Homework 2

Below are two faulty programs. Each includes a test case that results in failure.Answer the following questions (in the next slide) about each program.

public int findLast (int[] x, int y) {

//Effects: If x==null throw

NullPointerException

// else return the index of the last element

// in x that equals y.

// If no such element exists, return -1

for (int i=x.length-1; i > 0; i--)

{

if (x[i] == y)

{

return i;

}

}

return -1;

}

// test: x=[2, 3, 5]; y = 2

// Expected = 0

Answer:

1. fault: i>0 should be i>=0
2. a test case that does not execute the fault:

x=[ ]; y =2 Expected: NullPointerException Actual: NullPointerException

3. a test case that executes the fault, but does not result in an error state:

x=[2,3,5]; y=3 Expected:1 Actual: 1

4. a test case that results in an error, but not a failure:

x=[2,3,5]; y=4 Expected:-1 Actual: -1

public static int lastZero (int[] x) {

//Effects: if x==null throw

NullPointerException

// else return the index of the LAST 0 in x.

// Return -1 if 0 does not occur in x

for (int i = 0; i < x.length; i++)

{

if (x[i] == 0)

{

return i;

}

} return -1;

}

// test: x=[0, 1, 0]

// Expected = 2

Answer:

1. fault: for (int i = 0; i < x.length; i++) should be for (int i = x.length-1; i >=0; i--)

2. a test case that does not execute the fault:

x=[ ]; Expected: NullPointerException Actual: NullPointerException

3. a test case that executes the fault, but does not result in an error state:

x=[0]; Expected:0 Actual: 0

4. a test case that results in an error, but not a failure:

x=[2,3,5]; Expected:-1 Actual: -1