

Eight

<https://vjudge.net/problem/hdu-1043>

...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

You will receive, several descriptions of configuration of the 8 puzzle. One 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

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. Do not print a blank line between cases.

Sample

Input	Output
2 3 4 1 5 x 7 6 8	ullddrurdllurdruldr...