

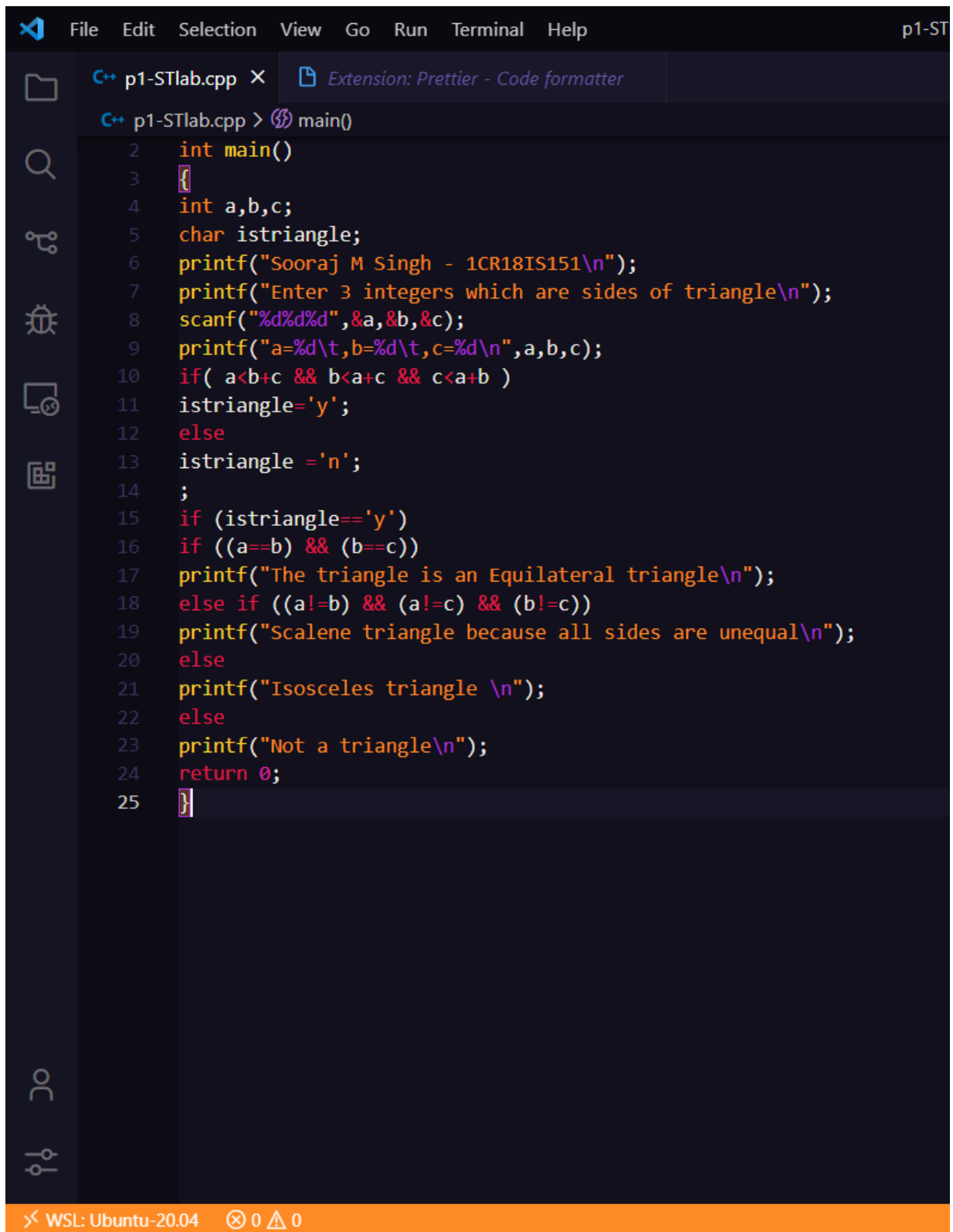
Program 1 (Boundary value analysis program)

/* 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 Boundary value analysis, execute the test cases and discuss the results */

```
#include<stdio.h> int
main()
{
    int a,b,c,c1,c2,c3;
    char istriangle;
    do
    {
        printf("Sooraj m Singh 1CR18IS151\n");
        printf("\nEnter 3 integers which are sides of triangle\n");
        scanf("%d%d%d",&a,&b,&c);
        printf("\na=%d\tb=%d\tc=%d",a,b,c);
        c1 = a>=1 && a<=10;          c2=
b>=1 && b<=10;          c3= c>=1 && c<=10;
        if (!c1)
            printf("\nThe value of a=%d is not the range of permitted
value",a);
        if (!c2)
            printf("\nThe value of b=%d is not the range of permitted
value",b);
        if (!c3)
            printf("\nThe value of c=%d is not the range of permitted
value",c);
    } while(!(c1 && c2 && c3));
    if( a<b+c && b<a+c && c<a+b )
        istriangle='y';
    else
        istriangle ='n';
    if (istriangle=='y')
        if ((a==b) && (b==c))
            printf("\nEquilateral triangle\n");          else
```

```
if ((a!=b) && (a!=c) && (b!=c))
    printf("\nScalene triangle\n");
    else
        printf("\nIsosceles triangle\n");
    else
        printf("\nNot a triangle\n"); return 0;
}
```

