1.Rotate the matrix by K times means rotating the given NN matrix to the specified (K) number of times. For example, consider the 33 matrix, which has to be rotated once, Enter the Size of the Matrix: 3, 3

Enter the Elements of the Matrix: 10, 20, 39, 40, 50, 60, 70, 80, 90

Enter the value of K (Number of Rotations): 1

Matrix before Rotation:

10 20 30

40 50 60

70 80 90

Matrix after Rotation:

20 30 10

50 60 40

80 90 70

**Solution:-**

#include <iostream>

#define M 3

#define N 3

using namespace std;

// Function to print the matrix

void displayMatrix(int matrix[][M])

{

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

{

for (int j = 0; j < M; j++)

{

cout << matrix[i][j] << " ";

}

cout << endl;

}}

// Main Function

int main()

{

int matrix[N][M];

cout<<"Enter the matrix elements"<<endl;

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

{

for(int j = 0 ; j < N ; j++)

{

cin >> matrix[i][j]; // Input the matrix elements

}}

cout << "The given matrix is" << endl;

displayMatrix(matrix);

int temp[M];

int k;

cout << "Number of rotations : ";

cin >> k; // input the number of rotations

k = k % M;

// For rotating matrix by k times

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

{

// copy first M-k elements to temporary array

for (int t = 0; t < M - k; t++)

{

temp[t] = matrix[i][t];

}

// copy the elements from k to end to starting

for (int j = M - k; j < M; j++)

{

matrix[i][j - M + k] = matrix[i][j];

}

// copy elements from temporary array to end

for (int j = k; j < M; j++)

{

matrix[i][j] = temp[j - k];

}}

cout<<"\nThe rotated matrix is\n";

// display rotated matrix

displayMatrix(matrix);

return 0;

}

Output:-

