CAR RENTAL SYSTEM

OOP project

4/20/2021

Sadhana Das

CONTENTS

Problem Definition and Proposed Solution

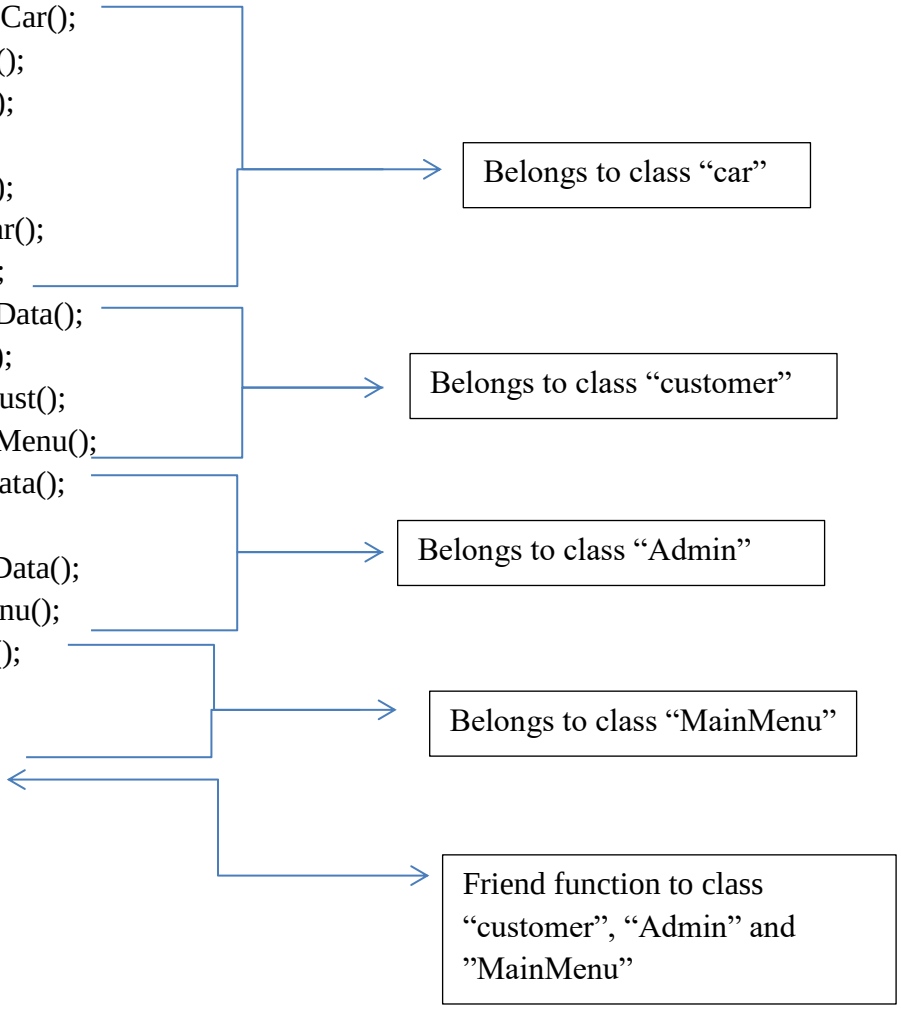
A new up and coming car rental service is wishing to have a user interface that will allow their customers to view the models, descriptions and prices of different cars available. The user has the ability to register and log in to the system and track their rental plan. The program code will be responsive, allowing for the customer to view it. The administrator will also be able to login through the same form but have the ability to add/remove new car rentals, change prices, and so on.

Car Rental System is based on a concept to rent cars and generate rental invoice of a rental company. Before stepping into the main system a user has to pass through a login system to get access, then only the user can select cars with a different model and rent for certain days.

Talking about the features of the Car Rental System, after logging in as a user he/she has to provide a name then the user can select available cars. After selecting a car, the system displays selected car details which contain maximum power, mileage and many more. Then the user has to provide the information such as Car number and number of days to rent the car. After all these procedures, the system calculates rent and displays Customer Invoice presenting invoice number, customer's name, car model, number, number of days and total rental amount.

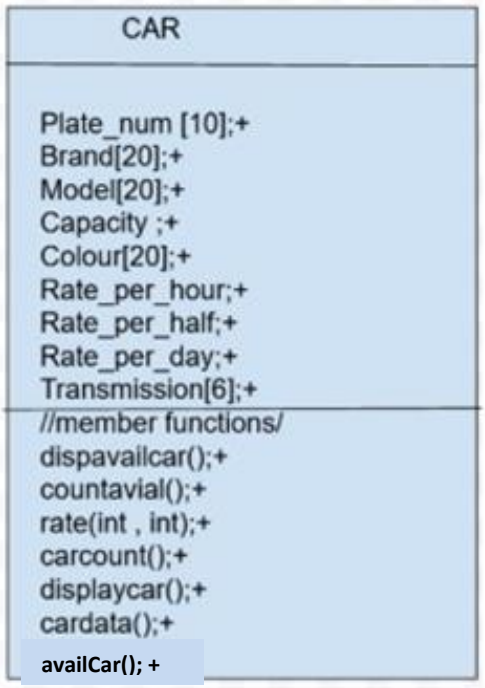
Identify Function & Users of the Application

