SYMBIOSIS INSTITUTE OF TECHNOLOGY

DEPARTMENT OF COMPUTER SCIENCE AND INFORMATION TECHNOLOGY

Software Testing and Quality Assurance

Lab Assignment – 5

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Question: Consider a program to classify the triangle. Its input is a triple of positive integers x,y and z and the data type of input parameters ensures that these will be integers greater than 0 and less than or equal to 100. The program output can be: Scalene, isosceles, equilateral or not a triangle. Generate robust and worst test cases for this problem.

Code for *Robustness Testing* (written in Python using Jupyter Notebook):

```
def checkTraingle(a,b,c):
   if (a+b<c)or(a+c<b)or(b+c<a):
      return("Not a Triangle");
   elif (a==b)and(b==c):
      return("Equilateral Triangle");
   elif ((a==b)and(b!=c))or((a==c)and(b!=c))or((c==b)and(b!=a)):
      return("Isosceles Triangle");
   else:
      return("Scalene Triangle");

def printTestCases(x, nom1, nom2, nom3):
   print("a=",x,"\tb=",nom2,"\tc=",nom3,"\tres=",checkTraingle(x,nom2,nom3));
   print("a=",nom1,"\tb=",x,"\tc=",nom3,"\tres=",checkTraingle(nom1,x,nom3));
   print("a=",nom1,"\tb=",nom2,"\tc=",x,"\tres=",checkTraingle(nom1,nom2,x));

min=1; max=100; nom1 = nom2 = nom3 = 50;

printTestCases(min, nom1, nom2, nom3)
printTestCases(min+1, nom1, nom2, nom3)
printTestCases(min-1, nom1, nom2, nom3)
printTestCases(max, nom1, nom2, nom3)
printTestCases(max+1, nom1, nom2, nom3)
printTestCases(max-1, nom1, nom2, nom3)
print("a=",nom1,"\tb=",nom2,"\tc=",nom3,"\tres=",checkTraingle(nom1,nom2,nom3));
```

Output for *Robustness Testing*:

```
a= 1    b= 50   c= 50   res= Isosceles Triangle
a= 50   b= 1    c= 50   res= Isosceles Triangle
a= 50   b= 50   c= 1    res= Isosceles Triangle
a= 2    b= 50   c= 50   res= Isosceles Triangle
a= 50   b= 2    c= 50   res= Isosceles Triangle
a= 50   b= 50   c= 2    res= Isosceles Triangle
a= 0    b= 50   c= 50   res= Isosceles Triangle
a= 50   b= 0    c= 50   res= Isosceles Triangle
a= 50   b= 50   c= 0    res= Isosceles Triangle
a= 100  b= 50   c= 50   res= Isosceles Triangle
a= 50   b= 100  c= 50   res= Isosceles Triangle
a= 50   b= 50   c= 100  res= Isosceles Triangle
a= 101  b= 50   c= 50   res= Not a Triangle
a= 50   b= 101  c= 50   res= Not a Triangle
a= 50   b= 50   c= 101  res= Not a Triangle
a= 99   b= 50   c= 50   res= Isosceles Triangle
a= 50   b= 99   c= 50   res= Isosceles Triangle
a= 50   b= 50   c= 99   res= Isosceles Triangle
a= 50   b= 50   c= 50   res= Equilateral Triangle
```

Code for *Worst Case Testing* (written in Python using Jupyter Notebook):

```
def checkTraingle(a,b,c):
   if (a+b<c)or(a+c<b)or(b+c<a):
      return("Not a Triangle");
   elif (a==b)and(b==c):
      return("Equilateral Triangle");
   elif ((a==b)and(b!=c))or((a==c)and(b!=c))or((c==b)and(b!=a)):
      return("Isosceles Triangle");
   else:
      return("Scalene Triangle");

def fixedFirst(no1):
   fixedFirstAndSecond(no1, val1);
   fixedFirstAndSecond(no1, val2);
   fixedFirstAndSecond(no1, val3);
   fixedFirstAndSecond(no1, val4);
   fixedFirstAndSecond(no1, val5);

def fixedFirstAndSecond(no1, no2):
   print("a=",no1,"\tb=",no2,"\tc=",val1,"\tres=",checkTraingle(no1,no2,val1));
   print("a=",no1,"\tb=",no2,"\tc=",val2,"\tres=",checkTraingle(no1,no2,val2));
   print("a=",no1,"\tb=",no2,"\tc=",val3,"\tres=",checkTraingle(no1,no2,val3));
   print("a=",no1,"\tb=",no2,"\tc=",val4,"\tres=",checkTraingle(no1,no2,val4));
   print("a=",no1,"\tb=",no2,"\tc=",val5,"\tres=",checkTraingle(no1,no2,val5));

val1 = 1
val2 = 2
val3 = 50
val4 = 99
val5 = 100

fixedFirst(val1);
fixedFirst(val2);
fixedFirst(val3);
fixedFirst(val4);
fixedFirst(val5);
```

