Software Testing – Assignment 01

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Task I:

Below is one faulty program. It includes test inputs that result in failure. Answer the following questions about this program.

public static double computeAverage(double[] arr)  
{  
 if (arr == null)  
 throw new NullPointerException();  
  
 double sum = 0.0;  
 for (int i=0; i<arr.length-1; i++)  
 sum += arr[i];  
  
 System.out.println("sum = "+ sum);  
  
 double average = sum / arr.length;  
 return average;  
}

1. **Explain what is wrong with the given code. Describe the fault precisely by proposing a modification to the code**

The for-loop should include all indexs in array   
 for (int i = 0; **i<arr.length**; i++);

1. **If possible, give a test case that executes the fault, but does not result in an error state. If not, briefly explain why not.**

Input: {3,3,0}

Expected output: 6/3 = 2

Actual output: 0

1. **If possible, give a test case that results in an error, but not a failure. If not, briefly explain why not. Hint: Don't forget about the program counter.**

Input: {0,0,0}

Expected output: 0

Actual output: 0

1. **if possible, give a test case that results in a failure. If not, briefly explain why not. Note: for credit, your test case must not be the same as the given test case.**

Input: {3,3,3}

Expected output: 3

Actual output: 2

1. **For the given test case:**

**// test input: arr = [90.5, -65.0, 72.25]**

**// expected = 32.58**

**Describe the first error state. Be sure to describe the complete state.**

**Iteration 0:**

sum = sum + arr[0]

sum = 90.5

**Iteration 1:**

sum = sum + arr[1]

sum = 90.5 + (-65)

**Iteration 2: (loops stopped)**

Actual Result: (25,5)/3 = 8.5

Expected Result: (90.3 + (-65) + 72.25) / 3 = 32