Problem H. Shreckless

Time limit: 2 seconds
Memory limit: 512 megabytes

Lord Farquaad has a table a of integers with n rows and m columns. Since he is obsessed with order, he wants each row of the table to be sorted in nondecreasing order.

Shrek, who finds Farquaad's need for order ridiculous, has other plans. He can arbitrarily permute the numbers in each column, and wants to make sure that not a single row in the table is nondecreasing. Can he achieve his goal?

An array $a_1, a_2, \ldots, a_k$ is called nondecreasing, if $a_1 \le a_2 \le \ldots \le a_k$.

Input

Each test consists of multiple test cases. The first line contains a single integer t — the number of test cases. The description of the test cases follows.

The first line of each test case contains two integer n, m — dimensions of the table.

The i-th of the next n lines contains m integers $a_{i,1}, a_{i,2}, \ldots, a_{i,m}$ — elements of the i-th row.

Constraints

$1 \le t \le 2 \cdot 10^4$,

$2 \le n, m \le 10^5$,

$n \cdot m \le 2 \cdot 10^5$,

the sum of $n \cdot m$ over all test cases doesn't exceed $2 \cdot 10^5$,

$1 \le a_{i,j} \le 10^9$.

Output

For each test case, if Shrek can make each row not nondecreasing, output `YES`. Else, output `NO`.

Example

standard input	standard output
3 2 2 69 69 2024 42 3 3 1 1 1 1 1 1 2 2 2 3 4 1 1 1 1 1 1 1 1 2 2 2 2	YES NO YES

Note

In the **first** test case, initially the first row is $[69, 69]$, and therefore is nondecreasing. However, Shrek can swap the numbers in the first column, getting

2024	69
69	42

In the **second** test case, there is no way to rearrange columns to make each row not nondecreasing.

In the **third** test case, Shrek can rearrange columns as follows:

1	1	2	1
1	2	1	1
2	1	1	2