



**CENG 241
OBJECT ORIENTED
PROGRAMMING**

**Vehicle Sale And Rental
Management System**

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1 INTRODUCTION

The Vehicle Sale and Rental Management System is an auxiliary software used to facilitate buying or renting a vehicle for clients, selling or leasing a vehicle for sellers and lessors also it gives privilege to admins so that they can ensure program operation.

1.1 Purpose

Our problem is the complexity in management systems and the inability to ensure data privacy.

To solve these problems, it is necessary to reduce complexity in management systems and to provide a regular view of data to all group of users. The program we designed aims to do these solutions.

The aim of this project is to create a sample of vehicle sale and rental management system similar to used in regular web sites such as sahibinden.com. Also, the aim of this program is to design a useful system for admins, sellers, lessors and clients.

1.2 Scope

Within the scope of the project, a system plan was created by collecting and analyzing the data required in a vehicle sale and rental management system. Then, an algorithm was considered in order to transform it into a code, and thoughts were transferred to the code. It is specified how the application works, by creating a class diagram. Finally, whether this program is running has been tested.

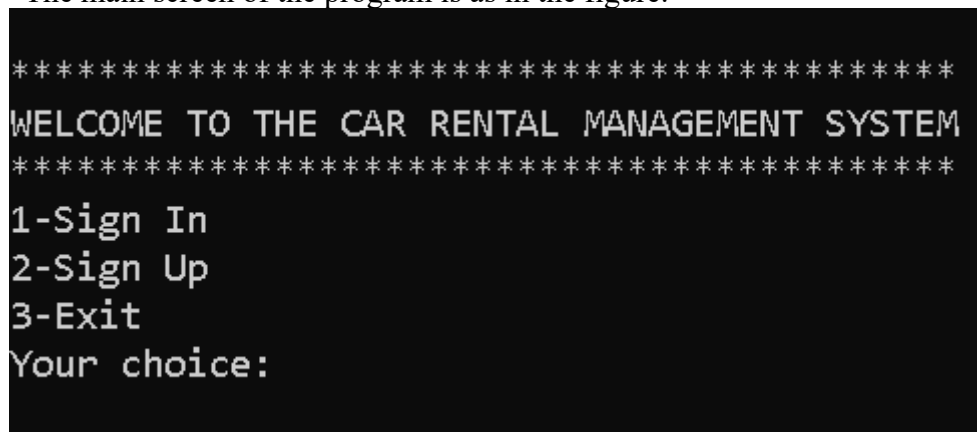
2 DESIGN

2.1 Approach

The program includes features that can meet the needs of an administrator. It is simple but has fast access to the information to be viewed.

2.2 System

The main screen of the program is as in the figure.



```
*****  
WELCOME TO THE CAR RENTAL MANAGEMENT SYSTEM  
*****  
1-Sign In  
2-Sign Up  
3-Exit  
Your choice:
```

With this program, the users can create seller accounts to sell and lease, lessor accounts if they only want to lease their vehicles or client accounts to view vehicle lists and buy or rent the available vehicles. Also they can directly enter their accounts using sign in option or log out of the system.

We run the program by entering the number of the operation we want in the "your choice" section.

For example, we can continue our process by choosing the second operation to create a new account. We enter the operation number into the system and press enter.

```
*****
WELCOME TO THE CAR RENTAL MANAGEMENT SYSTEM
*****
1-Sign In
2-Sign Up
3-Exit
Your choice:2

-----
                USER SIGN UP
-----
1- Sign up as Seller
2- Sign up as a Lessor
3- Sign up as a Client
4- Go Back to Menu
Your choice:
```

Since sellers can both sell and lease, we can continue our process by choosing the first operation.

```
-----  
                        USER SIGN UP  
-----  
1- Sign up as Seller  
2- Sign up as a Lessor  
3- Sign up as a Client  
4- Go Back to Menu  
Your choice:1  
  
Enter Your Name: _
```

