CS631-103 Term Project

Phase 1

Group 26: Jairo A. Perez
Manavkumar Patel

Date: 10/21/2022

Contents

PART 1 – Business Requirements:

The Following are the business requirements for the Car Rental system. These requirements will be grouped into sections to provide a better understanding from each component.

Customer requirements:
A. A customer must make a reservation prior to rent a car.
B. If customer decides to proceed with the rental, she/he will get a rental agreement.
C. The customer must provide name, address, and phone at reservation time.
D. Lastly, the customer must provide a valid driver's License and credit card if she/he gets a rental agreement.

Reservation requirements:
A. The reservation must specify a type of class car.
B. The reservation will be made for a specific pick-up and drop-off location.
C. Pick-up and drop-off location do not have to be the same but can.
D. The reservation will include a rental period. This period consists of the start date and time and end date and time.
E. Reservation will have a type. To know if customer reserved by phone, walk-in or online. *
F. The reservation will have a status. *
G. Status will be active if customer shows up at pick-up location on start date.
H. Reservation will be cancelled if customer does not appear on start date and/or calls to cancel.

Location requirements:
A. A location can hold several cars.
B. Not all locations will have the same number of cars or classes of cars.
C. Each location is associated with a reservation either in pick-up or drop-off form.

Car requirements:
A. A car must be either at a location or with a customer (under a rental agreement).
B. If a car is rented it must be associated with a rental agreement.
C. Once a car is returned it becomes available for a new rental agreement.
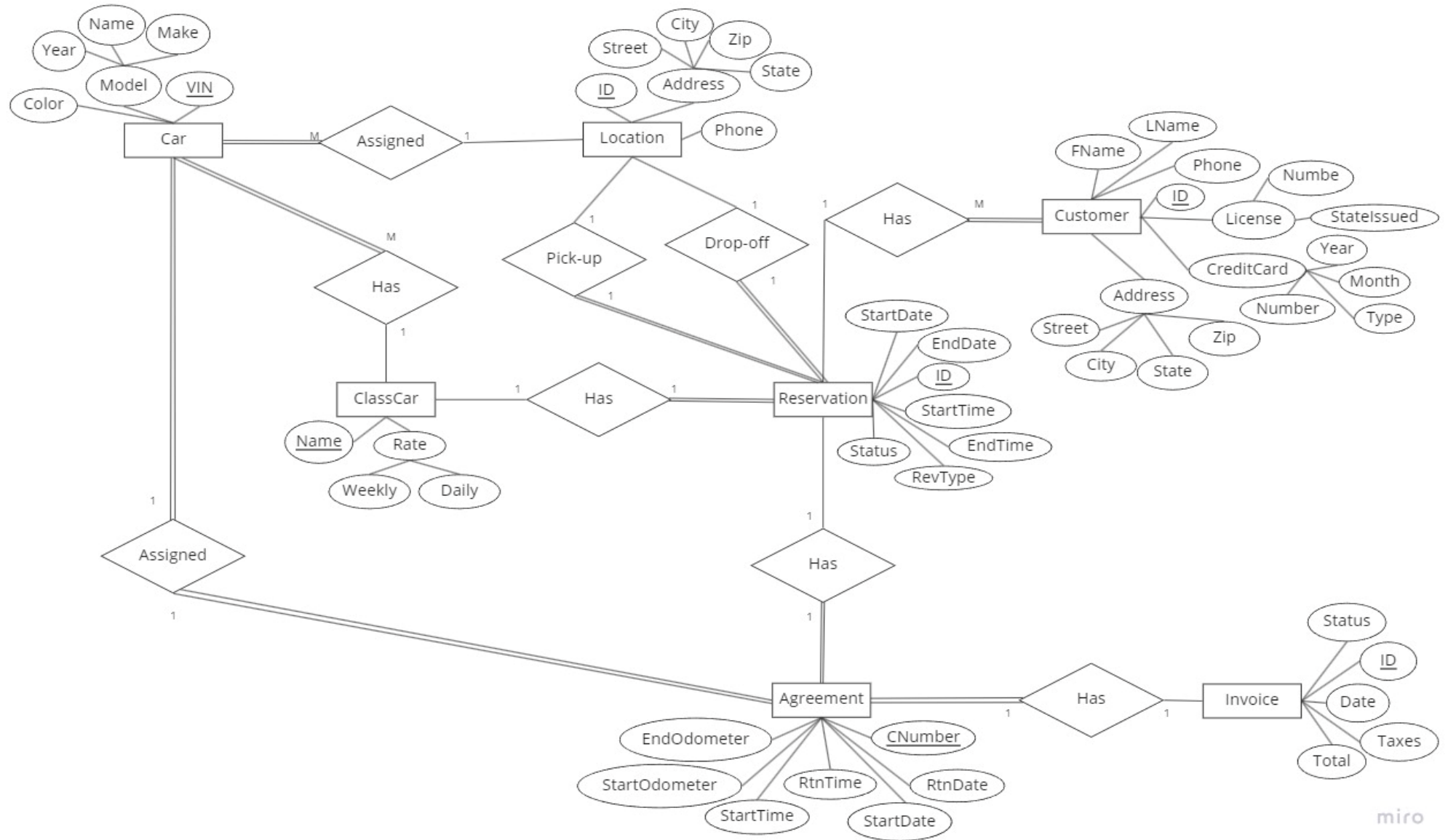
Agreement Requirement:
A. Getting a rental agreement is only possible if there is a reservation.
B. Agreements can only be made to one person.
C. Agreements can only be associated with one specific car.
D. An agreement's rental period is based on reservation rental period.
E. If a car is returned earlier, the Agreement will still base its rental period of the reservation.
F. If a car is returned late (after reservation rental period) the Agreement will save its new return date and time.
G. The agreement specifies the car's initial odometer reading.
H. Once the car is return the agreement will store the ending or returning odometer reading.

