Software Requirements Specification for Car Rental System

A project submitted to

UKA TARSADIA UNIVERSITY

In partial fulfilment of the requirements for the degree of

Bachelor of Science in Information Technology

for

5 Years Integrated M.Sc.(IT)

for 4th Semester

by

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April 2020

CERTIFICATE

Date: 01-04-2020

This is to certify that ***Mr. Shrey Patel (enro.: 201806100110057), Mr. Dilip Rajput (enro.: 201906100120001),*** *students of class S.Y. Five Year Integrated M.Sc.(IT) semester IV had submitted self-creation project entitled "car rental system" in subject 060010413 - CC13 Software Engineering as per Uka Tarsadiya University curriculum for the academic year 2019-20.*

External Examiner

Subject Teacher

Acknowledgements

By the Grace of God we have completed our term paper on the documentation of Software Requirements Specification for a car rental system.
A special thanks to our course instructor Mr Bhavik Sarang Sir and Mrs Jigna Solanki Mam for his supervision throughout
the working time. They helped us a lot by sharing his valuable knowledge with us.

201806100110057, 201906100120001

ABSTRACT:

This report was commissioned on us to investigate and relate different functional, operational and technical requirement of a dedicated desktop application for car rental system. This System will facilitate the functioning of desktop-based Rental Car store. Each type of car should have a different rental fee per day. Rental fee depends on number of day, brand and how fast the car runs.

The system should have the following functionalities:

Rent: The system equipped to answer Customer's inquiries about the availability and rental fee of various "types" of cars for certain dates in the future. When the customer makes a decision about the "Type “of car and the Dates, the system should be able to "Reserve" or "Earmark “the requested type of car for requested dates. The customer should be given a "Confirmation Number”.

Pick Up: The system process a Car Pick Up. Customer walks in and supplies either the confirmation number, or name. The system should pull up all the reservation information about this customer. The customer is then asked to supply a drivers ‘license.

Return: The system process a return. The system should record the date, time and processed by Depending on these parameters, the system calculate the final rental amount.

Table of Content

1 Introduction

Transport facility is a matter of headache for those people who do not have any personal transport in Bardoli town. On occasions like Wedding, Vacation, house shifting, and tour outside Bardoli and on many other situations they feel the necessity of a vehicle to sort out the problems. So if it is possible to design or develop a desktop based application for availing transport whenever and wherever possible, then it will be beneficial for both renter and transport provider. Now a days, by some clicks only, we can get whatever you want at home. We already know about the online shopping, e-banking etc. Similarly, The Car Rental System is the online facility to book cars online within few clicks only. Some people can not afford to have a car, for those people this system becomes very helpful. This system includes various cars, as per the customer order and comfort, it place the order and deliver the car as per the location within the area. For travelling a long distance, booking can be done via internet service only.

1.1 Document Purpose

The advancement in Information Technology and internet penetration has greatly enhanced various business processes and communication between companies (services provider) and their customers of which car rental industry is not left out. This E-Car Rental System is developed to provide the following services:

1.1.1 Enhance Business Processes:

To be able to use internet technology to project the rental company to the global world instead of limiting their services to their local domain alone, thus increase their return on investment (ROI).

1.1.2 Online Vehicle Reservation:

A tools through which customers can reserve available cars online prior to their expected pickup date or time.

1.1.3 Customer's registration:

A registration portal to hold customer's details, monitor their transaction and used same to offer better and improve services to them.

1.1.4 Group bookings:

Allows the customer to book space for a group in the case of weddings or corporate meetings (Event management).

1.2 Product Scope:

This project traverses a lot of areas ranging from business concept to computing field, and required to perform several researches to be able to achieve the project objectives. The area covers include:

- Car rental industry: This includes study on how the car rental business is being done, process involved and opportunity that exist for improvement.
- C# used for the development of the application.
- General customers as well as the company's staff will be able to use the system effectively.
- Desktop-platform means that the system will be available for access 24/7 except when there is a temporary server issue which is expected to be minimal.

1.3 Problem Statement:

A car rental is a vehicle that can be used temporarily for a fee during a specified period. Getting a rental car helps people get around despite the fact they do not have access to their own personal vehicle or don't own a vehicle at all. The individual who needs a car must contact a rental car company and contract out for a vehicle. This system increases customer retention and simplify vehicle and staff management.

1.4 Aims & Objectives Specific goals are –

- To produce a desktop-based system that allow customer to register and reserve car online and for the company to effectively manage their car rental business.
- To ease customer's task whenever they need to rent a car.

2 Overall Description

2.1 Product Perspective:

2.1.1 Existing system function:

A car rental is a vehicle that can be used temporarily for a period of time with a fee. Renting a car assists people to get around even when they do not have access to their own personal vehicle or don't own a vehicle at all. The individual who want to rent a car must first contact the car rental company for the desire vehicle. This can be done online. At this point, this person has to supply some information such as; dates of rental, and type of car. After these details are worked out, the individual renting the car must present a valid Identification Card. Most companies throughout the industry make a profit based on the type of cars that are rented. The rental cars are categorized into economy, compact, compact premium, premium and luxury. And customers are free to choose any car of their choice based on their purse and availability of such car at the time of reservation.
Car Rental System gives car rental service for both foreign and local customers. This organization carries out its daily work by providing; their service to the customers using manually system. The organization uses a manual system for reserving, renting, register and to keep record of all the rental activities and customer information. The detailed existing system functions are listed as follows -

- During car reservation the customers reserve a vehicle by making a phone call to the organization; otherwise he/she is expected to go to the organization to make reservation.
- During renting a car the customer personal information, payments status and rent agreements are filled in the car rent agreement form in order to hold legal contract between the customer and organization for renting the vehicle.
- The organization normal work time schedule is from 1:30am – 6:00pm; therefore the organization gives services for ten and half hours a day.
- The organization makes a general report about the rented cars once at the end of the month and generates a report.

2.1.2 Product functionality:

Car Rental System provides the features for booking a car online. It includes several functionalities describes as below:

2.1.2.1 Car Rental Management:

It provides car reservation facility online. Customer can visit the desktopsite and check for various cars. If they are feasible with requirement, then booking can be done.

2.1.2.2 Checking For Availability:

Employee can check for the availability of the car. He/she maintains the database of car. If no any car is available it is the responsibility of the employee to provide alternative options.

2.1.2.3 Payment system:

Administrator/owner of the applications responsible for payment to the employee. Order cancellation, order finalize, these all activities are done by the administrator of the application.

2.1.2.4 Maintenance Manager:

If any car requires maintain ace like repair or replacement of any parts, then maintenance manager maintain the data about that. Payment of maintenance are done by the administrator of the application.

2.2 Benefits of Online Car Rental Services

- This online car rental solution is fully functional and flexible.
- It is very easy to use.
- This online car rental system helps in back office administration by streamlining and standardizing the procedures.
- It saves a lot of time, money and labor.
- Eco-friendly: The monitoring of the vehicle activity and the overall business becomes easy and includes the least of paper work.
- The application acts as an office that is open 24/7.
- It increases the efficiency of the management at offering quality services to the customers.
- It provides custom features development and support with the application.

2.3 Users and Characteristics:

2.3.1 Admin:

- Admin can login to the system.
- Verify the car information database.
- Generate price strategy.
- Handle the payment system.
- Finalize the order.
- Cancel the order.

2.3.2 Maintenance Manager:

- It checks for the maintenance.

- Give to the maintenance.
- Give information to the admin.
- Update the database.

2.3.3 Customer:

- Customer can login to the system.
- Visit the desktopsite.
- Place the order.
- Cancel the order.

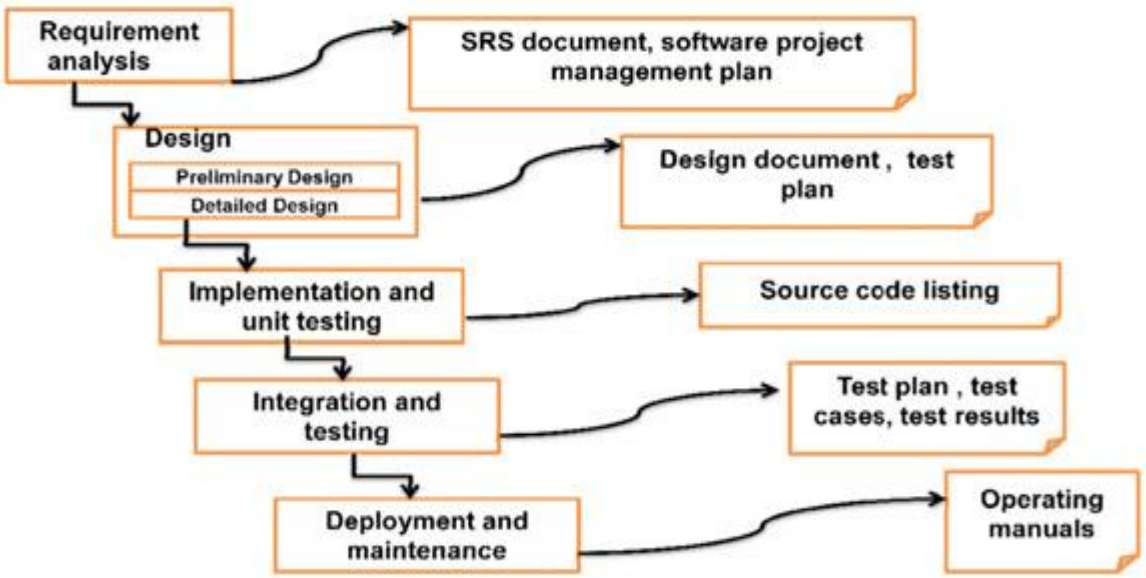
3 Overall Description

3.1 Software Engineering Model

- Waterfall Model
- We have followed this model step is…
  1. Requirement Analysis
  2. Design
  3. Implementation
  4. Unit Testing
  5. Integration and Testing
  6. Deployment and Maintenance

- The waterfall model begins with the the system. It gathers requirements from the customer. At the end SRS and software project plan are produced. The SRS acts as a contract between the customer and the developer.In the design phase, the SRS is transformed into design which is suitable for implementation in a programming language. First preliminary design is made then detailed design is m initial test plan are produced at the end of this phase
  - During the implementation phase.
  - In unit testing small modules are tested in isolation and the overhead code is written for handling communication amongst these modules.
  - After implementation and unit testing, the modules are integrated to form a complete system. Integration and testing are carried out to verify the functionality of the system.

After proper testing the software is, test phase and test results are outputs in this phase



4 Specific Requirement

4.1 Functional Requirements:

These are statements of services the system should provide, how the system should react to particular inputs, and how the system should behave in particular situations. It specifies the application functionality that the developers must build into the product to enable users to accomplish their tasks.

4.1.1 Reservation:

- The system must allow the customer to register for reservation.
- The system shall allow the customer to view detail description of particular car.
- The system must notify on selection of unavailable cars while reservation.
- The system shall present an option for advanced search to limit the car search to specific categories of car search.
- The system must allow the customers to select specific car using different search category while reservation.
- The system must view list of available car during reservation.
- The system shall allow the customers to cancel reservation using reservation confirmation number.
- The system shall allow the employee to update reservation information.
- The system shall allow the employee to view reservations made by customers.
- The system shall presents information on protection products and their daily costs, and requests the customer to accept or decline regulation terms during reservation.
- The system must be able to provide a unique reservation conformation number for all successfully committed reservations.
- The system must be able to display reservation summary for successfully committed reservation.

4.1.2 Log in:

- The system should allow manager to login to the system using their username and password.
- The system should allow employee to login to the system using their username and password.
- The system shall allow the manager to create new user account.
- The system shall allow manager to change account password.
- The system shall allow staff to change account password.
- The system shall allow staff to

4.1.3 Car:

- The system should allow staff to register new cars.
- The system shall allow staff to select cars in the list.
- The system shall allow customer to select cars in the list.
- The system shall allow staff to Search cars by specific record.
- The system shall allow customer staff to Search cars by specific record.
- The system shall allow staff to update information of the car in need of modification.
- The system shall allow staff to display all lists of car.
- The system shall allow staff to display all available car.
- The system shall allow customer to display all available car.
- The system shall allow staff to display all rented car.
- The system shall allow staff to display all off duty car.

4.2.4 Rent:

- The system shall allow staff to register customers into rental list.
- The system shall allow staff to update about customer rent record details in the rental list.
- The system shall be able to save all changes made on the customer rent list.
- The system shall allow staff to select customer rent record by specific search category.
- The system shall allow staff to search rent record of customers using specific categories.
- The system shall allow staff to display customers, who rent cars.
- The system shall allow staff to display all customers rent record.
- The system must provide printable summary for successful committed rent.

4.2 Non-functional Requirements:

Non-functional requirements, as the name suggests, are requirements that are not directly concerned with the specific services delivered by the system to its users. They may relate to emergent system properties such as reliability, response time, and store occupancy. Alternatively, they may define constraints on the system implementation such as the capabilities of I/O devices or the data representations used in interfaces with other systems. Non-functional requirements, such as performance, security, or availability, usually specify or constrain characteristics of the system as a whole.

4.2.1 Usability:

The system provides a help and support menu in all interfaces for the user to interact with the system. The user can use the system by reading help and support.

4.2.2 Security:

The system provides username and password to prevent the system from unauthorized access. The staffs' password must be greater than eight characters. The subsystem should provide a high level of security and integrity of the data held by the system, only authorized personnel of the company can gain access to the company's secured page on the system; and only users with valid password and username can login to view user's page.

4.2.3 Performance:

The system response time for every instruction conducted by the user must not exceed more than a minimum of 10 seconds. The system should have high performance rate when executing user's input and should be able to provide response within a short time span usually 50 second for highly complicated task and 20 to 25 seconds for less complicated task.

4.2.4 Availability:

The system should always be available for access at 24 hours, 7 days a week. Also in the occurrence of any major system malfunctioning, the system should be available in 1 to 2 working days, so that business process is not severely affected.

