Problem E: Domino Covering 2

Advanced Algorithms for Programming Contests

Restrictions

Time: 2 seconds
Memory: 512 MB

Problem description

On a grid of square cells a domino can be interpreted as a figure formed by two cells with a common edge. Based on this, a domino covering of an area is defined as a set of dominoes all placed entirely in said area with each of the area's cells being covered by exactly one of the dominoes. Two coverings P and Q are called different if there are dominoes $p \in P$ and $q \in Q$ such that p and q share one cell but not the other.

Given a grid in which some cells are cut out, you are to find the number of domino coverings that exist for it.

Input

The input consists of

- one line containing m and n, $(1 \leq m, n \leq 12)$ - height and width of the rectangle area, respectively
- m lines containing n characters each, describing the rectangle. Character "." denotes an existing cell and "#" one that has been cut out.

Output

Output the number of different domino coverings that exist for the grid.

Sample input and output

Input	Output
3 4	11
2 2 .. .#	0
2 3 #.. ..#	1