[Car Rental App]

By

[Mwanzia William Munguti]

[656333]

Contents

Chapter 1: INTRODUCTION

1. Background of the Application

The first car to be hired was traced back in the year 1904, when a bicycle shop in the town of Minneapolis started offering cars for rent. The first car rental company was started in Germany in the year 1912 and was called S**IXT**

The high rise in the demands of renting of cars has brought this to be a pretty good investment opportunity. Renting of a car starts with the customer calling the car renting company and talking to the secretary. The customer enquiries for available cars and the secretary of the company checks the records to see if the exact type is available for renting or a vehicle similar to that is available. When the vehicle is available the secretary will then declare the status of the

vehicle booked. This process sometimes takes a long time since the secretary has to get the callers' information which includes their address and the mode of payment as well.

The result is that in rush hours, mostly weekends, a lot of calls are missed due to the time taken for collection of this data and the possible solution to this was to develop an application that can capture data in minutes and can be done by multiple users. Moreover, the available cars will be categorized and a picture of the vehicle and registration number will be available to the user.

1.1. Problem Statement

The client, owner of **Rent a Ride** car rental business, which has a unique feature where a customer can book a car and it can either be delivered to an agreed location or the customer will come pick it up at the store, has gotten complaints from the regular customers that the calls they make in order to book a car is a bit too expensive. The idea to make booking easier and less expensive for the customers is to come up with a mobile application

Rent a ride is a successful car business and is well known, therefore a mobile application will be ideal. The application will enable user to choose their location from available listed towns, since Rent a Ride has different branches all over the country. All this will be done in a matter of 5 minutes on the app as compared to the long calls where the secretary has to keep searching through the system, which causes time wastage and using up of airtime.

1.2. Objectives

1.2.1. General Objectives

Create a software that enables a user to select a car to rent according to the client's location and choose whether to collect the car or have it delivered at the comfort of their homes.

1.2.2. Specific Objectives

The Application will be able to:

1. List all branches of **Rent a ride** and user will select the location they are located at.
2. List all cars available at a branch
3. Allow user to book a car
4. Give feedback after is booked

1.3. Assumptions

i. The user is booking a car from the location they will choose
ii. The user knows the location of the physical office

1.4. Scope

i. To help users to rent a car
ii. To enable user to select day, date.
iii. To enable user to see a list of available cars
iv. To give feedback to the user

1.5. Limitations

i. There is no guest user available

Chapter 2: LITERATURE REVIEW

2. Introduction

This chapter analyses in depth the knowledge, research and findings on a car rental management application. The topics that were researched on the application include: the accuracy of the system, the working principle the problems associated with existing systems which include: interface design.

Renting of cars gives people the opportunity to move around even though they do not have their own personal vehicles. It doesn't mean that just because you don't own a vehicle and when you need one you will have to buy it, just rent one instead. The customer who needs the vehicle will contact the company first. Then the customer will be asked to give their information that will be required by the company to give proof that you are an actual person and you are not just trying to swipe a car. If the customer has a particular request on the type of vehicle, he wants he will say and if available he will book it. If the vehicle requested is not available, the secretary will give the other available options in category then the booking on the car will be made.

This is a tedious process and takes roughly 10 minutes, why not do it in one? The development of an app that can do all the processes done by the secretary will save people a whole lot of time and money (phone bills).

2.1. Body

2.1.1. Features of most car rental apps

1. Easy to use interface- according to (M, 2021), it doesn't matter which car is up for rent if the customer is not able to communicate with the company. The company is the software that represents the company. Examples to make the software easy to use is given below.
    - the features should be neatly stacked not to confuse the customer
    - The booking, cancelation, scheduling should be easy
    - easy booking system (models, pricing plans, special offer)
2. Real time monitoring- most software have a gps system that monitors the car's movement and makes sure the car is safe and operating alright (M, 2021). The real time monitoring will tell the status of the engine and will be able to send back the condition of the car to the admin.
3. Chat bots- the chat bots are helpers that make sure the user understands areas that they may not be able to operate properly and the bots also answers frequently asked questions (M, 2021).
4. Security- Some car rental software has the ability to encrypt some personal information therefore keeping data safe from the hands of any hackers.
5. Input data- this software enable a user to enter their personal data which is then stored into the database and will recognize the user the next time they use the software again
6. Linked to the cloud- they are linked to the cloud that way the information will be updating every time and will be easily accessible to the users

7. Terms and entities

Admin

The admin is the manager of the application and will be able to see all the cars that exist.

Moreover, the admin will be able to use the application to generate reports on what is going on.

User

The user of the application in this point will be the customer of **Rent a Ride** and will be using the software to book a specific car. There are existing users and also there are new users who want to rent a car.

How the software works

The user will be start the app and will choose between client or admin. Assuming the user is an existing client they will log in with pre-existing details and the home page will be visible to the user. The home page is where you select the town you are located at, then the app will move to a different page that displays the available cars, in that town and then one will click on the book button which will open a form, the user will fill this form and it will be submitted to the database. The user will then get feedback that the car has been booked and the history page will show the car booked and when it was booked.

On the admin side the admin will be able to view the number of cars that have been booked and will be able to see the total amount earned form the lending of cars to customers.

Comparison to other similar software

1. Input- Rent a Ride will be able to capture data from the user and will be able to store it into the database of the software.
2. Output- Rent a Ride will be able to output data from the database and the user will be able to see information.
3. Authentication- the log in of the customer will enable the authentication of the user, if information is not in the database then the user will be prompted to sign up
4. Feedback- when the user books a car the application will give feedback that the car has been successfully booked.

Conclusion

A car rental software can have a lot of functionality and features. The type of application that you want will determine the functionalities and features that one wants, and the more the features the more complex the application is. In conclusion the scope of the app will determine the features to be included in software development time.

Chapter 3: DEVELOPMENT METHODOLOGY

In the development of this software I used agile approach. Agile development is a method of development that involves the gradual development of something that allows a developer to make changes whenever they want to. With the iterative development of the project. The

development can be done in bits or can also be done at different timings therefore the development process is affected. Because the app may have milestones, the agile development will work perfectly and will cater for changes in the app given by the client.

Advantages of Agile

1. It was cost effective- it is known to save money and also helps the investing of funds to be done properly.
2. It was flexible since it was able to accommodate the changes that were taking place during the whole development process
3. The quality of the product is usually high- when agile development is used, the app will most likely be of high quality.

How agile was used

The development of the software was gradual development of the app. The method of development will be most suitable when catering for changes within the app or also with the functionality of the application.

Functional and non-functional requirements

The requirements of an application are the various features that will make the app function properly and will be able to help the user achieve their objectives.

Functional Requirements

1. The user will be able to choose between existing user and admin.
2. The user will have to be authenticated when they log in.
3. If user is not existing, they will have to sign up entering their personal details.
4. The software should be able to store and retrieve data in a database.
5. The user should be able to select the location they are in from the listed ones.
6. The software should be able to show the list of available cars in categories
7. The software should be able to give back feedback when a customer chooses their vehicle of choice
8. The software should be able to show the user/ customer the history of previously rented cars.

9. The software should generate reports on the data to the admin.

Non Functional Requirements

1. Operating system- the software will be a desktop software
2. Usability- the software will be easy to use by people of all ages and will be self-explanatory

Design tools

The design tool that was used in the development of the software was a trial and error approach with the dragging and dropping of the objects into the IDE and trying to identify how they will best be presentable. The IDE used for this process was **APACHE NETBEANS.** The IDE was also used in the development of the software and also testing.

Development Tools

Programming and UI implementation

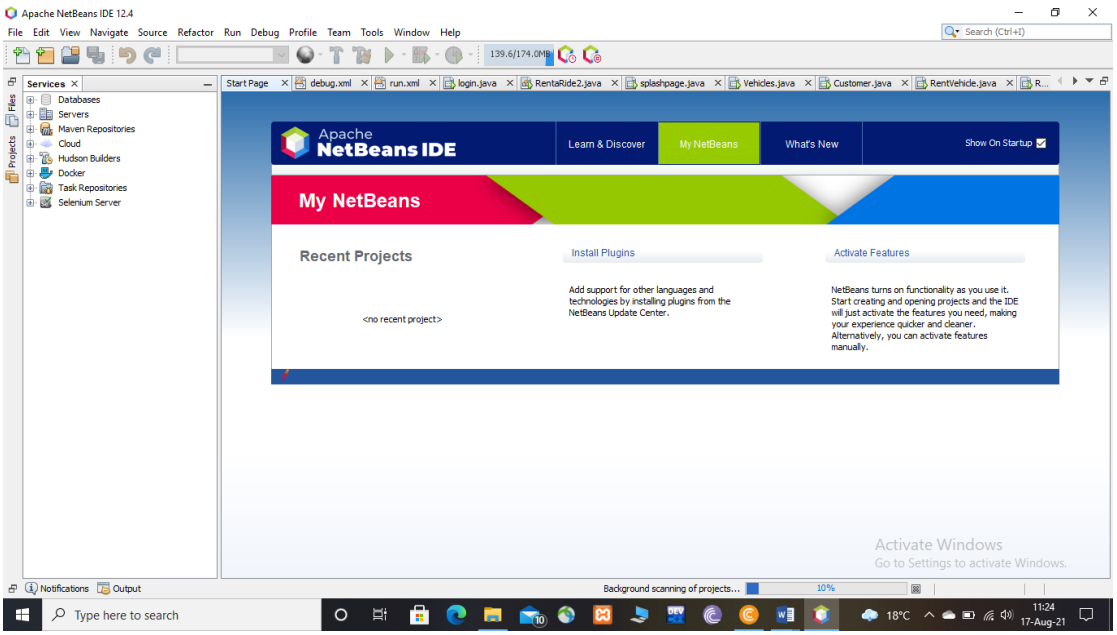
The programming process was also done using the APACHE NETBEANS ide. Java language is the language that was used in the implementation of this software. Java language was preferred since it is object oriented and the code can be re-used in some areas that have similar functionalities.

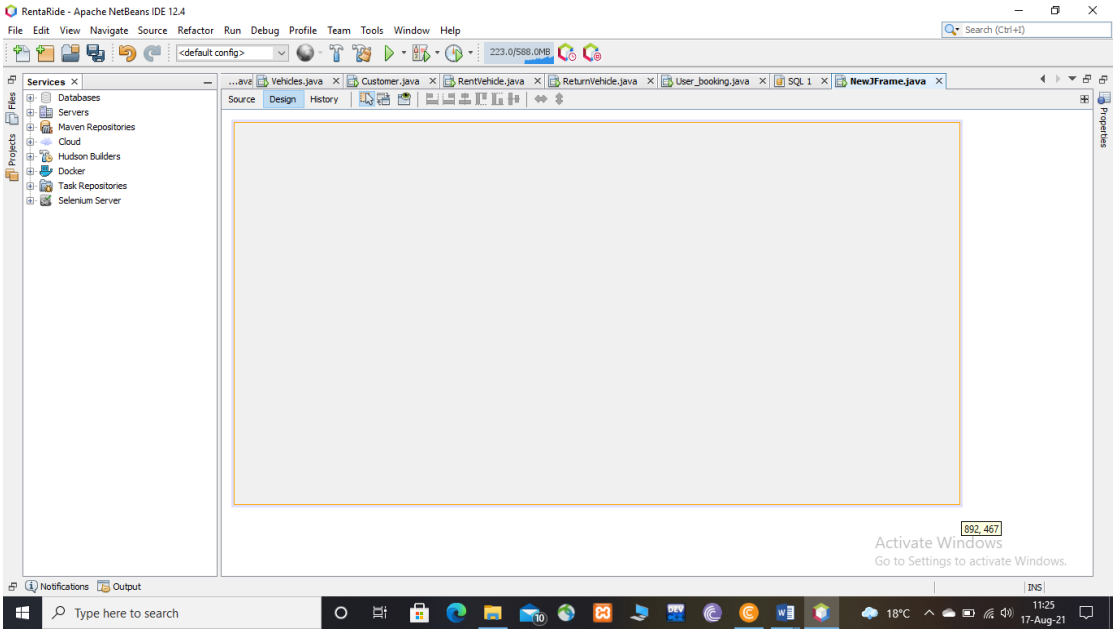
Reason for choosing the development tool

The reason for choosing APACHE NETBEANS IDE for development is because it is a generally light IDE that supports the development of software in java programming language. Moreover it also enables the use of a user interface that one designs according to their own wants and need. More over the pallets are customizable and one can manipulate them however they wish them to be.

How it was used

APACHE NETBEANS was used in the implementation of the software in the back end and also the designing of the user interface.

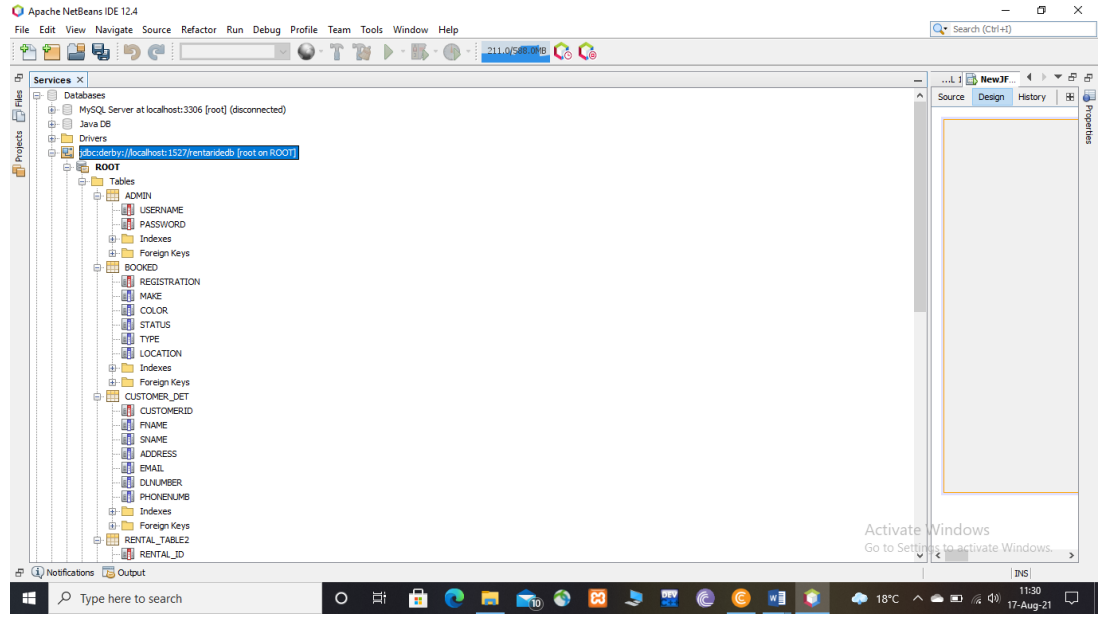


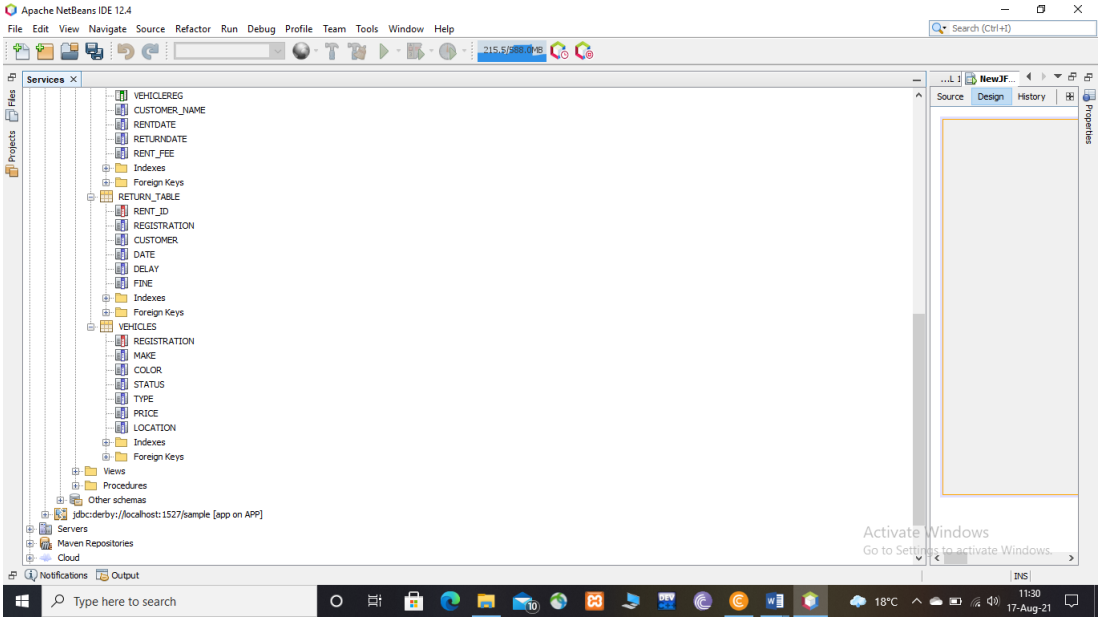


Database

The database that was used in the implementation of this software was the derby database that is an internal database located within the IDE environment. Derby is a simple database that allows the entry and saving of data. The data is also retrieved using SQL queries.