4.2.5 Error handling:

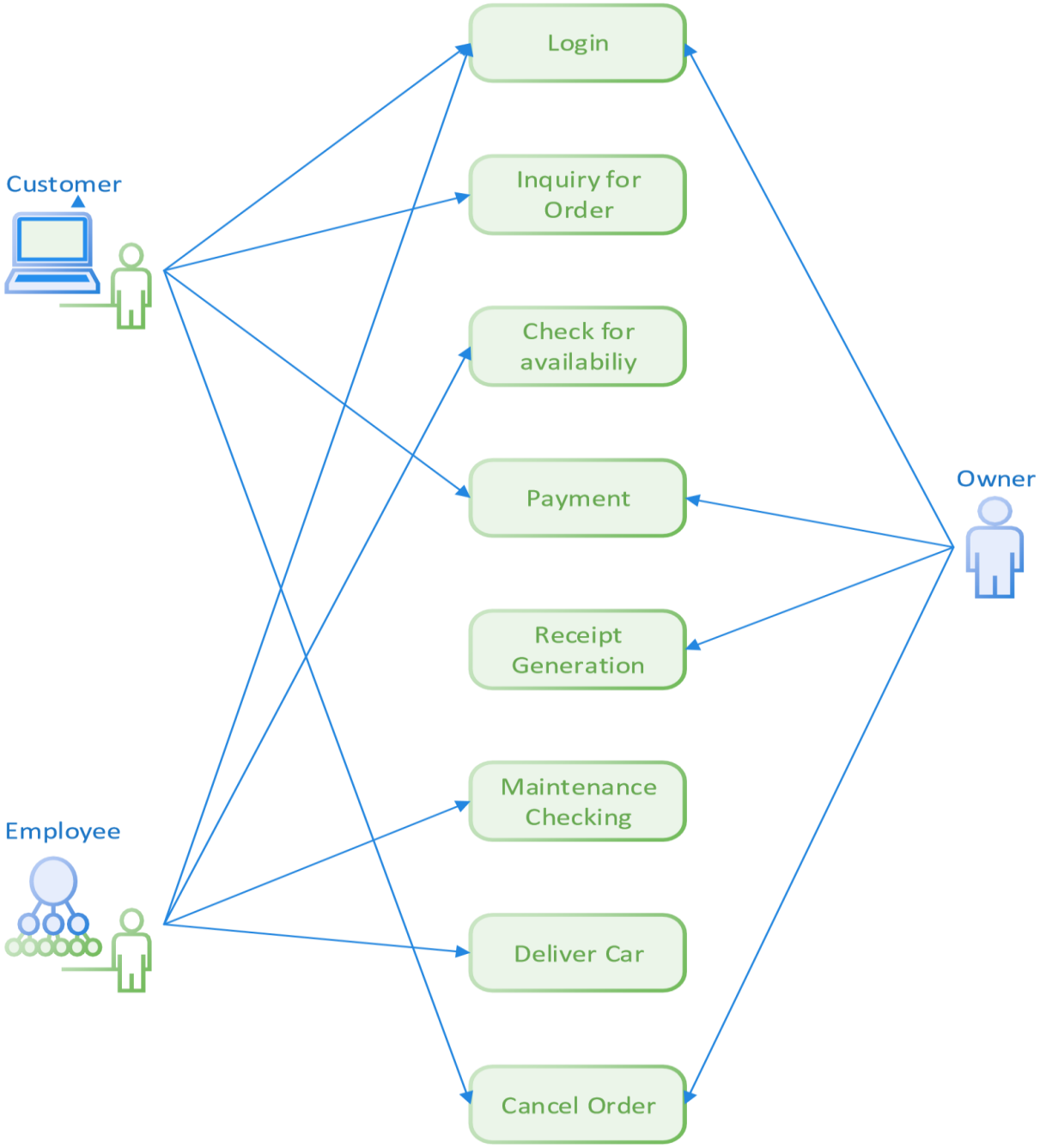
Error should be considerably minimized and an appropriate error message that guides the user to recover from an error should be provided. Validation of user's input is highly essential. Also the standard time taken to recover from an error should be 15 to 20 seconds.

4.2.6 Ease of use:

Considered the level of knowledge possessed by the users of this system, a simple but quality user interface should be developed to make it easy to understand.

5. System Analysis

Use case Diagram



Actor and use case description shows the detail description of interaction between the actors and their use cases. The description enables to have a proper understanding of how actor interacts with the system through their use cases.

Customer

5.1.1 Register as member:

This use case describes the activities of the customer to register online and become a member. Customer's details are required as part of the registration. Login detail is automatically sent to the customer after successful registration.

5.1.2 Make reservation:

This use case enable customer to search and make reservation. Non-register customer will be directed to register before their reservation can be confirmed. Notification is automatically send to the customer after the task is completed.

5.1.3 Return car:

This use case describes the event of customer returning the car borrowed, the use case extends "process rental" use case from the staff actor.

5.1.4 Give feedback:

This use case is used by the customer to provide feedbacks/comment to the company; a confirmation notification will be send to the customer once a feedback has been submitted.

Staff

5.1.5 Add new car:

This use case is used by the staff to add new car to the company's fleet database. Staff will need to login to activate this use case.

5.1.6 Update car details:

This use case is used by the staff to edit and modify car details whenever there is new renewal (insurance, road tax). It allows the company to keep up-to-date record of their fleet.

5.1.7 Reply to customer’s feedback:

This use case describes the event by which staff sends reply to customer's earlier feedback. It depends on `give feedback' use case from the customer.

5.1.8 Process rental:

This use case described the event by which staff updates the system when customer pick up or when returning car.

Admin

5.1.9 Add new staff:

This use case describes the event by which Admin add new staff detail to the company's staff database.
It is invoke whenever a new staff join the company.

5.1.10 View report:

This use case is used by the Admin to view transaction report.

Activity Diagram:

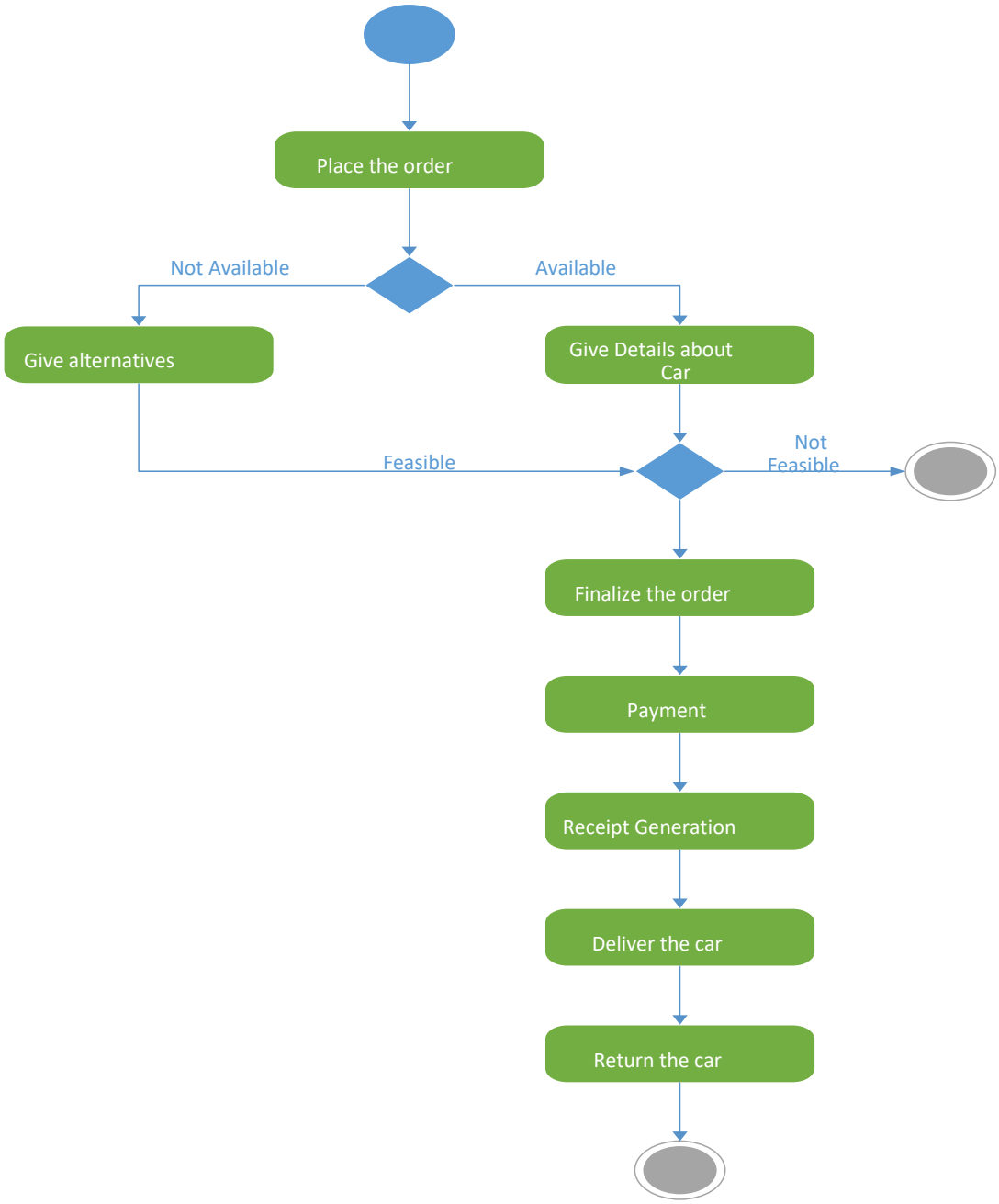


Figure 5.2.1 Activity Diagram of the system

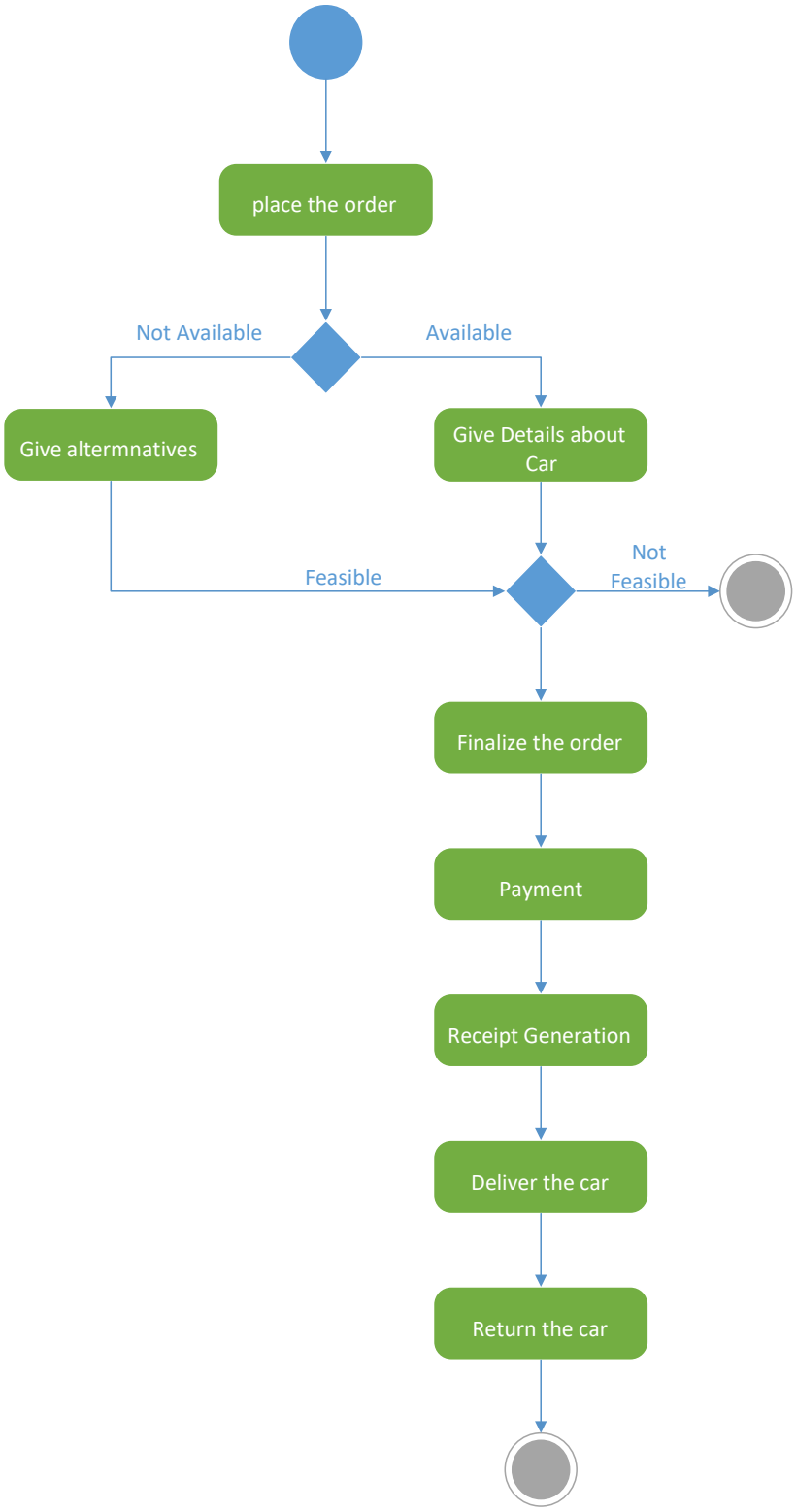


Figure 5.2.2: Member Registration

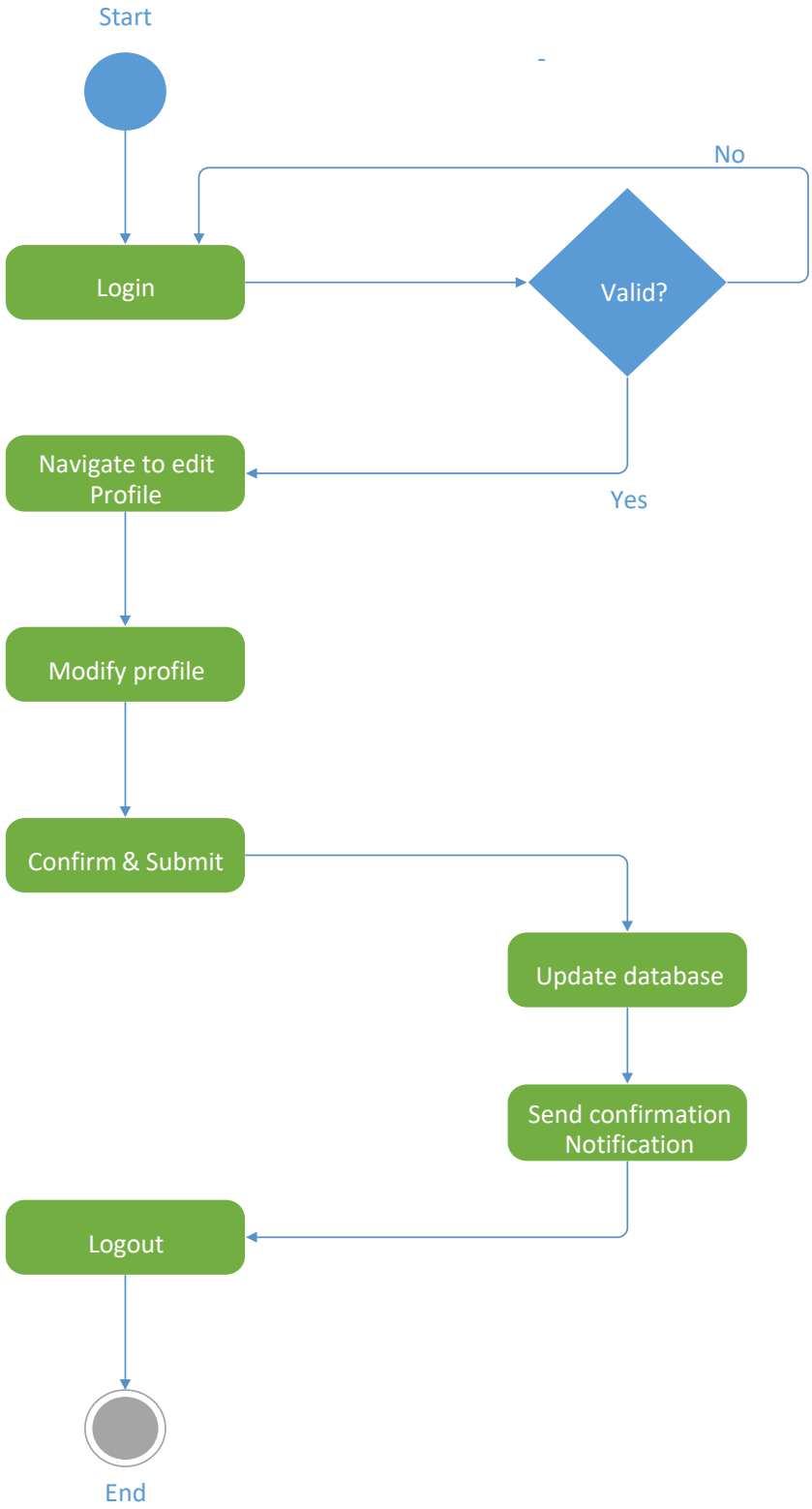


Figure 5.2.3: Profile Modification

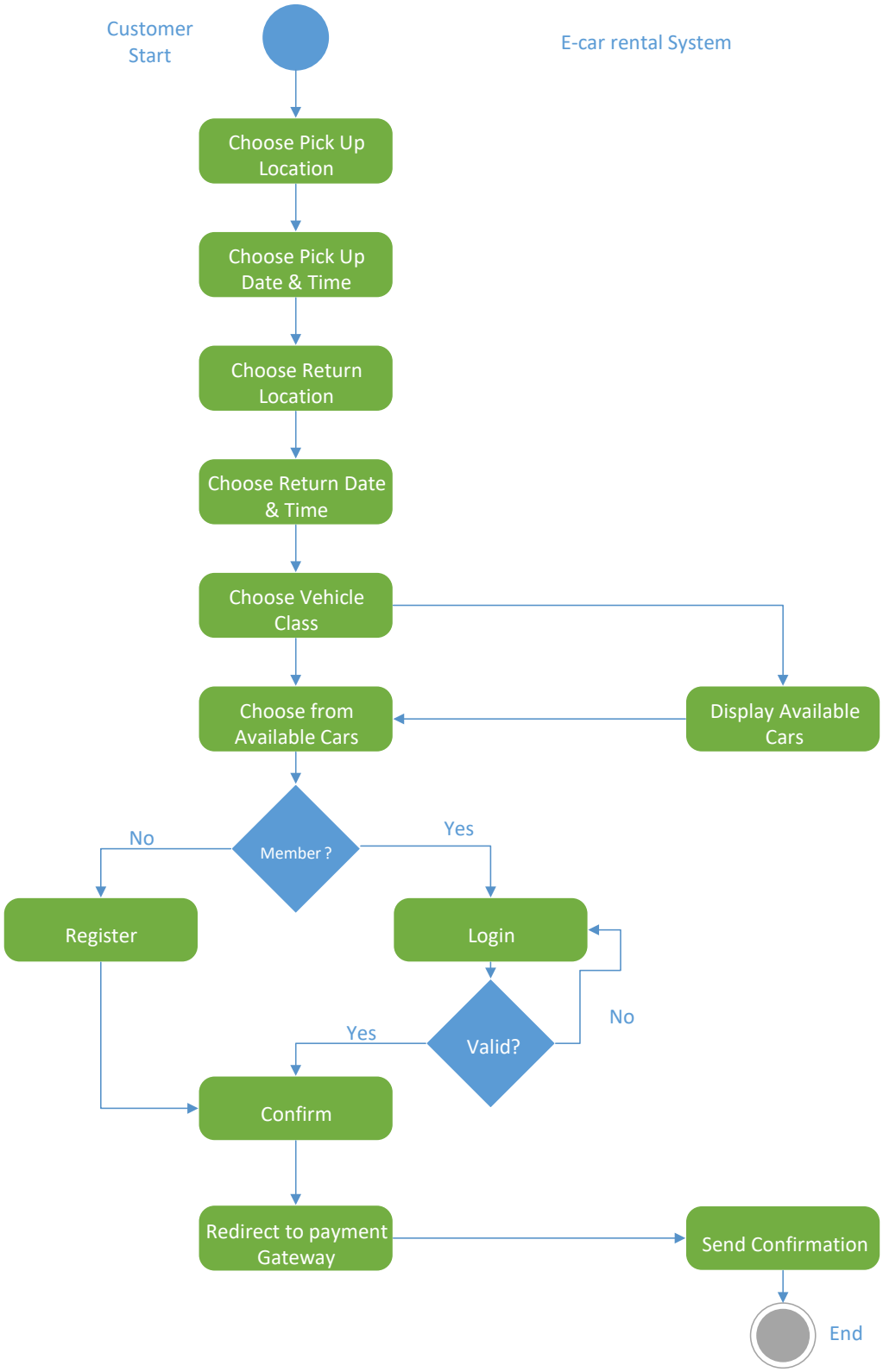


Figure 5.2.4: Reservation of Car

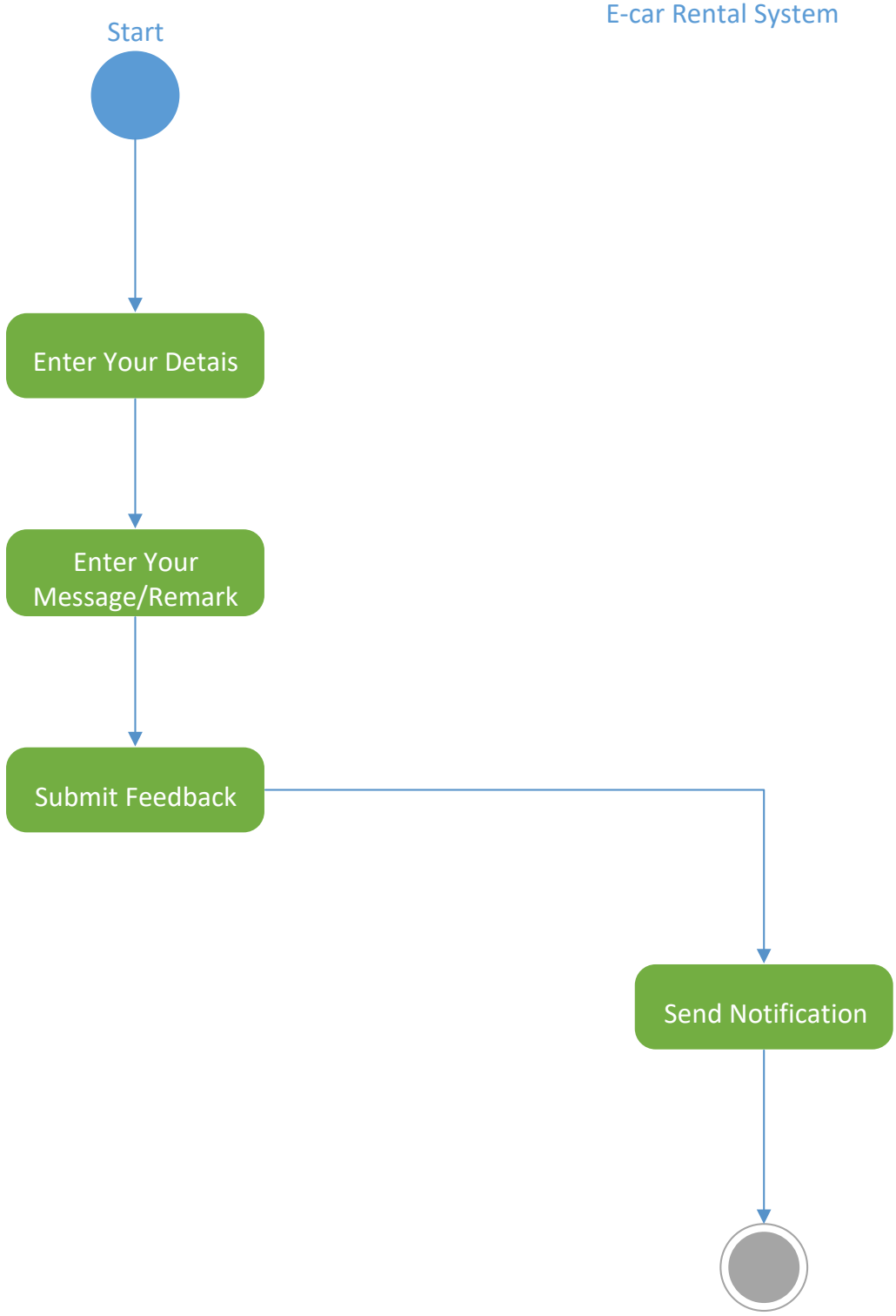


Figure 5.2.5: Customer Feedback

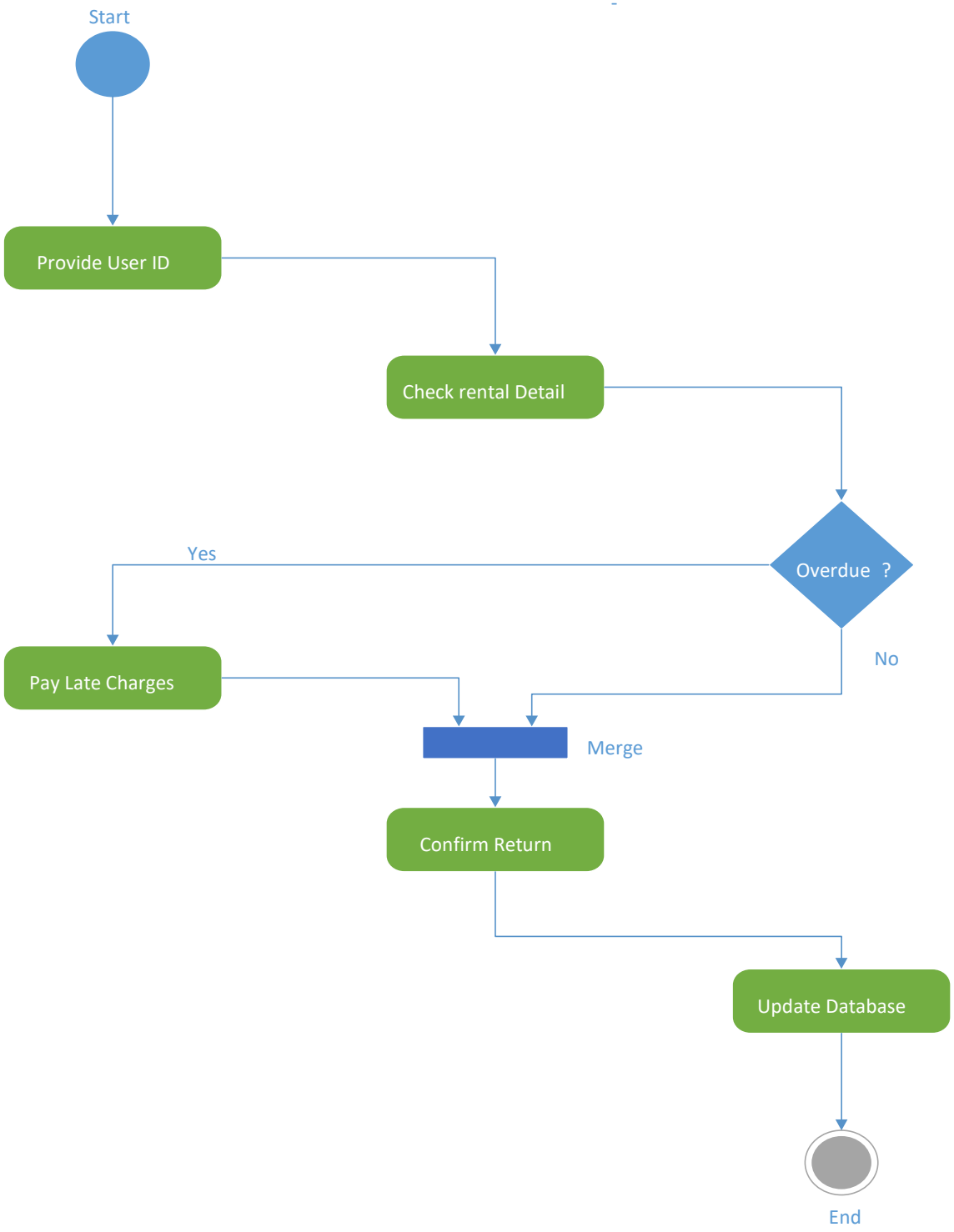


Figure 2.5.6: Payment of Car Rent

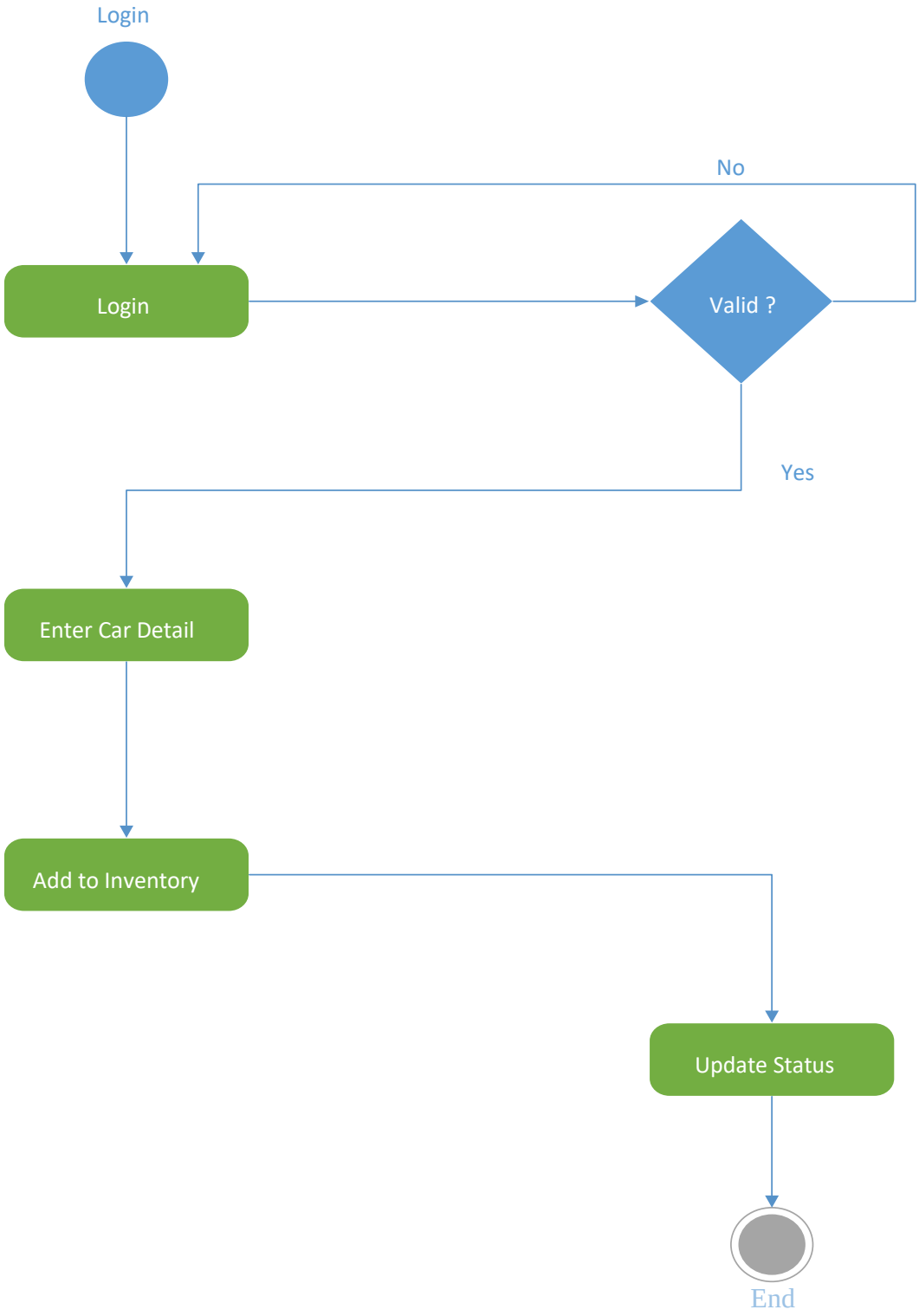


Figure 5.2.7: Adding a New Car

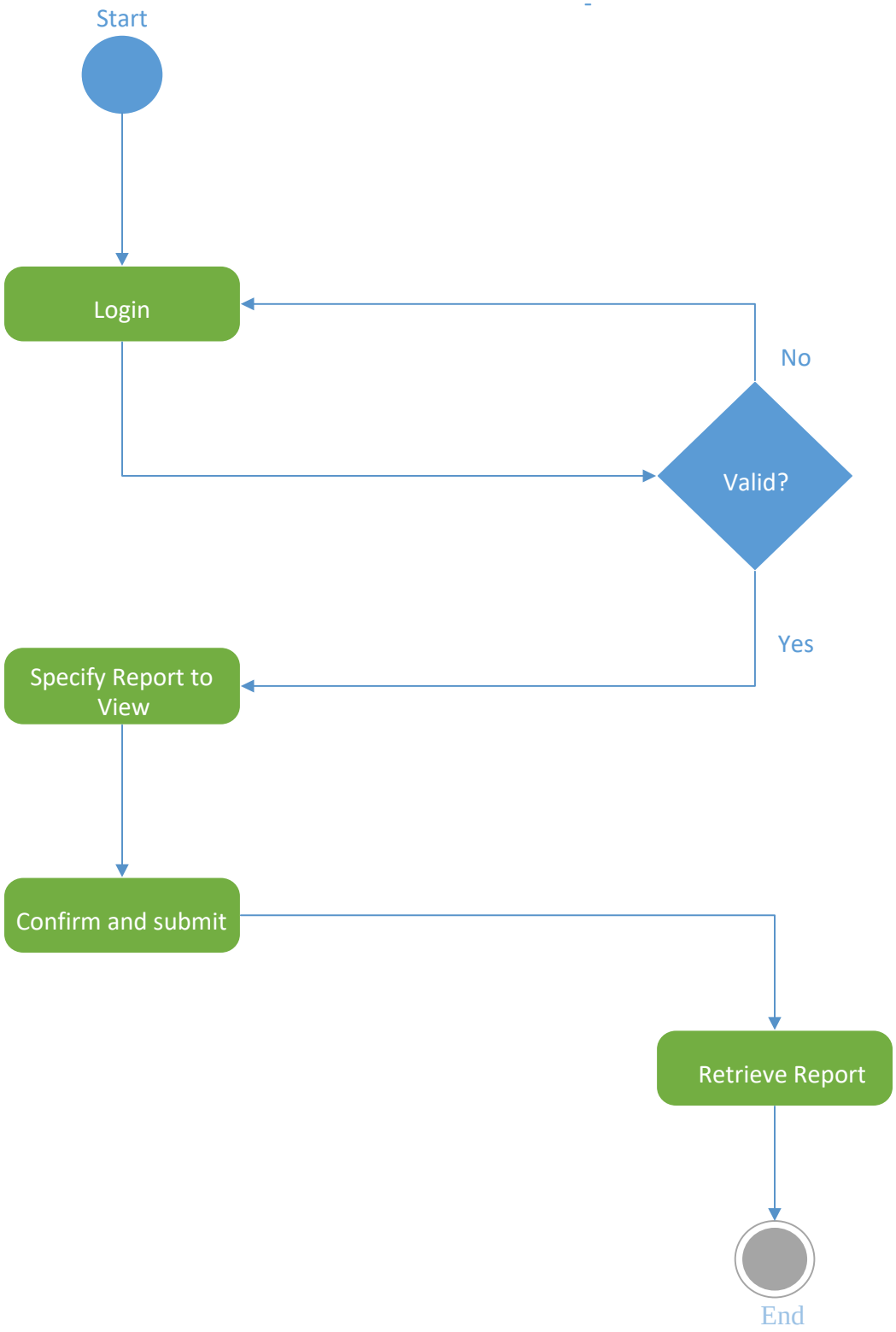
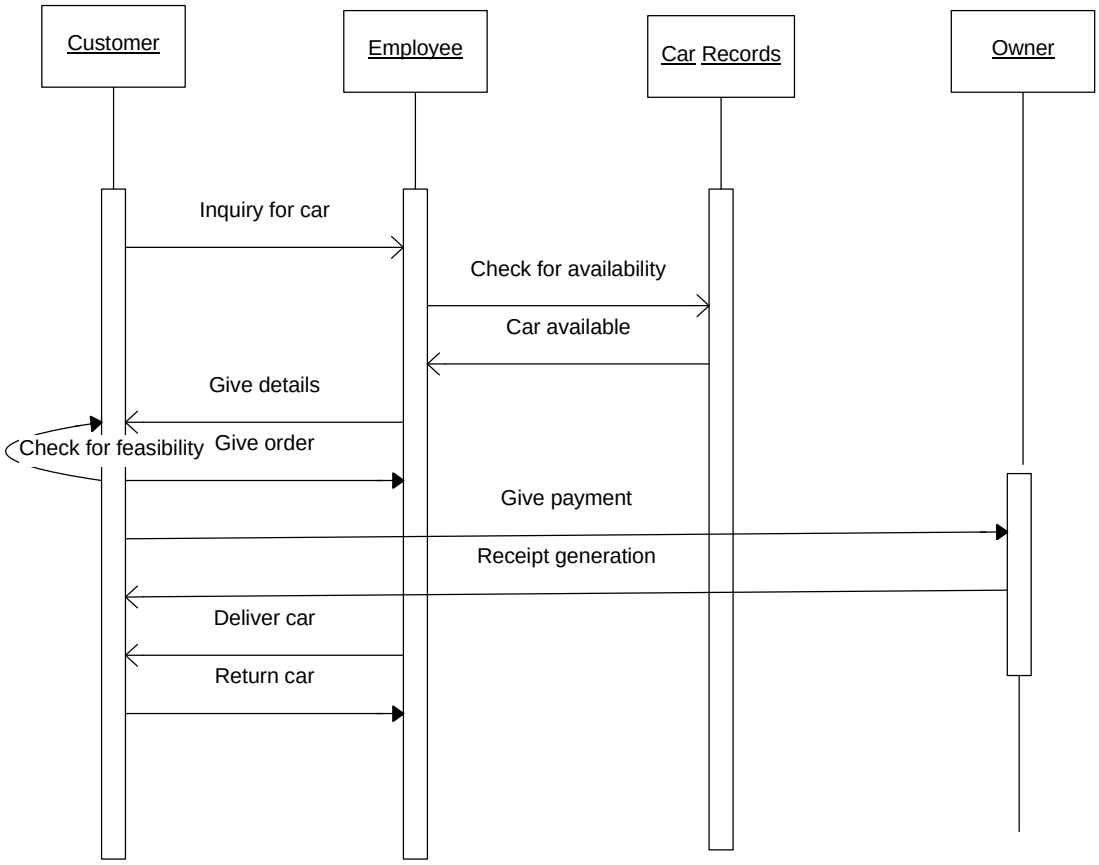


Figure 5.2.8: View Report

Sequence Diagram:

Sequence diagrams are used to demonstrate the behavior of objects in a use case by describing the objects and the messages they pass. It provides a graphical representation of object interactions over time. Sequence diagrams show an actor, the objects and components they interact with in the execution of a use case. One sequence diagram represents a single Use Case 'scenario' or events. Sequence diagrams show the flow of messages from one object to another, and as such correspond to the methods and events supported by an object.



6. System Design

Data Dictionary

Table Name		Admin		
Description		This table is store information about Admin		
Primary Key		A_id		
Foreign Key		-		
Sr. No	**Field Name**	**Data type(Size)**	**Constraints**	**Description**
1	A_id	Int	Primary Key	It is store Admin id
2	A_Name	Varchar(10)	Not Null	It is store admin name
3	Password	Varchar(20)	Not Null	It is store the password of Admin
4	Contact_No	Varchar(12)	Not Null	It is store the Contact no of Admin
5	E_mail	Varchar(70)	Not Null	It is store the Email id of Admin

Table Name	UserMaster
Description	This table is provide the information about User registration
