

# TLE '16 Contest 6 (Mock CCC) S3 - Hyper Fax

You live in a neighbourhood which is arranged as a straight line.

Your pet Fax is very popular among the  $N$  neighbours, so they will feed pies to your pet.

Initially, your Fax is lazy and unable to move, but when he consumes sugar, he becomes hyper and begins to run.

The  $i^{th}$  ( $1 \leq i \leq N$ ) neighbour is located at  $x_i$  metres from the origin, and this neighbour's pie contains enough sugar for your Fax to run a distance of  $d_i$  more metres while hyper. The neighbours are extremely kind and enjoy feeding their entire pie to your Fax. The neighbours only have 1 pie each, so your Fax can only eat a neighbour's pie on one visit.



*Fax McClad walking his pet Fax in his neighbourhood.*

You are the first neighbour, and you are located at 0 metres from the origin ( $x_1 = 0$ ). At time 0, your pet Fax is located at the origin, and you feed your pie to your Fax.

What is the maximum distance that your Fax can travel while hyper?

## Input Specification

The first line contains  $N$  ( $1 \leq N \leq 2000$ ).

For each of the next  $N$  lines, the  $i^{th}$  line will contain  $x_i$  ( $-10^9 \leq x_i \leq 10^9$ ) and  $d_i$  ( $1 \leq d_i \leq 10^9$ ). Also,  $x_1 = 0$ .

No two neighbours share the same  $x_i$ . The sum of all  $d_i$  will not exceed  $10^9$ .

- For 2 of the 15 available marks,  $x_i \geq 0$ .
- For an additional 3 of the 15 available marks,  $-100 \leq x_i \leq 100$ .
- For an additional 3 of the 15 available marks,  $N \leq 6$ .
- For an additional 3 of the 15 available marks,  $N \leq 20$ .

## Output Specification

Output one integer, which is the maximum total distance that your Fax can travel while hyper.

## Sample Input 1

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2
0 10
-10 10
```

## Sample Output 1

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20

## Sample Input 2

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2  
0 10  
11 10

## Sample Output 2

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10

## Sample Input 3

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3  
0 2  
1 2  
-1 2

## Sample Output 3

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6