# 11453    Traveling Fishmonger

The price of fish depends, among other things, on its freshness. To maximize profits, good fishmongers will try to sell as much of their stock of fish as early as possible. This is a problem for itinerant fishmongers who need to spend time traveling from one city to the next to sell their fish.

You need to write a program to optimize a traveling fishmonger's itinerary. Usually a fishmonger has a base city and sells its fish in other cities. Cities are connected by roads. You will be given a road map, a base city, a set of destination cities and some other information. Your program is expected to say in which order to visit each destination city so that the fishmonger earns as much money as possible for his fish. We will make the following assumptions:

- A fishmonger can spend a day either traveling or selling fish, but not doing both things; even if that means that the fishmonger will have nothing to do in the afternoon if he only travels during the morning.

- Fishmongers transport their fish using a cart pulled by oxen, hence they can only do 25 kilometers each day.

- The very first day, one fish can be sold for 10 euros, but its value decreases exponentially each day that passes. The price changes instantaneously at midnight, so you can assume that it is constant during a whole day.

- A fishmonger can only stay one day in each city, to avoid having to deal with dissatisfied customers the day after a sale.

- At each city, the fishmonger will sell at most five fishes every 10000 inhabitants (rounding down if necessary).

## Input

The input format is as follows:

- An integer in a single line which says the number of cities in the map ($NC$). There are no more than 1000 cities.

- $NC$ lines each one with the name of a city and its population separated by a space. The name of a city is always a single word and the population is an integer number.

- An integer in a single line which says the number of roads in the map ($NR$). There are 4000 roads at most.

- $NR$ lines each one describing a road. A road description consists of the name of two cities and the distance (in kilometers) that separates them, all items separated by a space. A road connects two cities always in both ways.

- An integer saying the number of test cases that will use the above map ($NT$).

- $NT$ sets of 5 lines, each describing a test case in the following way:

  - The first line indicates the number of fishes initially available in stock, as an integer number.

– The second line says the speed of rotting ($RS$) as a floating point number. At the end of each day, the price of the fish will become $RS$ times smaller due to the decreased quality and increased stink.

– The third line contains the name of the base city (the starting point).

– The fourth line says the number of destination cities ($ND$) (that is, cities where the fish will be sold). The base city will not be part of these set of cities. There will be 8 destination cities at most.

– A line with $ND$ names of destination cities.

## Output

For each test case, the program shall output a single line with the destination cities sorted in the best order to maximize profits, followed by '->' and the achieved benefit in euros rounded up to the nearest integer, everything separated by spaces. If there is more than one optimum order, the program must show the first one lexicographically.

## Sample Input

```
5
Murcia 422861
Cartagena 211286
Lorca 89936
Molina 62463
Yecla 35161
6
Murcia Cartagena 55
Murcia Molina 13
Lorca Yecla 165
Cartagena Yecla 186
Cartagena Molina 64
Molina Yecla 92
1
500
1.2
Cartagena
2
Murcia Lorca
```

## Sample Output

```
Murcia Lorca -> 594
```