CSI201 – Area Calculator

Practical:

Write a program that allows the user to calculate the area of multiple rectangles, equilateral triangles, and regular pentagons. After each area calculation, your program should ask the user whether they would like to perform another area calculation versus quitting the program. Please use double instead of int data types so that you do not lose the fractional portion of your results (including intermediary results). Here is the order that I would suggest building this program in:

1. Create an empty new project in Visual Studio called *YourName*\_Assmt2 with a single C++ file. Fill this file with C++ code that prints the following text message to the screen: *Area Calculator 1.0*.
2. Next write some code that asks the user to enter the width and height of a rectangle. Your program should then display the area of this rectangle, which can be calculated from the following formula:

$$area\_{RECTANGLE}=width × height$$

Once you have this calculation working, comment it out while you work on the next sections.

1. Write some code to calculate the area of an equilateral triangle based on the length of one side of this triangle. After you get this working, comment it out while completing the next step. Here’s the formula for calculating the area of an equilateral triangle:

$$area\_{TRIANGLE}=\frac{\sqrt{3}}{4}side^{2}$$

1. Finally, write code to calculate the area of a regular pentagon that the user specifies a side length for:

$$area\_{PENTAGON}=\frac{5 × side^{2}}{4 × tan⁡(\frac{π}{5})}$$

*Note that you can approximate* $π$ *with the value: 3.141592.*

1. Now that you have code in place for calculating the area of three different shapes, feel free to un-comment the code for the first two. Before any of this code runs, ask the user what shape they would like to calculate the area of. Your program should then only run the code that calculates the area of the requested shape.
2. Your final step for this assignment is to wrap all of this code in a loop, so that the user can calculate the area of as many shapes with different dimensions as they’d like. After displaying each calculated area, your program should ask the user whether they’d like to calculate the area of another shape or not.

# Problems:

(1-6). For each of the following loops, indicate the number of times each loop will repeat and the output that they will print to the screen.

 // for problems 1 and 2

 int i = 3;

 while(i<6)

 {

 cout << 2 \* i << " ";

 i++;

 }

1. Number of iterations: \_\_\_\_\_\_\_\_\_\_\_\_

2. Output printed to screen: \_\_\_\_\_\_\_\_\_\_\_\_

 // for problems 3 and 4

 int i = 9;

 while(i>2)

 {

 cout << i + 1 << " ";

 i = i - 2;

 }

3. Number of iterations: \_\_\_\_\_\_\_\_\_\_\_\_

4. Output printed to screen: \_\_\_\_\_\_\_\_\_\_\_\_

 // for problems 5 and 6

 for(int i=0;i<7;i++)

 cout << i/2 << " ";

5. Number of iterations: \_\_\_\_\_\_\_\_\_\_\_\_

6. Output printed to screen: \_\_\_\_\_\_\_\_\_\_\_\_

7. Which of the follow are **NOT** functions (circle/highlight each non-function name):

 a. rand b. int b. pow

 c. cout d. abs e. tan

8. What name, input, and output are specified by the following function declaration (also known as a function signature or prototype): double foo(int bar, char baz);

Function Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Input: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 Output: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Submission:

**Name:** [REPLACE WITH YOUR NAME]

**Honor Code:** [REPLACE WITH YOUR HONOR CODE PLEDGE]

**Resources:** [REPLACE WITH NAMES OF PEOPLE, WEBSITES, AND OTHER RESOURCES USED, ALONG WITH A BRIEF DECSRIPTION OF THE KIND OF HELP THEY PROVIDED]

After you have completed the practical portion of this assignment, zip your project folder into a single file and upload it to Canvas. After you have completed the written problems above, save this document (with your answers), and then upload it to canvas. For full credit, you will need to submit both halves of this assignment on Canvas, no later than **Thursday February 19th, 2015**.