Pumpkin on the Clocktower

Problem ID: pumpkinclocktower

One of the greatest mysteries in Cornell history is about a pumpkin placed atop the 173-foot-tall spire of McGraw Tower in October 1997. It has since been memorialized as an ice cream flavor, "Clocktower Pumpkin," produced by the Cornell Dairy.

No one has ever figured out how the pumpkin got up there, but one hypothesis that involves temporary support beams has caught our attention.

A close examination of the clock tower suggested that there are N positions where beams can be placed.

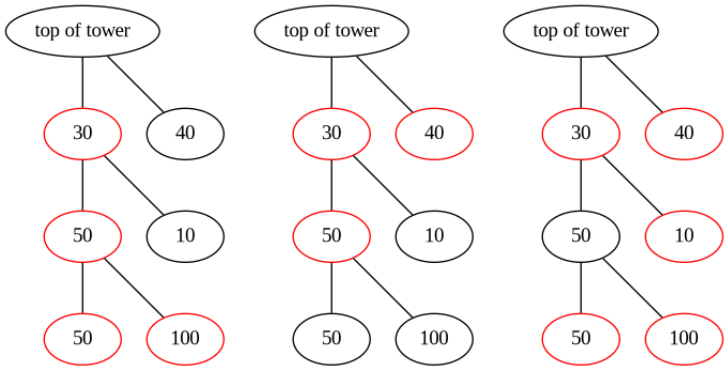
Each possible position is close to exactly one position above it (and may be close to zero or more positions below it). Such a close position can be either the top of the tower or another possible position for a beam.

In other words, if we connect each possible position to the position above it that is close to it, we will get a tree with $N + 1$ nodes and N edges, with the top of the tower as its root.

Each support beam i would provide some steadiness value s_i if placed. The civil engineering department advised you that if a beam is placed, then at most 1 other beam that is close to it can be placed.

A sixty pounds pumpkin just appeared on top of McGraw Tower

To test the hypothesis of placing the pumpkin through temporary support beams, you wonder what would be the maximum possible sum of steadiness values of a proper support beam placement.



Sample input 1:

The first selection of beam positions has value 230 but is invalid because a beam has 3 other beams close to it.
The second one is valid, and has value 120.
The third one is also valid, and has value 230, which is the highest possible.

Input

The first line of input contains a single integer N, $1 \leq N \leq 10^5$, the total number of possible positions. Positions are numbered from 1 to N, and the top of the tower is numbered 0. Positions are listed in decreasing order of height. So position 0 is the highest (top of the tower) followed by position 1, ...

The following N lines describe the tree structure. The i-th line contains two integer p_i and s_i ($0 \leq p_i < i$ and $1 \leq s_i \leq 10^4$), which are the position above i which is close to it and the steadiness of a beam placed at position i respectively.

Output

Output a single value, the maximum possible sum of steadiness values.

Sample Input 1

```
6
0 30
0 40
1 50
1 10
3 50
3 100
```

Sample Output 1

```
230
```

Sample Input 2

```
10
0 10
0 10
0 10
0 10
0 10
0 10
0 10
0 10
0 10
0 10
```

Sample Output 2

```
100
```