

## **GROUP 9 CMPT 291 FINAL PROJECT**

Due: April 12, 2022

Members:

Aamna Noor

Anika

Isaac Cheng

Salah Mohamed

### **Project Description**

This project involves designing and implementing a relational database system to support the operations of a car rental agency. It is a user-interactive application where a user is allowed to perform car rentals. They have a variety of options to choose from. This system allows the customer to make a reservation based on the availability of the car, time slots, and locations. The customer can view available cars and select from available dates and branches to rent. The branch member can add, delete and modify Customer, Branch, Car, CarType, and Rentals information.

### **Components**

- Relational Database Scheme
- E-R Diagram
- Relational Schema
- Reporting Screen Queries
- User guide for employees and customers

## **Relational Database Scheme**

The database consists of 5 tables:

1. Customer
2. Branch
3. CarType
4. Car
5. Rentals

The Customer table contains a unique customer ID and information about the individuals like name, address, driving license, phone number, insurance, and membership status. The customer ID allows the system to relate them to specific rental transactions.

The Branch table contains a unique branch ID and information about different branch locations. Cars can be rented and returned from the Branch.

The CarType table contains a unique CarTypeID and rent cost based on daily, weekly, and monthly.

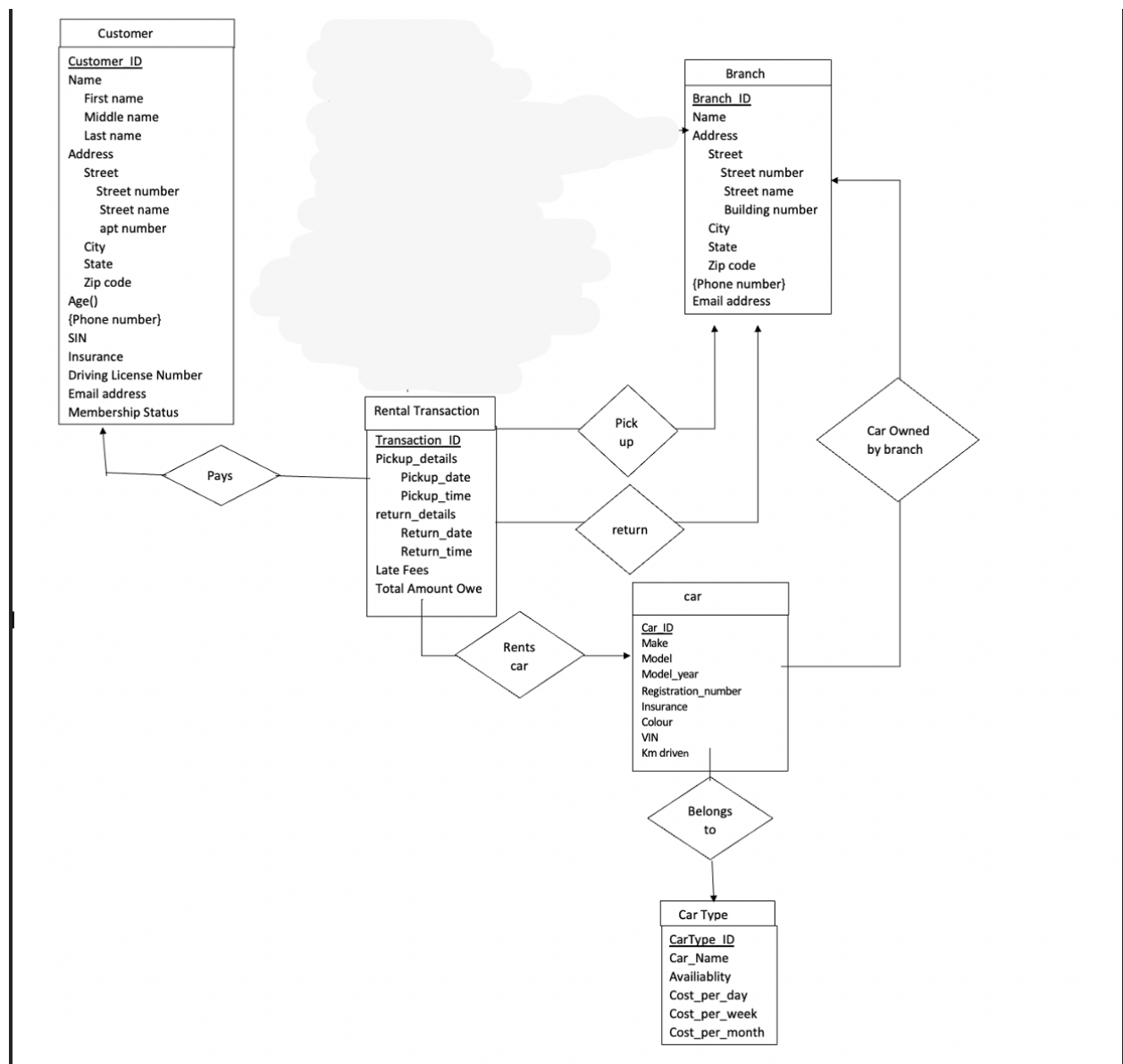
The Car table contains a unique VIN and information on available cars for rent through the Branch. Other information such as make, model, year, seat number, color, InsuranceNo, and odometer number are included.

The Rental table contains information about rented cars by customers. It also specifies the drop and returns date and time of the vehicle. If a customer rents a car at least three times in the same year, their membership is updated as "Gold membership" automatically.

Integrity constraints are used to prevent any kind of invalid responses.

