Program 1: Decision Table Approach for Solving Triangle Problem

/* Design and develop a program in a language of your choice to solve the triangle problem defined as follows : Accept three integers which are supposed to be the three sides of triangle and determine if the three values represent an equilateral triangle, isosceles triangle, scalene triangle, or they do not form a triangle at all. Derive test cases for your program based on decision-table approach, execute the test cases and discuss the results */

```
#include<stdio.h>
int main()
{
int a,b,c;
char istriangle;
printf("Anirudh Krishnaprasad 1CR18IS017\n");
printf("Enter 3 integers which are sides of triangle\n");
scanf("%d%d%d",&a,&b,&c);
printf("a=%d\t,b=%d\t,c=%d\n",a,b,c);
if( a<b+c && b<a+c && c<a+b )
        istriangle='y';
else
        istriangle ='n';
;
if (istriangle=='y')
if ((a==b) && (b==c))
        printf("The triangle is an Equilateral triangle\n");
else if ((a!=b) && (a!=c) && (b!=c))
        printf("Scalene triangle because all sides are unequal\n");
else
        printf("Isosceles triangle \n");
else
        printf("Not a triangle\n");
return 0;
}
```

Screenshot of the program:

p1_STLab.cpp

```
#include<stdio.h>
int main()
{
int a,b,c;
char istriangle;
printf("Anirudh Krishnaprasad 1CR18IS017\n");
printf("Enter 3 integers which are sides of triangle\n");
scanf("%d%d%d",&a,&b,&c);
printf("a=%d\t,b=%d\t,c=%d\n",a,b,c);
if( a<b+c && b<a+c && c<a+b )
    istriangle='y';
else
    istriangle ='n';
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if (istriangle=='y')
if ((a==b) && (b==c))
    printf("The triangle is an Equilateral triangle\n");
else if ((a!=b) && (a!=c) && (b!=c))
    printf("Scalene triangle because all sides are unequal\n");
else
    printf("Isosceles triangle \n");
else
    printf("Not a triangle\n");
return 0;
}
```
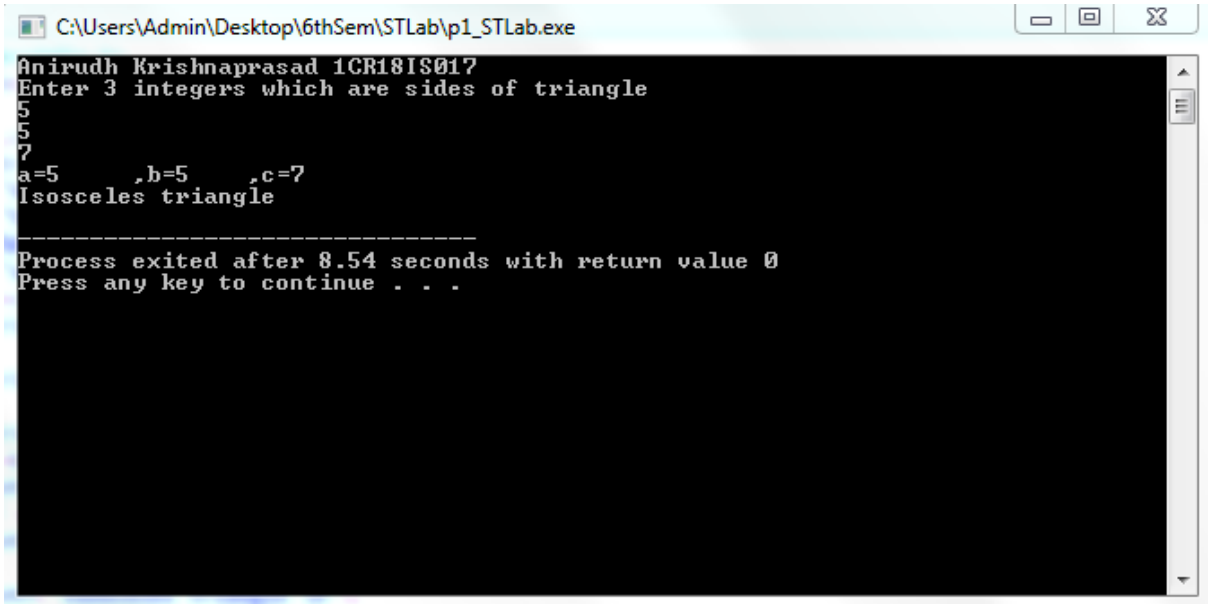
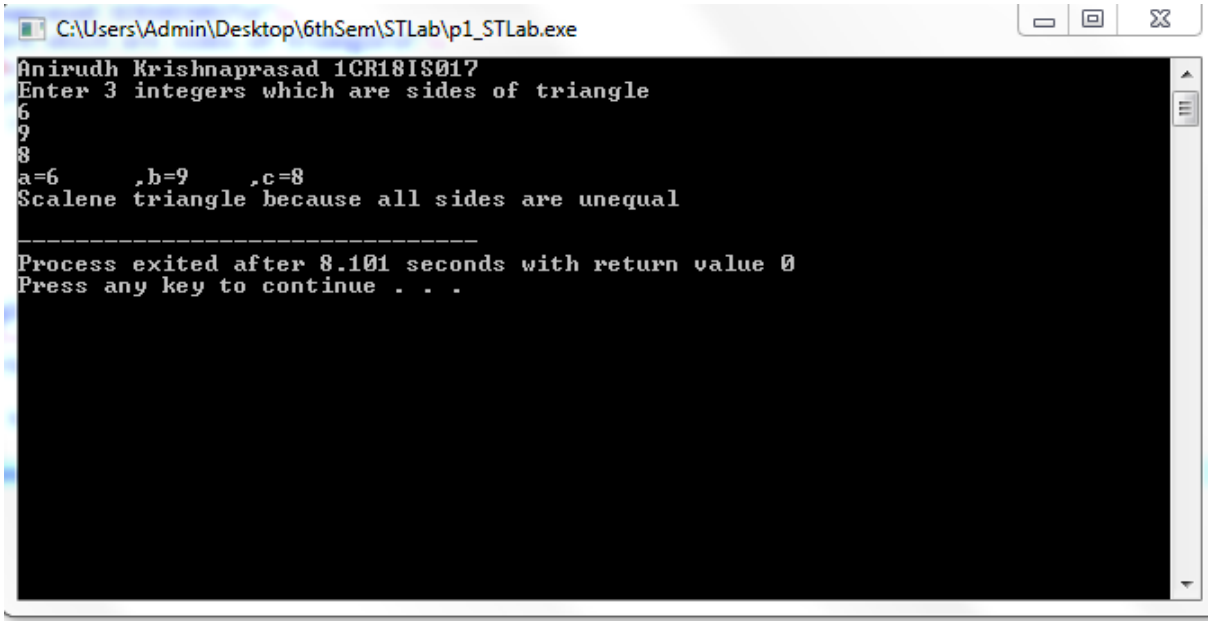