We can continue our process by entering our personel informations.

```
Enter Your Name: Ahmet  
Enter Your Surname: Uygun  
Enter Wallet: 14000  
Enter Your Phone Number: 05505505050  
Enter Your Username: sellerahmet  
Enter Your Password: sell123  
Enter City: Atlanta  
Enter Country: USA  
Enter District: Georgia  
Enter Zipcode: 30301  
Enter Buildingnumber: 14  
Enter Doornumber: 6  
Added...  
  
-----  
                        USER SIGN UP  
-----  
1- Sign up as Seller  
2- Sign up as a Lessor  
3- Sign up as a Client  
4- Go Back to Menu  
Your choice:
```

We can continue our process by choosing third option to create a client account.

```
Enter Your Name: Vedat
Enter Your Surname: Uygun
Enter Wallet: 50000
Enter Your Phone Number: 05105105511
Enter Your Username: iwanttobuy
Enter Your Password: buy55
Enter City: Samsun
Enter Country: Turkey
Enter District: Kara Deniz
Enter Zipcode: 55020
Enter Buildingnumber: 12
Enter Doornumber: 18
Added...
```

```
-----
                        USER SIGN UP
-----
```

```
1- Sign up as Seller
2- Sign up as a Lessor
3- Sign up as a Client
4- Go Back to Menu
Your choice:
```

We can continue our process by choosing the fourth operator to go back to the main menu.

```

-----
                        USER SIGN UP
-----
1- Sign up as Seller
2- Sign up as a Lessor
3- Sign up as a Client
4- Go Back to Menu
Your choice:4

*****
WELCOME TO THE CAR RENTAL MANAGEMENT SYSTEM
*****
1-Sign In
2-Sign Up
3-Exit
Your choice:_

```

We can continue our process by choosing the first option.

```

*****
WELCOME TO THE CAR RENTAL MANAGEMENT SYSTEM
*****
1-Sign In
2-Sign Up
3-Exit
Your choice:1

-----
                        USER SIGN IN
-----
1.Admin Login
2.Seller Login
3.Lessor Login
4.Client Login
5-Go Back to Menu
6.Exit
Your choice:

```

In sign up menu we can't create an admin account because admin accounts only can be added to the system manually or by another admin.

We can continue our process by choosing the first option.

```
-----  
                        USER SIGN IN  
-----  
1.Admin Login  
2.Seller Login  
3.Lessor Login  
4.Client Login  
5-Go Back to Menu  
6.Exit  
Your choice:1  
  
Enter admin username: vedat  
Enter suitable password for the user vedat: 132v  
Invalid username or password. Please try again!  
Remaining attempt: 2  
  
Enter admin username: vedat  
Enter suitable password for the user vedat: 123v  
  
Access Granted!  
Welcome Admin vedat
```

In admin login section admins must enter their usernames and password correctly. If they fail 3 times system will shut down.

In admin panel admins can add new admins, check user informations, delete users, delete ads or update ads.

We can continue or process by choosing second option.


```
-----  
                        ADMIN PANEL  
-----  
1-Add new admin users  
2-Check User information  
3-Delete users  
4-Delete ad  
5-Update ad  
6-Log out  
Your choice:2  
  
-----  
                        USER TYPE  
-----  
1-Admins  
2-Sellers  
3-Lessors  
4-Clients  
5-Go back to admin panel  
Your choice:_
```

We can continue our process by choosing second option.

```
-----  
                        USER TYPE  
-----  
1-Admins  
2-Sellers  
3-Lessors  
4-Clients  
5-Go back to admin panel  
Your choice:2  
  
-----  
                        SELLERS  
-----  
ID:1      NAME:Ahmet      SURNAME:Uygun      PHONE:05505505050
```

Note: Screenshot becomes very blurry when trying to show every user information!