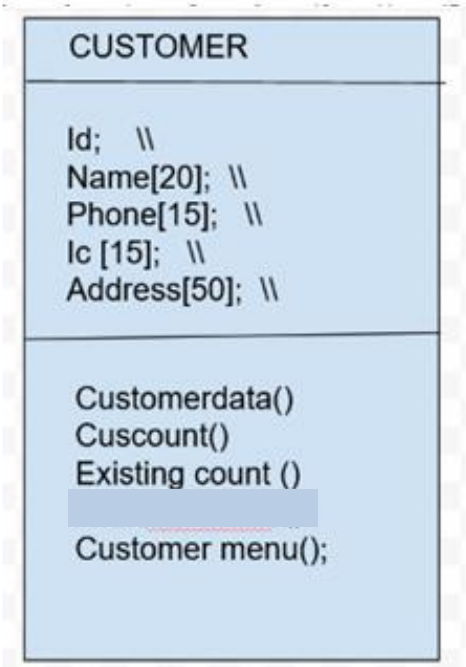
1. void dispAvailCar();
2. int countAvail();
3. int rate(int, int);
4. int carCount();
5. void availCar();
6. void displayCar();
7. void carData();
8. void customerData();
9. int custCount();
10. void existingCust();
11. void customerMenu();
12. void newCarData();
13. void delCar();
14. void showCarData();
15. void adminMenu();
16. void welcome();
17. void tNc();
18. void exitArt();
19. void menu();

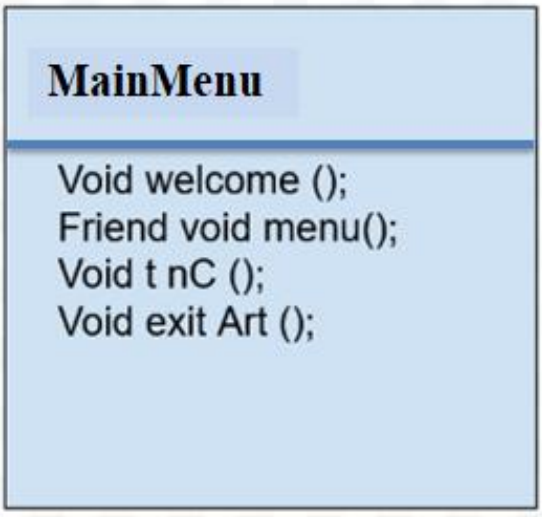


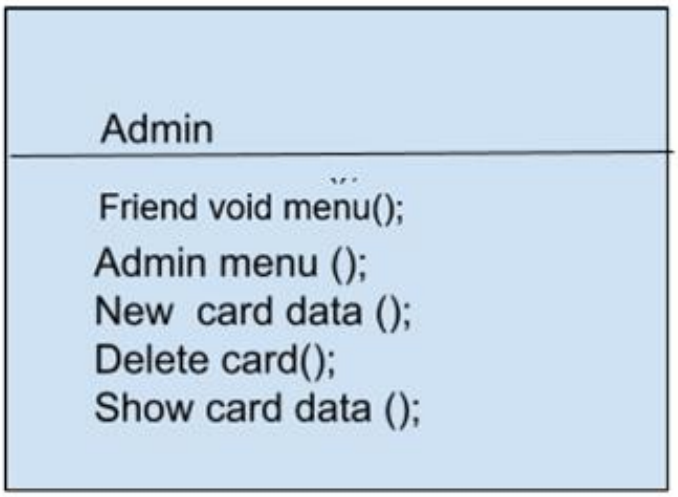
1. Void dispAvailCar() : the car rental file is opened, where the details of the car are copied to another temporary file ” available.txt” here the customer can read and select the car needed
2. Int countAvail() : the function is supposed to count the touple number and the price of the car renting calculation of the rented car is acquired present in “available.txt” file
3. Int rate(int, int) : rental price Is classified as 1 hour, 12 hour and 24 hour basis, hour required is given by customer, hence the car chosen is rented after the calculation is done
4. Int CarCount() : while reading the ‘car rental.txt’ file, the string word checks foe an empty row, until then ‘No. of car’ is incremented, after we reach the end of file, the counting stops and file is closed
5. Void availCar() : it basically reads the “available.txt” file , so no abnormality is caused during the car renting process
6. Void displayCar() : function is to display the car data from “car rental.txt”
7. Void carData() : it reads the “car rental.txt “ file
8. Void customerData() : the customer.txt file is opened and customer details like name, ic, address is stored
9. Int custCount() : counts the number of rows in customer.txt
10. Void existingCust(): function allows to enter the id and then procced to car selection and then to payment
11. CustomerMenu(): the menu portal for customer
12. Void newCarData() : allows admin to add new car details and the result is stored in carrental.txt
13. Void delCar () : allows to delete the car details from its plate number, a temp.txt is created where the details from car rental.txt file are copied except the car whose details are to deleted from record, the temp.txt is renamed as car rental.txt
14. Void showCarData(0: the admin function to display the car details
15. Void adminMenu() : the menu portal for admin
16. Void welcome (): to open welcome.txt
17. Void tNc() : to show the terms and conditions added to the project
18. Void exitArt() : to open the exitArt.txt file
19. Void menu(): it shows to enter the next menu portal of customer or admin , otherwise to read the terms and condition or simply log off

