Problem G

Largest Exotic Number

Athanasios: I have an interesting problem to be proposed for ACM-ICPC INC 2017!
Berdine: What the problem is about?
Athanasios: It involves an exotic algorithm.
Berdine: ... alright, let's hear it!

For readability reason, the element of a matrix A at the a-th row and b-th column, $A_{a,b}$, will be written as (a, b). The matrix indices start at 1.

Given a matrix A of size $N \times N$, two elements in the matrix (a, b) and (c, d) are called an exotic pair if all these three conditions are satisfied:
1. (a, b) and (c, d) have the same value.
2. At least one of the following condition is satisfied: a ≠ c, or b ≠ d.
3. Both of the following conditions are satisfied: a ≤ c, and b ≤ d.

For example, given a matrix:

3 2 1
5 2 3
4 3 4

There are four exotic pairs in the matrix:
- (1, 1) and (2, 3), of value 3;
- (1, 1) and (3, 2), of value 3;
- (2, 1) and (2, 2), of value 2;
- (3, 1) and (3, 3), of value 4.

Among those four exotic pairs, (3, 1) and (3, 3) have the largest value (of 4); we call this kind of number as the largest exotic number.

Your task in this problem is to find the largest exotic number given a matrix, or output -1 if there is no such number.

Input

The first line contains an integer: N ($2 \le N \le 300$) denoting the size of the matrix. The following N lines, each contains N integers (each separated by a single space): $A_{i,j}$ ($1 \le A_{i,j} \le 100{,}000$) denoting the matrix element at i-th row and j-th column for $1 \le i \le N$ and $1 \le j \le N$, respectively.

Output

The output contains the largest exotic number for the given input, in a line. Output -1 if there is no such number.

Sample Input	Output for Sample Input
3 3 2 1 5 2 3 4 3 4	4
4 3 2 1 4 4 2 1 4 5 1 2 1 3 1 5 6	5
2 1 2 2 4	-1