We can continue our process by choosing fifth option.

```
-----  
                        USER TYPE  
-----  
1-Admins  
2-Sellers  
3-Lessors  
4-Clients  
5-Go back to admin panel  
Your choice:5  
  
-----  
                        ADMIN PANEL  
-----  
1-Add new admin users  
2-Check User information  
3-Delete users  
4-Delete ad  
5-Update ad  
6-Log out  
Your choice:_
```

We can continue our process by choosing third option.

```
-----  
ADMIN PANEL  
-----  
1-Add new admin users  
2-Check User information  
3-Delete users  
4-Delete ad  
5-Update ad  
6-Log out  
Your choice:3  
  
-----  
USER TYPE  
-----  
1-Admins  
2-Sellers  
3-Lessors  
4-Clients  
Your choice:
```

We can continue our process by choosing third option.

```
-----  
LESSORS  
-----  
ID:1    NAME:qwer    SURNAME:asdf    PHONE:05555555555
```

There is an inappropriate account in lessors section. Admins can delete this kind of users by entering their usernames.

```
USERNAME:qwer
```

```
Please Enter The Username To Delete: qwer
```

```
-----  
ADMIN PANEL  
-----  
1-Add new admin users  
2-Check User information  
3-Delete users  
4-Delete ad  
5-Update ad  
6-Log out  
Your choice:2  
  
-----  
USER TYPE  
-----  
1-Admins  
2-Sellers  
3-Lessors  
4-Clients  
5-Go back to admin panel  
Your choice:3  
  
-----  
LESSORS  
-----
```

The system removes accounts that deleted by admins permanently.

We can continue our process by choosing fifth and sixth options to return to sign in menu.

```
-----  
                        USER TYPE  
-----  
1-Admins  
2-Sellers  
3-Lessors  
4-Clients  
5-Go back to admin panel  
Your choice:5  
  
-----  
                        ADMIN PANEL  
-----  
1-Add new admin users  
2-Check User information  
3-Delete users  
4-Delete ad  
5-Update ad  
6-Log out  
Your choice:6
```

We can continue our process by choosing second option and enter correct username and password.

```
-----  
                        USER SIGN IN  
-----  
1.Admin Login  
2.Seller Login  
3.Lessor Login  
4.Client Login  
5-Go Back to Menu  
6.Exit  
Your choice:2  
  
Enter seller username: sellerahmet  
Enter suitable password for the user sellerahmet: sell123  
  
Access Granted!  
Welcome Seller sellerahmet
```

In seller panel users can add selling ads, renting ads, update their ads, view their ads, view their wallet to check their money or view address informations and update them.

```
-----  
                        SELLER PANEL  
-----  
1-Add new selling ad  
2-Add new renting ad  
3-Update your ad  
4-See ads  
5-Wallet  
6-See Adress Informations  
7-UpdateAdress  
8-Log out  
Your choice: _
```

We can continue our process by choosing first option.

```
-----  
                        SELLER PANEL  
-----  
1-Add new selling ad  
2-Add new renting ad  
3-Update your ad  
4-See ads  
5-Wallet  
6-See Address Informations  
7-UpdateAddress  
8-Log out  
Your choice:1  
  
-----  
                        VEHICLE TYPE  
-----  
1-Car  
2-Motorcycle  
3-Vessel  
4-Go back to seller menu  
Your choice: _
```

In here users can choose three types of vehicles to advertise.

We can continue our process by choosing the first option.

```
-----  
VEHICLE TYPE  
-----  
1-Car  
2-Motorcycle  
3-Vessel  
4-Go back to seller menu  
Your choice: 1  
Enter Brand: Ford  
Enter Model: f100  
Enter Year: 1953  
Enter Km: 37000  
Enter Hp: 93  
Enter Fuel: Gasoline  
Enter Shift: Manual  
Enter Body Type: Pickup  
Enter Color: Black  
Enter From: Owner  
Enter Price: 20800  
Enter Weight: 1407  
Enter is damage or not: No
```

The system will automatically add our advertise and send us back to the vehicle type menu the moment we specify whether our vehicle is damaged or not.

