Lab 1:

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Q1. Write a C or C++ program to do the following. Pass matrics as parameters in all of them.

i) Matrix addition & sub.
ii) Matrix multiplication
iii) Sum of principle & non principle diagonal.
iv) Sum of rows & columns.
v) Transpos of a matrix.
vi) Check if the given matrix is symmetric or not.

$$\begin{bmatrix} a_{00} & a_{02} & a_{03} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{bmatrix} \qquad \begin{bmatrix} a_{00} & a_{01} & a_{02} \\ a_{10} & a_{11} & a_{12} \\ a_{20} & a_{21} & a_{22} \end{bmatrix}$$

```
// For add or subtract
void add (int m, int M1[m][m], int M2[m][m]
   or sub
{
  int i, j; int M3[m][m];
  printf (" Sum : \n");

  for (i=0; i<m; i++)
  {
     for (j=0; j<m; j++)
  {
To add: M3[i][j] = M1[i][j] + M2[i][j];
     printf ("%d", M3[i][j]);
  }
     printf ("\n");
  }
```

To substract : M3[i][j] = M1[i][j] - M2[i][j];

```
void multiply (int m, int M1[m][m], int M2[m][m])
{
  int M3[m][m];
  int i, j, k;

  for (i=0; i<m; i++)
  {
    for (j=0; j<m; j++)
    {
      M3[i][j]=0;
      for (int k=0; k<m; k++)
      {
        M3[i][j] += M1[i][k] * M2[k][j];
      }
    }
  }

  Display Matrix M3
}

void sumRC (int m, int M1[m][m])
{
  int sumR, sumC, i, j;
  int M3[m+1][m+2];

  for (i=0; i<n; i++)
  {
    sumR=0;
    for (j=0; j<n; j++)
      M3[i][j] = M1[i][j];
```

```
        sumR += M1[i][j];
    }
    M3[i][m] = sumR;
}

for(j=0; j<m; j++)
{
    sumC = 0;
    for(i=0; i<m; i++)
    {
        sumC += M1[i][j];
    }
    M3[m][j] = sumC;
}
M3[m][m] = 0

Display Matrix M3.

}

void sumD(int m, int M1[m][m])
{
    int sumP = 0, sumNP = 0, i;

    for(i=0; i<m; i++)
    {
        SumP += M1[i][i];
        SumNP += M1[i][m-1-i];
    }
    Display SumP & SumNP
}
```

```
void transposeM(int m, int M1[m][m])
{
    int i, j;
    printf("Transpos of the matrix :\n");
    for(j=0; j<m; j++)
    {
        for(i=0; i<m; i++)
        {
            printf("%d\t", M1[i][j]);
        }
        printf("\n");
    }
}

void isSymmetrix(int m, int M1[m][m])
{
    int i, j;
    for(i=0; i<m; i++)
    {
        for(j=0; j<m; j++)
        {
            if(M1[i][j] != M1[j][i])
            {
                printf("Not symmetrix\n");
            }
        }
    }
    printf("Matrix is Symmetrix\n");
}
```

Output:

```
Enter orders of the square matrix
2

Enter a square matrix
1 2
3 4

MENU
1. Add Matrix
2. Subtract Matrix
3. Multiply Matrix
4. Sum of principle & non principle diagonal of Matrix
5. Sum of rows & colums of Matrix
6. Transpose
7. Check Symmetrix
8. Exit

1
Enter a square matrix to add to M1
1 1
1 1
The Sum is:
2 3
4 5

2
Enter a square matrix to subtract from M1
1 1
1 1
```

