Problem C. Paths in Matrix

Input file:	*standard input*
Output file:	*standard output*
Time limit:	3 seconds
Memory limit:	1024 mebibytes

You are given a matrix with n rows (numbered from 1 to n) and m columns (numbered from 1 to m). An integer $a_{i,j}$ is written in the cell belonging to the i-th row and j-th column.

A chip is initially in the cell $(1, 1)$, and it will be moved to the cell (n, m). During each move, it moves to the next cell either in the current row or in the current column (if the current cell is (x, y), then it moves either to $(x + 1, y)$ or to $(x, y + 1)$). The chip cannot leave the matrix. Let's denote the route of the chip from cell $(1, 1)$ to cell (n, m) as a *path*.

The cost of a path is the sum of all integers written in the cells on this path **without repetitions**. For example, if the numbers written in the cells are $[5, 7, 3, 5, 5, 1, 7]$, then the cost of the path is $5 + 7 + 3 + 1 = 16$. Calculate the sum of costs for all possible paths.

Input

The first line contains two integers n and m ($1 \le n, m \le 500$) — the dimensions of the matrix.

Then n lines follow, the i-th of them contains m integers $a_{i,1}, a_{i,2}, \ldots, a_{i,m}$ ($1 \le a_{i,j} \le 998\,244\,352$).

Output

Print one integer — the sum of costs for all possible paths. Since it can be huge, print it modulo 998 244 353.

Examples

standard input	standard output
2 3 1 3 2 2 4 2	23
3 3 1 5 1 1 1 5 9 1 1	35

Note

In the first example from the statement, there are three possible paths:

- $a_{1,1} \to a_{2,1} \to a_{2,2} \to a_{2,3}$; its cost is equal to $1 + 2 + 4 = 7$;
- $a_{1,1} \to a_{1,2} \to a_{2,2} \to a_{2,3}$; its cost is equal to $1 + 2 + 3 + 4 = 10$;
- $a_{1,1} \to a_{1,2} \to a_{1,3} \to a_{2,3}$; its cost is equal to $1 + 2 + 3 = 6$.

The sum of costs over all possible paths is equal to $7 + 10 + 6 = 23$.

In the second example from the statement, there are six possible paths:

- $a_{1,1} \to a_{2,1} \to a_{3,1} \to a_{3,2} \to a_{3,3}$; its cost is equal to $1 + 9 = 10$;

- $a_{1,1} \to a_{2,1} \to a_{2,2} \to a_{3,2} \to a_{3,3}$; its cost is equal to 1;
- $a_{1,1} \to a_{2,1} \to a_{2,2} \to a_{2,3} \to a_{3,3}$; its cost is equal to $1 + 5 = 6$;
- $a_{1,1} \to a_{1,2} \to a_{2,2} \to a_{3,2} \to a_{3,3}$; its cost is equal to $1 + 5 = 6$;
- $a_{1,1} \to a_{1,2} \to a_{2,2} \to a_{2,3} \to a_{3,3}$; its cost is equal to $1 + 5 = 6$;
- $a_{1,1} \to a_{1,2} \to a_{1,3} \to a_{2,3} \to a_{3,3}$; its cost is equal to $1 + 5 = 6$.

The sum of costs over all possible paths is equal to $10 + 1 + 6 + 6 + 6 + 6 = 35$.