Abstract: Car Rental System Using MERN Stack

The **Car Rental System** is a web-based application developed using the MERN (MongoDB, Express.js, React.js, Node.js) stack. It is designed to simplify the process of renting cars by providing a user-friendly platform for customers and an easy-to-manage backend for administrators. The system enables users to browse available cars, make bookings, and manage their reservations. Administrators can oversee vehicle inventory, user information, and bookings through a centralized interface.

The project focuses on essential features, ensuring a smooth user experience while covering the core functionalities of a car rental business. The frontend, built with React.js, offers a clean and responsive interface for users to interact with the application. The backend, powered by Node.js and Express.js, manages API endpoints and application logic. MongoDB is used as the database to store and retrieve data such as user accounts, car details, and booking records.

This project provides an affordable and efficient solution for car rental businesses to automate their operations. It ensures data security with role-based authentication and guarantees system reliability with proper validation and error handling. Designed with scalability in mind, the system serves as an excellent project for MCA students to demonstrate their skills in web development.

Modules for the Car Rental System

1. **User Registration and Login**

   o   Allows users to create accounts and log in securely.

   o   Includes basic authentication using email and password.

2. **Vehicle Inventory Management**

   o   Admins can add, edit, or remove vehicle details like model, price, and availability.

3. **Search and Browse Vehicles**

   o   Users can view available vehicles with basic filters such as price, type, and seating capacity.

4. **Booking Management**

   o   Enables users to book cars by selecting the date and rental duration.

   o   Allows admins to view and manage bookings.

5. **Payment Module**

   o   Supports basic payment details capture (e.g., pay-at-counter or basic payment confirmation).

6. **Admin Dashboard**

   o   Provides a simple interface for managing users, bookings, and vehicle inventory.

7. **Feedback and Review**

   o   Users can leave feedback about the rental experience.

- o   Feedback can be viewed by admins to improve services.

8. **Notifications and Alerts**

- o   Sends confirmation messages for bookings and reminders for return deadlines.

9. **Reports Module**

- o   Generates simple reports on bookings and vehicle usage for admins.

10. **Profile Management**

- o   Allows users to update their personal information like name, contact details, and password.

11. **Basic Help and Support**

- o   Includes a simple contact form for users to raise queries or complaints.

12. **Logout and Session Management**

- o   Ensures users can securely log out and terminate sessions to prevent unauthorized access.