

# Problem TOUCHGAME: Touch Game

Recently, I've developed a simple single-player touch screen game: the player gets two grids of equal size, where some grid cells contain a ball. The goal of the game is to make the two grids identical by modifying the grid on the left side. By clicking on cell, you *invert* a cell – if the cell is empty, a ball will be added, removed otherwise. Not only the touched cell is inverted but also cells that lie on the same diagonals and have distance less or equal 2 to the touched cell.

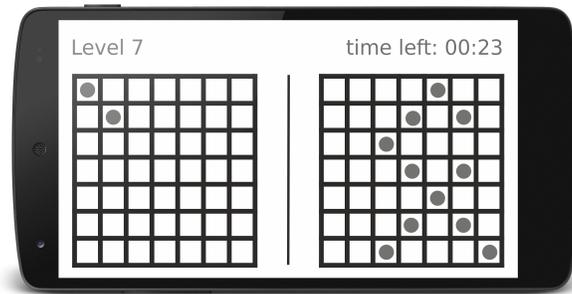


Figure 1: This is my current level 7 (see sample II). You can finish the level in three steps: by clicking on coordinates (0, 0) (upper left corner), on (0, 5), and on (5, 5).

I did create many levels, but I am a bit unsure about their difficulty. I could ask many people to try those levels and rate their difficulties but I decided to go for a different approach: given the original and the target grid the difficulty of a level is given by the minimal number of touches.

## Input

The input consists of exactly one level, starting with two integers  $h$  and  $w$  on one line, where  $h$  specifies the height and  $w$  the width of the grids ( $1 \leq h \leq 20; 1 \leq w \leq 7$ ). Then follow  $h$  lines specifying the two grids (original on the left, target on the right). '-' marks an empty cell, while '\*' is a cell with a ball.

## Output

If the level is solvable, print the minimal number of touches, otherwise 'Impossible'.

### Sample Input 1

```
7 7
*----- *---*--
-*----- ---*-*-
----- --*-----
----- ---*-*-
----- ---*---
----- ---*-*-
----- --*-----
```

### Sample Output 1

3

### Sample Input 2

```
3 3
*-- *--
--- ---
--* ---
```

### Sample Output 2

Impossible

### Sample Input 3

```
5 7
*---*--- -----
-*-*---- -----
--*----- -----
-*-*---- -----
*---*--- -----
```

### Sample Output 3

1