

# Car Rental System

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# Synopsis

- Data Requirements
- ER Diagram
- Mapping Diagram
- Functional Dependencies

# Data Requirements

- The Car Rental Database involves around three main entities Car, User and Reservation
- Car can be reserved from a rental location with a specific address. It has a unique Rental\_Location\_ID, a phone number and a contact email. A rental location keeps track of address where the car belongs using street name, state and zip code.
- A rental location has a number of cars for rental. Each car is described by VIN, Registration Number, Color, Model, Manufactured year, Seating capacity of the car, whether it has Disabled friendly feature and its Status marked ‘Available’ or ‘Unavailable’

# Data Requirements

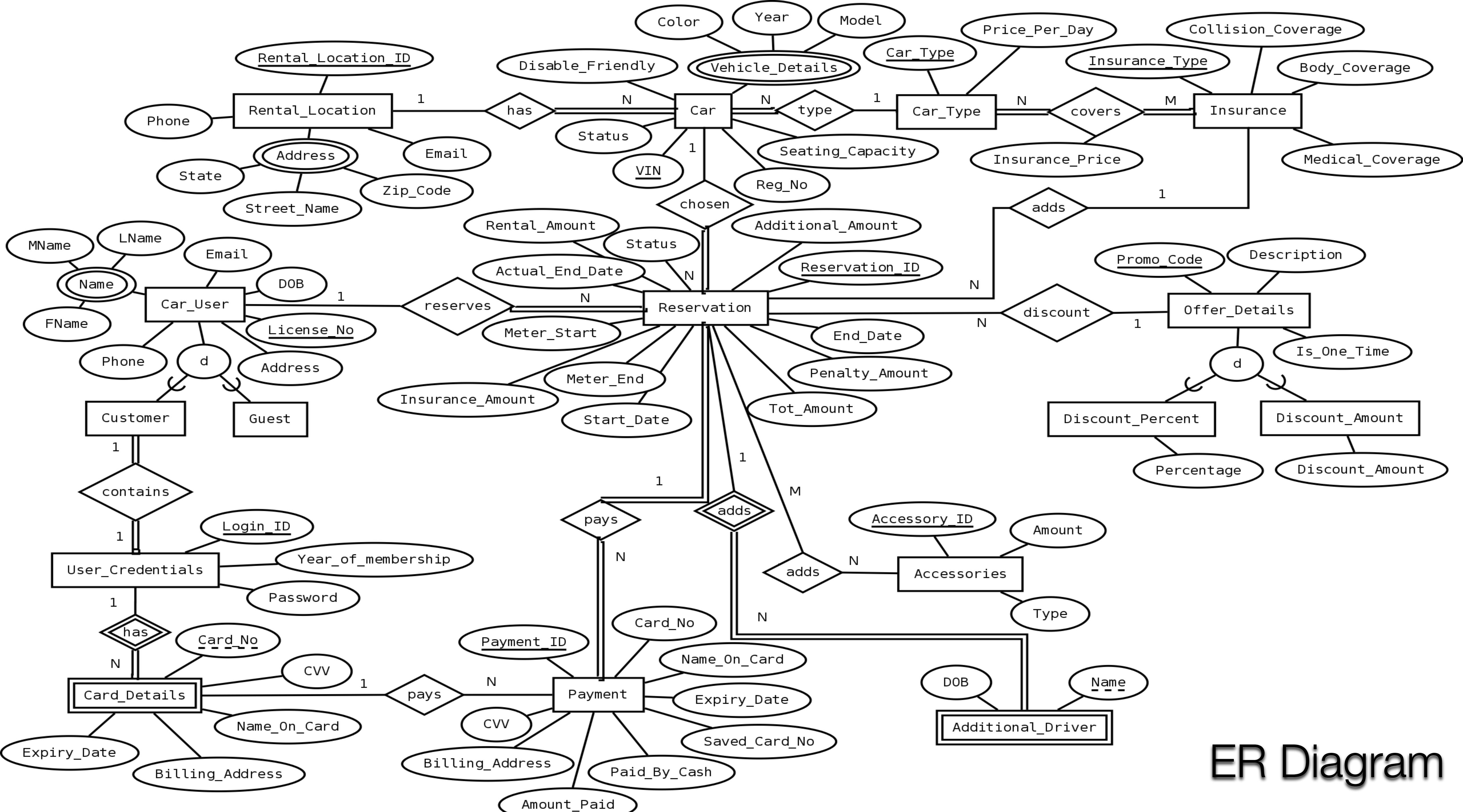
- Car has a parameter Car Type. It can be ‘Economy’, ‘Standard’, ‘SUV’, ‘Premium’ and ‘Minivan’. Car Type defines the rental price per day. A user can take Insurance per day for the rental car. There are different types of Insurances each having different medical coverage, collision coverage and bodily coverage. Insurance Types are ‘Liability’ and ‘Comprehensive’. Car type and Insurance Type drives the Insurance price per day
- A user can reserve a car for a number of days. He can use any valid promotional code which is maintained by status. When a user books a car he mentions the start date and end date for which he needs the car. The end date will be hypothetical at the time of reservation and updated with actual end date when the car is returned. The total amount and net amount are calculated based on start date, end date, rental price per day, insurance price per day and promotional code if any

# Data Requirements

- A user is categorized as guest and customer. User can continue reserving car as guest as long as he has not registered as customer. A user is uniquely identified by his/her license number. User information consists of his name as first name, middle name and last name, email, address, date of birth and contact number
- A registered customer will be provided with a login id and password. A customer can save his credit/debit card details for future payment
- Partial payment can also be made at the time of reservation and the balance must be paid by the user during car return when actual end date is known. If user is a customer, he/she can pay through saved debit/credit card details

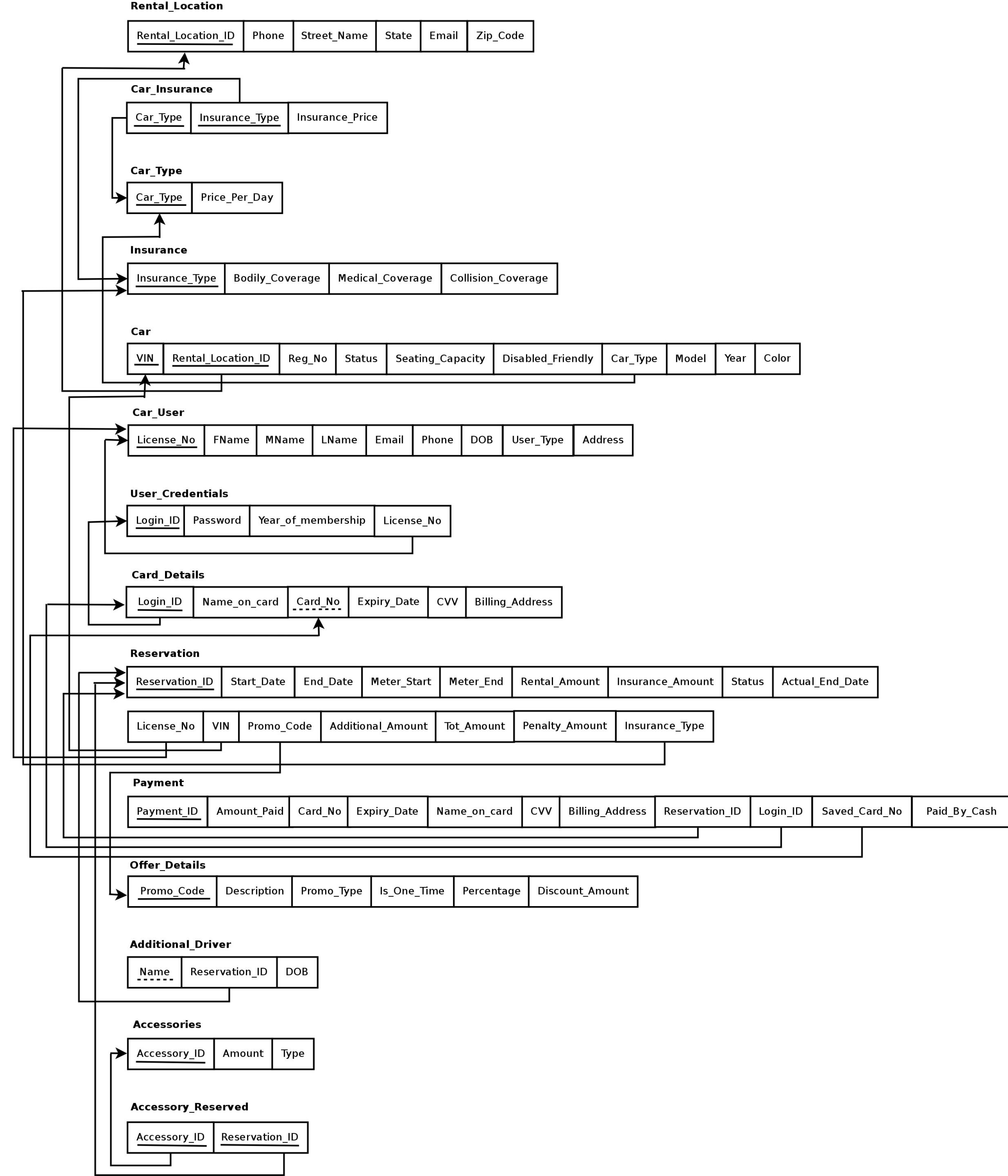
# Data Requirements

- A user can add any accessories as part of his/her reservation. Accessories can be ‘Car Seat’ and ‘GPS’. A user can add as many accessories he/she needs as part of the reservation
- Additional driver can be added as part of his/her reservation. For each additional driver there will be an additional charge
- A user can cancel a reserved car before the car has been rented. A reservation can have status as ‘Reserved’, ‘Completed’ and ‘Cancelled’. When the car is reserved, status will be in ‘Reserved’ Status. Once the car is returned and the total amount is paid, the status will be ‘Completed’



**ER Diagram**

# Mapping



# Functional Dependencies

- In Rental car location, Rental\_Location\_ID is the primary key  
 $\text{Rental\_Location\_ID} \rightarrow \{\text{Phone}, \text{Email}, \text{Street\_Name}, \text{State}, \text{Zip\_Code}\}$
- Type of the car defines the rental price of the car per day  
 $\text{Car\_Type} \rightarrow \text{Price\_Per\_Day}$
- Type of the insurance defines the insurance coverage  
 $\text{Insurance\_Type} \rightarrow \{\text{Bodily\_Coverage}, \text{Medical\_Coverage}, \text{Collision\_Coverage}\}$
- Insurance Type and Car Type defines the Insurance price per day  
 $\{\text{Car\_Type}, \text{Insurance\_Type}\} \rightarrow \{\text{Insurance\_Price}\}$

# Functional Dependencies

- A user is defined by his/her License\_No  
 $\{License\_No\} \rightarrow \{FName, Mname, Lname, Email, Address, Phone, DOB, User\_Type\}$
- In a user credential, Login\_ID defines the rest of the attributes in the entity  
 $\{Login\_ID\} \rightarrow \{Password, Year\_Of\_Membership, License\_No\}$
- Login\_ID and Card\_No in Card\_Details defines complete card information  
 $\{Login\_ID, Card\_No\} \rightarrow \{Name\_On\_Card, Expiry\_Date, CVV, Billing\_Address\}$

# Functional Dependencies

- Reservation\_ID drives all the other attributes in Reservation relation  
 $\text{Reservation\_ID} \rightarrow \{\text{Start\_Date}, \text{End\_Date}, \text{Meter\_Start}, \text{Meter\_End}, \text{Rental\_Amount}, \text{Insurance\_Amount}, \text{Status}, \text{License\_No}, \text{VIN}, \text{Promo\_Code}, \text{Additional\_Amount}, \text{Tot\_Amount}, \text{Insurance\_Type}\}$
- Payment\_ID is the primary key of Payment relation  
 $\text{Payment\_ID} \rightarrow \{\text{Amount\_Paid}, \text{Card\_No}, \text{Expiry\_Date}, \text{Name\_On\_Card}, \text{CW}, \text{Billing\_Address}, \text{Reservation\_ID}, \text>Login\_ID}, \text{Saved\_Card\_No}, \text{Paid\_By\_Cash}\}$

# Functional Dependencies

- Promo\_Code defines other attributes in Offer\_Details relation  
 $Promo\_Code \rightarrow \{Description, Promo\_Type, Is\_One\_Time, Percentage, Discounted\_Amount\}$
- Additional\_Drivers relation  
 $\{Reservation\_ID, Name\} \rightarrow DOB$
- In Accessories relation, Accessory\_ID drives the type and amount of the accessory  
 $Accessory\_ID \rightarrow \{Type, Amount\}$

Thank You