

CPSC 471: Final Report

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1 Introduction

This report discusses the technical specifications and design of Renti, the peer to peer car rental service. The goal of Renti is to allow the users to easily and effortlessly rent out their vehicles while they are not using them. We have a similar business model to Airbnb except for cars. This report will cover the system requirements, deviations from proposed solution, entity-relationship design, object orientated model, and lastly provide a user manual.

2 System Requirements

3 Deviations from Original Requirements

4 Entity-Relationship design

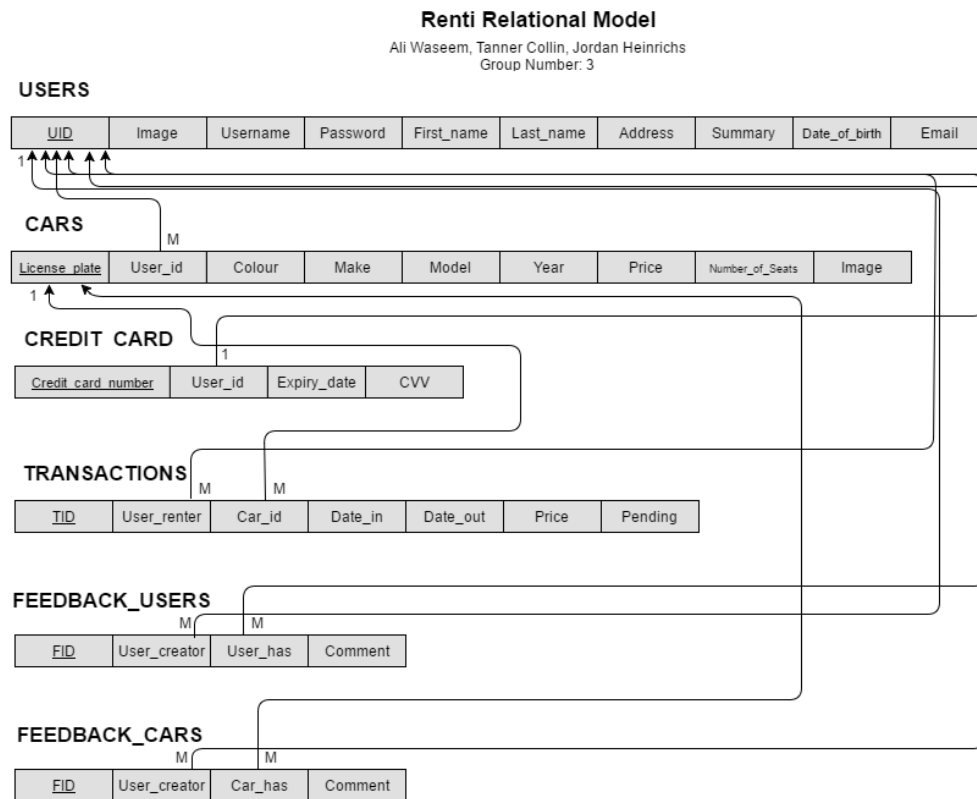


Figure 1: Relational Model

5 Object Orientated Model

The object orientated model is shown in Figure 2. For each of the routes the SQL query is listed.

5.1 Users

The model of the user:

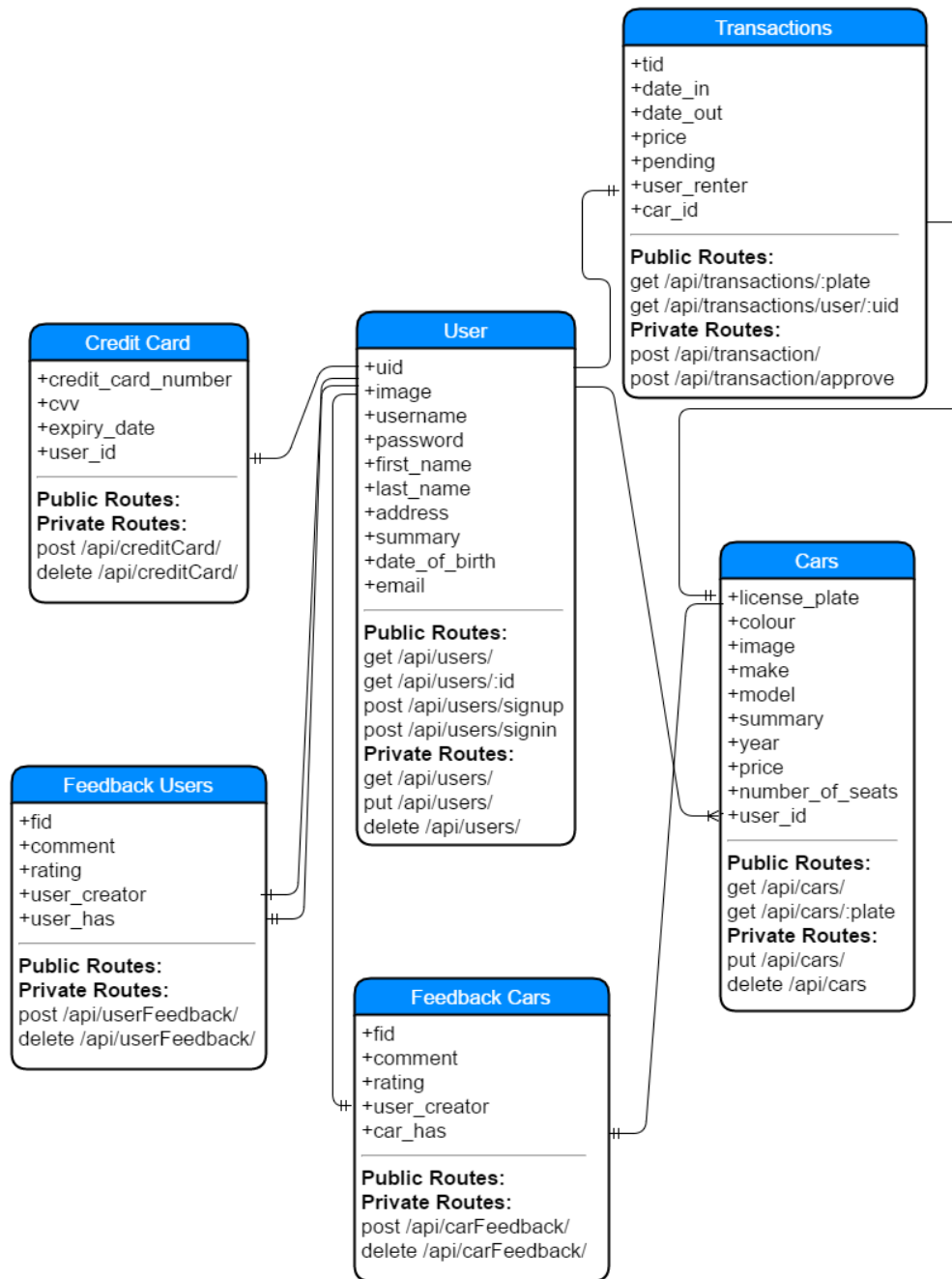


Figure 2: Database Object Orientated Model

5.1.1 The public routes:

get /api/users/

```
SELECT u.uid, u.first_name, u.last_name, u.address, u.username, u.
email, u.image, u.summary, f.*, userF.uid, userF.first_name, userF.
last_name, userF.address, userF.username, userF.email, userF.image,
userF.summary, c.*, carF.*, carFUser.uid, carFUser.first_name,
carFUser.last_name, carFUser.address, carFUser.username, carFUser.
```

```

email, carFUser.image, carFUser.summary, t.*, userT.uid, userT.
first_name, userT.last_name, userT.address, userT.username, userT.
email, userT.image, userT.summary
FROM USERS AS u, FEEDBACK_USERS AS f, USERS AS userF, USERS AS userT,
USERS AS carFUser, CARS AS c, FEEDBACK_CARS AS carF, TRANSACTIONS
AS t
WHERE u.uid=f.user_has AND c.user_id=u.uid AND c.license_plate=carF.
car_has AND carFUser.uid=carF.user_creator AND c.license_plate=t.
car_id AND t.user_renter=userT.uid;