Primary Key	U_Id
Foreign Key	-

Sr. No	**Field Name**	**Data type(Size)**	**Constraints**	**Description**
1	U_Id	Int	Primary Key	It is store User id
2	Full_name	Varchar(50)	Not Null	It is store User name
3	Password	Varchar(20)	Not Null	It is store Password
4	Address	Varchar(100)	Not Null	It is store address of User
5	Birthdate	Datetime	Not Null	It is store Birthdate
6	Contact_No	Varchar(12)	Not Null	It is store Contact no
7	Email	Varchar(50)	Not Null	It is store email address of User

Table Name	Car			
Description	This table is provide the information about Car			
Primary Key	C_Id			
Foreign Key	-			
Sr. No	**Field Name**	**Data type(Size)**	**Constraints**	**Description**
1	C_Id	Int	Primary Key	It is store Car id
2	Model_Name	Varchar(20)	Not Null	It is store Model name
3	Brand	Varchar(20)	Not Null	It is store Brand of the car
4	Color	Varchar(10)	NotNull	It is store Color name of the car
5	No_of_Pas	Varchar(10)	NotNull	It is store information of passenger seats
6	Price	Int	NotNull	It is store price of the car
7	Image	Varchar(50)	NotNull	It is store images of car
8	Fueltype	Varchar(10)	NotNull	It is store fueltype in car

Table Name	Booking
Description	This table is provide the information about book the car
Primary Key	-
Foreign Key	Car_Id

Sr. No	**Field Name**	**Data type(Size)**	**Constraints**	**Description**
1	C_Id	Int	Foreign Key	It is references to C_Id from car
2	Name	Varchar(20)	Not Null	It is store name of the car
3	Date	DateTime	Not Null	It is store booking date
4	S_address	Varchar(50)	NotNull	It is store source address
5	D_address	Varchar(50)	NotNull	It is store information about destination address
6	Email_Id	Varchar(50)	NotNull	It is store email address
7	No_Pieces	Int	NotNull	It is store information how many car available in time
8	Contact_No	Varchar(12)	NotNull	It is store Contact no of user

