D - Long Waiting

Editorial (/contests/abc423/tasks/abc423_d/editorial)

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Time Limit: 2 sec / Memory Limit: 1024 MiB

Score : 400 points

Problem Statement

There is a restaurant that can accommodate at most K customers simultaneously. In front of this restaurant, there is a side street where one queue is managed.

At time 0, there are no customers in the restaurant, and the queue is also empty.

Today, N groups of customers are scheduled to come, and they are numbered from 1 to N in the order of their arrival. Group i consists of C_i people, joins the end of the queue at time A_i, and leaves the restaurant B_i time units after entering.

Each group enters the restaurant by leaving the queue at the earliest time when both of the following two conditions are satisfied simultaneously:

- The group is at the front of the queue. In other words, the group is the earliest to have joined among those still in the queue at that point.
- When the number of people in that group and all groups currently in the restaurant (including those entering at exactly that time and excluding those leaving) are combined, there are K or fewer people.

Find the time when each group enters the restaurant.

Constraints

- $1 \leq N \leq 3 \times 10^5$

- $1 \leq K \leq 10^7$
- $1 \leq A_i, B_i \leq 10^7$ $(1 \leq i \leq N)$
- $A_1 < \cdots < A_N$
- $1 \leq C_i \leq K$ $(1 \leq i \leq N)$
- All input values are integers.

Input

The input is given from Standard Input in the following format:

$$
\begin{array}{lll}
N & K & \\
A_1 & B_1 & C_1 \\
\vdots & & \\
A_N & B_N & C_N
\end{array}
$$

Output

Output N lines. The i-th line $(1 \leq i \leq N)$ should contain the time when group i enters the restaurant as an integer.

Sample Input 1 Copy

Copy

```
4 10
30 300 3
60 45 4
90 45 5
120 45 2
```

Sample Output 1 Copy

Copy

```
30
60
105
120
```

The entry and exit of each group proceed as follows:

- At time 30, group 1 joins the queue and immediately enters, making the number of customers in the restaurant 3.
- At time 60, group 2 joins the queue and immediately enters, making the number of customers in the restaurant 7.
- At time 90, group 3 joins the queue.

- At time 105, group 2 leaves, making the number of customers in the restaurant 3. Immediately after, group 3 enters, making the number of customers in the restaurant 8.
- At time 120, group 4 joins the queue and immediately enters, making the number of customers in the restaurant 10.
- At time 150, group 3 leaves, making the number of customers in the restaurant 5.
- At time 165, group 4 leaves, making the number of customers in the restaurant 3.
- At time 330, group 1 leaves, making the number of customers in the restaurant 0.

Sample Input 2 Copy

Copy

```
4 10
30 300 10
60 45 2
90 45 3
120 45 4
```

Sample Output 2 Copy

Copy

```
30
330
330
330
```

The entry and exit of each group proceed as follows:

- At time 30, group 1 joins the queue and immediately enters, making the number of customers in the restaurant 10.
- At time 60, group 2 joins the queue.
- At time 90, group 3 joins the queue.
- At time 120, group 4 joins the queue.
- At time 330, group 1 leaves, making the number of customers in the restaurant 0. Immediately after, groups $2, 3, 4$ enter, making the number of customers in the restaurant 9.
- At time 375, groups $2, 3, 4$ leave, making the number of customers in the restaurant 0.

Sample Input 3 Copy

Copy

2026-01-02 (Fri)
05:30:05 +11:00

```
10 24
279290 9485601 1
1094410 8022270 4
1314176 7214745 5
1897674 5924694 10
1921802 5769841 4
2506394 2765234 2
2558629 2727489 9
2681289 4061363 5
3022540 2291905 3
4407692 1313036 8
```

Sample Output 3 Copy

```
279290
1094410
1314176
1897674
1921802
7691643
7822368
8528921
8528921
10549857
```

#telegram)

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