EcoRide: A Car Rental with Environmental Rewards System

Project Summary

Our goal for this project is to create EcoRide, a car rental platform that is user-friendly as well as environmentally conscious. The web app will offer a hassle-free experience for both renters and car owners, along with a novel idea of a rewards system based on eco-points. These points are earned through car ratings and mileage. Car owners can list their vehicles, update information, keep track of their rental history and earn eco-points based on their car's performance. Renters can book cars, manage their reservations, and earn eco-points for using fuel efficiently. Both owners and renters will have access to their past data and rewards, aiming for a more interactive and responsible experience.

Description

Our project revolves around a car rental service that promotes environmental awareness through a unique reward strategy. The platform will allow two types of users to interact with the system, buyers (who rent cars) and sellers (who list cars).

Key functionalities include:

- **Sellers** can list multiple cars, update details like pricing, track their bookings, and view historical rental records. Additionally, sellers earn ecopoints when their cars receive high ratings and complete several trips, ultimately unlocking rewards like free car servicing.
- **Buyers** can rent cars, manage the duration of their trips, cancel bookings, and view available cars. Buyers will also accumulate or lose ecopoints depending on the mileage logged during their trips—encouraging fuel-efficient driving.

Creative Component

The **creative component** of our application lies in the integration of environmental rewards (ecopoints) and dynamic cost calculations. These features go beyond the basic renting system by introducing:

1. **Eco-Tracking & Points System:** We have introduced ecopoints, for buyers, they are calculated based on fuel efficiency during trips, while sellers earn ecopoints based on car ratings and the number of trips completed by each car. This requires building a reward system that dynamically assigns and adjusts ecopoints.
2. **Dynamic Pricing:** The cost of car rentals will be calculated dynamically based on the actual time duration a buyer keeps the car, with fines applied for late returns, ensuring real-time accountability without relying on external payment gateways.
3. **Historical Data & Rating System:** Users will have access to their past bookings and can view the ratings they have given or received, providing transparency and tracking for both buyers and sellers.

Usefulness

Our application is aiming to solve two significant issues: (1) simplifying the car rental process and (2) Promoting environmentally friendly driving behaviors. With climate change concerns rising globally, the addition of ecopoints as an incentive system promotes sustainable practices in the car rental market.

While there are various other car rental applications, ours differentiates by introducing this environmental reward system, focusing on eco-conscious behavior. We ensure that the platform is simple for users to manage their bookings, track ratings, and gain rewards based on their contributions to environmental sustainability.

Realness

Our project will utilize the following real-world data sources:

1. Car Rental Data:

   (https://github.com/protima-tarafdar/US-Car-Rentals/blob/main/Project.csv)

   Format - CSV b. Cardinality 5340 c. Data fuelType,rating,renterTripsTaken,reviewCount,location.city,location.latitude,location.longitude,location.state,owner.id,rate.daily,vehicle.make,vehicle.model,vehicle.type,vehicle.year

2. CO2 emission Data: (https://www.kaggle.com/datasets/debajyotipodder/co2-emission-by-vehicles?resource=download) Format - CSV b. Cardinality 7386 c. Data - Make,Model,Vehicle Class,Engine Size(L),Cylinders,Transmission,Fuel Type,Fuel Consumption City (L/100 km),Fuel Consumption Hwy (L/100 km),Fuel Consumption Comb (L/100 km),Fuel Consumption Comb (mpg),CO2 Emissions(g/km)

