CODE 1:

```
import java.util.*;
public class Main {
  public static void main(String[] args) {
     Scanner sc =new Scanner(System.in);
     int N =sc.nextInt();
     int M =sc.nextInt();
     int[][] arr =new int[N][M];
     for(int i =0;i < N;i++){
        for(int j =0;j<M;j++){
           arr[i][j] =sc.nextInt();
        }
     }
     for (int j =0;j <M;j++) {
        if (j%2==0) {
           for(int i =0;i<N;i++){
              System.out.print(arr[i][j] + " ");
           }
        } else{
           for(int i =N - 1;i >=0;i--){
              System.out.print(arr[i][j] + " ");
           }
        }
     }
  }
}
```

CODE 2:

```
import java.util.*;
public class Main {
  public static void main(String[] args) {
     Scanner sc =new Scanner(System.in);
     int N =sc.nextInt();
     int M =sc.nextInt();


     int[][] arr =new int[N][M];
     for (int i =0;i <N;i++){
        for(int j =0;j <M;j++){
           arr[i][j] =sc.nextInt();
        }
```

```
    }
    for(int j =0;j <M;j++){
       for(int i =0;i <N;i++){
          System.out.print(arr[i][j] + " ");
       }
       System.out.println();
    }
 }
}
```

CODE 3:

```
import java.util.*;
public class Main {
  public static void main(String[] args){
     Scanner sc =new Scanner(System.in);
     int N =sc.nextInt();
     int M =sc.nextInt();
     int[][] arr =new int[N][M];
     for (int i =0;i <N;i++){
        for (int j =0;j <M;j++){
           arr[i][j] =sc.nextInt();
        }
     }
     int top =0, bottom =N-1;
     int left =0, right =M-1;
     while(top <=bottom && left<= right){
        for (int j =left;j <=right;j++){
           System.out.print(arr[top][j] + " ");
        }
        top++;
        for(int i =top;i <=bottom;i++){
           System.out.print(arr[i][right] + " ");
        }
        right--;
        if(top <=bottom) {
           for(int j =right; j >=left;j--){
              System.out.print(arr[bottom][j] + " ");
           }
           bottom--;
        }
        if (left <=right) {
           for (int i =bottom;i >=top;i--){
              System.out.print(arr[i][left] + " ");
```

```
            }
            left++;
        }
    }
 }
}
```

CODE 4:

```
import java.util.*;
public class Main {
  public static void main(String[] args) {
     Scanner sc =new Scanner(System.in);
     int N =sc.nextInt();
     int[][] arr =new int[N][N];
     for (int i =0;i <N;i++){
        for(int j =0;j <N;j++){
           arr[i][j] =sc.nextInt();
        }
     }
     for (int i =0; i <N;i++){
        for(int j =i;j <N;j++){
           int temp =arr[i][j];
           arr[i][j] =arr[j][i];
           arr[j][i] =temp;
        }
     }
     for(int i =0;i <N;i++){
        int left =0,right =N-1;
        while(left<right){
           int temp =arr[i][left];
           arr[i][left] =arr[i][right];
           arr[i][right] =temp;
           left++;
           right--;
        }
     }
     for(int i =0;i <N;i++){
        for(int j =0;j <N;j++){
           System.out.print(arr[i][j] + " ");
        }
        System.out.println();
     }
  }
```

```
}
```

ROTATE IMAGE(LEETCODE):

```
class Solution {
  public List<Integer> spiralOrder(int[][] matrix){
      List<Integer> result = new ArrayList<>();
      if(matrix.length==0) return result;
      int top=0,bottom=matrix.length-1;
      int left=0,right=matrix[0].length-1;
      while(top<=bottom && left<=right){
          for(int j=left;j<=right;j++){
              result.add(matrix[top][j]);
          }
          top++;
          for(int i=top;i<=bottom;i++){
              result.add(matrix[i][right]);
          }
          right--;
          if(top<=bottom){
              for(int j=right;j>=left;j--){
                  result.add(matrix[bottom][j]);
              }
```

```
            bottom--;
        }
        if(left<=right){
            for(int i=bottom;i>=top;i--){
                result.add(matrix[i][left]);
            }
            left++;
        }
    }
    return result;
  }
}
```

ROTATE BY 90 DEGREES:

```
class Solution {
  static void rotateMatrix(int mat[][]){
    int n = mat.length;
    for (int i =0; i <n;i++){
        for (int j =i;j <n;j++){
            int temp =mat[i][j];
            mat[i][j] =mat[j][i];
            mat[j][i] =temp;
        }
    }
    for(int j = 0; j < n; j++) {
        int top =0, bottom =n-1;
        while (top < bottom){
            int temp =mat[top][j];
            mat[top][j] =mat[bottom][j];
            mat[bottom][j] =temp;
            top++;
```

```
            bottom--;
        }
    }
  }
}
```

ROTATE A MATRIX BY 180 DEGREES COUNTERCLOCKWISE:

```
class Solution{
  void rotateMatrix(int[][] mat){
    int n=mat.length;
    for(int i=0;i<n/2;i++){
        for(int j=0;j<n;j++){
            int temp=mat[i][j];
            mat[i][j]=mat[n-1-i][n-1-j];
            mat[n-1-i][n-1-j]=temp;
        }
    }
    if(n%2==1){
        int mid=n/2;
        for(int j=0;j<n/2;j++){
            int temp=mat[mid][j];
            mat[mid][j]=mat[mid][n-1-j];
            mat[mid][n-1-j]=temp;
        }
    }
  }
}
```