

## C. Those Who Are With Us

time limit per test: 1 second  
 memory limit per test: 256 megabytes

You are given a matrix of integers with  $n$  rows and  $m$  columns. The cell at the intersection of the  $i$ -th row and the  $j$ -th column contains the number  $a_{ij}$ .

You can perform the following operation **exactly once**:

- Choose two numbers  $1 \leq r \leq n$  and  $1 \leq c \leq m$ .
- For all cells  $(i, j)$  in the matrix such that  $i = r$  or  $j = c$ , decrease  $a_{ij}$  by one.

You need to find the minimal possible maximum value in the matrix  $a$  after performing exactly one such operation.

### Input

Each test consists of multiple test cases. The first line contains a single integer  $t$  ( $1 \leq t \leq 10^4$ ) — the number of test cases. The description of the test cases follows.

The first line of each test case contains two integers  $n$  and  $m$  ( $1 \leq n \cdot m \leq 10^5$ ) — the number of rows and columns in the matrix.

The next  $n$  lines of each test case describe the matrix  $a$ . The  $i$ -th line contains  $m$  integers  $a_{i1}, a_{i2}, \dots, a_{im}$  ( $1 \leq a_{ij} \leq 100$ ) — the elements in the  $i$ -th row of the matrix.

It is guaranteed that the sum of  $n \cdot m$  across all test cases does not exceed  $2 \cdot 10^5$ .

### Output

For each test case, output the minimum maximum value in the matrix  $a$  after performing exactly one operation.

### Example

input

Copy

```
10
1 1
1
1 2
1 2
2 1
2
1
2 2
4 2
3 4
3 4
1 2 3 2
3 2 1 3
2 1 3 2
4 3
1 5 1
3 1 3
5 5 5
3 5 1
4 4
1 3 3 2
2 3 2 2
1 2 2 1
3 3 2 3
2 2
2 2
```

### Codeforces Round 1032 (Div. 3)

Contest is running

01:53:20

Contestant



### → Submit?

Language: GNU G++23 14.2 (64 bit, ms) ▼

Choose file:  No file chosen

### → Last submissions

Submission	Time	Verdict
<a href="#">324819072</a>	Jun/17/2025 17:55	Accepted
<a href="#">324811403</a>	Jun/17/2025 17:50	Wrong answer on test 1

```

1 2
3 2
1 2
2 1
1 2
3 3
2 1 1
1 2 1
1 1 2

```

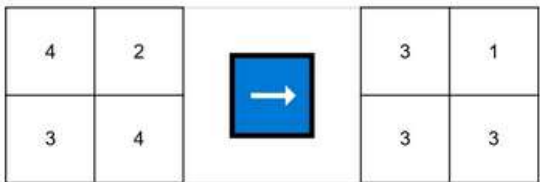
output Copy

```

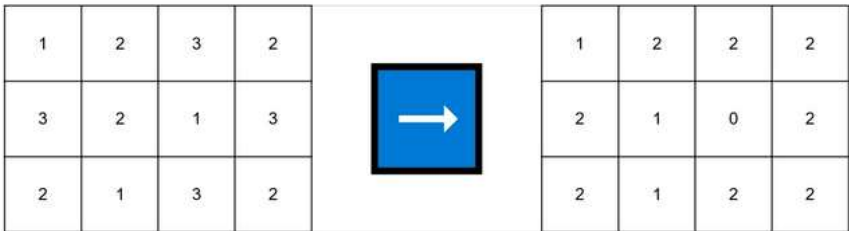
0
1
1
3
2
4
3
1
1
2

```

**Note**  
 In the first three test cases, you can choose  $r = 1$  and  $c = 1$ .  
 In the fourth test case, you can choose  $r = 1$  and  $c = 2$ .



In the fifth test case, you can choose  $r = 2$  and  $c = 3$ .



In the sixth test case, you can choose  $r = 3$  and  $c = 2$ .

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