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("\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("\n the 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));

// to check is it a triangle or not

if( a<b+c && b<a+c && c<a+b )

istriangle='y';

else

istriangle ='n';

if (istriangle=='y')

if ((a==b) && (b==c))

printf("equilateral triangle\n");

else if ((a!=b) && (a!=c) && (b!=c))

printf("scalene triangle\n");

else

printf("isosceles triangle\n");

else

printf("Not a triangle\n");

return 0

}

Test Case Name: Boundary Value Analysis for triangle problem

Test Data: Enter the 3 Integer Value (a, b and c)

Pre-condition: 1 ≤ a ≤ 10, 1 ≤ b ≤ 10 and 1 ≤ c ≤ 10 and a < b + c, b < a + c and c < a + b

Brief Description: Check whether given value for a equilateral, isosceles, Scalene triangle or can't from a triangle

Triangle Problem -Boundary value Test cases for input data

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Case id** | **Description** | **Input data** | | | **Expected output** | **Actual output** | **Comments** |
| a | b | c |
| 1 | Enter the min value for a, b and c | 1 | 1 | 1 | Equilateral triangle | Equilateral triangle | Outputs Matched, Test passed |
| 2 | Enter min value for 2 items and min+1 for any one item | 1 | 1 | 2 | Can’t form a triangle | Can’t form a triangle | Pass |
| 3 | Enter min value for 2 items and min+1 for any one item | 1 | 2 | 1 | Can’t form a triangle | Can’t form a triangle | Pass |
| 4 | Enter min value for 2 items and min+1 for any one item | 2 | 1 | 1 | Can’t form a triangle | Can’t form a triangle | Pass |
| 5 | Enter normal value for 2 items and 1 item is min value | 5 | 5 | 1 | Isosceles triangle | Isosceles triangle | Pass |
| 6 | Enter normal value for 2 items and 1 item is min value | 5 | 1 | 5 | Isosceles triangle | Isosceles triangle | Pass |
| 7 | Enter normal value for 2 items and 1 item is min value | 1 | 5 | 5 | Isosceles triangle | Isosceles triangle | Pass |
| 8 | Enter the normal value for a, b, and c | 5 | 5 | 5 | Equilateral triangle | Equilateral triangle | Pass |
| 9 | Enter the normal value for 2 items and 1 item is max value | 5 | 5 | 10 | Not a triangle | Not a triangle | Pass |
| 10 | Enter the normal value for 2 items and 1 item is max value | 5 | 10 | 5 | Not a triangle | Not a triangle | Pass |
| 11 | Enter the normal value for 2 items and 1 item is max value | 10 | 5 | 5 | Not a triangle | Not a triangle | Pass |
| 12 | Enter the max value for 2 items and max-1 for any one item | 10 | 10 | 9 | Isosceles triangle | Isosceles triangle | Pass |
| 13 | Enter the max value for 2 items and max-1 for any one item | 10 | 9 | 10 | Isosceles triangle | Isosceles triangle | Pass |
| 14 | Enter the max value for 2 items and max-1 for any one item | 9 | 10 | 10 | Isosceles triangle | Isosceles triangle | Pass |
| 15 | Enter the values of sides such that it forms a scalene triangle | 2 | 5 | 4 | Scalene Triangle | Scalene Triangle | Pass |
| 16 | Enter max value for a, b and c | 10 | 10 | 10 | Equilateral triangle | Equilateral triangle | Pass |