

# Activity 4

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Git Hub link- <https://github.com/ojal21/average.git>

(a)The function average aims to find the average of elements on the list. It has two parameters, k and list. While determining the value n (number of elements to be considered) the minimum value between k and list length is taken, as if k is greater than the length of the list the index value becomes invalid while calculating average. The function returns the average value for n elements in the list.

(b)Functional test cases

Sno	Summary	Test Case	Expected Result
1	Value of n being determined	1. User passes value of k while calling the function average 2. Using Math.min the lower value between k and length of list.	1. k is passed while calling the function. No error. 2. The minimum value is selected as value of n
2	Value of n greater than 0	1. Value of n greater than 0 then the for loop is called. 2. Calculated value returned	1. For loop for calculating the average value executes. 2. The calculated average value of the given range returned as result.
3	Value of n less than 0	1. Value of n less than 0 then then checks the if condition 2. Return the calculated value	1. If condition return false, the for loop for calculating the average value does not execute and a negative number is not a valid index value. 2. Return 0

(c) Test case partitions

Partition 1 -Invalid	Partition 2- Valid	Partition 3 - Invalid
n<0	0<= n <=list length	n> list length

For average function takes value of n that lies between 0 and list length. Any value less than 0 or grater than list length is invalid as they are not valid index values.

(d) Boundary value test case

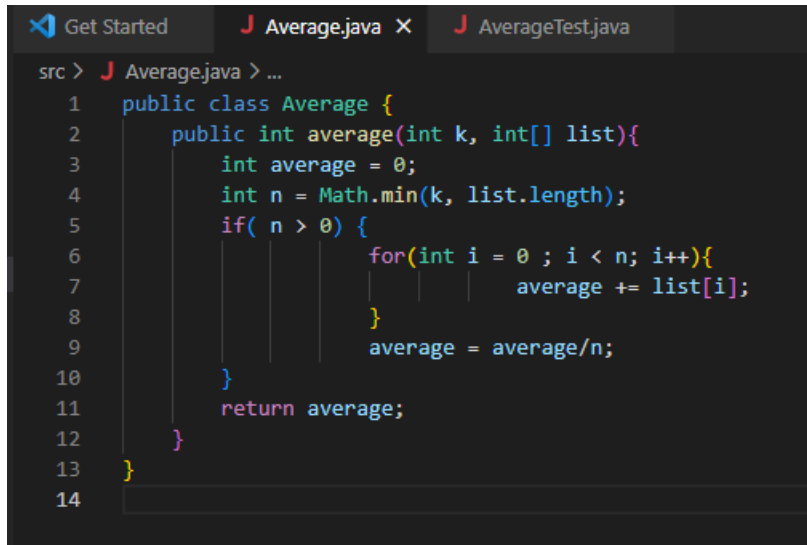
n is valid between values 0 and list length

Invalid test case (min value -1)	Valid test cases (Min, +min, max,-max)	Invalid test case (max+1)
-1	0, 1, list.length , list.length-1	List.length +1

From the above table, we can view the following inputs that are given.

- The minimum boundary value is given as 0.
- The maximum boundary value is given as length of list.
- The valid inputs for testing purposes are 0,1,length of list -1, length of list.
- The invalid inputs for test cases are -1 and length of list +1.

(e)Code



```
src > J Average.java > ...
1  public class Average {
2      public int average(int k, int[] list){
3          int average = 0;
4          int n = Math.min(k, list.length);
5          if( n > 0) {
6              for(int i = 0 ; i < n; i++){
7                  average += list[i];
8              }
9              average = average/n;
10         }
11         return average;
12     }
13 }
14
```

```
src > J AverageTest.java > AverageTest > averageTest()
2 import org.junit.jupiter.api.Test;
3
4 public class AverageTest {
5     Average avg_test=new Average();
6
7     int [] l1={1,5,2,7,8,4,2,10};
8
9     //list.length=0
10    int [] l2={};
11
12    //min-1
13    int k1=-1;
14
15    //min+1,max
16    int k2=3;
17    int k3=8;
18
19    //max+1
20    int k4=l1.length+1;
21
22    @Test
23    void averageTest(){
24        int tc1=avg_test.average(k1,l1);
25        assertEquals(0, tc1);
26
27        int tc2= avg_test.average(k2, l1);
28        assertEquals(2, tc2);
29
30        int tc3= avg_test.average(k3, l1);
31        assertEquals(4, tc3);
32
33        int tc4=avg_test.average(k4, l1);
34        assertEquals(4,tc4);
35
36        int tc5= avg_test.average(k2, l2);
37        assertEquals(0, tc5);
38    }
39
40
41 }
```

(f)All 5 test cases passed successfully

(g)

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  JUPYTER: VARIABLES

> Test run finished at 11/19/2022, 8:04:15 PM <

%TESTC 1 v2
%TSTTREE2,AverageTest,true,1,false,1,AverageTest,,[engine:junit-jupiter]/[class:AverageTest]
%TSTTREE3,averageTest(AverageTest),false,1,false,2,averageTest(),,[engine:junit-jupiter]/[class:AverageTest]/[method:averageTest()]
%TESTS 3,averageTest(AverageTest)

%TESTE 3,averageTest(AverageTest)

%RUNTIME97

> Test run finished at 11/19/2022, 8:04:57 PM <
```

