Problem J. Job Lookup

Time limit: 3 seconds
Memory limit: 512 megabytes

Julia's n friends want to organize a startup in a new country they moved to. They assigned each other numbers from 1 to n according to the jobs they have, from the most front-end tasks to the most back-end ones. They also estimated a matrix c, where $c_{ij} = c_{ji}$ is the average number of messages per month between people doing jobs i and j.

Now they want to make a hierarchy tree. It will be a **binary tree** with each node containing one member of the team. Some member will be selected as a leader of the team and will be contained in the root node. In order for the leader to be able to easily reach any subordinate, for each node v of the tree, the following should apply: all members in its left subtree must have smaller numbers than v, and all members in its right subtree must have larger numbers than v.

After the hierarchy tree is settled, people doing jobs i and j will be communicating via the shortest path in the tree between their nodes. Let's denote the length of this path as d_{ij}. Thus, the cost of their communication is $c_{ij} \cdot d_{ij}$.

Your task is to find a hierarchy tree that minimizes the total cost of communication over all pairs: $\sum_{1 \le i < j \le n} c_{ij} \cdot d_{ij}$.

Input

The first line contains an integer n ($1 \le n \le 200$) – the number of team members organizing a startup.

The next n lines contain n integers each, j-th number in i-th line is c_{ij} — the estimated number of messages per month between team members i and j ($0 \le c_{ij} \le 10^9; c_{ij} = c_{ji}; c_{ii} = 0$).

Output

Output a description of a hierarchy tree that minimizes the total cost of communication. To do so, for each team member from 1 to n output the number of the member in its parent node, or 0 for the leader. If there are many optimal trees, output a description of any one of them.

Example

standard input	standard output
4 0 566 1 0 566 0 239 30 1 239 0 1 0 30 1 0	2 4 2 0

Note

The minimal possible total cost is $566 \cdot 1 + 239 \cdot 1 + 30 \cdot 1 + 1 \cdot 2 + 1 \cdot 2 = 839$: