Task Sirologija

You are an ant, but not just any ant – you're an ant obsessed with cheeseology!

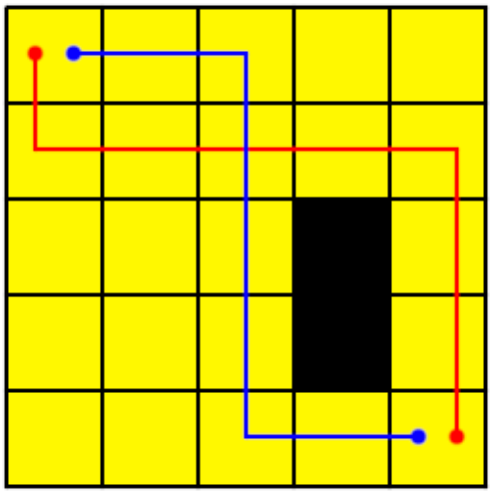
You've discovered a new slice of cheese in the kitchen and want to send as many of your minions as possible to explore it. Imagine the cheese as a table with N rows and M columns, where the rows are labeled from 1 to N from top to bottom, and the columns are labeled from 1 to M from left to right. Some fields contain holes, while others contain cheese. We will denote the field in the r-th row and s-th column as (r, s). The top-left and bottom-right fields will definitely contain cheese.

Let's denote the number of minions as K. Your minions will start their exploration in the top-left field and finish in the bottom-right field. They can only move downwards and to the right. Additionally, their paths must not "cross", meaning we can assign labels from 1 to K to them in such a way that there is no field from which a minion with a lower label exited to the right, and a minion with a higher label exited downwards.

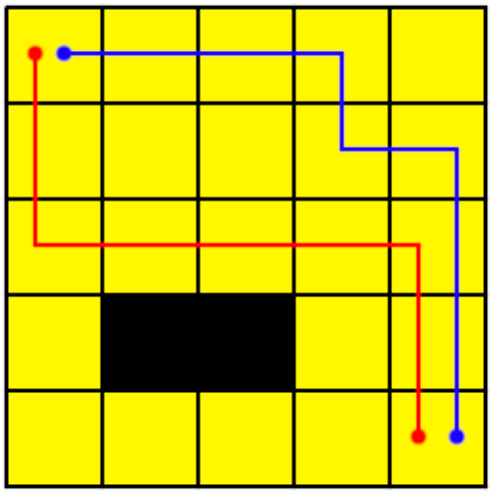
Moreover, you would like these paths to be "different" in some sense, meaning that for every two minions, there exists a field (r, s) containing a hole, such that one of them was at some point in column s and in a row labeled lower than r, while the other was at some point (not necessarily simultaneously) in column s and in a row labeled higher than r. Informally, every pair of minions approached some hole from different sides.

Output the maximum value of K such that there exists a selection of minion paths satisfying the given conditions.

Some examples of paths that do not satisfy the conditions:



(a) Invalid choice of paths - they intersect



(b) Invalid choice of paths - they approach a hole from the same side

Input

The first line contains positive integers N, M.

The next N lines contain descriptions of the table rows. The i-th line contains M characters, where `.` denotes cheese and `#` denotes a field containing a hole.

Output

Output the maximum possible value of the number K in a single line.

Scoring

In all subtasks, $2 \leq N, M \leq 2000$.

Subtask	Score	Constraints
1	15	All holes are in the same row.
2	18	$N, M \leq 10$
3	16	$N, M \leq 50$, there are no holes in the first or last row or in the first or last column.
4	18	$N, M \leq 50$
5	16	$N, M \leq 2000$, there are no holes in the first or last row or in the first or last column.
6	17	No additional constraints.

Examples

input

```
5 5
.....
.#...
.....
...#.
.....
```

output

```
3
```

input

```
5 5
....#
....#
.....
.....
#....
```

output

```
1
```

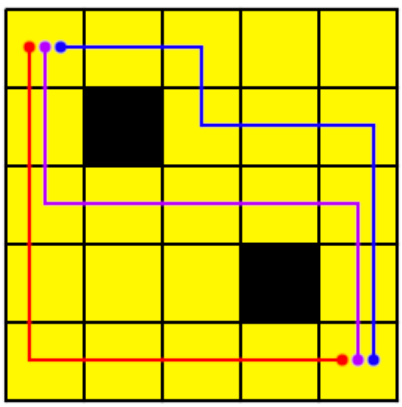
input

```
3 2
.#
#.
..
```

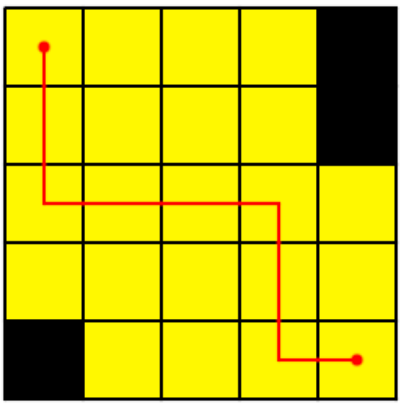
output

```
0
```

Explanation of the first and second example:



(a) Example of paths for the first sample



(b) Example of paths for the second sample