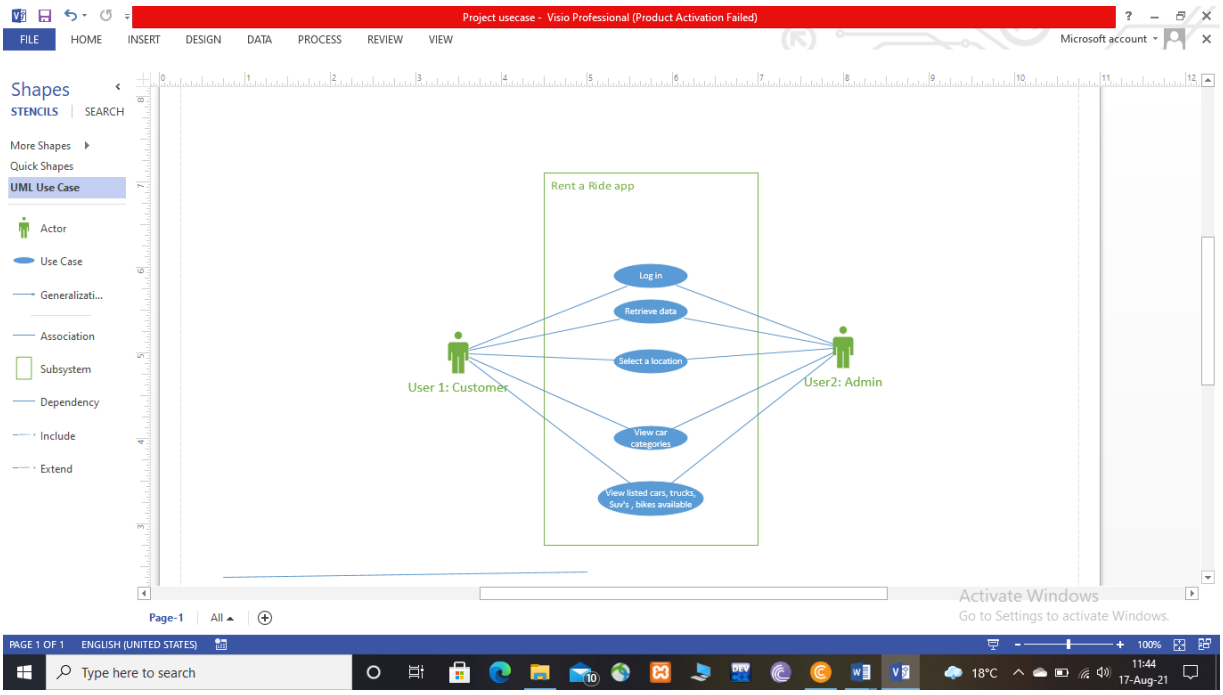
How it was used



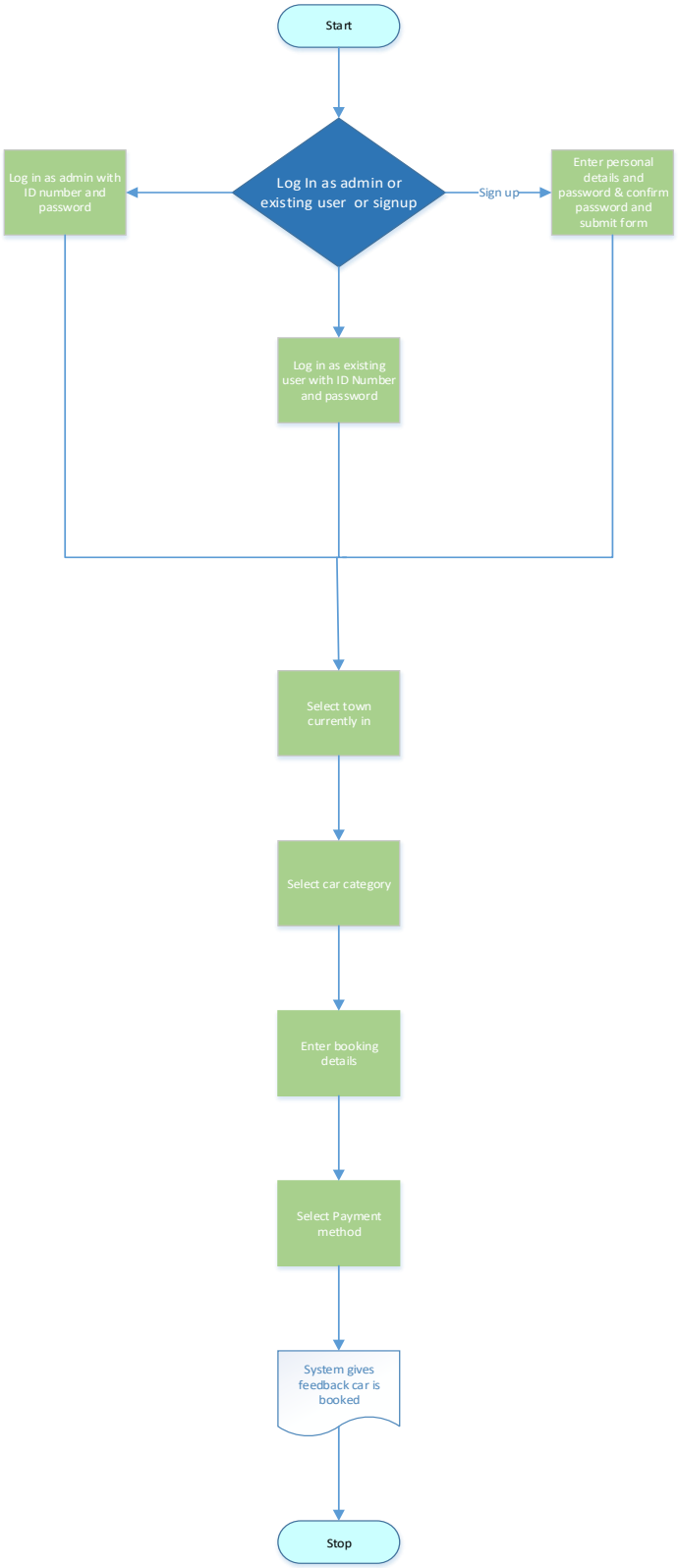


Chapter 4: System Analysis and Design

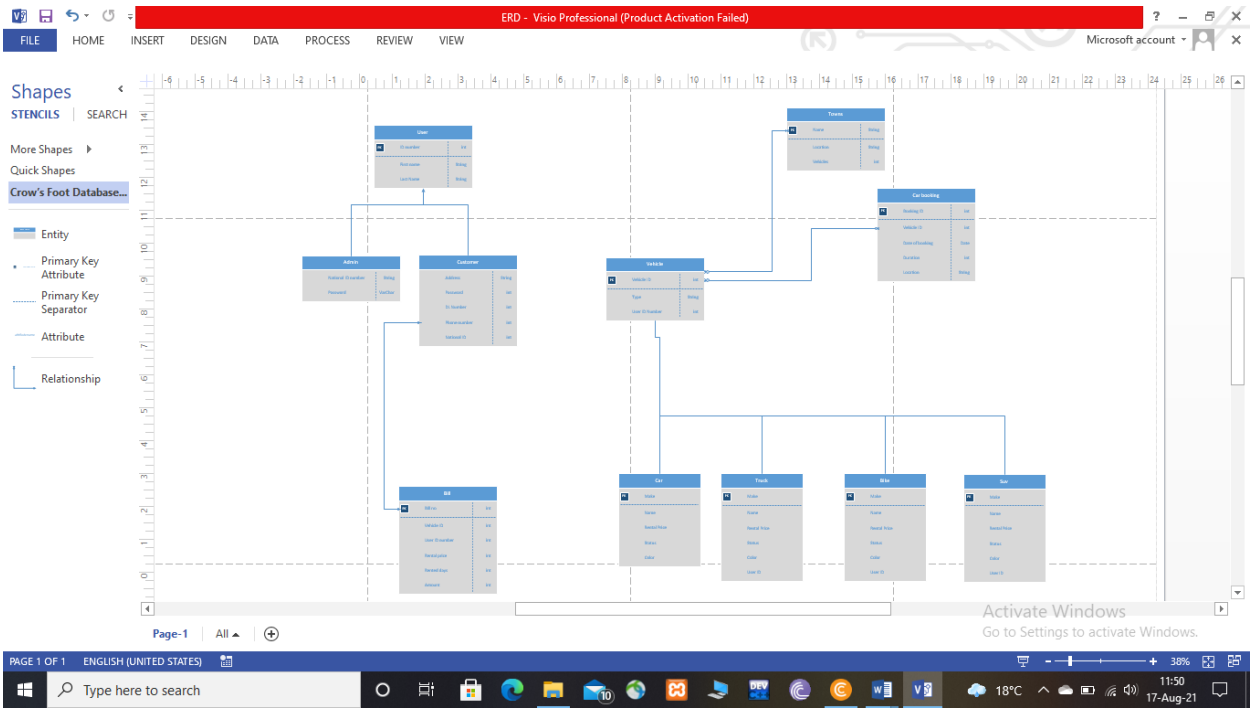
