

# Relative Board

[English](#)

[Vietnamese](#)

Given a matrix  $A$  with dimension  $N \times N$  ( $2 \leq N \leq 1000$ ) which contains only 6 types of value:  $\{-1, -2, 0, 1, 2, 3\}$

$A$  is called the relative board of a sequence  $T = (T_1, T_2, \dots, T_n)$ , or  $T$  relates to  $A$  if:

- $A_{ij} = 0 : T_i = T_j$
- $A_{ij} = 1 : T_i < T_j$
- $A_{ij} = -1 : T_i > T_j$
- $A_{ij} = 2 : T_i \leq T_j$
- $A_{ij} = -2 : T_i \geq T_j$
- $A_{ij} = 3 : T_i$  is not equal to  $T_j$

For all  $i, j: 1 \leq i, j \leq N$

Given the relative board  $A$ , find the sequence of positive integers  $T = (T_1, T_2, \dots, T_n)$  that relates to  $A$  such that  $\text{Max}(T)$  is as small as possible. Suppose that the sequence  $T$  always exists.

Define  $\text{Max}(T) = \text{Max}(T_1, T_2, \dots, T_n)$ .

## Input

The first line contains an integer  $N$ .  $N$  lines follow, each line contains  $N$  integers that describe the relative board  $A$ .

## Output

The first line contains  $\text{Max}(T)$ . The second line contains  $N$  separated positive integers  $T_1, T_2, \dots, T_n$ .

## Score

Your score =  $\text{Max}(T)$ .

## Example

**Input:**

```
6
0 1 1 1 2 2
-2 0 1 0 2 2
-2 -1 0 3 0 1
-2 -2 3 0 1 1
-1 -2 0 -1 0 1
-1 -2 -1 -1 -1 0
```

**Output:**

4

1 2 3 2 3 4

-> Score = 4