Hasso Plattner Institut
IT Systems Engineering | Universität Potsdam

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Sommersemester 2017

Woche 05 – (Adv.) Competitive Programming

Abgabe 22.05.2017 17:00 Uhr, über das Judge-Interface

Aufgabe 1 (punctuality)**.** (100 Points – 1 second timelimit)

Since being late on his first day of classes at Hogwarts, Harry Potter decided he needed to do something so that this would never happen again. Over the next weeks he started mapping out the castle, assigning names[1] to any intersections and other important places as well as recording which places are directly connected to each other and how long it takes to walk from one to the other[2].

One thing that Harry hadn't counted on was the castle actually changing around him – making his original plan of mapping out the ideal paths once no longer viable.

It is your task to help Harry find the shortest path throughout the day. He always starts his day in the `Gryffindor-Common-Room`. You may also assume that Harry can reach any place in the castle from whereever he currently is.

Input The first line contains n ($0 \leq n \leq 600$), the number of times Harry will ask you for help today. Then, for every time he will ask you, there will be a line containing the name of his next destination, one line containing k the number of changed corridors and k lines containing the names of two places as well as how long it will take to get from one to the other for this journey. If the time is 0, that means that for this journey there is no direct connection between the two places.

Output For every journey print how long it will take Harry to get from his previous location to the next one, given that he takes the shortest path.

Points There are three groups of test sets:

- *easy:* For the first group worth 25 Points, you can assume, that $n \leq 100$, the total amount of places is less than 200 and the distances are less than 100.

[1] Without knowing that they are called that, Harry has restricted himself to printable, non-whitespace ascii characters.

[2] Every corridor may of course be used in both directions

- *medium:* For the second group worth 35 Points, you can assume, that $n \leq 400$, the total amount of places is less than 2000 and the distances are less than 100000.
- *hard:* For the third group of test sets worth 40 Points, you can assume that the total amount of places is less than 4000 and the distances are less than $2 \cdot 10^9$.

Sample Input

```
2
Great-Hall
5
Gryffindor-Common-Room West-Wing-Staircase 20
Grand-Staircase Gryffindor-Common-Room 10
Entrance-Hall Grand-Staircase  10
Great-Hall Entrance-Hall 2
West-Wing-Staircase Great-Hall 15
Potions-Laboratory
5
Grand-Staircase Entrance-Hall 5
Grand-Staircase Dungeons 20
West-Wing-Staircase Dungeons 5
Potions-Laboratory Dungeons 5
Great-Hall West-Wing-Staircase 0
```

Sample Output

```
22
32
```