9 June

**Write a C Program to rotate the matrix by K times.**

|  |
| --- |
|  |
|  | #include<iostream> |
|  | // size of matrix |
|  | #define M 3 |
|  | #define N 3 |
|  |  |
|  | using namespace std; |
|  |  |
|  | // function to rotate matrix by k times |
|  | void rotateMatrix(int matrix[][M], int k) { |
|  | // temporary array of size M |
|  | int temp[M]; |
|  |  |
|  | // within the size of matrix |
|  | k = k % M; |
|  |  |
|  | 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]; |
|  | } |
|  | } |
|  |  |
|  | // function to display 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; |
|  | } |
|  | } |
|  |  |
|  | // Driver's code |
|  | int main() { |
|  | int matrix[N][M] = {{12, 23, 34}, |
|  | {45, 56, 67}, |
|  | {78, 89, 91}}; |
|  | int k = 2; |
|  |  |
|  | // rotate matrix by k |
|  | rotateMatrix(matrix, k); |
|  |  |
|  | // display rotated matrix |
|  | displayMatrix(matrix); |
|  |  |
|  | return 0; |
|  | } |
|  | Output: |
|  | 23 34 12 |
|  | 56 67 45 |
|  | 89 91 78 |