We want to implement a rudimentary flight trip planner. The input is the set of flights between various cities. It is given as a file. Each line of the file contains **"city1 city2 departure-time arrival-time flight-no. price"** This means that there is a flight called "flight-no" (which is a string of the form XY012) from city1 to city2 which leaves city1 at time "departure-time" and arrives city2 at time "arrival-time". Further the price of this flight is "price" which is a positive integer. All times are given as a string of 4 digits in the 24hr format e.g. 1135, 0245, 2210. Assume that all city names are integers between 1 and a number N (where N is the total number of cities).

Note that there could be multiple flights between two cities (at different times).

We want to respond to two type of queries:

1) Given two cities "A" and "B", times "t1", "t2", where t1 < t2, find the cheapest trip which leaves city "A" at or after time "t1" and arrives at city "B" at or before time "t2".
2) Given two cities "A" and "B" and time "t1", find the trip which leaves city "A" at or after time "t1" and arrives at city "B" as soon as possible

A trip is a sequence of flights which starts at A after time t1 and ends at B before time t2. Further, the departure time from any transit (intermediate) city C is at least xx mins after the arrival at C.

Sample input file

==========

7 # no of cities

1 0030 # 30 min wait time at city 1

2 0040

3 0023

.

.

7 0050

15 # no of lines with information of one flight in each line.

2 5 1026 1234 AI324 6234 # says that flight AI324 leaves from city 2 at 1026 and reaches city 5 at 1234 and costs Rs 6234

3 7 1221 1456 TG342 543

... # 13 more lines

10 # no of queries of cheapest trip to follow, one in each line

3 6 0245 1735 # compute the cheapest trip from city 3 to city 6 which starts after 0245hrs and arrives before 1735.

.... # 9 more queries

5 # no of queries of shortest time to follow, one in each line

1 5 0300 #compute the earliest you can reach city 5, if you start at city 1 at 0300

…# 4 more queries

==========

Output format
For each query output:

1) the price of the cheapest trip (one number only) on one line.
2) The time when you arrive at city B in one line

(-1 if such a trip is not possible)

Example output

==========
34526
34784
73267
....

==========