimeter
- Calculate the area
- Calculate the width (Dimension along the horizontal line)
- Calculate the length (The larger of the two dimensions)
- Print the rectangle corners

The implementation of the class rectangle is divided in two steps:

Part 1: Class Definition

Implement the class definition for class `Rectangle` in a file called `Rectangle.h`. The class definition should contain only the prototypes of the member functions `Rectangle`, `setCorners`, `getPerimemter`, `getArea`, `getWidth`, `getLength` and `printCorners`. You can define more member functions if it is necessary. You also need to include the coordinates of the corners as integer data members.
Determine if the functions and the data members should be private or public.
You can find an example of the class definition for the class Time in the file Time.h – also available in Chapter 9.2 (page 379 of the Deitel book, ninth edition).

Part 2.1: Member-function definition

Implement the member-function definition of class `Rectangle` in a file called `Rectangle.cpp`. This .cpp file contains the actual implementation of the member functions of class Rectangle.
You can find an example of the member-function implementation in the file Time.cpp – also available in Chapter 9.2 (page 380 of the Deitel book).

Part 2.2: Test program
Write a program that tests your class Rectangle. Call your file `TestRectangle.cpp`. This program should:

1. Instantiate two objects of class Rectangle
2. Output the objects' values (using the function print)
3. Change the corners for one of the objects and output the object's new corners
4. Print the object's perimeter
5. Print the object's area
6. Print the object's width
7. Print the object's length

You can find an example of a test program for the class Time in the file testTime.cpp – also available in Chapter 9.3 (page 384 of the Deitel book).

Grading

Part 2.1: Class Definition	30%	Required
Part 2.2: Member-function definition and test program	70%	Required

Submission
You are required to submit via sakai one cpp file for each of the parts in this lab. Name your files:

```
Rectangle.h
Rectangle.cpp
TestRectangle.cpp
```

Remember to include following information at the beginning of `TestRectangle.cpp` file as a comment.

```
// Course Number and section: 14:332:254:XX
// Lab Instructor: Kazem Cheshmi
// Date Performed: 04/02/2018
// Date Submitted: 04/02/2018
// Submitted by: YOUR NAME, RUID
```

NOTE – You need to **Upload** your files and then **Submit** them. The TAs will have no access to your files if you forget to submit them.

If you do not submit your files to sakai, you will not receive a grade.

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