Programming Assignment 3 (Static Methods)

Due date/time: Thursday, Feb 17th, 11:59 PM. **Total Points: (30 Pints)**

Part 1: Work with strings [20 Points]

Design and implement a full Java program that uses static methods to receive a string form the user and perform all tasks as shown below. All results should be printed in the main method.

Static methods you need to implement:

1. Define static method **`reverseString()`** that receives a string then return the string in the reverse order. (5 points)

For example: Entered string is Computer
The output will be retupmoc

2. Define static method middleChar() that receives a string then return the middle character/characters. (5 points)

If the characters number is odd, print the middle character.
If the characters number is even, print the middle two characters.

3. Define static method countChar() that receives a string and character then return the repetition of the received character in this string. (5 points)

For example: if we call the function such as countChar("Computer Science Engineering", 'e')
The output should be the letter e is repeated 5 times in Computer Science Engineering

4. Define static method countWords() that receives a string as a sentence then return how many words in the received sentence. (5 points)

For example: if we call the function such as countWords ("Computer Science Engineering")
The output should be the Computer Science Engineering consist of **three** words. ***(not 3 words)***

Note: Please expect the use might enter more than one space between the words.
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Part 2: Array Programming (Problem-Solving.) [10 Points]

Design and implement a full Java program that uses static methods to calculate **Y** for the equation below. The program is expected to create two methods one for the numerator and one for denominator.

$$Y = \frac{(x+1)^1}{10!} + \frac{(x+4)^2}{9!} + \frac{(x+9)^3}{8!} + \cdots + \frac{(x+100)^{10}}{1!}$$

Note: The value of Y should be calculated and printed in the main method.