Binge Watching (binge)

Penny spends too much time every day binge watching her favourite TV series! In order to get out of her addiction, she decided to be more disciplined and devote no more than M minutes every day to her favourite activity.

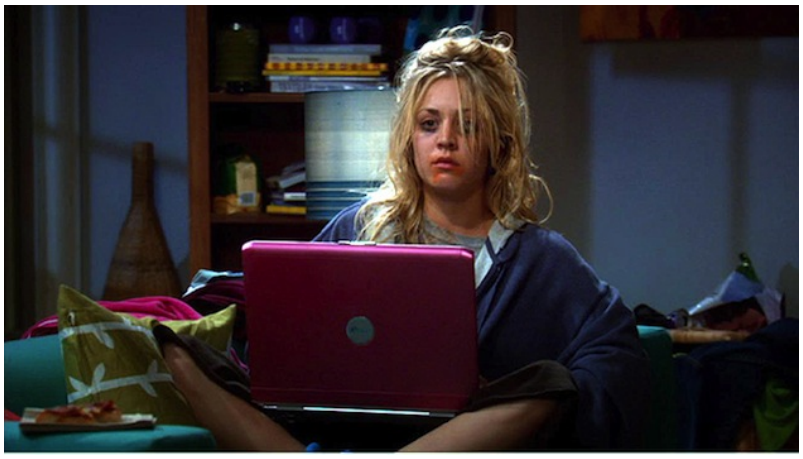

Figure 1: Penny realising that she is watching too many TV series.

To get the most out of the time that she has, Penny made a list of the next N shows that she wants to watch, in order. Every TV series is composed of E_i episodes each with a length of L_i minutes (where $i = 0 \dots N-1$). Penny will never start a TV series before finishing to watch the previous one; and will never start an episode in a day if she does not have enough time left to finish it. How many days D Penny needs to watch all the TV series she has planned so far? How many minutes S will Penny spare in the last day, that could be used to start watching a new TV series?

☞ Among the attachments of this task you may find a template file `binge.*` with a sample incomplete implementation.

Input

The first line contains the two integers M and N. The following N lines contain each two integers E_i and L_i.

Output

You need to write a single line with two integers D and S: the number of days needed to watch all the shows, and the number of minutes spared in the last day.

Constraints

- $1 \leq M \leq 1\,000\,000\,000$.
- $1 \leq N \leq 10\,000$.
- $1 \leq E_i \leq 1\,000\,000\,000$ for each $i = 0 \dots N-1$.
- $1 \leq L_i \leq M$ for each $i = 0 \dots N-1$.

Scoring

Your program will be tested against several test cases grouped in subtasks. In order to obtain the score of a subtask, your program needs to correctly solve all of its test cases.

– **Subtask 1** (0 points) Examples.

– **Subtask 2** (10 points) $L_i = M$ for each i.

– **Subtask 3** (20 points) $N = 1$.

– **Subtask 4** (30 points) $E_i = 1$ for each i.

– **Subtask 5** (40 points) No additional limitations.

Examples

input	output
60 4 4 60 3 6 5 42 2 15	10 45
30 5 1000000000 30 1000000000 30 1000000000 30 1000000000 30 1000000000 30	5000000000 0

Explanation

In the **first sample case**, Penny wants to spend an hour every day on TV series. Her first 4 days are spent watching the episodes of the first series. She can then watch the whole second series on the 5th day, using a total of $3 \times 6 = 18$ minutes. With the remaining 42 minutes she can already start the first episode of the third series on the 5th day, watching the following ones on days 6, 7, 8 and 9. Notice that during days 6, 7 and 8 several minutes are left that cannot be used, since Penny does not want to start a new series before finishing the previous one. Part of the 18 minutes left on the 9th day can however be used to start the last TV series. Her plan ends on the 10th day, with the only remaining episode of 15 minutes. The other 45 minutes are spare and usable for future shows.

In the **second sample case**, Penny only wants to spend half an hour every day, forcing her to spend 5 billion days to end all the five TV series.