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Homework 2

Part 1: EER Diagram

Description of ERR Diagram Design:

* In the EER Model for Car Rental, there are 3 entities: customer, car, and rentals
* In the customer entity, there are 3 attributes: ID number, name, and phone number
  + ID number is the primary key for the customer entity
  + Name is a composite attribute that is composed of a first name initial and a last name variable
* In the car entity, there are 5 attributes: vehicle ID, daily rate, weekly rate, model, and year
  + Vehicle ID is the primary key for the car entity
* The car entity is a general class which contains 6 super classes that will inherit the attributes above: compact car, medium car, large car, SUV, truck, and van
  + All the different types of cars will have their own set daily rates and weekly rates
* In the rentals entity, there are 5 attributes: available now, periods available, start date, return date, and amount due
  + Available\_now is the attribute that describes if the car is currently rented by another customer or if it is available to rent by a customer, it will be a Boolean value
    - If the Boolean value is false, it is assumed that it is rented by another customer or that it is not available for rent because it not during the periods available time frame
  + Periods\_available is the attribute that describes the periods that the car can be rented out; the attribute will contain a range of times during the day that the car is available for rentals
  + Rentals entity is a weak entity that depends on the customer and car entities to make each rental entity unique
* The rentals entity is a general class which contains 2 super classes that will inherit the attributes above: daily and weekly rentals
  + The daily rentals have its own attribute, number of days, which records the number of days that the car was rented out
  + The weekly rentals have its own attribute, number of weeks, which records the number of weeks the car was rented out
  + The attribute, amount due, depends on the type of rental the car is under, the pay rate for each car depending on the type of rental, and the total numbers of days or weeks the car was rented out

Incomplete requirements considered:

* Each car entity is required to fit in 1 of the 6 types of cars possible (total participation to be one of the special classes)
* Each car rental entity is required to fit in 1 of the 2 types of rentals possible (total participation to be one of the special classes)

Assumptions considered:

* The car entity as a generalized class is assumed to be like an abstract or template class for the super classes of cars
  + Each super class will share the same types of attributes but will have to initialize each attribute on their own
* Customers can rent multiple cars under their name if another family member is not able to rent a car on their own due to age restrictions or if they want to rent a car for someone else under their name
* Assumed that the customer is at or above the age requirement for renting out a car, so there is no age attribute in customer
* Assumed that the customer has a valid driver’s license, so there is no Boolean value to check if a customer has a valid license or not
* There is no location attribute in the rental entity because it is already assumed that there is only one rental location for simplicity
* Relationships between entities:
  + Customer and Car
    - 1 to many relationship
    - 1 customer can rent multiple cars
    - Each car can only be rented by 1 customer
  + Car and Rentals
    - 1 to many relationship
    - Each car can have one rental type (daily or weekly rentals)[\*\*\*Note as modification]
    - Each rental type can apply to multiple cars
      * Example: A van and a SUV can both have a daily rental type
  + Customer and Rentals
    - 1 to many relationship
    - Each customer can pay for multiple rentals
    - Each rental payment is only applied to 1 customer/only one customer needs to pay for the rental
* [\*\*Added]: Assume each car type has the same daily and weekly rental rates