UNIVERSITI TEKNIKAL MALAYSIA MELAKA

FAKULTI TEKNOLOGI MAKLUMAT DAN KOMUNIKASI

WORKSHOP 1 REPORT

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CHAPTER I

INTRODUCTION

1.1 Project Background

Car rental is a business service that rent vehicles for a short period of time for a fee. Car rental agencies mostly attracts customers that requires temporary transportation vehicle whether they are travelling or having their cars out of service at the moment. Car rental agency sometimes offer other various automobiles such as motorcycles, vans, or trucks that suits the market. Some of the notable car rental agencies in Malaysia are SOCAR and Moovby. These agencies are highly praised for their quick services, perfect for customers urgently in need of transportation vehicle.

Car Rental System aims to create a simple and user friendly system that allows car owners and users alike to find a car to rent or rent their own car for an income with an automated system that keeps track of the vehicles

1.2 Problem Statement

Rental car owners might find it difficult to reach an audience without a proper platform to advertise their rental cars. Plus, without an automated system a contract needs to be made between the owner and the consumer to sign a rent agreement which can be time consuming. Besides, it is a hassle to note and keep track of all the rented cars. Consumer might also find it difficult to find a rental car that suits their needs.

1.3 Objective

Car Rental System aims to create a simple system that allows users to find and rent a car and car owners to rent their own car for an income with an automated rental system that keeps track of the vehicles. The highlight of the goals to be achieved with this system are as follows:

1. To develop and design a vehicle rental system that suits the vehicle owners and renters need of automated system.

2. To assess the requirements of a rental system.

3. To make recommendations based on observations of the current vehicle rental system.

1.4 Scope

1. Module to be developed

- Login

Authorize login to owner or user account with username and password

- Renting

Vehicle owners can rent their cars by entering the vehicle details and naming the rent price. They can also see the list of their rented vehicles.

- Vehicle List

User can get a list of vehicles to choose to rent them and set the duration of the rent

- Vehicle returning

User can choose to return the rented car earlier than the agreed date. The cost will automatically be calculated based on the duration of the rent and display it for the user.

2. Target User

- Car owners

Car owners can easily rent their cars by registering it in the system and find consumers that are interested while earning an income.

- People that travels a lot without their own transportation

Travelers may need a temporary transportation if they are moving around a lot and might be tempted to rent a vehicle.

CHAPTER II

ANALYSIS OF PROBLEM

2.1 Introduction

Below discusses the problems that car rentals business are facing:

1. It is hard to reach an audience

Since this age of social distancing, car rentals are hard pressed to find customers even though automobiles renting market was surging. This is because car rental owners have no means to advertise to their potential customers.

2. Signing a contract can be time consuming

Car rental owner and customer needs to sign a contract for a rental so that the rental terms were understood by both parties, but this process often may take a while.

3. A hassle to keep track of rental cars

Car rental owners need to document and take note of their rentals so that business ran smoothly. These documents may accumulate overtime as more rentals were being made and can became harder to keep track of.

4. Difficult to find suitable cars

For customers, finding cars that fits their needs can take a while as they have to gather car rental owners and search through their catalogue of rentals.