Invoice Requirements:

A. An invoice must be associated with a rental agreement.
B. Invoices will have a status. This indicate if it has been paid or not.
C. The invoice will calculate its amount due based on:
    a. Comparing Reservation's rental period and Agreement's return date.
        i. If return dates are equal no extra fees are applied
        ii. If Agreement's return date is less than Reservation's, amount is based on Reservation's period.
        iii. If Agreement's return date is older than Reservation's, amount is based on Reservation's period, extra days, and late fees.
    b. Extra days:
        i. Extra days are solely charge on daily rate
    c. Rates:
        i. Car rates are based on the car class selected
        ii. If a reservation period is a week period, the weekly rate is applied.
        iii. If a reservation period is less than a week period, the daily rate is applied.
        iv. If a reservation period is more than a week period:
            1. A 7-day period will have a weekly rate
            2. Days outside of a week period will be charge with a daily rate.
    d. Late Fee:
        i. A late fee is 15% of a daily rate for a type of class car.
        ii. A late fee will be applied to every single extra day.

Part 2 – ER Diagram:

Below you can find the Entity Relationship diagram based on the business requirements.

Part 3 – Rational Schema Diagram:

Below you can find the Relational Schema based on the ER diagram.

Customer

CustomerID	FName	LName	Phone	LcNum	LcSstate	CCTYPE	CCNumber	CCYear	AStreet	ACity	AState	AZip	IDResrv

Location

LocationID	Phone	AStreet	ACity	AState	AZip	VIM

Car

VIM	MYear	MMake	MName	Color	ClassCarName

ClassCar

ClassCarName	RateWeek	RateDaily

Reservation

IDResrv	Status	StartDate	StartTime	EndDate	EndTime	ClassCarName	PU-LocationID	RT-LocationID

Invoice

InvID	Status	Date	Taxes	Total

Agreement

CntNumber	StartTime	RtnTime	StartDate	RtnDate	StartOdometer	EndOdometer	InvID	VIM