CS1020 Take-home Lab #2
Exercise #3: Airlines Query System
(http://www.comp.nus.edu.sg/~cs1020/3_ca/labs.html)

Objective

The objective of this problem is to test the understanding of Object-Oriented Programming (OOP) concept and the use of **ArrayList**.

Task Statement

ZGDH serves N airlines that fly among a group of cities. To serve the customers better, the CTO wants to build a system that is able to answer the following queries:

1. What is the earliest departure time from City A to City B?

2. What is the earliest arrival time from City A to City B?

3. What is the shortest flight time from City A to City B?

4. What is the lowest cost to fly from City A to City B?

You are to create three Java classes, namely **SGTime**, **Airline**, and **Query**. **SGTime** stores the hour and minute of Singapore time. **Airline** keeps the following information:

Airline
• fromCity: String
• toCity: String
• departureTime: SGTime
• arrivalDay: int // 0 for the same day, 1 for next day, 2 for two days later, etc.
• arrivalTime: SGTime
• cost: int

The **Query** class stores a list of Airlines served and implements methods to answer the 4 types of query.

You are also to write a client **ProcessQueries** to accept user's queries and output the answers to each query. A query is in the form of

```
queryType fromCity toCity currentTime
```

where **queryType** is an integer in [1, 4] corresponding to the 4 types of queries above. For example, if queryType is 1, the query is about the earliest departure time. If queryType is 2, the query concerns the earliest arrival time. If queryType is 3 or 4, then it concerns the shortest flight time or the lowest cost respectively. You may assume that there exists at least one airline that flies from the departure city to the arrival city.

Input

The first line contains an integer N, which is the number of airlines.

Each of the following N lines contains the information of an airline:

> fromCity toCity departureTime arrivalDay arrivalTime cost

This is followed by an integer Q, which is the number of queries.

Each of the following Q lines contains a query in the form of:

> queryType fromCity toCity currentTime

All the times are displayed in Singapore time, and costs in Singapore dollars. To take a flight, the current time must be at least 1 hour earlier than the departure time of the flight.

Output

For each query, output the complete information of the desired airline. If multiple answers exist, output the airline which appears earliest in the input list.

Sample Input

```
6
CDSL SGP 6:00 0 10:20 550
CDSL SGP 22:00 1 3:00 500
CDSL SGP 22:10 1 2:30 550
SZBA SGP 10:00 0 14:10 300
SZBA SGP 11:00 0 14:20 400
SZBA SGP 23:20 1 2:10 400
7
1 CDSL SGP 8:00
2 CDSL SGP 8:00
3 CDSL SGP 8:00
4 CDSL SGP 9:00
1 SZBA SGP 9:00
2 SZBA SGP 9:00
2 SZBA SGP 10:00
```

Sample Output

```
CDSL SGP 22:00 1 3:00 500
CDSL SGP 22:10 1 2:30 550
CDSL SGP 6:00 0 10:20 550
CDSL SGP 22:00 1 3:00 500
SZBA SGP 10:00 0 14:10 300
SZBA SGP 10:00 0 14:10 300
SZBA SGP 11:00 0 14:20 400
```

Explanations:

1. Query 3: output the one appears earliest in the input list.
2. Please note that minutes always consist of 2 digits, while hours can be 1 or 2 digits.