Problem D – Delivery schedules.

Author: Moroni Silverio

Jaime's delivery box company has expanded to several cities now. He has hired people that helps him do the delivery, they receive boxes in some cities and deliver in other cities.
To save time and money, Jaime encourages his employees to search the routes that allow them to receive and deliver boxes in the same trip. The employees do it, but at the way they want. Employees communicate a lot them and they talk about the problems they face delivering boxes in certain cities; that's why some employees have decided to avoid going to some cities during their trips unless it is strictly necessary to go (they have to receive or deliver boxes in that city), this means if an employee does not want to go through city x, when delivering boxes from city a to city b, he will not use any path that goes through x in the delivery unless $a = x$ or $b = x$.
Jaime is not happy with this, he is a bussiness man now and he sees that when an employee avoids cities in the trip, they usually take more time for the trip which means also more cost for the company to operate, however, since the employees are efficient and always follow the shortest path to do the delivery even when they will not go through certain cities, he decided he prefers to change the employees delivery schedule instead of the way they work.
Each morning, Jaime assigns to each of his employees a list of deliveries the employee has to do, in order to make Jaime's customers happy, it is important that the employee performs the deliveries in the order Jaime gave them. The delivery trucks has capacity only to carry the packages for one delivery, so the employees always reload the truck before starting a new delivery.
Jaime wants to know the total time each of his employees will need to complete all the deliveries in the schedule. He has given you a map that lists the roads that can be used to do the delivery and the time it takes for an employee to drive that road. He also gave you the list of cities each employee avoids, Jaime has sorted this list in such way that if the j-th employee does not want to go to city c, then all employees listed after him will also avoid going through city c. He also provided you with the delivery schedule of each employee.

Help Jaime find the time each employee will take to complete the assigned delivery schedule. For this, consider the time it takes to the employee to go from the starting city G to the city where the employee receives the boxes of the first delivery, the time it takes for the employee in each delivery to go from the city where the boxes were received to the city where the boxes should be delivered, the time it takes to go from the city where boxes were delivered in the previous delivery to the city where the boxes needs to be received for the next delivery, and the time it takes to go from the city where boxes are delivered in the last delivery to the starting city G.

Input

The first line of the input contains an integer number N ($1 \leq N \leq 200$), the number of cities in the map, the next line contains an integer number M ($1 \leq M \leq N^2$), the number of roads in the map. The next M lines contain three integer numbers each a_i, b_i, t_i ($1 \leq a_i, b_i \leq N, 1 \leq t_i \leq 10^8$), representing the i-th road connects cities a_i and b_i, which can be traversed in any direction and that takes t_i time to drive. The next line contains an integer number E ($1 \leq E \leq 10^4$), the number of employees in Jaime's company. Each of the following E lines start with a number x_j, representing the number of cities the j-th employee and all employes listed after him will avoid, followed by x_j integer numbers representing the x_j cities the $j - th$ employee and all employees listed after him will avoid in their trips unless it is strictly necessary to go. Each of the next E lines describes the schedule for an employee, each line contains an even number of integers separated by a space, each pair of consecutive integers represent a delivery job for the employee, where the first city of the delivery job represent the city where the employee needs to receive the boxes for that delivery and the second city represents the city where the employee needs to deliver the boxes, there will be at most 500 jobs in an employee delivery schedule. The last line of input contains an integer G, the city where all employees start the delivery day.

Output

For each employee in the input, print a line with a single integer, representing the total time it takes for the employee to complete his delivery schedule. If it is not possible for an employee to complete the schedule, print a line with the text "Assign a better schedule".

Sample input 1	**Sample output 1**
7 7 1 2 3 1 3 7 2 3 2 2 5 1 1 4 2 4 6 1 1 7 1 3 1 2 1 6 1 7 1 3 1 5 7 6 4 1 1	14 Assign a better schedule 4

Sample input 2	**Sample output 2**
4 4 1 4 10 1 3 7 4 3 2 3 2 1 2 1 2 1 3 1 4 1 4 1	18 20