Table Name	Enquiry
Description	This table will store the information of car enquiry of user
Description	This table will store the information of car enquiry of user
Primary Key	E_Id
Foreign Key	-

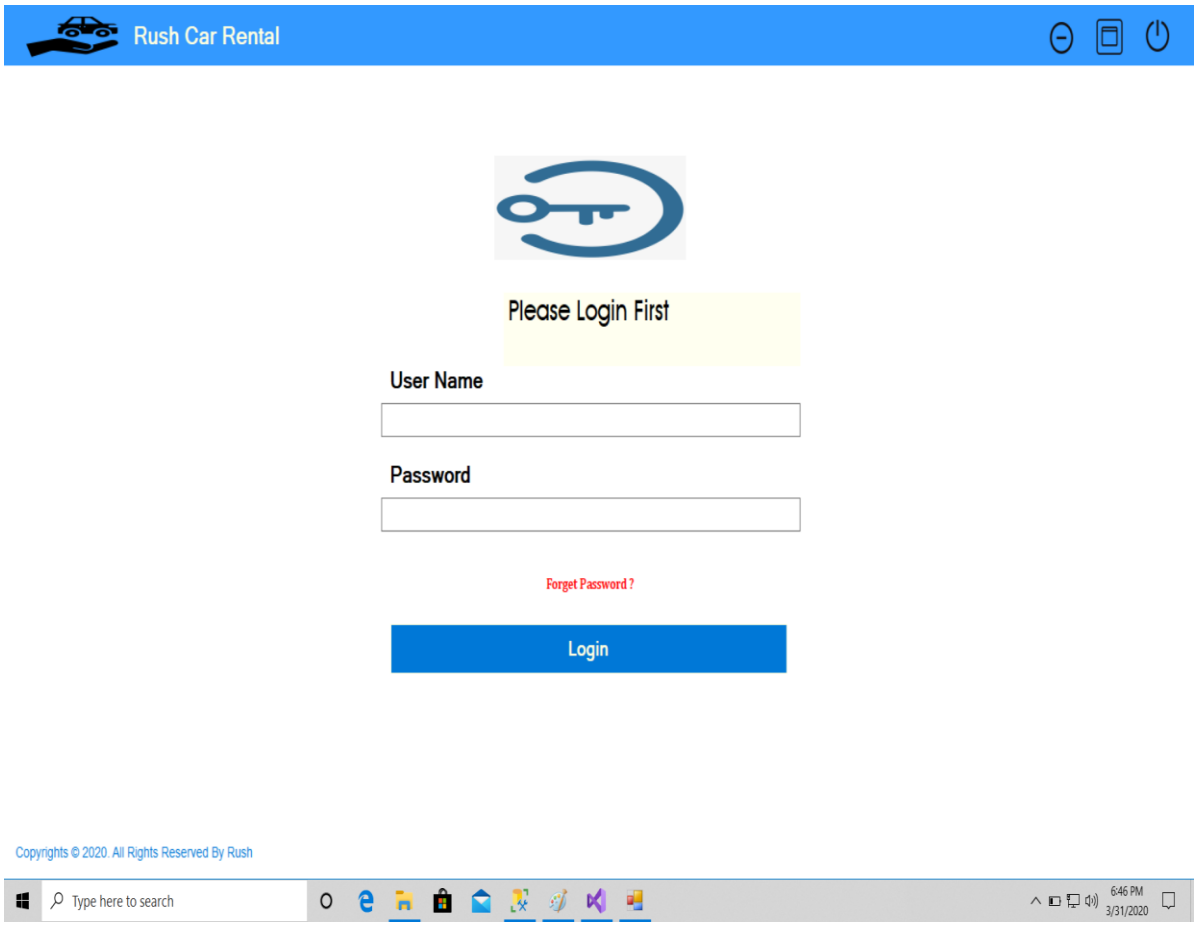
Sr. No	**Field Name**	**Data type(Size)**	**Constraints**	**Description**
1	E_Id	Int	Primary Key	It is store enquiry id
2	User_Name	Varchar(20)	Not Null	It is store user name
3	Email_Id	Varchar(50)	Not Null	It is store email id
4	Contact_No	Varchar(12)	NotNull	It is store contact no for user
5	Date_From	DateTime	NotNull	Display date of which the car should take
6	To_Date	DateTime	NotNull	Display date that is required date will come
7	Query	Varchar(50)	NotNull	It is store query of the user

Table Name	Payment
Description	This table store information about payment
Primary Key	P_Id
Foreign Key	-

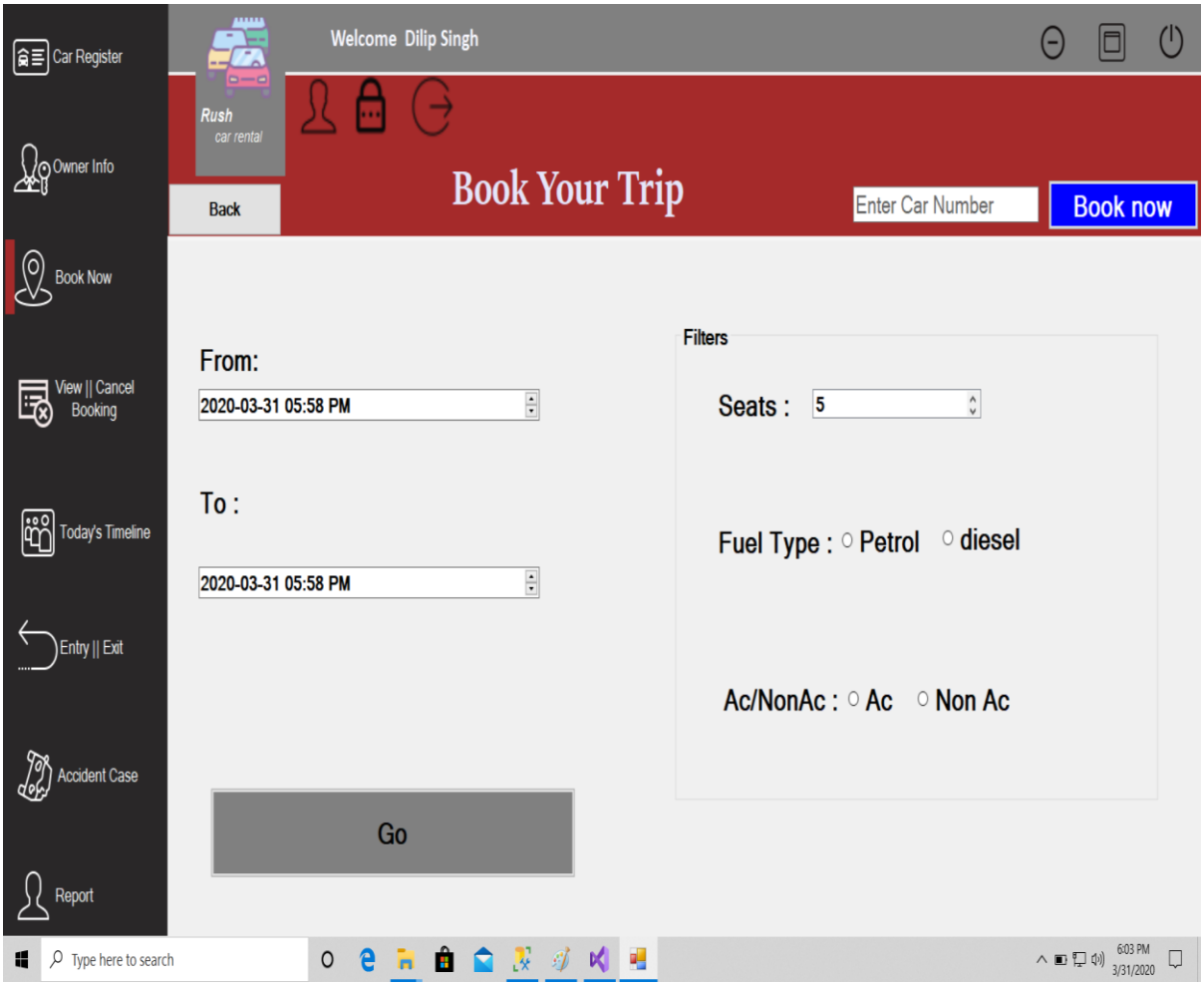
Sr. No	**Field Name**	**Data type(Size)**	**Constraints**	**Description**
1	P_Id	Int	Primary Key	It is store Payment id of user
2	Car_Name	Varchar(20)	Not Null	It is store Car name
3	Email	Varchar(70)	NotNull	It is store email id for user
4	Amount	Int	NotNull	It is store Amount of car rent

7. System Implementation

Screenshots



Login Page


Car Register
Owner Info
Book Now
View || Cancel Booking
Today's Timeline
Entry || Exit
Accident Case
Report
Welcome Dilip Singh
Rush
car rental
Back
Book Your Trip
Enter Car Number
Book now
From:
2020-03-31 05:58 PM
To :
2020-03-31 05:58 PM
Filters
Seats :
5
Fuel Type : Petrol diesel
Ac/NonAc : Ac Non Ac
Go
Type here to search
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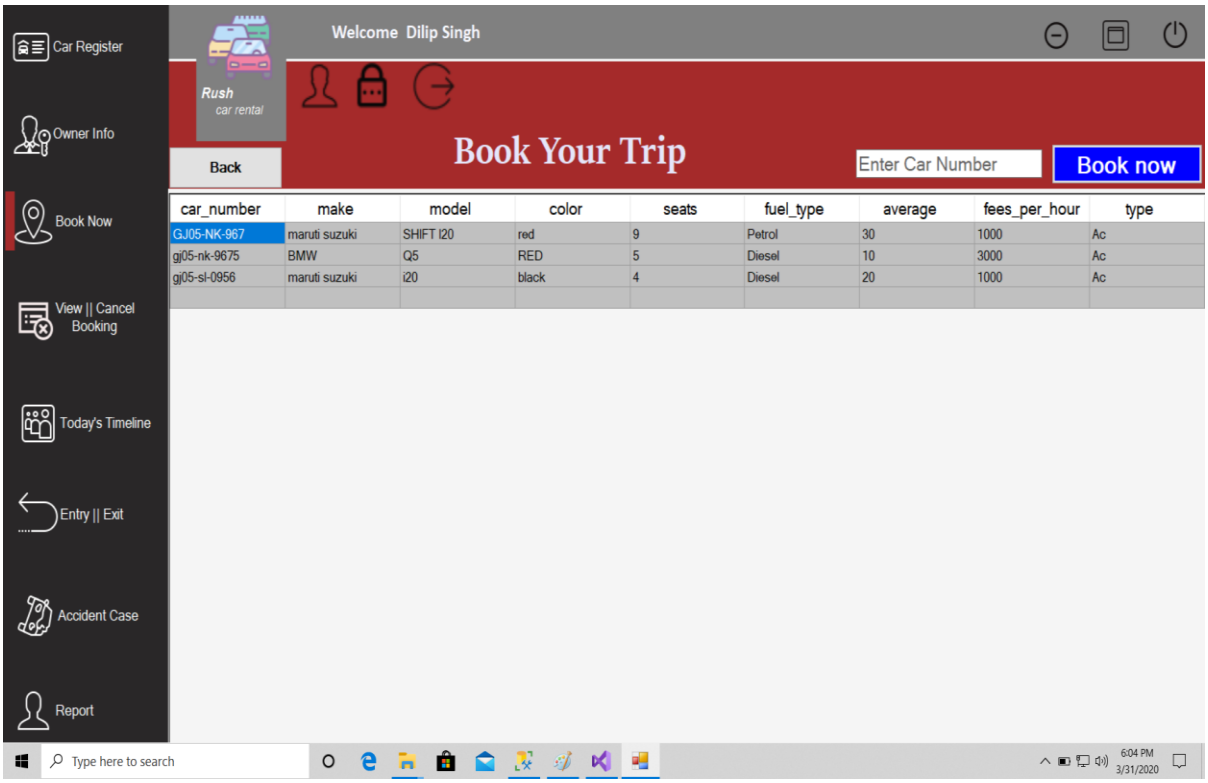
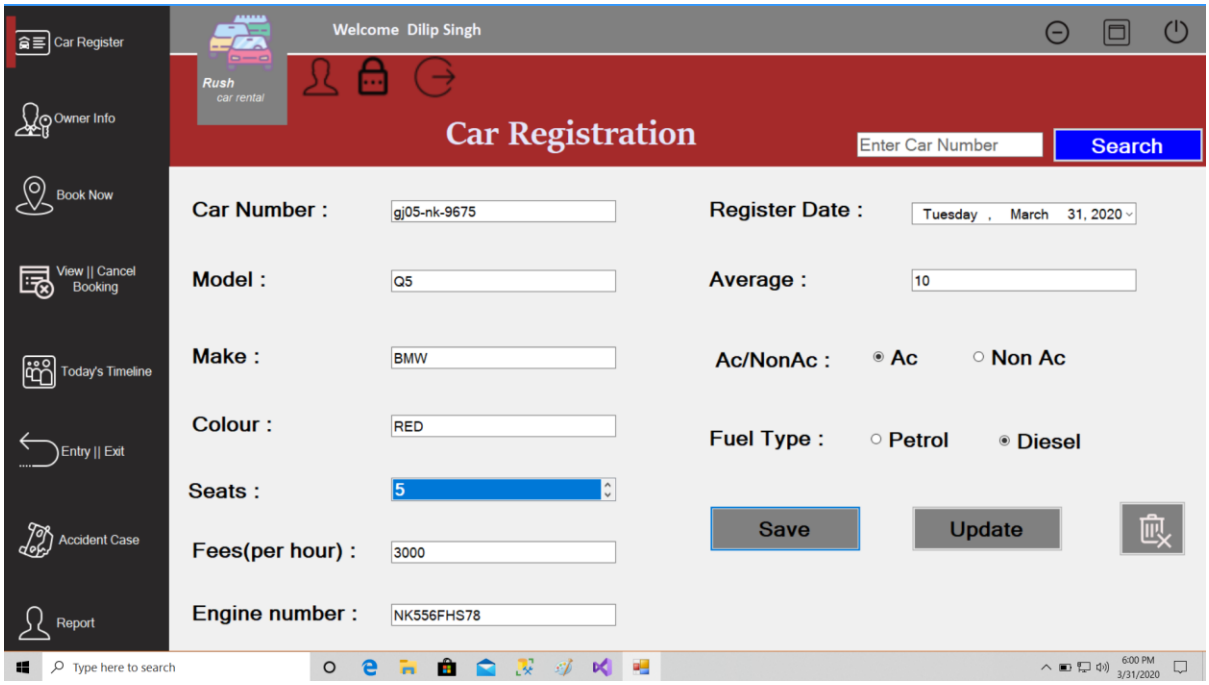
3/31/2020

