Assignment 1

IT832: Blockchain Technologies and Application - Decentralization and Smart Contracts

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OPTIMAL CHARGING STATION

For this assignment, we developed a DApp with a blockchain-based web service that aids in finding the optimal charging station for an EV depending on customer preferences.

In general, the sole criterion taken into consideration is the distance between the present position of the EV and the charging station. In order to provide the customer with the best charging station, we have incorporated other parameters such as price, charging type (i.e., fast charging or not), waiting time, number of charging stations, and ratings.

The way that our model functions is as follows:

- The user is asked to give preferences if they need cheaper charging stations or charging stations that are closer.
- Users are asked if they require fast charging and how far their vehicle can drive under the current charging conditions.
- We take the x and y coordinates of the vehicle and calculate the distance between the EV and the charging station using the **Manhattan formula**

  Abs [a − x] + Abs [b − y]

  - Here a is latitude of Electric Vehicle, x is latitude of charging station, b is longitude of Electric Vehicle and y is longitude of charging station
- According to the preferences and conditions, a list of charging stations that are ranked best based on preference is shown.
- We are also showing the distance they need to go, waiting time and number of charging points of the charging stations and the previous rating of the station which they can choose and go.

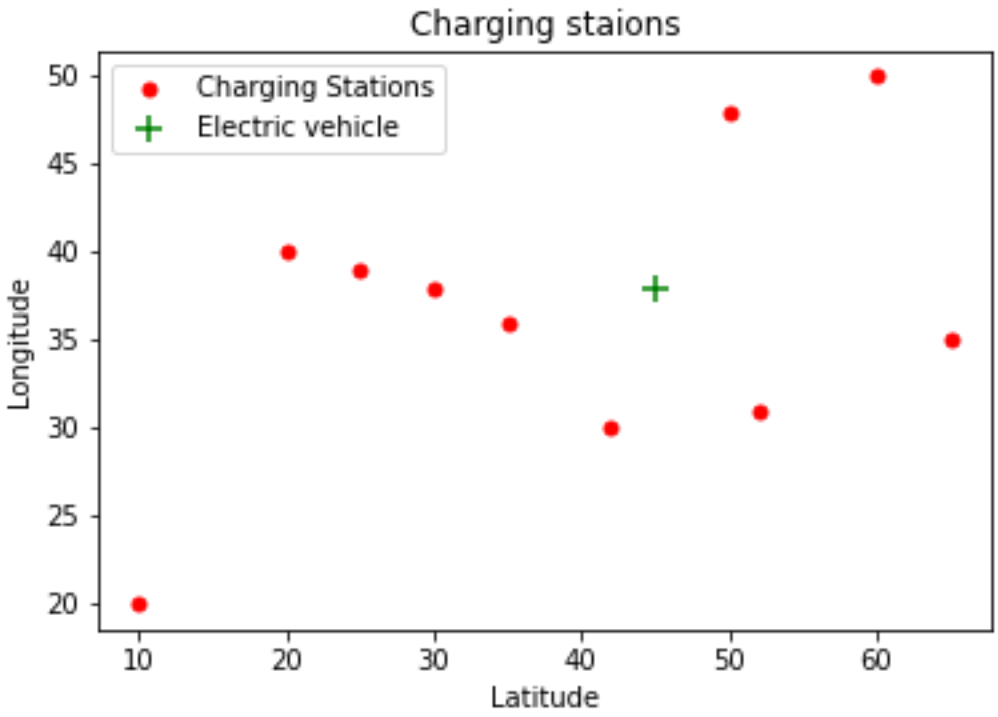