2.2 Structure Chart

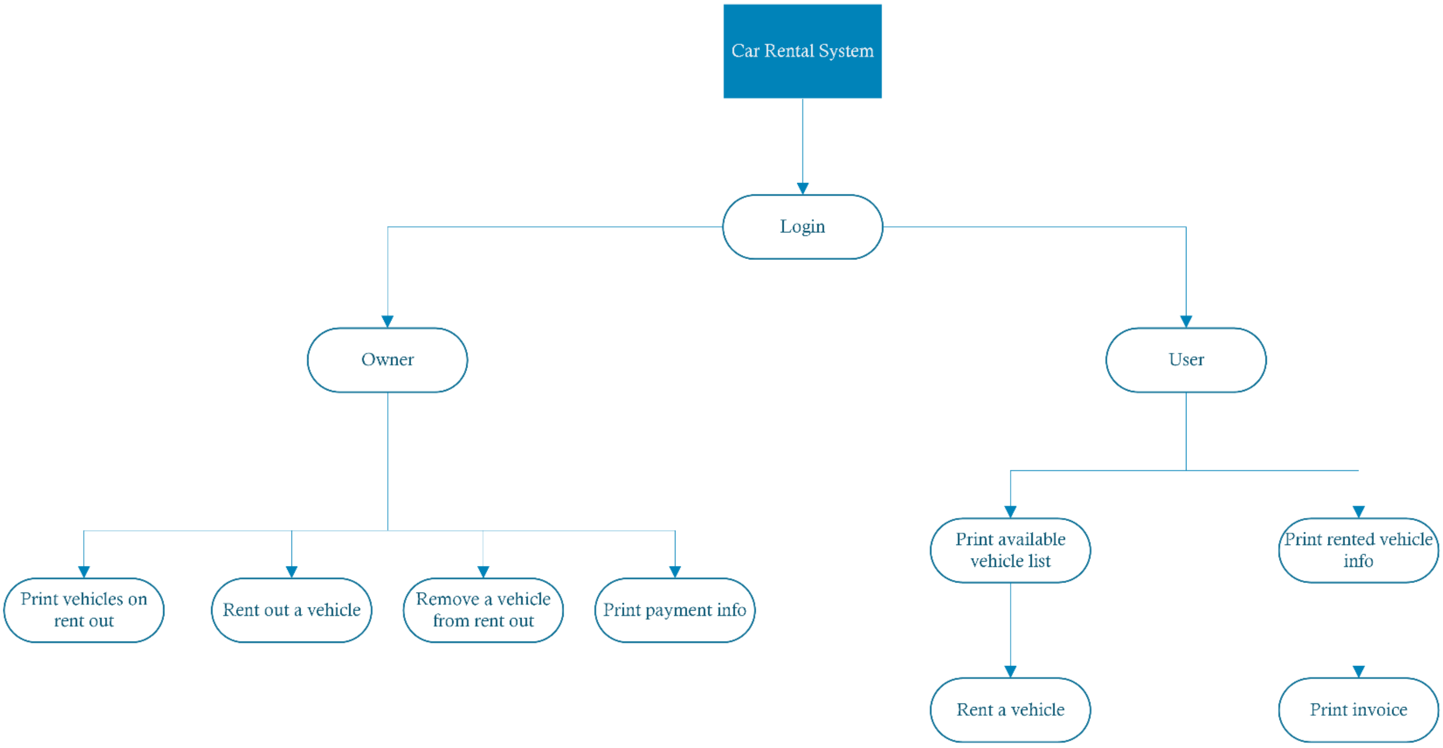

Car Rental System
Login
Owner
User
Print vehicles on rent out
Rent out a vehicle
Remove a vehicle from rent out
Print payment info
Print available vehicle list
Print rented vehicle info
Rent a vehicle
Print invoice

Figure 2.2 Structure Chart

CHAPTER III

DESIGN

3.1 Flow Chart

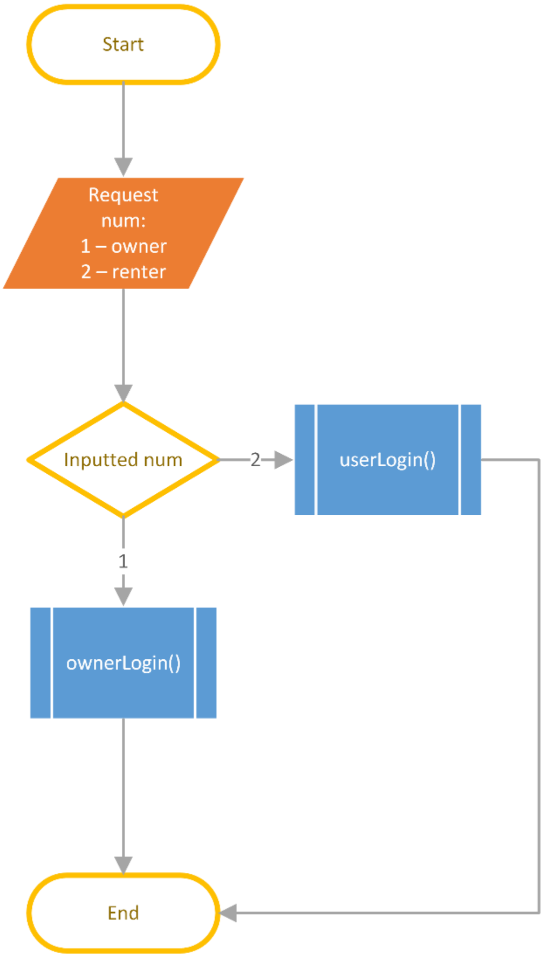


Figure 3.1.1 Flow Chart main()

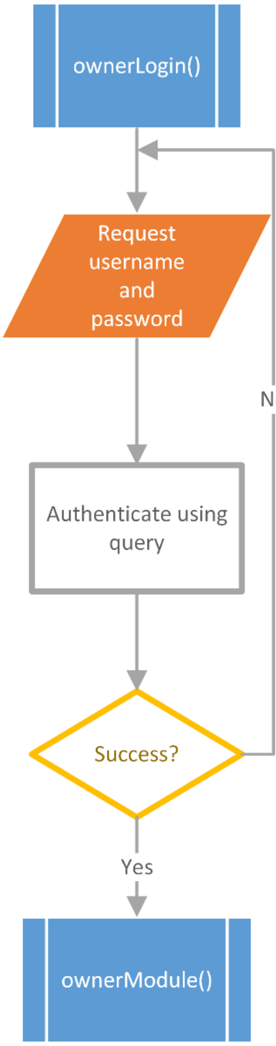


Figure 3.1.2 Flow Chart ownerLogin()

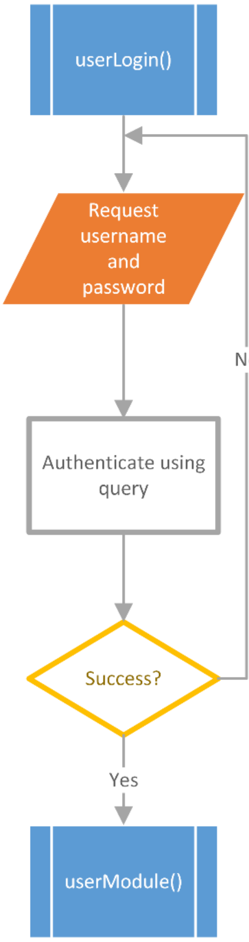


Figure 3.1.3 Flow Chart userLogin()

