Problem H
Hiring Help
Time limit: 4 seconds

A certain large unnamed software development company has n developers. The productivity of each coder working for the company has been rigorously measured in terms of two key performance indicators: the number of lines of code they write per hour, and the number of bugs they fix per hour.

When a project needs to be done, the manager in charge of the project is allocated some budget of t man-hours of programmer time. The manager can then staff different coders on the project, up to a total of t hours. For instance if there are three programmers, the manager can allocate any non-negative real numbers t_1, t_2, and t_3 hours of their respective work hours, as long as $t_1 + t_2 + t_3 \leq t$. If the three programmers write l_1, l_2, and l_3 lines of code per hour, a total amount of $t_1 \cdot l_1 + t_2 \cdot l_2 + t_3 \cdot l_3$ lines of code will then be written for the project. Similarly if they fix b_1, b_2, and b_3 bugs per hour, a total of $t_1 \cdot b_1 + t_2 \cdot b_2 + t_3 \cdot b_3$ bugs will be fixed.

Due to the uncertain economy, the company has a hiring freeze, meaning that no new coders are hired to the company. However, under certain conditions, a manager is allowed to bring in outside help by outsourcing a project to an external consultant rather than doing it in-house. But this is only allowed if it is not possible to do the project equally efficiently in-house. In particular, if the consultant writes ℓ lines of code and fixes b bugs in t hours, and there exists some allocation of our existing coders which would write at least ℓ lines of code *and* fix at least b bugs in at most t hours, then a manager is *not* allowed to hire this consultant (regardless of whether those existing coders would actually have time to work on the project or whether they are already too busy with other projects).

While no new coders are hired, employees do sometimes decide to leave the company. Given a chronological list of events – requests to use a consultant, and employees quitting – find out which of the requests will be approved.

Input

The first line of input consists of a single integer n ($0 \leq n \leq 2 \cdot 10^5$), the number of coders (initially) at the company. The employees are numbered from 1 to n (names are too personal). Then follow n lines, the ith of which contains two integers ℓ_i and f_i ($1 \leq \ell_i, f_i \leq 10^8$), the number of lines of code and the number of bugs fixed per hour by coder i.

Next follows a line with a single integer e ($1 \leq e \leq 10^5$), the number of events. This is followed by e lines, describing the events in chronological order. An event is a line in one of the following two forms:

- "`c` t ℓ f", for three integers t, ℓ and f ($1 \leq t \leq 100$, $1 \leq \ell, f \leq 10^8$): a request to take in a consultant for a project of t hours, where the consultant would write ℓ lines of code and fix f bugs in those t hours.
- "`q` i", for an integer i ($1 \leq i \leq n$): coder i quit the company.

You may assume that no coder quits more than once.

Output

For each request to take in a consultant, output "`yes`" if the request is approved, and "`no`" if it is not approved.

Sample Input 1

```
4
200 100
100 200
100 100
200 200
5
c 10 2000 2000
c 5 750 750
q 4
c 3 600 600
c 10 1500 1500
```

Sample Output 1

```
no
no
yes
no
```

Sample Input 2

```
8
400 300
300 200
300 400
200 300
500 500
100 500
100 100
500 100
12
c 4 1611 1601
c 3 602 601
c 2 399 795
c 1 395 206
q 7
q 6
q 5
q 4
c 4 1611 1601
c 3 602 601
c 2 399 795
c 1 395 206
```

Sample Output 2

```
no
no
no
no
yes
no
no
no
```