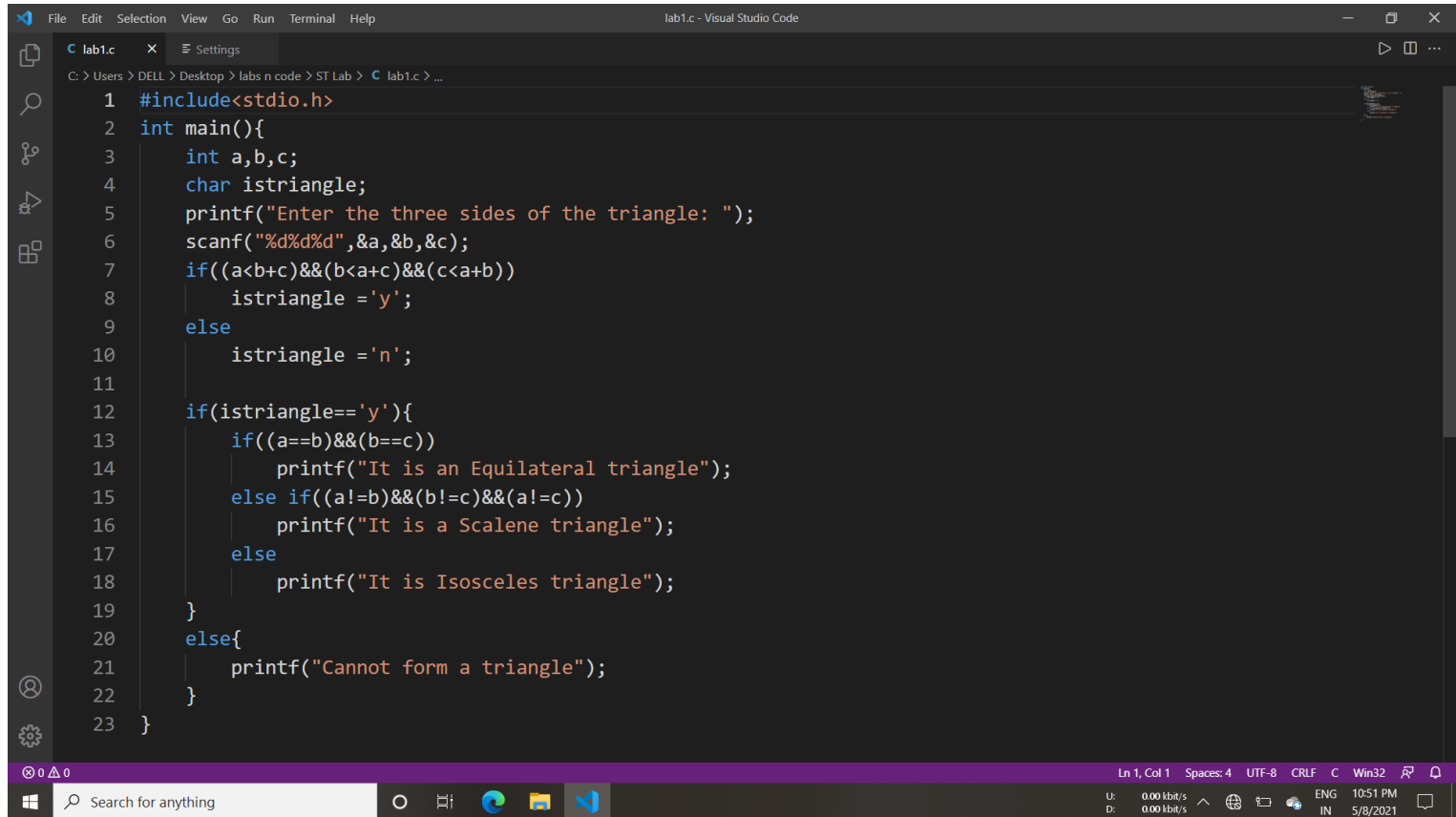**Program 1: Decision Table Approach for Solving Triangle Problem**

