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Project: Smart Hire.

StakeHolders:

1. Car Hire services.
2. Battery recharging stations.
3. Passengers.

Motivation:

In near future, electric cars can be used for daily travel. Electric cars offer energy savings and pollution free environment, thus can be readily deployed into public transport services. One such application is a case scenario where car hire services are provided by city administration and/or private companies.

Scenario:

1. Consider electric cars commuting all over the city. Each such battery operated car will have its own current power level and performance-to-battery-power proportion. All of these cars are run by the public/private company.

2. There are multiple recharging stations in the city in different areas having different recharging costs. This is because each area in the city has different pricing policy for power at different time of the day.

3. These charging stations are spread all over the city. The cars not currently hired can then use those stations for charging and standby.

4. Passenger calls to the central station requesting a car at a particular time to travel from point A to B.

5. The passenger will have some convenience index modeled on the time he/she can wait for nearest car to come and pick him/her up.

6. The station will then respond with allotting a car which is not only the nearest possible to the customer to reach at the requested point but also ensure that the allotted car has sufficient power level and performance-to-power balance to complete the travel it will be hired for.

Problem Statement:

Given is the passenger's source and destination requested and the location of all the cars with respect to source. Also given is the power levels of each car and the distance of the charging stations from the passenger's destination.

Find which car to allot to the passenger so as to optimally use the battery resources and yet to make sure the car reaches its charging station back for standby if needed after it has serviced the passenger.

Increment 01:

City administrations use local slab-based electricity pricing policy. Thus all the charging stations will have different cost per KWh for charging.
If this condition is also enforced in the information given in the problem above, which car must be chosen to reduce the charging costs as much as possible.

Increment 02:

Customer might have different tolerance limits for waiting for the cars to arrive. Given customer comfort index according to his/her urgency in the same problem increment 01, which car to allot to the customer now in rigid time frame.
