

UE21CS351A: Database Management System

MINI PROJECT USER REQUIREMENT SPECIFICATION

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Introduction:

Purpose of the project:

The primary purpose of the Car Rental System is to provide a seamless and user-friendly interface to facilitate customers in reserving cars for their needs. With the increasing demand for self-driven car experiences and the convenience of not owning a car in urban environments, a robust car rental system is crucial. This system aims to simplify the process of car rentals, track availability of cars, calculate costs based on selected categories, monitor bookings, and handle the billing process effectively. The project focuses on ensuring the storage, retrieval, modification, and deletion of data related to car rentals is smooth, accurate, and efficient.

Scope of the Project:

The Car Rental System is envisioned to cater to a broad range of users, both members and non-members. The scope includes:

- a) **Customer Management:** Registration of new members, storage of crucial customer details like driving license, contact details, and membership ID. This also caters to non-members, ensuring they can avail the services with ease.
- b) **Car Inventory Management:** Track all cars in the system, their current status (available or booked), and manage the details of each car, including its make, model, mileage, and registration number.
- c) **Car Category Management:** Define and manage different car categories, setting the number of persons it can accommodate, luggage capacity, pricing details, and late fee structures.
- d) **Location Management:** Manage different pickup and drop-off locations, providing customers the flexibility to choose based on their convenience.
- e) **Booking and Reservation Management:** Handle all bookings, track their current status, duration of booking, and any additional details like rental insurance or discount codes.
- f) **Billing and Payment Management:** Generate bills post car return, detailing all charges, taxes, and any late fees incurred.

The system is designed keeping in mind the ease of use for customers and effective management for administrators. It aims to revolutionize the car rental experience by integrating technology effectively.

Project Description

Project Overview:

The Car Rental System is an integrated platform designed to centralize and streamline the process of renting cars to customers. In the modern urban landscape where the costs of car ownership are escalating and the convenience of cab services is evident, there's a growing demand for self-drive rental options. Catering to this demand, our system provides customers with an intuitive interface to browse available cars, select their desired models based on their requirements, and complete the reservation process. Simultaneously, the system aids admins in managing the cars, tracking bookings, and ensuring efficient billing.

Major Project Functionalities:

1. User Registration & Authentication:

- Allows new users to register either as a member or a non-member.
- Secure login and authentication for returning users.
- Profile management with options to update personal details and view booking history.
- Entities Involved: Customer
- Inputs Required: Name, Email, Password, Driving License Number, Phone Number, Address.

2. Car Browsing & Selection:

- Display available cars with necessary details like make, model, mileage, and registration number.
- Filter options based on car categories, locations, or other specifications.
- Check car availability in real-time.

3. Booking & Reservation:

- Select pickup and drop off locations.
- Choose the duration for the rental.
- Add on options like rental insurance or apply discount codes.
- Confirmation of booking with a unique booking ID for tracking.

4. Dynamic Pricing & Billing:

- Pricing calculations based on selected car category, rental duration, and any additional features.
- Realtime billing estimate.
- Generate detailed bills post car return with all charges, taxes, and late fees, if applicable.

5. Location Management:

- Display available pickup and drop off locations.
- Option for users to suggest or request new locations.

6. Admin Panel & Car Management:

- A separate interface for administrators to manage the fleet, add new cars, or remove old ones.
- Track all active bookings, upcoming reservations, and past bookings.
- Manage pricing models, discount codes, or promotional offers.

System Features and Function Requirements

Functional Requirements:

1. User Signup:

- Provision for users to create a new account using their email.
- Validation of email format and check for existing accounts with the same email.
- Secure entry and storage of passwords, preferably hashed.
- Entities Involved: Customer
- Inputs Required: Name, Email, Password, Driving License Number, Phone Number, Address.

2. User Login:

- Match entered email and password with stored credentials.
- Option for password recovery via registered email.
- Session management to keep users logged in during an active session.

- Entities Involved: Customer
- Inputs Required: Email, Password.

3. Profile Management:

- Allow users to view and edit their personal details.
- Display past booking history and active reservations.
- Option to change password.
- Entities Involved: Customer
- Inputs Required: Name, Email, Driving License Number, Phone Number, Address (for editing).

System Feature 2: Car Browsing & Selection

Description of Feature:

This feature enables users to view available cars, filter them based on preferences, and select the one they desire. It offers an intuitive user interface displaying car details and real-time availability status.

Functional Requirements:

1. Display Cars:

- Show available cars with essential details like make, model, mileage, and registration number.
- Include visual thumbnails or pictures of the cars.
- Entities Involved: Car, Car Category
- Inputs Required: None (system displays the available cars by default).

2. Filter & Search:

- Offer filter options based on car category, availability status, location, and other specifications.
- Provide a search bar for users to quickly find cars by model, make, or other keywords.
- Entities Involved: Car, Car Category, Location
- Inputs Required: Desired category, location, availability status, and other specifications.

3. Car Details Page:

- Detailed view of selected car, displaying comprehensive information.
- Include user reviews or ratings if available.
- Entities Involved: Car, Car Category
- Inputs Required: None (system displays details upon selection).