Screenshot of the program:



The screenshot shows a Visual Studio Code editor window with the file 'p1-STlab.cpp' open. The editor is running on a Windows Subsystem for Linux (WSL) environment, specifically Ubuntu-20.04. The code is a C++ program that takes three integers as input and classifies them as an Equilateral, Scalene, or Isosceles triangle, or determines if they do not form a triangle at all. The code is formatted using Prettier. The status bar at the bottom indicates the WSL environment and the number of errors and warnings.

```
File Edit Selection View Go Run Terminal Help p1-STlab.cpp × Extension: Prettier - Code formatter
p1-STlab.cpp > main()
2  int main()
3  {
4  int a,b,c;
5  char istriangle;
6  printf("Sooraj M Singh - 1CR18IS151\n");
7  printf("Enter 3 integers which are sides of triangle\n");
8  scanf("%d%d%d",&a,&b,&c);
9  printf("a=%d\t,b=%d\t,c=%d\n",a,b,c);
10 if( a<b+c && b<a+c && c<a+b )
11 istriangle='y';
12 else
13 istriangle = 'n';
14 ;
15 if (istriangle=='y')
16 if ((a==b) && (b==c))
17 printf("The triangle is an Equilateral triangle\n");
18 else if ((a!=b) && (a!=c) && (b!=c))
19 printf("Scalene triangle because all sides are unequal\n");
20 else
21 printf("Isosceles triangle \n");
22 else
23 printf("Not a triangle\n");
24 return 0;
25 }
```

WSL: Ubuntu-20.04 0 0

Screenshots:

```
sooraj@Asus-F-15:/mnt/c/Users/soora$ cd "/home/sooraj/st-lab/" && g++ p1-STlab.cpp -o p1-STlab && "/home/sooraj/st-lab/"
p1-STlab
Sooraj M Singh - 1CR18IS151
Enter 3 integers which are sides of triangle
1
2
3
a=1      ,b=2      ,c=3
Not a triangle
sooraj@Asus-F-15:~/st-lab$ _
```

```
sooraj@Asus-F-15:~/st-lab$ cd "/home/sooraj/st-lab/" && g++ p1-STlab.cpp -o p1-STlab && "/home/sooraj/st-lab/"p1-STlab
Sooraj M Singh - 1CR18IS151
Enter 3 integers which are sides of triangle
5 5 7
a=5      ,b=5      ,c=7
Isosceles triangle
sooraj@Asus-F-15:~/st-lab$ _
```

```
sooraj@Asus-F-15:~/st-lab$ cd "/home/sooraj/st-lab/" && g++ p1-STlab.cpp -o p1-STlab && "/home/sooraj/st-lab/"p1-STlab
Sooraj M Singh - 1CR18IS151
Enter 3 integers which are sides of triangle
2 2 2
a=2      ,b=2      ,c=2
The triangle is an Equilateral triangle
sooraj@Asus-F-15:~/st-lab$ _
```

INPUT CASES :

Case Id	Description	Input Data			Expected Output	Actual Output	Status	Comments
		a	b	c				
1	Enter the min value for a, b and c	1	1	1	Should display the message Equilateral triangle	Equilateral triangle	working	Nothing unusual
2	Enter the min value for 2 items and min + 1 for any one item	1	1	2	Message should be displayed can't form a triangle	Not a triangle	Working	Doesn't satisfy triangle condition
3	Enter the min value for 2 items and min + 1 for any one item	1	2	1	Message should be displayed can't form a triangle	Not a triangle	Working	Doesn't satisfy triangle condition
		2	1	1				

4	Enter the min value for 2 items and min + 1 for any one item				Message should be displayed can't form a triangle	Not a triangle	Working	Doesn't satisfy triangle condition
5	Enter the normal value for 2 items and one item is min value	5	5	1	Should display the message Isosceles triangle	Isosceles triangle	working	Nothing unusual
6	Enter the normal value for 2 items and one item is min value	5	1	5	Should display the message Isosceles triangle	Isosceles triangle	Working	Nothing unusual
7	Enter the normal value for 2 items and one item is min value	1	5	5	Should display the message Isosceles triangle	Isosceles triangle	Working	Nothing unusual

8	Enter normal values for a, b and c.	5	5	5	Message should be displayed can't form a triangle	Equilateral triangle	Working Nothing unusual
9	Enter random values for a, b and c	3	4	5	Should display the message Scalene triangle	Scalene triangle	Working Nothing unusual