We can continue our process by choosing the fourth option to go back to seller panel.


```
-----  
                        VEHICLE TYPE  
-----  
1-Car  
2-Motorcycle  
3-Vessel  
4-Go back to seller menu  
Your choice: 4  
  
-----  
                        SELLER PANEL  
-----  
1-Add new selling ad  
2-Add new renting ad  
3-Update your ad  
4-See ads  
5-Wallet  
6-See Adress Informations  
7-UpdateAdress  
8-Log out  
Your choice:
```

We can continue our process by choosing the third option.

```

-----
                        SELLER PANEL
-----
1-Add new selling ad
2-Add new renting ad
3-Update your ad
4-See ads
5-Wallet
6-See Address Informations
7-UpdateAddress
8-Log out
Your choice:3

-----
                        VEHICLE TYPE
-----

1-Cars
2-Motorcycles
3-Vessels
4-Go Back
Select vehicle type:1

```

After choosing the vehicle type system will list our ads with their ID's.

```

-----
                        CARS
-----
ID: 1   USERNAME: sellerahmet   USERTYPE: SELLER   BRAND: Ford
.0      KM: 37000.0   HP: 93.0   FUEL: Gasoline   SHIFT: Manual
AGE: 0wner   PRICE: 20800.0   WEIGHT: 1407.0   ISDAMAGED: No

Enter id(press 0 to go back!): _

```

We can continue our process by choosing the car with ID: 1.

```
Enter id(press 0 to go back!): 1
Enter columnname: PRICE
Enter set new: 30000
```

By entering the column name we can update our vehicles properties.

USERNAME: sellerahmet KM: 37000.0 HP: 93.0 er PRICE: 20800.0	USERNAME: sellerahmet KM: 37000.0 HP: 93.0 er PRICE: 30000.0
--	--

After we changed the price system sends us back to vehicle type menu. To go back to the seller panel we can choose the fourth option.

```
-----
                        VEHICLE TYPE
-----

1-Cars
2-Motorcycles
3-Vessels
4-Go Back
Select vehicle type:4

-----
                        SELLER PANEL
-----

1-Add new selling ad
2-Add new renting ad
3-Update your ad
4-See ads
5-Wallet
6-See Adress Informations
7-UpdateAddress
8-Log out
Your choice: 4
```

We can continue our process by choosing the fifth option.

```
-----  
TOTAL MONEY  
-----  
14000 $  
-----  
SELLER PANEL  
-----  
1-Add new selling ad  
2-Add new renting ad  
3-Update your ad  
4-See ads  
5-Wallet  
6-See Address Informations  
7-UpdateAddress  
8-Log out  
Your choice:
```

We can continue our process by choosing the seventh option. In update address menu, system will ask us to confirm that we want to change our address information.

```
new address information (y/n):
```

By typing 'y' we can change our address information.

Your address has deleted...

Enter your new address

Enter City: Atlanta

Enter Country: USA

Enter District: Georgia

Enter Zipcode: 30304

Enter Buildingnumber: 12

Enter Doornumber: 4

Added...

SELLER PANEL

1-Add new selling ad

2-Add new renting ad

3-Update your ad

4-See ads

5-Wallet

6-See Address Informations

7-UpdateAddress

8-Log out

Your choice:

We can continue our process by choosing the eighth option. Then, we can continue by choosing fourth option and sign in to our client account.

```
-----  
                          SELLER PANEL  
-----  
1-Add new selling ad  
2-Add new renting ad  
3-Update your ad  
4-See ads  
5-Wallet  
6-See Address Informations  
7-UpdateAddress  
8-Log out  
Your choice:8  
Logging out...  
Bye!  
  
-----  
                          USER SIGN IN  
-----  
1.Admin Login  
2.Seller Login  
3.Lessor Login  
4.Client Login  
5-Go Back to Menu  
6.Exit  
Your choice:4  
  
Enter client username: iwanttobuy  
Enter suitable password for the user iwanttobuy: buy55
```