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The Difference is:
0 1
2 3

3
Enter a square matrix to Multiply to M1
1 2
3 4
The Product is:
7 10
15 22

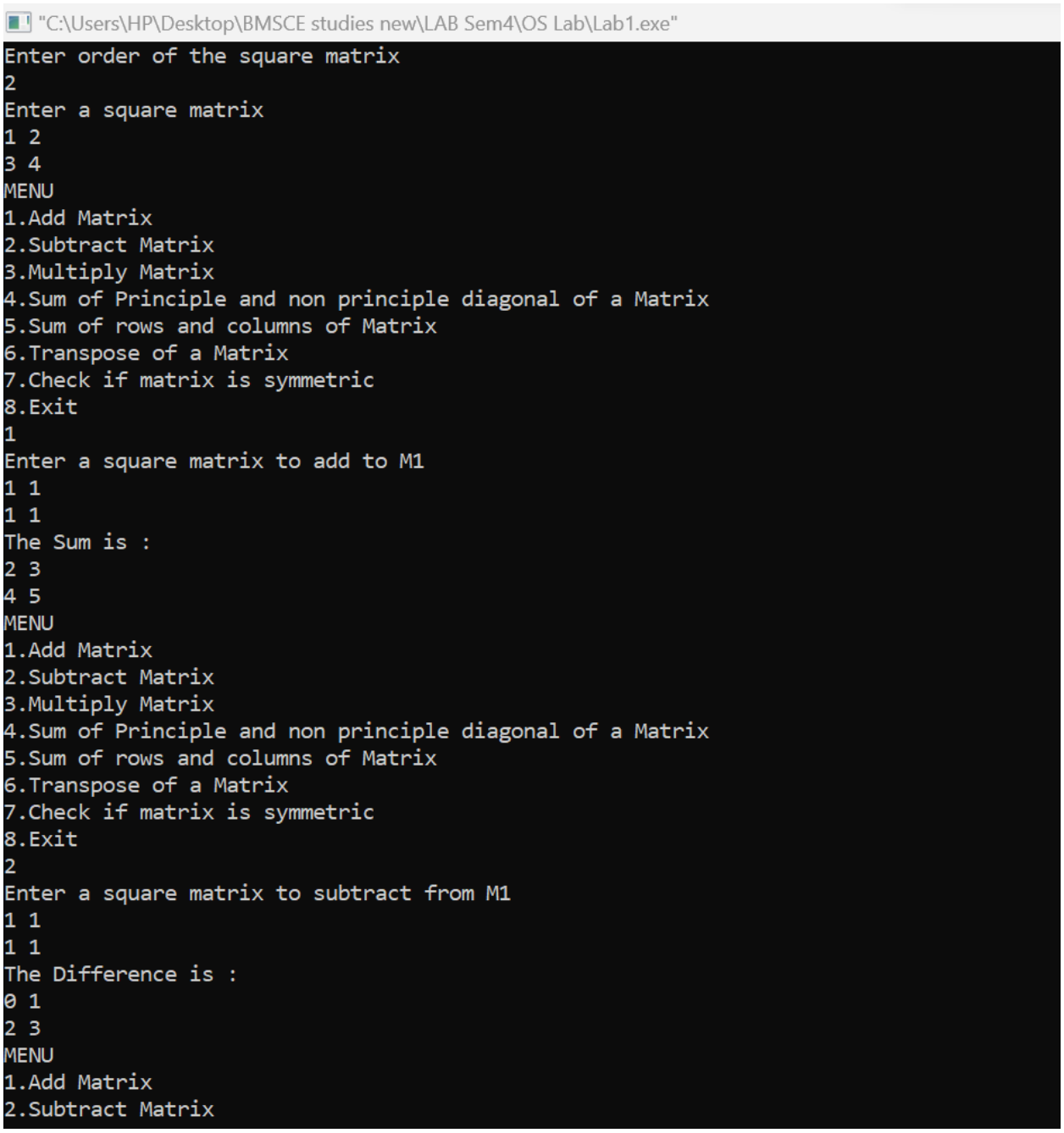
4
Sum of principal diagonal: 5
Sum of non-principal diagonal: 5