Identify Classes, Data Members and Member Functions

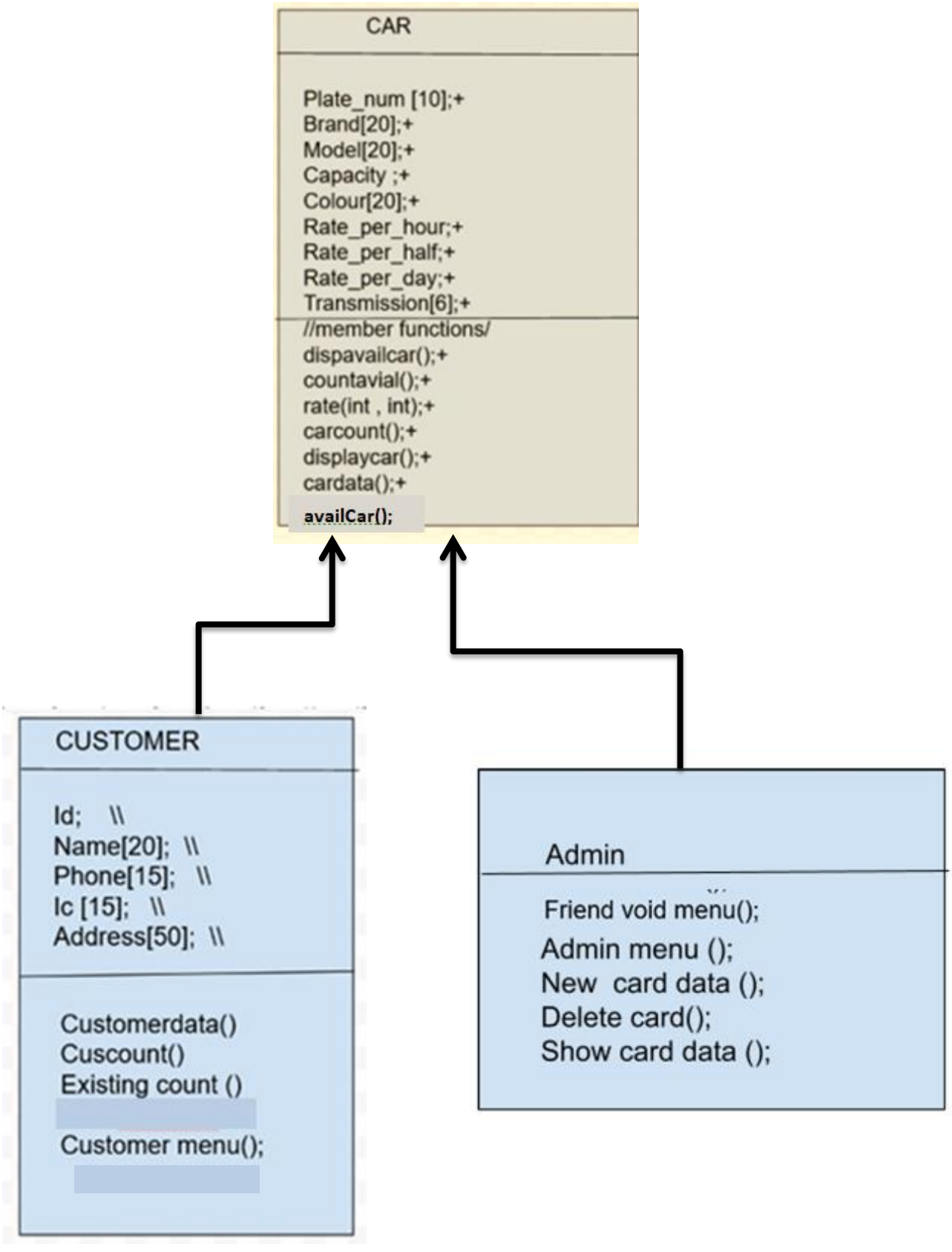






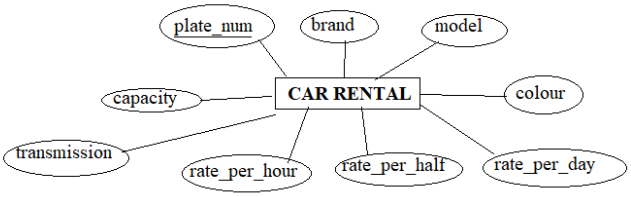


Class Diagrams with Relationships

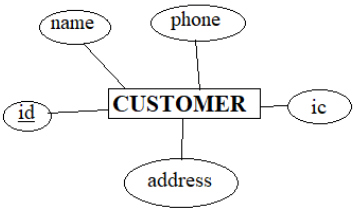


The Files Required with Attributes

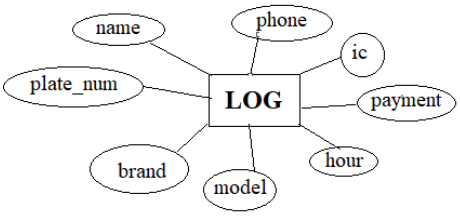
1. **Car Rental .txt**
    - char plate_num [10];
    - char brand [20};char model [20];
    - float capacity;
    - char colour [20];
    - float rate_per_hour;
    - float rate_per_half;
    - float rate_per_day;
    - char transmission;