```

get /api/users/:id

```

SELECT u.uid, u.first_name, u.last_name, u.address, u.username, u.
email, u.image, u.summary, f.*, userF.uid, userF.first_name, userF.
last_name, userF.address, userF.username, userF.email, userF.image,
userF.summary, c.*, carF.*, carFUser.uid, carFUser.first_name,
carFUser.last_name, carFUser.address, carFUser.username, carFUser.
email, carFUser.image, carFUser.summary, t.*, userT.uid, userT.
first_name, userT.last_name, userT.address, userT.username, userT.
email, userT.image, userT.summary
FROM USERS AS u, FEEDBACK_USERS AS f, USERS AS userF, USERS AS userT,
USERS AS carFUser, CARS AS c, FEEDBACK_CARS AS carF, TRANSACTIONS
as t
WHERE u.uid="id" AND u.uid=f.user_has AND c.user_id=u.uid AND c.
license_plate=carF.car_has AND carFUser.uid=carF.user_creator AND c
.license_plate=t.car_id AND t.user_renter=userT.uid;

```

post /api/users/signup

```

INSERT INTO USERS (image, username, password, first_name, last_name,
address, summary, date_of_birth, email)
VALUES ('URL_OF_USER_PHOTO', 'tcollin', 'test', 'Tanner', 'Collin', '
123 place rd NW', 'Hi. I love for you to rent one of my cars!',
730869558, 'test@someemail.com');

```

post /api/users/signin

```

SELECT username, password FROM USERS where username='tcollin',
password='test';

```

5.1.2 The private routes:

get /api/users/

```

SELECT u.uid, u.first_name, u.last_name, u.address, u.username, u.
email, u.image, u.summary, f.*, userF.uid, userF.first_name, userF.
last_name, userF.address, userF.username, userF.email, userF.image,
userF.summary, c.*, carF.*, carFUser.uid, carFUser.first_name,
carFUser.last_name, carFUser.address, carFUser.username, carFUser.
email, carFUser.image, carFUser.summary, t.*, userT.uid, userT.
first_name, userT.last_name, userT.address, userT.username, userT.
email, userT.image, userT.summary

```

```
FROM USERS AS u, FEEDBACK_USERS AS f, USERS AS userF, USERS AS userT,
    USERS AS carFUser, CARS AS c, FEEDBACK_CARS AS carF, TRANSACTIONS
    as t, CREDIT_CARD AS cred
WHERE u.uid=f.user_has AND c.user_id=u.uid AND c.license_plate=carF.
    car_has AND carFUser.uid=carF.user_creator AND c.license_plate=t.
    car_id AND t.user_renter=userT.uid AND cred.user_id=u.uid;
```

put /api/users/

```
UPDATE USERS SET summary='hi my name is tanner' WHERE uid='1';
```

delete /api/users/

```
DELETE FROM USERS WHERE uid='1', username='tcollin', password='test';
```

5.2 Credit Card

The model of the credit card, there are no public routes for credit cards because of security reasons.

5.2.1 The private routes:

post /api/creditCard/

```
INSERT INTO CREDIT_CARD (credit_card_number, cvv, expiry_date, user_id
)
VALUES (347249711260948, 433, 0617, 1);
```

delete /api/creditCard/

```
DELETE FROM CREDIT_CARD as c INNER JOIN USERS as u ON c.user_id = a.
    uid WHERE
a.username='tcollin' AND a.password='test';
```

5.3 Cars

The model of the cars, contains both public and private routes.