5
1 2 3
3 4 7
4 6 0

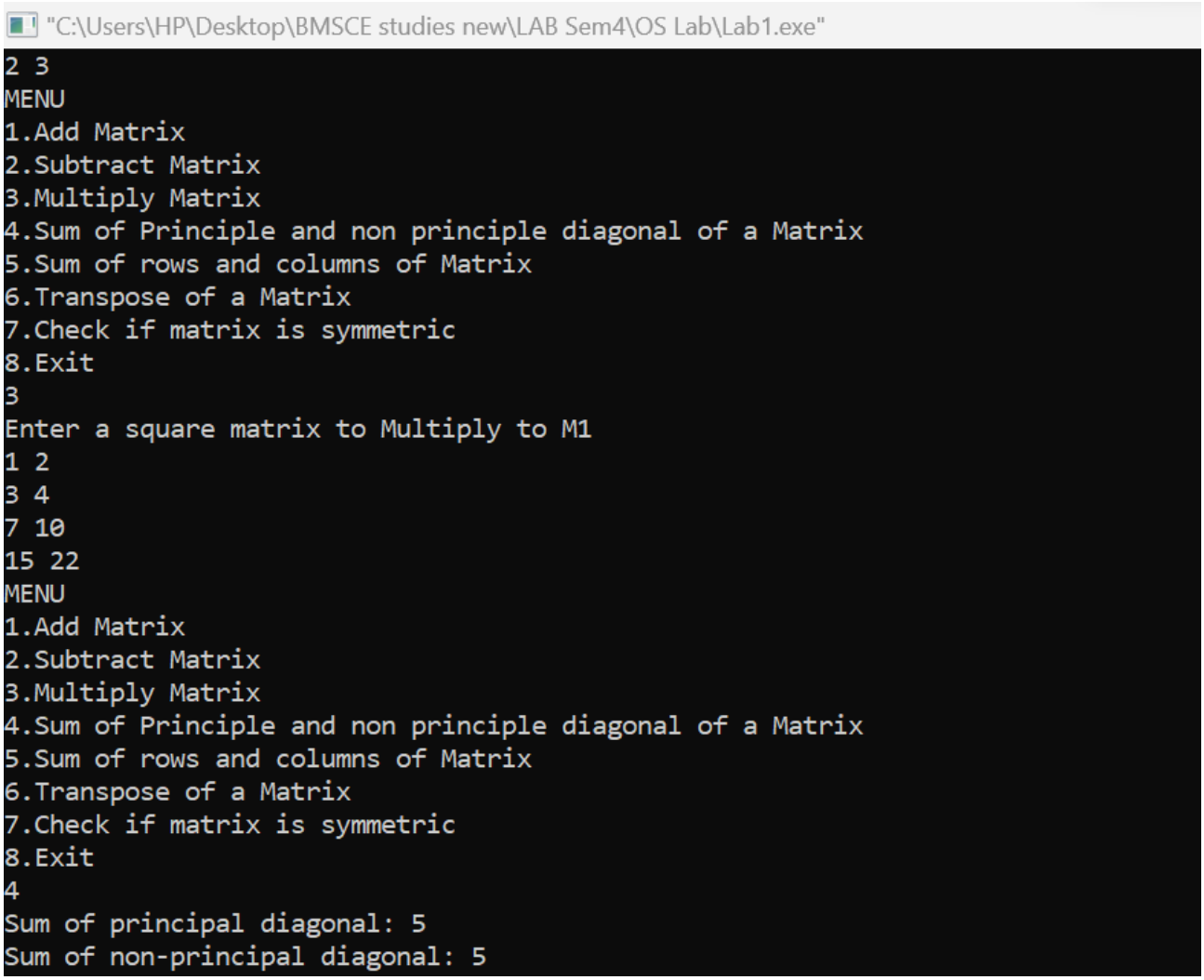
6
The Transpose of the matrix:
1 3
2 4

7
Not Symmetric

OUTPUT:



```
"C:\Users\HP\Desktop\BMSCE studies new\LAB Sem4\OS Lab\Lab1.exe"
Enter order of the square matrix
2
Enter a square matrix
1 2
3 4
MENU
1.Add Matrix
2.Subtract Matrix
3.Multiply Matrix
4.Sum of Principle and non principle diagonal of a Matrix
5.Sum of rows and columns of Matrix
6.Transpose of a Matrix
7.Check if matrix is symmetric
8.Exit
1
Enter a square matrix to add to M1
1 1
1 1
The Sum is :
2 3
4 5
MENU
1.Add Matrix
2.Subtract Matrix
3.Multiply Matrix
4.Sum of Principle and non principle diagonal of a Matrix
5.Sum of rows and columns of Matrix
6.Transpose of a Matrix
7.Check if matrix is symmetric
8.Exit
2
Enter a square matrix to subtract from M1
1 1
1 1
The Difference is :
0 1
2 3
MENU
1.Add Matrix
2.Subtract Matrix
```


"C:\Users\HP\Desktop\BMSCE studies new\LAB Sem4\OS Lab\Lab1.exe"
2 3
MENU
1.Add Matrix
2.Subtract Matrix
3.Multiply Matrix
4.Sum of Principle and non principle diagonal of a Matrix
5.Sum of rows and columns of Matrix
6.Transpose of a Matrix
7.Check if matrix is symmetric
8.Exit
3
Enter a square matrix to Multiply to M1
1 2
3 4
7 10
15 22
MENU
1.Add Matrix
2.Subtract Matrix
3.Multiply Matrix
4.Sum of Principle and non principle diagonal of a Matrix
5.Sum of rows and columns of Matrix
6.Transpose of a Matrix
7.Check if matrix is symmetric
8.Exit
4
Sum of principal diagonal: 5
Sum of non-principal diagonal: 5

```
MENU
1.Add Matrix
2.Subtract Matrix
3.Multiply Matrix
4.Sum of Principle and non principle diagonal of a Matrix
5.Sum of rows and columns of Matrix
6.Transpose of a Matrix
7.Check if matrix is symmetric
8.Exit
5
1 2 3
3 4 7
4 6 0
MENU
1.Add Matrix
2.Subtract Matrix
3.Multiply Matrix
4.Sum of Principle and non principle diagonal of a Matrix
5.Sum of rows and columns of Matrix
6.Transpose of a Matrix
7.Check if matrix is symmetric
8.Exit
6
Transpose of the matrix:
1       3
2       4
MENU
1.Add Matrix
2.Subtract Matrix
3.Multiply Matrix
4.Sum of Principle and non principle diagonal of a Matrix
5.Sum of rows and columns of Matrix
6.Transpose of a Matrix
7.Check if matrix is symmetric
8.Exit
7
Not Symmetric
```