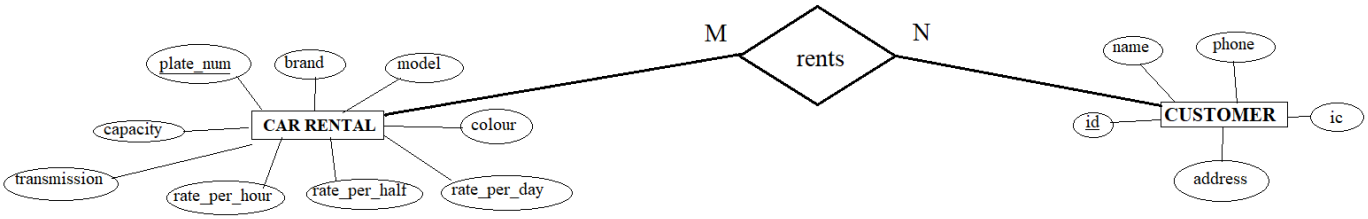
2. **Customer.txt**
    - int id;
    - char name [20];
    - char phone [15];
    - char ic [15];
    - char address [50];



3. **log.txt**
    - char name [20];
    - char phone [15];
    - char ic [15];
    - char plate_num [10];
    - char brand [20};
    - char model [20];
    - int payment



4. **welcome.txt**
5. **exit art.txt**



Implementation

```
void menu() {
    int adminId,custId,x;
    Admin a ;
    customer c;
    MainMenu m;
    m.welcome();
    cout << endl;
    cout<<"¥n¥t   ¥t¥t¥t¥t¥t¥t¥t   1. ADMIN";
    cout<<"¥n¥t   ¥t¥t¥t¥t¥t¥t¥t   2. USER";
    cout<<"¥n¥t   ¥t¥t¥t¥t¥t¥t¥t   3. T%C";
    cout<<"¥n¥t   ¥t¥t¥t¥t¥t¥t¥t   4. EXIT"<<endl<<"¥n";
    cout<<"¥n¥t   ¥t¥t¥t¥t¥t¥t¥tINPUT :";
    cin>>x;
    system("cls");
    if (x==1){
        cout<<"¥n¥t   ¥t¥t¥t¥t¥t¥t¥t  ENTER ADMIN PASSWORD:  "; cin>>adminId;
        if(adminId==1234){a.adminMenu();}
        else{
        cout<<"¥n¥t   ¥t¥t¥t¥t¥t¥t¥t WRONG PASSWORD, CONTACT ADMIN ...."<<endl;
        Sleep(1000);
        menu();
        }
    }
    else if(x==2){
        cout<<"¥n¥t   ¥t¥t¥t¥t¥t¥t¥t  ENTER USER PASSWORD:  ";cin>>custId;
        if(custId==1001){c.customerMenu();}
        else{
        cout<<"¥n¥t   ¥t¥t¥t¥t¥t¥t¥t WRONG PASSWORD, CONTACT ADMIN ...."<<endl;
        Sleep(1000);
        menu();
        }
    }
    else if(x==3){   m.tNc();     }
    else if(x==4){       m.exitArt();     }
}
```

```
int car :: rate(int hour, int j){

    int hour_24, hour_12, hour_1;
    int total, total_24, total_12, total_1;
    hour_24=hour/24;
    hour_12=(hour - hour_24*24)/12;
    hour_1=(hour - hour_24*24 - hour_12*12)/1;
    total_24 = hour_24 * rent[j].rate_per_day;
    total_12 = hour_12 * rent[j].rate_per_half;
    total_1 = hour_1 * rent[j].rate_per_hour;

    total = total_24 + total_12 + total_1;

    return total;
}
```

```
void customer :: existingCust(){
    int tempCust, hour, userID;
    char carSelect[10];
    tempCust = custCount() - 1;
    ofstream log;
    log.open("Log", fstream::app);
    ofstream ofs;
    ofs.open("temp");
    cout<<"¥n¥n¥n¥n";
    cout << endl;

    cout<<"¥n¥n";
    cout << endl;

    cout << "¥n¥t  |¥t¥t¥t¥tPlease enter user ID : ";
    cin >> userID;

    for (int i = 0 ; i < custCount() ; i++){
    if (userID == cust[i].id)    {
            cout<<"¥n¥t  |¥t¥t¥t¥t¥tWELCOME ";
            cout << cust[i].name;
            log <<"¥nNAME: "<< cust[i].name;
            cout<<"¥t  |¥tID ";
            cout << cust[i].id;
            cout << "¥n¥n";
            log<<"¥nPHONE: "<<cust[i].phone;
            log<<"¥nINSURANCE CERTIFICATE NUMBER: "<<cust[i].ic;
        }
    }

    car::displayCar();

    cout<<"¥n¥n¥t  |¥t¥t¥t¥t¥tPlease select car";
    cout<<"¥n¥t  |¥t¥t¥t¥t¥tPlate Number : ";
    cin>>ws;
    cin.getline(carSelect,10);
    int x=car::countAvail();
    for(int i = 0; i < car::countAvail(); i++){
        if (strcmp(carSelect,avail[i].plate_num) != 0){
            ofs << avail[i].plate_num;
            ofs << " ";
            ofs << avail[i].brand;
            ofs << " ";
            ofs << avail[i].model;
            ofs << " ";
            ofs << avail[i].capacity;
            ofs << " ";
            ofs << avail[i].colour;
            ofs << " ";
            ofs << avail[i].rate_per_hour;
            ofs << " ";
            ofs << avail[i].rate_per_half;
            ofs << " ";
            ofs << avail[i].rate_per_day;
            ofs << " ";
            ofs << avail[i].transmission;
            if(i != countAvail()){
                ofs<<endl;
            }
        }
    }
    ofs.close();
```

