

Car Rental System: Streamlining the Car Rental Experience

Project Title:

Car Rental System

Introduction:

The Car Rental System is a C++ based software application designed to automate and manage the process of renting vehicles. This project was developed as part of a college case study to illustrate the practical application of C++ programming concepts in developing a real-world system. The project encompasses various functionalities such as customer management, vehicle selection, rental calculations, and invoice generation.

Objectives:

- To provide a user-friendly interface for customers to rent cars.
- To streamline the car rental process for both customers and the rental company.
- To manage and maintain a database of available vehicles, rentals, and customer information.
- To implement efficient algorithms for searching and booking vehicles.
- To ensure data integrity and security throughout the system.

Features:

1. **User Authentication:**
 - Secure login system requiring a PIN for access.
2. **Customer Information Management:**
 - Collecting and storing customer details such as name, age, Aadhar card number, driving license number, and phone number.
3. **Vehicle Selection:**
 - Offering a choice of different car models (TATA, HYUNDAI, MARUTI SUZUKI, BMW, AUDI).
 - Displaying detailed information about each car model from corresponding text files.
4. **Booking Details:**
 - Allowing customers to specify the number of cars and rental duration.
 - Collecting rental date and advance payment details.
5. **Rental Fee Calculation:**
 - Calculating the rental fee based on the car model, number of cars, and rental duration.
 - Deducting the advance amount from the total rental fee to determine the due amount.
6. **Invoice Generation:**
 - Displaying a detailed invoice with all relevant information including customer details, car model, rental duration, total rental amount, and due amount.
 - Providing terms and conditions for rental.

Technology and Tools:

- **Programming Language:** C++
- **Development Environment:** Visual Studio / Code::Blocks / any other C++ IDE
- **Libraries:** Standard Template Library (STL) for data structures and algorithms
- **File Handling:** Used to store and retrieve car model information and other text-based data

Implementation Details:

The Car Rental System is implemented using object-oriented programming principles. It consists of the following key classes and functions:

- **Customer Class:**
 - Manages customer details such as name, age, Aadhar card number, driving license number, and phone number.
- **Rent Class:**
 - Inherits from the Customer class.
 - Manages rental details, including car model selection, rental duration, fee calculation, and invoice generation.
 - Contains methods for collecting customer data (data()), calculating rental fees (calculate()), and displaying the rental invoice (showrent()).
- **Login Function:**
 - Ensures secure access to the system by requiring a PIN.

The system flow is as follows:

1. The user logs into the system using a secure PIN.
2. The user enters personal information.
3. The user selects a car model from the available options.
4. The system displays car details and collects rental information.
5. The system calculates the rental fee based on the selected car model and rental duration.
6. The system generates and displays a detailed invoice.