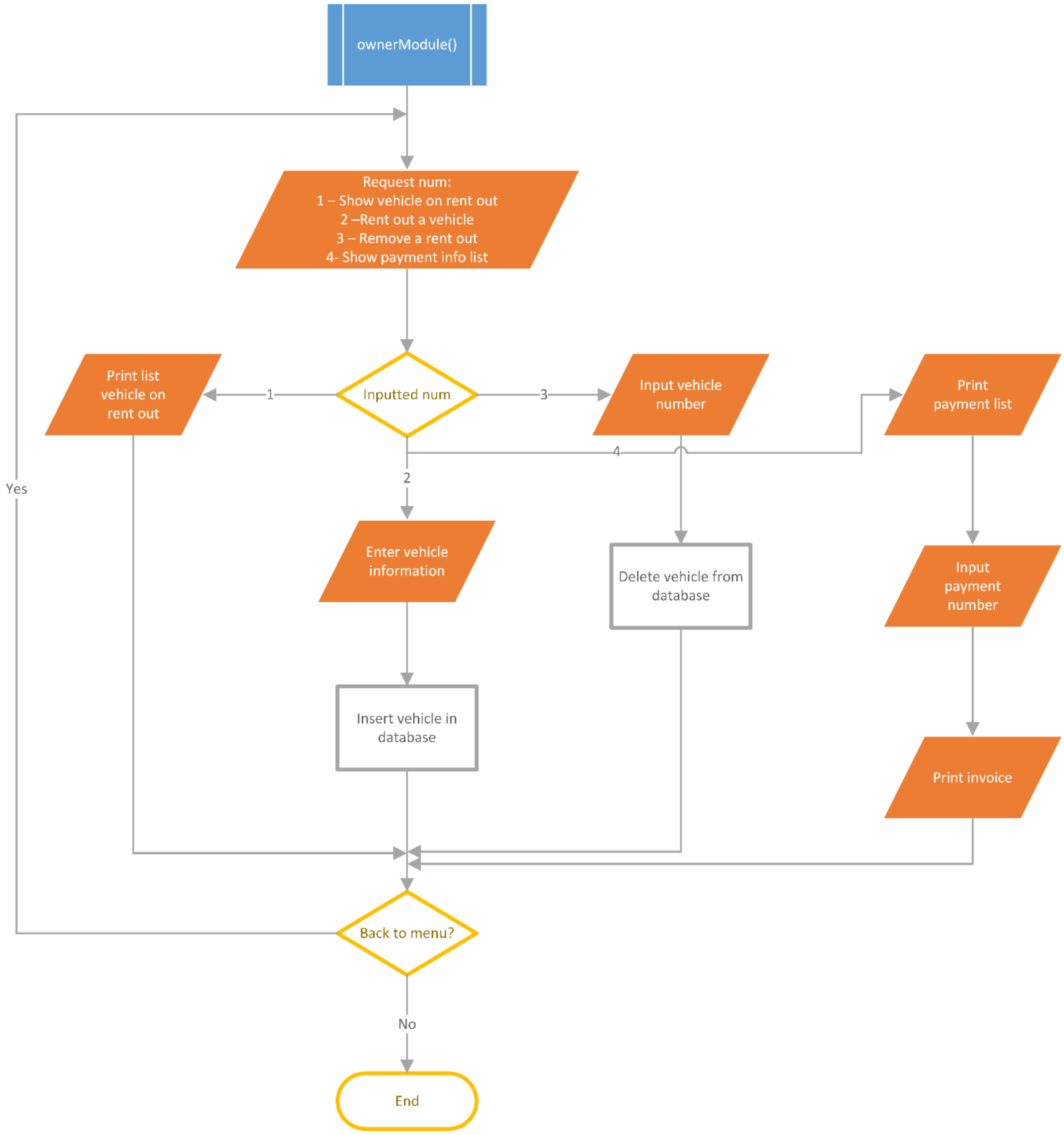


Figure 3.1.4 Flow Chart ownerModule()

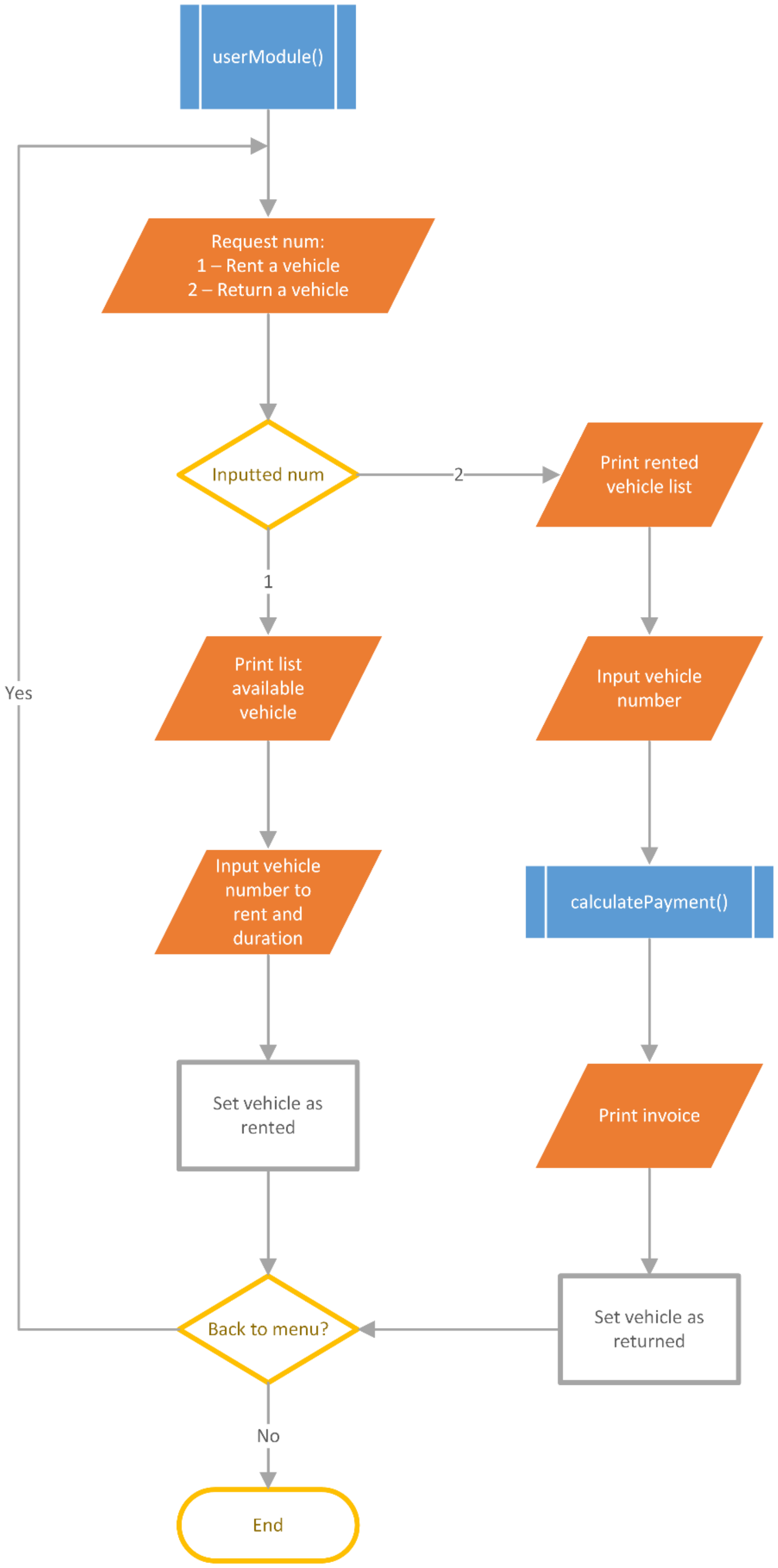


Figure 3.1.5 Flow Chart userModule()

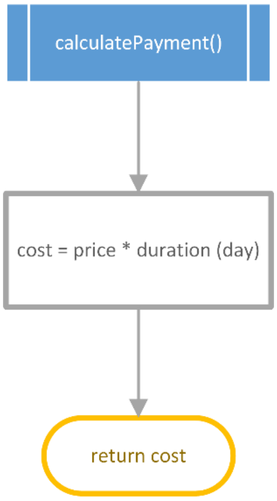


Figure 3.1.6 Flow Chart calculatePayment()

