Shop Lifting

Mouse André and Johannes went buying some sweets in the supermarket for the workshop. They put n items into their trolley and went to the checkout counter to pay. Each item is described by its price c_i and time t_i in seconds that a checkout assistant spends on this item.

While the checkout assistant is occupied with some item that Johannes gave to her, André can steal some other items from the trolley. To steal one item André needs exactly 1 second. What is the minimum amount of money that Johannes will have to pay to the checkout assistant so they get all items through (either by paying or by stealing)?

Remember that Johannes and André can arrange the order of items for the checkout assistant as they want.

Input

The first input line contains number n, the number of items. In each of the following n lines each item is described by a pair of numbers t_i and c_i. If t_i is 0, André won't be able to steal anything while the checkout assistant is occupied with item i.

Output

Output a single number: the minimum amount of money that Johannes will have to pay.

Limits

There are two test groups, each of which is worth 50 points. In all tests, we have $1 \leq c_i \leq 10^5$.

- In test group 1, we have $1 \leq n \leq 20$ and $0 \leq t_i \leq 20$.
- In test group 2, we have $1 \leq n \leq 2000$ and $0 \leq t_i \leq 2000$.

Examples

Input	Output
4 2 10 0 20 1 5 1 3	8

Input	Output
3 0 1 0 10 0 100	111