
IV BXComp

4th Freshmen's Programming Championship of Information Systems 2014

6th Stage – Challenge 1

Traveler

Dilmécio loves traveling and driving. In spite of distances, he is always ready for an adventure. He takes his car with his wife, Aécilma, and his dog, Spike, and goes out to the road. As a prudent driver, Dilmécio does some halts during his trip to rest and have some fun with his wife and pet. In order to optimize the trip, Dilmécio needs to estimate the distances between cities in which he does halts. Then, he asks you to help him in this mission.

Task

Your task consists of doing a program which calculates the distance traveled by the family and indicates the mileage traveled.

Input

The input consists of several test cases. The first line of the input defines the amount of test cases. For each test case there is an integer **N** that indicates the number of cities included in the trip. Next, it is presented a block of **N** lines composed by the city name (without spaces), the x coordinate and the y coordinate of the respective city. These data are separated by a single space. In the next line, the **origin** and the **destination** of the travelers (separated by a single space) are shown. The possible halts are indicated in the line below, separated by a space, if any. Otherwise, there will be a blank line. There is a blank line after each test case.

Output

For each test case, your program must print the initial mileage followed by the origin of the trip in the first line. In the following lines, it must be printed the mileage traveled by that time, followed by the possible halts, in the same sequence they appear in the input. After these lines, the program must print the mileage traveled

until the destination of the trip and its name. The mileage and the city name should be separated by a simple space.

Input Example

```
2
5
SaoPaulo 0 0
BeloHorizonte 20 30
Campinas 15 18
SaoCarlos 20 29
Uberaba 19 28
SaoPaulo BeloHorizonte
Campinas Uberaba

4
SaoPaulo 0 0
RioDeJaneiro 400 500
Americana 30 50
Rezende 50 80
SaoPaulo RioDeJaneiro
```

Output Example

```
0 SaoPaulo
23 Campinas
33 Uberaba
35 BeloHorizonte

0 SaoPaulo
640 RioDeJaneiro
```