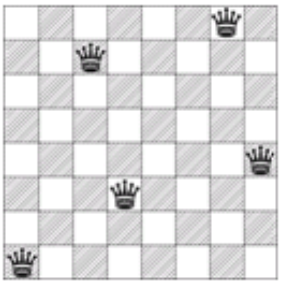
Problem G

Guarding the Chessboard

Given an n*m chessboard with some marked squares, your task is to place as few queens as possible to guard (attack or occupy) all marked squares. Below is a solution to an 8*8 board with every square marked. Note that queens can be placed on non-marked squares.



Input

The input consists of at most 15 test cases. Each case begins with a line containing two integers n, m (1 < n, m < 10), the size of the chessboard. Next n lines each contain m characters, 'X' denotes marked square, '.' denotes unmarked squares. The last case is followed by a single zero, which should not be processed.

Output

For each test case, print the case number and the minimal number of queens needed.

Sample Input

```
8 8
XXXXXXXX
XXXXXXXX
XXXXXXXX
XXXXXXXX
XXXXXXXX
XXXXXXXX
XXXXXXXX
XXXXXXXX
8 8
X.......
.X......
..X.....
...X....
....X...
.....X..
......X.
.......X
0
```

Output for the Sample Input

```
Case 1: 5
Case 2: 1
```

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