In client panel users can view seller ads, renting ads, view their money by choosing the wallet and view their address information or change it.

```
Access Granted!  
Welcome Client iwanttobuy
```

```
-----  
CLIENT PANEL  
-----
```

```
1-See seller ads  
2-See renting ads  
3-Wallet  
4-See address Informations  
5-Update Adress  
6-Log out  
Your choice:
```

We can continue our process by choosing the first option.

```

-----
                        CLIENT PANEL
-----

1-See seller ads
2-See renting ads
3-Wallet
4-See address Informations
5-Update Adress
6-Log out
Your choice:1

-----
                        VEHICLE TYPE
-----

1-Car
2-Motorcycle
3-Vessel
4-Go Back
Your choice: 1

```

We can continue our process by viewing car ads.

```

-----
                        CARS
-----
ID:1      USERNAME:sellerahmet    USERTYPE:SELLER BRAND:
:37000.0      HP:93.0 FUEL:Gasoline  SHIFT:Manual
0.0      WEIGHT:1407.0  ISDAMAGED:No

Enter ID to buy:

```

We can continue our process by entering the correct ID of the vehicle we want to buy.


```
Enter ID to buy: 1
Enter car owner username: sellerahmet
Purchase? (y / n):
```

After confirming the ID and seller's user name system asks us one final question to complete purchase.

```
Enter ID to buy: 1
Enter car owner username: sellerahmet
Purchase? (y / n): y
Successful purchase/renting
```

```
-----
                        CLIENT PANEL
-----
```

```
1-See seller ads
2-See renting ads
3-Wallet
4-See address Informations
5-Update Adress
6-Log out
Your choice: _
```

When purchase complete, system sends us back to client panel.

We can continue our process by choosing the third option.

```
-----  
                        CLIENT PANEL  
-----  
  
1-See seller ads  
2-See renting ads  
3-Wallet  
4-See address Informations  
5-Update Address  
6-Log out  
Your choice:3  
  
-----  
                        TOTAL MONEY  
-----  
  
20000 $
```

When we first created our account we set our money to 50000. After the purchase, system successfully decreases our money.

```
Enter Your Name: Vedat  
Enter Your Surname: Uygun  
Enter Wallet: 50000  
Enter Your Phone Number: 05105105511  
Enter Your Username: iwanttobuy  
Enter Your Password: buy55  
Enter City: Samsun  
Enter Country: Turkey  
Enter District: Kara Deniz  
Enter Zipcode: 55020  
Enter Buildingnumber: 12  
Enter Doornumber: 18  
Added...
```

We can continue our process by log out from the client account and log in to our seller account to confirm money has been transferred.

```
-----
                        CLIENT PANEL
-----

1-See seller ads
2-See renting ads
3-Wallet
4-See address Informations
5-Update Adress
6-Log out
Your choice:6
Logging out...
Bye!

-----
                        USER SIGN IN
-----

1.Admin Login
2.Seller Login
3.Lessor Login
4.Client Login
5-Go Back to Menu
6.Exit
Your choice:
```

```
-----
                        USER SIGN IN
-----

1.Admin Login
2.Seller Login
3.Lessor Login
4.Client Login
5-Go Back to Menu
6.Exit
Your choice:2

Enter seller username: sellerahmet
Enter suitable password for the user sellerahmet: sell123

Access Granted!
Welcome Seller sellerahmet
```

```
-----  
                        SELLER PANEL  
-----  
1-Add new selling ad  
2-Add new renting ad  
3-Update your ad  
4-See ads  
5-Wallet  
6-See Address Informations  
7-UpdateAddress  
8-Log out  
Your choice:5  
  
-----  
                        TOTAL MONEY  
-----  
  
44000 $
```

The system successfully transferred the money.

