Experiment No-2

Experiment name: Write a C program to calculate the area of Triangle where the value of Three lines are given.

Objective:

- To develop a C program that computes the area of a triangle using the lengths of its three sides by applying Heron's Formula, while ensuring input validation to confirm the sides form a valid triangle.

Problem Analysis:

- Formula (Heron's Formula): If the sides are a, b, and c, then

$$s=\frac{(a+b+c)}{2} \text{ and}$$

$$\text{Area}=\sqrt{s(s-a)(s-b)(s-c)}$$

Input Variables	Processing Variables	Output Variable	Header File
a, b, c: float	s: Semi-perimeter area= calculated using Heron's formula	area (area of the triangle)	#include <stdio.h> #include <math.h>

Algorithm:

Step-1 : Start

Step-2 : Declare variables a, b, c, s, and area.

Step-3 : Input three sides a, b, and c.

Step-4 : Calculate semi-perimeter: s = (a + b + c) / 2.

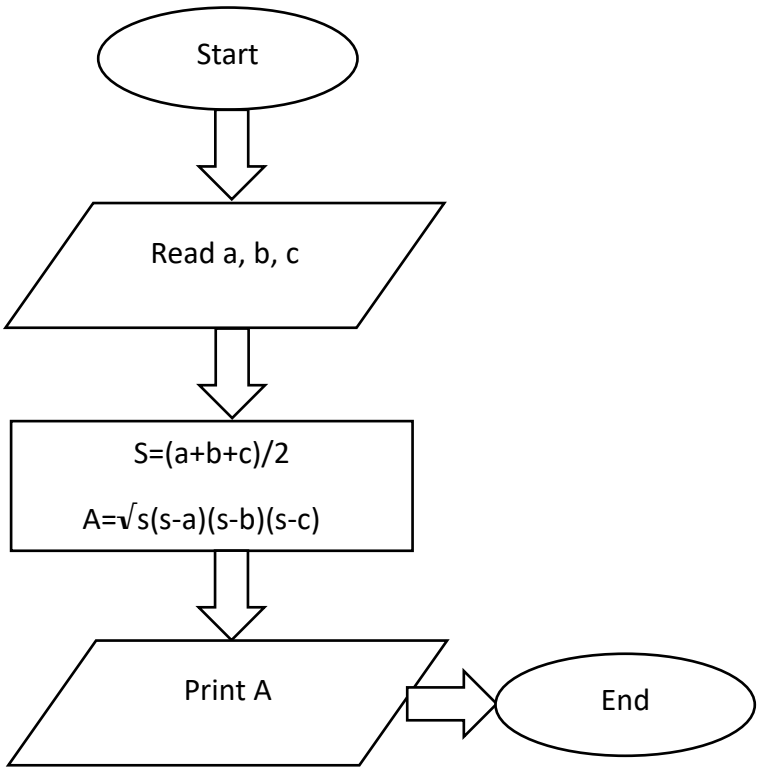
Step-5 : Calculate area using formula:

area = √(s * (s - a) * (s - b) * (s - c))