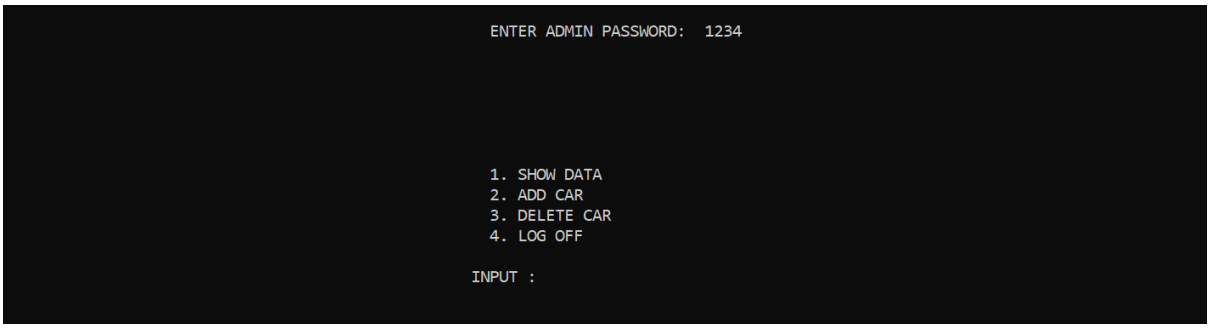
[*] oopProject2.cpp

```
382 void Admin::newCarData(){
383     cout<<"¥n¥n";
384     cout << endl;
385     ofstream ofs;
386     ofs.open("car rental.txt" , fstream::app);
387     ofs<<endl;
388     int newCar = carCount() + 1;
389     cout << "¥n¥n";
390     cout << "¥n¥t  ¥t¥t¥t¥t¥t  Please enter the car data below : " << endl;
391     cout << "¥n¥t  ¥t¥t¥t¥t¥t  Plate Number : ";
392     cin >> ws;
393     cin.getline(rent[newCar].plate_num,10);ofs << rent[newCar].plate_num;ofs << " ";
394     cout << "¥t  ¥t¥t¥t¥t¥t  Brand : ";
395     cin.getline(rent[newCar].brand,20);ofs << rent[newCar].brand;ofs << " ";
396     cout << "¥t  ¥t¥t¥t¥t¥t  Model : ";
397     cin.getline(rent[newCar].model,20);ofs << rent[newCar].model;ofs << " ";
398     cout << "¥t  ¥t¥t¥t¥t¥t  Capacity : ";
399     cin >> rent[newCar].capacity;ofs << rent[newCar].capacity;ofs << " ";
400     cout << "¥t  ¥t¥t¥t¥t¥t  Colour : ";
401     cin >> ws;
402     cin.getline(rent[newCar].colour,20);ofs << rent[newCar].colour;ofs << " ";
403     cout << "¥t  ¥t¥t¥t¥t¥t  Rate Per Hour : ";
404     cin >> rent[newCar].rate_per_hour;ofs << rent[newCar].rate_per_hour;ofs << " ";
405     cout << "¥t  ¥t¥t¥t¥t¥t  Rate Per 12 Hour : ";
406     cin >> rent[newCar].rate_per_half;ofs << rent[newCar].rate_per_half;ofs << " ";
407     cout << "¥t  ¥t¥t¥t¥t¥t  Rate Per 24 Hour : ";
408     cin >> rent[newCar].rate_per_day;ofs << rent[newCar].rate_per_day;ofs << " ";
409     cout << "¥t  ¥t¥t¥t¥t¥t  Tranmission (Automatic:A/Manual:M) : ";
410     cin >> ws;
411     cin.getline(rent[newCar].transmission,6);ofs << rent[newCar].transmission;ofs.close();
412     system("cls");
413     car::carData();
414     adminMenu();
415 }
416
```

