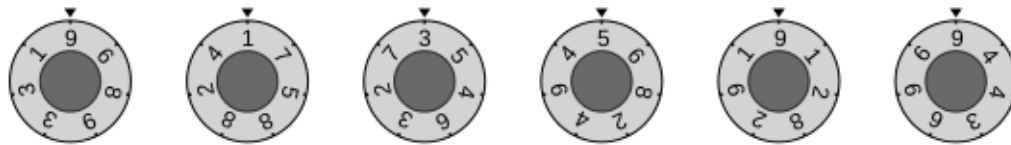


Problem K. Kitchen Knobs

Input file: *standard input*
Output file: *standard output*
Time limit: 3 seconds
Memory limit: 512 mebibytes

You are cooking on a gigantic stove at a large fast-food restaurant. The stove contains n heating elements arranged in a line and numbered with integers 1 through n left to right. Each element is operated by its *control knob*. The knobs are a bit unusual: each knob is marked with seven non-zero digits evenly distributed around a circle. The *power* of the heating element is equal to the positive integer obtained by reading the digits on its control knob clockwise starting from the top of the knob.



Initial positions of the control knobs in the first example input below.

In a single step, you can rotate one or more *consecutive* knobs by any number of positions in any direction. However, all knobs rotated in one step need to be rotated by the same number of positions in the same direction.

Find the smallest number of steps needed to set all the heating elements to maximal possible power.

Input

The first line contains an integer n ($1 \leq n \leq 501$) — the number of heating elements. The j -th of the following n lines contains an integer x_j — the initial power of the j -th heating element. Each x_j consists of exactly seven non-zero digits.

Output

Output a single integer — the minimal number of steps needed.

Example

standard input	standard output
6 9689331 1758824 3546327 5682494 9128291 9443696	3
7 5941186 3871463 8156346 9925977 8836125 9999999 5987743	2

Note

In the first example, one of the ways to achieve maximal possible power is: rotate knobs 2 through 3 by 3 positions in the counterclockwise direction, rotate knob 3 by 3 positions in the counterclockwise direction, and rotate knobs 4 through 6 by 2 positions in the clockwise direction.