Use case diagram



Flowchart

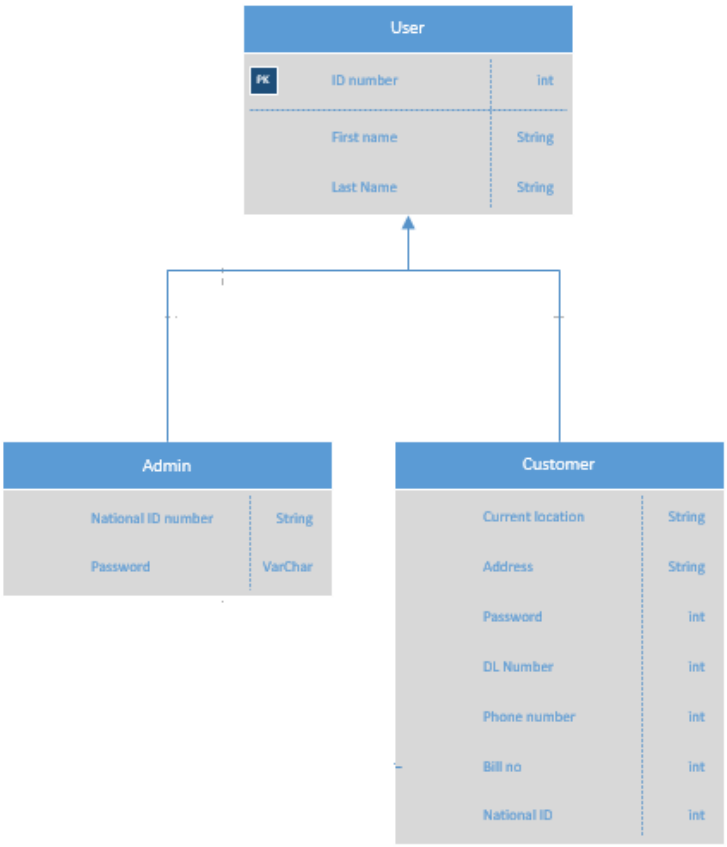

Start
Log In as admin or existing user or signup
Log in as admin with ID number and password
Sign up
