Problem F: Pet Adoption [Hard II]

Time Limit: 1 Sec Memory Limit: 128 MB
Submit: 0 Solved: 0
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Description

Lanran opened a pet adoption center. Each pet has a characteristic value
($0 < p < 2^{31}$)
and each adopter also hash a value q
($0 < q < 2^{31}$)
.

Lanran needs to provide the following services:

- For a pet with characteristic value p
  arriving, it will be adopted by a person staying in the center whose q
  is **the minimum closest** to p
  or stay in the center if there is no adopter left.
- For an adopter with value q
  arriving, he/she will choose a pet staying in the center whose p
  is **the minimum closest** to q
  or stay in the center if there is no pet left.

a
is **the minimum closest** to v
in set S
if and only if:

- for all $a_x \in S$
  there is $|a - v| \leq |a_x - v|$
- for all $a_i \in S$
  and $|a - v| = |a_i - v|$
  there is $a \leq a_i$

the dissatisfaction for each adoption is defined as $|p - q|$

Input

The first line is a positive integer n
($n \leq 80000$
), which represents the total number of pets and adopters who come to the adoption center. The next n lines describe the pets and adopters who came to the adoption center in the order of arrival. Each line has two positive integers a, b, where a=0 for pets, a=1 for adopters, and b for character values.

Output

A positive integer representing the sum of the dissatisfaction of all adopted adopters of pets.

Sample Input

```
5
0 2
0 4
1 3
1 2
1 5
```

Sample Output

```
3
```

HINT

$|3-2|+|2-4|=3$ and the last adopter has no pets to adopt.

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