import java.util.Scanner;

class Transpose {

public static void main(String[] args) {

int[][] matrix;

int[][] transpose;

int sum = 0, r, c;

Scanner in = new Scanner(System.in);

System.out.print("Enter the Number of Rows : ");

r = in.nextInt();

System.out.print("nter the Number of Columns : ");

c = in.nextInt();

if (r != c) {

System.out.println("Only square matrix allowed.");

} else {

matrix = new int[r][c];

transpose = new int[c][r];

System.out.print("Enter the Elements of Matrix : ");

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

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

matrix[i][j] = in.nextInt();

}

}

System.out.println("\nGiven Matrix");

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

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

System.out.print(matrix[i][j] + " ");

}

System.out.print("\n");

}

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

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

transpose[j][i] = matrix[i][j];

if (i == j) {

sum = sum + (matrix[i][j]);

}

}

}

System.out.println("\nThe Trace of the Given Matrix is = " + sum);

System.out.println("\nTranspose Matrix");

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

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

System.out.print(transpose[i][j] + " ");

}

System.out.print("\n");

}

}

}

}