/* 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 *
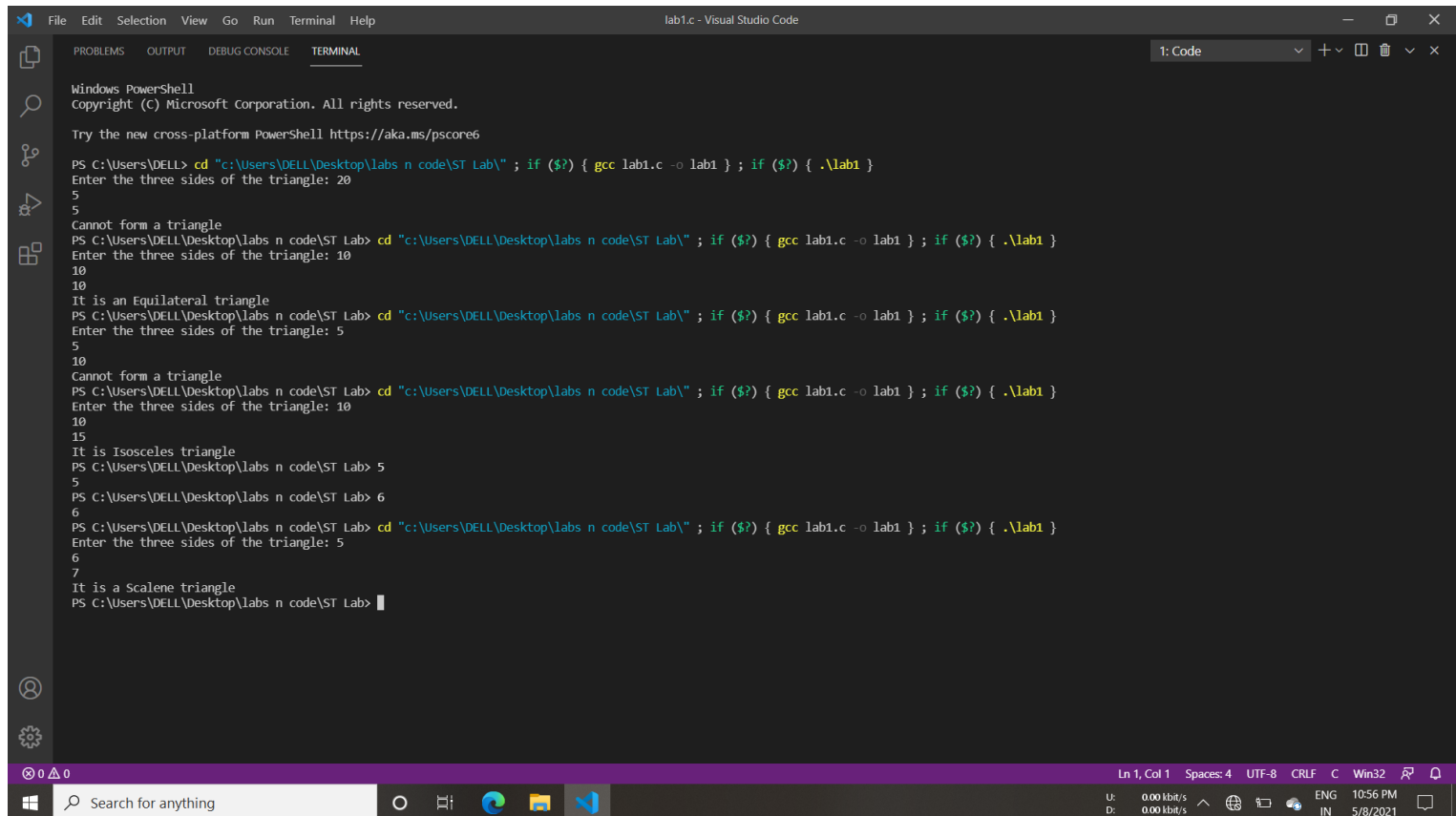
INPUT CASES :

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			
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			
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			
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			
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			
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			

Program Execution:

```c
#include<stdio.h>
int main(){
    int a,b,c;
    char istriangle;
    printf("Enter the three sides of the triangle: ");
    scanf("%d%d%d",&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("It is an Equilateral triangle");
        else if((a!=b)&&(b!=c)&&(a!=c))
            printf("It is a Scalene triangle");
        else
            printf("It is Isosceles triangle");
    }
    else{
        printf("Cannot form a triangle");
    }
}
```

Output:

```
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

Try the new cross-platform PowerShell https://aka.ms/pscore6

PS C:\Users\DELL> cd "c:\Users\DELL\Desktop\labs n code\ST Lab\" ; if ($?) { gcc lab1.c -o lab1 } ; if ($?) { .\lab1 }
Enter the three sides of the triangle: 20
5
5
Cannot form a triangle
PS C:\Users\DELL\Desktop\labs n code\ST Lab> cd "c:\Users\DELL\Desktop\labs n code\ST Lab\" ; if ($?) { gcc lab1.c -o lab1 } ; if ($?) { .\lab1 }
Enter the three sides of the triangle: 10
10
10
It is an Equilateral triangle
PS C:\Users\DELL\Desktop\labs n code\ST Lab> cd "c:\Users\DELL\Desktop\labs n code\ST Lab\" ; if ($?) { gcc lab1.c -o lab1 } ; if ($?) { .\lab1 }
Enter the three sides of the triangle: 5
5
10
Cannot form a triangle
PS C:\Users\DELL\Desktop\labs n code\ST Lab> cd "c:\Users\DELL\Desktop\labs n code\ST Lab\" ; if ($?) { gcc lab1.c -o lab1 } ; if ($?) { .\lab1 }
Enter the three sides of the triangle: 10
10
15
It is Isosceles triangle
PS C:\Users\DELL\Desktop\labs n code\ST Lab> 5
5
PS C:\Users\DELL\Desktop\labs n code\ST Lab> 6
6
PS C:\Users\DELL\Desktop\labs n code\ST Lab> cd "c:\Users\DELL\Desktop\labs n code\ST Lab\" ; if ($?) { gcc lab1.c -o lab1 } ; if ($?) { .\lab1 }
Enter the three sides of the triangle: 5
6
7
It is a Scalene triangle
PS C:\Users\DELL\Desktop\labs n code\ST Lab>
```

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	**Cannot form a triangle**	Correct output	20> 5+5 Therefore, it can't form a triangle
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	**Cannot form a triangle**	Correct output	15> 3+11 Therefore, it can't form a triangle
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	**Cannot form a triangle**	Correct output	20> 4+5 Therefore, it can't form a triangle
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	**It is an Equilateral triangle**	Correct output	5=5=5 all sides are equal Therefore, it is an equilateral triangle
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	**It is an Isosceles triangle**	Correct output	Two sides are equal. Therefore, Isosceles triangle
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	**It is a Scalene triangle**	Correct output	All sides are different. Therefore, it is a Scalene triangle