We can continue our process by choosing the second option.

```
-----  
                        SELLER PANEL  
-----  
1-Add new selling ad  
2-Add new renting ad  
3-Update your ad  
4-See ads  
5-Wallet  
6-See Address Informations  
7-UpdateAddress  
8-Log out  
Your choice:2  
  
-----  
                        VEHICLE TYPE  
-----  
1-Car  
2-Motorcycle  
3-Vessel  
4-Go back to menu  
Your choice:
```

We can continue our process by choosing the third option.

```
1-Car
2-Motorcycle
3-Vessel
4-Go back to menu
Your choice:
3

Enter Brand: Gemi
Enter Motor Amount: 2
Enter Kamara: 2
Enter Number of Beds: 4
Enter Total Active Hour: 102
Enter Height: 6
Enter Width: 14
Enter Color: White
Enter From: Owner
Enter Daily Price:200
Enter is damage or not: No
```

The system completes saving our ad.

We can continue our process by sign in to our client account.

```
-----
                        CLIENT PANEL
-----

1-See seller ads
2-See renting ads
3-Wallet
4-See address Informations
5-Update Adress
6-Log out
Your choice:2

-----
                        VEHICLE TYPE
-----

1-Car
2-Motorcycle
3-Vessel
4-Go Back
Your choice: _
```

From there we can continue our process by viewing renting ads and choosing vessel option.

```

-----
                        VEHICLE TYPE
-----

1-Car
2-Motorcycle
3-Vessel
4-Go Back
Your choice: 3

-----
                        VESSELS
-----
ID:1      USERNAME:sellerahmet    USERTYPE:LESSO
DNUMBER:4      TOTALACTIVEHOUR:102    HEIGHT
0      ISDAMAGED:No

Enter ID to buy: 1
Enter car owner username: sellerahmet
Rent? (y / n): _

```

After confirming ID and seller's user name we can rent the vehicle by typing 'y'.

We can continue our process by checking whether our ads removed or not.


```
-----  
                        SELLER PANEL  
-----  
1-Add new selling ad  
2-Add new renting ad  
3-Update your ad  
4-See ads  
5-Wallet  
6-See Address Informations  
7-UpdateAddress  
8-Log out  
Your choice:4  
  
-----  
                        VEHICLE TYPE  
-----  
  
1-Cars  
2-Motorcycles  
3-Vessels  
4-Go Back  
Select vehicle type:
```

We can continue our process by choosing the first option.

```
-----  
                        VEHICLE TYPE  
-----  
  
1-Cars  
2-Motorcycles  
3-Vessels  
4-Go Back  
Select vehicle type:1  
  
-----  
                        CARS  
-----  
  
-----  
                        VEHICLE TYPE  
-----  
  
1-Cars  
2-Motorcycles  
3-Vessels  
4-Go Back  
Select vehicle type:_
```

Ad successfully removed.

We can continue our process by choosing the third option.

```
-----  
                        VEHICLE TYPE  
-----  
  
1-Cars  
2-Motorcycles  
3-Vessels  
4-Go Back  
Select vehicle type:3  
  
-----  
                        VESSELS  
-----  
  
-----  
                        VEHICLE TYPE  
-----  
  
1-Cars  
2-Motorcycles  
3-Vessels  
4-Go Back  
Select vehicle type:_
```

Renting ad successfully removed.

We can continue our process by logging out, going back to main menu and exit from the system by choosing the third option.

