

Problem EATINGSTONES: Eating Stones

Luke is training his mind with Yoda, they are playing a game called “Family-Drama”.

Yoda sets up the board of 3×4 fields. He has two kinds of stones: black ones, which apparently stand for dark-sided camps, and white ones, for rebellion camps. He places a few of those stones on the board, not more than one per field, and leaves the rest next to the board.

“Battlefield, this is and go to war for the rebellion, you must.”

The result of this game is the number of rebellion camps minus the number of dark-sided camps on the board after the game ends. Luke’s goal is to maximize the result and Yoda’s goal is to minimize the result.

Yoda continues to explain the rules:

- They both take alternating turns, Luke placing the leftover white stones, Yoda the black. In every turn, a player has to place a new stone on an empty field, he may only pass if he cannot make a valid move or if he has no more stones left.
- The game ends if none of the players can make a **valid** move any more. A move is considered **valid** if one of the leftover stones is placed on an empty field and the move is not **suicidal**.
- Let us call camps connected horizontally or vertically a *group* of camps. A group is alive if at least one of its camps is connected horizontally or vertically to an empty field (border does not count as empty). Otherwise it is dead.
- Dead groups are removed from the board after each turn and Luke eats the stones, they may not be placed again.
- A move is **suicidal** if it would result in one of the player’s own groups being dead (before stone removal).

After losing a lot and eating even more stones Luke gets angry, and wants to know the purpose of this game.

“In war you fight only the battles, win, you can. Hmmm.”

Can you help Luke find out how the game will end once Yoda set up the board assuming they both play optimally?

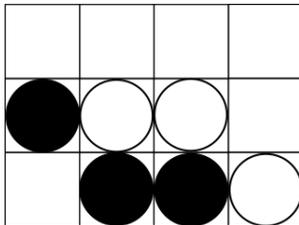


Figure 1: Placing a white stone in the bottom left corner is suicidal.

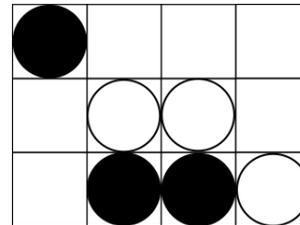


Figure 2: Luke may place a stone in the bottom left corner to kill the two black stones.

Input

One line with two integers: The number of white and black stones, they will be between 0 and 8, inclusively. Three lines with four characters each: ‘.’ for an empty field, ‘x’ for dark-sided camps and ‘o’ for rebellion camps. It is guaranteed that every group of camps in the initial field is alive.

Output

Print the result of the game if both play optimally and Luke moves first. They play until none of them can make a valid move any more and then count the stones on the board to compute the result.

Sample Input 1

```
8 8
xxxo
xxoo
x.oo
```

Sample Output 1

```
-1
```

Sample Input 2

5 0
x.x.
...x
x.x.

Sample Input 3

4 1
....
..x.
.x..

Sample Output 2

2

Sample Output 3

1