Another Random Contest 1 P4 - Bracket Query

Time limit: 1.0s **Memory limit:** 256M

A valid bracket sequence consisting of `(` and `)` is defined as follows:

- An empty sequence is valid.
- If X is a valid bracket sequence, then `(` X `)` is a valid bracket sequence.
- If X and Y are valid bracket sequences, then the concatenation of X and Y, $Z = X + Y$, is a valid bracket sequence.

For example, `(())`, `()()`, and `(()())()` are all valid bracket sequences, while `(` and `())` are invalid bracket sequences.

A professor gave you a sequence of brackets of length N. The professor will ask you Q queries, each consisting of two numbers, l_i and r_i. For each query, you need to check if it is possible to insert a continuous number (possibly zero) of `(` or `)` brackets into the interval l_i to r_i to make the subsequence valid.

For example:

Let the original string be `xxxxxxx`.

Then, `xxxxx((((((xx` or `xxxxxxx)))))` are all valid insertions.

If it is possible, output `YES`; otherwise, output `NO`.

Constraints

For all subtasks:

$1 \leq N, Q \leq 2 \times 10^5$

$1 \leq l_i \leq r_i \leq N$

Subtask 1 [20%]

$1 \leq N, Q \leq 5 \times 10^3$

Subtask 2 [80%]

No additional constraints.

Input Specification

The first line consists of two integers N and Q, the length of the string and the number of queries.

The next line consists of a bracket sequence of length N.

The following Q lines consist of two integers, l_i and r_i.

Output Specification

Output `YES` and `NO` on Q separate lines, each line answering a query.

Sample Input

```
8 8
(())()((
5 6
2 7
6 7
4 5
5 7
7 8
3 4
6 7
```

Sample Output

```
YES
NO
NO
NO
YES
YES
YES
NO
```