**Enterprise Rent-A-Car Database**

Database Fundamentals

IT 214 -BO3

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# Description

## Project Topic

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## About Enterprise

Enterprise Rent-A-Car was founded in 1957 by Jack Taylor. Enterprise offers car and truck rentals as well as car sharing and car sales. Enterprise is often recognized as being a car rental service at an airport. It has amassed a massive network of over 8,000 locations worldwide. The company is in need of a database to keep track of its car-rental inventory. The company would like to keep a record of what vehicles are available for rental, what vehicles are being rented, and by what customer. Given that customers are allowed to request vehicles, this information will be useful for determining what vehicles are often requested and which spend more time on the lot.

## Business Requirements

The Scope of the Project consists of the following sections:

* Vehicle Type
* Vehicle
* Customer
* Insurance Plan
* Rental

The Vehicle Type section describes different types of vehicles rented out by the company. Vehicles can be either Trucks, Sedans, Vans, SUVS, or Luxury. For each vehicle type a vehicle code and vehicle type description must be included.

The Vehicle section describes vehicles sold by the company. For each vehicle, the vehicle type, license plate information , make, model, year, and color must be recorded.

The Customer section describes the person purchasing the vehicle. This includes but not limited to, name, date of birth, and customer id. In addition, the company would like to have contact information for each customer.

The Insurance Plan section describes the insurance plan that each customer may have. The insurance can be the customer’s personal insurance or purchased with the company. The company has four types of insurance to choose from: Damage Waiver (DW), Personal Accident Insurance (PAI) & Personal Effects Coverage (PEC), Supplemental Liability Protection (SLP), and Roadside Assistance Protection (RAP). All insurance plans must have a policy number to uniquely identify.

The Rental section describes the vehicles rented by a customer. For each rental, the pickup date, return date, and odometer reading must be included.

# Business Rules

1. Each vehicle belongs to one and only one vehicle type. Each vehicle type may or may not include zero or more vehicles.
2. A vehicle may be sold as zero, one, or many rentals. A sold rental must be one and only one vehicle.
3. Insurance plans must be owned by one or more customers. Each customer must own one and only one insurance plan.
4. A customer may purchase zero or more rentals. Each rental purchase is by one and only one customer.

# Entities & Attributes

**Entity #1: VEHICLE\_TYPE**

The VEHICLE\_TYPE entity will contain information that describes different types of vehicles.

Attribute #1 (PK): VEHICLE\_TYPE\_CODE

Description: VEHICLE\_TYPE\_CODE is a unique identifier that will be used as a reference in other tables.

Data Type: Text

Sample Values: “SD” for Sedan, “TK” for Trucks, “LX” for luxury, etc.

Attribute #2: VEHICLE\_TYPE\_DESC:

Description: VEHICLE\_TYPE\_DESC will be a description on the type of vehicle.

Data Type: Text

Sample Values: “Sedan”, “Truck”, “Van”, etc.

**Entity #2: VEHICLE**

Each VEHICLE\_TYPE has specific information to uniquely identity that vehicle from similar vehicles. VEHICLE will contain information on the vehicle’s make, model, year etc.

Attribute #1 (PK): VEHICLE\_ID

Description: VEHICLE\_ID is a unique identifier that will be used as a reference in other tables.

Data Type: Numeric

Sample Values: 33, 150, 200, etc.

Attribute #2 : VEHICLE\_LICENSE\_PLATE

Description: VEHICLE\_LICENSE\_PLATE is the license plate for each vehicle

Data Type: Text

Sample Values: “YKG093”, “680VZW”, “7TYP290”, etc.

Attribute #3: VEHICLE\_MAKE

Description: VEHICLE\_MAKE is the make of a vehicle

Data Type: Text

Sample Values: “Honda”, “BMW”, “Nissan”, etc.

Attribute #4: VEHICLE\_MODEL

Description: VEHICLE\_MODEL is the model of the vehicle.

Data Type: Text

Sample Values: “Civic”, “320i”, “Frontier”, etc.

Attribute #5: VEHICLE\_YEAR

Description: VEHICLE\_YEAR is the vehicle’s model year.

Data Type: Numeric

Sample Values: 2018,2020, 2017, etc.

Attribute #6: VEHICLE\_COLOR

Description: VEHICLE\_COLOR is the color of the vehicle

Data Type: Text

Sample Values: “Red”, “White”, “Black”, etc.

