



## DVDs

Mouse Ron loves to watch movies on dvd. Instead of buying all those dvds he borrows them in video rental stores. As he watched all the movies he wants to bring them back as fast as possible so he can minimize the fee he has to pay. Each video rental store charges 1 SFr per dvd and hour.

Of course mouse Ron wants to pay as little as possible. Luckily all the video rental stores are located on the same street as mouse Ron lives. Some are located to the left of Rons house, some to the right. Mouse Ron packs up all dvds in his backpack and visits one store after the other in such an order that he has to pay as little as possible. Can you help him minimize the fees?

### Input

The first line contains one integer  $N$ , the number of video rental stores from which mouse Ron rented dvds.

The following  $N$  lines describe each a video rental store. Each line contains two integers  $a_i$  and  $b_i$ .  $a_i$  is the position of the  $i$ th store in walk hours from Ron's house. If  $a_i$  is negative the store is located to the left of Ron's house. Otherwise if  $a_i$  is positive the store is located to the right.  $b_i$  denotes the number of dvds Ron rented from this video rental store.

### Output

Print one integer, the minimal fee in SFr mouse Ron has to pay.

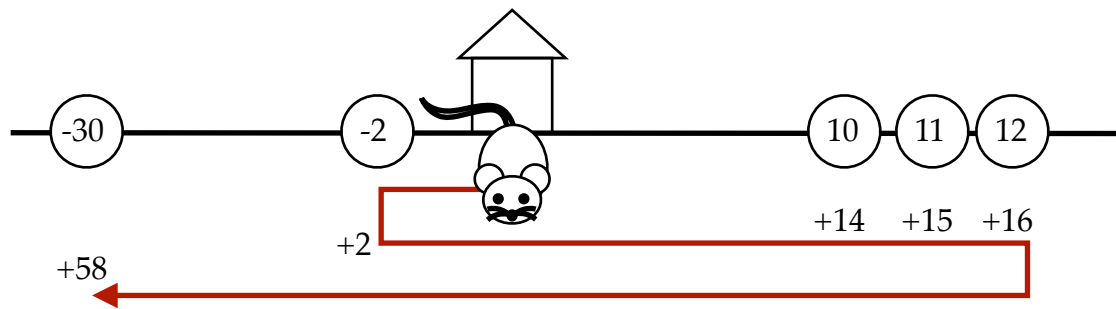
### Constraints

- For each testcase:  $-10^6 \leq a_i \leq 10^6$ ,  $1 \leq b_i \leq 100$ .
- No video rental store is located at Ron's house ( $a_i \neq 0$ ) and every store is located at a different position.
- For 30 points:  $1 \leq N \leq 10$ , for 20 points additionally  $b_i = 1$ .
- For 50 points:  $1 \leq N \leq 20$ , for 30 points additionally  $b_i = 1$ .
- For 100 points:  $1 \leq N \leq 1\,000$ , for 50 points additionally  $b_i = 1$ .

### Examples

Input	Output
5 10 1 -2 1 11 1 12 1 -30 1	105

Ron minimizes his fees by first returning the dvd that belongs to the rental store at position  $-2$ , where he arrives after two hours. After that, he visits the stores at position 10, 11 and 12 each after 14, 15, 16 walk hours respectively. Finally, he passes his house once more to visit the last store at position  $-30$ , where he arrives after  $16 + 12 + 30 = 58$  hours. In total he pays  $2 + 14 + 15 + 16 + 58 = 105$  SFr. The image below shows this optimal trip.



Input	Output
10 -40 12 2 124 3 18 20 1 -72 48 99 6 32 8 84 12 102010 1 -1029820 1	1346676