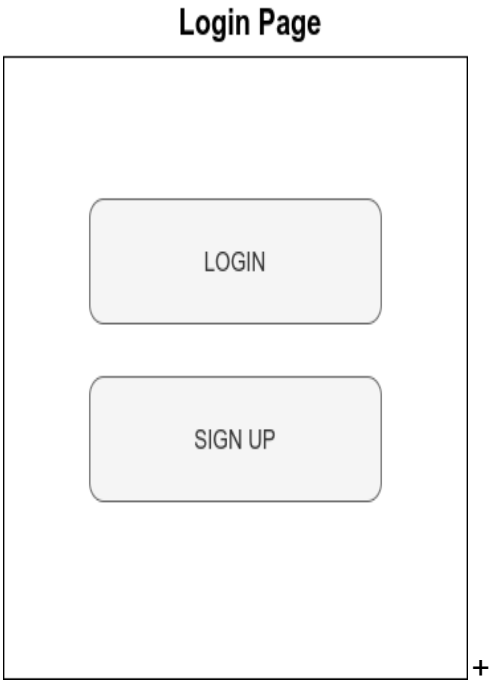
Functionality

1. **Sellers:**
   - 1.1. List cars for rent (multiple cars can be listed)
   - 1.2. Update the details of listed cars (e.g., price, availability)
   - 1.3. Delete car entries
   - 1.4. View history of all car bookings
   - 1.5. Gain eco points based on car ratings provided by buyers and the number of trips each car completes.

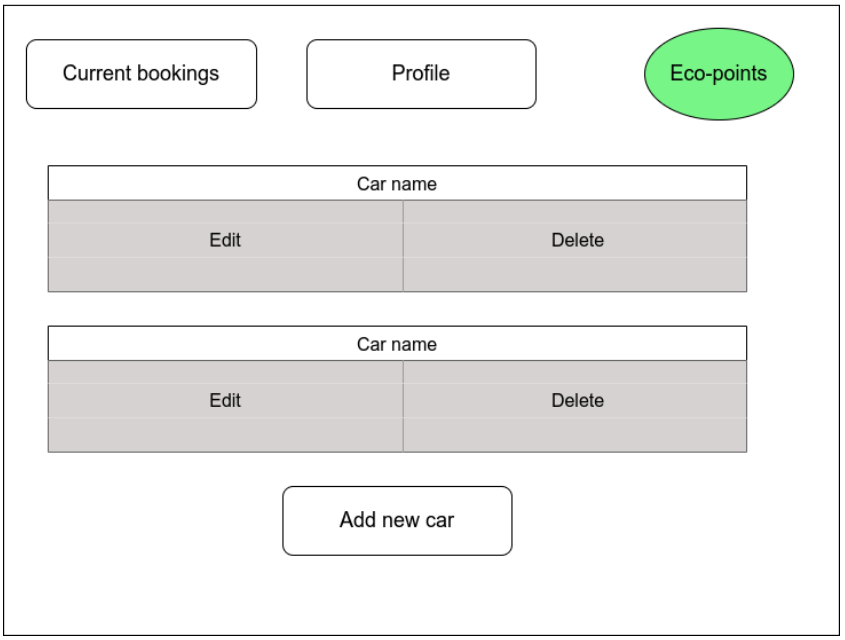
2. **Buyers:**
    2.1. Book one or multiple cars
    2.2. View available cars for rent
    2.3. Update trip duration
    2.4. Delete bookings
    2.5. View booking history
    2.6. Gain or lose ecopoints based on fuel efficiency

3. **General:**
    3.1. Once a car is booked, it will disappear from the listings.
    3.2. A dynamic cost system based on actual rental duration.
    3.3. Historical data for both buyers and sellers to track their previous bookings and trips.

