beCP
2022
Task 1.1: Parkour (parkour)

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Time limit: 1 s   Memory limit: 128 MB

When your brain starts overheating from training too much for beCP and IOI, you often like to cool it down with some sports. Your choice of sports for this: parkour. However, parkour isn't without its dangers, and jumping from building to building can take a lot of effort and concentration. To minimize the possibility of being too tired, you carefully map out your trajectories beforehand, and you only ever perform a single kind of jump. That means that you always move exactly the same distance every time you jump. You do not run along the rooftops in between your jumps. That is, once you start jumping, you only stop once the trajectory is done.

To prepare for your cool-down after this beCP contest, you're looking at a map of rooftops, and you want to evaluate for each of the jumps you know, whether or not they'd be suitable for this trajectory. For simplicity, we will always assume all rooftops are on the same height, and all lie on a single line. The first rooftop on the map is your starting point, you can start at any point of that rooftop you'd like to make it possible to finish the trajectory. The last rooftop on the map is considered your goal, and once you land a jump on there, you consider it finished.

Input

The input begins with a line containing two integers: N, the number of rooftops, and Q, the number of jump distances to examine. Then follow N lines with two integers r_i, the starting point of rooftop i and ℓ_i, the length of rooftop i. The rooftop stretches from r_i to $r_i + \ell_i$, excluding the right endpoint. That is, $r_i = 0, \ell_i = 1$ implies that only at index 0 the rooftop is there, and no longer at point 1. After that, Q lines follow, each with a single integer: the jumping distance d_i.

Important remark: Some numbers can exceed the capacity of a 32-bit number, so be sure to use `long long`.

Output

Output Q integers each on an individual line. Line i should contain a 1 if jumping distance d_i correctly gets you to the final rooftop, and a 0 otherwise.

General limits

- No two rooftops overlap, i.e. there is no $r_j \neq r_i$ such that $r_i \leq r_j < r_i + \ell_i$.
- $0 \leq r_i < 10^{12}$
- $1 \leq \ell_i < 10^{12}$
- $1 \leq d_i < 10^{12}$
- $1 \leq N, Q \leq 10^3$
- The starting rooftop has length $\ell_0 \leq 10$
- The starting rooftop is the first entry of the input

Additional constraints

Subtask	Points	Constraints
A	30	The starting rooftop has length $\ell_0 = 1$; $\ell_i \leq 10^3$
B	30	$\ell_i \leq 10^3$
C	40	No additional constraint

Example 1

sample1.in

```
3 3
0 1
20 5
10 10
12
13
20
```

sample1.out

```
1
0
1
```

There are three rooftops in this challenge:

- $[0, 1)$, the starting rooftop
- $[10, 20)$
- $[20, 25)$, the goal

Observe that the last rooftop on the map is not necessarily the last rooftop of the input. We only guarantee this for the starting rooftop.

For the query with jump size 12, we can finish the parkour in 2 jumps: landing on the second rooftop at position 12 and then at the goal rooftop at position 24.

For the second query, with size 13, we can land on the first rooftop at position 13, but the jump after that, we're beyond the goal rooftop, and we'd fall down.

The last query can land at position 20, which is directly on the goal rooftop. Keep in mind here that position 20 no longer belongs to the rooftop starting at position 10.