5.3.1 The public routes:

get /api/cars/

```
SELECT c.*, carF.*, carOwner.uid, carOwner.first_name, carOwner.
    last_name, carOwner.address, carOwner.username, carOwner.email,
    carOwner.image, carOwner.summary, carFcreator.uid, carFcreator.
    first_name, carFcreator.last_name, carFcreator.address, carFcreator.
    username, carFcreator.email, carFcreator.image, carFcreator.
    summary, userF.*, userFcreator.uid, userFcreator.first_name,
    userFcreator.last_name, userFcreator.address, userFcreator.username
    , userFcreator.email, userFcreator.image, userFcreator.summary
FROM CARS AS c, FEEDBACK_CARS AS carF, USERS AS carOwner, USERS AS
    carFcreator, FEEDBACK_USERS AS userF, USERS AS userFcreator
WHERE c.license_plate=carF.car_has AND carFcreator.uid=carF.
    user_creator AND c.user_id=carOwner.uid AND userF.user_has=carOwner.
    uid AND userF.user_creator=userFcreator.uid;
```

get /api/cars/:plate

```
SELECT c.*, carF.*, carOwner.uid, carOwner.first_name, carOwner.
last_name, carOwner.address, carOwner.username, carOwner.email,
carOwner.image, carOwner.summary, carFcreator.uid, carFcreator.
first_name, carFcreator.last_name, carFcreator.address, carFcreator.
username, carFcreator.email, carFcreator.image, carFcreator.
summary, userF.*, userFcreator.uid, userFcreator.first_name,
userFcreator.last_name, userFcreator.address, userFcreator.username
, userFcreator.email, userFcreator.image, userFcreator.summary
FROM CARS AS c, FEEDBACK_CARS AS carF, USERS AS carOwner, USERS AS
carFcreator, FEEDBACK_USERS AS userF, USERS AS userFcreator
WHERE c.license_plate="plate" AND c.license_plate=carF.car_has AND
carFcreator.uid=carF.user_creator AND c.user_id=carOwner.uid AND
userF.user_has=carOwner.uid AND userF.user_creator=userFcreator.uid
;
```

5.3.2 The private routes:

post /api/cars/

```
INSERT INTO CARS (license_plate, model, make, year, number_of_seats,
price, colour, image, summary, user_id)
VALUES ('892WSM', 'Focus RS', 'Ford', 2016, 4, 200, 'Blue', '
URL_OF_CAR_PHOTO', 'This car is fast', 2);
```

put /api/cars/

```
UPDATE CARS SET model='VW', make='Golf R' WHERE license_plate='892WSM'
AND user_id='2';
```

delete /api/cars/

```
DELETE FROM CARS AS c WHERE c.uid='2' AND c.license_plate='892WSM';
```

5.4 Transactions

5.4.1 The public routes:

get /api/transactions/

```
SELECT * FROM TRANSACTIONS AS t WHERE t.plate='123ABC';
```

get /api/transactions/user/:uid

```
SELECT t.*, c.*, u.uid, u.first_name, u.last_name, u.address, u.
username, u.email, u.image, u.summary
FROM TRANSACTIONS AS t, CARS AS c, USERS AS u,
WHERE u.uid="uid" AND c.user_id=u.uid AND t.plate=c.license_plate;
```

5.4.2 The private routes:

post /api/transactions/

```
INSERT INTO TRANSACTIONS (date_in, date_out, price, pending,
    user_renter, car_id)
VALUES ('2016-3-27', '2016-3-21', 40, 1, '2', '123ABC');
```

post /api/transactions/approve

```
UPDATE TRANSACTIONS as t SET pending='0' WHERE c.tid='10' AND EXISTS (
    Select * FROM CARS as c WHERE t.license_plate=c.license_plate AND c
    .user_id='2');
```

5.5 Car Feedback

There are no public routes with car feedback. The feedback is returned with a car get requests.

5.5.1 The private routes:

post /api/carfeedback/

```
INSERT INTO FEEDBACK_CARS (comment, rating, user_creator, car_has)
VALUES ('This car is really shiny.', '5', '2', '892WSM');
```

delete /api/carfeedback/

```
DELETE FROM FEEDBACK_CARS AS f WHERE f.fid='7' AND f.user_creator='2';
```

5.6 User Feedback

There are no public routes with user feedback. The feedback is returned with a user get request.

5.6.1 The private routes:

post /api/userfeedback/

```
INSERT INTO FEEDBACK_USERS (comment, rating, user_creator, user_has)
VALUES ('This user is not friendly.', '2', '2', '1');
```

delete /api/userfeedback/

```
DELETE FROM FEEDBACK_USERS WHERE fid='6' AND user_creator='2';
```

6 General Hierarchical Structure

This is the hierarchical design of Renti. Most of the database options are available within the user admin page. Otherwise the user is limited to creating transactions and adding feedback.