Attribute #7 (PK): VEHICLE\_TYPE\_CODE

Description: VEHICLE\_TYPE\_CODE is a unique identifier that will be used as a reference in other tables.

Data Type: Text

Sample Values: “SD” for Sedan, “TK” for Trucks, “LX” for luxury, etc.

**Entity #3: INSURANCE\_PLAN**

Its required that all customers have insurance either from an outside provider or with the company. The INSURANCE\_PLAN entity will contain information regarding customer insurance.

Attribute #1(PK): POLICY\_NUM

Description: POLICY\_NUM will contain the policy number of the CUSTOMER to uniquely identify Insurance information.

Data Type: Text

Sample Values: “12345678910”, “324322456”, “1235551334”, etc.

Attribute #2: INSURANCE\_PLAN\_PROVIDER

Description: INSURANCE\_PLAN\_PROVIDER will contain the name of the company of the policy holder.

Data Type: Text

Sample Values: “USA”, “ Geico” , “Enterprise”, etc.

Attribute #3: INSURANCE\_PLAN\_DESC

Description: INSURANCE\_PLAN\_DESC will be a short description of the insurance plan.

Data Type: Text

Sample Values: “Personal”, “Damage Waiver”, “Roadside Assistance Protection”, etc.

**Entity #4: CUSTOMER**

The CUSTOMER entity is to keep a record of the purchaser’s contact and payment information.

Attribute #1 (PK): CUSTOMER\_ID

Description: CUSTOMER\_ID is a unique identifier that will be used as a reference in other tables.

Data Type: Numeric

Sample Values: 1, 54, 101, etc.

Attribute #2: CUSTOMER\_FNAME

Description: CUSTOMER\_FNAME will be the first name of the customer.

Data Type: Text

Sample Values: “O’Ryan”, “John”,” Darius”

Attribute #3: CUSTOMER\_LNAME

Description: CUSTOMER\_LNAME will be the last name of the customer.

Data Type: Text

Sample Values: ”Lattin”,” Millbury”, “Brown”, etc.

Attribute #4: CUSTOMER\_M\_INIT

Description: CUSTOMER\_M\_INIT will be the middle initial of the customer.

Data Type: Text

Sample Values: ‘K’, ‘P’,’ L’, etc.

Attribute #5: CUSTOMER\_DOB

Description: CUSTOMER\_DOB will be the date of birth of the customer.

Data Type: Date

Sample Values: ”1998-29-03”, “1964-04-03”, “1991-04-13”, etc.

Attribute #6: CUSTOMER\_PHONE\_NUM

Description: CUSTOMER\_PHONE\_NUM will be the customer’s phone number

Data Type: Text

Sample Values: ”3343342223”,” 5713343344”, “1234567890”, etc.

Attribute #7(FK): INSURANCE\_PLAN\_POLICY\_NUM

Description: INSURANCE\_PLAN\_POLICY\_NUM is a foreign key column that references the INSURANCE table.

Data Type: Text

Sample Values: 12345678910, 324322456, 1235551334, etc.

**Entity #5: Rental**

Attribute #1 (PK): RENTAL\_ID

Description: RENTAL\_ID is a unique identifier that will be used as a reference in other tables.

Data Type: Numeric

Sample Values: 44, 233, 151, etc.

Attribute #2: RENTAL\_PICKUP

Description: RENTAL\_PICKUP is the date a vehicle is picked up for rental.

Data Type: DATE

Sample Values: ”2020-03-03”, “2020-04-13”, “2020-04-13”, etc.

Attribute #3: RENTAL\_RETURN

Description: RENTAL\_RETURN is the date a vehicle is returned after renting.

Data Type: DATE

Sample Values: ”2020-03-20”, “2020-05-03”, “2020-04-15”, etc.

Attribute #4: ODOMETER\_READING

Description: ODOMETER\_READING is the value of an odometer before a rental.

Data Type: Numeric

Sample Values: 38292, 1000, 130200, etc.

Attribute #5 (FK): VEHICLE\_ID

Description: VEHICLE\_ID is a foreign key column that references the VEHICLE table.

Data Type: Numeric

Sample Values: 33, 150, 200, etc.