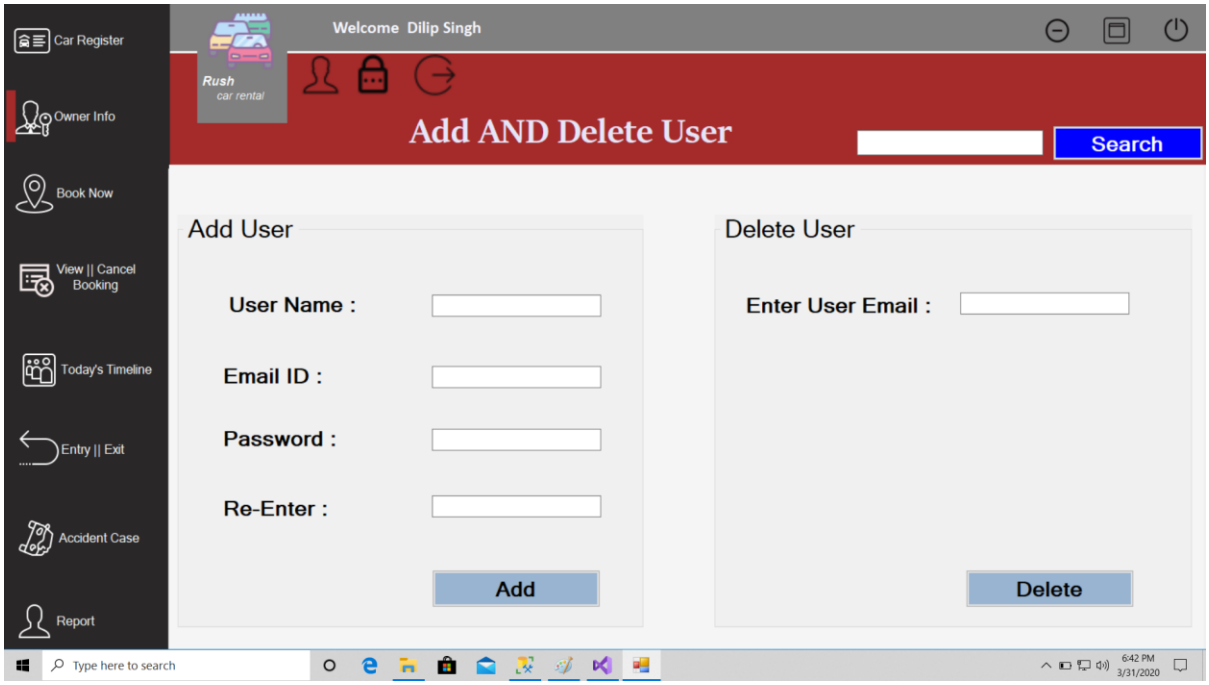
Booking



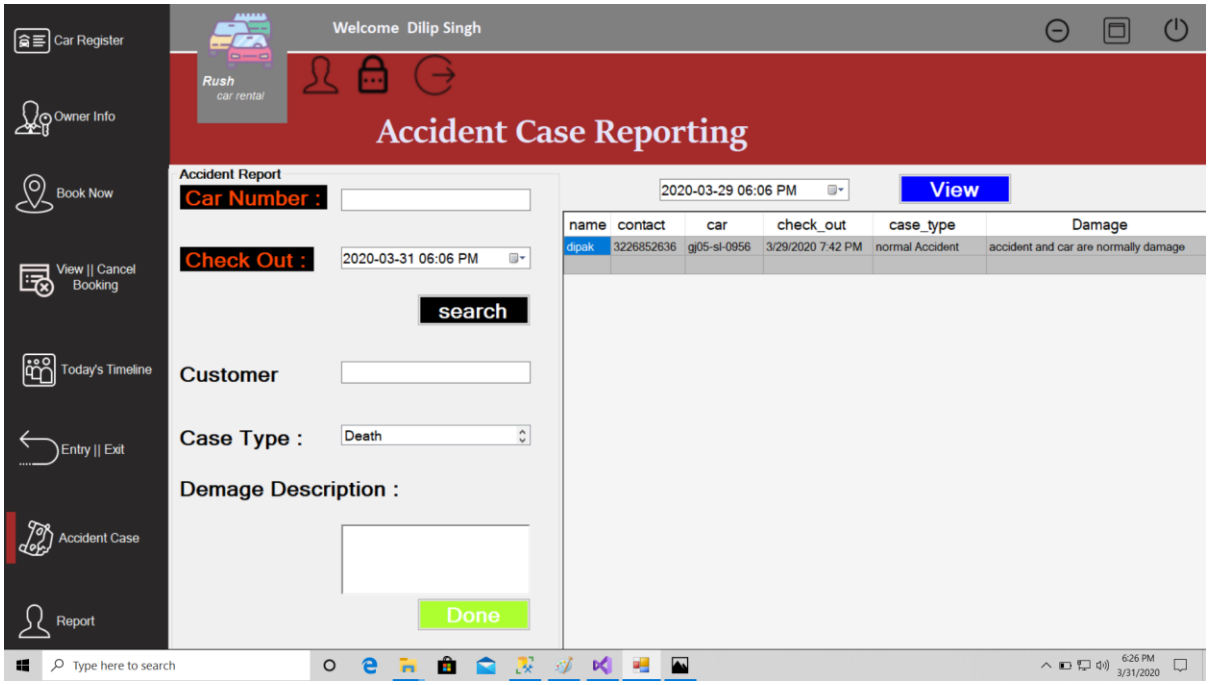
Booking Availability



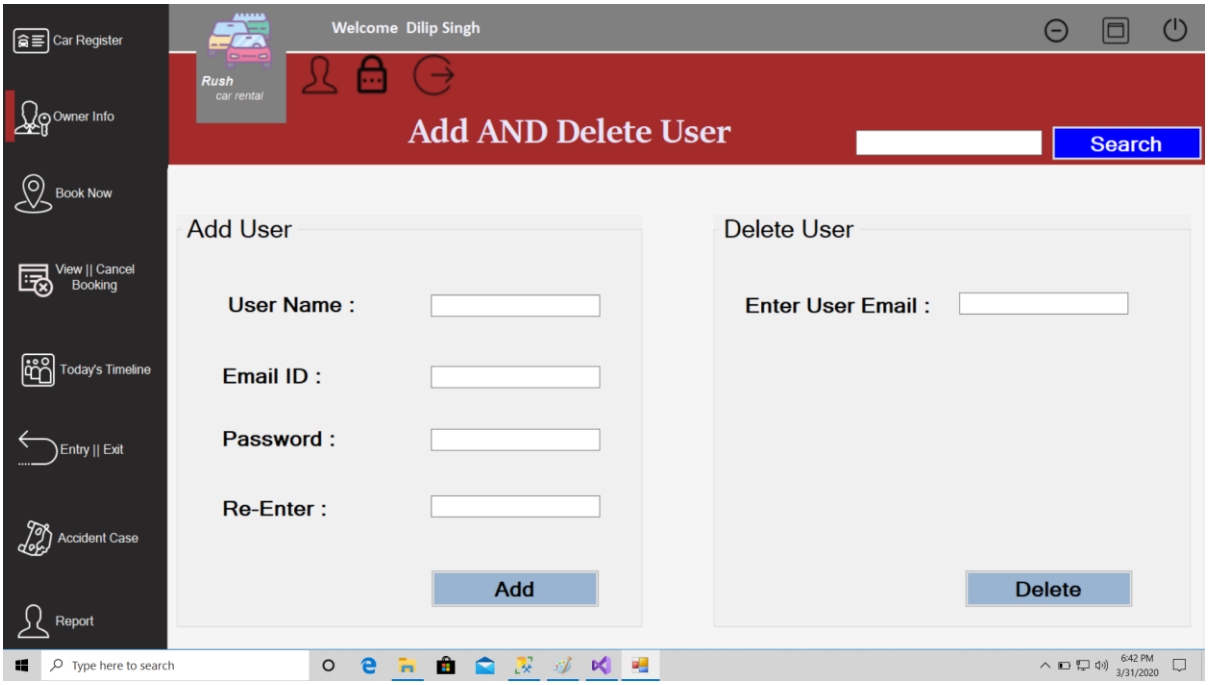
Car Registration


Car Register
Owner Info
Book Now
View || Cancel Booking
Today's Timeline
Entry || Exit
Accident Case
Report
Welcome Dilip Singh
Rush
car rental
Add AND Delete User
Search
Add User
User Name :
Email ID :
Password :
Re-Enter :
Add
Delete User
Enter User Email :
Delete
Type here to search
6:42 PM
3/31/2020

