

Mock CCC '22 1 S5 - Berkeley Math Tournament Awards Ceremony

Time limit: 0.25s **Memory limit:** 1G

Kaity is the tournament director for the Berkeley Math Tournament, a tournament so large that Kaity runs it on an infinite 2D plane.

The 2D plane is templated by an $N \times M$ rectangle R , the top-left corner being $(0, 0)$ and the bottom-right corner being $(N - 1, M - 1)$. Square (x, y) has an obstacle if and only if square (r, s) in the template rectangle has an obstacle, where r and s are respectively remainders when x and y are divided by N and M . One can only travel directly between two squares if their Manhattan distance is 1 and both are empty.

Kaity is running the awards ceremony at $(0, 0)$. She wishes to know for Q distinct empty points (x_i, y_i) whether someone at (x_i, y_i) can travel to $(0, 0)$ without running into any obstacles.

Constraints

$$1 \leq N, M \leq 100$$

$$1 \leq Q \leq 2 \cdot 10^5$$

$$|x_i|, |y_i| \leq 10^9$$

In tests worth 1 mark, $Q \leq 10^3$.

Input Specification

The first line contains two integers, N and M .

The next N lines contain a string of M characters, each character being either `.` if it is empty or `#` if it contains an obstacle.

The next line contains one integer, Q .

The next Q lines contain two integers, x_i and y_i , indicating a query point (x_i, y_i) .

The input is set such that each of these points and $(0, 0)$ will not contain an obstacle.

Output Specification

Output Q lines. On the i th line, output `yes` if $(0, 0)$ is reachable. Otherwise, output `no`.

Sample Input 1

```
6 9
..#####..
..#...#..
.....#..
..#####..
..#.....
..#...#..
5
1 4
5 4
1 -5
5 -5
-1000000000 0
```

Sample Output 1

```
yes
no
no
yes
yes
```