

The Car Rental System is a simple Java application designed to facilitate the management of cars and customers within a rental agency. The system allows users to perform various operations, including renting cars, returning them, and generating rental reports.

At the core of the application is the Car class, which represents the cars available for rent. Each car object contains attributes such as id, make, model, year, rentalRatePerDay, and isAvailable, which indicates whether the car is currently available for rent. The class provides methods to retrieve these attributes, check availability, rent the car, return it, and calculate the rental cost based on the number of days rented.

The Customer class models the customers of the rental agency, with attributes for id, name, address, and contactInfo. This class includes methods for retrieving customer details and managing the rental process. Specifically, it provides a method to rent a car, ensuring that the car is available, and a method to return a rented car to the agency.

The RentalAgency class serves as the primary interface for managing the rental operations. It maintains lists of cars, customers, and rental transactions. The agency can add and remove cars and customers, process rental requests, and return cars. When a car is successfully rented, it logs the transaction by creating a RentalTransaction object, which captures details like the customer involved, the car rented, the duration of the rental, and the total rental cost. The RentalAgency class also includes a method to generate and print a report of all completed rental transactions.

The application's entry point is the main method within the CarRentalSystem class. This method demonstrates the functionalities of the car rental system by creating instances of Car and Customer, initializing the RentalAgency, adding cars and customers to the agency, processing a rental transaction, returning a car, and generating a rental report.