

Deliverable 1

Database 420-231-VA

Due date: Sunday, March 22, 2022

Scenario 2: Car Rental System

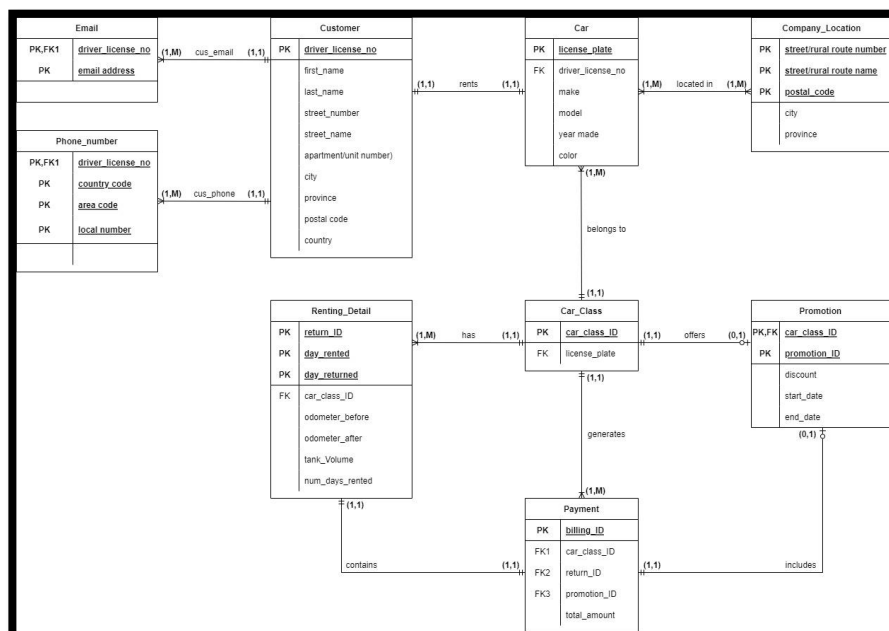
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Description:

The company Car2Go is a car rental company that has several locations and offers a multitude of classes such as subcompact, compact, sedan and luxury. Each car has a different make, model, year made and color. Also, they each have a unique identification number and a unique license plate. When a car is rented, the company keeps track of the mileage, tank and the date (before and after a car is rented). The rented car can be returned to a different location. A customer can only rent one car at a time and request a specific class. For every customer, the company keeps record of their full name, mailing address, zero or more phone numbers, zero or more email addresses and the driver's license number (unique for each customer). If the company does not have a vehicle of the class requested, the customer can get a higher class for the same price (free upgrade). All cars of the same class are priced the same. The drop-off charge is calculated by the car's class, the duration in days (minimum 1) and if there is any weekly promotion. In certain weeks of the year, the company has a promotion (usually 50%, not always) that only affects a single class of car at a time.

Business Rules and Assumptions:

- Each car is different so they must each be unique
- Customer can only rent one car at a time
- If the car requested by the customer is not available, they can get a car of higher class at the same price as the car requested
- Company keeps track of the rented cars
- Company keeps record of the customer
- All cars in the same class have the same price
- Cars always leave with a full tank
- Drop-off charge can be found with the price of the car, duration in days, and promotion, if there are any.



Relation schema

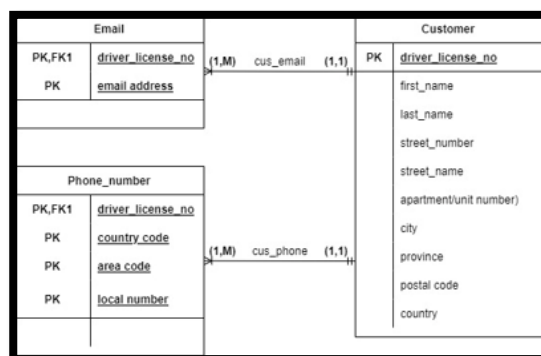
- **Email** (driver_license_no, email_address)
- **Phone_Number** (driver_license_no, country_code, area_code, local_number)
- **Customer** (driver_license_no, first_name, last_name, street_number, street_name, apartment/unit_number, city, province, postal_code, country)
- **Car** (license_plate, driver_license_no, make, model, year_made, color)
- **Company_Location** (street/rural route number, street/rural route name, postal_code, city, province)
- **Car_Class** (car_class_ID, license_plate)
- **Renting_Detail** (return_ID, day_rented, day_returned, car_class_ID, odometer_before, odometer_after, tank_volume, num_days_rented)
- **Payment** (billing_ID, car_class_ID, return_ID, promotion_ID, total_amount)
- **Promotion** (promotion_ID, car_class_ID, discount, start_date, end_date)

Normalization

1NF:

The following tables are the changes we made after 1NF. Green being the old table and White being the new tables.

Customer
<u>driver's license number</u>
first_name
last_name
(email address)
(phone number)
country code
area code
local number
mailing address(
street address(
street number,
street name,
apartment/unit number)
city,
province,
postal code,
country)



Car	
<u>car class</u>	
<u>identification number</u>	
license plate	
make	
model	
year made	
color	

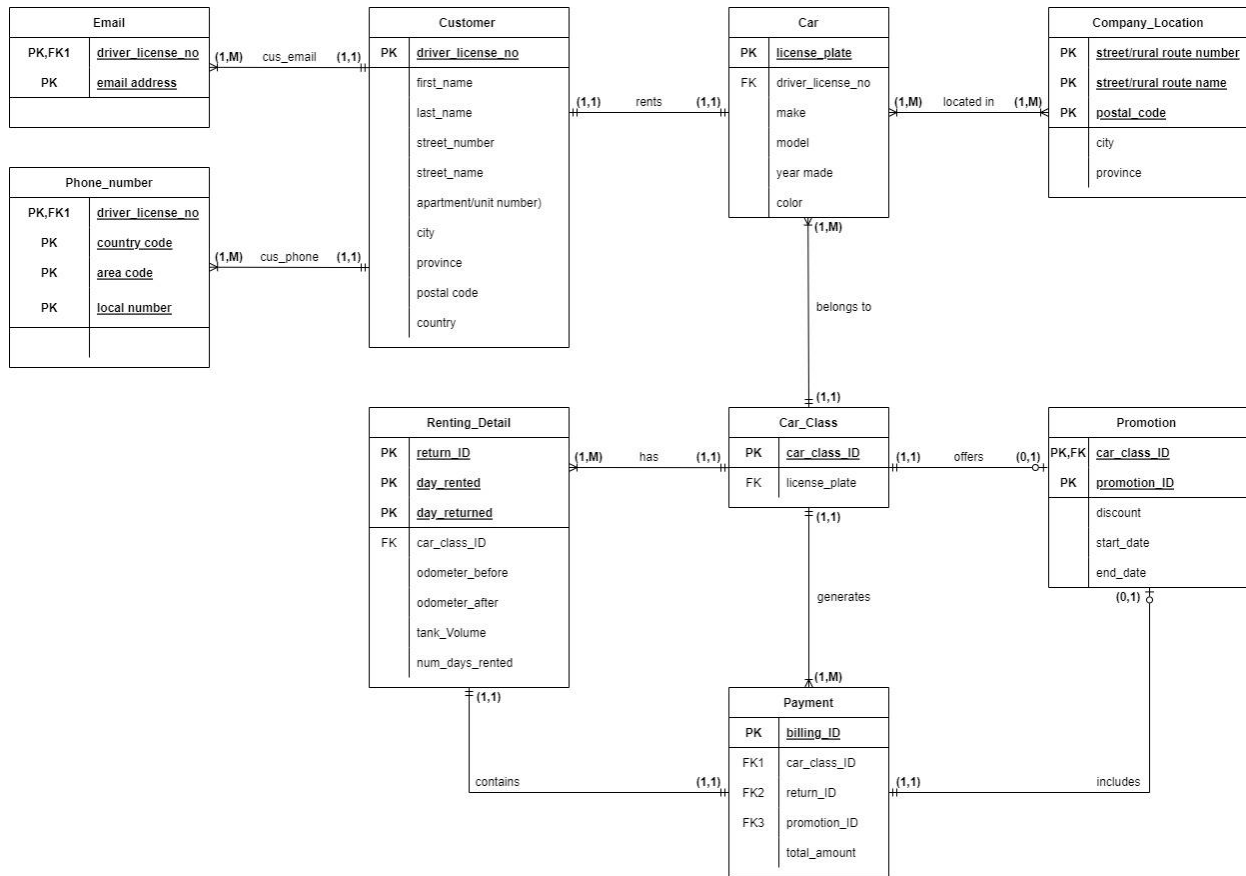
Car	
PK	<u>license_plate</u>
FK	driver_license_no
	make
	model
	year made
	color
	(1,M)
	belongs to
	(1,1)
Car_Class	
PK	<u>car_class_ID</u>
FK	license_plate

Company_Location	
<u>street/rural route address(</u>	
<u>street/rural route number</u>	
<u>street/rural route name)</u>	
<u>postal code</u>	
city	
province	

Company_Location	
PK	<u>street/rural route number</u>
PK	<u>street/rural route name</u>
PK	<u>postal code</u>
	city
	province

2NF:

We separated phone number and email from Customer.



3NF:

We don't have any