Assignment – 6(Continue Assignment – 5)

Assignment:

1. Write a C program to add two matrices of order M × N

Algorithm:

a[10][10], b[10][10], sum[10][10] are arrays

print"Enter the number of rows (between 1 and 10): "

Input r

print"Enter the number of columns (between 1 and 10): "

Input c

print"\nEnter elements of 1st matrix:\n"

for (i = 0; i < r; ++i)

for (j = 0; j < c; ++j) {

print"Enter element a%d%d: ", i + 1, j + 1

Input a[i][j]

}

print"Enter elements of 2nd matrix:\n"

for (i = 0; i < r; ++i)

for (j = 0; j < c; ++j) {

print "Enter element a ", i + 1, j + 1

Input b[i][j]

}

// adding two matrices

for (i = 0; i < r; ++i)

for (j = 0; j < c; ++j) {

sum[i][j] = a[i][j] + b[i][j];

}

```
// printing the result
print"\nSum of two matrices: \n"
for (i = 0; i < r; ++i)
      for (j = 0; j < c; ++j) {
                print ( sum[i][j])
      }
     Print "\n"
}
```

2. Write a C program to multiply two matrices.

   Algorithm:

```
a[10][10], b[10][10], multiply[10][10] are arrays

 print "Enter number of rows and columns of a matrix"
  Input m, n
 print"Enter elements of a matrix\n"

 for (i = 0; i < m; i++)
   for (j = 0; j < n; j++)
      Input a[i][j]

 print"Enter number of rows and columns of b matrix\n"
  Input p, q

 if (n != p)
```

```
  print "The multiplication isn't possible.\n"
 else
 {
  Print "Enter elements of b matrix\n"
 for (i = 0; i < p; i++)
    for (j = 0; j < q; j++)
       Input   b[i][j]



 //Multiplication
   print"Product of the matrices:\n"
  for (i = 0; i < m ; i++) {
    for (j = 0; j < q ; j++) {
     sum = 0
      for (k = 0; k < n ; k++) { // p=n
        sum = sum + a[i][k]*b[k][j]
      }


      multiply[i][j] = sum
      print multiply[i][j]
    }
    print"\n"
  }


}// end of else
```

3. Write a C program to find transpose of a matrix.

Algorithm:

```
int a[10][10], transpose[10][10] are arrays
print "Enter rows and columns: "
 Input r, c

// Assigning elements to the matrix
Print "Enter matrix elements:"
for (i = 0; i < r; ++i)
   for (j = 0; j < c; ++j) {
       Input   a[i][j]
   }

// Displaying the matrix a[][]
Print "Entered matrix: "
for (i = 0; i < r; ++i){
   for (j = 0; j < c; ++j)
      print  a[i][j]

   print"\n"
   }

// Finding the transpose of matrix a
for (i = 0; i < r; ++i)
```

```
    for (j = 0; j < c; ++j) {
        transpose[j][i] = a[i][j]
    }

// Displaying the transpose of matrix a
Print "\nTranspose of the matrix:\n"
for (i = 0; i < c; ++i){
    for (j = 0; j < r; ++j) {
        print transpose[i][j]
    }
    Print "\n"
}
```

Practice:

1. Write a C program to subtract two matrices.
2. Write a C program to perform Scalar matrix multiplication.
3. Write a C program to find sum of main diagonal and minor diagonal elements of a matrix.
4. Write a C program to find sum of each row and column of a matrix.
5. Write a C program to find upper triangular matrix and lower triangular matrix.
6. Write a C program to check Identity matrix.
7. Write a C program to check Symmetric matrix.
8. Write a C program to check Sparse matrix.