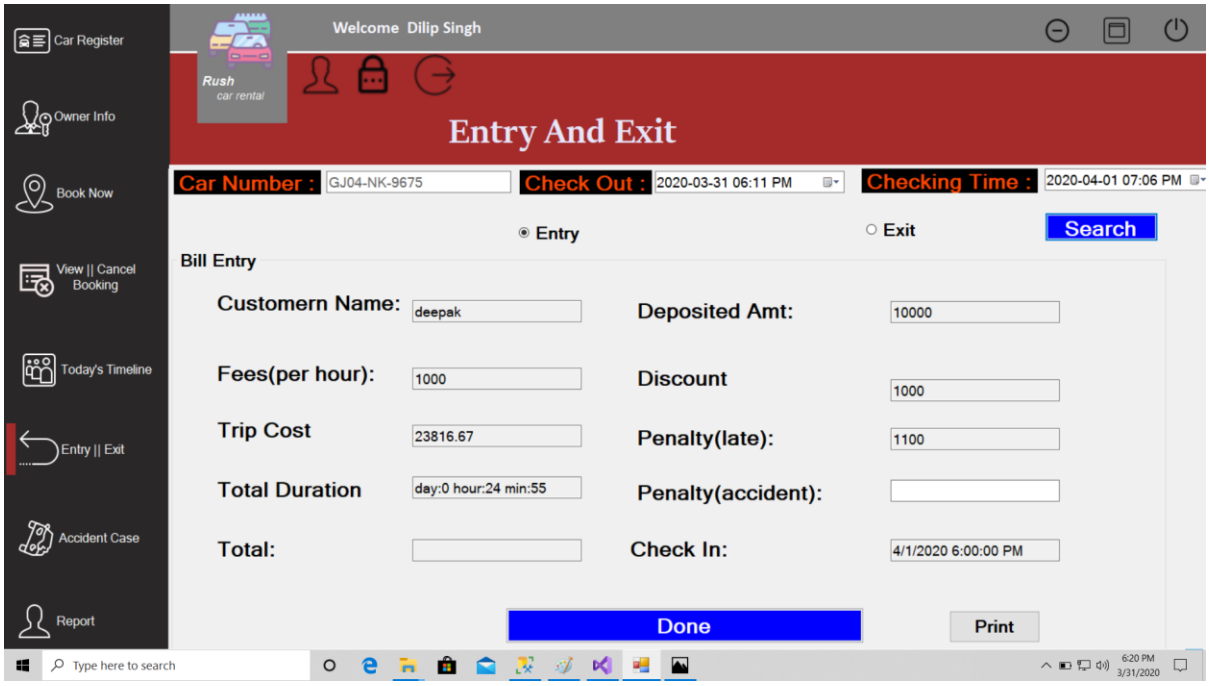
Add New User



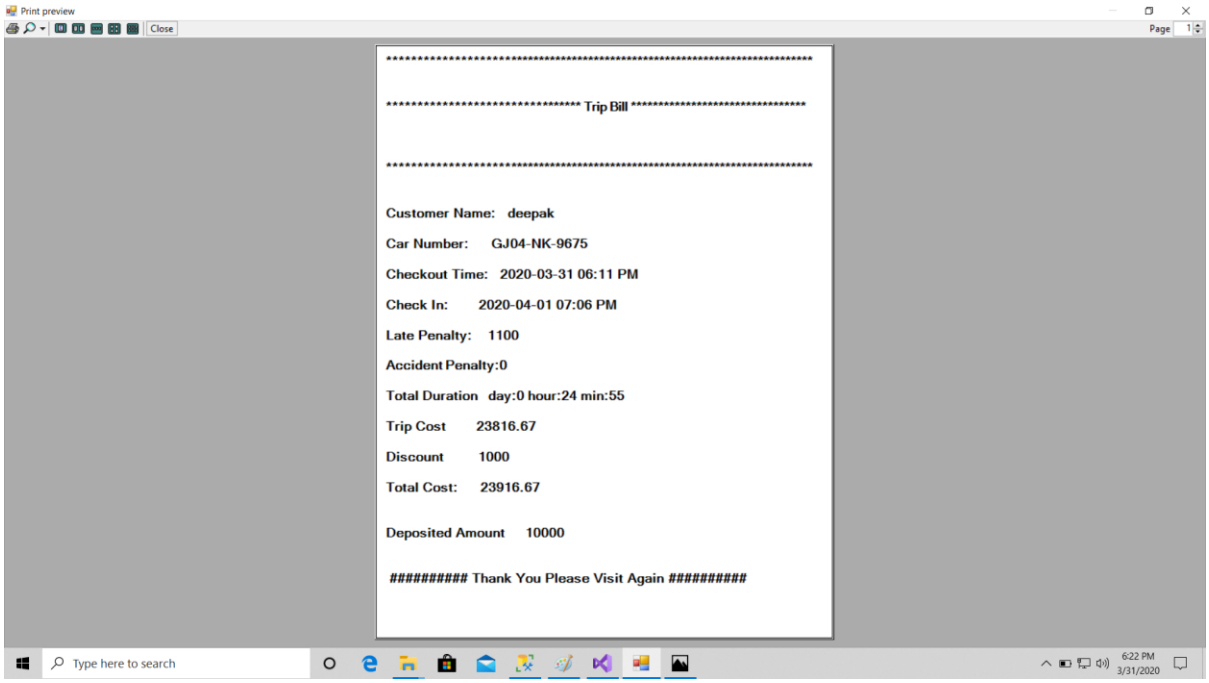
Accident Report



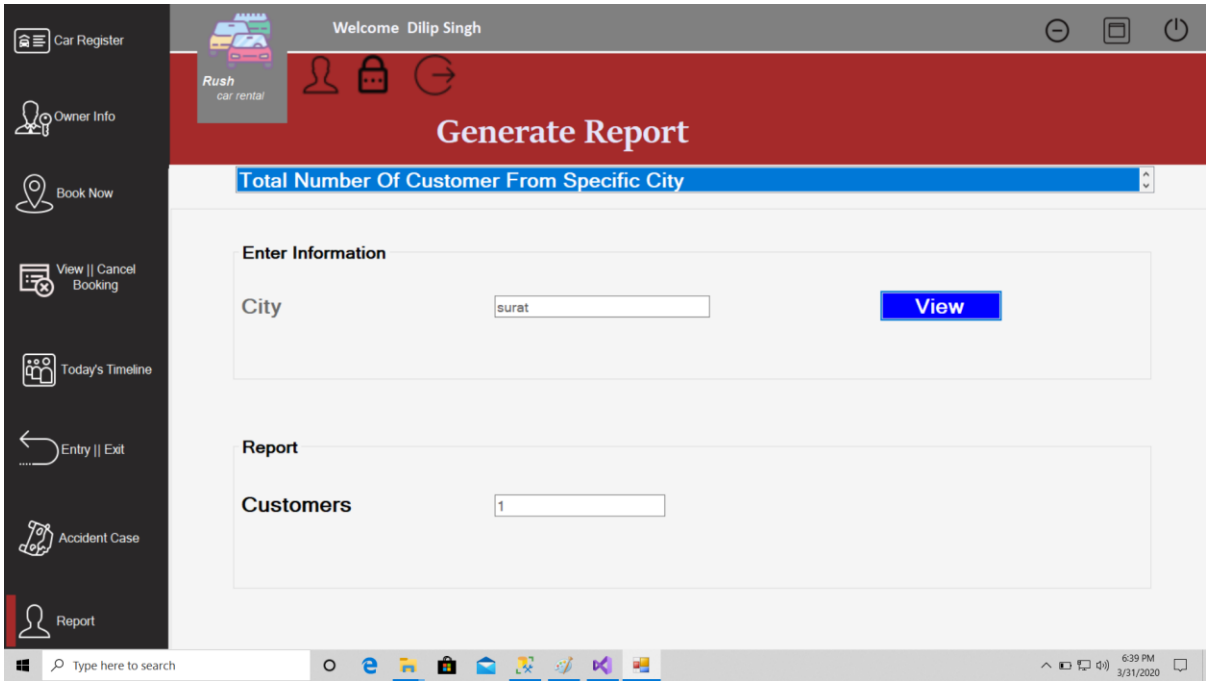
Add New Users


Car Register
Owner Info
Book Now
View || Cancel Booking
Today's Timeline
Entry || Exit
Accident Case
Report
Welcome Dilip Singh
Rush
car rental
Entry And Exit
Car Number :
GJ04-NK-9675
Check Out :
2020-03-31 06:11 PM
Checking Time :
2020-04-01 07:06 PM
Entry
Exit
Search
Bill Entry
Customern Name:
deepak
Deposited Amt:
10000
Fees(per hour):
1000
Discount
1000
Trip Cost
23816.67
Penalty(late):
1100
Total Duration
day:0 hour:24 min:55
Penalty(accident):
Total:
Check In:
4/1/2020 6:00:00 PM
Done
Print
Type here to search
6:20 PM
3/31/2020

