CS-111

<Module No- 4>

> **Lab3**

NITK SURATHKAL

INBASEKARAN.P

201EC226

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```c
// Lab 4.1 Questin 1
// Inbasekaran.P 201EC226
/*To read an array of N elements and reverse it.*/

// For printf() and scanf()
#include <stdio.h>
// Including stdlib for system("clear") to clear the screen in the
 terminal.
#include <stdlib.h>


int main()
{
    // To clear the console.
    system("clear");
    printf("Number of elements: ");
    int size = 10;
    scanf("%d",&size);
    int arr[size];
    printf("Enter elements: ");
    for (int i = 0; i < size; i++)
    {
        scanf("%d",&arr[i]);
    }
    int rev_arr[size];
    for (int i = 0; i < size; i++)
    {
        rev_arr[i] = arr[size - i - 1];
    }
    printf("Printing the elements of the reversed array: ");
    for (int i = 0; i < size; i++)
    {
        printf("%d ", rev_arr[i]);
    }
    printf("\n");
    return 0;
}
```

OUTPUT

```
Number of elements: 4
Enter elements: 1 9 7 2
Printing the elements of the reversed array: 2 7 9 1
PS D:\Documents\NIT-K\My_Second_Sem\CS111\M4\Array> █
```

```c
// Lab 4.1 Questin 2
// Inbasekaran.P 201EC226
/*Program to count the number of palindromes in a given list of n numbers*/

// For printf() and scanf()
#include <stdio.h>
// Including stdlib for system("clear") to clear the screen in the terminal.
#include <stdlib.h>

int main()
{
    // To clear the console.
    system("clear");
    int arr[100],size;
    int count =0;

    printf("Number of elements: ");
    scanf("%d",&size);

    printf("Enter elements: ");
    for(int i=0;i<size;i++)
        scanf("%d",&arr[i]);

    for(int i=0;i<size;i++)
    {
        int rev = 0;
        int num = arr[i];

        while(num)
        {
            int last = num%10;
            rev = 10*rev + last;
            num /= 10;
        }
        if(rev == arr[i])
            count++;

    }
    printf("Number of palindromes in the list: %d",count);

    return 0;
}
```

OUTPUT

```
Number of elements: 5
Enter elements: 1428
1234
121
1991
141
Number of palindromes in the list: 3
PS D:\Documents\NIT-K\My_Second_Sem\CS111\M4\Array>
```

```c
// Lab 4.1 Questin 7
// Inbasekaran.P 201EC226
/*To add and multiply two matrices.*/

// For printf() and scanf()
#include <stdio.h>
// Including stdlib for system("clear") to clear the screen in the terminal.
#include <stdlib.h>

#define SIZE 10

int main()
{
    // To clear the console.
    system("clear");
    printf("Enter the order[n x m] of the first matrix: ");
    int n1 ,m1;
    scanf("%d %d", &n1, &m1);

    printf("Enter the order[n x m] of the second matrix: ");
    int n2 ,m2;
    scanf("%d %d", &n2, &m2);


    int mat1[SIZE][SIZE] = {0};
    int mat2[SIZE][SIZE] = {0};
    int add_matrix[SIZE][SIZE] = {0};
    int mul_matrix[SIZE][SIZE] = {0};

    printf("Enter the elements of first matrix: \n");
    for(int i = 0; i < n1; ++i)
    {
        for(int j = 0; j< m1; ++j)
        {
            scanf("%d",&mat1[i][j]);
        }
    }
    printf("Enter the elements of second matrix: \n");
    for(int i = 0; i < n2; ++i)
    {
        for(int j = 0; j< m2; ++j)
        {
            scanf("%d",&mat2[i][j]);
        }
    }
```

```c
if(n1 == n2 && m2==m1)
 {
     for(int i = 0; i < n1; ++i)
     {
         for(int j = 0; j< m1; ++j)
         {
             add_matrix[i][j] = mat1[i][j]+mat2[i][j];
         }
     }
     printf("The elements of the addition matrix: \n");
     for(int i = 0; i < n1; ++i)
     {
         for(int j = 0; j< m1; ++j)
         {
             printf("%d  ",add_matrix[i][j]);
         }
         printf("\n");
     }

 }
 else
     printf("!!! The order of the matrix is different.Matrix addition is not
possible\n");

 if(m1 == n2)
 {

     for(int i = 0; i < n1; ++i)
     {
         for(int j = 0; j< m2; ++j)
         {
             for (int k = 0; k < m1; k++)
             {
                 mul_matrix[i][j] += (mat1[i][k] * mat2[k][j]);
             }