3.2 ERD

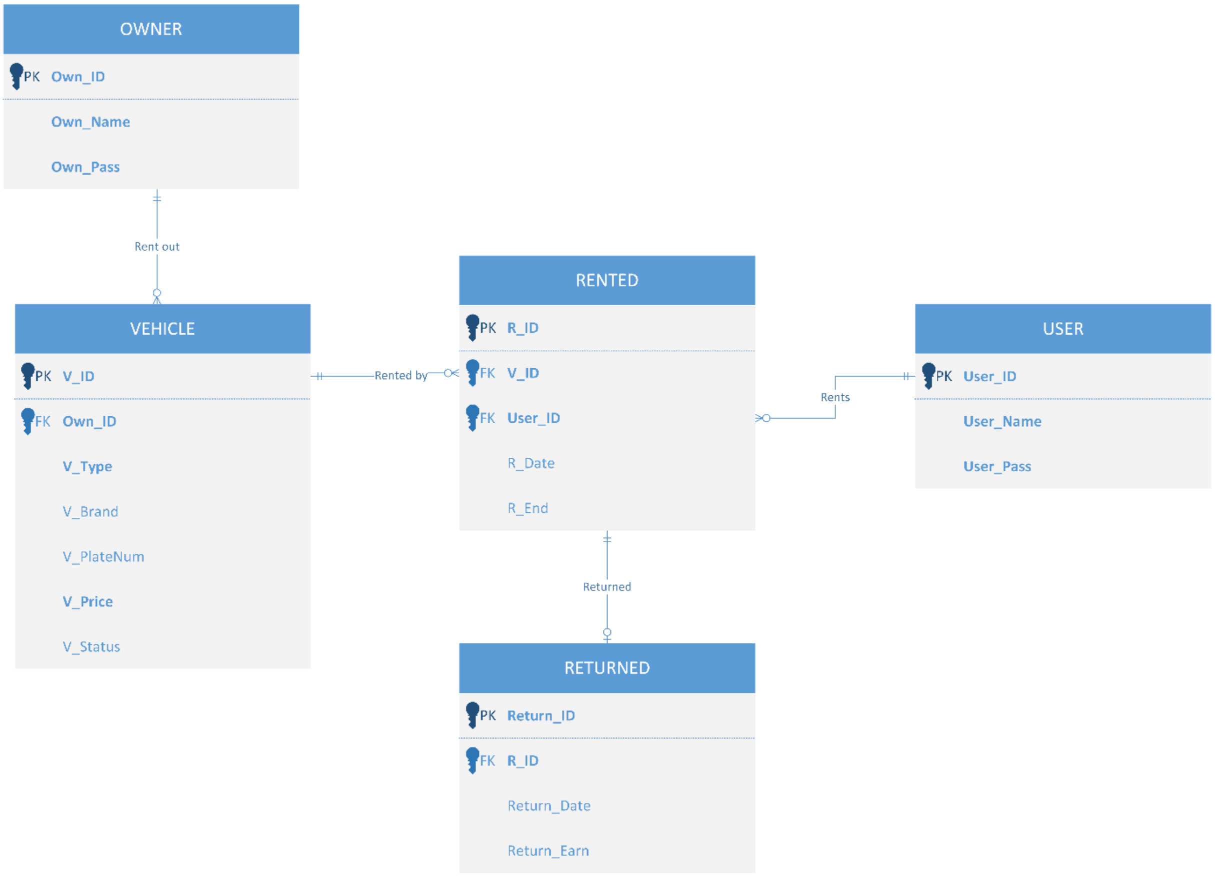


Figure 3.2.1 Entity Relational Diagram

3.3 Data Dictionary

Table USER

No	Name	DataType	Length	Key	Description	Mandatory (Yes/No)
1	User_ID	Number	10	PK	A unique user identification	Yes
2	User_Name	Character	20		Name of the user	Yes
3	User_Pass	Character	20		Password of the user account	Yes

Figure 3.3.1 Table User

Table OWNER

No	Name	DataType	Length	Key	Description	Mandatory (Yes/No)
1	Own_ID	Number	10	PK	A unique owner identification	Yes
2	Own_Name	Character	20		Name of owner	Yes
3	Own_Pass	Character	20		Password of owner account	Yes

Figure 3.3.2 Table Owner

Table VEHICLE

No	Name	DataType	Length	Key	Description	Mandatory (Yes/No)
1	V_ID	Number	10	PK	A unique vehicle identification	Yes
2	Own_ID	Number	10	FK	A foreign key of table OWNER	Yes
3	V_Type	Character	20		Vehicle type	Yes
4	V_Brand	Character	20		Vehicle brand	No
5	V_PlateNum	Character	20		Vehicle plate number	No
6	V_Price	Number	10		The price of the rental per day	Yes
7	V_Status	Character	20		(available/unavailable)	No

Figure 3.3.3 Table Vehicle

Table RENTED

No	Name	DataType	Length	Key	Description	Mandatory (Yes/No)
1	R_ID	Number	10	PK	A unique rental identification	Yes
2	V_ID	Number	10	FK	A foreign key of table VEHICLE	Yes
3	User_ID	Number	10	FK	A foreign key of table USER	Yes
4	R_Date	Date			The date when the rental starts	No
5	R_End	Date			The date when the rental ends	No
6	R_Status	Character	30		(active/returned)	No

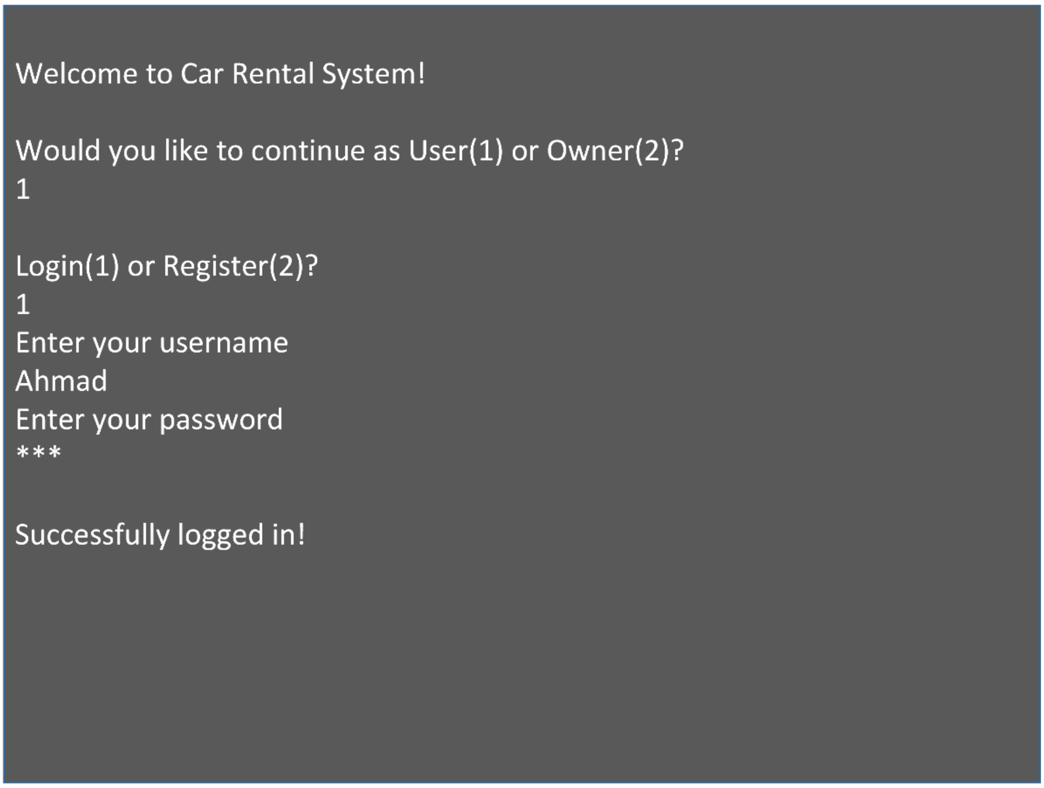
Figure 3.3.4 Table Rented

Table RETURNED

No	Name	DataType	Length	Key	Description	Mandatory (Yes/No)
1	Return_ID	Number	10	PK	A unique rental returned identification	Yes
2	R_ID	Number	10	FK	A foreign key of table RENTED	Yes
3	Return_Date	Date			The date of rental returned/cancellation	No
4	Return_Earn	Number	10		Calculated rent cost by day	No

