

Problem G

Rooks

Input: Standard Input

Output: Standard Output

Time Limit: 8 Seconds

Given a chessboard $N \times N$, on which the rooks are placed. You have to color those rooks in a minimal number of colors in that way – no horizontal and vertical line contains two rooks of the same color.

Input

First line of the input file contains an integer S ($0 \leq S \leq 10$) that indicates how many sets of inputs are there. The description of each set is given below:

The first line of each input set contains number N ($0 \leq N \leq 100$).

The next N lines contain a chessboard (array $N \times N$), where an empty cell is marked as '.', and a cell that contains a rook is marked as '*' (there are not blanks between the symbols in a line).

Output

The description of output for each test case is given below:

The first line of the output for each test case contains number M – the minimal number of colors. The next N lines contain a chessboard, where an empty cell is marked as '0', and a cell that contains a rook is marked as ' K ', where K is a color of the rook. There can be more than correct solution any valid solution will be accepted.

Sample Input

Output for Sample Input

| | |
|------|---------|
| 2 | 2 |
| 2 | 2 0 |
| *. | 1 2 |
| ** | 4 |
| 4 | 1 0 2 0 |
| *.*. | 3 0 1 0 |
| *.*. | 2 1 3 0 |
| ***. | 0 0 4 1 |
| ..** | |

Problem source: Russian summer training camp 2000.

Problem author: Maxim Babenko

Problem translation: Dmytro Chernysh