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Electrifex
Enhancing Quality of Life

Coding Round EFX/240315/A

QUESTION 1

Burger Happiness: In Burger Town new burger restaurants will be opened! Concretely, N restaurants will open in N days, while restaurant i will be opened on day i and will be located at X_i. The town should be imagined as a one-dimensional line in which every object's location can be described by the x-coordinate.

Tim has just recently arrived the town after a very bad result in a programming contest. Thus, he wants to cheer himself up by starting a trip to try out some new burgers.

Every burger restaurant is associated with two integers A_i and B_i. If Tim eats a burger from i, then his happiness will increase by A_i, which can also be negative, depending on the deliciousness of the burger. On the other hand, if Tim looks through the window of an opened restaurant i, from which he will not eat a burger, then his happiness decreases by B_i, since Tim gets sad by only seeing the burgers.

Tim's journey can start from any day d at the burger restaurant d and eats a burger from there. On each subsequent day $n > d$, Tim has the following options:

- Stay at the previous restaurant p.
- Or go to the new restaurant n to eat a burger from there.

If he decides for the latter option, then on the path from p to n he will look through all the windows that are on his path and maybe lose some happiness. If $X_p < X_n$ then he will look through the window of every opened restaurant i, having $X_p \leq X_i < X_n$. Similar for the case $X_n < X_p$.

Write a program help Tim to find a trip that will maximize his happiness. If he should stay at home since no trip would cheer him up, then print 0.

Tim's happiness is 0 at the beginning of the trip and is allowed to be negative throughout the time.

Input Format	Constraints	Output Format
N will be given on the first line, then N lines will follow, describing the restaurants numbered from 1 to N accordingly. Restaurant i will be described by X_i, A_i and B_i separated by a single space.	$1 \leq N \leq 10^5$ $\lvert A_i \rvert \leq 10^6$ $0 \leq B_i \leq 10^6$ $0 \leq X_i \leq 10^9$ *and no two restaurants will have the same coordinates.*	Output the maximum happiness on one line.
Sample Input	**Sample Output**	
3 2 -5 1 1 5 1 3 5 1	8	
4 4 10 0	15	

1 -5 0 3 0 10 2 10 0	
3 1 -1 0 2 -2 0 3 -3 0	0

QUESTION 2

Euler published the remarkable quadratic formula: $n^2 + n + 41$
It turns out that the formula will produce *40* primes for the consecutive values $n = 0$ to *39*.
However, when $n = 40$, $40^2 + 40 + 41 = 40(40 + 1) + 41$ is divisible by *41*, and certainly when $n = 41$, $41^2 + 41 + 41$ is clearly divisible by *41*.
Using computers, the incredible formula $n^2 - 79n + 1601$ was discovered, which produces *80* primes for the consecutive values $n = 0$ to *79*. The product of the coefficients, *-79* and *1601*, is *-126479*.
Considering quadratics of the form:

$n^2 + an + b$, where $|a| <= N$ and $|b| <= N$

where $|n|$ is the modulus/absolute value of n

e.g. |11| = 11 and |-4| = 4

Find the coefficients, a and b, for the quadratic expression that produces the maximum number of primes for consecutive values of *n*, starting with $n = 0$.
Note: You can assume solution to be unique.

Input Format	**Constraints**	**Output Format**
The first line contains an integer *N*.	$42 \leq N \leq 2000$	Print the value of a and b separated by space.
Sample Input	**Sample Output**	
42	-1 41	