

Lab 12 Class and Objects

Please test the correctness of your program in **Q1**, **Q2** and **Q3** on **PASS**.

Q-1.

Design and implement a class to compute the area of a triangle using the values of their sides. The design of class (named **Triangle**) should include:

- 1) Three private members **side1**, **side2**, and **side3**, which present sides of a triangle.
- 2) One private member **area** to preserve the computed area of triangle.
- 3) A default constructor (i.e., **Triangle()**) to initialize sides of triangle and area of triangle as zero.
- 4) A parameter constructor (i.e., **Triangle(double, double, double)**) to initialize the values of sides for corresponding triangle and initialize area of triangle as zero.
- 5) A set method (i.e., **setSides(double, double, double)**) to enter the new values for the sides.
- 6) A method (i.e., **computeArea()**) to compute the area of triangle.
- 7) A get method (i.e., **getArea()**) to display the area.

Hint-1. Area of Triangle can be computed through the following Heron's Formula:

$$\text{Area} = \sqrt{s(s-a)(s-b)(s-c)}, \text{ where } s = (a+b+c)/2.$$

Hint-2. You need to include `<cmath>` library to use the `sqrt()` function and include `<iomanip>` library to use `setprecision` and `fixed` manipulators to change the precision value and printing format.

According to the requirements above, write a program to:

- 1) Create first Triangle object (i.e., **triangle1**) with default constructor and display its area.
- 2) Create second Triangle object (i.e., **triangle2**) with parameter constructor and display its area. The values of sides are 3, 4, and 5.
- 3) Call the set method using first Triangle object (i.e., **triangle1**) and display its area. Assume that all inputs are valid, i.e., new sides can form a triangle.

Expected Outputs:

Example 1.	Example 2.
Area of triangle1: 0.00 Area of triangle2: 6.00 Enter new sides for triangle1: 4 2 3 Area of triangle1: 2.90	Area of triangle1: 0.00 Area of triangle2: 6.00 Enter new sides for triangle1: 3 3 3 Area of triangle1: 3.90