         }
     }
```

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```c
        printf("The elements of the multiplication matrix: \n");
        for(int i = 0; i < n1; ++i)
        {
            for(int j = 0; j< m2; ++j)
            {
                printf("%d  ",mul_matrix[i][j]);
            }
            printf("\n");
        }
    }
    else
        printf("!!! Matrix multiplication is not possible\n");

    return 0;
}
```

OUTPUT

```
Enter the order[n x m] of the first matrix: 3 3
Enter the order[n x m] of the second matrix: 3 3
Enter the elements of first matrix:
1 0 0
0 1 0
0 0 1
Enter the elements of second matrix:
1 1 1
1 1 1
1 1 1
The elements of the addition matrix:
2  1  1
1  2  1
1  1  2
The elements of the multiplication matrix:
1  1  1
1  1  1
1  1  1
PS D:\Documents\NIT-K\My_Second_Sem\CS111\M4\Array> █
```

```c
// Lab 4.2 Questin 2
// Inbasekaran.P 201EC226
/*To reverse a string and check whether the string is palindrome or not*/

// For printf() and scanf()
#include <stdio.h>
// Including stdlib for system("clear") to clear the screen in the terminal.
#include <stdlib.h>
// Size of the string
# define SIZE 100

int main()
{
    // To clear the console.
    system("clear");
    char string[SIZE] = {'\0'};
    // Input the string
    printf("Enter the string: ");
    scanf("%[^\n]s",string);
    int i = 0;
    while(string[i++]);
    i--;
    char rev_string[SIZE] = {'\0'};
    for(int j = 0; j < i; ++j)
        rev_string[j] = string[i-j-1];

    printf("The string  entered is %s\n", string);
    printf("The reversed string is %s\n", rev_string);

    for(int j = 0; j < i; ++j)
    {
        if(rev_string[j] != string[j])
        {
            printf("The string is NOT a palindrome.\n");
            return 0;
        }
    }

    printf("The strings is a palindrome.\n");
    return 0;
}
```

OUTPUT

```
Enter the string: tenet
The string  entered is tenet
The reversed string is tenet
The strings is a palindrome.
PS D:\Documents\NIT-K\My_Second_Sem\CS111\M4\Strings> 
```

```c
// Lab 4.2 Questin 3
// Inbasekaran.P 201EC226
/*To delete extra blank spaces in a string*/
// For printf() and scanf()
#include <stdio.h>
// Including stdlib for system("clear") to clear the screen in the terminal.
#include <stdlib.h>
// Size of the string
# define SIZE 100

int main()
{
    // To clear the console.
    system("clear");
    char string[SIZE] = {'\0'};
    // input the string
    printf("Enter the string: ");
    scanf("%[^\n]s",string);

    for (int i = 0; string[i] != '\0'; i++)
    {
        if(string[i] == ' '&& string[i + 1] == ' ')
        {
            for (int j = i + 1; string[j] != '\0' ;j++)
            {
                string[j] = string[j+1];
            }
            i--;
        }
    }

    printf("The string  withour extra blank spaces is: %s\n", string);
    return 0;
}
```

OUTPUT

```
Enter the string: Hello     world   this is Inba   sekaran P
The string  withour extra blank spaces is: Hello world this is Inba sekaran P
PS D:\Documents\NIT-K\My_Second_Sem\CS111\M4\Strings> █
```

```c
// Lab 4.2 Questin 4
// Inbasekaran.P 201EC226
/*Program to replace lowercase characters by uppercase & vice-versa*/

// For printf() and scanf()
#include <stdio.h>
// Including stdlib for system("clear") to clear the screen in the terminal.
#include <stdlib.h>
// Size of the string
# define SIZE 100

int main()
{
    // To clear the console.
    system("clear");
    char string[SIZE] = {'\0'};
    // input the string
    printf("Enter the string: ");
    scanf("%[^\n]s",string);

    for (int i = 0; string[i] != '\0'; i++)
    {
       if(string[i] >= 'a' && string[i] <= 'z')
        {
            string[i] = string[i] - 'a' + 'A';
        }
        else if (string[i] >= 'A' && string[i] <= 'Z')
        {
            string[i] = string[i] - 'A' + 'a';
        }
    }

    printf("The new string is: %s\n", string);
    return 0;
}
```

OUTPUT

```
Enter the string: THis is a TEst
The new string is: thIS IS A teST
PS D:\Documents\NIT-K\My_Second_Sem\CS111\M4\Strings> █
```