Lab Assignment 7

2-D ARRAY

1. Write a program to read and display a matrix.
2. Write a program to add two matrices.
3. Write a program to find the transpose of a matrix.
4. Write a program to find the sum of all the elements in a 2D array.
5. Write a program to find the sum of the elements in each row of a 2D array and print it.
6. Write a program to fill a square matrix with value 0 on the diagonal, 1 on the upper right triagle and -1 on the lower left triangle.
7. Write a program to multiply two matrices.
8. Write a program to find out whether a particular element is in the 2D integer array and print its row and column value using call by reference.
9. Write a program to interchange any two Rows & Columns in the given Matrix.
10. Write a program to Sort Rows of the Matrix in Ascending & Columns in Descending Order.

    Sample Output

    ```
    Enter the order of the matrix
    3 3
    Enter co-efficients of the matrix
    3 7 9
    2 4 8
    5 2 6
    The given matrix is
     3 7 9
     2 4 8
     5 2 6
    After arranging rows in ascending order
     3 7 9
     2 4 8
     2 5 6
    After arranging the columns in descending order
     5 7 9
     3 4 8
     2 2 6
    ```

11. Write a program to do the Sum of the Main & Opposite Diagonal Elements of a MxN Matrix.

Sample Output

```
Enter the order of the matix
2 2
Enter the co-efficients of the matrix
40 30
38 90
The given matrix is
 40 30
 38 90

The sum of the main diagonal elements is = 130
The sum of the off diagonal elements is   = 68
```

STRINGS

Reading Strings

12. If we declare a string by writing char str[50]; Then str can be read by the user by using three ways:
    1. Using scanf() function
    2. Using scanset
    3. Using getchar() function repeatedly

Write a C program to read a string in the above three ways.

13. The string can be displayed on the screen using three ways:
    a Using printf() function
    b Using puts() function
    c Using putchar()function repeatedly.

    Modify the above program to display the string that you read.

14. Run the following program and analyze the result.

```
#include<stdio.h>
        int main()
        {
                char str = “Hello”;
                printf(“\n %s”,str);
                printf(“\n %s”,&str);
                printf(“\n%s”,&str[2]);
        }
```

15. Run the following program and analyze the result. It’s about the use of width and precision specifications along with %s .

```
#include<stdio.h>
int main()
{
        char str[] = “Introduction to C”;
        printf(“\n |%s|”,str);
        printf(“\n |%20s|”,str);
        printf(“\n |%20s|”,str);
         printf(“\n |%.4s|”,str);
         printf(“\n |%20.4s|”,str);
```

```
        printf("\n |%-20.4s|",str);
}
```

16. Write a C program to find the length of a string without using the string handling functions. Do the same operation using the strlen() function in string.h

17. Write a C program to copy one string to another without using any string library functions. Do the same operation using strcpy() function in string.h

18. Write a C program to convert lowercase characters of a string to upper case.

19. Note: Recall that ASCII code for A-Z varies from 65 to 91 and the ASCII code for a-z ranges from 97 to 123

20. Write a C program to concatenate two strings. (Do the same operation using the string library function strcat() and analyze the behavior; you should include string .h)

21. Write a C program to compare two strings. (Do the same operation using the string library function strcmp() and analyze the behavior; you should include string .h)

22. Write a C program to check whether the entered string is a palindrome.

23. Write a C program to print the longest word in a sentence.

24. Wite a C Program to sort a list of given names; you can choose any one of the sorting algorithms.