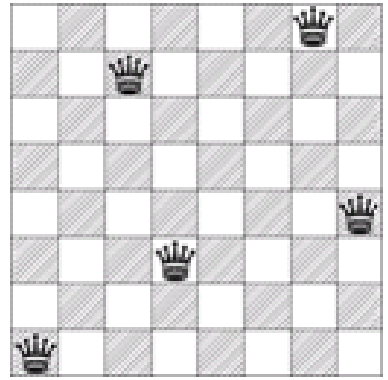


Given an  $n * m$  chessboard with some marked squares, your task is to place as few queens as possible to guard (attack or occupy) all marked squares. Below is a solution to an  $8 * 8$  board with every square marked. Note that queens can be placed on non-marked squares.



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

## Sample Output

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