GNG1106 C
PROFESSOR: SHERVIN SHIRMOHAMMADI

LAB REPORT BY
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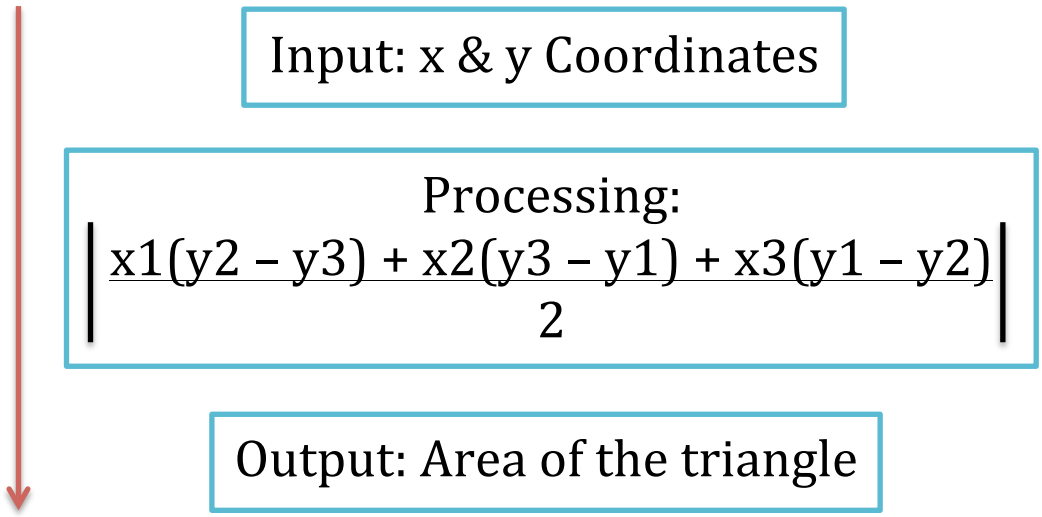
LAB 1
COMPUTE THE AREA OF A TRIANGLE

Step 1: Problem Identification & Definition

We need to develop a software that will compute the area of a triangle using the coordinates entered by the user.

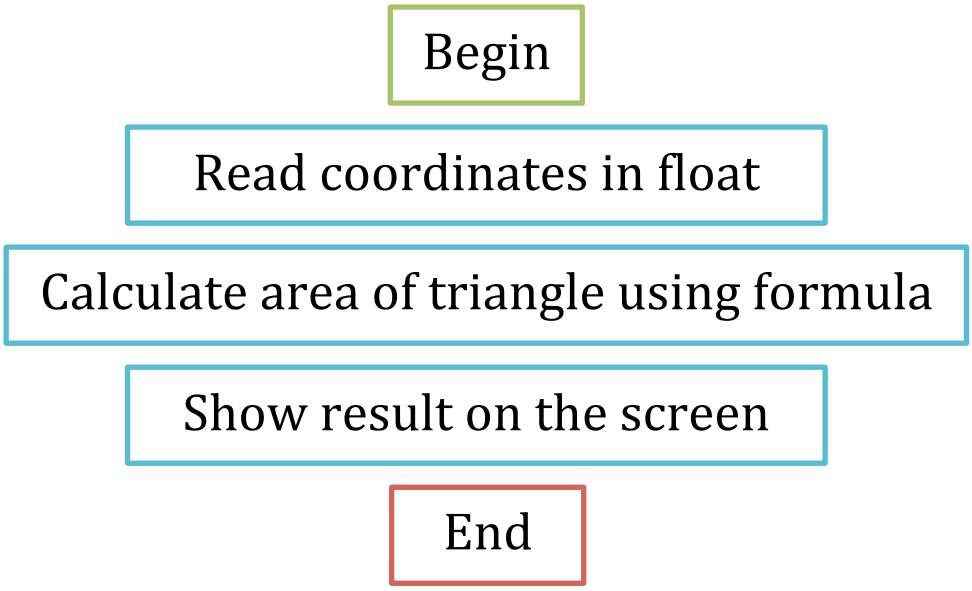
Step 2: Gathering of Information & I/O Description

- The points of the coordinates must be float to allow input of decimal numbers.
- User should be prompted to enter the x coordinate first and then the y coordinate for each point
- A formula for calculating the area of the triangle must be used to produce a result
- The value after calculation must be converted to an absolute value (using fabs) to avoid showing a negative result.



Step 3: Algorithm Development & Verification

- Indicate that the following variables are float
- Print the instruction for the user to enter the x coordinate of the first point
- Scan the variable for the program to be able to read the float number entered
- Use \n to print the instruction for the y coordinate of the first point in the next line
- Repeat previous 3 steps to obtain coordinates of all 3 points
- Use a formula to calculate the area of the triangle using the coordinates of the points entered.



