Automated Parking System

MLB_09.01_07

Malabe

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We declare that this is our own work, and this Assignment does not incorporate without acknowledgment any material previously submitted by anyone else in SLIIT or any other university/Institute. And we declare that each one of us equally contributed to the completion of this Assignment.

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Introduction

An automated parking system enables people to acquire a parking space in a much more convenient way. Every day people spend a lot of time searching for a place to park their vehicles.

Therefore, they need to search for available places to park their vehicles and it is only a waste of time and fuel and it also increases the traffic congestion. This automated parking system is dedicated for customers to check available parking area and book them for a limited time. We have enhanced the service to provide customers with the solution to lack of parking space in modern cities.

The automated parking system is dedicated for customers to check available parking and reserve for a certain period of time. There are two types of users who can access this system: registered and unregistered. The system allows users to both view and use the system for reservations. Users who have registered can gain access to the system by logging in. If unregistered users wish to register, they can do so by signing up for the system.

Users can choose and reserve a preferred parking space ahead of time. The parking fee is calculated based on the locations and time slots chosen by the users. Users can pay using any online transaction method they prefer. To complete the payment, a QR code is generated. Users must contact support service agents to update reservations

User Requirements

1. The width of viewing and accessing the system is different according to the user.

2. Unregistered users can view the details about the site, which are parking availability, cost, about us, and ratings.

3. Registered users can gain access to the availability of the parking slots, schedule, reservation, cost, ratings, customer support, feedback, and complaints.

4. Admin of the system can view, edit, update, and delete the system information. And also contact customers and responded to customers.

5. When registering to the system as a new user, if the user is a customer, the customer should register as a customer to the site by providing the required details. (Name, contact number, E-mail address, Date of Birth, address)

6. Users can log in to the site by using their email/username and password.

7. Once logged in to the system as a user, the customer can get the service of the parking spot by choosing the date, time, and location, and making the payment done.

8. Payment can be done online or on any other preferred method. (Credit, debit, cash)

9. Once the customer completes the process, the system will provide a receipt with a QR Code.

10. Customers can give their complaints, feedback, and suggestions using the feedback page.

11. Customers can get online help using the system.

12. System admin can generate reports such as daily/monthly financial reports.

Noun/Verb Analysis

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7. Once logged in to the system as a user, the customer can get the service of the parking spot by choosing the date, time, and location, and making the payment done.

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Noun Analysis

Identified classes:

- **CLASSES**
  - **Unregistered User**
  - **Registered user**
  - **Parking slots**
  - **Reservation**
  - **Feedback**
  - **Admin**
  - **Payment**

Reasons for rejecting other nouns

- **OUT OF SCOPE**
  - **System**
  - **Customers**
  - **New user**
  - **Online help**
  - **location**
- **REDUNDANT**
  - **Width**
  - **User**
  - **Site**
  - **Parking Availability**
  - **Access**
  - **Availability**
  - **Schedule**
  - **Cost**
  - **Customers support**
  - **Complaints**
  - **System Information**
  - **Service**
  - **Parking spot**
  - **Online**
  - **Preferred method**
  - **Process**
  - **Suggestions**
  - **Feedback page**

- **ATTRIBUTE**

  - **Details**
  - **Cost**
  - **Rating**
  - **Name**
  - **Contact number**
  - **Email address**
  - **Date of birth**
  - **Address**
  - **Email/username**
  - **Password**
  - **Date**
  - **Time**
  - **Credit**
  - **Debit**
  - **Cash**
  - **Receipt**
  - **QR Code**

Verb Analysis

Unregistered Customer

- Viewing
- Accessing
- Registering
- Providing
- Get
- Choosing
- Making
- Done
- Completes
- Give

Registered Customer

- Gain
- Log in
- Using
- Get
- Choosing
- Making
- Done
- Completes
- Give

Admin

- View
- Edit
- Update
- Delete
- Contact
- Responded
- Provide
- Generate

CRC Cards

Class: Admin	
Responsibility	**Collaborations**
Login	
Search customer details	Customer
View parking details	
Register Person Details	
Update person Details	
View person Details	
Delete Person Details	

