

# Jelly

Input file:            **standard input**  
Output file:           **standard output**  
Time limit:            2 seconds  
Memory limit:         1024 megabytes

There are  $N + 1$  kinds of food in total:  $N$  kinds of food numbered  $1, 2, \dots, N$ , and water jelly. For  $i = 1, 2, \dots, N$ , the sweetness of food  $i$  is  $A_i$  and its spiciness is  $B_i$ . The sweetness of water jelly is 0 and its spiciness is 0.

UTPC-kun first eats water jelly, then eats foods  $1, 2, \dots, N$  exactly once each in any order, and finally eats water jelly again.

UTPC-kun's happiness is 0 immediately after eating the first water jelly. After that, every time he eats a food, his happiness changes as follows:

- Let  $a$  and  $b$  be the sweetness and spiciness of the food he is currently eating, and let  $a'$  and  $b'$  be the sweetness and spiciness of the food he ate immediately before. His happiness increases by  $\max(a - a', b - b')$ . (The increase in happiness can be negative.)

Find the maximum possible final happiness of UTPC-kun by choosing the optimal order to eat foods  $1, 2, \dots, N$ .

## Input

The input is given in the following format:

```
N
A1 B1
A2 B2
⋮
AN BN
```

- All input values are integers.
- $1 \leq N \leq 5 \times 10^5$
- $0 \leq A_i, B_i \leq 10^9$

## Output

Print the answer on a single line.

## Examples

standard input	standard output
4 1 4 3 1 2 3 3 4	6
3 1 2 2 1 1 2	3
6 3 1 4 1 5 9 2 6 5 3 5 8	18

## Note

In the first example, One optimal order to eat the foods is 1, 2, 3, 4. In this case, UTPC-kun's happiness changes as follows after he finishes eating the first water jelly:

- Eats food 1: His happiness increases by  $\max(1 - 0, 4 - 0) = 4$ , becoming 4.
- Eats food 2: His happiness increases by  $\max(3 - 1, 1 - 4) = 2$ , becoming 6.
- Eats food 3: His happiness increases by  $\max(2 - 3, 3 - 1) = 2$ , becoming 8.
- Eats food 4: His happiness increases by  $\max(3 - 2, 4 - 3) = 1$ , becoming 9.
- Eats water jelly: His happiness increases by  $\max(0 - 3, 0 - 4) = -3$ , becoming 6.