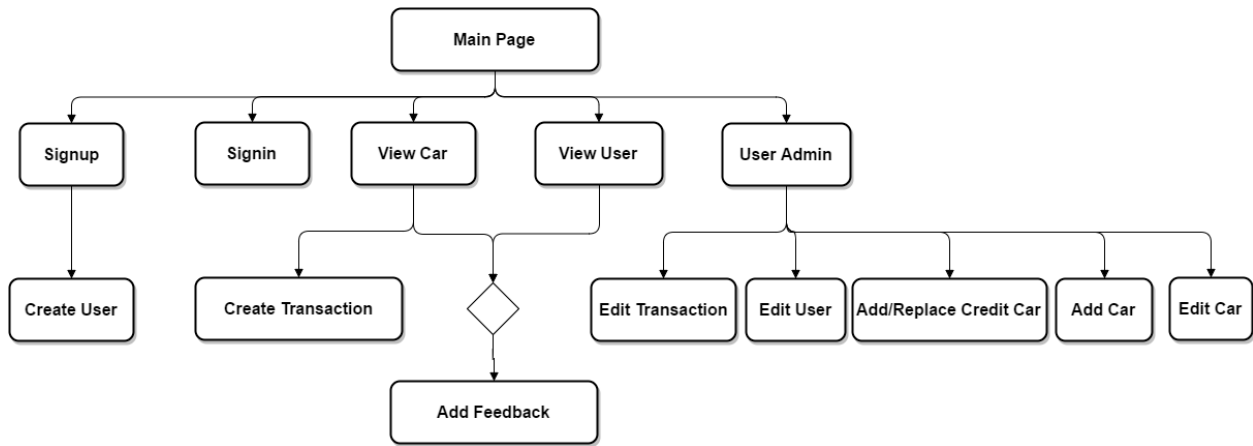


Figure 3: Hierarchical design of the application

7 User Manual

8 Conclusion

The design and functional implementation of Renti is completed. This report outlined the technical requirements, database design, user manual of the application. For the database design the relational model, object orientated model, and sample SQL queries which may be a representation of what our Object Relational Mapping layer would do. The general hierarchical structure and user manual was also provided.

9 Appendix A: Filler Data

The following is the filler data that is used to set up the database. It will be automatically added during an 'npm install'.

```

var bcrypt = require("bcrypt"); // eslint-disable-line

exports.seed = function(knex, Promise) {
  return Promise.join(

    // Inserts entries for the user table
    knex("users").insert({
      username: "tcollin",
      first_name: "Tanner",
      last_name: "Collin",
      date_of_birth: "730869558",
      address: "123 place rd NW",
      email: "test@someemail.com",
      summary: "Hi. I love for you to rent one of my cars!",
      image: "https://cdn4.iconfinder.com/data/icons/SIGMA/
        project_managment/png/400/tester.png",
      password: bcrypt.hashSync("test", 10)
    }),
  ),

```

```

knex("users").insert({
  username: "awaseem",
  first_name: "Ali",
  last_name: "Waseem",
  date_of_birth: "749186517",
  address: "123 newway rd NW",
  email: "hello@someemail.com",
  summary: "Hi. Please rent one of my cars!",
  image: "https://cdn4.iconfinder.com/data/icons/SIGMA/
    project_managment/png/400/tester.png",
  password: bcrypt.hashSync("test", 10)
}),

knex("users").insert({
  username: "jheinrichs",
  first_name: "Jordan",
  last_name: "Heinrichs",
  date_of_birth: "738559317",
  address: "123 cotunk rd NW",
  email: "hi@someemail.com",
  summary: "Hi. check out my cars for rent!",
  image: "https://cdn4.iconfinder.com/data/icons/SIGMA/
    project_managment/png/400/tester.png",
  password: bcrypt.hashSync("test", 10)
}),

// Credit card for Tanner
knex("credit_card").insert({
  credit_card_number: "371131951383474",
  cvv: 123,
  expiry_date: "0918",
  user_id: 1
}),

// Credit card for Ali
knex("credit_card").insert({
  credit_card_number: "347126747971237",
  cvv: 123,
  expiry_date: "0318",
  user_id: 2
}),

// Credit card for Jordan
knex("credit_card").insert({
  credit_card_number: "372552024488355",
  cvv: 123,
  expiry_date: "0118",
  user_id: 3
})

