

# Su Doku

## Problem

In many newspapers we may find some puzzles to solve, one of those is Su Doku. Given a grid  $9 \times 9$  with some of entries filled, the objective is to fill in the grid so that every row, every column, and every  $3 \times 3$  box contains the digits 1 through 9.

|   |   |   |   |  |   |   |   |   |
|---|---|---|---|--|---|---|---|---|
|   | 6 |   | 1 |  | 4 |   | 5 |   |
|   |   | 8 | 3 |  | 5 | 6 |   |   |
| 2 |   |   |   |  |   |   |   | 1 |
| 8 |   |   | 4 |  | 7 |   |   | 6 |
|   |   | 6 |   |  |   | 3 |   |   |
| 7 |   |   | 9 |  | 1 |   |   | 4 |
| 5 |   |   |   |  |   |   |   | 2 |
|   |   | 7 | 2 |  | 6 | 9 |   |   |
|   | 4 |   | 5 |  | 8 |   | 7 |   |

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 9 | 6 | 3 | 1 | 7 | 4 | 2 | 5 | 8 |
| 1 | 7 | 8 | 3 | 2 | 5 | 6 | 4 | 9 |
| 2 | 5 | 4 | 6 | 8 | 9 | 7 | 3 | 1 |
| 8 | 2 | 1 | 4 | 3 | 7 | 5 | 9 | 6 |
| 4 | 9 | 6 | 8 | 5 | 2 | 3 | 1 | 7 |
| 7 | 3 | 5 | 9 | 6 | 1 | 8 | 2 | 4 |
| 5 | 8 | 9 | 7 | 1 | 3 | 4 | 6 | 2 |
| 3 | 1 | 7 | 2 | 4 | 6 | 9 | 8 | 5 |
| 6 | 4 | 2 | 5 | 9 | 8 | 1 | 7 | 3 |

source: <http://www.sudoku.com>

## Input

Input contains several test cases separated by a blank line. Each of them contains an integer  $n$  such that  $1 \leq n \leq 3$  and a grid  $n^2 \times n^2$  with some of the entries filled with digits from 1 to  $n^2$  (an entry not filled will have 0). In this case, the objective is to fill in the grid so that every row, every column, and every  $n \times n$  box contains the digits 1 through  $n^2$ .

## Output

A solution for the problem. If exists more than one, you should give the lower one assuming a lexicographic order. If there is no solution, you should print 'NO SOLUTION'. For lexicographic comparison you should consider lines in first place. Print a blank line between test cases.

## Sample input

```
3
0 6 0 1 0 4 0 5 0
0 0 8 3 0 5 6 0 0
2 0 0 0 0 0 0 0 1
8 0 0 4 0 7 0 0 6
0 0 6 0 0 0 3 0 0
7 0 0 9 0 1 0 0 4
5 0 0 0 0 0 0 0 2
0 0 7 2 0 6 9 0 0
0 4 0 5 0 8 0 7 0
```

## Sample output

```
9 6 3 1 7 4 2 5 8
1 7 8 3 2 5 6 4 9
2 5 4 6 8 9 7 3 1
8 2 1 4 3 7 5 9 6
4 9 6 8 5 2 3 1 7
7 3 5 9 6 1 8 2 4
5 8 9 7 1 3 4 6 2
3 1 7 2 4 6 9 8 5
6 4 2 5 9 8 1 7 3
```