

Problem: FIF

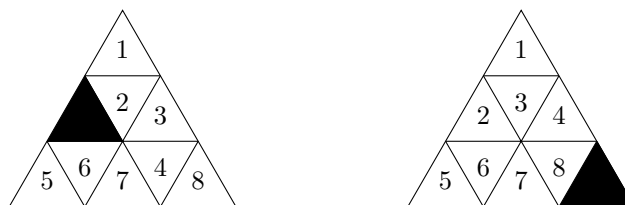
Game of Fifteen

Qualifications, 19.10.2013

Today is Johnny Citrus' — the son's of Andrew Citrus (the Mayor of Limonia) birthday. Andrew wants to exercise his son's brains so that he can become a talented algorithmician in the future and win the Marathon24 contest. That is why Andrew presented Johnny with a new logical puzzle. Unfortunately, it did not bring the expected effects. Johnny struggled with the puzzle for a long time and eventually he could not succeed. He asked his father to present how it should be solved. The Mayor toiled over the puzzle, but it was more difficult than it appeared at first! It is obvious that the Mayor does not want to compromise himself in front of his son, so he has to learn the solution. Help him with this! Remember, the fewer moves this solution requires, the more impressed will Johnny be by his dad's intellect.

The puzzle consists of equilateral triangle board with the side length of n , divided into n^2 equilateral triangle cells with the side length of 1 (see the left triangle on the following picture). On the board there are $n^2 - 1$ pebbles numbered with integers from 1 to $n^2 - 1$; no more than one pebble can stand in every cell. Every move consists in moving the pebble to the empty a cell which shares a side.

The objective of the puzzle is to bring it to the state, when the empty cell will be in the bottom right corner of the board, and pebbles numbers read in rows from the top to the bottom, from left to right, will be consecutive integers (see the right triangle on the picture).



Input

In the first line of the input file there is one integer n ($3 \leq n \leq 6$) specifying the side length of the puzzle. Next there are n lines describing consecutive puzzle rows. In the i -th line there are $2i - 1$ integers specifying consecutive cells in the i -th row of the puzzle. If the cell is described with 0, it means no pebble is on this cell. Otherwise, there is a pebble with the given number. Among the numbers describing the cells, every integer from 0 to $n^2 - 1$ appears exactly once. You can assume there is a solution to the given puzzle.

Output

In the first line of the output file there should be one number r specifying the length of the found moves sequence that leads to the puzzle solution. In the second line there should be r integers specifying numbers of pebbles moved in consecutive moves of this solution.

Scoring

In case of the correct moves sequence, the score for a test is r . This is a minimization problem, therefore, the shorter the sequence, the better. The percentage of guaranteed points is 40%.

Example

For the input data:

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

the correct result is:

```
4
2 3 4 8
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Explanation of the example: The sequence above, consisting of 4 moves, is the shortest sequence leading to the solution of the puzzle presented in the picture.