Game on a Matrix (matgame)

John is playing a game on a square matrix of dimensions $N \times N$. The rows and the columns of the matrix are numbered from 1 to N. Cell (i, j) is the cell located in the j-th column of the i-th row. The matrix contains integers in each cell, specifically, the number written in cell (i, j) is $a_{i,j}$.

The game consists of a sequence of moves of the form:

- Select a cell (i, j).
- The score of the move is the value $a_{i,j}$ written in cell (i, j).
- Remove the i-th row and the j-th column from the matrix.
- Repeat the same process until the matrix becomes empty.

The *score of the game* is defined as the **minimum of the scores of the moves**. John asks you to determine the maximum possible score of a game that can be played on the given matrix.

☞ Among the attachments of this task you may find a template file `matgame.*` with a sample incomplete implementation.

Input

The first line of input contains N, the number of rows and columns of the matrix.

Each of the next N lines contains N numbers. The j-th number in the i-th line is the value $a_{i,j}$, i.e., the number written in cell (i, j).

Output

Output a single number, representing the maximal possible score achievable in a game.

Constraints

- $1 \leq N \leq 1\,000$.
- $0 \leq a_{i,j} \leq 10^9$ for each $i = 1 \ldots N$ and $j = 1 \ldots N$.

Scoring

Your program will be tested against several test cases grouped in subtasks. In order to obtain the score of a subtask, your program needs to correctly solve all of its test cases.

– **Subtask 1** (0 points) Examples.

– **Subtask 2** (10 points) $N \leq 10$.

– **Subtask 3** (30 points) $N \leq 300$, $0 \leq a_{i,j} \leq 1$ for each $i = 1 \ldots N$ and $j = 1 \ldots N$.

– **Subtask 4** (45 points) $N \leq 100$.

– **Subtask 5** (15 points) No additional limitations.

Examples

input	output
3 8 0 7 5 6 9 1 7 9	7

Explanation

In the sample case, one possible optimal way of playing the game is as follows:

- First, select cell $(1, 1)$ with the value 8, and remove the first row and the first column. The matrix becomes this: $\begin{matrix} 6 & 9 \\ 7 & 9 \end{matrix}$
- Then, select the cell $(2, 1)$ of this new matrix with the value 7, and remove the second row and the first column. The matrix will consist of a single value 9.
- Finally, select the single value 9 in the matrix, and remove it so that the matrix becomes empty.

The score of the game is the minimum of the scores of the moves, which is 7.