

## 6557 Stampede!

You have an  $n \times n$  game board. Some squares contain obstacles, except the left- and right-most columns which are obstacle-free. The left-most column is filled with your  $n$  pieces, 1 per row. Your goal is to move all your pieces to the right-most column as quickly as possible. In a given turn, you can move each piece N, S, E, or W one space, or leave that piece in place. A piece cannot move onto a square containing an obstacle, nor may two pieces move to the same square on the same turn. All pieces move simultaneously, so one may move to a location currently occupied by another piece so long as that piece itself moves elsewhere at the same time.

Given  $n$  and the obstacles, determine the fewest number of turns needed to get all your pieces to the right-hand side of the board.

### Input

Each test case starts with a positive integer  $n$  indicating the size of the game board, with  $n \leq 25$ . Following this will be  $n$  lines containing  $n$  characters each. If the  $j$ -th character in the  $i$ -th line is an 'X', then there is an obstacle in board location  $i, j$ ; otherwise this character will be a '.' indicating no obstacle. There will never be an obstacle in the 0-th or  $(n - 1)$ -st column and there will always be at least one obstacle-free path between these two columns. A line containing a single '0' will terminate input.

### Output

For each test case output the minimum number of turns to move all the pieces from the left side of the board to the right side.

### Sample Input

```
5
.....
.X...
...X.
..X..
.....
5
.X...
.X...
.X...
.XXX.
.....
0
```

### Sample Output

```
Case 1: 6
Case 2: 8
```