CS0045 ALGORITHMS AND INFO STRUCTURES APPLICATIONS

Assignment 12 – Recursive Methods

The assignment can be done in Netbeans (or some other IDE) or NotePad++

Task

Write a class called **`RecursiveMethods`** which contains the following **`public static`** methods **which must be recursive:**

- **`countUp`**: to print the integers from 1 to n
- **`factorial`** to return n! for any integer from 0 to n
- **`isPalindrome`** to decide whether a string is a palindrome or not. Will ignore case of letters but will include all characters. ("Ra,dar" is not a palindrome, "RadAr" and "radar" are palindromes)
- **`largest`** to return the largest element in an integer array
- **`frequenecy`** to return how many times an integer appears in an integer array.

The last two methods should reduce the array by one element at each recursion. Use the method **`Arrays.copyOf`** when reducing the array.

Test Data

Write a **`main`** inside **`RecursiveMethods`** to do the following tests.

Method	Number of calls	Test Data
`countUp`	1	21
`factorial`	1	9
`isPalindrome`	4	Radar RaDdar Raddr radgar
`largest`	3	{1, 9, 2, 7, 2, 11, 8, 10, 2, 5} {11, 5, 6, 2, 9, 7, 5} {5, 6, 2, 9, 7, 5, 11}
`frequency`	3	{1, 9, 2, 7, 2, 11, 8, 10, 2, 5} 2 {1, 9, 2, 7, 2, 11, 8, 10, 2, 5} 8 {1, 9, 2, 7, 2, 11, 8, 10, 2, 5} 4

Turning in the Assignment

Upload files in the normal way and include a screenshot of your program running the test data. Due by the start of the next class.