Week 4 Lab

Dhaka University of Engineering & Technology, Gazipur

Computer Science and Engineering Department

CSE 1122 (Structured Programming Language Sessional)

These Programs illustrates on *Arrays* in C Language .

1. Write a program to input and print a 1-D array elements.
2. Write a C Program to Calculate Addition of All Elements in Array.
3. Write a program to average a 1-D array elements.
4. Write a C Program to delete an element from the specified location from Array.
   Sample input: 5
   12 20 5 17 8
   3
   Output: 12 20 17 8
5. Write a program to C Program to Find Largest/Smallest Element in an Array.
   12 20 13 5 65
   Max: 65
   Min: 5
6. Write a C Program to Reversing an Array Element.
   Input: 12 20 13 5 65
   Output : 65 5 13 20 12

7. Write a C Program to insert an element into the specified location in an array.
   Sample input: 5
   10 30 50 80 11
   3
   77
   10 30 77 50 80 11
8. Write a program to sort a list of elements in descending order.

9. Write a program to input and print a 2-D array elements.

10. Write a program to calculate the multiplication of two 3x3 matrices.

    Suppose A= $\begin{bmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{bmatrix}$ and B= $\begin{bmatrix} b_{11} & b_{12} & b_{13} \\ b_{21} & b_{22} & b_{23} \\ b_{31} & b_{32} & b_{33} \end{bmatrix}$.

    Then C=A*B= [c11] = [a11*b11 + a12 *b21 +a13 *b31] and
    [c12]= [a11*b12+a12*b22+a13*b32]
    so on for other elements in the matrix C.
    C=$\begin{bmatrix} c_{11} & c_{12} & c_{13} \\ c_{21} & c_{22} & c_{23} \\ c_{31} & c_{32} & c_{33} \end{bmatrix}$

11. Write a program in C to find transpose of a given matrix.

    Sample input-output:

    Input the rows and columns of the matrix : 3 3
    Input elements in the first matrix :
    $\begin{bmatrix} 1 & 2 & 6 \\ 3 & 4 & 8 \\ 10 & 12 & 15 \end{bmatrix}$

Expected Output :
The matrix is :

1 2 6
3 4 8
10 12 15

The transpose of a matrix is : $\begin{bmatrix} 1 & 3 & 10 \\ 2 & 4 & 12 \\ 6 & 8 & 15 \end{bmatrix}$

1 3 10
2 4 12
6 8 15

12. Write a program in C to Cyclically Permute the Elements of an Array.

Sample input-output:

```
Enter the value of the n = 4
Enter the numbers
3
40
100
68
Cyclically permuted numbers are given below
40
100
68
3
```

13. Write a program in C to print all unique elements in an array.

Sample input-output:

Input the number of elements to be stored in the array: 4
Input 4 elements in the array :
element - 0 : 3
element - 1 : 2
element - 2 : 2
element - 3 : 5
Expected Output :
The unique elements found in the array are:
3 5

14. Write a program in C to Merge the Elements of 2 Sorted Array.
Sample input: 10 20 30 40
15 25 35
Ouput: 10 15 20 25 30 35 40

15. Write a program in C to count the frequency of each element of an array.

Sample input-output:

Input the number of elements to be stored in the array :4
Input 3 elements in the array :
element - 0 : 25
element - 1 : 12
element - 2 : 43
element - 3 : 25

Expected Output :

The frequency of all elements of an array :
25 occurs 2 times
12 occurs 1 times
43 occurs 1 times