Foundations & Data Structures With C++

Assignment 7 – Recursion 1

Note : Do all questions recursively

1. Multiple two numbers m & n using only addition & subtraction.

2. Count number of zeros in an integer.

3. Given k find the geometric Sum i.e. $1 + 1/2 + 1/4 + 1/8 + ... + 1/(2^k)$

4. Check if a given String is palindrome or not.

5. Given a string, compute recursively (no loops) a new string where all appearances of "pi" have been replaced by "3.14".

   changePi("xpix") → "x3.14x"
   changePi("pipi") → "3.143.14"
   changePi("pip") → "3.14p"

6. Given a string, compute recursively a new string where all the 'x' chars have been removed.

   noX("xaxb") → "ab"
   noX("abc") → "abc"
   noX("xx") → ""

7. Write a recursive function to convert a String into the number it represents. e.g. for input "1231" you should return integer 1231.

8. Write a function that returns the sum of the digits of an integer.

9. Given two Strings check if one is reverse of the other.

10. Given a string, compute recursively a new string where identical chars that are adjacent in the original string are separated from each other by a "*".

    pairStar("hello") → "hel*lo"
    pairStar("xxyy") → "x*xy*y"
    pairStar("aaaa") → "a*a*a*a"

11. Find a recursive solution to the towers of hanoi puzzle. You don't have to write code for this. Read about towers of hanoi on wikipedia.