Points	Test 1	Test 2	Test 3
x1	15.0	2.0	4.5
y1	15.0	2.0	6.0
x2	23.0	-2.0	-3.0
y2	30.0	2.0	4.0
x3	50.0	0.0	6.3
y3	25.0	-4.0	0.0

Test 1

$$\left| \frac{15(30 - 25) + 23(25 - 15) + 50(15 - 30)}{2} \right|$$

$=222.5$

Test 2

$$\left| \frac{2(2 - (-4)) + -2(-4 - 2) + 0(2 - 2)}{2} \right|$$

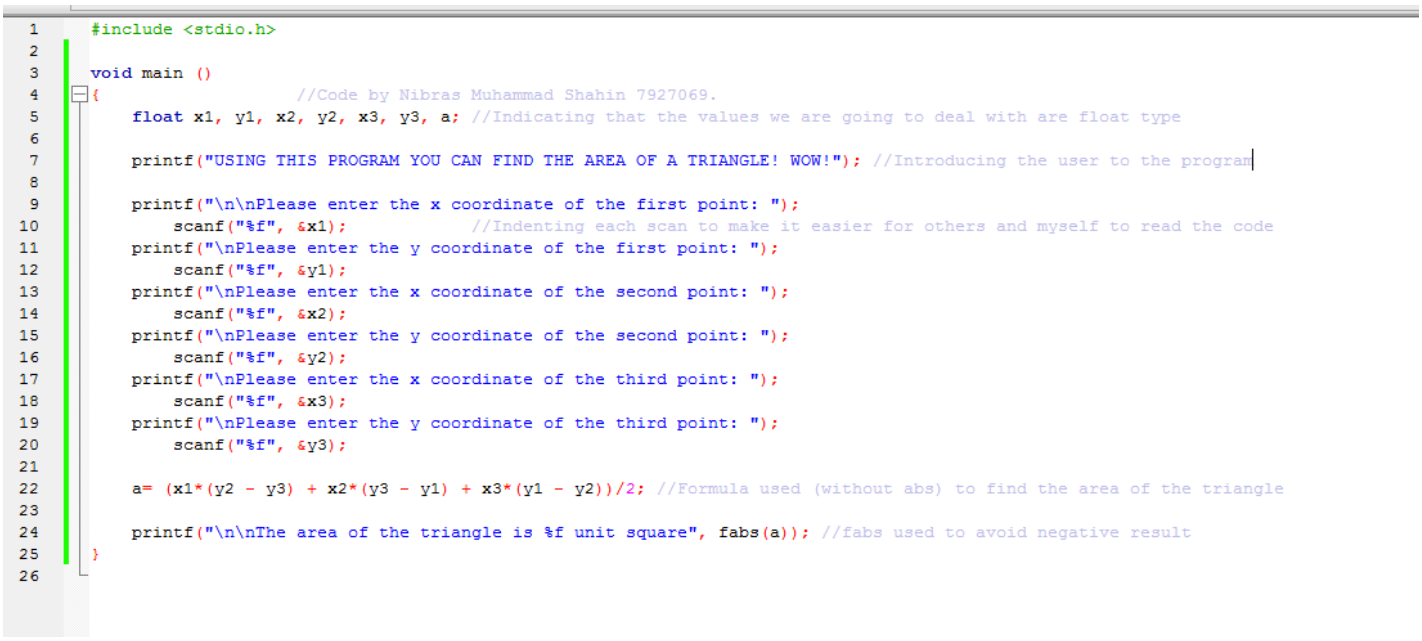
$=12$

Test 3

$$\left| \frac{4.5(4 - 0) + -3(0 - 6) + 6.3(6 - 4)}{2} \right|$$

$=24.3$

Step 4: Implementation



```c
#include <stdio.h>

void main ()
{                   //Code by Nibras Muhammad Shahin 7927069.
    float x1, y1, x2, y2, x3, y3, a; //Indicating that the values we are going to deal with are float type

    printf("USING THIS PROGRAM YOU CAN FIND THE AREA OF A TRIANGLE! WOW!"); //Introducing the user to the program

    printf("\n\nPlease enter the x coordinate of the first point: ");
        scanf("%f", &x1);           //Indenting each scan to make it easier for others and myself to read the code
