CSES Problem Set

Forest Queries II

TASK | SUBMIT | RESULTS | STATISTICS

Time limit: 1.00 s   **Memory limit:** 512 MB

You are given an $n \times n$ grid representing the map of a forest. Each square is either empty or has a tree. Your task is to process q queries of the following types:

1. Change the state (empty/tree) of a square.
2. How many trees are inside a rectangle in the forest?

Input

The first input line has two integers n and q: the size of the forest and the number of queries.

Then, there are n lines describing the forest. Each line has n characters: . is an empty square and * is a tree.

Finally, there are q lines describing the queries. The format of each line is either "1 y x" or "2 y_1 x_1 y_2 x_2".

Output

Print the answer to each query of the second type.

Constraints

- $1 \le n \le 1000$
- $1 \le q \le 2 \cdot 10^5$
- $1 \le y, x \le n$
- $1 \le y_1 \le y_2 \le n$
- $1 \le x_1 \le x_2 \le n$

Example

Input:
```
4 3
.*..
*.**
```

Your submissions

```
**..
****
2 2 2 3 4
1 3 3
2 2 2 3 4
```

Output:
```
3
4
```