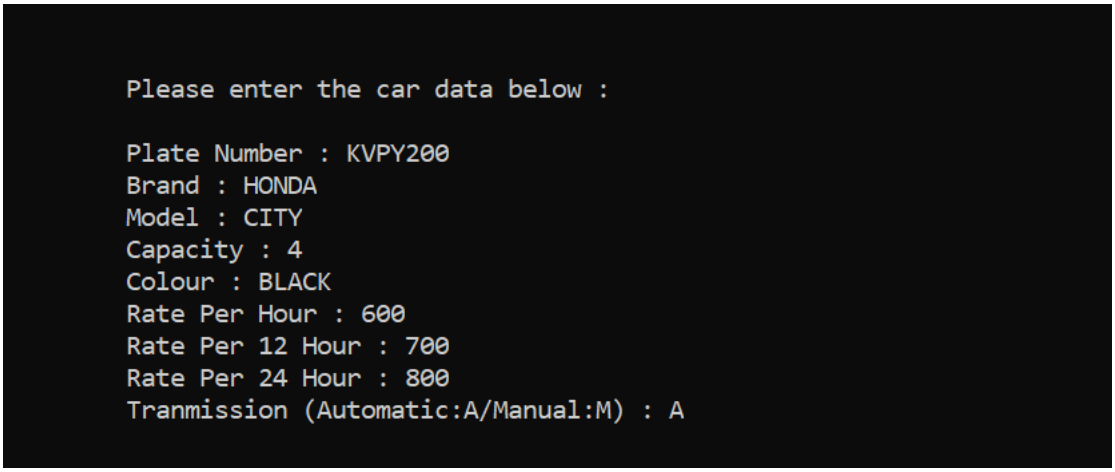
```
415 void Admin ::delCar(){
416     char plate[10];
417     ofstream ofs;
418     ofs.open("temp.txt");
419     cout<<"¥n¥n¥n¥n";
420     cout << endl;
421     car::displayCar();
422     cout << "¥n¥n";
423     cout << "¥t ¥t¥tEnter the car plate number to be deleted (CAPITAL LETTER W/OUT SPACE): "<<endl;
424     cout<< "¥t     ¥t¥t¥t¥t¥t¥t¥t";
425     cin>>ws;
426     cin.getline(plate,10);
427     int x=carCount();
428     for(int i = 0; i < carCount(); i++){
429         if (strcmp(plate,rent[i].plate_num) != 0){
430             ofs << rent[i].plate_num;    ofs << " ";
431             ofs << rent[i].brand;    ofs << " ";
432             ofs << rent[i].model;    ofs << " ";
433             ofs << rent[i].capacity;    ofs << " ";
434             ofs << rent[i].colour;    ofs << " ";
435             ofs << rent[i].rate_per_hour;    ofs << " ";
436             ofs << rent[i].rate_per_half;    ofs << " ";
437             ofs << rent[i].rate_per_day;    ofs << " ";
438             ofs << rent[i].transmission;
439             if(i != carCount()){
440                 ofs<<endl;
441             }
442         }
443     }
444     ofs.close();
445     remove("car rental.txt");
446     rename("temp.txt","car rental.txt");
447     system("cls");
448     car::carData();
449     adminMenu();
450 }
451
```

Screen Shots Of The Output And The Files Used

ADMIN MENU:



ADMIN >> ADD CAR()



ADMIN>>> SHOW DATA()

```
Plate Number       Brand    Model  Capacity    Colour   Rate Per Hour   Rate Per 12 Hour   Rate Per 24 Hour   Transmission
=============================================================================================================
TN6753             HONDA    CITY      4        black       500             1000                2000                  A
OD2345             KIA      SELTOS    6        BLACK       7000            8000                9000                  A
OD1234             HYUNDAI  I20       4        WHITE       5000            6000                6500                  M
TS987              SUZUKI   AC800     4        MAROON      2000            3000                4000                  M
SAD270             SUZUKI   SWIFT     5        WHITE       5000            1000                2000                  A
GJ6796             HONDA    AMAZE     5        BLACK       5000            2000                2500                  A
DAS123             HYUNDAI  I10       4        BLACK       5000            5000                5000                  A
KIA123             KIA      SELTOS    8        BLACK       9000            10000               20000                 A
TATA342            TATA     NEXON     5        RED         4000            3000                10000                 A
CAR123             TOYOTA   VIOS      2.5      WHITE       1000            1500                2000                  A
TRY000             TATA     TIAGO     5        BLACK       600             1000                1500                  A
KVPY200            HONDA    CITY      4        BLACK       600             700            800              A


|                                1. BACK
|                                2. MAIN MENU


|                               INPUT :_
```

