We will focus on the following set of requirements while designing our Car Rental System:

1. The system will support the renting of different automobiles like cars, trucks, SUVs, vans, and motorcycles.
2. Each vehicle should be added with a unique barcode and other details, including a parking stall number which helps to locate the vehicle.
3. The system should be able to retrieve information like which member took a particular vehicle or what vehicles have been rented out by a specific member.
4. The system should collect a late-fee for vehicles returned after the due date.
5. Members should be able to search the vehicle inventory and reserve any available vehicle.
6. The system should be able to send notifications whenever the reservation is approaching the pick-up date, as well as when the vehicle is nearing the due date or has not been returned within the due date.
7. The system will be able to read barcodes from vehicles.
8. Members should be able to cancel their reservations.
9. The system should maintain a vehicle log to track all events related to the vehicles.
10. Members can add rental insurance to their reservation.
11. Members can rent additional equipment, like navigation, child seat, ski rack, etc.
12. Members can add additional services to their reservation, such as roadside assistance, additional driver, wifi, etc.

class Vehicle{

VehicleType car;

String vehicleId;

String registrationNum;

boolean isReserved;

String model;

Long mileage;

String uniqueBarCode;

String createReservation(String vehicleId, String customerId) {

}

String getReservation(String vehicleId) {

` }

}

enum VehicleType {

CAR, SUV, VAN, MOTORCYCLE

}

class ParkingSpot {

String parkingSpotNum;

Vehicle vehicleNum;

Boolean isEmptySpot;

}

class Account{

String email;

String userID;

Long phoneNum;

AccountType userType;

}

class Authentication{

}

enum UserType{

ADMIN, CUSTOMER, EMPLOYEE

}

class RentalLocation{

List<Vehicle> vehicles;

List<ParkingSpot>parkingSpots;

List<Vehicle> getAvailableVehicles {

}

}

class Reservation {

String vehicleId;

TimeStamp checkOutTime;

TimeStamp checkInTime;

` Account userId;

Long totalCost;

RentalInsurance rentalInsurance;

AdditionalEquipment addEquip;

AdditionalServices addServices;

Account employee;

String createReservation()

String getBarCode(String vehicleId)

void cancelReservation()

addAdditionalServices();

addRentalInsurance();

addAdditionalEquipment();

}

class RentalInsurance {

InsuranceType insuranceType;

Long insuranceCost;

}

class AdditionalEquipment{

EquipmentType type;

Long cost;

}

class Additional Services{

ServicesType serviceType;

Long cost;

}

enum ServicesType {

ROAD\_ASSISTANCE, ADD\_DRIVER, WIFI

}

class NotificationService {

String reservationId;

void sendNotification(String reservationId, String userId)

}

class Charge{

}