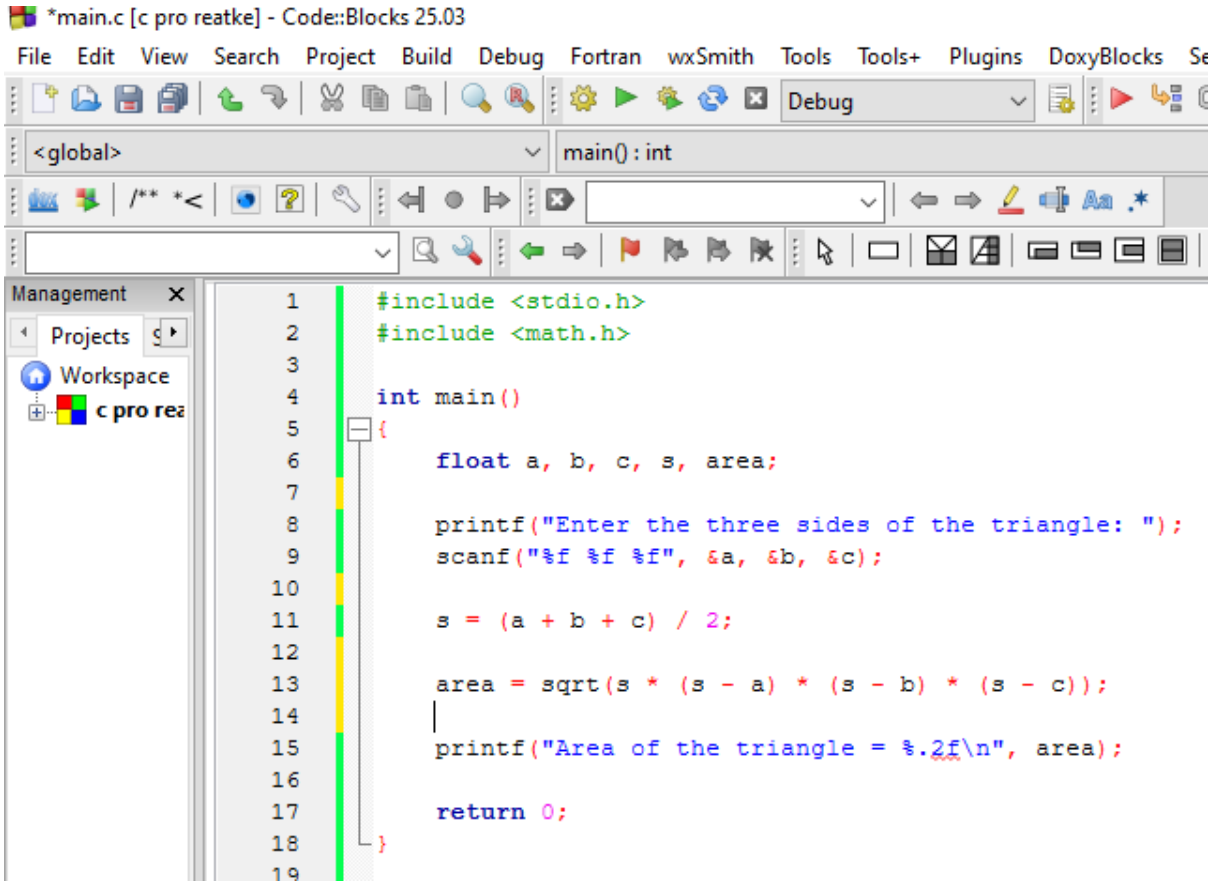
Step-6 : Display the area.

Step-7 : End

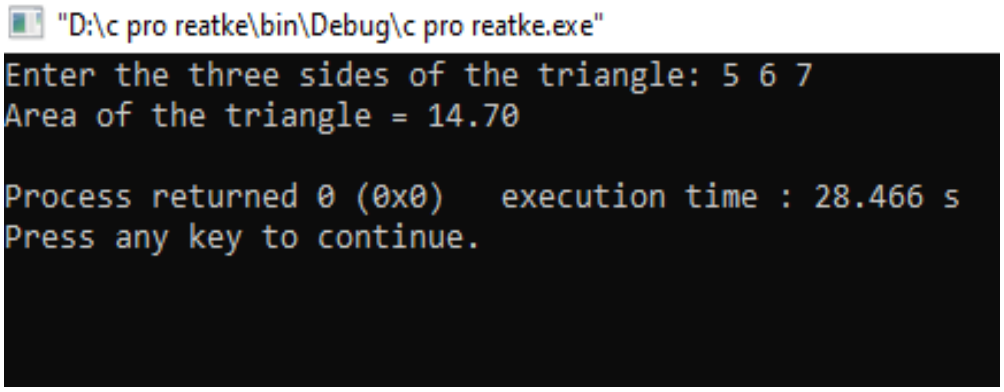
Flowchart:



Source Code:



Output:



Discussion:

This program effectively calculates the area of a triangle using Heron's formula, which is suitable when only the lengths of the three sides are known. The program includes input validation to ensure that the provided side lengths can actually form a triangle (the sum of any two sides must be greater than the third side). The use of float data type allows for handling decimal values for side lengths and area. The math.h library is crucial the sqrt() function required by Heron's formula. The output is formatted to two decimal places for better readability.