ADMIN >>> DELETE CAR ()

```
|  Plate Number       Brand    Model  Capacity    Colour   Rate Per Hour   Rate Per 12 Hour   Rate Per 24 Hour   Transmission
|  =============================================================================================================
|   TN6753            HONDA    CITY      4        black       500             1000                2000                  A
|   OD2345            KIA      SELTOS    6        BLACK       7000            8000                9000                  A
|   OD1234            HYUNDAI  I20       4        WHITE       5000            6000                6500                  M
|   TS987             SUZUKI   AC800     4        MAROON      2000            3000                4000                  M
|   SAD270            SUZUKI   SWIFT     5        WHITE       5000            1000                2000                  A
|   GJ6796            HONDA    AMAZE     5        BLACK       5000            2000                2500                  A
|   DAS123            HYUNDAI  I10       4        BLACK       5000            5000                5000                  A
|   KIA123            KIA      SELTOS    8        BLACK       9000            10000               20000                 A
|   TATA342           TATA     NEXON     5        RED         4000            3000                10000                 A
|   CAR123            TOYOTA   VIOS      2.5      WHITE       1000            1500                2000                  A
|   TRY000            TATA     TIAGO     5        BLACK       600             1000                1500                  A
|   KVPY200           HONDA    CITY      4        BLACK       600             700            800              A


              Enter the car plate number that are going to be deleted (CAPITAL LETTER W/OUT SPACE):
                                                  KVPY200_
```

ADMIN >> SHOWDATA () AFTER DELETECAR ()

```
Plate Number       Brand    Model  Capacity    Colour   Rate Per Hour   Rate Per 12 Hour   Rate Per 24 Hour   Transmission
=============================================================================================================
TN6753             HONDA    CITY      4        black       500             1000                2000                  A
OD2345             KIA      SELTOS    6        BLACK       7000            8000                9000                  A
OD1234             HYUNDAI  I20       4        WHITE       5000            6000                6500                  M
TS987              SUZUKI   AC800     4        MAROON      2000            3000                4000                  M
SAD270             SUZUKI   SWIFT     5        WHITE       5000            1000                2000                  A
GJ6796             HONDA    AMAZE     5        BLACK       5000            2000                2500                  A
DAS123             HYUNDAI  I10       4        BLACK       5000            5000                5000                  A
KIA123             KIA      SELTOS    8        BLACK       9000            10000               20000                 A
TATA342            TATA     NEXON     5        RED         4000            3000                10000                 A
CAR123             TOYOTA   VIOS      2.5      WHITE       1000            1500                2000                  A
TRY000             TATA     TIAGO     5        BLACK       600             1000                1500                  A


|                                1. BACK
|                                2. MAIN MENU


|                               INPUT :_
```

USER/CUSTOMER MENU:

```
        ENTER USER PASSWORD:  1001


        1. RENT A CAR
        2. MAIN MENU


       INPUT :
```

USER >>> RENT A CAR()

```
        |                          Please enter user ID : 1001
        | Plate Number      Brand    Model  Capacity    Colour   Rate Per Hour   Rate Per 12 Hour   Rate Per 24 Hour   Transmission
        | ================================================================================================================================
        |  TN6753           HONDA    CITY      4         black       500             1000                2000                    A
        |  OD2345           KIA      SELTOS    6         BLACK       7000            8000                9000                    A
        |  OD1234           HYUNDAI  I20       4         WHITE       5000            6000                6500                    M
        |  TS987            SUZUKI   AC800     4         MAROON      2000            3000                4000                    M
        |  SAD270           SUZUKI   SWIFT     5         WHITE       5000            1000                2000                    A
        |  GJ6796           HONDA    AMAZE     5         BLACK       5000            2000                2500                    A
        |  DAS123           HYUNDAI  I10       4         BLACK       5000            5000                5000                    A
        |  KIA123           KIA      SELTOS    8         BLACK       9000            10000               20000                   A
        |  TATA342          TATA     NEXON     5         RED         4000            3000                10000                   A
        |  CAR123           TOYOTA   VIOS      2.5       WHITE       1000            1500                2000                    A
        |  TRY000           TATA     TIAGO     5         BLACK       600             1000                1500                    A

        |                                Please select car
        |                                Plate Number : KIA123
        |                                Hours of rent : 72
calculation starts.......
                                 Price for 72 hours of rent :  60000
ENTER 1 TO GO BACK
```

T&C

```
    1. MINIMUM RENT TIME IS 3 HOURS
    2. ADMIN PASSWORD=1234
    3. USER ID AND PASSWORD=1001
    4. RISK BY YOUR OWN
    5. INCASE ACCIDENT, ALL COSTING IS PAID BY THE DRIVER
    6. PREPARE ITEM AS BELOW
         COPY OF IC, LICENSE
         DEPOSIT (BASED ON CAR TYPE)
    7. ADDITIONAL CHARGE IF LATE
    8. SAFE DRIVE!
```

EXIT

```
 _____ _                 _      __   __            _
|_   _| |__   __ _ _ __ | | __  \ \ / /__  _   _  | |
  | | | '_ \ / _` | '_ \| |/ /   \ V / _ \| | | | | |
  | | | | | | (_| | | | |   <     | | (_) | |_| | |_|
  |_| |_| |_|\__,_|_| |_|_|\_\    |_|\___/ \__,_| (_)


--------------------------------
Process exited after 558.8 seconds with return value 1
Press any key to continue . . .
```