System Feature 3: Booking & Reservation

Description of Feature:

Users can reserve a car for a specific duration, selecting pickup and drop-off locations.

Functional Requirement:

1. Create a Booking:

- Entities Involved: Customer, Car, Location, Booking
- Inputs Required: Selected Car, Pickup Location, Dropoff Location, From Date & Time, Due Return Date & Time, Optional: Insurance, Discount Code.

2. View Current Booking:

- Entities Involved: Booking, Customer
- Inputs Required: None (system fetches details based on user profile).

3. Modify/Cancel Booking:

- Entities Involved: Booking, Customer
- Inputs Required: Booking ID, Changes to be made (if modifying).

System Feature 4: Dynamic Pricing & Billing

Description of Feature:

The system automatically calculates the cost of the rental based on various factors such as the type of car, rental duration, additional features, and promotions, if any. Post the trip, it generates a detailed bill.

Functional Requirements:

1. Pricing Engine:

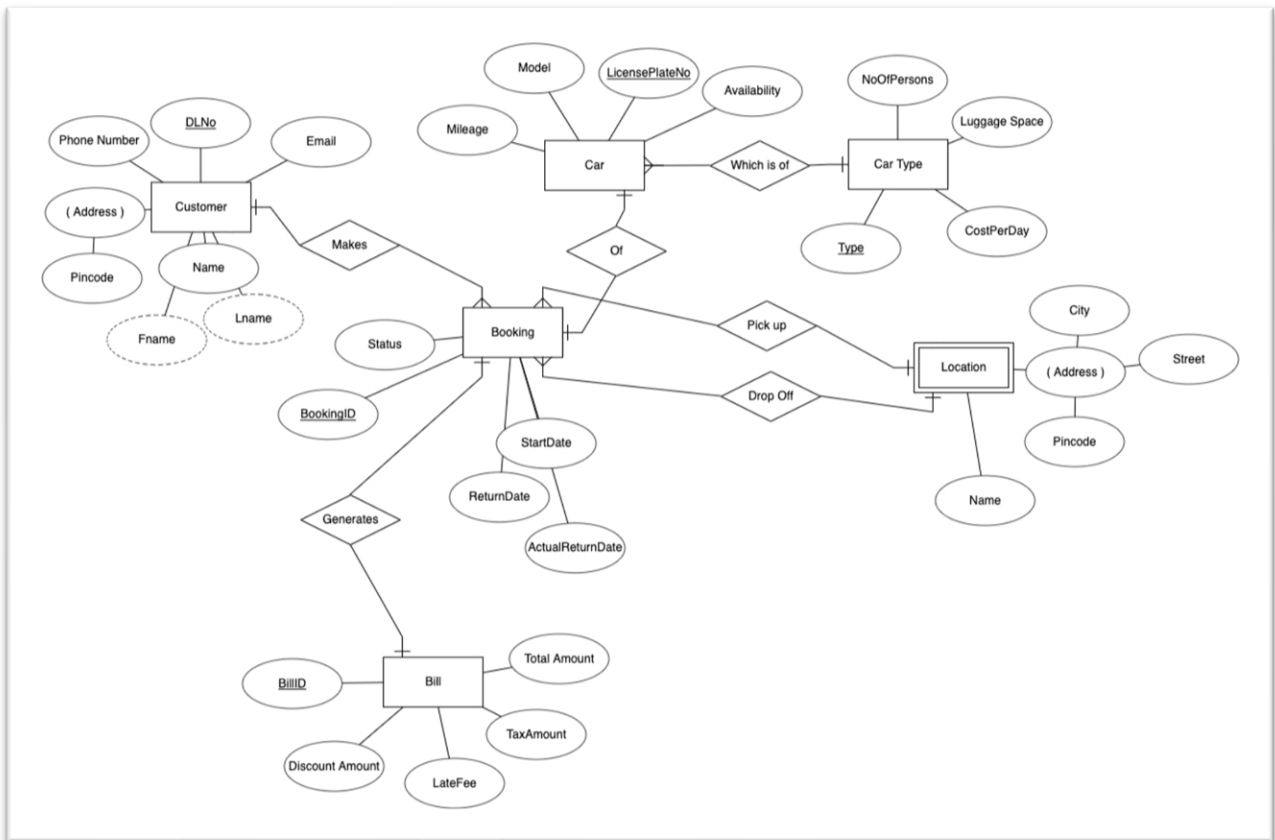
- Dynamically calculate the rental's cost based on selected car category, rental duration, and additional features.

- Adjust prices for promotional offers or applied discount codes.
- Entities Involved: Car Category, Booking
- Inputs Required: Selected Car Category, Duration, Additional Features, Optional: Discount Codes

2. Bill Generation:

- Automatically generate a bill once the car is returned.
- Include itemized details like base cost, late fees (if any), taxes, and total amount.
- Offer digital receipts via email.
- Entities Involved: Booking, Billing, Car Category
- Inputs Required: Actual Return Date & Time (to compute if any late fees apply).

E-R Diagram:



Relational Schema:

