

Car Rental Management System – Project Documentation

1. Database Schema Overview

Tables:

- Cars

Columns: CarId (PK), Make, Model, Year, DailyRate, IsAvailable (BIT)

Relationships: One-to-Many with Rentals

- Customers

Columns: CustomerId (PK), Name, Phone, Email

Relationships: One-to-Many with Rentals

- Rentals

Columns: RentalId (PK), CarId (FK), CustomerId (FK), StartDate, EndDate, ActualReturnDate, EstimatedCost, FinalCost, Status

Relationships: Many-to-One to Cars, Many-to-One to Customers

Relationships:

- A Customer can have many Rentals.
- A Car can have many Rentals.
- Each Rental is linked to exactly one Car and one Customer.

2. Code Structure Overview

Forms:

- MainForm

Purpose: Acts as the main navigation hub for Cars, Customers, and Rentals forms.

- CarForm

Purpose: Add, edit, view, and remove cars. Contains fields for Make, Model, Year, Rate, and IsAvailable (checkbox).

- CustomerForm

Purpose: Add, edit, view, and remove customers. Fields for name and contact info.

- RentalForm

Purpose: Create rentals, return cars, calculate costs, and prevent double-booking.

Classes:

- Car

Holds car data, mapped to Cars table.

- Customer

Holds customer data, mapped to Customers table.

- Rental

Holds rental data, mapped to Rentals table.

- CarRentalContext (EF DbContext)

Manages database interaction for Cars, Customers, and Rentals tables.