

F. Intuition (round 2)

Input: standard input (from the keyboard)

Output: standard output (to the screen)

Time limit: 1 second

Memory limit: 256 Mb

Problem

In the TV-show «Intuition» a participant has to guess, which occupations the people, presented to him, have. The participant sees the list of occupations and the people, corresponding to them. Also he knows, that every occupation is possessed by exactly one human and that every human has exactly one occupation from the list. The participant has to distribute the occupations between the people correctly. He may exclude some variants, which seem impossible to him: for example, a model-like girl is doubtedly a bodybuilder, and a human, covered with tattoos, most likely, won't be a school director. :) Maybe, the participant has involved wrong restrictions and due to this he won't be able to distribute the occupations correctly or won't have possible variants at all. But he wants to check at least, if his restrictions imply a unique distribution of the occupations between the people.

Input

There is a natural number n – the quantity of people and of occupations, corresponding to them ($n \leq 2000$), in the first line of the input. Then a table of n line follows, there are n numbers, equal to 0 or 1, in each line. If for some integer i, j ($1 \leq i, j \leq n$) the j -th number in the i -th line of the table is equal to 0, then the i -th human, by participant's opinion, can't have the j -th occupation. In the opposite case the i -th human can have the j -th occupation. The numbers in the lines of the table are splitted by single spaces.

Output

If the given restrictions imply a unique distribution of the occupations between the people, output 1. In another case output 0.

Example

Input	Output
3 0 1 0 1 1 0 1 0 1	1
4 1 1 1 1 1 1 0 0 1 1 0 0 1 1 0 0	0
2 1 1 1 1	0