Shubham Arya 1001650536 January 30, 2021

Software Testing and Maintenance
Homework 1

5

Find last index of element

a. The code will not reach the 0th index of the array as the for loop in the findLast function has the condition of "i" as i > 0. This means that i can never be equal to 0 and the first element of array will never be used. A modification to this code will be if we change the code
for (int i = x.length-1; i > 0; i++) to
for (int i = x.length-1; i >= 0; i++)

b. A test case that does not execute the fault is if x = [1,2,3] and y = 3.
A null value for x will result in a null pointer exception before the loop test is evaluated hence no exception of the fault.

c. A test case that will not result in an error state is if x = [1,2,1] and y = 1. With the function, the expected answer is 1 as x[2] = 1 = y or x[0] = 1 = y. Since x[0] is never used in this function and the function returns the value before it reaches the i = 0 state, an error state is not reached.
Position where y occurs in second or later position

d. If the program is in error state, it will result in a failure because an error state will trigger a fault for a failure in this code.
If y is not in x, the missing path is an error but not a failure

e. The first error state is when i = 0, and the function has not returned a value yet, and the 0th position in the array is equal to y. The for loop will not loop for this because 0 is not less than 0, and the incorrect result (-1) will be returned.

Count positive elements

a. The function countPositive should only count positive numbers, that is, numbers greater than 0. The if condition in the for loop has x[i] >= 0 in it. This means that if a number is equal to 0, it will count it as a positive number. A modification to this code will be if we change the code
if (x[i] >= 0) to if (x[i] > 0)

b. A test case that does not execute the fault is if x = [1,2,3]
X must either by null or empty. All the other inputs in the fault are executed.

c. A test case that executes the fault but not result an error state is when x = [-1,2,3]
Any entry without 0

d. No, in an error state, the array of x must have a 0 in it which would result in a failure as it would give us an answer that will be n times greater where n is the number of 0s in the array.

e. The first error state occurs when the for loop reaches the index of the array that has 0 as it's value. In this case, the statement x[i] >= 0 will be true and count++ will be executed. This will lead to a failure as additional positive values will be counted.