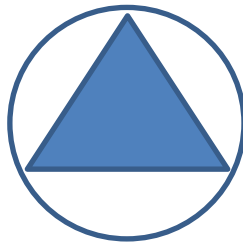


## Programming Project 3 – Tri Circle Sign

*Note: When you turn in an assignment to be graded in this class, you are making the claim that you neither gave nor received assistance on the work you turned in (except, of course, assistance from the instructor or teaching assistants).*

Write a program called **TriCircleSign.java** that determines the cost of a custom-made sign that is in the shape of a circle that surrounds a given equilateral triangle as show below.



The user will enter the length of a side of the triangle. Then the user will enter the string they would like on their sign. The program will calculate the area in square feet of the tri-circle sign using the formula:

- $Radius (r) = \frac{L^3}{4\sqrt{s(s-L)^3}}$ , where side is the  $L$  = the length of a side, and
- $s = \frac{3L}{2}$
- $Area = \pi r^2$

The program will count up the number of non-blank characters in the string for the sign. The total cost for the sign will be computed using \$2.35 per square foot and \$1.45 per character. The program will display the total cost of the sign as the output for this program. This cost will be rounded to two decimal places using print formatting (printf).

After the first calculation is performed, the program should ask the user if they would like to continue. They will type in the word “quit” if they wish to end the program. If they wish to continue, they will enter a new length of a triangle side and the string they would like on their sign.

Here is a sample run:

**Enter the length of a side of your triangle:**

**5**

**Enter the string you would like on your sign:**

*Welcome to VCU*

**\$78.92**

**Would you like to create another sign? Enter quit to exit.**

*yes*

**Enter the length of a side of your triangle:**

*8*

**Enter the string you would like on your sign:**

*I love computer science*

**\$186.50**

**Would you like to create another sign? Enter quit to exit.**

*quit*

Note for Gradescope Testing:

- Use `nextLine()` for all String inputs.
- You should use `nextLine().trim()` for the last String input of if you would like to continue or not.
- You will also need to use `printf()` for printing and rounding your values.

This and all program files in this course must include a comment block at the beginning (top) of the source code file that contains:

- the Java program name
- project description
- your name
- the version date
- the course number and section

The comment lines should look like this:

```
/******  
* Java program name  
*****  
* Project description  
*  
* _____  
* Your name  
* The version date  
* The course number and section  
*****/
```

Before beginning this project, you will document your algorithm as a list of steps to take you from your inputs to your outputs. This algorithm will be due on paper at the beginning of class on the day it is due. This will be graded and returned to you. It will be your responsibility to understand and correct any errors you might have with your algorithm.

Each step of your algorithm will be added as a comment block within your code. You will have the comment block right above the code that performs the actions specified. For example, before your lines of code that ask the user for inputs, you would have a comment block that states what inputs you are requesting from the user.

You will document your tests using the form shown below. You need to show a run through each path in your program and show the looping.

You will submit your Java source code file (TriCircleSign.java) to Gradescope and submit your test documentation (TestPlan.docx) by uploading the file to the Assignment link in Blackboard.

Ask questions about any part of the programming project that is not clear!

## Test Plan:

**Expected output** – expected test results against which the output of the test is compared.

[illegible]

### Rubric for Programming Project 3

Item	Points
Algorithm submitted in class on time	20
Program file name correct and submitted as specified	5
Comment block at top of file with specified project information	5
Comment blocks stating the algorithm step above the code as specified including comment header block	10
Appropriate choice of variable names	5
Appropriate use of constants	5
Appropriate use of looping	10
Program layout and appearance (Coding style is clear and easily understood)	5
User prompts are in the correct order and clearly written	5
Output is correct	15
Output is properly rounded using printf to two significant digits	5
Documentation of test plan submitted	10
<b>Total</b>	<b>100</b>