E. Strictly Positive Matrix

time limit per test: 1 second
memory limit per test: 256 megabytes
input: standard input
output: standard output

You have matrix a of size $n \times n$. Let's number the rows of the matrix from 1 to n from top to bottom, let's number the columns from 1 to n from left to right. Let's use a_{ij} to represent the element on the intersection of the i-th row and the j-th column.

Matrix a meets the following two conditions:

- for any numbers i, j $(1 \le i, j \le n)$ the following inequality holds: $a_{ij} \ge 0$;
- .

Matrix b is *strictly positive*, if for any numbers i, j $(1 \le i, j \le n)$ the inequality $b_{ij} > 0$ holds. You task is to determine if there is such integer $k \ge 1$, that matrix a^k is strictly positive.

Input

The first line contains integer n $(2 \le n \le 2000)$ — the number of rows and columns in matrix a.

The next n lines contain the description of the rows of matrix a. The i-th line contains n non-negative integers $a_{i1}, a_{i2}, ..., a_{in}$ $(0 \le a_{ij} \le 50)$. It is guaranteed that .

Output

If there is a positive integer $k \ge 1$, such that matrix a^k is strictly positive, print "YES" (without the quotes). Otherwise, print "NO" (without the quotes).

Examples

input
2 1 0 0 1

output
NO

input
5 4 5 6 1 2 1 2 3 4 5 6 4 1 2 4 1 1 1 1 1 4 4 4 4 4

output
YES