WIA1002/WIB1002 Data Structure

Lab 2: Recursion (Fundamental)

Instruction: Submit your solutions for all the questions in one zip file named Lab2-*yourName-yourMatricNum*.zip to Spectrum by Wednesday (28 Feb 2018) of Week 4. You should submit the project folder for each question.

1. Create a recursive function that accepts a String parameter, and substitute any of the lowercase “a” (no applicable for uppercase "A") found with “i” char. Example:
   substituteAI ("flabbergasted ") → "flibbergisted "
   substituteAI ("Astronaut ") → " Astroniut"

2. Write a recursive method called permuteString() that will find and print all the possibilities to arrange the letters of a given word. Example:
   Input String : “ABC”
   Output Permutation :
   ABC
   ACB
   BAC
   BCA
   CAB
   CBA

   Tips:
   1) Take out the first char from String and permute the remaining chars.
   If String = “ABC”
   First char = A and remaining chars permutations are BC and CB.
   2) Insert first char in the available positions in the permutations.
   BC -> ABC, BAC, BCA
   CB -> ACB, CAB, CBA
   3) Then write a recursive function call to return the permutations and then another function call to insert the first characters to get the complete list of permutations.

3. Write a recursive method called exponent(x,y) to perform exponentiation return x^y, assuming y >= 0. Example:

   exponent(10,3) → will produce an output of 1000

   Method signature as follows:

```
public static long exponent(int x, int m) {
}
```