    printf("\nPlease enter the y coordinate of the first point: ");
        scanf("%f", &y1);
    printf("\nPlease enter the x coordinate of the second point: ");
        scanf("%f", &x2);
    printf("\nPlease enter the y coordinate of the second point: ");
        scanf("%f", &y2);
    printf("\nPlease enter the x coordinate of the third point: ");
        scanf("%f", &x3);
    printf("\nPlease enter the y coordinate of the third point: ");
        scanf("%f", &y3);

    a= (x1*(y2 - y3) + x2*(y3 - y1) + x3*(y1 - y2))/2; //Formula used (without abs) to find the area of the triangle

    printf("\n\nThe area of the triangle is %f unit square", fabs(a)); //fabs used to avoid negative result
}
```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void main ()
{ //Code by Nibras Muhammad Shahin 7927069.
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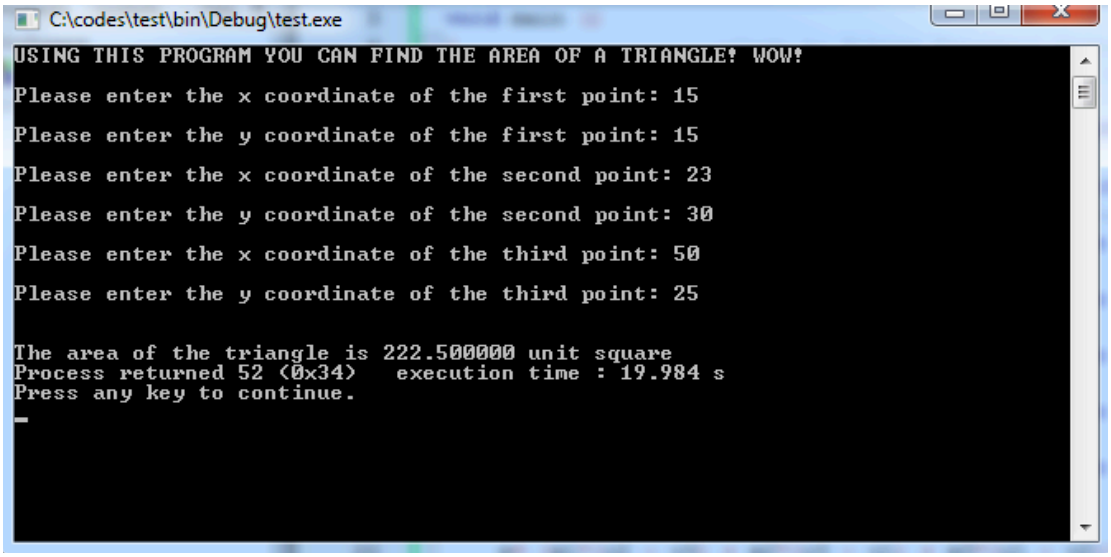
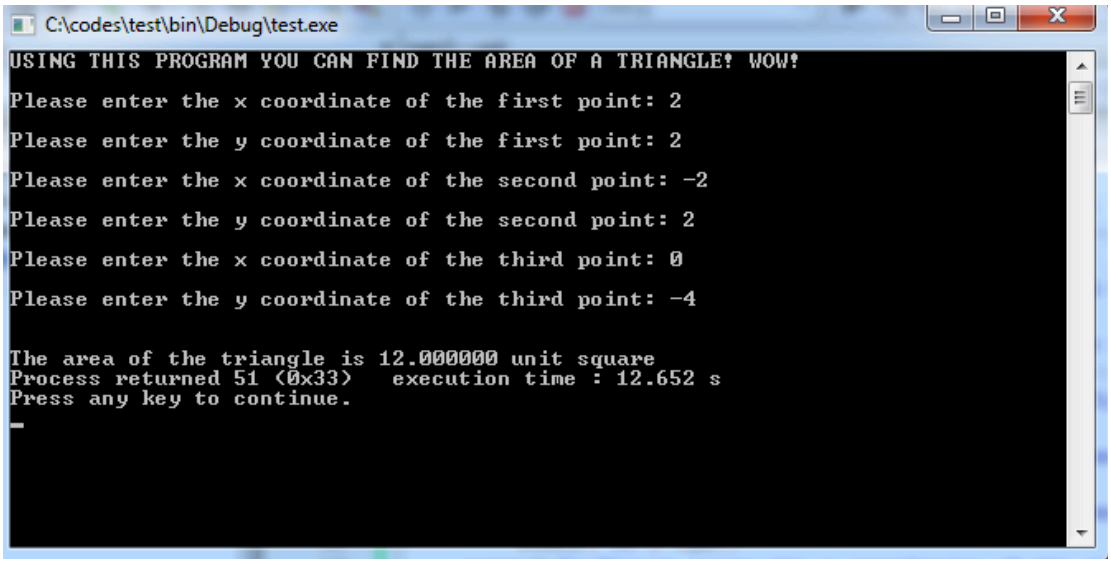
Step 5: Testing and Validation

Test 1



Test 2



Test 3