FILES USED

car rental - Notepad

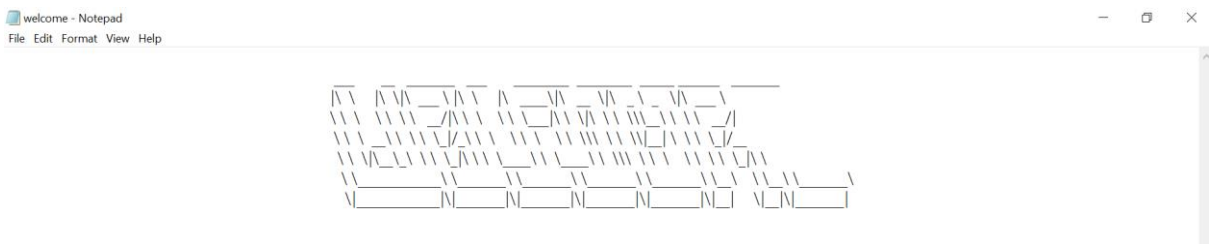
File Edit Format View Help

```
TN6753 HONDA CITY 4 black 500 1000 2000 A
OD2345 KIA SELTOS 6 BLACK 7000 8000 9000 A
OD1234 HYUNDAI I20 4 WHITE 5000 6000 6500 M
TS987 SUZUKI AC800 4 MAROON 2000 3000 4000 M
SAD270 SUZUKI SWIFT 5 WHITE 5000 1000 2000 A
GJ6796 HONDA AMAZE 5 BLACK 5000 2000 2500 A
DAS123 HYUNDAI I10 4 BLACK 5000 5000 5000 A
KIA123 KIA SELTOS 8 BLACK 9000 10000 20000 A
TATA342 TATA NEXON 5 RED 4000 3000 10000 A
CAR123 TOYOTA VIOS 2.5 WHITE 1000 1500 2000 A
TRY000 TATA TIAGO 5 BLACK 600 1000 1500 A
```

Customer - Notepad

File Edit Format View Help

```
1001;PRAKASH;4567789;PRA1233;DELHI
1002;SADHANA DAS;7897654;tyi;yhgfdcv
1003;Sid;74575757757;1234567890-;asdfghjkl
1004;;6789654;6YHTEEW;BBSR
1005;SDAS;1234567;TRUTH;BBSR
1006;KRIS;7809653;OOP15;BBSR
1007;SID;43567;DARE;CTC
1008;PUYUL;453234;DAS;DELHI
1009;RAVI;9876543;DEL8900;DELHI
```



exit art - Notepad

File Edit Format View Help

Log - Notepad

File Edit Format View Help

NAME: Sid
PHONE: 74575757757
IC: 1234567890-
CAR: CL03
BRAND: KIA
MODEL: K50
HOUR: 24
PAYMENT: 7200

==========

NAME: PRAKASH
PHONE: 4567789
IC: PRA1233
CAR: PDC602
BRAND: PROTON
MODEL: SAGA
HOUR: 7
PAYMENT: 4200

==========

NAME: Sid
PHONE: 74575757757
IC: 1234567890-
CAR: MH4539
BRAND: HONDA
MODEL: AMAZE
HOUR: 73
PAYMENT: 6600

Test Cases

The following are examples of test cases we implemented:

- Amount values should be displayed with correct calculated results
- The “Welcome” and “Thankyou” graphics to display properly
- Smooth navigations from one screen to another
- The file contents implementation to run smooth
- The password protected system and message display if the input doesn’t match
- The table of the object entered to be displayed properly
- Check all pages for broken images
- Check all pages for broken links

Troubleshooting Common Problems

Problem: Invalid Login

- The credentials used to log in was not found in the database, input the credentials again in case of mistype
- If invalid login persists, pursue the lost password option to obtain a new password. Look for ID input of “customer.txt “ or the “ T&C ” page

Problem: Page Not Found

- Make sure you have entered the text files correctly.
- Make sure the code file and the text file are present in same folder.

Problem: Customer/Vehicle Not Found

- Upon searching through the software, this means that the customer or vehicle is not currently in the database or may have been removed. Review recent changes to the Database by the company to see if any changes had occurred.

Limitations

1. In order to perform the rent a car capability;-Customers must login to their own profiles.Guests must create their own accounts which in the hand of admin.

2. Unless the payment phase is completed, the system will not allow to perform the booking and renting capabilities

Future Scope

Car Rental Business in the whole world growing rapidly. Now rental companies are focusing on customer support, training, sales and marketing to stand out clearly and to communicate better with the customers. This will increase the customer footfalls and sales.

- Easy Access to buyers & Chart and Graph analysis of Car
- Multi User Account System
- Free Listings and inquiries
- Zero loss of customers
- Invoice Management
- Monitoring the whole Car Management System
- Responsive User Interface
- Management of all type of users' account
- Car report management

Conclusion

Hence, the Car Rental System is properly studied and implemented. The outputs and files used are attached to the report.

Reference

1. https://youtu.be/MPJT9xwIBUI
2. https://code-projects.org/car-rental-system-in-c-with-source-code/
3. https://www.coursehero.com/file/p1h93uf/14-Scope-and-limitations-of-the-system-The-developer-is-going-to-develop/
4. OOP with ANSI &Turbo C++, Kamthane, Pearson
5. OOP with C++, E Balagurusamy, 8th Edition, Mc Graw Hill