Minesweeper

2024/2025 SEASON – FOURTH ROUND

Sponegbob The Sponge is in love with the game Minesweeper. It takes place on a table with N rows and M columns, where the value $a_{i,j}$ is 1 if there is a mine at the cell (i,j) and 0 if there is no mine. At the start of the game the player does not know where the mines are and has to choose cells to open. When a cell is opened, the player sees how many mines touch that cell (two cells touch if they share a side or a corner). The player wins when all the cells that do not contain mines are opened. Each move in the game consists of the following steps:

1. The player selects a cell to open.
2. If the player opens a cell with a mine, they lose.
3. If the chosen cell does not contain a mine, cells are opened according to the next steps.
4. If the current cell does not touch any mines, all the cells that touch it are opened, and the process is repeated from this step (step 4) for those cells.
5. If the current cell touches mines, the process for that cell ends at this step.
6. Once the process is completed for all the cells that will be opened, the move ends, and a new move starts again from step 1.

The Sponge considers himselft to be relatively good at the game, but to be safe, he wants to know the minimum number of moves required to win the game for a given Minesweeper board. He gives you the values of N, M, and the values $a_{i,j}$, which indicate the positions of the mines, and asks you to write a program that finds the minimum number of moves needed.

Input

The first line of the file **minesweeper.in** contains N and M – the amount of rows and columns of the table. Each of the next N lines contains M numbers: the number j on line i is $a_{i,j}$, showing whether there is a mine on that cell.

Output

On the only line of the file **minesweeper.out** print 1 number – the desired minimum number of moves.

Constraint

$1 \leq N, M \leq 10^3$

$0 \leq a_{i,j} \leq 1$

Time Limit: 0.5 sec.

Memory Limit: 256 MB.

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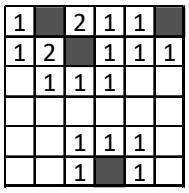
Sample Test

Input (minesweeper.in)	Output (minesweeper.out)
6 6 0 1 0 0 0 1 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0	5

Sample test explanation

The opened table looks like this:



An example game which takes 5 moves is shown below (blue marks the cell which was pressed):