SHORT PROGRAMS LIST

1	Write a C++ program to **reverse** a given positive integer M, of arbitrary length (i.e. any number of digits) and output M as well as its reverse.
2	Write a C++ program to calculate Sin(x), by summing the terms of the sine series given below. N is the number of terms to be summed and x is real number specifying an angle in radians. Also check the result of your calculation with that of the standard library function sin(). $$Sin(x) = x - \frac{x3}{3!} + \frac{x5}{5!} - \frac{x7}{7!} \dots\dots\dots\dots\dots up \text{ to } N \text{ terms}$$
3	Write a C++ program to generate the first N terms(N>=1) of the **Fibonacci series** 0, 1, 1, 2, 3, 5………………
4	Write a C++ program to **count the no of vowels** in a given line of text. Output the line of text and the number of vowels in it.
5	Define a class NUMBER_LIST having the following specifications: Private data member: num_list-an array of integers capable of storing maximum 10 numbers. Public member functions: read_list()- to read N(N<=10) numbers in the array num_list. calc_product()-to compute the product of the numbers in the array and display the numbers and their product.
6	Write a C++ program to create an array of maximum size 10 and storing integer values. Input N (N<=10) numbers into the array. Process the array to find and output the **largest and the smallest** numbers from the array as well as all the values in the array.
7	Write a C++ program to **transpose** a m x n matrix of integers , where (m!=n) and output the original input matrix and its transpose.
8	Define a class with two private data members **d1** and **d2** of type **double** and one private member function **smaller()**, that returns the smaller of the two values. Define two public member functions as follows: get-data(double,double)- to assign values to the data members. put_data() - to display the data values and the **smaller of the two values** by calling **smaller()**.
9	Define a class **BASE** having one private data member num1 and one public data member num2 both of type float. Define public member functions : **input_data()**- to read data value **num1.** **get_num1()**- to return the value of **num1** Extend class **BASE** to another class **DERIVED** using public derivation. Define for class **DERIVED**, a private data member sum which is to be calculated by adding **num1** and **num2** and a public member function : **get_data()**- to read **num2** and to call **input_data()** for reading value to and to compute sum. **show_data()**- to output **num1 ,num2** and **sum** Write a **main()** to create object of type **DERIVED** and input and output all data.

10	Write a C++ program to create two text files named: **COUNTRY** and **CAPITAL** to store names of n countries and their corresponding capitals. Then read the files to display the names of their countries and their capitals in a neat tabular form.

LONG PROGRAM LIST

1	Write a menu driven program in C++ to create an array of N integers sorted in ascending order and to search for a given value in the array using **Binary Search** algorithm.
2	Write a C++ program to input two arrays A and B of integers , both sorted in ascending order .**Merge** A and B to obtain a third array C, such that C is also in ascending order. Output all the arrays A , B and C
3	Write a C++ program to input two matrices having integer elements – M1 of order (m x n)and M2 of order (n x p) and obtain the **product matrix** P. Output all the three matrices M1, M2 and P.
4	Write a menu driven program in C++ to create an array of N numbers and to sort the array in ascending order using **Bubble Sort** technique. Output the array before and after sorting.
5	Write a menu driven program in C++ to create an array of N numbers and to sort the array in ascending order using **Selection Sort** technique. Output the array before and after sorting.
6	Write a menu driven program in C++ to create an array of N numbers and to sort the array in ascending order using **Insertion Sort** technique. Output the array before and after sorting.
7	Write a menu driven program in C++ to push and pop a value in a linked stack storing float point numbers. Display the contents of the **stack** after each operation.
8	Write a menu driven program in C++ to add and remove a value in a linked queue storing float point numbers. Display the contents of the **queue** after each operation.
9	Write a menu driven program in C++ to create and display a linked list having N nodes, where the data part consist of empcode- integer empname- of maximum length 20 characters basic_pay- float allowance- float The output should be in a neat tabular form as shown below: `**********************************************************************` Sr.No Emp Code Emp Name Basic Pay Allowance Total 1 101 .... `**********************************************************************`