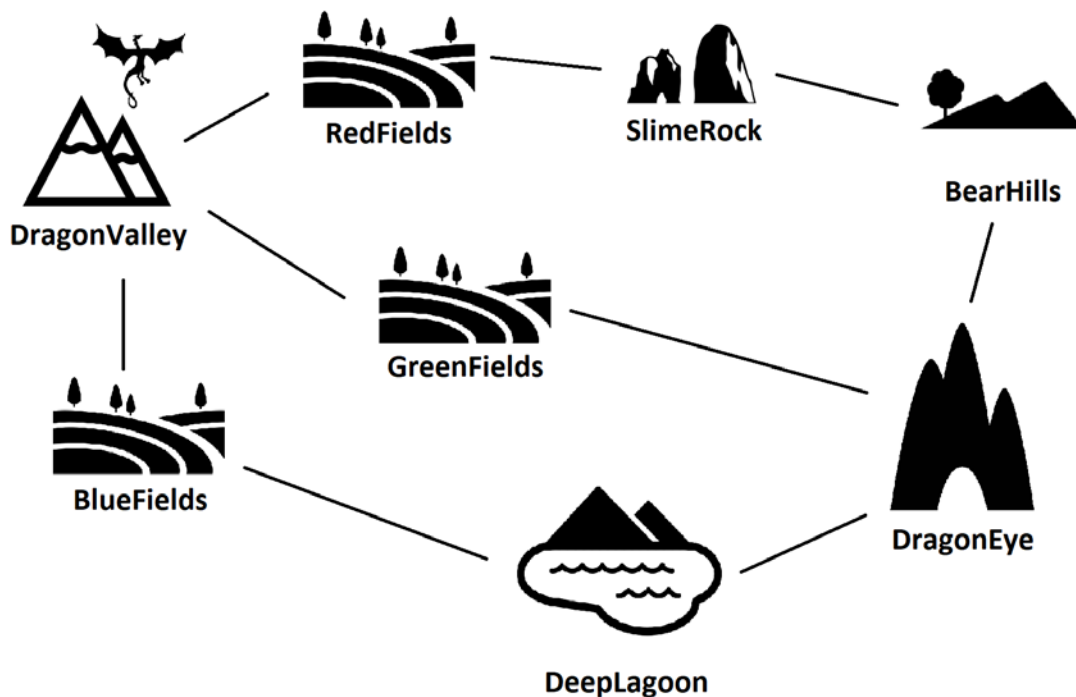# 32 The Dragon King
31 points

Introduction

In a remote part of this world there is a place called the DragonValley, land of dragons. The last Dragon King died recently and, according to the ancient tradition, the king's successors must prove their bravery to become the next Dragon King. They do this by competing to see who is first to reach the Dragons' Gem, which is stored at the top of the highest mountain in the land: the DragonEye.

However, there are a lot of different paths that link DragonValley to the DragonEye, and these paths have a peculiarity: the direction of the wind changes every 30 minutes. Therefore, the time it takes a dragon to fly from one point to another varies from the half hour to the next.

Please, help our friend Spyro find the quickest path from DragonValley to DragonEye and become the next Dragon King!

HINT: Note that if a point is reached during the first half hour of the journey, the dragon can either take the next path immediately, or wait until the next half hour and only then take the second path. For example, if there is a connection "A B 50 15" and the dragon reaches A at minute 20, the dragon can then continue on to B right away, which will take, a total of 20 + 50 = 70 minutes, or alternatively, it can wait 10 minutes in node A and then leave for B, which will take a total of 20 + 10 + 15 = 45 minutes.

Input

The input describes the connections between different points of the dragon lands. It starts with a number N that indicates the amount of connections in the sky map, followed by the N connections.

Each connection is represented by 4 words: - The origin point O. - The destination point D. - The time (in minutes) required to go from the O to D during the first half of an hour. - The time (in minutes) required to go from the O to D during the second half of an hour.

The input must always contain the points DragonValley and DragonEye, which indicate the beginning and the ending respectively.

Output

The output is the time of the quickest path from the DragonValley to the DragonEye, and the stops along that path.

If there are 2 paths with an identical time, the path with fewer stops wins. If there are 2 paths with the same time and the same number of stops, the first path in alphabetical order wins. For example: if the two quickest paths are "DragonValley A DragonEye" and "DragonValley B DragonEye", the first path wins because A goes before B.

Example 1

Input
```
5
DragonValley GreenFields 10 5
DragonValley BlueFields 15 5
DragonValley RedFields 20 5
RedFields DragonEye 5 10
GreenFields DragonEye 16 20
```

Output
```
Minimum time: 25
Minimum path: DragonValley RedFields DragonEye
```

Example 2

Input
```
5
DragonValley GreenFields 10 5
DragonValley BlueFields 15 5
DragonValley RedFields 20 5
RedFields DragonEye 5 10
GreenFields DragonEye 15 20
```

Output
```
Minimum time: 25
Minimum path: DragonValley GreenFields DragonEye
```

Example 3

Input
9
DragonValley GreenFields 10 5
DragonValley BlueFields 15 5
DragonValley RedFields 20 5
RedFields SlimeRock 20 8
GreenFields DragonEye 210 184
SlimeRock BearHills 35 10
BearHills DragonEye 22 22
BlueFields DeepLagoon 34 10
DeepLagoon DragonEye 43 27

Output
Minimum time: 67
Minimum path: DragonValley BlueFields DeepLagoon DragonEye