



2

Art Exhibition

An art exhibition will be held in Republic of JOI. Many artworks from all over the country will be displayed in the art exhibition.

There are N artworks which are candidates for the exhibition. The artworks are numbered from 1 to N . Two integers are defined for each artwork: its *size* and its *value*. The size of the artwork i ($1 \leq i \leq N$) is A_i , and the value of the artwork i is B_i .

In the art exhibition, at least one artwork will be chosen and displayed. Since the exhibition hall is large enough, it is possible to display all of the N artworks. However, due to the aesthetic sense of people in Republic of JOI, we want to choose artworks for the exhibition so that the difference between the sizes of the displayed artworks is not too large. On the other hand, we want to display many artworks with large value. We decided to choose the artworks for the exhibition by the following rule:

- Among chosen artworks for the exhibition, let A_{\max} be the largest size of the chosen artworks, and A_{\min} be the smallest size of the chosen artworks. Let S be the total value of the chosen artworks.
- Then, we want to maximize $S - (A_{\max} - A_{\min})$.

Task

Given the number of candidates of artworks for the exhibition, and the size and the value of each artwork, write a program which calculates the maximum of $S - (A_{\max} - A_{\min})$.

Input

Read the following data from the standard input.

- The first line contains an integer N , the number of candidates of artworks for the exhibition.
- The i -th line ($1 \leq i \leq N$) of the following N lines contains two space separated integers A_i, B_i . This means the size of the artwork i is A_i , and the value of the artwork i is B_i .

Output

Write one line to the standard output. The output should contain the maximum of $S - (A_{\max} - A_{\min})$.



Constraints

All input data satisfy the following conditions.

- $2 \leq N \leq 500\,000$.
- $1 \leq A_i \leq 1\,000\,000\,000\,000\,000 = 10^{15}$ ($1 \leq i \leq N$).
- $1 \leq B_i \leq 1\,000\,000\,000$ ($1 \leq i \leq N$).

Subtask

Subtask 1 [10 points]

- $N \leq 16$.

Subtask 2 [20 points]

- $N \leq 300$.

Subtask 3 [20 points]

- $N \leq 5000$.

Subtask 4 [50 points]

- There are no additional constraints.

Sample Input and Output

Sample Input 1	Sample Output 1
3	6
2 3	
11 2	
4 5	

In this sample input, there are 3 candidates of artworks for the exhibition. The size and the value of each artwork are as follows:

- The artwork 1 has size 2, and value 3.
- The artwork 2 has size 11, and value 2.



- The artwork 3 has size 4, and value 5.

In this case, if we choose the artwork 1 and the artwork 3 for the exhibition, we have $S - (A_{\max} - A_{\min}) = 6$ by the following way:

- Among the chosen artworks, the artwork 3 has the largest size. Therefore, $A_{\max} = 4$.
- Among the chosen artworks, the artwork 1 has the smallest size. Therefore, $A_{\min} = 2$.
- The total value of the chosen artworks is $3 + 5 = 8$. Therefore, $S = 8$.

Since $S - (A_{\max} - A_{\min})$ cannot be greater than 7, output 6.

Sample Input 2	Sample Output 2
6	7
4 1	
1 5	
10 3	
9 1	
4 2	
5 3	

Sample Input 3	Sample Output 3
15	4232545716
1543361732 260774320	
2089759661 257198921	
1555665663 389548466	
4133306295 296394520	
2596448427 301103944	
1701413087 274491541	
2347488426 912791996	
2133012079 444074242	
2659886224 656957044	
1345396764 259870638	
2671164286 233246973	
2791812672 585862344	
2996614635 91065315	
971304780 488995617	
1523452673 988137562	