**F - Intervals**

Time limit : 2sec / Memory limit : 256MB

Score : 1000 points

**Problem Statement**

Snuke received *N* intervals as a birthday present. The *i*-th interval was [−*Li*,*Ri*]. It is guaranteed that both *Li* and *Ri* are positive. In other words, the origin is strictly inside each interval.

Snuke doesn't like overlapping intervals, so he decided to move some intervals. For any positive integer *d*, if he pays *d* dollars, he can choose one of the intervals and move it by the distance of *d*. That is, if the chosen segment is [*a*,*b*], he can change it to either [*a*+*d*,*b*+*d*] or [*a*−*d*,*b*−*d*].

He can repeat this type of operation arbitrary number of times. After the operations, the intervals must be pairwise disjoint (however, they may touch at a point). Formally, for any two intervals, the length of the intersection must be zero.

Compute the minimum cost required to achieve his goal.

**Constraints**

* 1≤*N*≤5000
* 1≤*Li*,*Ri*≤109
* All values in the input are integers.

**Input**

The input is given from Standard Input in the following format:

*N*

*L*1 *R*1

:

*LN* *RN*

**Output**

Print the minimum cost required to achieve his goal.

**Sample Input 1**

Copy

4

2 7

2 5

4 1

7 5

**Sample Output 1**

Copy

22

One optimal solution is as follows:

* Move the interval [−2,7] to [6,15] with 8 dollars
* Move the interval [−2,5] to [−1,6] with 1 dollars
* Move the interval [−4,1] to [−6,−2] with 2 dollars
* Move the interval [−7,5] to [−18,−6] with 11 dollars

The total cost is 8+1+2+11=22 dollars.

**Sample Input 2**

Copy

20

97 2

75 25

82 84

17 56

32 2

28 37

57 39

18 11

79 6

40 68

68 16

40 63

93 49

91 10

55 68

31 80

57 18

34 28

76 55

21 80

**Sample Output 2**

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7337