Figure 3.3.5 Table Returned

3.4 Interface Design



```
Welcome to Car Rental System!

Would you like to continue as User(1) or Owner(2)?
1

Login(1) or Register(2)?
1
Enter your username
Ahmad
Enter your password
***

Successfully logged in!
```

Figure 3.4.1 Interface Design

CHAPTER IV

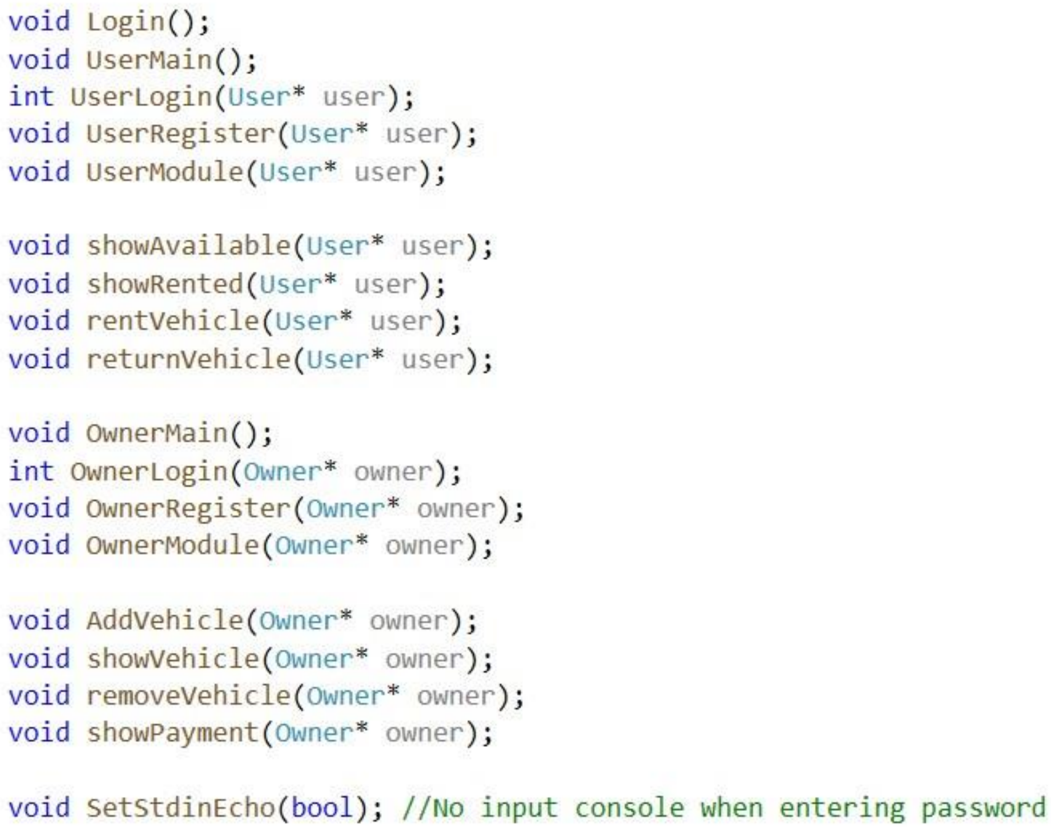
IMPLEMENTATION

4.1 Introduction

In order to implement the system using C++, various coding methods were used to fully construct the system’s features such as functions, selections, controls, and classes.

4.2 Function

Functions were used to cut the codes into small, readable chunks.

