**LAB EXERCISES**

**EX.NO:06**

**MATRIX ADDITION AND TRANSPOSE**

**AIM:**

**To write a C program to demonstrate matrix addition and transpose operations.**

**PROCEDURE:**

1. **Start the program.**
2. **Declare variables:**
   * **A[10][10], B[10][10], Sum[10][10], Transpose[10][10]**
   * **i, j → loop counters**
   * **rows, cols → to store dimensions of the matrices**
3. **Get the number of rows and columns of the matrices from the user.**
4. **Input elements for Matrix A:**
   * **Loop through each element using i and j**
   * **Read A[i][j]**
5. **Input elements for Matrix B:**
   * **Loop through each element using i and j**
   * **Read B[i][j]**
6. **Perform Matrix Addition:**
   * **Loop through each element using i and j**
   * **Compute Sum[i][j] = A[i][j] + B[i][j]**
7. **Display the Resultant Matrix (Sum)**
8. **Compute Transpose of Matrix A:**
   * **Loop through each element using i and j**
   * **Set Transpose[j][i] = A[i][j]**
9. **Display the Transpose of Matrix A**
10. **End the program.**

**PROGRAM:**

**#include <stdio.h>**

**void main()**

**{**

**int i, j, a[5][5], b[5][5], c[5][5], t1[5][5], t2[5][5];**

**int m, n;**

**clrscr();**

**printf("Enter the row value and column value:\n");**

**scanf("%d %d", &m, &n);**

**printf("\nEnter the first matrix:\n");**

**for(i = 0; i < m; i++) {**

**for(j = 0; j < n; j++) {**

**scanf("%d", &a[i][j]);**

**}**

**}**

**printf("\nEnter the second matrix:\n");**

**for(i = 0; i < m; i++) {**

**for(j = 0; j < n; j++) {**

**scanf("%d", &b[i][j]);**

**}**

**}**

**// Matrix Addition**

**for(i = 0; i < m; i++) {**

**for(j = 0; j < n; j++) {**

**c[i][j] = a[i][j] + b[i][j];**

**}**

**}**

**printf("\nThe resultant matrix after addition is:\n");**

**for(i = 0; i < m; i++) {**

**for(j = 0; j < n; j++) {**

**printf("%d\t", c[i][j]);**

**}**

**printf("\n");**

**}**

**// Matrix Transpose**

**for(i = 0; i < m; i++) {**

**for(j = 0; j < n; j++) {**

**t1[j][i] = a[i][j]; // Transpose of first matrix**

**t2[j][i] = b[i][j]; // Transpose of second matrix**

**}**

**}**

**printf("\nTranspose of first matrix is:\n");**

**for(i = 0; i < n; i++) {**

**for(j = 0; j < m; j++) {**

**printf("%d\t", t1[i][j]);**

**}**

**printf("\n");**

**}**

**printf("\nTranspose of second matrix is:\n");**

**for(i = 0; i < n; i++) {**

**for(j = 0; j < m; j++) {**

**printf("%d\t", t2[i][j]);**

**}**

**printf("\n");**

**}**

**getch();**

**}**

**RESULT:**

**Thus the above C program is executed and the output is obtained.**