

Coding Arena

A B C D E F G H

Problem : Water Management

There are N tubs of water, numbered from 1 to N. Initially there is a few litres of water in each tub. Each water tub has 2 taps attached to it. Incoming Tap with speed x litres / second and Outgoing Tap with speed y litres / second.

Let water(i) denote the final volume of water in i^{th} tub.

Amit wants to attain such a situation that $\text{water}(i) < \text{water}(i+1)$ for $1 \leq i \leq N$. i.e. water in each tub must be less than water in the tub next to it. He wants to do this as quickly as possible.

You task is to find out and tell Amit, what is the minimum number of seconds required to attain in this situation.

Input Format:

First line will contains the number of tubs, denoted by N

Next N lines contain a tuple with 3 integers delimited by white space. The tuple contents are

- W_i - volume of water present initially in i^{th} tub (in litres)
- x - speed of incoming tap of i^{th} tub (in litres/second)
- y - speed of outgoing tap of i^{th} tub (in litres/second)

Output Format:

Minimum time in seconds, needed to arrange water in N tubs, in ascending order of volume.

Constraints:

$2 \leq N \leq 100000$

$0 \leq W \leq 1000000000$ (1 billion) for each tub

$1 \leq x \leq 10000$ for each tub

$1 \leq y \leq 10000$ for each tub

A tap can be used only for integral number of seconds i.e. you cannot use a tap for 0.3 or 0.5 seconds. It can be used either for 1,2,3.... Seconds

Capacity of each tub is infinite.

Volume of water in any tub cannot be less than zero at any point of time.

Any number of taps can be turned on or off simultaneously.

Sample Input and Output

SNo.	Input	Output
1	3 2 3 3 3 4 5 3 5 5	1
2	3 6 2 1 4 1 3 4 1 4	2

Explanation for sample input and output 1:

Time Left**05 53 20**
hr min sec**Rules & Regulations**

Here we have 3 tubs with following information about each of them

Tub Number	Initial Volume	Incoming Tap speed	Outgoing Tap speed
Tub 1	2	3	3
Tub 2	3	4	5
Tub 3	3	5	5

Initially tub 2 and 3 have same volume of water. So he will just turn on the Incoming Tap at Tub 3 for one second. After one second the water in 3rd tub will be 8 litres. Since $2 < 3 < 8$, the answer is 1 second.

Explanation for sample input and output 2:

Here we have 3 tubs with following information about each of them

Tub Number	Initial Volume	Incoming Tap speed	Outgoing Tap speed
Tub 1	6	2	1
Tub 2	4	1	3
Tub 3	4	1	4

As we can see that it is impossible to do the task in one second. But it can be done in two second as below.

Turn on the outgoing tap at tub 1. So after two seconds water level will reduce to 4 litres.

Turn on the incoming tap at tub 2 only for one second. So water level will be 5 litres.

Turn on the incoming tap at tub 3 for two seconds. So water level will be 6 litres.

Since $4 < 5 < 6$, the answer is 2 seconds.

Note:

Please do not use package and namespace in your code. For object oriented languages your code should be written in one class.

Note:

Participants submitting solutions in C language should not use functions from `<conio.h>` / `<process.h>` as these files do not exist in gcc

Note:

For C and C++, return type of `main()` function should be `int`.

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☐ I, **SAI PAYAVULA** confirm that the answer submitted is my own.

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