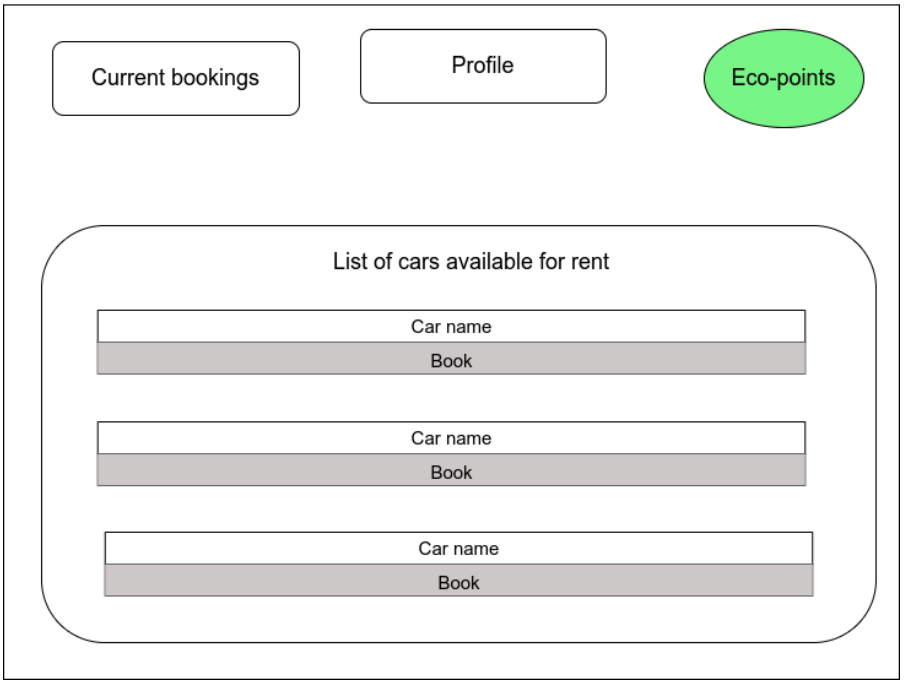
Low fidelity UI mockup



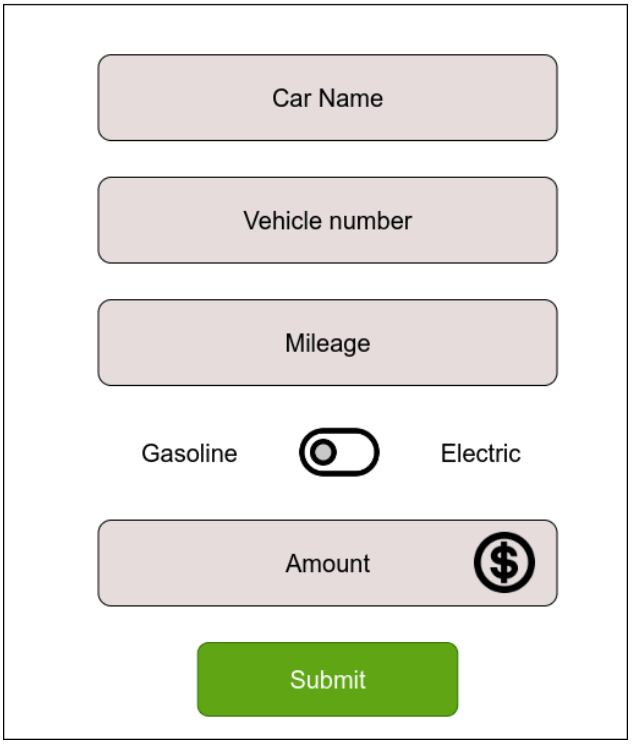
Home Page for Seller (Owners)



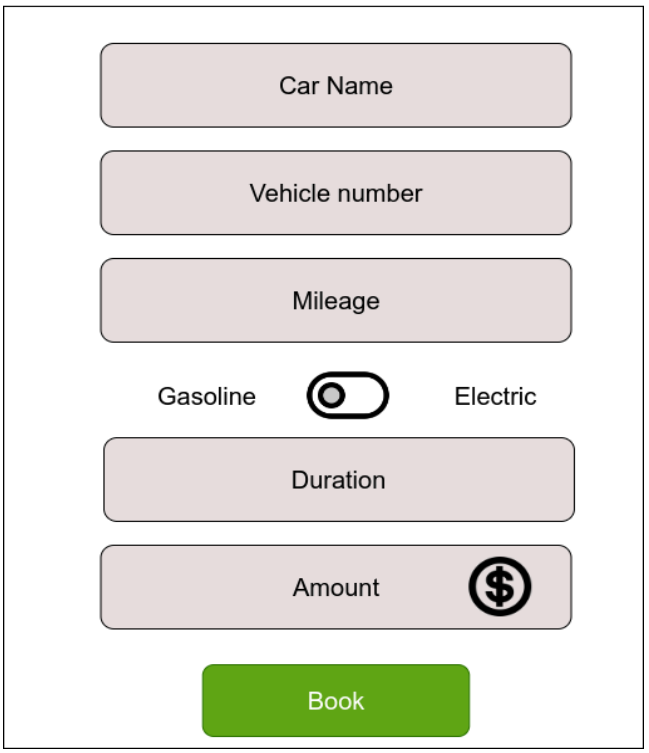
Home Page for Buyer (Renter)



