The 15-puzzle has been around for over 100 years; even if you don't know it by that name, you've seen it. It is constructed with 15 sliding tiles, each with a number from 1 to 15 on it, and all packed into a 4 by 4 frame with one tile missing. Let's call the missing tile 'x'; the object of the puzzle is to arrange the tiles so that they are ordered as:

```
 1  2  3  4
 5  6  7  8
 9 10 11 12
13 14 15  x
```

where the only legal operation is to exchange 'x' with one of the tiles with which it shares an edge. As an example, the following sequence of moves solves a slightly scrambled puzzle:

```
 1  2  3  4     1  2  3  4     1  2  3  4     1  2  3  4
 5  6  7  8     5  6  7  8     5  6  7  8     5  6  7  8
 9  x 10 12     9 10  x 12     9 10 11 12     9 10 11 12
13 14 11 15    13 14 11 15    13 14  x 15    13 14 15  x
            r->            d->            r->
```

The letters in the previous row indicate which neighbor of the 'x' tile is swapped with the 'x' tile at each step; legal values are 'r','l','u' and 'd', for right, left, up, and down, respectively.

Not all puzzles can be solved; in 1870, a man named Sam Loyd was famous for distributing an unsolvable version of the puzzle, and frustrating many people. In fact, all you have to do to make a regular puzzle into an unsolvable one is to swap two tiles (not counting the missing 'x' tile, of course).

In this problem, you will write a program for solving the less well-known 8-puzzle, composed of tiles on a three by three arrangement.

Input

The first line of the input is an integer N, then a blank line followed by N datasets. There is a blank line between datasets.

In each dataset, you will receive a description of a configuration of the 8 puzzle. The description is just a list of the tiles in their initial positions, with the rows listed from top to bottom, and the tiles listed from left to right within a row, where the tiles are represented by numbers '1' to '8', plus 'x'.

For example, this puzzle

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

is described by this list:

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

Output

For each dataset, you will print to standard output either the word 'unsolvable', if the puzzle has no solution, or a string consisting entirely of the letters 'r', 'l', 'u' and 'd' that describes a series of moves that produce a solution. The string should include no spaces and start at the beginning of the line.

Print a blank line between datasets.

Sample Input

```
1

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

Sample Output

```
ullddrurdllurdruldr
```