D. Sharky Surfing

time limit per test: 3 seconds
memory limit per test: 256 megabytes

Mualani loves surfing on her sharky surfboard!

Mualani's surf path can be modeled by a number line. She starts at position 1, and the path ends at position L. When she is at position x with a jump power of k, she can jump to any **integer** position in the interval $[x, x + k]$. Initially, her jump power is 1.

However, her surf path isn't completely smooth. There are n hurdles on her path. Each hurdle is represented by an interval $[l, r]$, meaning she cannot jump to any position in the interval $[l, r]$.

There are also m power-ups at certain positions on the path. Power-up i is located at position x_i and has a value of v_i. When Mualani is at position x_i, she has the option to collect the power-up to increase her jump power by v_i. There may be multiple power-ups at the same position. When she is at a position with some power-ups, she may choose to take or ignore each individual power-up. No power-up is in the interval of any hurdle.

What is the minimum number of power-ups she must collect to reach position L to finish the path? If it is not possible to finish the surf path, output -1.

Input

The first line contains an integer t ($1 \le t \le 10^4$) — the number of test cases.

The first line of each test case contains three integers n, m, and L ($1 \le n, m \le 2 \cdot 10^5, 3 \le L \le 10^9$) — the number of hurdles, the number of power-ups, and the position of the end.

The following n lines contain two integers l_i and r_i ($2 \le l_i \le r_i \le L - 1$) — the bounds of the interval for the i'th hurdle. It is guaranteed that $r_i + 1 < l_{i+1}$ for all $1 \le i < n$ (i.e. all hurdles are non-overlapping, sorted by increasing positions, and the end point of a previous hurdle is not consecutive with the start point of the next hurdle).

The following m lines contain two integers x_i and v_i ($1 \le x_i, v_i \le L$) — the position and the value for the i'th power-up. There may be multiple power-ups with the same x. It is guaranteed that $x_i \le x_{i+1}$ for all $1 \le i < m$ (i.e. the power-ups are sorted by non-decreasing position) and no power-up is in the interval of any hurdle.

It is guaranteed the sum of n and the sum of m over all test cases does not exceed $2 \cdot 10^5$.

Output

For each test case, output the minimum number of power-ups she must collect to reach position L. If it is not possible, output -1.

Example

input Copy

```
4
2 5 50
7 14
30 40
2 2
3 1
3 5
18 2
22 32
4 3 50
4 6
15 18
20 26
34 38
1 2
8 2
10 2
1 4 17
10 14
1 6
1 2
1 2
16 9
1 2 10
5 9
2 3
2 2
```

output Copy

```
4
-1
1
2
```

Note

In the first test case, she can collect power-ups 1, 2, 3, and 5 to clear all hurdles.

In the second test case, she cannot jump over the first hurdle.

In the fourth test case, by collecting both power-ups, she can jump over the hurdle.

Codeforces Round 988 (Div. 3)
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Practice

→ Virtual participation

Virtual contest is a way to take part in past contest, as close as possible to participation on time. It is supported only ICPC mode for virtual contests. If you've seen these problems, a virtual contest is not for you - solve these problems in the archive. If you just want to solve some problem from a contest, a virtual contest is not for you - solve this problem in the archive. Never use someone else's code, read the tutorials or communicate with other person during a virtual contest.

Start virtual contest

→ Clone Contest to Mashup

You can clone this contest to a mashup.

Clone Contest

→ Submit?

Language: GNU G++20 13.2 (64 bit, win

Choose file: Choose File No file chosen

Submit

→ Last submissions

Submission	Time	Verdict
293134766	Nov/24/2024 20:56	Accepted
293133974	Nov/24/2024 20:49	Wrong answer on test 2
293133848	Nov/24/2024 20:48	Wrong answer on test 2
293133757	Nov/24/2024 20:47	Wrong answer on test 2
293132268	Nov/24/2024 20:35	Wrong answer on test 2
293129056	Nov/24/2024 20:08	Wrong answer on test 2

→ Problem tags

data structures greedy two pointers *1300

No tag edit access

→ Contest materials

- Announcement (en)
- Video Tutorial (en)
- Tutorial #2 (en)