Screenshots:





INPUT CASES :

Case Id	Description	Input Data			Expected Output	Actual Output	Status	Comments
		a	b	c				
1	Enter the value of a, b and c Such that a is not less than sum of two sides	20	5	5	Message should be displayed can't form a triangle	**Not a triangle**	working	Doesn't comply with rule a<b+c
2	Enter the value of a, b and c Such that b is not less than sum of two sides and a is less than sum of other two sides	3	15	11	Message should be displayed can't form a triangle	**Not a triangle**	Working	Doesn't comply with rule b<a+c
3	Enter the value of a, b and c Such that c is not less than sum of two sides and a and b is less than sum of other two sides	4	5	20	Message should be displayed can't form a triangle	**Not a triangle**	Working	Doesn't comply with rule c<a+b
4	Enter the value a, b and c satisfying precondition and a=b, b=c and c=a	5	5	5	Should display the message Equilateral triangle	**The triangle is an Equilateral triangle**	Working	Nothing unusual
5	Enter the value a ,b and c satisfying precondition and a=b and b ≠ c	10	10	9	Should display the message Isosceles triangle	**Isosceles triangle**	working	Nothing unusual
6	Enter the value a, b and c satisfying precondition and a ≠b , b ≠ c and c ≠ a	5	6	7	Should display the message Scalene triangle	**Scalene triangle because all sides are unequal**	Working	Nothing unusual

7	Enter a value for a, b, c where one of the values is negative.	-1	2	5	Message should be displayed can't form a triangle	**Not a triangle**	Working	Negative numbers can’t be used to form a triangle
8	Enter a value for a, b, c where one of the values is an alphabet	7	8	a	Message should be displayed can't form a triangle	**Not a triangle**	Working	The alphabet is taken as 0
9	Enter the value a, b and c satisfying precondition and a ≠b , b ≠ c and c ≠ a	10^10	1+10^10	2+10^10	Should display the message Scalene triangle	**Not a triangle**	Working	The numbers are too big to be integers