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Visits

Time Limit: 3.0s

Memory Limit: 256MB

Input: stdin

Output: stdout

When submitting, please check that the problem listed (on the Submission page where you upload your solution) matches the problem you intend to submit.

Each of Bessie's N ($2 \leq N \leq 10^5$) bovine buddies (conveniently labeled $1 \dots N$) owns her own farm. For each $1 \leq i \leq N$, buddy i wants to visit buddy a_i ($1 \leq a_i \leq N, a_i \neq i$).

The collective pleasure value is initially defined to be zero. Given a permutation (p_1, p_2, \dots, p_N) of $1 \dots N$, the visits occur as follows.

For each i from 1 up to N :

- If buddy a_{p_i} has already departed her farm, then buddy p_i remains at her own farm.
- Otherwise, buddy p_i departs her farm to visit buddy a_{p_i} 's farm. This visit causes the collective pleasure value to change by v_{p_i} ($-10^9 \leq v_{p_i} \leq 10^9$).

Compute the maximum possible collective pleasure value after all visits over all permutations p . Note that this value may be negative.

INPUT FORMAT (pipe stdin):

The first line contains N .

For each $1 \leq i \leq N$, the $i + 1$ -st line contains two space-separated integers a_i and v_i .

OUTPUT FORMAT (pipe stdout):

A single integer denoting the answer.

Note that the large size of integers involved in this problem may require the use of 64-bit integer data types (e.g., a "long long" in C/C++).

Input

Output

4
2 10
3 20
4 30
1 40

90

If $p = (1, 4, 3, 2)$ then

- Buddy 1 visits buddy 2's farm, increasing the collective pleasure value by 10.
- Buddy 4 sees that buddy 1 has already departed, so nothing happens.
- Buddy 3 visits buddy 4's farm, increasing the collective pleasure value by 30.
- Buddy 2 sees that buddy 3 has already departed, so nothing happens.

This gives a collective pleasure value of $10 + 30 = 40$.

On the other hand, if $p = (2, 3, 4, 1)$ then

- Buddy 2 visits buddy 3's farm, increasing the collective pleasure value by 20.
- Buddy 3 visits buddy 4's farm, increasing the collective pleasure value by 30.
- Buddy 4 visits buddy 1's farm, increasing the collective pleasure value by 40.
- Buddy 1 sees that buddy 4 has already departed, so nothing happens.

This gives a collective pleasure value of $20 + 30 + 40 = 90$. It can be shown that this is the maximum possible collective pleasure value after all visits over all permutations p .

Input

Output

7
2 -1
3 -1
1 -1
5 10
6 10
7 10
4 10

28

Input

Output

```
7
2 -1000000000
1 -1000000000
1 -1000000000
3 -1000000000
4 -1000000000
5 -1000000000
6 -1000000000
```

-3000000000

An example where the answer is (very) negative.

SCORING:

- For 10% of points, $N \leq 1000$ and $\lceil \frac{i}{7} \rceil = \lceil \frac{a_i}{7} \rceil$ for all i .
- For 10% of points, $a_i \neq a_j$ for all $i \neq j$ and $v_i \geq 0$ for all i .
- For 15% of points, $v_i \geq 0$ for all i .
- For 15% of points, $a_i \neq a_j$ for all $i \neq j$.
- For 50% of points, no additional constraints.