E. Hongcow Buys a Deck of Cards

One day, Hongcow goes to the store and sees a brand new deck of n special cards. Each individual card is either red or blue. He decides he wants to buy them immediately. To do this, he needs to play a game with the owner of the store.

This game takes some number of turns to complete. On a turn, Hongcow may do one of two things:

- Collect tokens. Hongcow collects 1 red token **and** 1 blue token by choosing this option (thus, 2 tokens in total per one operation).
- Buy a card. Hongcow chooses some card and spends tokens to purchase it as specified below.

The i-th card requires r_i red resources and b_i blue resources. Suppose Hongcow currently has A red cards and B blue cards. Then, the i-th card will require Hongcow to spend $max(r_i - A, 0)$ red tokens, and $max(b_i - B, 0)$ blue tokens. Note, only tokens disappear, but the cards stay with Hongcow forever. Each card can be bought only once.

Given a description of the cards and their costs determine the minimum number of turns Hongcow needs to purchase all cards.

Input

The first line of input will contain a single integer n ($1 \leq n \leq 16$).

The next n lines of input will contain three tokens c_i, r_i and b_i. c_i will be 'R' or 'B', denoting the color of the card as red or blue. r_i will be an integer denoting the amount of red resources required to obtain the card, and b_i will be an integer denoting the amount of blue resources required to obtain the card ($0 \leq r_i, b_i \leq 10^7$).

Output

Output a single integer, denoting the minimum number of turns needed to acquire all the cards.

Examples

```
input
3
R 0 1
B 1 0
R 1 1
output
4
```

```
input
3
R 3 0
R 2 0
R 1 0
output
6
```

Note

For the first sample, Hongcow's four moves are as follows:

1. Collect tokens
2. Buy card 1

3. Buy card 2
4. Buy card 3

Note, at the fourth step, Hongcow is able to buy card 3 because Hongcow already has one red and one blue card, so we don't need to collect tokens.

For the second sample, one optimal strategy is as follows:

1. Collect tokens
2. Collect tokens
3. Buy card 2
4. Collect tokens
5. Buy card 3
6. Buy card 1

At the fifth step, even though Hongcow has a red token, Hongcow doesn't actually need to spend it, since Hongcow has a red card already.