DMOPC '17 Contest 1 P1 - Fujō Neko

Time limit: 3.0s **Memory limit:** 64M

Saki is walking around the school fields when she notices that *something* might be stalking her. As such, she stops at Q locations on the field, with the i^{th} being (x_i, y_i) and takes a look directly in all 4 cardinal directions (north, south, east, and west) to see if she can locate these mysterious being**s**. Saki's vision is quite good, so even if the being is far away, as long as she's looking in the right direction, she is able to see it. (The top left corner is $(1, 1)$ and the bottom right corner is (C, R).) Can you help Saki figure out if she's being stalked?

Constraints

For all subtasks:

$1 \leq x_i \leq C$

$1 \leq y_i \leq R$

Subtask 1 [20%]

$1 \leq R, C \leq 1\,000$

$1 \leq Q \leq 1\,000$

Subtask 2 [80%]

$1 \leq R, C \leq 1\,000$

$1 \leq Q \leq 10^6$

Input Specification

The first line will contain 2 space-separated integers, R and C, the number of rows and columns her school field has.
The next R lines will each have C characters, with an `X` representing a mysterious being, and a `.` representing flat land.
The next line will have an integer, Q.
The next Q lines will have two integers, x_i and y_i, her position on the field for the i^{th} location.

Output Specification

The output should have Q lines, either `Y` if she can see one of the mysterious beings, or `N` otherwise.

Note that fast input/output may be necessary.

Sample Input

```
4 4
X...
....
....
..X.
3
2 3
4 4
1 1
```

Sample Output

```
N
Y
Y
```

Explanation for Sample Output

Let `S` denote Saki's position. The first query looks like this:

```
X...
....
.S..
..X.
```

For the second query, the grid looks like the following:

```
X...
....
....
..XS
```

For the third query, the grid looks like this:

```
S...
....
....
..X.
```

Note that even though Saki is on the same square as a mysterious being, she can still see it.