2300-003 Database 1

Customer Serive Department Of a Local Car Rental company

Professor : Caesar Jude Clemente

Student: Cheng-Yi Chen  
Student number: 300335751

Date: 2021.11.30

**Description of the requirements**

In this department, employees deal with customer service. When customers call in to ask any questions of car rental, for example, what are the tpyes of car you have ? How much for the rental price? Does the car avaliable now? And so on…Employees must accurately and quickly respond. In order to do that, company needs a good database to store data for employees to use.

The system is used for employees operating customer service. The employees can assist customers who have booked a car or future customers who intend to reserve a car. Notice that, the payment is using another secure system to operate, not included in this system.

The database is designed based on the employees interviewed result. The system enables employees to do the below:

1. Check the car inventory (this is for answering customers question about car avaliable)

2. Check Car information (this is for answering customers question about car type)

3. Check promotions (Discount only apply in festival day period. Like Father day, monther day, Christmas so on so for.. Discount will be apply after summing the price and one invoice only can have one promotion.

4. Check customer information (this is for getting info of who is calling )

5. Check receipt. (this is for answering customers question about their previous rent)

6. Check the price ( Company only provide a day period rental. Each car only have one basic price for a day. Unlimited mileage)

**Conceptual Design (Intial ERD)**

A picture containing text, whiteboard

Description automatically generated

Intial ERD looks straight because this is only for the customer service department to chek the informaion of customer, information of car, promotions and the invoice. Each tables in here are strong entity.

Invoice connect to the all tables. This table will use when the customer who is calling

has a ordered and ask about their ordered. It also records the promotion if it has.

The company provides routine promotions at the same time period every year .

For instance, Chirstmas vaction, Father Day, Monther Day,Valentine’s Day and so on.

The company record all callers into customer table. Employees will ask base information when they service them on the phone. So telephone number and first name can not be null. The company can get more customer information when they have a order.

I didn’t design a inventory table due to every single car has its ID. When custoermer asking which car is avaliable, the user just need to search that carID there will show avalible state in the car info table.

**Logical Design(Revised ERD diagram or table structures)**

A picture containing text, receipt

Description automatically generated

* In the CAR STATUS table, StartDate and EndDate will be null if the car is avaliable. Only the car is rented then it will shows the StartDate and EndDate.
* The Discount in the INVOICE table, is a total discount, not a discount percentage.
* Every invoice only can have one car on it. If the customer wants to rent more than one car at a time then the customer will get multiple invoices.
* The UnitePrice in the CAR\_INFO table, it means the rental price for a day. Not the value of the car.
* The reason I put the promotion code in the invoice table is that for checking why would have a discount. Discount = unite price \* days \* discount percentage
* Only accept using one promotion code in a invoice.

**Physical Design(Table structures, SQL create**

CREATE TABLE PROMOTION

(Promotion\_Code int NOT NULL,

Promo\_Name varchar2 (30) NOT NULL,

Discount\_Percentage number(10,2) NOT NULL,

StartDate date,

EndDate date,

CONSTRAINT Promotion\_PromotionCode\_pk PRIMARY KEY(Promotion\_Code));

CREATE TABLE CUSTOMER\_INFO

(Customer\_Id NUMBER(4),

FirstName VARCHAR2(10) NOT NULL,

LastName VARCHAR2(10) NOT NULL,

Phone NUMBER(10)NOT NULL,

Email VARCHAR2(30)NOT NULL,

Address VARCHAR2(20),

City VARCHAR2(10),

State VARCHAR2(4),

Zip VARCHAR2(6),

CONSTRAINT Customer\_CustomerID\_pk PRIMARY KEY(customer\_Id));

CREATE TABLE CAR\_INFO

(Car\_Id int NOT NULL,

PlateNumber varchar2 (6) NOT NULL,

CarModel\_Year varchar2 (15) NOT NULL,

Brand varchar2 (10),

Color varchar2 (10),

Capacity number(1),

AirBag number(1),

Door number(1),

VechicleClass varchar2(10),

UnitePrice number(10,2),

CONSTRAINT CAR\_INFO\_CarId\_pk PRIMARY KEY(Car\_Id));

CREATE TABLE CAR\_STATUS

(Car\_Id int NOT NULL,

Avaliable varchar2 (5) NOT NULL,

StartDate date,

EndDate date,

Remark varchar2(60),

CONSTRAINT CAR\_STATUS\_CarId\_pk PRIMARY KEY(Car\_Id),

CONSTRAINT CAR\_STATUS\_CarId\_fk FOREIGN KEY (Car\_Id)

REFERENCES CAR\_INFO(Car\_Id));

CREATE TABLE INVOICE

(Invoice\_Number int NOT NULL,

Customer\_Id number (4) NOT NULL,

Invoice\_Date date NOT NULL,

Car\_Id int NOT NULL,

Description varchar2 (100),

UnitePrice number(10,2) NOT NULL,

StartDate date NOT NULL,

EndDate date NOT NULL,

Promotion\_Code int,

Discount number(10,2),

Tax number(10,2) NOT NULL,

Total\_Charge number (10,2) NOT NULL,

PRIMARY KEY (Invoice\_NUmber),

CONSTRAINT invoice\_customerId\_fk FOREIGN KEY (Customer\_Id) REFERENCES CUSTOMER\_INFO (Customer\_Id),