Attribute #6 (FK): CUSTOMER\_ID

Description: CUSTOMER\_ID is a foreign key column that references the CUSTOMER table.

Data Type: Numeric

Sample Values: 1, 54, 101, etc.

# Entities & Relationships

**Relationship:** VEHICLE\_ TYPE “includes” VEHICLE

**Relationship Type:** 1:M

Explanation: Business rule states, “Each vehicle belongs to **one and only one** vehicle type. Each vehicle type may include **zero or more** vehicles.” The VEHICLE\_TYPE entity is on the “one” side of the relationship and the VEHICLE is on the “many” side of the relationship.

**Relationship Participation:** Mandatory on the “one” side of the relationship and optional on the “many” side of the relationship.

Explanation: The VEHICLE\_TYPE entity is mandatory in the relationship because “Each vehicle **belongs** to one and only one vehicle type”. The VEHICLE entity is optional in the relationship because “Each vehicle type **may** include zero or more vehicles”, so a vehicle type may have no vehicles.

**Cardinality:**

* The cardinality of VEHICLE\_TYPE is (1,1)
* The cardinality of VEHICLE is (0,N)

**Relationship Strength:** Weak

Explanation: The relationship is weak because the primary key of the VEHICLE entity does not contain the primary key of the VEHICLE\_TYPE entity.

**Relationship:** CUSTOMER “purchases” Rental

**Relationship Type:** 1:M

Explanation: Business rule states, “A customer may purchase **zero or more** rentals. Each rental purchase must be by **one** and **only one** customer.” The CUSTOMER entity is on the “one” side of the relationship and the RENTAL is on the “many” side of the relationship.

**Relationship Participation:** Mandatory on the “one” side of the relationship and optional on the “many” side of the relationship.

Explanation: The CUSTOMER entity is mandatory in the relationship because “Each rental purchase **must be** by one and only one customer”. The RENTAL entity is optional in the relationship because “A customer **may** purchase zero or more rentals”, so there may be no rentals purchased by a customer.

**Cardinality:**

* The cardinality of CUSTOMER is (1,1)
* The cardinality of RENTAL is (0,N)

**Relationship Strength:** Weak

Explanation: The relationship is weak because the primary key of the RENTAL entity does not contain the primary key of the CUSTOMER entity.

Insurance plans must be owned by one or more customers. Each customer must own one and only one insurance plan.

**Relationship:** CUSTOMER “owns” INSURANCE

**Relationship Type:** 1:M

Explanation: Business rule states, “Insurance plans must be owned by **one** or **more** customers. Each customer must own **one** and **only one** insurance plan.” The INSURANCE entity is on the “one” side of the relationship and the CUSTOMER is on the “many” side of the relationship.

**Relationship Participation:** Mandatory on the “one” side of the relationship and on the “many” side of the relationship.

Explanation: The INSURANCE entity is mandatory in the relationship because “Insurance plans **must be** owned by one or more customers”. The CUSTOMER entity is mandatory in the relationship because “Each customer **must** own one and only one insurance plan”.

**Cardinality:**

* The cardinality of INSURANCE is (1,5)
* The cardinality of CUSTOMER is (1,N)

**Relationship Strength:** Weak

Explanation: The relationship is weak because the primary key of the CUSTOMER entity does not contain the primary key of the INSURANCE entity.

**Relationship: VEHICLE “sold as” RENTAL**

**Relationship Type:** 1:M

Explanation: Business rule states, “ A vehicle may be sold as **zero**, **one**, or **many** rentals. A sold rental must be **one** and **only one** vehicle”. The VEHICLE entity is on the “one” side of the relationship and the RENTAL is on the “many” side of the relationship.

**Relationship Participation:** Mandatory on the “one” side of the relationship and optional on the “many” side of the relationship.

Explanation: The VEHICLE entity is mandatory in the relationship because “A sold rental **must be** one and only one vehicle”. The RENTAL entity is optional in the relationship because “A vehicle **may be** sold as **zero**, one, or many rentals”, so there may be no rentals.

**Cardinality:**

* The cardinality of VEHICLE is (1,1)
* The cardinality of RENTAL is (0,N)

**Relationship Strength:** Weak

Explanation: The relationship is weak because the primary key of the RENTAL entity does not contain the primary key of the VEHICLE entity.

# Crow’s Foot Entity Relationship Diagram

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