

4260 Fortune Card Game

A popular card game called “fortune” is getting popular in country X. Fig. 1 shows one of the cards. In each card, a positive integer number (20 in the figure) is listed as the address of the card. A symbol is drawn beside the address. There are five kinds of symbols, which are listed below the card. For convenience, let each symbol be represented by an English letter from ‘A’..‘E’. The bottom of a card contains another number called “next fortune number.”

In a set of fortune cards, many cards can have same address; that is, address 20 is not limited to appear only in one card. However, there will be no cards that are identical, i.e., no two cards with same address, symbol, and next fortune number.

The fortune card game is played as follows. A player starts with cards that have address 1. The goal of the game is trying to complete a “spell” that is composed by the symbols. For example, let a spell be “BADDAD”. In the first move, the player will look for cards that have address 1 with a star symbol (which matches ‘B’ in the spell). The next fortune numbers of these cards are the new addresses for the next move. The player can select one card to advance to a new address x . The selected card is then put back to the cards for next move but the fortune number is written down.

Let the example be continued. In the next move, the player needs to look for the cards that have new address x with the cross symbol (which matches the second ‘A’ in the spell). Again, the player selects one card to advance to another new address. This procedure continues until the spell “BADDAD” is completed. Once the player completes a spell, he wins a score by adding all the next fortune numbers of the selected card, which have been written down.

Given a spell and a set of fortune cards, please output the maximum score that can be played in this card game.

Technical Specification

1. N - the number of test cases, $N \leq 10$.
2. C - the number of cards, $C \leq 800$.
3. L - the length of a spell, $L \leq 150$.

Input

Test data begins with an integer N which is the number of test cases. Each test case begins with an integer C , which is the number of cards. Following the number C is C lines of card information. Each card is represented by (*Address Symbol NextFortuneNumber*). The address and next fortune number are between 1 and 800. The symbols are capital letters from ‘A’ to ‘E’. The last line of a test case is a spell. The spell is a string composed by capital letters from ‘A’ to ‘E’. The length of the spell (L) is less than 150.

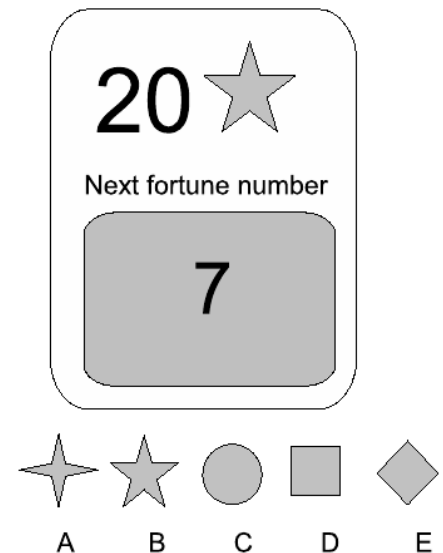


Figure 1: A sample fortune card and symbols.

Output

For each test case, please output the maximum score that can be collected for each test case.

Sample Input

```
2
7
1 A 2
1 A 3
2 A 3
2 B 4
2 B 5
3 A 3
3 B 4
AAAAB
6
1 A 2
1 B 2
1 A 3
1 B 3
2 A 3
2 B 3
AB
```

Sample Output

```
16
5
```