Class: Payment	
Responsibility	**Collaborations**
Store the payment details	
Put the reservation through online transaction	
Registered customers can do their month-to-month payments at the end of the month	
Will get discounts	
Show Payment details	

Class: Parking Locations	
Responsibility	**Collaborations**
Input parking location	
Expel parking location	
Update parking location	

Class: Inquires	
Responsibility	**Collaborations**
Input User Details	
Add Inquiry	
Update Inquiry	
Show Inquiry	

Class Name: Reservations	
Responsibility	**Collaborations**
Input reservations details	Payment, location
Update reservation details	
Show reservation details	

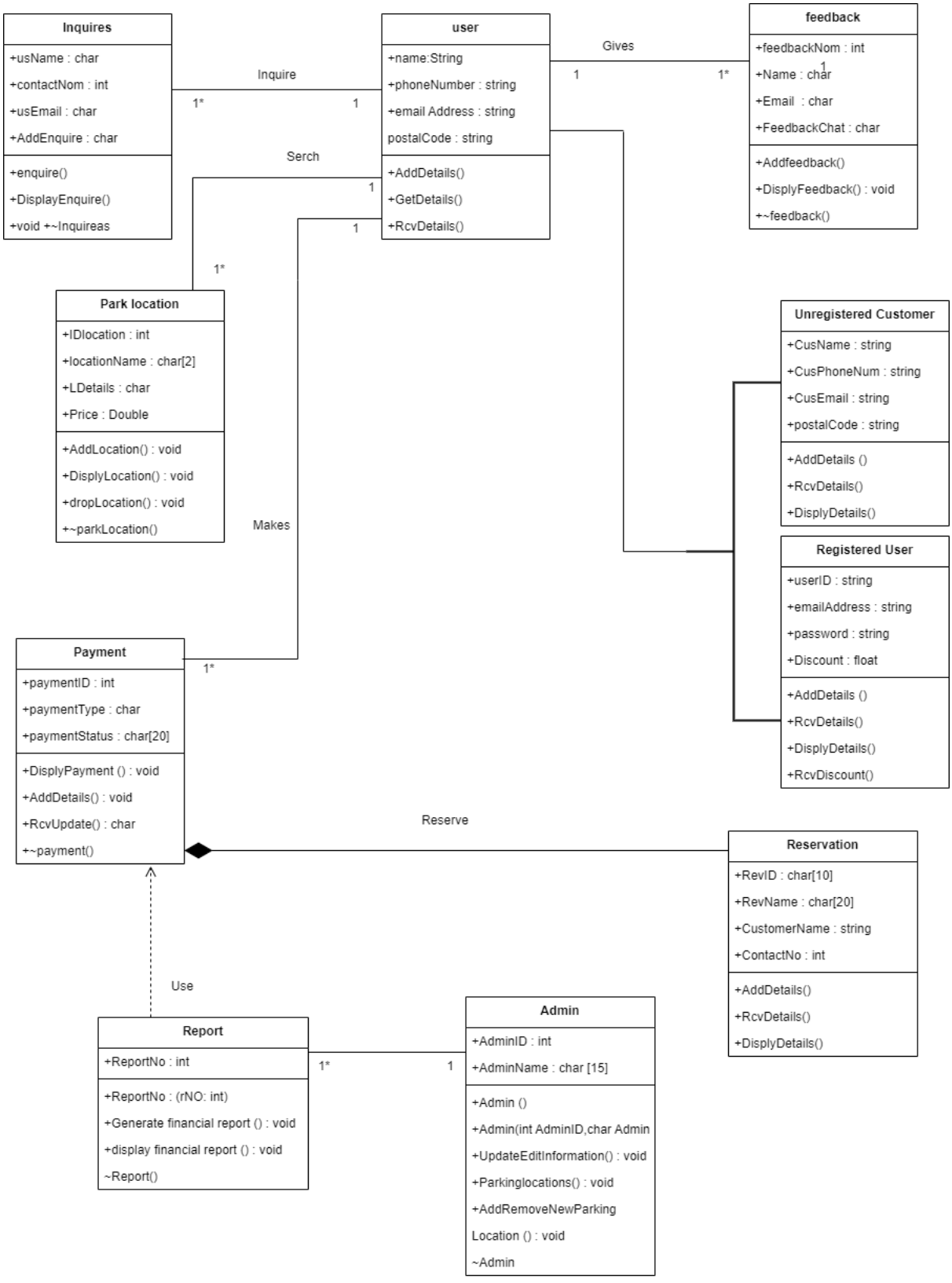
Class: Feedback	
Responsibility	**Collaborations**
Input User Details	
Add Feedback	
Show Feedback	

