

# 2017 Canadian Computing Olympiad

## Day 2, Problem 2

### Professional Network

**Time Limit: 2 seconds**

#### Problem Description

Kevin is developing his professional network within a certain community. Unfortunately, he has not connected with anybody yet. But he has his eyes on  $N$  potentially valuable connections, numbered from 1 to  $N$ . He is determined to connect with them all.

However, few people in this community are willing to friend an outsider. Each of the  $N$  people Kevin wants to connect with has similar, but different criteria for determining who is an outsider and who isn't. Person  $i$  is willing to friend Kevin if he either has at least  $A_i$  connections within the community already, or if Kevin gives this person  $B_i$  Internet Points.

Kevin likes his Internet Points very much, and so he doesn't want to give away too many. Now it is your job to help Kevin give away the least number of Internet Points while still making connections with each of the  $N$  people.

#### Input Specification

The first line will contain the integer  $N$  ( $1 \leq N \leq 200\,000$ ). Each of the next  $N$  lines will contain integers  $A_i$  and  $B_i$  ( $1 \leq i \leq N; 0 \leq A_i \leq N; 0 \leq B_i \leq 10\,000$ ).

For 2 of the 25 available marks,  $B_i = 1$  for all  $i$ .

For an additional 4 of the 25 available marks,  $N \leq 10$ .

For an additional 7 of the 25 available marks,  $N \leq 1000$ .

#### Output Specification

Output one integer on a single line, the minimum number of Internet Points Kevin has to give away.

#### Sample Input 1

```
4
3 3
1 2
0 5
3 4
```

#### Output for Sample Input 1

```
3
```

#### Explanation for Output for Sample Input 1

Kevin can connect with person 3 immediately, and with this connection made, he can also connect with person 2. He doesn't have enough connections to connect with person 1 or person 4, so he gives 3 Internet Points to person 1 to acquire 3 total connections which enables him to connect with person 4.

### **Sample Input 2**

```
5
0 9
1 8
2 7
3 6
4 5
```

### **Output for Sample Input 2**

```
0
```

### **Explanation for Output for Sample Input 2**

It is possible that Kevin can connect with everyone without giving away any Internet Points.

### **Sample Input 3**

```
3
0 6
2 7
3 8
```

### **Output for Sample Input 3**

```
8
```

### **Explanation for Output for Sample Input 3**

Kevin should connect with person 1 immediately, then give 8 Internet Points to person 3 to connect with them, then connect with person 2.