The transpose of a matrix is a new matrix that is obtained by exchanging the rows and columns.

In this program, the user is asked to enter the number of rows r and columns c. Their values should be less than 10 in this program.

Then, the user is asked to enter the elements of the matrix (of order r\*c).

The program below then computes the transpose of the matrix and prints it on the screen.

**Program to Find the Transpose of a Matrix**

#include <stdio.h>

int main() {

int a[10][10], transpose[10][10], r, c;

printf("Enter rows and columns: ");

scanf("%d %d", &r, &c);

// asssigning elements to the matrix

printf("\nEnter matrix elements:\n");

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

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

printf("Enter element a%d%d: ", i + 1, j + 1);

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

}

// printing the matrix a[][]

printf("\nEntered matrix: \n");

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

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

printf("%d ", a[i][j]);

if (j == c - 1)

printf("\n");

}

// computing the transpose

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

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

transpose[j][i] = a[i][j];

}

// printing the transpose

printf("\nTranspose of the matrix:\n");

for (int i = 0; i < c; ++i)

for (int j = 0; j < r; ++j) {

printf("%d ", transpose[i][j]);

if (j == r - 1)

printf("\n");

}

return 0;

}

**Output**

Enter rows and columns: 2

3

Enter matrix elements:

Enter element a11: 1

Enter element a12: 4

Enter element a13: 0

Enter element a21: -5

Enter element a22: 2

Enter element a23: 7

Entered matrix:

1 4 0

-5 2 7

Transpose of the matrix:

1 -5

4 2

0 7