COP5725 Data Base Manage System
Project Report III

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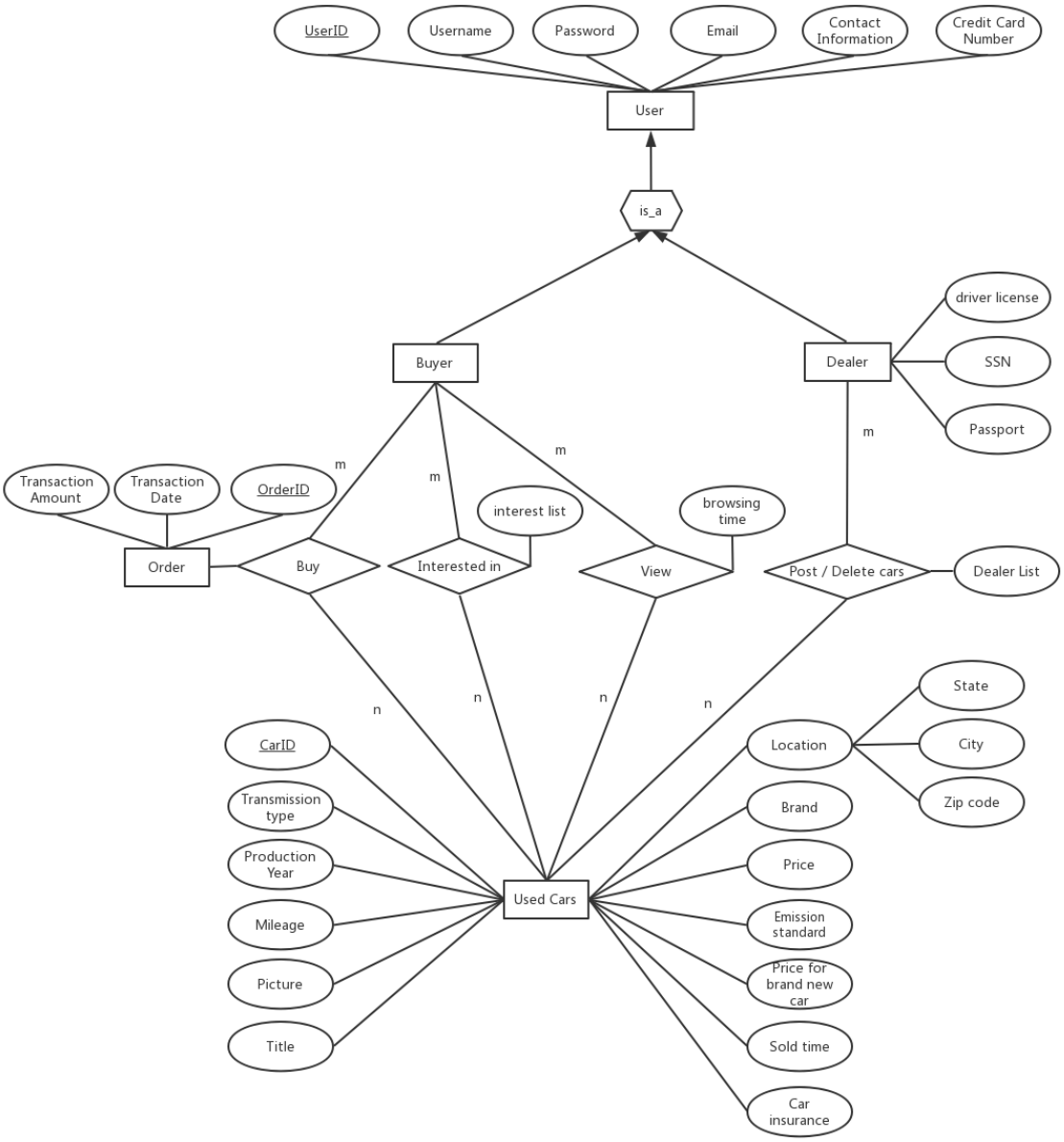
1. Introduction

In this report, we apply a transformation to our E-R diagram to get a relation schema for our database. First, we will give the mathematical expressions of our relation schema. Then, the relation schemas are further transferred into SQL tables in CISE Oracle and will later be modified and used by our application.

2. Database Schema Design

This is the E-R diagram of our database structure from conceptual level.

2.1 E-R Diagram



2.2 Relation Schema

User: (UserID, Email, Username,Password,Contact_Information,Credit_card_Number)
All registered users in our website.
UserID: The user ID of user that registered in our website.
Email: The email of user.
Username: The username for user to log in.
Password: The password for user to log in.
Contact_Information: The telephone number of user.
Credit_card_Number: The credit card Number of user.
DealerID: The ID that can uniquely identify the dealers, which can be null if the user isn't a dealer.

Dealer: (DealerID, Driver_License, SSN, Passport)
All verified dealers in our website.
DealerID: A unique ID for each dealer.
Driver_License: The driver license of the dealer, which can't be null.
SSN: The SSN of the dealer.
Passport: The passport number of the dealer.