```

```

    }),

    // Car for Jordan
    knex("cars").insert({
      license_plate: "bmz-123",
      colour: "gray",
      image: "https://upload.wikimedia.org/wikipedia/commons/e/ef/06-07_Honda_Civic_LX_Sedan.jpg",
      make: "honda",
      model: "civic",
      summary: "A clean honda civic up for rent!",
      year: 2009,
      price: 40.00,
      number_of_seats: 4,
      user_id: 2
    }),

    // Car for Jordan
    knex("cars").insert({
      license_plate: "agh-234",
      colour: "red",
      make: "mazda",
      image: "http://www.gunaxin.com/wp-content/uploads/2013/08/2014-Mazda6-01.jpg",
      model: "6",
      summary: "A nice red car",
      year: 2006,
      price: 30.00,
      number_of_seats: 4,
      user_id: 3
    }),

    // Car for Jordan
    knex("cars").insert({
      license_plate: "sdf-2344",
      colour: "gray",
      make: "BMW",
      image: "https://upload.wikimedia.org/wikipedia/commons/1/18/2012_BMW_320d_(F30_MY13)_Luxury_Line_sedan_(2015-07-24)_01.jpg",
      model: "3 series",
      summary: "A nice BMW for rent!",
      year: 2008,
      price: 60.00,
      number_of_seats: 4,
      user_id: 3
    }),

    // Car for Tanner

```

```

knex("cars").insert({
  license_plate: "ign-2344",
  colour: "gray",
  make: "Ford",
  image: "http://www.torquenews.com/sites/default/files/image
        -106/13f150-lariat_02_hr.jpg",
  model: "F-150",
  summary: "A big truck for rent!",
  year: 2010,
  price: 20.00,
  number_of_seats: 4,
  user_id: 1
}),

// Feedback for Tanner created by Ali
knex("feedback_users").insert({
  comment: "Tanner was keeps his car very clean!",
  rating: 5,
  user_creator: 2,
  user_has: 1
}),

// Feedback for Tanner created by Jordan
knex("feedback_users").insert({
  comment: "Tanner was very rude!",
  rating: 2,
  user_creator: 3,
  user_has: 1
}),

// Feedback for Ali created by Tanner
knex("feedback_users").insert({
  comment: "Ali was very nice!",
  rating: 5,
  user_creator: 1,
  user_has: 2
}),

// Feedback for Ali created by Jordan
knex("feedback_users").insert({
  comment: "Ali was very humble!",
  rating: 3,
  user_creator: 3,
  user_has: 2
}),

// Feedback for Jordan created by Tanner
knex("feedback_users").insert({
  comment: "Jordan was very mean!",

```

```

        rating: 1,
        user_creator: 1,
        user_has: 3
    }},

    // Feedback for Jordan created by Ali
    knex("feedback_users").insert({
        comment: "Jordan was very nice with his car!",
        rating: 5,
        user_creator: 2,
        user_has: 3
    }),

    // Feedback for Tanner's ford f150 by Ali
    knex("feedback_cars").insert({
        comment: "This truck was great for driving!",
        rating: 4,
        user_creator: 2,
        car_has: "ign-2344"
    }),

    // Feedback for Ali's honda civic by Tanner
    knex("feedback_cars").insert({
        comment: "This civic was great for driving!",
        rating: 5,
        user_creator: 1,
        car_has: "bmz-123"
    }),

    // Feedback for Jordans's bmw 3 series by Ali
    knex("feedback_cars").insert({
        comment: "This bmw was fun!",
        rating: 5,
        user_creator: 2,
        car_has: "sdf-2344"
    })
);
};

```