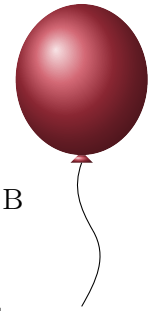
H Controllers



Time limit: 2.0s
Memory limit: 2048MB

You are at your grandparents' house and you are playing an old video game on a strange console. Your controller has only two buttons and each button has a number written on it.

Initially, your score is 0. The game is composed of n rounds. For each $1 \leq i \leq n$, the i-th round works as follows.

On the screen, a symbol s_i appears, which is either `+` (*plus*) or `-` (*minus*). Then you must press one of the two buttons on the controller **once**. Suppose you press a button with the number x written on it: your score will increase by x if the symbol was `+` and will decrease by x if the symbol was `-`. After you press the button, the round ends.

After you have played all n rounds, you win if your score is 0.

Over the years, your grandparents bought many different controllers, so you have q of them. The two buttons on the j-th controller have the numbers a_j and b_j written on them. For each controller, you must compute whether you can win the game playing with that controller.

Input

The first line contains a single integer n ($1 \leq n \leq 2 \cdot 10^5$) — the number of rounds.

The second line contains a string s of length n — where s_i is the symbol that will appear on the screen in the i-th round. It is guaranteed that s contains only the characters `+` and `-`.

The third line contains an integer q ($1 \leq q \leq 10^5$) — the number of controllers.

The following q lines contain two integers a_j and b_j each ($1 \leq a_j, b_j \leq 10^9$) — the numbers on the buttons of controller j.

Output

Output q lines. On line j print `YES` if the game is winnable using controller j, otherwise print `NO`.

Samples

Sample input 1	Sample output 1
8 +-+---+- 5 2 1 10 3 7 9 10 10 5 3	YES NO NO NO YES

Explanation of sample 1.
One possible way to get score 0 using the first controller is by pressing the button with numnber 1 in rounds 1, 2, 4, 5, 6 and 8, and pressing the button with number 2 in rounds 3 and 7. It is possible to show that there is no way to get a score of 0 using the second controller.

Sample input 2	Sample output 2
6 +-++-- 2 9 7 1 1	YES YES

Sample input 3	Sample output 3
20 +-----+--+--------+- 2 1000000000 99999997 250000000 1000000000	NO YES