Userd_Cars:(CarID,Transmission_type,Production_Year,Mileage,Picture,Title,Location(State,City,Zip_code),Brand,Price,Emission_standard,Sold_time,Car_insurance)
All used cars posted on the website.
CarID: The car ID of the posted used car.
Transmission_type: The transmission type of the car.
Production_Year: The production year of the car.
Mileage: The mileage of the car.
Picture: Picture of the car.
Title: Title of the car.
Location (State, City, Zip_code): The current location of the car.
Brand: The brand of the car.
Price: The price of the car.
Emission_standard: The emission standard of the car.
Sold_time: The time sold.
Car_insurance: The insurance state of the car.

Interest: (UserID, CarID)
Store the interest list.
UserID: userID.
CarID: carID.

View: (UserID, CarID, Time)
Store the view history.
UserID: userID.
CarID: carID.
Time: View time.

Order: (OrderID,UserID,CarID,transcation_date,transcation_amount)
Store the view history.
OrderID: OrderID.
UserID: userID(buyer).

CarID: carID.
Transcation_date: Order date.
Transcation_amount: Order price.

Post: (UserID, DealerID, CarID)
UserID: The userID of the dealer.
CarID: The carID of the car posted.

3. SQL Tables

In this section, we will provide the SQL of how we create the tables in CISE Oracle.

User Table

```
CREATE TABLE USER (
    UserID NUMBER,
    Email VARCHAR2(40) CONSTRINT USEREMAIL CHECK (Email IS NOT NULL),
    Username VARCHAR2(20)   CONSTRINT UN CHECK (Username IS NOT NULL),
    Password VARCHAR2(20),
    Contact_Information VARCHAR2(20),
    Credit_card_Number NUMBER,
    DealerID NUMBER,
    CONSTRAINT UserKey PRIMARY KEY (UserID)
    );
```

Car Table

```
CREATE TABLE  Userd_Cars(
    CarID NUMBER,
    Transmission_type VARCHAR2(10) CONSTRINT TRANS CHECK (Transmission_type="Auto"
OR Transmission_type="Hand"),
    Production_Year NUMBER CONSTRAINT P_YEAR   CHECK (Production_Year>1950 AND
Production_Year<=SELECT EXTRACT(YEAR FROM SYSDATE) FROM DUAL),
    Mileage BINARY_FLOAT CONSTRINT MI CHECK (Mileage>=0.0),
    Picture BLOB,
    Title VARCHAR2(50),
    State VARCHAR2(2),
    City VARCHAR2(10),
    Zip_code NUMBER,
    Brand VARCHAR2(10),
    Price BINARY_FLOAT,
    Emission_standard BINARY_FLOAT,
    Price_for_brand_new_car BINARY_FLOAT,
    Sold_time DATE,
    Car_insurance INTEGER
    CONSTRAINT UserKey PRIMARY KEY (CarID)
    );
```

Dealer Table

```
CREATE TABLE DEALER (
    DealerID NUMBER,
    Driver_License NUMBER,
    SSN NUMBER,
    Passport_Number NUMBER
    CONSTRAINT DealerKey PRIMARY KEY (DealerID)
    );
```

Interest Table

```
CREATE TABLE INTEREST (
    UserID     NUMBER,
    CarID NUMBER,
    CONSTRAINT InterestKey PRIMARY KEY (UserID,CarID)
    );
ALTER TABLE INTEREST ADD CONSTRAINT FK_INTREFUSER FOREIGN KEY (UserID)
REFERENCES User(UserID);
ALTER TABLE INTEREST ADD CONSTRAINT FK_INTREFCAR FOREIGN KEY (CarID)
REFERENCES Used_Cars(CarID);
```

View Table

```
CREATE TABLE View (
    UserID     NUMBER,
    CarID NUMBER,
    Time DATE,
    CONSTRAINT InterestKey PRIMARY KEY (UserID,CarID)
    );
ALTER TABLE View ADD CONSTRAINT FK_VIEWREFUSER FOREIGN KEY (UserID)
REFERENCES User(UserID);
ALTER TABLE View ADD CONSTRAINT FK_VIEWREFCAR FOREIGN KEY (CarID)
REFERENCES Used_Cars(CarID);
```

Order Table

```
CREATE TABLE ORDER (
    OrderID NUMBER,
    UserID NUMBER,
    CarID NUMBER,
    Transcation_date DATE,
    Transcation_amount BINARY_FLOAT,
    CONSTRAINT InterestKey PRIMARY KEY (OrderID)
    );
ALTER TABLE ORDER ADD CONSTRAINT FK_ORDERREFUSER FOREIGN KEY (UserID)
REFERENCES User(UserID);
ALTER TABLE ORDER ADD CONSTRAINT FK_ORDERREFCAR FOREIGN KEY (CarID)
REFERENCES Used_Cars(UserID);
```

Post Table

```
CREATE TABLE POST (
    UserID NUMBER,
    CarID NUMBER,
    CONSTRAINT PostKey PRIMARY KEY (UserID, CarID)
    );
ALTER TABLE ORDER ADD CONSTRAINT FK_ORDERREFUSER FOREIGN KEY (UserID)
REFERENCES User(UserID);
ALTER TABLE POST ADD CONSTRAINT FK_POSTREFUSER FOREIGN KEY (UserID)
REFERENCES User(UserID);
```