Boxes of Delights

April 2025
C++ — 2 sec — 512 MB

Just 30 km due south of Susie's Sweetest Sweet Shop lies an enormous warehouse. Due to a plethora of popular proprietary demand, Susie has rented out a long thin strip for storage, spanning from left to right. Her plan is to hold her candy-filled boxes of delights in the warehouse until they can be delivered to sweet-toothed customers.

Susie's rented strip is *very, very* long and is just wide enough to fit one box of delights. It can thus be thought of as a 2D plane, stretching from left to right and bottom to top. Susie wants to store **n** boxes in the warehouse and the **i**th box has a length and height of $\mathbf{s_i}$.

Susie has already decided where each box is to be stored. The warehouse operators will go through the list in order and place the left-most edge of the **i**th box at her specified location ($\mathbf{x_i}$). The boxes are added by a winch from the warehouse ceiling and will come to rest on top of the first box beneath them. The packing of each box ensures that the operators do not need to worry about balancing the boxes.

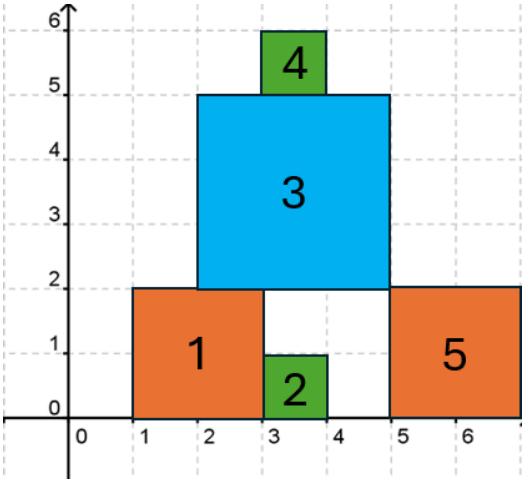
For reasons of health and safety, the warehouse has a maximum stacking height. To ensure that her stacks are compliant, Susie wants to know the height of the tallest stack after each box has been placed.

INPUT You will be given an integer, **n**, denoting the number of boxes that Susie wants to store in the warehouse. This will be followed by **n** lines containing two integers, **x** and **s**. The **i**th line specifies the position to place the left-most edge of the **i**th box, and its length and height, respectively.

$1 \leq \mathbf{n} \leq 2^{20}$
$0 \leq \mathbf{x_i} < 2^{31}$
$1 \leq \mathbf{s_i} \leq 2^{20}$

OUTPUT After placing each box, you should output the height of the tallest stack of boxes on a new line.

SAMPLE For example, suppose there are 5 boxes to be placed at positions 1, 3, 2, 3, and 5, and that these boxes have lengths and heights of 2, 1, 3, 1, and 2, respectively. The outcome of placing these boxes in order is shown to the right.



INPUT	OUTPUT
5 1 2 3 1 2 3 3 1 5 2	2 2 5 6 6
10 5 2 6 1 9 2 9 1 6 4 10 2 11 2 10 3 3 2 10 1	2 3 3 3 7 7 7 9 9 10