Infinite Loop

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	1024 megabytes

Bobo is trapped in an infinite time loop of a peculiar day! Each day consists of exactly k hours, and every day, n tasks arrive for Bobo to complete.

- The i-th task of the day arrives at the beginning of the a_i-th hour and requires b_i hours of uninterrupted effort to finish.
- Bobo works diligently and always follows a disciplined approach: whenever there are unfinished tasks, **Bobo works on the earliest received unfinished task**.

At the beginning of the first day, Bobo starts with no tasks.

Your mission is to help Bobo answer q queries. For the i-th query, you are given x_i, the day on which a task is received, and y_i, the index of the task received on that day. Your goal is to determine the exact day and hour when Bobo will complete the y_i-th taskof day x_i.

Input

The first line contains three space-separated integers, which are n ($1 \le n \le 10^5$), k ($1 \le k \le 10^8$), and q ($1 \le q \le 10^5$), respectively.

The next n lines each contain two space-separated integers, where the i-th line contains a_i ($1 \le a_i \le k$) and b_i ($1 \le b_i \le k$). It is guaranteed that a_i is strictly monotonically increasing.

Then q lines follow, each containing two space-separated integers, where the i-th line contains x_i ($1 \le x_i \le 5 \times 10^5$) and y_i ($1 \le y_i \le n$).

Output

Output q lines, where the i-th line outputs two space-separated integers d_i and h_i, indicating that the task for the i-th query is completed at the h_i-th hour on the d_i-th day.

Examples

standard input	standard output
2 5 6 1 1 4 3 1 1 1 2 2 1 2 2 3 1 3 2	1 1 2 1 2 2 3 1 3 2 4 1
3 10 5 2 4 3 1 10 7 2 2 7 1 4 3 5 2 28 3	3 1 8 10 6 2 6 7 34 10