

Det.java

```
1 import java.lang.reflect.Array;
2 import java.util.Arrays;
3 import java.util.Scanner;
4
5 public class Det {
6     public static void main(String[] args) {
7         int[][] mat = InputMatrix();
8         print(mat);
9         //int[][] m = { { 1, 2, 3, 0 }, { 0, 3, 5, 1 }, { 0, 1, 9, -6 }, { 1, -5, -2, 8 } };
10        System.out.println("Determinant is : " + Determinant(mat));
11    }
12
13
14    private static int[][] InputMatrix() {
15        Scanner sc = new Scanner(System.in);
16        int m = sc.nextInt();
17        int n = sc.nextInt();
18        int[][] Matrix = new int[m][n];
19        MatrixIsSquare(Matrix);
20        for (int i = 0; i < m; i++) {
21            for (int j = 0; j < n; j++) {
22                Matrix[i][j] = sc.nextInt();
23            }
24        }
25        sc.close();
26        return Matrix;
27    }
28
29    private static void MatrixIsSquare(int[][] Matrix) {
30        if (Matrix[0].length != Matrix.length) {
31            System.out.println("CANT FIND DET");
32            System.exit(0);
33        }
34    }
35
36    private static int[][] GetCofactor(int[][] Matrix, int DelRow, int DelCol) {
37        int i = 0, j = 0;
38        int[][] temp = new int[Matrix.length - 1][Matrix.length - 1];
39        for (int row = 0; row < Matrix[0].length; row++) {
40            for (int col = 0; col < Matrix.length; col++) {
41                if (row != DelRow && col != DelCol) {
42                    temp[i][j++] = Matrix[row][col];
43                }
44                if (j == Matrix.length - 1) {
45                    j = 0;
46                    i++;
47                }
48            }
49        }
50        return temp;
51    }
52
53    private static int Determinant(int[][] Matrix) {
54        int det = 0;
55        int sign = 1;
56        if (Matrix[0].length == 1 && Matrix.length == 1) {
57            return Matrix[0][0];
58        }
59        for (int i = 0; i < Matrix.length; i++) {
60            det += sign * Matrix[0][i] * Determinant(GetCofactor(Matrix, 0, i));
61            sign = -sign;
62        }
63        return det;
64    }
65
66
67    private static void print(int[][] n) {
68        for (int[] row : n) {
69            System.out.println(Arrays.toString(row));
70        }
71    }
72
73 }
```