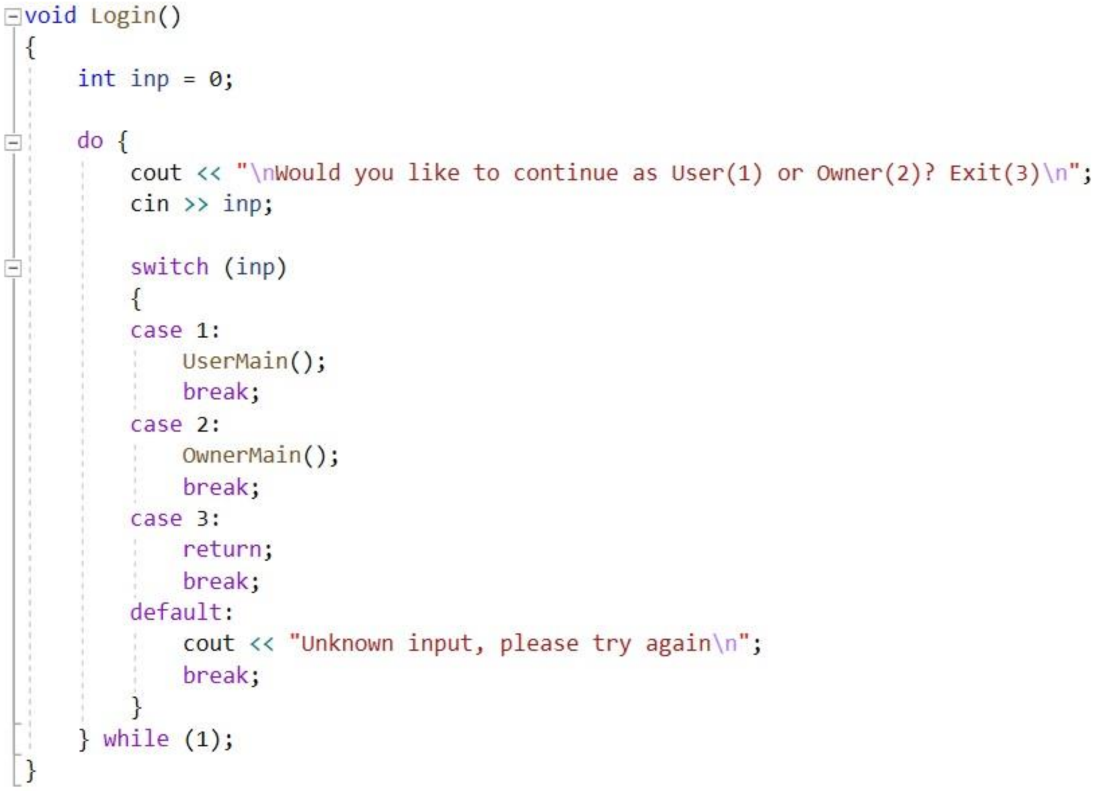


```
void Login();
void UserMain();
int UserLogin(User* user);
void UserRegister(User* user);
void UserModule(User* user);

void showAvailable(User* user);
void showRented(User* user);
void rentVehicle(User* user);
void returnVehicle(User* user);

void OwnerMain();
int OwnerLogin(Owner* owner);
void OwnerRegister(Owner* owner);
void OwnerModule(Owner* owner);

void AddVehicle(Owner* owner);
void showVehicle(Owner* owner);
void removeVehicle(Owner* owner);
void showPayment(Owner* owner);

void SetStdinEcho(bool); //No input console when entering password
```

Figure 4.2.1 Function

4.3 Selection

Selections were used in functions to simulate menu choices by allowing user to enter numbers.

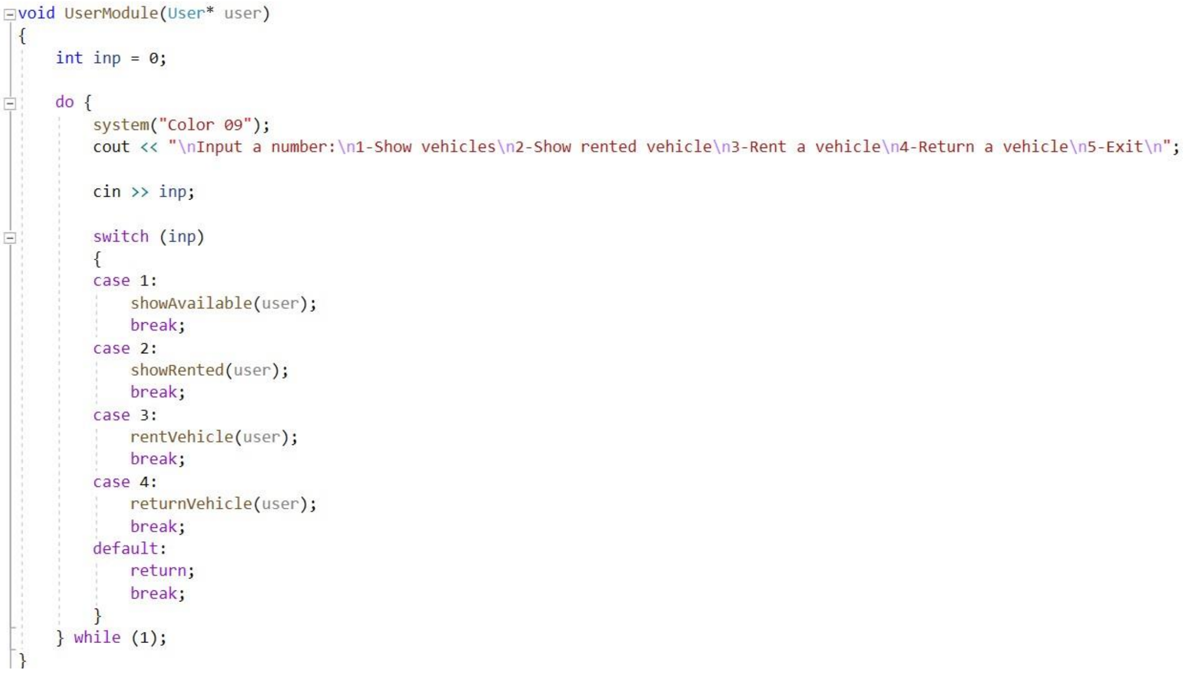


```
void Login()
{
    int inp = 0;

    do {
        cout << "\nWould you like to continue as User(1) or Owner(2)? Exit(3)\n";
        cin >> inp;

        switch (inp)
        {
        case 1:
            UserMain();
            break;
        case 2:
            OwnerMain();
            break;
        case 3:
            return;
            break;
        default:
            cout << "Unknown input, please try again\n";
            break;
        }
    } while (1);
}
```

Figure 4.3.1 Selection

4.4 Control

Controls were used in functions in the form of do…while loop to simulate navigations between menus and input validations.