Class: Reports	
Responsibility	**Collaborations**
Create financial report	Customer
Show reports	

Class: Unregistered Customer	
Responsibility	**Collaborations**
Register Details	
Search parking Location	
View parking Location	Parking Location
Reserve parking Location	Reservation
Pay the payment for parking	Payment
Create Inquiry	Inquiry
Provide Feedback	Feedback

Class: Registered Customer	
Responsibility	**Collaborations**
Login	
Search parking Location	
View parking Location	Parking Location
Reserve parking Location	Reservation
Pay the payment for parking	Payment
Get Discount	
Create Inquiry	Inquiry
Provide Feedback	Feedback

Class Diagram



Codes

Customer.h

```
class Customer {
protected: char name[20];
char email[30];
char num[11];
char code[5];

public: void setDetails(char const pname, char const pemail,char const pnum, char const
pcode);

char getDetails();

Customer() {}
Customer(char const pname[], char const pemail[], char const pnum[], char const pcode[]);

void displayDetails();
};


class Unregistered_customer: public Customer{
private: char userID[6];

public:Unregistered_customer( char const pname[], char const pemail[],char const
pnum[],char const pcode[]);

void displayunregDetails();
char getDetails();
};


class Registered_customer: public Customer{
private: char userID[6];
char password[8];
float discount;
public:Registered_customer(char const ID[],char const pemail[], char const ppw[], float disc);

void displayregDetails();
char getDetails();
};
```

Customer.cpp

```
#include <iostream>
#include<cstring>
#include "Customer.h"
using namespace std;


Customer::Customer(char const pname[], char const pemail[], char const pnum[], char const pcode[]){

strcpy( name,pname);
strcpy( email, pemail);
strcpy ( num, pnum);
strcpy (code, pcode);
}


void Customer::displayDetails(){

cout<< name <<endl;
cout<< email <<endl;
cout<< num <<endl;
cout<< code <<endl;
cout<<endl;
}


Unregistered_customer::Unregistered_customer(char const pname[],char const pemail[],char const pnum[],char
const pcode[]){


strcpy( name,pname);
strcpy( email, pemail);
strcpy ( num, pnum);
strcpy (code, pcode);
};



void Unregistered_customer::displayunregDetails(){

cout<<"Name: "<< name <<endl;
cout<<"Email Address" <<email <<endl;
cout<<"Phone Number: "<< num <<endl;
cout<<"Postal Code: "<< code <<endl;
cout<<endl;
}




Registered_customer::Registered_customer(char const ID[], char const pemail[],char const ppw[], float disc){

strcpy( userID,ID);
strcpy( email, pemail);
strcpy ( password, ppw);

  discount= disc;
};
```

```
void Registered_customer::displayregDetails(){

cout<<"User ID: "<< userID <<endl;
cout<<"Email Address: "<< email <<endl;
cout<<"Password: "<< password <<endl;
cout<<"Discount Amount: Rs."<< discount <<endl;
cout<<endl;
}
```