- Some text-boxes(like phone numbers, etc.) will only accept digits.
- Combo-boxes are used to constrain input to a specific set of values when required.

## ER DIAGRAM



## **RELATIONAL SCHEMA**

Customer (Customer\_ID, First name, Middle name, Last name, Street number, Street name, apt number, City, State, Zip code, Age, Phone number, SIN, Insurance, Driving License Number, Membership Status)

Branch (Branch\_ID, Name, Street number, Street name, Building number, City, State, Zip code, Phone number)

Rental Transaction (Transaction\_ID, Pickup\_date, Pickup\_time, return\_date, return\_time, Customer\_ID, Car\_ID, PickBranch\_ID, ReturnBranch\_ID, total\_amount\_owe)

Customer\_ID FK references Customer

Car\_ID FK references Car

PickBranch\_ID FK references Branch

ReturnBranch\_ID FK references Branch

Car (Car\_ID, Make, Model, Model\_year, Registration\_number, Insurance, VIN, Branch\_ID, Car\_Name, KM driven)

Branch\_ID FK references Branch

Car\_Name FK references Car Type

Car Type (CarType\_ID, Car\_Name, Availability, Cost\_per\_day, Cost\_per\_week, Cost\_per\_month, Late fees)

## **REPORTING SCREEN QUERIES**

1. Getting names for all customers for ONLY rented from branches in their city

For this query, we had to determine all customers who rented in branches outside of their city using the customer, branch and rental tables. From that data we filtered out customers who were not in this group of data.

2. Find the total amount of revenue a branch made in a given period of time

For this query, we used the rental and the branch table. Using the user-chosen branch ID and user-chosen dates to create the duration of the rental period, we summed the rental revenue that the branch made in the given period of time and displayed the total revenue of that branch.

3. Find the branch with the most rentals within the given period of time.

For this query, we use user-chosen dates to create the duration of the rental period. We use the rental and branch table. We count the branch ID in the rental table and its rentals and display all information about the branch that has the most rental in the given time period.

4. Find the branches that do not have any rentals within the given period of time.

For this query, we use user-chosen dates to create the duration of the rental period. From these dates we filter out branch IDs from the rental table that did not have any rentals during the user-created period and display the branch IDs and description of the branches that satisfy the requirement.

5. Find name of all customer who rented from the same branch more than once

For this query we used the customer and rental table. We went through the branches the customer rented from and if the branches were the same, we counted them and if the counter was greater than one, we displayed the customer's name.

## **USER GUIDE FOR BRANCH EMPLOYEE**

This is a guide to aid you in your experience using the Car Rental Application as a branch employee. Each aspect of the application will be explained here to make sure you get the best experience.

When the application first opens, you will be greeted with a menu consisting of three options. You will choose the staff option and then will be prompted with a screen with six options. These options are:

### **Branch, Car, Car Type and Customer:**

Once you select an option, you will be prompted to a screen displaying the table based on the option. The table is refreshed upon changing the entries of the table. The left side of the screen is the area for adding, modifying and deleting entries in the table. To perform these changes, you have to:

#### Add

Enter values for every attribute (except middle name and street address 2)

#### Modify

Enter the primary key and the values to be modified. Please leave other textboxes blank. Primary keys of each option are as follows:

Table	Primary Key
Car	VIN
Car Type	Car Type ID
Customer	Customer ID
Branch	Branch ID

#### Delete

You will only have to enter the primary key for this option. Please keep in mind that this action is irreversible.

## Rental:

The purpose of this screen is to 1) find available cars in a given period of time, 2) add/modify/delete transactions to the transaction table, 3) return the car.

### Find available cars in a given period of time

The right side of the screen gives you the interface to find available cars based on the start date, end date and branch requested by the customer.

### Add/modify/delete transactions

You can add, modify and delete transactions similar to the 4 screens described above. The primary key for this table is Transaction ID. Make sure that the car is available before you add the transaction. After adding the transaction, you will be prompted with a message box displaying the summary of the transaction. The cost is calculated based on the car, the number of days (converted into daily, weekly and monthly rates), drop off branch, and membership status. Please note that the late fee cost will be added when the customer returns the car. To display all transactions in the database, please use the fourth button "Display All Transactions".

Note: you can simply copy and paste the VIN from the search results.

### Return the car

When the customer returns the car, you will use the "Return Car" option. You will have to enter the Transaction ID, return Branch ID and return date to calculate the final cost. This final cost is calculated based on the estimated cost (when adding the transaction), the return branch (extra cost if the customer is not a gold member and returns to a different branch) and the late fees. The late fee is calculated by multiplying the number of days late by twice the daily price. For example, if a person returns the car late for 3 days and the daily rate for the car is 100, the late fee would be  $3 \times (100 \times 2) = 600$ . The transaction record will be updated to the transaction table.

## Reports:

This option allows you to run five queries consisting of finding data from the car rental database. Please see **REPORTING SCREEN QUERIES** section for details of each query.

## **USER GUIDE FOR CUSTOMER**

This is a guide to aid you in your experience using the Car Rental Application as a customer. Each aspect of the application will be explained here to make sure you get the best experience.

When the application first opens, you will be greeted with a menu consisting of three options.

Out of these three, you will choose from two options which are:

### **Existing User:**

Use this option if you have already rented a car with the rental system before. You will be prompted to the rental screen where you will be able to see car availability and complete a rental reservation.

### **New User:**

Use this option if you are a new customer who has never rented with the rental system before. You will be asked to fill in your data to create an account. You will be given your customer id upon account creation. You will then be prompted to the rental screen where you will be able to see car availability and complete a rental transaction.