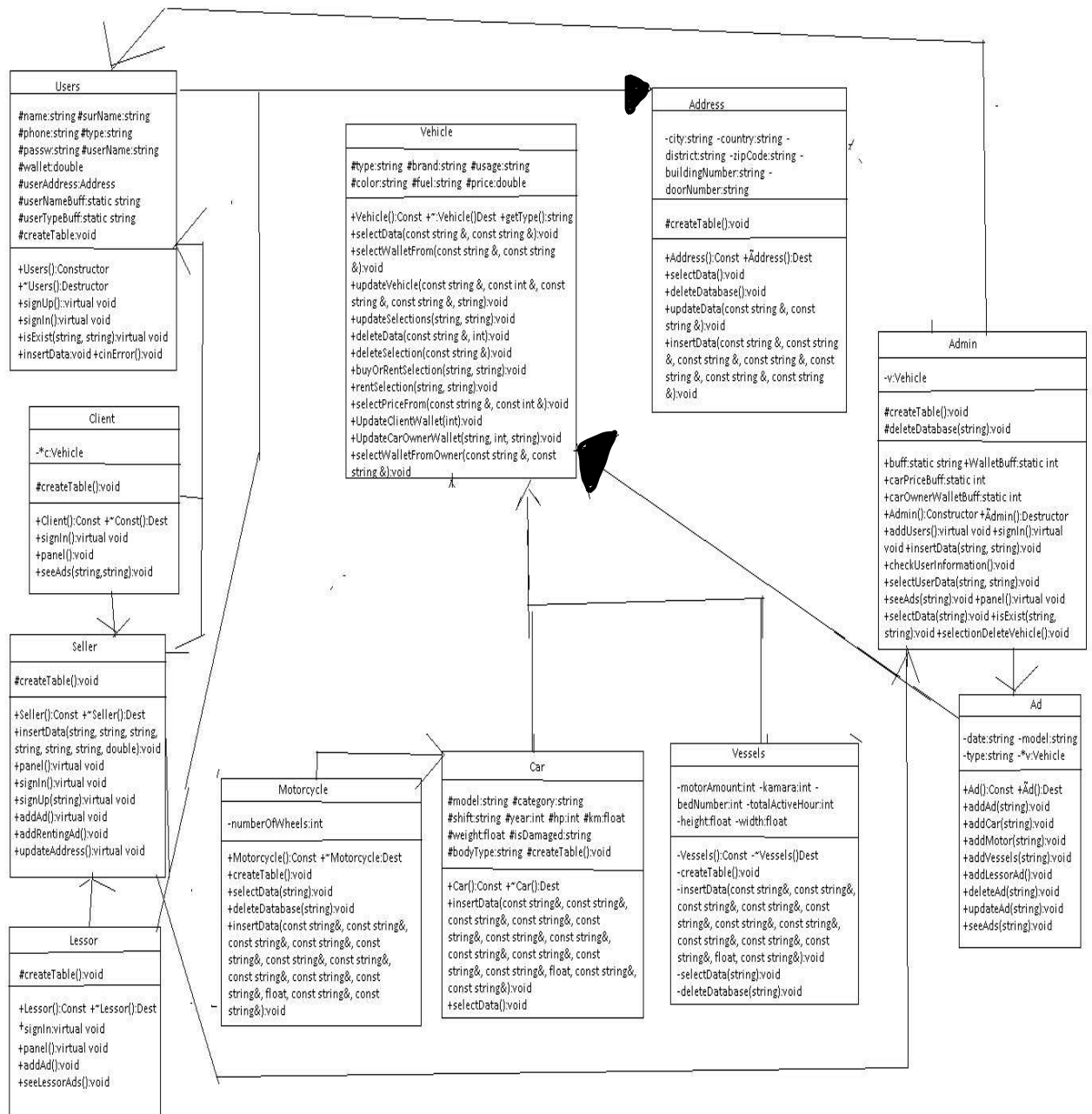
```
-----
                        USER SIGN IN
-----
1.Admin Login
2.Seller Login
3.Lessor Login
4.Client Login
5-Go Back to Menu
6.Exit
Your choice:5

*****
WELCOME TO THE CAR RENTAL MANAGEMENT SYSTEM
*****
1-Sign In
2-Sign Up
3-Exit
Your choice:3
```

2.3 System Design

In the system, the users class is the parent of the admin, seller, lessor and client classes and the vehicle class is the parent of the car, motorcycle and vessels classes. In the system, it is aimed to protect the system by using private and protected attributes. Vehicles can be added to users in the program. We use set and get functions to access variables within the classes.

The class diagram:



3. CONCLUSION

This project is an example created for the needs of ease in vehicle sale and rent industry. It is an application that has been tried to be exemplified by using the topics (functions, class structures, constructors, destructors, etc.) we see in CENG241 course content. Also it has sqlite database system. It is a system that has been created with C++ object-oriented software language and sqlite. It can be developed according to needs and can be setting an example for the users in the field.

