C Programs List

Basic

1. Evaluate the following expressions:
   a. (ax+b)/(ax-b)
   b. Area of a Triangle (given Sides) - sqrt (s * (s-a) * (s-b) * (s-c))
   c. 2.5 log x + cos 32 + $| x^2 - y^2 |$+ √2xy
2. Develop a program to swap two Numbers.
3. Develop a program for calculating the Net Salary of an Employee.
   [Net Salary = (Basic + DA + HRA + CCA) – IT – PF – Transport]
   (Assume the following data: DA=30% of BASIC, HRA=15% of BASIC, CCA=500, IT = 20% of BASIC, PF = 5% of BASIC, Transport = 300).
4. Develop a program to convert temperature from Fahrenheit to degree Celsius.

If, If … Else, Nested If Condition

1. Develop a program to check whether a number entered is even or odd.
2. Develop a program to find the largest of three numbers.
3. Develop a program to print 3 numbers entered in the ascending order.
4. Develop a program to find the different types of roots (real, equal, complex) based on the discriminant of a x^2 + bx + c.
5. Develop a program that will read the value of x and evaluate the following function using if, if else & conditional operators. Y = 1 for x > 0 Y = 0 for x = 0 Y = -1 for x < 0

While, Do … While, For Loops

1. Develop a program to display the sum of N natural numbers.
2. Develop a program to find the Factorial of a given number.
3. Develop a program to generate Fibonacci series of N numbers.
4. Develop a program to check whether the number entered is a Palindrome.
5. Develop a program to find sum of the digits of a number.
6. Develop a program to convert a number accepted in Decimal form to Binary.
7. Develop a program to generate prime numbers till nth number.
8. Develop a program to find the Sum up to 25 terms: 1 + $\frac{1}{4}$ + $\frac{1}{9}$ + $\frac{1}{16}$ ......
9. Develop a program to find the sum of the series:
   a. Sum = $\frac{1}{1!}$ + $\frac{1}{2!}$ +......+ $\frac{1}{n!}$

b. Evaluate the sinx series :

$$Sin(x) = x - \frac{X^3}{3!} + \frac{X^5}{5!} - \ldots\text{up to 7 digits accuracy.}$$

c. Develop a program to evaluate COS(x) series :

$$1 + \frac{X^2}{2!} + \frac{X^4}{4!} + \ldots\ldots \text{ to 7 digits of accuracy.}$$

10. Using switch statement , write a C program that takes two operands and one operator from the user , performs the operation and then prints the answer . (+ , - , * ,/ , %)

11. Develop programs for the following outputs:

```
1         1          1              *
0 1       2 2        2 1           * *
1 0 1     3 3 3      1 2 1         * * *
0 1 0 1   4 4 4 4    2 1 2 1       * * * *
```

12. Develop a program to generate Armstrong numbers in range 1 to 2000.

13. Write a C program using FOR statement to find the following from a given set of 20 integers.
   a. Total number of even integers
   b. Total number of odd integers
   c. Sum of all even integers
   d. Sum of all odd integers

14. Develop programs for the following output:

```
A B C D E F E D C B A
A B C D E   E D C B A
A B C D       D C B A
A B C           C B A
A B               B A
A                   A
```

15. WAP to print Following pattern

```
1  2  3  4  5  26  27  28  29  30
   6  7  8  9  22  23  24  25
      10 11 12 19  20  21
         13 14 17 18
            15 16
```

Single Dimensional Arrays

1. Develop a program to find sum and average of given N elements in an array.
2. Develop a program to print the given array in reverse order.

3. Develop a program to insert an element into a list of elements in the Array.
4. Develop a program to delete an element from a list of elements in the Array.
5. Develop a program to print the elements of array by eliminating the duplicate numbers.
6. Develop a program to merge two sorted arrays.

Double Dimensional Arrays

1. Develop a program to find sum, difference and product of two matrices.
2. Develop a program to test whether a given matrix is symmetric or not.
3. Develop a program to find the sum of diagonal elements of a given matrix.(trace of a matrix)
4. Write a program to print the Upper triangle of a matrix.
5. Write a program to replace the lower triangle of a given matrix by 0.
6. Develop a program to replace the principal diagonal elements of a given matrix by 0.

Strings

1. Write a program to implement string handling functions in C.
2. Develop a program to check whether given string is palindrome or not.
3. Develop a program to count the number of vowels special characters, consonants, and words in a given line of text.
4. Write a C program to extract a portion of a Character string and print the extracted string. Assume that the characters are extracted starting with the nth character.

Functions

1. Develop a program with functions:
   a. Without Arguments & without Return Value.
   b. With Arguments & without Return Value.
   c. With Arguments & with Return Value for the following:
      i. Factorial of a given number.
      ii. X^Y .
2. Develop a program with Recursive Function for:
   a. Factorial of a given number
   b. Generation of Fibonacci series
3. Develop a program to implement the storage classes in C.

4. Write a C procedure to add, subtract, multiply and divide two complex numbers (x+iy) and (a+ib). Also write the main program that uses these procedures.
5. write a C program that implants functions and arrays.
6. Write a C function that will scan a character string passed as an argument and convert all lowercase letters in to upper case.

Pointers

1. Develop a program to access variables through pointers.
2. Write a C Program to illustrate the use of indirection operator " * " to access the value pointed by a pointer.
3. Differentiate between call by value and call by reference using a program to swap two numbers.
4. Write a C program to illustrate the use of structure pointer.
5. Write a C program to find factorial of a given number using pointers.
6. Develop a program to Student record to find smallest element of an array using pointers.
7. Develop a program to reverse a string using pointers.
8. Write a C program to find the length of a given string using pointers.
9. Develop a program to display the content of a 2D array using pointers.

Structures and unions

1. Develop a program to assign some values to the members a structure and to display the same on the screen. (Members of a structure include the student name, roll number and marks).
2. Write a C program to illustrate the comparison of structure variables.
3. Write a C program to illustrate the concept of structure within structure.
4. Develop a program to find total and average of sales of all employees using array of structure.
5. The annual examination is conducted for 50 students for three subjects. Write a program to read the data and determine the following:
6. Total marks obtained by each student,
7. The highest marks in each subject and the Roll No. of the student who secured it,
8. The student who obtained the highest total marks.
9. Develop a program to illustrate the method of sending and one entry of the structure as a parameter to a function.
10. Write a program to implement a union for various fields name, num, and average of a student.

Sorting and Searching

1. Develop program to sort a given set of N numbers using Bubble Sort.
2. Develop program to sort a given set of N numbers using Selection Sort.
3. Develop program to perform Linear Search in a given set of N numbers
4. Develop program to perform Binary Search in a given set of N numbers.