CS 2024 – ASSIGNMENT #2

Assigned: **9/5/2019**
Due: **9/11/2019**

PROBLEM:

This week in lecture we learned some basic syntax for C++ such as variable declarations, conditional statements and classes. Your assignment is to implement the following class (I'm giving you the basic interface):

```
class Rectangle {
public:
     Rectangle();
     void setDimensions(int width,int height);
     int area();
     int circumference();
     void print();
private:
     int mWidth;
     int mHeight;
};
```

The class above is just the definition of the class with no definitions of its member functions. You can choose to implement the methods in the class either right inside the class definition OR outside using the syntax discussed in lecture.

For this assignment only, you are allowed to implement the class in the same file that your `main`() function appears (main.cpp).

The methods will do the following:

`Rectangle`	This is the constructor. It will initialize both of the member variables to a value of 0.
`setDimensions`	This will take two integer arguments (width and height). The values passed to this function will be used to set the values of the member variables (`mWidth` and `mHeight`). You will need to validate that these are NOT negative numbers before setting the member variables using conditional statements. If either argument is less than zero, the corresponding member variable should be set to the value 0.
`area`	Calculates the area of the rectangle (`mWidth` * `mHeight`) and returns it.
`circumference`	Calculates the circumference of the rectangle (`mWidth` + `mHeight`) * 2 and returns it.

`print`	Prints out the stored height and width for this instance of the class. So if `mWidth` has a value of 10 and `mHeight` has a value of 8, it would print out something like: `Rectangle(10,8)`

Your `main`() function will need to do the following:

1. Declare an instance of `Rectangle`
2. Call the `print` method of your instance to show that your constructor initialized the member variables to 0
3. Prompt the user to enter a width and height (separately)
4. Take the values entered by the user and pass them to a call to `setDimensions`()
5. Call the print method of your instance again to show that the values entered by the user are now stored your instance of Rectangle (again, if the user enters a negative number for either dimension, the corresponding member variable should be set to 0)
6. Call the `area`() method and output the result
7. Call the `circumference`() method and output the result

HINTS/DISCUSSION:

Use the class declaration above as a starting point. It's ok to define all functionality right in the class definition (related to the class) as opposed to using the syntax that lets you define member functions outside of the class declaration – but it's up to you.

I've chosen to use "signed integers" to represent the dimensions of rectangle for simplicity; If we were doing this for "real" we'd probably use a floating point type that didn't allow for negative numbers for width/height.

The output of a "run" of your program should look something like this:

```
Rectangle (WxH): (0,0)
Enter a width: 3
Enter a height: 4
Rectangle (WxH): (3,4)
area is: 12
circumference is: 14
```

If the user enters 0 for either of the dimensions OR if you end up setting either of the dimensions to 0 because the user entered a negative number, it's ok to let 0 be used for both the area and circumference calculations.

If you accidentally end up entering string data (letters, punctuation) when prompted for an integer, you might see some unexpected results. Don't worry. You are not required to validate the input "type" for this assignment. Just assume that the user will be good and enter an integer when asked!

FINALLY: Please remember to comment your code including a "header" comment on your main.cpp file similar to the sample assignment (see course website). Remember you must also submit a writeup for this assignment (again, see sample assignment for an example)

FILES TO SUBMIT:

1. main.cpp
2. Writeup (.doc, .docx, .pdf, .txt accepted)