CONSTRAINT invoice\_carId\_fk FOREIGN KEY (Car\_Id) REFERENCES CAR\_INFO (Car\_Id),

CONSTRAINT invoice\_promoCode\_fk FOREIGN KEY (Promotion\_Code) REFERENCES PROMOTION (Promotion\_Code)); Graphical user interface, application

Description automatically generated

**Data Management(Insert, Update and Delete Queries)**

Insert queries

INSERT INTO PROMOTION

VALUES(1225,'Chirstmas' ,0.8,'12/18/2021','12/31/2021');

INSERT INTO PROMOTION

VALUES(0314,'Valentines Day',0.7,'02/07/2022','02/21/2022');

INSERT INTO PROMOTION

VALUES(0808,'Father Day',0.88,'08/01/2021','08/15/2021');

INSERT INTO PROMOTION

VALUES(1111,'Remember Day',0.9,'11/05/2021','11/19/2021');

A screenshot of a computer

Description automatically generated with medium confidence

INSERT INTO CUSTOMER\_INFO

VALUES (0001, 'RICK', 'CHEN', 7789991234, 'rick@gmail.com', '2020 41Ave', 'Vancouver', 'BC', 'V5R3E4');

INSERT INTO CUSTOMER\_INFO

VALUES (0002, 'TONY', 'LEE', 6047771234, 'tony@gmail.com', '2020 cambi', 'Vancouver', 'BC', 'V5R3E5');

INSERT INTO CUSTOMER\_INFO

VALUES (0032, 'ERIC', 'ROSS', 6047776688, 'eric@gmail.com', '2020 victoria', 'Vancouver', 'BC', 'V5R4E2');

INSERT INTO CUSTOMER\_INFO

VALUES (0003, 'Maggie', 'ROSS', 7889995201, 'maggie@gmail.com', '2020 Hasting', 'Burnaby', 'BC', 'V6R3B2');

A screenshot of a computer

Description automatically generated with medium confidence

INSERT INTO CAR\_INFO

VALUES (001,'abc123','Durango2021','Dodge','Black',7,5,4,'SUV',166.99);

INSERT INTO CAR\_INFO

VALUES (002,'DFG123','Sonata2020','Hyundai','Black',5,3,4,'Standard',38.99);

INSERT INTO CAR\_INFO

VALUES (003,'QOO666','Mirage 2020','Mitsubishi','Black',4,2,4,'Economy',30.99);

INSERT INTO CAR\_INFO

VALUES (004,'BMW666','X6 2021', 'BMW','Black',5,6,5, 'SUV',200);

A screenshot of a computer

Description automatically generated with medium confidence

INSERT INTO CAR\_STATUS (Car\_Id,Avaliable)

VALUES(001,'YES');

INSERT INTO CAR\_STATUS (Car\_Id,Avaliable)

VALUES(002,'YES');

INSERT INTO CAR\_STATUS

VALUES(003,'NO','11/29/2021','12/02/2021','Need to check tire');

INSERT INTO CAR\_STATUS

VALUES(004,'NO','11/10/2021','12/10/2021','NULL');

A screenshot of a computer

Description automatically generated with medium confidence

INSERT INTO INVOICE

VALUES(10193,0002,'10/10/2021',001,

'Two days, no discount',166.99,'10/10/2021','10/11/2021',NULL,NULL ,40.07,374.05);

INSERT INTO INVOICE

VALUES(10195,0003,'11/10/2021',004,

'Have 10 days discount',200,'11/10/2021','12/10/2021',1111,200,720,6720);

INSERT INTO INVOICE

VALUES(10198,0001,'11/29/2021',003,

'Four days',30.99,'11/29/2021','12/02/2021',NULL,NULL ,14.87,138.83);

Graphical user interface, application

Description automatically generated

Update queries on two table

CUSTOMER\_INFO table

Graphical user interface, application

Description automatically generated

Graphical user interface

Description automatically generated

Background pattern

Description automatically generated

CAR\_INFO table

Graphical user interface

Description automatically generated with medium confidence

Graphical user interface, background pattern

Description automatically generated

Graphical user interface, background pattern

Description automatically generated

Delete queries on two tables

Promotion table

Graphical user interface, background pattern

Description automatically generated

CUSTOMER\_INFO table

Graphical user interface, application, background pattern

Description automatically generated

**Queries(Select Queries with results)**

(Please zoom in 130% for seeing queries clearly)

1. A select query that extracts all fields in a table.

A screenshot of a computer

Description automatically generated with medium confidence

1. A select query that extracts specific fields in a table.

A screenshot of a computer

Description automatically generated with medium confidence

1. A select query that extract fields from two or more tables and uses a condition to filter query results.

A screenshot of a computer screen

Description automatically generated with medium confidence

1. A select query that extracts fields from two or more tables and uses a pattern search as a filter

A picture containing text, indoor, screenshot, electronics

Description automatically generated

1. Two select queries that demonstrates the use of group by with aggregate functions

A picture containing background pattern

Description automatically generated

A screenshot of a computer screen

Description automatically generated with medium confidence

1. A select query that demonstrates the use of group by with having clause and sorts the data in a descending format.

A picture containing text, screenshot, indoor

Description automatically generated

1. A select query that utilizes a subquery.

A screenshot of a computer screen

Description automatically generated with medium confidence