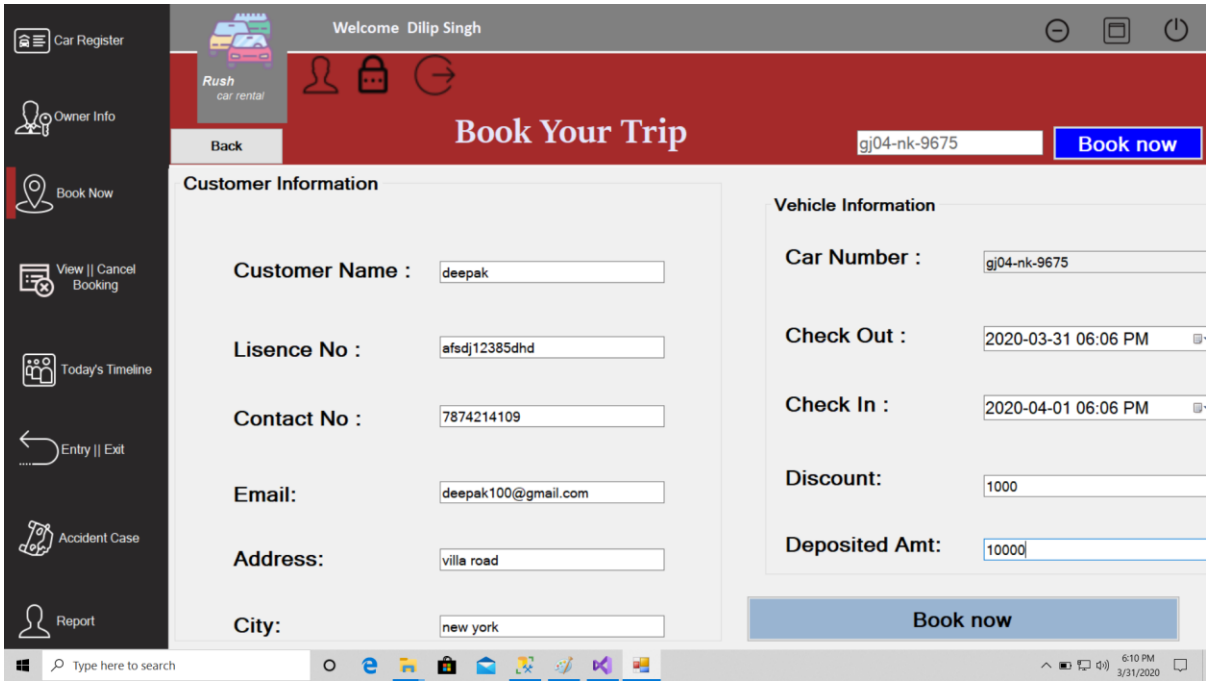
Bill Entry



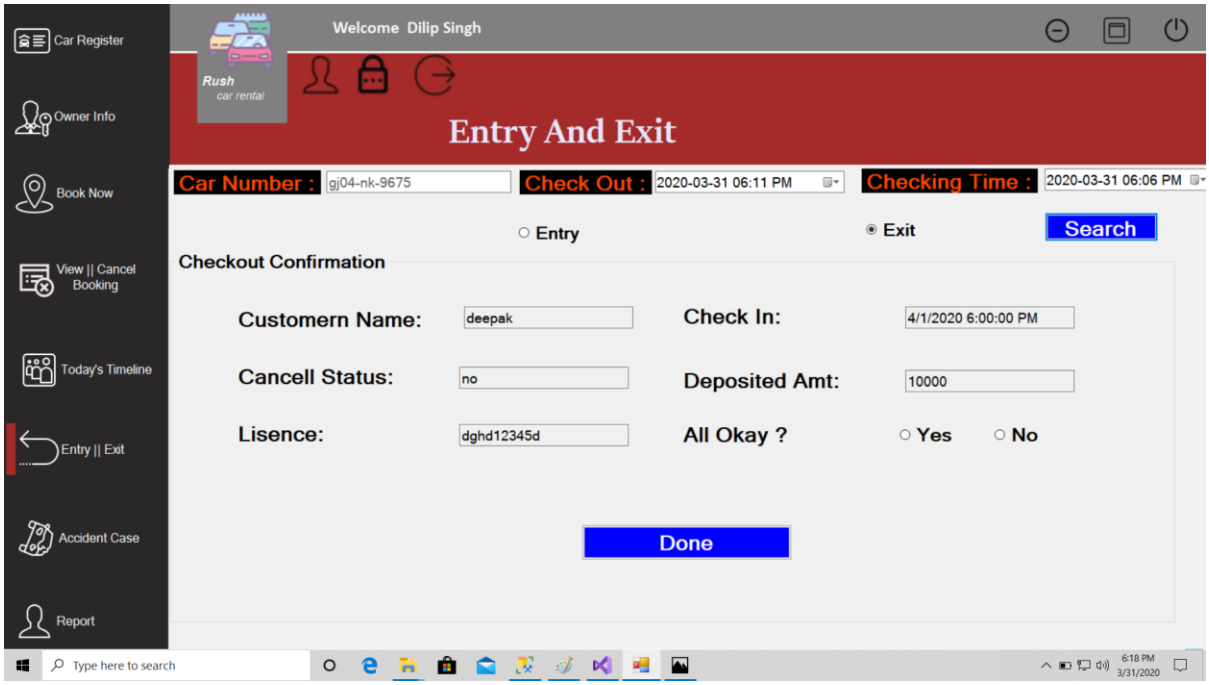
Bill Generate



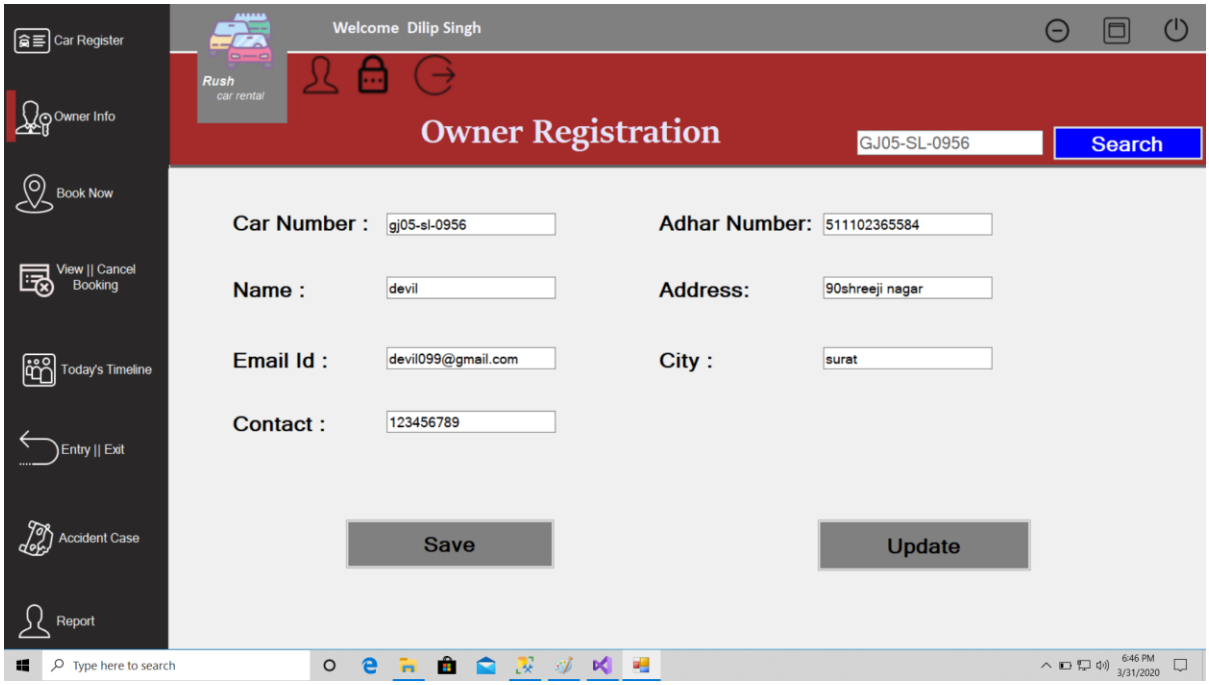
Generate Report For Particular City



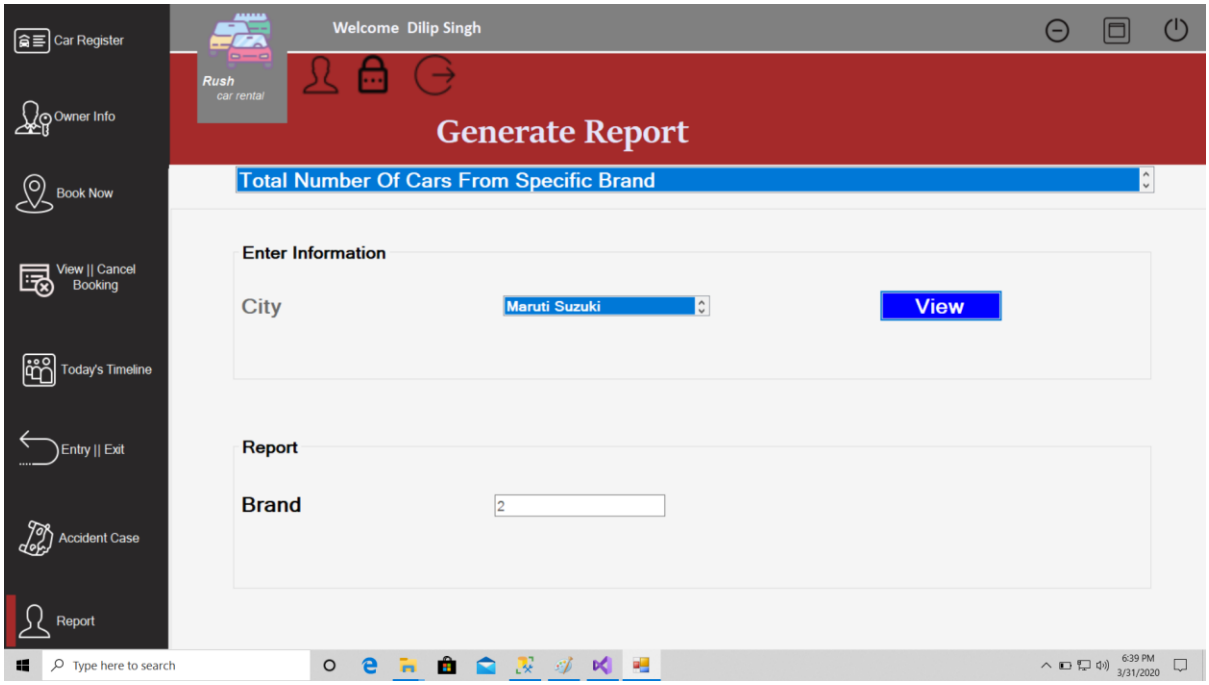
Customer Detail While Booking



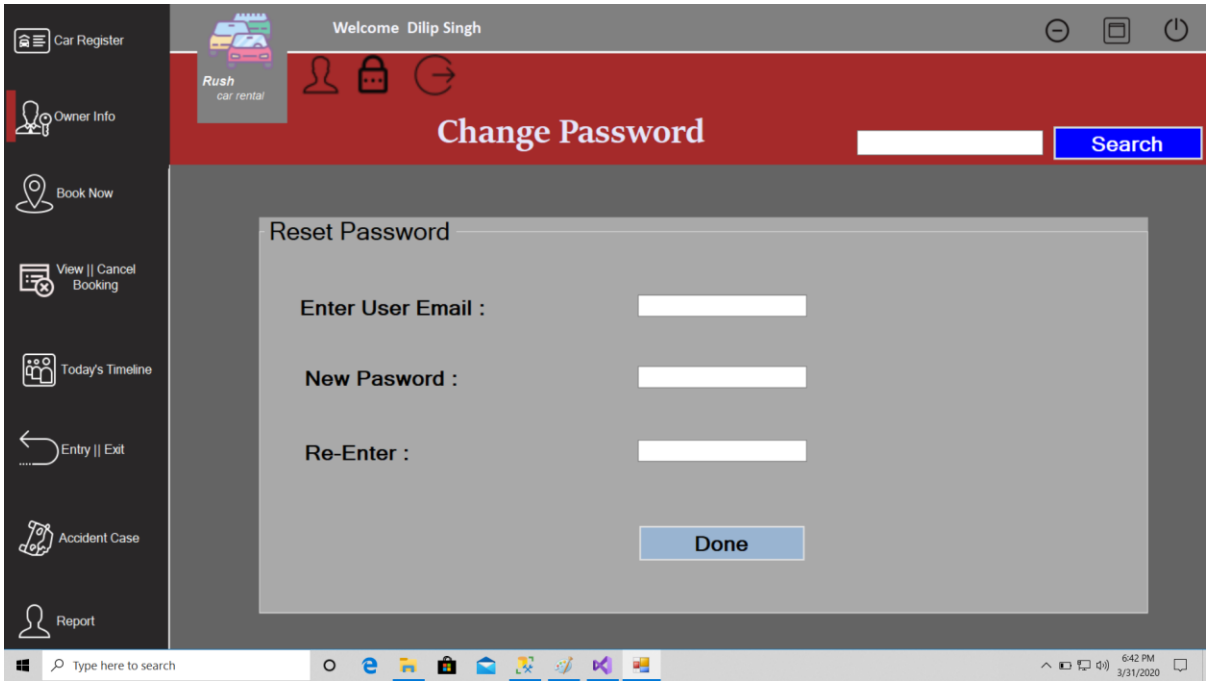
Entry And Exit Issue



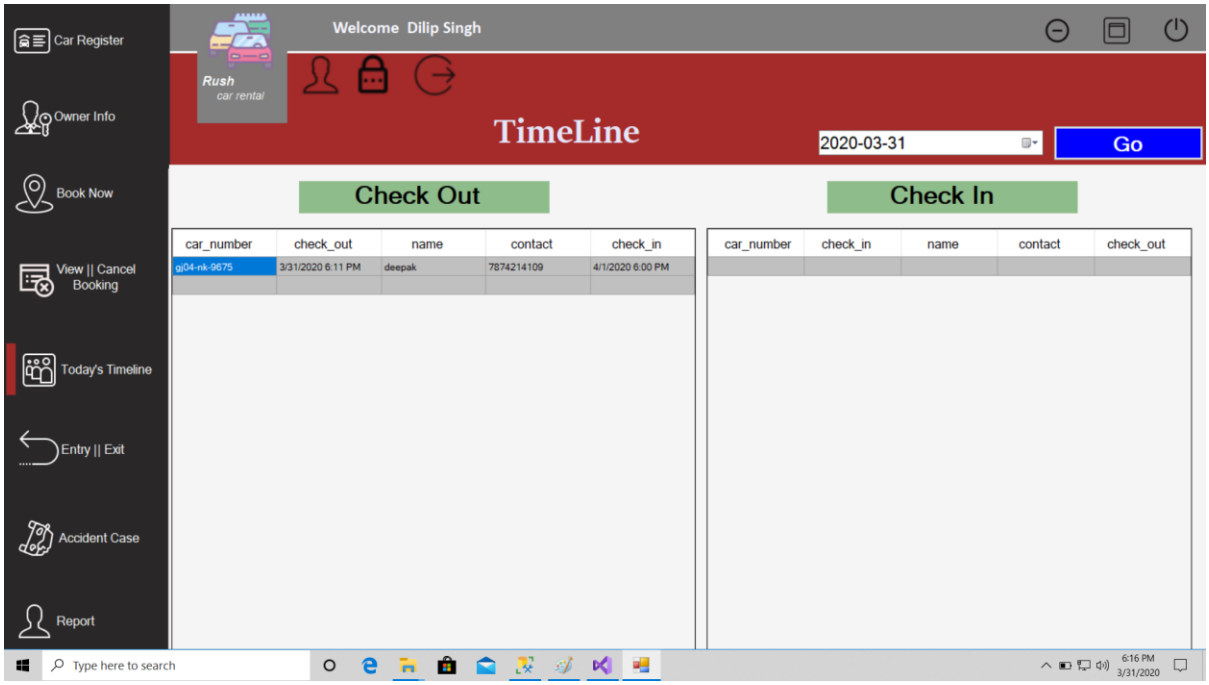
Owner Report



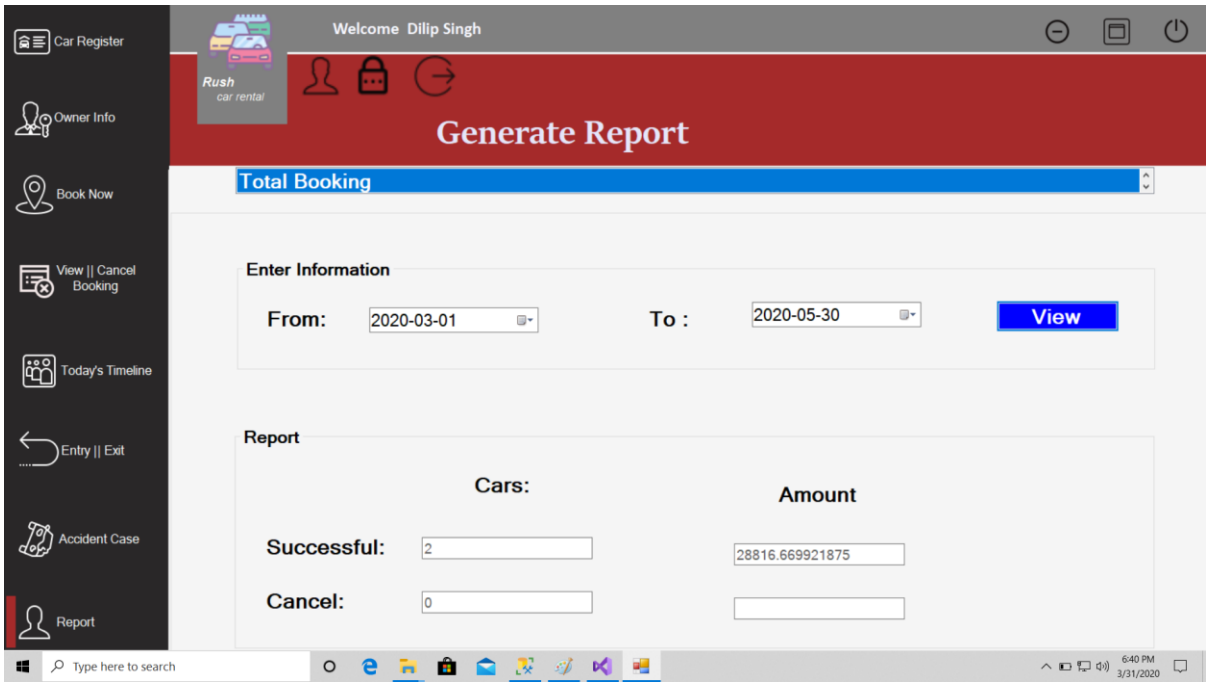
Report For Particular Brand



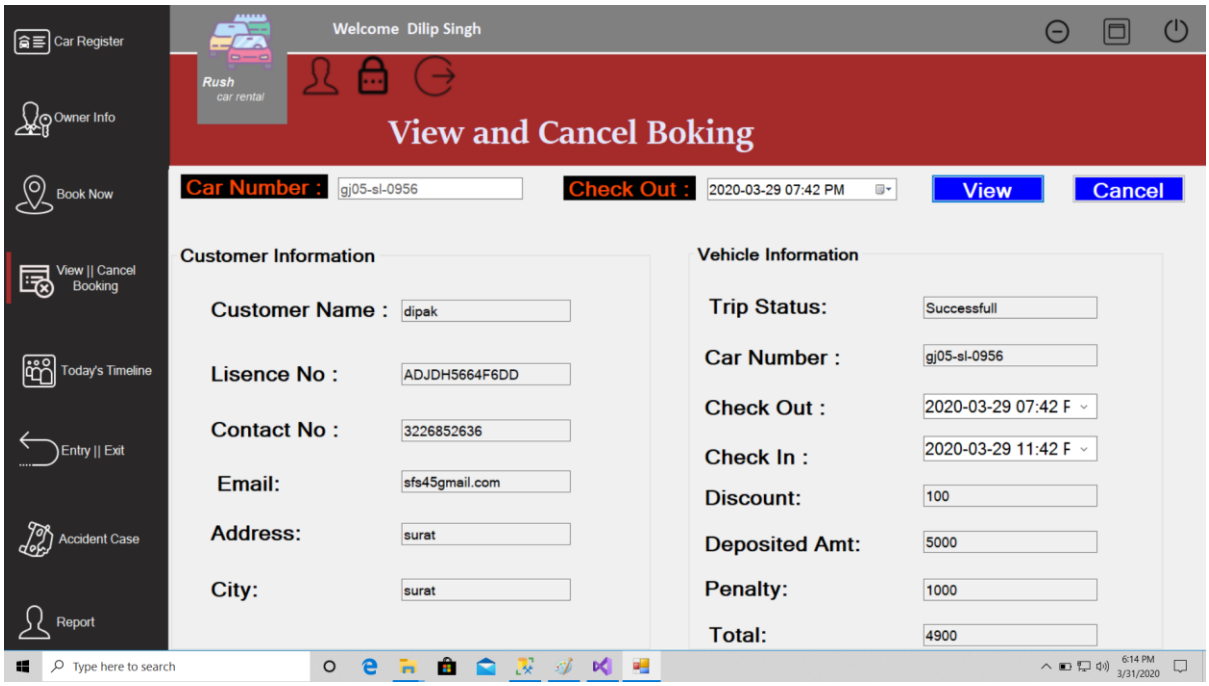
Reset Password


Car Register
Owner Info
Book Now
View || Cancel Booking
Today's Timeline
Entry || Exit
Accident Case
Report
Welcome Dilip Singh
Rush
car rental
TimeLine
2020-03-31
Go
Check Out
Check In
car_number
check_out
name
contact
check_in
gj04-nk-9675
3/31/2020 6:11 PM
deepak
7874214109
4/1/2020 6:00 PM
Type here to search
6:16 PM
3/31/2020

Timeline



Total Booking Report



View And Cancel Booking

8. Testing:

No	Data input	Excepted Output	Actual Output	Pass / Fail
1	All files are empty	Error message: *indicates compulsory field*	Error message: *indicates compulsory field*	Pass
2	Email	Error message: Invalid Email-address	Error message: Invalid Email-address	Pass
3	Password and confirm password	Error message: Both Password does not match	Error message: Both Password does not match	Pass
4	Login	Login to the system should be try with the login assigned by the admin and the correct password	Login should be successful and the user should enter into the system	Fail
		The System give an error and denied from the Login.	Login should fail with an error 'Invalid Details'	Pass
5	User	Login should be allow and admin get Admin home page.	Login successfully and admin get its admin home page	Pass

		Login should be allow and Travel admin get Travel admin home page.	Login successfully and Travel admin get its Travel admin home page	Pass
		Login should be allow and User get Visitor side User page.	Login successfully and User gets its user page.	Pass
6	Validation Test cases	Pre-define format must be required in control	System give error to enter valid input	Pass
		Enter data in a compulsory field with required field validations.	Data must be field in compulsory field otherwise its messages are displayed.	Pass

9. FUTURE ENHANCEMENT:

- Add new car represent the car list.

- The user payment for the current receipt of the payment.

- Add the current project for the booking.

Conclusion

Car rental business has emerged with a new goodies compared to the past experience where Every activity concerning car rental business is limited to a physical location only. Even though the physical location has not been totally eradicated; the nature of functions and how these functions are achieved has been reshaped by the power of internet. Nowadays, customers can reserve cars online, rent car online, and have the car brought to their door step once the customer is a registered member or go to the office to pick the car. The desktop based car rental system has offered an advantage to both customers as well as Car Rental Company to efficiently and effectively manage the business and satisfies customers' need at the click of a button.

Bibliography

1. **Yogesh Singh, Ruchika Malhotra, "Object-Oriented Software Engineering" – PHI.**
2. **Mall R., Fundamental of Software Engineering, PHI**