

C Programming Assignment

1. Develop a calculator program with 4 functionalities namely addition, subtraction, multiplication and division. Use multifile program and also use storage class specifiers wherever required.
2. Use scanf function to read a string of characters (into character type array called text) including alphabets, digits, blanks, tabs etc except new line character. Write a loop that will examine each character in a character-type array and determine how many of the characters are letters, how many are digits, how many are blanks and how many are tabs. Assume that text contains 80 characters.
3. Consider `int val=0xCAFE`; Write expressions using bitwise operators that do the following:
 - a. test if atleast three of last four bits (LSB) are on
 - b. reverse the byte order (i.e., produce `val=0xFECA`)
 - c. rotate fourbits (i.e., produce `val=0xECAF`)
4. Write a Program to find if a given number is Armstrong number
5. Write a program to find whether given number is palindrome or not
6. A decimal number between 0 and 32 exclusive can be expressed in binary system as $x_4x_3x_2x_1x_0$, where x_i 's are either zero or one. Write a C program that accepts (from the terminal) a decimal number in the above range and prints out the equivalent binary representation with leading bit 1.
7. Write a C program that accepts integers from the keyboard until we enter a zero or a negative number. The program will output the number of positive values entered, the minimum value, the maximum value and the average of all numbers.
8. Accept the salary of an employee from the user. Calculate the gross salary on the following basis:

Basic	HRA	DA .
1 - 4000	10%	50%
4001 - 8000	20%	60%
8001 - 12000	25%	70%
12000 and above	30%	80%
9. Generate the following pyramid of numbers using nested loops

```
1
212
32123
4321234
543212345
```
10. Write a program to find the sum of digits of a given number.
11. Write a C program that calculates the total interest income on amount Rupees 5 lakhs in a period of 10 years. Show the results for simple interest, compounded interest when the compounding is done annually, semi-annually, quarterly, monthly and daily.

12. Write a C program with a function `rotate_right (n, b)`. This function rotates integer `n` towards right by `b` positions
13. Write a C program with a function `invertpowards (n, p, b)`. This function inverts `b` bits of integer `n`, that begin at position `p`, leaving the others unchanged
14. Write a C program with two functions `itob (n, s)` and `itoh (n, s)`. `itob` converts integer into binary character representation in `s`. Similarly `itoh` converts integer into hexadecimal character representation in `s`