Main.cpp

```
//Customer codes
#include <iostream>
#include<cstring>
#include "Customer.h"
using namespace std;
int main()
{

cout<<"Unregistered Customers " <<endl<<endl;

Unregistered_customer UC1("Kavin", "kavin@yahoo.com",   "0717777770", "11111");
UC1.displayunregDetails();

Unregistered_customer UC2("Prasa", "prasa@gmail.com", "0717777770", "22222");


UC2.displayunregDetails();

Unregistered_customer UC3("Asmi", "asmi@yahoo.com", "0776543210", "33333");


UC3.displayunregDetails();

Unregistered_customer UC4("Nandun", "Nandun@hotmail.com", "0767865432", "44444");

UC4.displayunregDetails();
cout<<"Registered Customers " <<endl<<endl;

Registered_customer RC1("RG001", "kamal@yahoo.com", "zxcv8n7", 100.00);
RC1.displayregDetails();

Registered_customer RC2("RG002", "nimal@gmail.com", "as3h6gf", 150.00 );
RC2.displayregDetails();

Registered_customer RC3("RG003", "sunil@gmail.com", "qwe6rty", 100.00);
RC3.displayregDetails();

Registered_customer RC4("RG004", "gayan@hotmail.com", "wsde5rf", 125.00);

  RC4.displayregDetails();
}
```

Feedback.h

```
class Feedback
{
private:
int feedbackNo;
char name[25];
char email[50];
char feedbackMsg[100];

public:
void feedback(int fbNo, char userName[], char userEmail[], char
addFeedback[]);

void displayFeedback();
};
```

Feedback.cpp

```
#include "Feedback.h"
#include <iostream>
#include <cstring>
using namespace std;

// Assign User Details and Feedback Message
void Feedback::feedback(int fbNo, char userName[], char userEmail[], char addFeedback[]) {

int feedbackNo = fbNo;

strcpy(name, userName);
strcpy(email, userEmail);
strcpy(feedbackMsg, addFeedback);
}

// Display User Details and Feedback Message
void Feedback::displayFeedback() {

cout << "Feedback No : " << feedbackNo << endl;
cout << "Customer Name : " << name << endl;
cout << "Email : " << email << endl;
cout << "Feedback : " << feedbackMsg << endl;
}
```

Inquiry.h

```
class Inquiry
{
private:
char uName[25];
int contactNo;
char uEmail[50];
char addEnquire[100];

public:
void enquire(char username[], int cNo, char useremail[], char addEnq[]);

void displayEnquire();
};
```

Inquiry.cpp

```
#include "Inquiry.h"
#include <iostream>
#include <cstring>
using namespace std;

// Assign User Details and Inquiry Details
void Inquiry::enquire(char username[], int cNo, char useremail[], char addEnq[]){

strcpy(uName, username);

int       contactNo = cNo;
strcpy(uEmail, useremail);
strcpy(addEnquire, addEnq);
}

// Display User Details and Inquiry Details
void Inquiry::displayEnquire(){

cout << "Customer Name : " << uName << endl;
cout << "Contact Number : " << contactNo << endl;
cout << "Email : " << uEmail << endl;
cout << "Inquiry : " << addEnquire << endl;
}
```

Main.cpp

```
 //Feedback codes

#include <iostream>
#include "Feedback.h"
#include "Inquiry.h"
using namespace std;
int main()
{
Feedback fb;

fb.feedback(17, (char*)"Saman Perera", (char*)"samanPerera@gmail.com", (char*)"Great Solution"); //Create Feedback object

fb.displayFeedback(); //Display Feedback
cout << "\n" << endl;


Inquiry inq;

inq.enquire((char*)"Dasun Nethsara", 717128328, (char*)"Nethsara@gmail.com", (char*)"Change Password"); //Create Inquiry object

inq.displayEnquire(); //Display Inquiry

return 0;
}
```

Payment.h

```
class Payment{
private:
int p_ID;
char p_Type[25];
char p_Status[20];

public:
void payment(int pP_ID, char pP_Type[], char pP_Status[]);

void displayPaymentDetails();
void addDetails();
void getUpdatePaymentDetails();
char removeDetails();
};
```

Payment.cpp

```
#include<iostream>
#include<cstring>
#include"payment.h"
using namespace std;

void Payment::payment(int pP_ID, char pP_Type[], char pP_Status[]){
p_ID = pP_ID;
```

```
strcpy (p_Type ,pP_Type);
strcpy(p_Status ,pP_Status);
}

void Payment::displayPaymentDetails(){ cout<<"Payment ID: "<<p_ID<<endl;
cout<<"Payment Type: "<<p_Type<<endl; cout<<"Payment Status: "<<p_Status<<endl;
}

void Payment::getUpdatePaymentDetails()
{

}
```