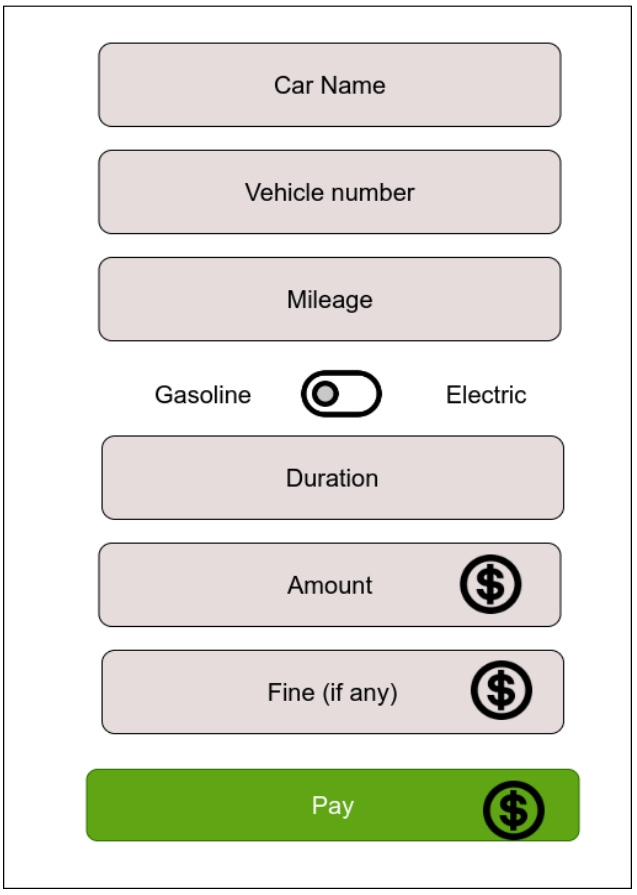
Add or Edit page



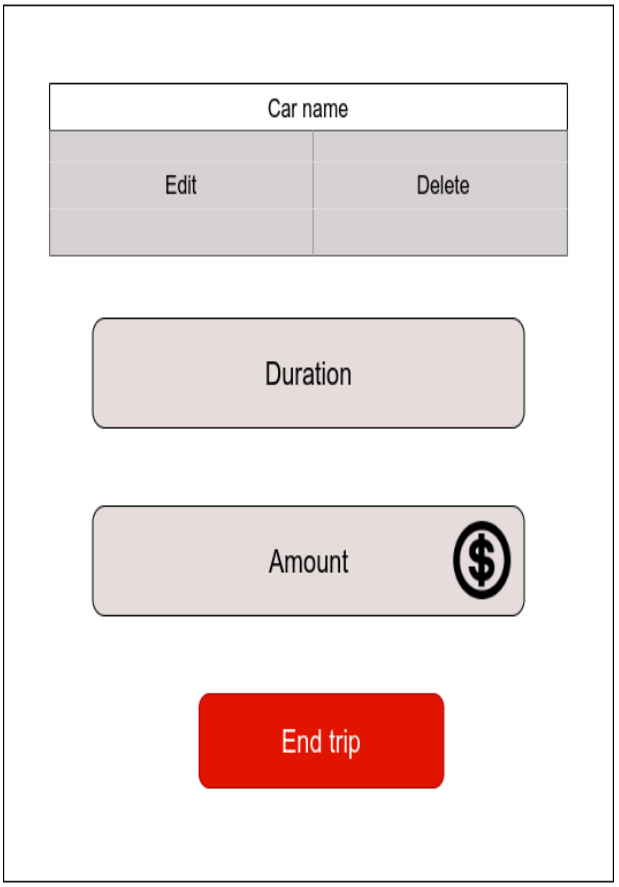
Booking page

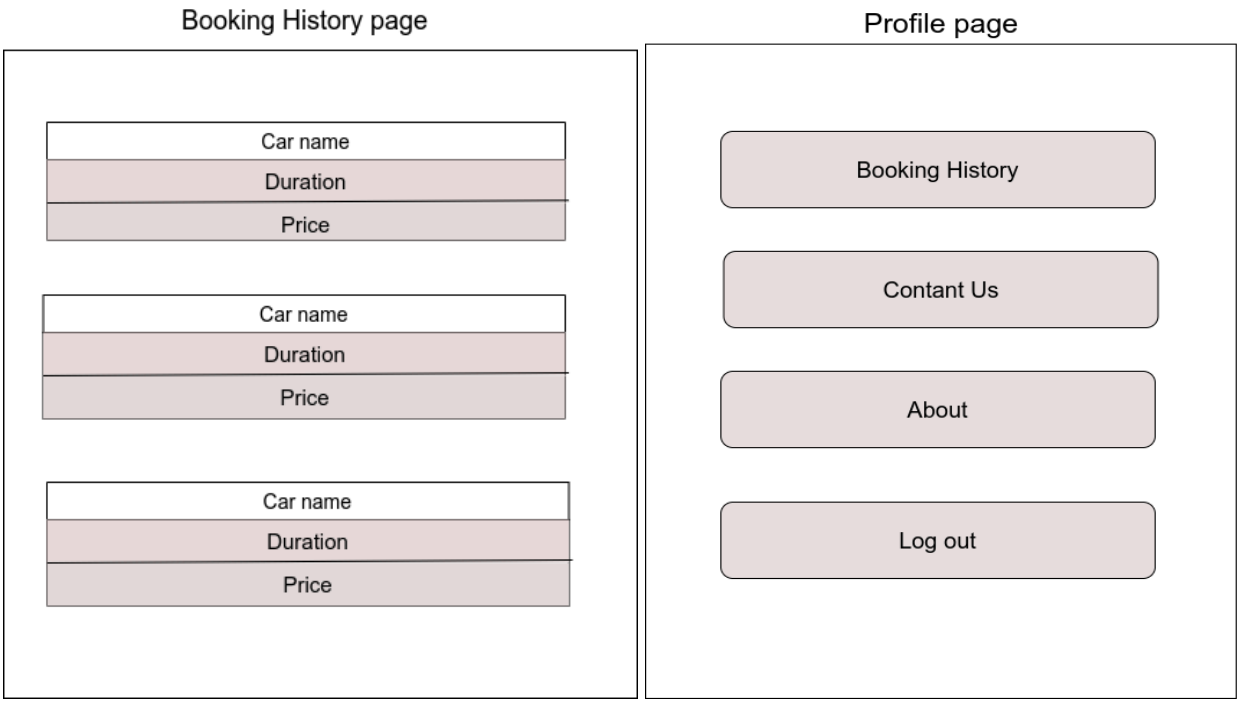


End trip page



Current bookings page





Work distribution

We are a group of 4, and our work distribution is as follows:

1. **Chaitanya Deshpande:** Data modeling, Query Optimization, and API implementation
2. **Nandini Deore:** Database Design, Integrating the UI with backend APIs, Tables creation
3. **Rohan Patil:** Data modeling, Database Design, Indexing, Eco-points logic
4. **Ankit Chavan:** UI Design, Triggers, Stored procedures