Fig. 1: Charging stations and Electric Vehicle

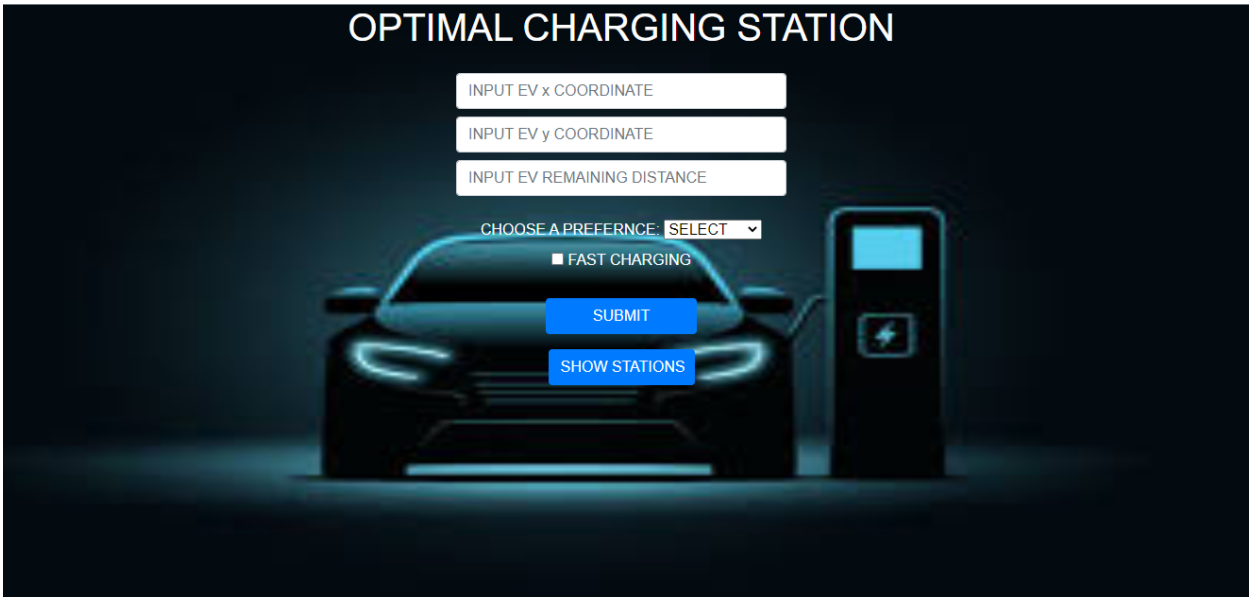

Fig. 2: Front End of DApp

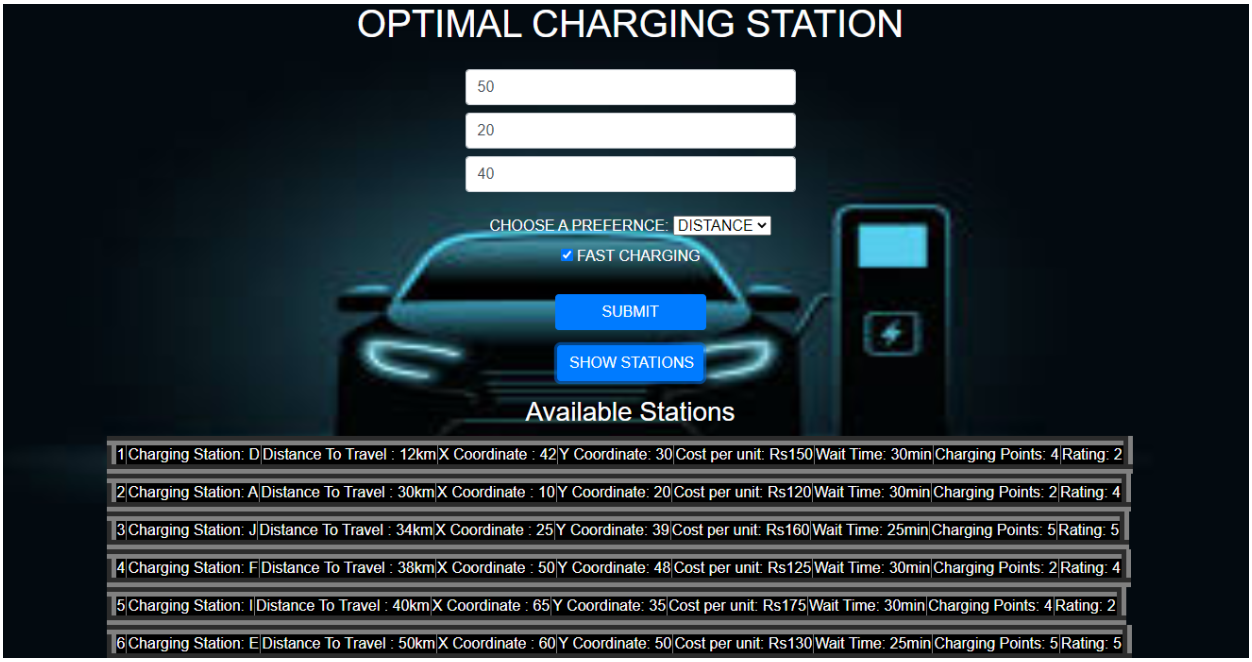

Fig. 3: Charging Stations based on Closest distance and fast charging

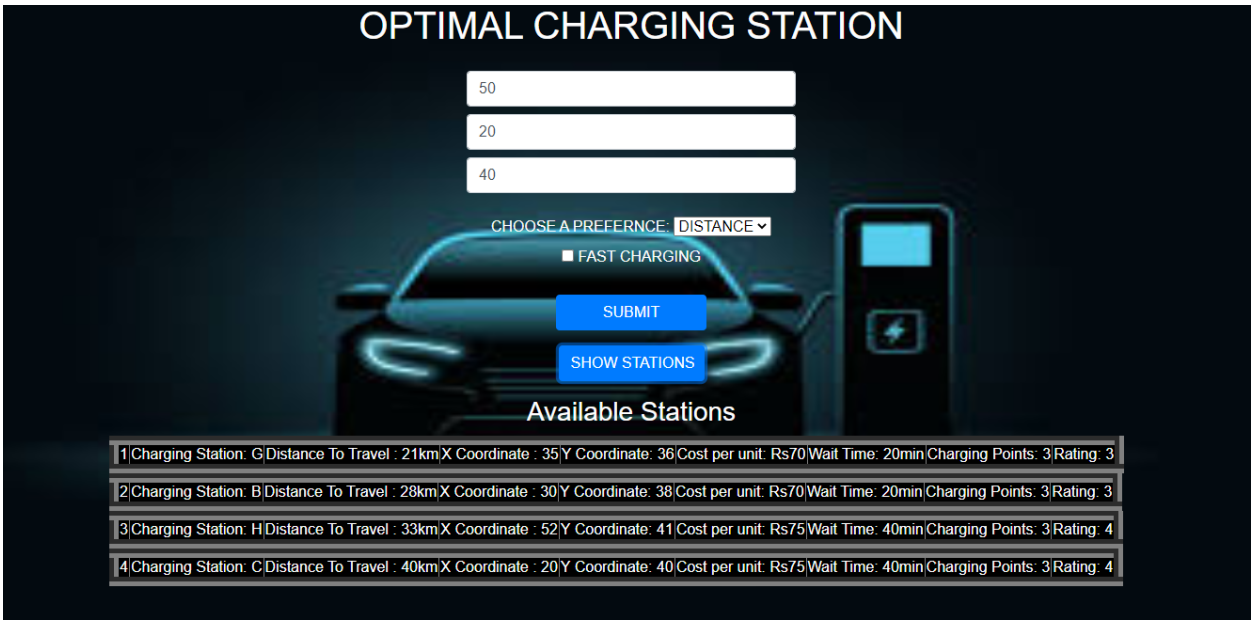

Fig. 4:Charging Stations based on Closest distance but not fast charging

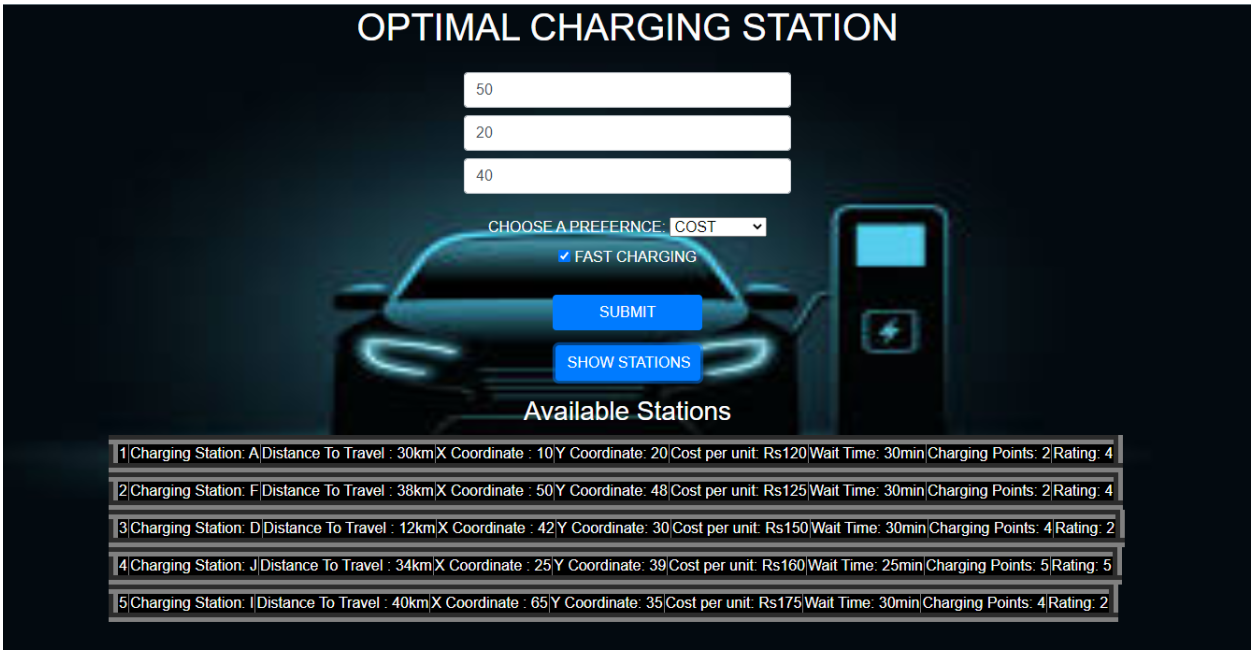

Fig. 5: Charging Stations based on cheapest cost and fast charging

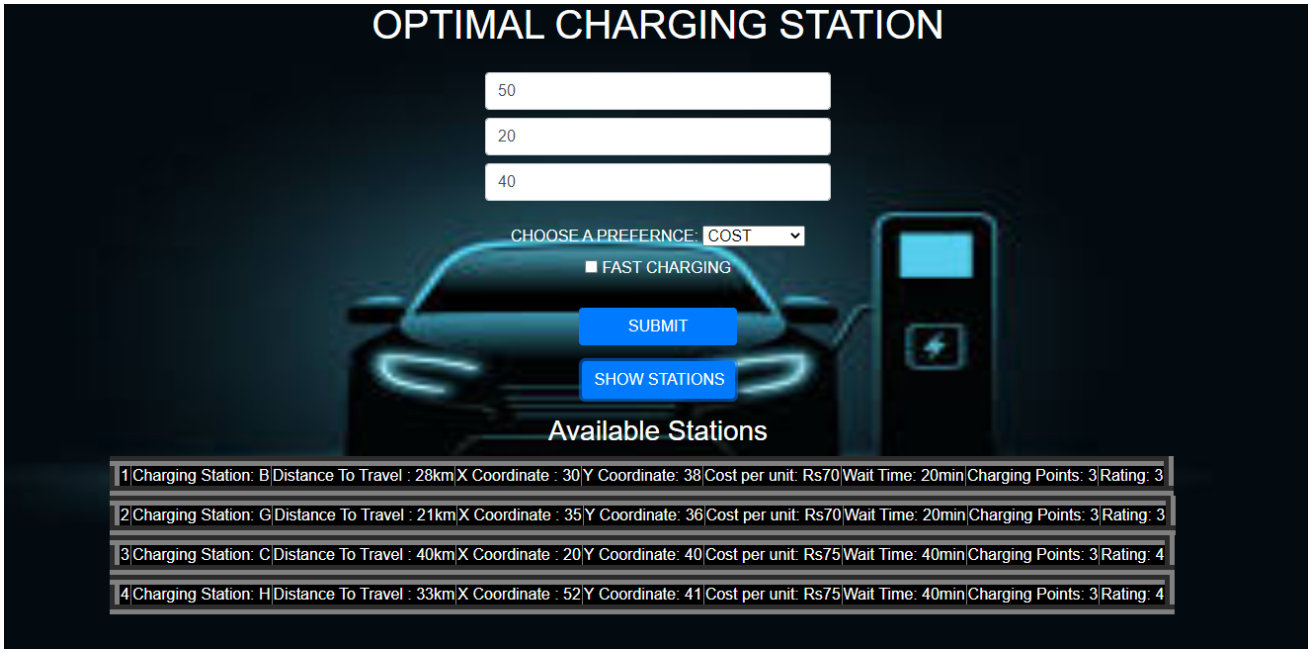

Fig. 6: Charging Stations based on cheapest cost but not fast charging