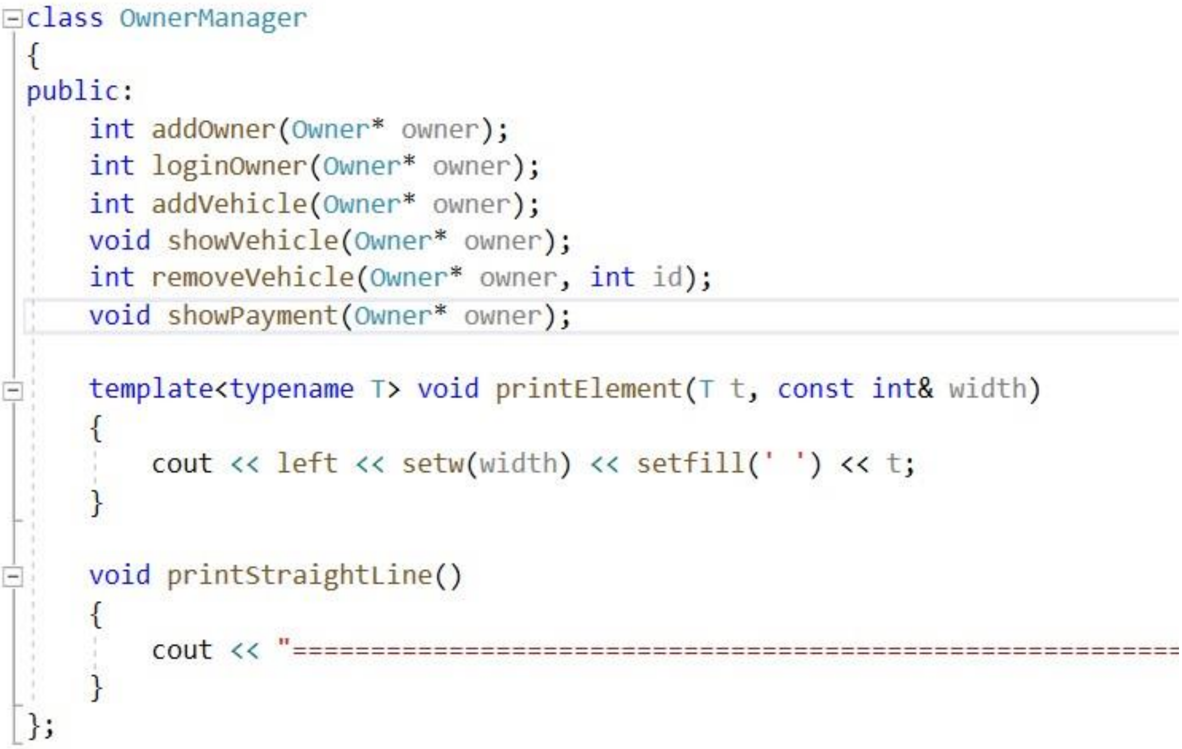


```
void UserModule(User* user)
{
    int inp = 0;

    do {
        system("Color 09");
        cout << "\nInput a number:\n1-Show vehicles\n2-Show rented vehicle\n3-Rent a vehicle\n4-Return a vehicle\n5-Exit\n";

        cin >> inp;

        switch (inp)
        {
        case 1:
            showAvailable(user);
            break;
        case 2:
            showRented(user);
            break;
        case 3:
            rentVehicle(user);
            break;
        case 4:
            returnVehicle(user);
            break;
        default:
            return;
            break;
        }
    } while (1);
}
```

Figure 4.4.1 Control

4.5 Class

Classes were used as objects to store and retrieve functions and data related to users and database. Such functions include user login and user features.



```
class OwnerManager
{
public:
    int addOwner(Owner* owner);
    int loginOwner(Owner* owner);
    int addVehicle(Owner* owner);
    void showVehicle(Owner* owner);
    int removeVehicle(Owner* owner, int id);
    void showPayment(Owner* owner);

    template<typename T> void printElement(T t, const int& width)
    {
        cout << left << setw(width) << setfill(' ') << t;
    }

    void printStraightLine()
    {
        cout << "=========================================================
    }
};
```

Figure 4.5.1 Class

CHAPTER VI

PROJECT CONCLUSION

5.1 Summary

Overall, Car Rental System project ran smoothly throughout its development. All the features were successfully implemented.

5.2 System Strengths and Weaknesses

Car Rental System is very light meaning that it can run on any pc. Users can register in the system as owner or user for rent and rent out businesses. Also, the process of renting or renting out a vehicle is quick and efficient. The vehicles that are available to rent are listed in an organized table.

Since the system uses Command Line Interface (CLI), the user may have to go through multiple menus and navigations before reaching their desired function. It is also difficult to distinguish whether you are logged in as a user or owner.

5.3 Suggestions for Improvements

Since there are a lot of menus and navigation in the system, it can be improved but replacing the CLI with Graphical User Interface (GUI) to be more user friendly.

5.4 Conclusion

The system's lightweight build made it accessible for many pc and fast in delivering its services although it could use an upgrade from CLI to GUI.