Output for *Worst Case Testing*:

```
a= 1    b= 1    c= 1    res= Equilateral Triangle
a= 1    b= 1    c= 2    res= Isosceles Triangle
a= 1    b= 1    c= 50   res= Not a Triangle
a= 1    b= 1    c= 99   res= Not a Triangle
a= 1    b= 1    c= 100  res= Not a Triangle
a= 1    b= 2    c= 1    res= Isosceles Triangle
a= 1    b= 2    c= 2    res= Isosceles Triangle
a= 1    b= 2    c= 50   res= Not a Triangle
a= 1    b= 2    c= 99   res= Not a Triangle
a= 1    b= 2    c= 100  res= Not a Triangle
a= 1    b= 50   c= 1    res= Not a Triangle
a= 1    b= 50   c= 2    res= Not a Triangle
a= 1    b= 50   c= 50   res= Isosceles Triangle
a= 1    b= 50   c= 99   res= Not a Triangle
```

```
a= 1   b= 50  c= 100 res= Not a Triangle
a= 1   b= 99  c= 1   res= Not a Triangle
a= 1   b= 99  c= 2   res= Not a Triangle
a= 1   b= 99  c= 50  res= Not a Triangle
a= 1   b= 99  c= 99  res= Isosceles Triangle
a= 1   b= 99  c= 100 res= Scalene Triangle
a= 1   b= 100 c= 1   res= Not a Triangle
a= 1   b= 100 c= 2   res= Not a Triangle
a= 1   b= 100 c= 50  res= Not a Triangle
a= 1   b= 100 c= 99  res= Scalene Triangle
a= 1   b= 100 c= 100 res= Isosceles Triangle
a= 2   b= 1   c= 1   res= Isosceles Triangle
a= 2   b= 1   c= 2   res= Isosceles Triangle
a= 2   b= 1   c= 50  res= Not a Triangle
a= 2   b= 1   c= 99  res= Not a Triangle
a= 2   b= 1   c= 100 res= Not a Triangle
a= 2   b= 2   c= 1   res= Isosceles Triangle
a= 2   b= 2   c= 2   res= Equilateral Triangle
a= 2   b= 2   c= 50  res= Not a Triangle
a= 2   b= 2   c= 99  res= Not a Triangle
a= 2   b= 2   c= 100 res= Not a Triangle
a= 2   b= 50  c= 1   res= Not a Triangle
a= 2   b= 50  c= 2   res= Not a Triangle
a= 2   b= 50  c= 50  res= Isosceles Triangle
a= 2   b= 50  c= 99  res= Not a Triangle
a= 2   b= 50  c= 100 res= Not a Triangle
a= 2   b= 99  c= 1   res= Not a Triangle
a= 2   b= 99  c= 2   res= Not a Triangle
a= 2   b= 99  c= 50  res= Not a Triangle
a= 2   b= 99  c= 99  res= Isosceles Triangle
a= 2   b= 99  c= 100 res= Scalene Triangle
a= 2   b= 100 c= 1   res= Not a Triangle
a= 2   b= 100 c= 2   res= Not a Triangle
a= 2   b= 100 c= 50  res= Not a Triangle
a= 2   b= 100 c= 99  res= Scalene Triangle
a= 2   b= 100 c= 100 res= Isosceles Triangle
a= 50  b= 1   c= 1   res= Not a Triangle
a= 50  b= 1   c= 2   res= Not a Triangle
a= 50  b= 1   c= 50  res= Isosceles Triangle
a= 50  b= 1   c= 99  res= Not a Triangle
a= 50  b= 1   c= 100 res= Not a Triangle
a= 50  b= 2   c= 1   res= Not a Triangle
a= 50  b= 2   c= 2   res= Not a Triangle
a= 50  b= 2   c= 50  res= Isosceles Triangle
a= 50  b= 2   c= 99  res= Not a Triangle
a= 50  b= 2   c= 100 res= Not a Triangle
a= 50  b= 50  c= 1   res= Isosceles Triangle
a= 50  b= 50  c= 2   res= Isosceles Triangle
