

## Problem K – Keep Branches Ordered.

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Nlogonia postal offices have  $N$  branches across the cities labeled with numbers from 1 to  $N$ , to deliver the mail each morning buses go from one branch to another based on a map of branches that has been created. This map of branches specify to what branches a bus that depart from branch  $i$  can go next in his traveling. Since the buses leave early morning, it is very common that some bus drivers do not pay attention to the branches map and go to branches not intended for the branch they depart from, this is a problem for the postal offices deliveries as people that expect their packages to be delivered at a branch may not get them in time.

The postal offices manager has determined that a relabeling of the branches should be made so that if a bus departs from a branch with the label  $i$ , any of its destinations branches  $j$  should have a label greater than  $i$ , the manager believes this will help stop bus drivers going to the wrong branches because now they can at least check if they are driving to a branch with a higher label than the one they depart from.

Given the branches map, help the postal offices manager determine what the new label for each branch should be.

### Input

The first line of the input contains an integer  $N$  ( $1 \leq N \leq 100$ ), representing the number of branches. Each of the next  $N$  lines contains  $N$  integer numbers separated by a space, the  $j$ -th integer in the  $i$ -th line represents whether or not bus drivers should go from branch  $i$  to branch  $j$  based on the branches map.

### Output

Output a single line with  $N$  integers separated by a space where the  $i$ -th integer represents the new label for the  $i$ -th branch, or  $-1$  if no possible relabeling exists. If more than one labeling exists, print the lexicographically smallest. For two labelings  $p$  and  $q$ , we say that  $p$  is lexicographically smaller than  $q$  if and only if there exists an index  $1 \leq l \leq N$  such that: For any  $1 \leq i < l$ ,  $p_i = q_i$  and  $p_l < q_l$ .

<b>Sample input 1</b> 4 0 1 0 0 0 0 1 0 0 0 0 1 0 0 0 0	<b>Sample output 1</b> 1 2 3 4
<b>Sample input 2</b> 3 0 1 0 0 0 1 1 0 0	<b>Sample output 2</b> -1