Lost Island

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	1024 megabytes

The light began to flicker more and more, its glow growing fragile—on the verge of vanishing. The elemental flows that once sustained the island wavered, and the very forces that shaped the land began to scatter.

In a final attempt, the people tried to return everything to its rightful place. They worked to realign the disrupted patterns, to weave the island back together and restore the balance that had unraveled.

Witness their last effort to protect the island, and uncover the answer they could not find.

All the islanders have gathered in one place. The land they occupy is represented as a grid of size $N \times M$. The cell at the r-th row from the top and c-th column from the left is denoted as (r, c).

Each cell in the grid is engraved with a pattern representing everything the people have created and protected. However, the original order of these patterns has been lost, and they are now arranged randomly.

The people believe that restoring left–right (mirror) symmetry—making the grid symmetric from left to right—will bring back the lost order.

Let's consider the following example. For convenience, each pattern is labeled with a number. In the image below, the grid on the left is not left-right symmetric. However, by rearranging the patterns appropriately, it can be transformed into the grid on the right, which is left-right symmetric:

3	5	9	2	5
9	6	3	5	7
5	3	6	9	3
2	9	6	3	6
2	3	9	5	2

3	2	9	2	3
9	6	5	6	9
5	3	6	3	5
9	5	6	5	9
2	3	7	3	2

The islanders want to know whether it is possible to rearrange the patterns in the grid so that the final configuration restores the island's order through left-right symmetry.

Input

The first line contains two space-separated integers N and M, denoting the size of the grid.

The following N lines each contain the initial state of the grid. Each line contains M integers $A_{i1}, A_{i2}, \cdots, A_{iM}$, where A_{rc} corresponds to the integer representing the pattern in cell (r, c).

- $1 \leq N \leq 100$
- $1 \leq M \leq 100$
- $1 \leq A_{ij} \leq 10^4$ $(1 \leq i \leq N, 1 \leq j \leq M)$

Output

If it is possible to rearrange the patterns in the grid to make it left-right symmetric, output `YES`.

Otherwise, if it is impossible to achieve such symmetry through rearrangement, output `NO`.

Scoring

- Subtask 1 (10 points): $M = 1$
- Subtask 2 (20 points): $N = 1$, M is even
- Subtask 3 (20 points): $N = 1$
- Subtask 4 (10 points): M is even
- Subtask 5 (40 points): No additional constraints.

Examples

standard input	standard output
5 5 3 5 9 2 5 9 6 3 5 7 5 3 6 9 3 2 9 6 3 6 2 3 9 5 2	YES
4 1 1 4 2 3	YES
1 6 2 3 3 2 3 2	NO
1 7 2 3 2 2 3 1 2	YES
2 4 4 3 3 7 2 7 2 4	YES
2 4 4 3 3 7 2 9 2 4	NO
3 5 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15	NO
2 5 1 5 6 2 5 3 2 4 1 3	YES