a= 50  b= 50  c= 50  res= Equilateral Triangle
a= 50  b= 50  c= 99  res= Isosceles Triangle
a= 50  b= 50  c= 100 res= Isosceles Triangle
a= 50  b= 99  c= 1   res= Not a Triangle
a= 50  b= 99  c= 2   res= Not a Triangle
a= 50  b= 99  c= 50  res= Isosceles Triangle
a= 50  b= 99  c= 99  res= Isosceles Triangle
a= 50  b= 99  c= 100 res= Scalene Triangle
a= 50  b= 100 c= 1   res= Not a Triangle
a= 50  b= 100 c= 2   res= Not a Triangle
a= 50  b= 100 c= 50  res= Isosceles Triangle
a= 50  b= 100 c= 99  res= Scalene Triangle
```

```
a= 50  b= 100 c= 100 res= Isosceles Triangle
a= 99  b= 1   c= 1   res= Not a Triangle
a= 99  b= 1   c= 2   res= Not a Triangle
a= 99  b= 1   c= 50  res= Not a Triangle
a= 99  b= 1   c= 99  res= Isosceles Triangle
a= 99  b= 1   c= 100 res= Scalene Triangle
a= 99  b= 2   c= 1   res= Not a Triangle
a= 99  b= 2   c= 2   res= Not a Triangle
a= 99  b= 2   c= 50  res= Not a Triangle
a= 99  b= 2   c= 99  res= Isosceles Triangle
a= 99  b= 2   c= 100 res= Scalene Triangle
a= 99  b= 50  c= 1   res= Not a Triangle
a= 99  b= 50  c= 2   res= Not a Triangle
a= 99  b= 50  c= 50  res= Isosceles Triangle
a= 99  b= 50  c= 99  res= Isosceles Triangle
a= 99  b= 50  c= 100 res= Scalene Triangle
a= 99  b= 99  c= 1   res= Isosceles Triangle
a= 99  b= 99  c= 2   res= Isosceles Triangle
a= 99  b= 99  c= 50  res= Isosceles Triangle
a= 99  b= 99  c= 99  res= Equilateral Triangle
a= 99  b= 99  c= 100 res= Isosceles Triangle
a= 99  b= 100 c= 1   res= Scalene Triangle
a= 99  b= 100 c= 2   res= Scalene Triangle
a= 99  b= 100 c= 50  res= Scalene Triangle
a= 99  b= 100 c= 99  res= Isosceles Triangle
a= 99  b= 100 c= 100 res= Isosceles Triangle
a= 100 b= 1   c= 1   res= Not a Triangle
a= 100 b= 1   c= 2   res= Not a Triangle
a= 100 b= 1   c= 50  res= Not a Triangle
a= 100 b= 1   c= 99  res= Scalene Triangle
a= 100 b= 1   c= 100 res= Isosceles Triangle
a= 100 b= 2   c= 1   res= Not a Triangle
a= 100 b= 2   c= 2   res= Not a Triangle
a= 100 b= 2   c= 50  res= Not a Triangle
a= 100 b= 2   c= 99  res= Scalene Triangle
a= 100 b= 2   c= 100 res= Isosceles Triangle
a= 100 b= 50  c= 1   res= Not a Triangle
a= 100 b= 50  c= 2   res= Not a Triangle
a= 100 b= 50  c= 50  res= Isosceles Triangle
a= 100 b= 50  c= 99  res= Scalene Triangle
a= 100 b= 50  c= 100 res= Isosceles Triangle
a= 100 b= 99  c= 1   res= Scalene Triangle
a= 100 b= 99  c= 2   res= Scalene Triangle
a= 100 b= 99  c= 50  res= Scalene Triangle
a= 100 b= 99  c= 99  res= Isosceles Triangle
a= 100 b= 99  c= 100 res= Isosceles Triangle
a= 100 b= 100 c= 1   res= Isosceles Triangle
a= 100 b= 100 c= 2   res= Isosceles Triangle
a= 100 b= 100 c= 50  res= Isosceles Triangle
a= 100 b= 100 c= 99  res= Isosceles Triangle
a= 100 b= 100 c= 100 res= Equilateral Triangle
```