Park Location.h

```
class ParkLocation {
private:
int Location_ID;
char Location_Name[20];
char Details[25];
double Price;

public:
void parkLocation(int pLocation_ID, char pLocation_Name[], char pDetails[], double
pPrice);
void addLocation();
void displayLocationDetails();
void deleteLocation();
void searchLocation();
};
```

Park Location.cpp

```
#include<iostream>
#include<cstring>
#include"ParkLocation.h"
using namespace std;

void ParkLocation::parkLocation(int pLocation_ID, char pLocation_Name[], char
pDetails[], double pPrice)
{

Location_ID = pLocation_ID;
strcpy(Location_Name, pLocation_Name);
strcpy(Details, pDetails);
Price = pPrice;
}

void ParkLocation::addLocation()
{

}
```

```
void ParkLocation::displayLocationDetails()
{
cout<<"Location ID: "<<Location_ID<<endl;
cout<<"Location Name: "<<Location_Name<<endl;
cout<<"Details: "<<Details<<endl;
cout<<"Price: "<<Price<<endl;

}
```

Main.cpp

```
//Pay & Location codes

#include<iostream>
#include<cstring>
#include"payment.h"
#include"ParkLocation.h"
using namespace std;
int main()
{
Payment pay;
pay.payment(12,(char*)"PayPal",(char*)"Done"); pay.displayPaymentDetails();

  cout<<"--------------------------------"<<endl;

ParkLocation parkL;

parkL.parkLocation(0001,(char*)"NugegodaPark", (char*)"Nugegoda
Highlevel Rd, Nugegoda", 500.00);

  parkL.displayLocationDetails();

  return 0;
}
```

Admin.h

```
class Admin
{
private:
int AdminID;
char name[25];

public:
void Admins(int ADNo, char ADName[]);
void displayAdmin();
};
```

Admin.cpp

```
#include "Admin.h"
#include <iostream>
#include <cstring>
using namespace std;

void Admin::Admins(int ADNo, char ADName[])
{
int AdminID = ADNo;

  strcpy(name, ADName);
}

void Admin::displayAdmin()
{

cout << "ADMIN ID : " << AdminID << endl;
cout << "ADMIN Name : " << name << endl;

}
```

Report.h

```
class Report
{
private:
int ReportNo;
char name[25];

public:
void Reports(int rpNo, char reportName[]);
void displayReport();
};
```

Report.cpp

```
#include "Report.h"
#include <iostream>
#include <cstring>
using namespace std;

void Report::Reports(int rpNo, char reportName[])
{
int ReportNo = rpNo;

  strcpy(name, reportName);
}

void Report::displayReport()
{
cout << "Report No : " << ReportNo << endl;
cout << "Repoet Name : " << name << endl;

}
```

Main.cpp

```
 //Admin & Report codes
#include <iostream>
#include <cstring>
#include "Admin.h"
#include "Report.h"
using namespace std;
int main() {
Report rpNo;

rpNo.Reports(4197392, (char*)"CUSTOMR REPORTS"); rpNo.displayReport();

cout << "\n" << endl;
cout << "--------------------------------" << endl;

Admin ADNo;
ADNo.Admins(4, (char*)"Nimal");
ADNo.displayAdmin();

cout << "\n" << endl;
cout << "--------------------------------" << endl;

}
```

Sample Outputs

main.cpp

```
7
8  cout<<"Unregistered Customers " <<endl<<endl;
9
10 Unregistered_customer UC1("Kavin", "kavin@yahoo.com",
    "0717777770", "11111"); UC1.displayunregDetails();
11
12 Unregistered_customer UC2("Prasa", "prasa@gmail.com",
   "0717777770", "22222");
13
14
15 UC2.displayunregDetails();
16
17 Unregistered_customer UC3("Asmi", "asmi@yahoo.com",
   "0776543210", "33333");
18
19
20 UC3.displayunregDetails();
21
22 Unregistered_customer UC4("Nandun",
   "Nandun@hotmail.com", "0767865432", "44444");
23
24 UC4.displayunregDetails();
25 cout<<"Registered Customers " <<endl<<endl;
26
27 Registered_customer RC1("RG001", "kamal@yahoo.com",
```

