Mr. Buridan and coffee shops

Input file:	`stdin`
Output file:	`stdout`
Time limit:	3 seconds
Memory limit:	256 megabytes

Buridan's donkey is a famous philosophical mind experiment. Imagine putting a hungry donkey in front of two identical heaps of hay. The donkey would like to eat, but as the situation's perfectly symmetric, it can't decide whether to pick the left or right heap. And so, it stays in place until it dies of hunger.

Little David is still trying to find a place to live in Manhattan. Besides other stuff, he likes visiting coffee shops. But he just realized that he's in the same danger as Buridan's donkey: if some 2 coffee shops were equally distant from his flat, it's possible that he couldn't decide which one to visit and that wouldn't end well...

For simplicity, we'll picture Manhattan as a square grid, where we can only move in the 4 basic directions. There are coffee shops at some grid points and David also wants to live at some grid point (possibly containing a coffee shop).

The input contains a map of Manhattan. For every intersection (grid point), find out if little David can live there — e.g. if all coffee shops are at different distances from there.

Input

The first line of the input contains an integer N — dimension of the Manhattan square grid. The grid is formed by N vertical and N horizontal streets, so we have N^2 intersections (grid points). The rest of the input contains N lines of N integers each: 0 if there's no coffee shop at that point and 1 if there is one.

Output

Print N lines of N characters each: A if little David can live at that point and N otherwise.

Examples

stdin	stdout
5 1 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0	A A A A A A A A A N N N N N A A A A A A A A A A A
3 1 0 1 0 0 0 1 0 1	N N N N N N N N N
2 0 1 0 0	A A A A

Note

In all tests, $1 \le N \le 10^3$.