Jesse and OS

locked

by saikiran9194

Problem Submissions Leaderboard Discussions

Jesse is building his own operating system and now faces the task of building the process scheduling and the memory management feature. He has laid down the rules of how he is going to do it. It's as follows:

1. If a process needs to be executed and memory is available, the process is given the required amount of memory.
2. If a process needs to be executed and memory is not available, Jesse will wait until a few processes are completed which will free up enough memory and then he will assign it to the process.
3. Once a process is assigned some memory, it can't be removed from the memory until it's completed.
4. The processes should be executed in the given order. A process j can't be allocated memory before process i, if $i < j$.

Jesse is busy with other stuff and needs your help in implementing this. Can you help him do this?

Assume that the time taken to allocate memory to a process is 0.

Input Format

The first line contains two integers n and m, where n is the number of processes and m is the amount of memory available initially. Then n lines follow, each line contains two integers dur and mem where dur is the time needed for the current process to complete and mem is the amount of memory it needs.

Constraints

- $1 \leq n \leq 10^5$
- $1 \leq m \leq 10^9$
- $1 \leq dur_i \leq 10^6$
- $1 \leq mem_i \leq n$

Output Format

Print in a single line, the total time taken to execute all the given processes.

Sample Input

```
5 20
5 10
6 11
4 8
2 9
3 10
```

Sample Output

```
14
```

Explanation

The first process starts at time 0 and utilizes 10 units of memory. The second process can't start at time 0 because it needs 11 units of memory but only

10 units is available. The second process starts at time 5 and even the third process starts at the same time and in total both occupy 19 units of memory. The third process finishes at time 9 and the fourth process starts at time 9. The second and the fourth process end at time 11 and the fifth process starts at 11 and ends at time 14. So the answer is 14.

Submissions: 47

Max Score: 80

Difficulty: Hard

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Java 8

```
1  import java.io.*;
2  import java.util.*;
3
4  public class Solution {
5
6      public static void main(String[] args) {
7          /* Enter your code here. Read input from STDIN. Print output to STDOUT. Your class should be
   named Solution. */
8      }
9  }
```

Line: 1 Col: 1

Upload Code as File Test against custom input Run Code Submit Code