Console Shell

```
Unregistered Customers

Name: Kavin
Email Addresskavin@yahoo.com
Phone Number: 0717777770
Postal Code: 11111

Name: Prasa
Email Addressprasa@gmail.com
Phone Number: 0717777770
Postal Code: 22222

Name: Asmi
Email Addressasmi@yahoo.com
Phone Number: 0776543210
Postal Code: 33333

Name: Nandun
Email AddressNandun@hotmail.com
Phone Number: 0767865432
Postal Code: 44444

Registered Customers

User ID: RG001
Email Address: kamal@yahoo.com
Password: zxcv8n7
Discount Amount: Rs.100

User ID: RG002
Email Address: nimal@gmail.com
Password: as3h6gf
```

main.cpp

```
40 //Feedback codes
41 #include <iostream>
42 #include "Feedback.h"
43 #include "Inquiry.h"
44 using namespace std;
45 int main()
46 {
47 Feedback fb;
48
49 fb.feedback(17, (char*)"Saman Perera",
   (char*)"samanPerera@gmail.com", (char*)"Great
   Solution"); //Create Feedback object
50
51 fb.displayFeedback(); //Display Feedback
52 cout << "\n" << endl;
53
54 Inquiry inq;
55
56 inq.enquire((char*)"Dasun Nethsara", 717128328,
   (char*)"Nethsara@gmail.com", (char*)"Change
   Password"); //Create Inquiry object
57
58 inq.displayEnquire(); //Display Inquiry
59
60 return 0;
61 }
```

Console Shell

```
make -s
./main
Feedback No : 17
Customer Name : Saman Perera
Email : samanPerera@gmail.com
Feedback : Great Solution


Customer Name : Dasun Nethsara
Contact Number : 32524
Email : Nethsara@gmail.com
Inquiry : Change Password
```

main.cpp

```
//Admin & Report codes
#include <iostream>
#include <cstring>
#include "Admin.h"
#include "Report.h"
using namespace std;
int main() {
Report rpNo;

rpNo.Reports(4197392, (char*)"CUSTOMR REPORTS");
rpNo.displayReport();

cout << "\n" << endl;
cout << "--------------------------------" << endl;

Admin ADNo;
ADNo.Admins(4, (char*)"Nimal");
ADNo.displayAdmin();

cout << "\n" << endl;
cout << "--------------------------------" << endl;

}
```

Console Shell

```
make -s
./main
Report No : 931554448
Report Name : CUSTOMR REPORTS


--------------------------------
ADMIN ID : 14
ADMIN Name : Nimal


--------------------------------
```

Individual Contributions

IT21175398 – Godage D.N.P

- Wrote the introduction.
- Created and documented the user requirements.
- Created the CRC cards for unregistered user , location.
- Implemented the coding for admin, customer, feedback, inquiry, park location and report class.

IT21176210 - Asmitha Thiraviyarasa

- Created and documented noun verb analysis.
- I have drawn the admin , reports class diagram .
- Created the CRC cards for admin , reports.
- Assisted in implementing the coding for admin , reports.

IT21176142 - Abiramy Kumaresan

- Created and documented noun verb analysis.
- I have drawn the registered user ,reservation class diagram .
- Created the CRC cards for registered user ,reservation.
- Assisted in implementing the coding for registered user ,reservation.

IT21173936 - Kodithuwakku K.G.K.M.J

- I have drawn the payment ,feedback class diagram .
- Assisted in implementing the coding for payment ,feedback.
- Created the CRC cards for payment ,feedback.

IT21174612 - G.G.P.N. De Davin

- Created and documented the user requirements.
- I have drawn the inquiry class diagram.
- Created the CRC cards for inquiry.
- Assisted in implementing the coding for inquiry.