Branch : MCA
Semester : Spring Semester 2022-23
Course Code : CA3205
Laboratory Name : Numerical Computing Lab (using C++)
Assignment No. : ASSIGNMENT – 1
Assignment Title : C++ Overview

1) Define a structure named “KYC” that contains following data members
    a. name, date of birth, PAN No., Adhaar No., Address, Annual Income, saving under tax scheme
    b. Define the following functions to perform the mentioned tasks.
        i. input_data() : to input the data for KYC details.
        ii. output_data(): to output the data of a KYC details.
        iii. computeIncomeTax(): The rule of income tax caluculation is as follows.

            Upto 5 lakhs – No tax

            Between 5 – 10 lakhs – 10% on (Total income – saving under tax scheme (upto max. of 1.5 lakhs))

            above 10 lakhs 20% on (Total income – saving under tax scheme (upto max. of 1.5 lakhs))
    c. Define an array of structure for 7 KYC to perform the above tasks.
2) Define a structure named “product” that contains following data members
    a. product id, product name, current discount percentage, product label price, user rating.
    b. Define the following functions to perform the mentioned tasks.
        i. input_detail() : to input the data for product details.
        ii. output_detail(): to output the data of a product details.
        iii. computesalesprice(): the sales price of a product is = label price – current discount rate + SGST + CGST
    c. Define an array of structure for 5 product and demonstrate the above task.
3) Write a C++ program to create 2-D integer arrays using pointer and new operator and demonstrate the matrix multiplication. Use delete operator to free up memories.

4) Write a C++ program to input an interger array and define a function to check whether the array is sorted either in ascending or descening order. Use reference argument for this purpose .

5) Write a function in C++ input an interger and convert into its binary equivalent.

6) Write a program using C++ to input an interger array of n elements by creating it using pointer, and define a function to input an index position, '**pos**' of the array and prints number of elements on the left of '**pos**' that are less than the element at '**pos**', and number of elements on the right of the '**pos**' that are greater than the element at '**pos**'.

Example : array : 7, 5 , 2 , 4, 7, 3

pos : 3

output: left < array[pos] = 1, right > array[pos] = 1

7) Write a program in C++ to define a recursive and a non-recursive function for computing sum of digits of a given integer n of any size.

8) Write a program to print the value of standard deviaton and variation of a set of numbers. Use math library.