

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **CoDay**  **Problem Statement**  NICE Power Ltd has got a contract from the Government of India to establish charging stations for electric vehicles across the country. There is a new highway that starts from Kashmir to Kanyakumari which has several entry/exit points. The Govt. of India, with the help of NICE Power Ltd, is aiming to make this new highway as a green corridor i.e. zero emission zone, by allowing only electric vehicles on this highway. There would be different types of electric vehicles that would travel across this route daily with different battery capacities, charging times, mileage, etc. NICE Power Ltd wants effective management of the charging stations and optimization of their infrastructure to accommodate the daily demand for electric vehicle charging.  So, they want to assess the daily aggregate electricity consumption and the total charging time required per day, for all the vehicles which will travel across this highway.  To solve the problem, we would be providing the following.   * Distance of each entry and exit point from the starting point. * Distance of each charging station from the starting point. * Vehicle type based on the total capacity (charge units) and max distance covered when fully charged. * Initial battery percentage for all the vehicles that will start traveling and their entry/exit points. * The time needed for each vehicle type to charge (per unit) at each charging station.     **Input Files (Resource files)**   1. **ChargingStationInfo.csv**   This file contains the list of charging stations and their distance from the starting point.     |  |  |  |  | | --- | --- | --- | --- | | **Column Name** | **Description** | **Example-1** | **Example-2** | | ChargingStation | Name of the charging station | C1 | C2 | | DistanceFromStart | Distance of the charging station from the Starting point | 20 | 60 |      * 1. **EntryExitPointInfo.csv**   This file contains the list of various entry-exit points available on the route.    |  |  |  |  | | --- | --- | --- | --- | | **Column Name** | **Description** | **Example-1** | **Example-2** | | EntryExitPoint | Name of the entry point | A1 | A2 | | DistanceFromStart | Distance of the entry point from the Starting point | 0 | 20 |      * 1. **VehicleTypeInfo.csv**   This file contains the vehicle specifications such as the battery capacity of the vehicle and its mileage when fully charged.     |  |  |  |  | | --- | --- | --- | --- | | **Column Name** | **Description** | **Example-1** | **Example-2** | | VehicleType | The type of the vehicle | V1 | V2 | | NumberOfUnitsForFullyCharge | The total number of electricity units required to fully charge the vehicle | 18 | 25 | | Mileage | The maximum distance the vehicle can travel when it’s fully charged | 50 | 70 |      1. **TimeToChargeVehicleInfo.csv**   This file provides information about the charging rate for a specific vehicle type at a designated charging station.     |  |  |  |  | | --- | --- | --- | --- | | **Column Name** | **Description** | **Example-1** | **Example-2** | | VehicleType | The type of the vehicle | V1 | V1 | | ChargingStation | Name of the charging station | C1 | C6 | | TimeToChargePerUnit | The time (in seconds) required to charge 1 electricity unit | 480 | 500 |      1. **TripDetails.csv**   This file contains information about the trips that happen on the route.    |  |  |  |  | | --- | --- | --- | --- | | **Column Name** | **Description** | **Example-1** | **Example-2** | | Id | Unique identifier of a trip | 7 | 10 | | VehicleType | The type of the vehicle | V1 | V2 | | RemainingBatteryPercentage | The percentage of battery remaining before the journey begins. | 91 | 30 | | EntryPoint | Name of the entry point | A3 | A7 | | ExitPoint | Name of the exit point | A10 | A10 |     **Output:**   1. The solution should return a collection of detailed consumption data grouped by vehicle type. Each object in this contains:  * Vehicle type. * Total energy consumed. * Total time taken for charging. * Total count of finished trips.  1. In addition to this, the solution should also output the total time spent for charging at each charging station.     **Example output in JSON format:**        **Additional notes:**   * Charging stations along this route are installed by various subcontractors hired by NICE Power Ltd, so the charging time for the same type of vehicle is expected to vary between stations. * Charging station will always be available (24x7) * If a vehicle cannot reach another charging station, exclude it partially or completely from the calculations. * The vehicle should choose the last charging station it can reach. For example, if there are stations at 50, 120, 180, and 240 KM, and the vehicle's capacity is 200 KM, it should pick the one at 180 KM. * When a vehicle starts charging, it must finish a full charge; partial charging isn't permitted. * Attaching the skeleton solution zip file with minimum test cases for evaluation * Refer guidelines and ground rules file of respective language for environment setup and solution submission guidelines.   **Project Template to use** |