Ending Poverty

The government wants to solve the poverty problem of the country. To do that they need to collect data about the socio-economic life of the country. The country can be considered as a grid of size $\mathbf{n \times m}$. Government planning to use some kind of software that can predict the financial status of each family. Note that exactly one family is living on each cell of the grid and each family has a distinct financial status value(*FSV*) in the range $\mathbf{[1, n \cdot m]}$. More precisely, the *FSV* of all cells in the grid (country) forms a permutation of integers from $\mathbf{1}$ to $\mathbf{n \cdot m}$. Since the government thinks straightforwardly, it always wants to help the family with the lowest *FSV* in some regions.

We denote the cell at row $\mathbf{i}$, column $\mathbf{j}$ as $\mathbf{(i, j)}$. Meanwhile a region (submatrix) defined by $\mathbf{((x_1, y_1), (x_2, y_2))}$ where $\mathbf{1 \le x_1 \le x_2 \le n}$ and $\mathbf{1 \le y_1 \le y_2 \le m}$ and the region itself contains the cells $\mathbf{(x, y)}$ for which $\mathbf{x_1 \le x \le x_2}$ and $\mathbf{y_1 \le y \le y_2}$. Two regions $\mathbf{((x_1, y_1), (x_2, y_2))}$ and $\mathbf{((x'_1, y'_1), (x'_2, y'_2))}$ are the same if and only if $\mathbf{((x_1, y_1), (x_2, y_2)) = ((x'_1, y'_1), (x'_2, y'_2))}$.

To determine how to distribute government budget of the country in an effective manner, the government wants to know how many regions (submatrices) are there such that the minimum *FSV* of the region is equal to $\mathbf{x}$. Help the government to find the answers for all $\mathbf{x = 1, 2, \ldots, n \cdot m}$ to solve the poverty problem of the country.

Submit Solution

Points: 1

Time limit: 1.0s
Java 8: 3.0s
Python: 5.0s

All submissions

Best submissions

My submissions

Input Format

The first line of the input contains two integers $\mathbf{n}$ and $\mathbf{m}$.

Then follow $\mathbf{n}$ lines, where $\mathbf{i^{th}}$ of them contains $\mathbf{m}$ integers, where the $\mathbf{j^{th}}$ integer is the *FSV* value of cell in $\mathbf{(i, j)}$, where it shows the financial status of family located in the cell $\mathbf{(i, j)}$.

Constraint

$\mathbf{1 \le n, m \le 300}$

It is guaranteed that the grid values form a permutation of integers from $\mathbf{1}$ to $\mathbf{n \cdot m}$.

Output Format

Print $\mathbf{n \cdot m}$ lines, with one integer on each line. The integer on the $\mathbf{i^{th}}$ line is the answer for $\mathbf{x = i}$.

Sample Input:

Copy

```
2 3
2 5 1
6 3 4
```

Sample Output:

Copy

```
6
4
5
1
1
1
```

Request clarification