Lab # 7 *Takahiro Mitsuhashi*
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CPSC 1150 - 003 Instructor:
H. Darbandi Lab Title:
Practice with Top-down
design, Pseudo code, and
methods

Formula Lab Date
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Department:
CSIS

Program Lab7 File Name: Lab7.java Purpose:To get and set an array ,modify the elements of array by method, and print.

Technical Information: (You should fill the following information based on compiler and computer you are using). Compiler:Java SDk version 10.0.1
Computer: something like ::Intel(R)Core(™)i5-6300U CPU 2.40GHz 2.50GHz ,4.00GB
Operating System: 64-bit Operating System,x64-based processor(Windows10)
Language: Java

Program Logic (Pseudocode) Algorithm: input the size and range of numbers for an array. Create an array and pass through the methods such as "reverse()", "sort()", "count()" etc. to modify the array and print

START :
1. initialize method
size, lowerBound, upperBound ←int

int i←0; i<size; i++ for-loop
arr[i]←Math.random()*upperBound+lowerBound

RETURN arr

2. printArray method

int i←0; i<arr.length; i++ for-loop

PRINT arr[i]

3. reverse method
[] newArray←new int[arr.length]

int i=0; i<arr.length; i++ for-loop
newArray[n-1]←arr[i]
N--

PRINT newArray

4. sort method
use i&j←Nested loop
START loop
int i ←0; i<arr.length; i++
int j ←0; j<arr.length; j++

if arr[j] is greater than arr[i]
temp ← int
temp ←arr[i]
arr[i]←arr[j]
arr[j]←temp
END nested loop

PRINT arr

5. count method
temp←int []
visit←int

START loop
int i ←0; i<arr.length; i++
count←int
int j ←1; j<arr.length; j++
if arr[i] is equal to arr[j]
Counter++
END nested loop

PRINT amount of repeated number

6. insert method
if the index is less than arr.length-1

int i←arr.length-1; i>index; i--
arr[i]←arr[i-1] (shifting the arr[i] to arr[i-1] to insert a number of n on index)

arr[index]←n

RETRUN true

Else
RETURN false

Generate your test cases based on the specifications in your lab assignment. Follow following format for each test case:

Test case1:
intput:
initialize(10, 5, 20)
insert(arr,21,5)

Output:

```
Show the all number in the array
13 8 12 6 13 22 6 15 11 24
After the all element are reversed:
Reverse array is :
24 11 15 6 22 13 6 12 8 13
After the array is sorted:
Ascending order: 6 6 8 11 12 13 13 15 22 24
6 occurs = 2
8 occurs = 1
11 occurs = 1
12 occurs = 1
13 occurs = 2
15 occurs = 1
22 occurs = 1
24 occurs = 1
```

if it is valid, a number would be inserted
true

After a number is inserted:
6 6 8 11 12 21 13 13 15 22

<valid>

Test case 2:
Input:
initialize(10,20,40)
insert(arr,33,7)

Output:

Show the all number in the array
40 51 28 48 45 24 39 47 45 58
After the all element are reversed:
Reverse array is :
58 45 47 39 24 45 48 28 51 40
After the array is sorted:
Ascending order: 24 28 39 40 45 45 47 48 51 58
24 occurs = 1
28 occurs = 1
39 occurs = 1
40 occurs = 1
45 occurs = 2
47 occurs = 1
48 occurs = 1
51 occurs = 1
58 occurs = 1
if it is valid, a number would be inserted
true

After a number is inserted:
24 28 39 40 45 45 47 33 48 51

<valid>