Indian Institute of Technology Kharagpur
Programming Language Lab (MA49015/MA69003)
(Home work)

Instructions:

- The last date of submission of this assignment is November 02, 2020
- The .c files and the images of all the programs written in your machine should be attached in the email
- In the viva exam, questions related to these problems may be asked.

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1. Write a program in C to calculate the length of the string using pointer.

    i/p: Input string : cprogramming

    o/p: 12

2. Write a program in C to merge two arrays of same size sorted in descending order.

    i/p: Input the number of elements to be stored in the first array :3

      Input 3 elements in the array : 1 2 3

      Input the number of elements to be stored in the second array : 3

      Input 3 elements in the array : 1 2 3

    o/p: The merged array in decending order is : 3 3 2 2 1 1

3. Write a C program to count frequency of digits in a given number (use loop).

    i/p: Input any number: 116540

    o/p:

            Frequency of 0 = 1

            Frequency of 1 = 2

            Frequency of 2 = 0

            Frequency of 3 = 0

            Frequency of 4 = 1

            Frequency of 5 = 1

            Frequency of 6 = 1

            Frequency of 7 = 0

            Frequency of 8 = 0

Frequency of 9 = 0

4. Write a program in C to sort an array using Pointer.

i/p: Input the number of elements to store in the array : 5

Input 5 number of elements in the array :   25 45 89 15 82

o/p: The elements in the array after sorting : 15 25 45 82 89

5. Write a C program to input elements in array and search an element in array using pointers.

i/p: Input array elements: 10 20 30 40 50 60 70 80 90 100

Input element to search: 25

o/p: 25 does not exists in array.

6. Write a C program to print equilateral triangle or Pyramid star pattern series of `N` rows using for loop.

Input: Input rows: 5

Output:

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7. Suppose a matrix of order n x n is said to have a *sparsity pattern* if the number of nonzero entries of the matrix is less or equal to kn, for some positive integer k < n/2. Then write a C program to verify whether a given input matrix of order 10 x 10 follows the sparsity pattern.

Eg:

Input:

Input elements in matrix:

1 0 3

0 0 4

6 0 0

Output: The given matrix has *sparsity pattern*

8. Given a Binary Number, the task is to convert the given binary number to its equivalent hexadecimal number.

Eg:

Input: 110001110

Output: 18E

9. Given an array Arr of size `N`, swap the `K`th element from beginning with `K`th element from end.

Eg:

Input: N = 8, K = 3, Arr[] = {1, 2, 3, 4, 5, 6, 7, 8}

Output: 1 2 6 4 5 3 7 8

Explanation: Kth element from beginning is 3 and from end is 6.

10. Given a string `S`, the task is to output a string with the first letter of every word in the string.

Eg:

Input: department of mathematics

Output: dom

11. Given the first 2 terms `A1` and `A2` of an Arithmetic Series. Find the `N`th term of the series.

Eg:

Input: A1=2, A2=3, N=4

Output: 5

Explanation: The series is 2,3,4,5,6....Thus, 4th term is 5.

12. Strong Numbers are the numbers whose sum of factorial of digits is equal to the original number. Given a number `N`, the task is to check if it is a Strong Number or not. Print `1` if the Number is Strong, else Print `0`.

Eg:

Input: N = 145

Output: 1

Explanation: 1! + 4! + 5! = 145 So, 145 is a Strong Number.