Enter personal details and password & confirm password and submit form
Log in as existing user with ID Number and password
Select town currently in
Select car category
Enter booking details
Select Payment method
System gives feedback car is booked
Stop

ERD

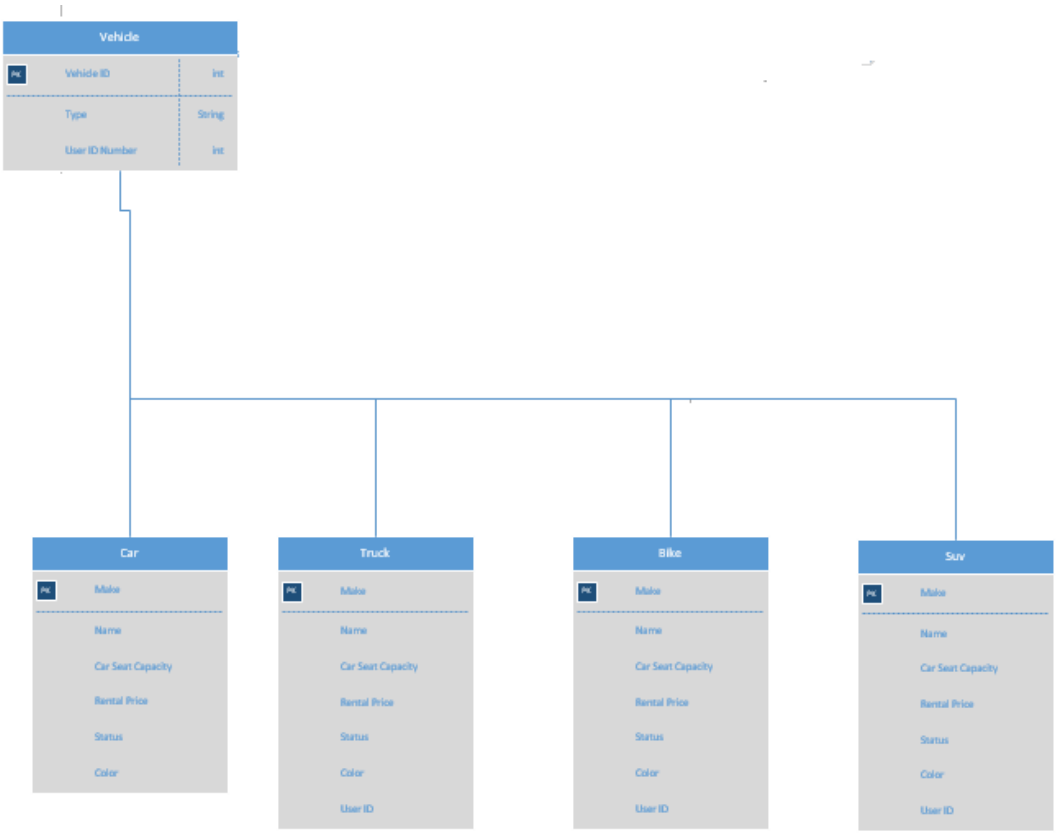

ERD - Visio Professional (Product Activation Failed)
FILE
HOME
INSERT
DESIGN
DATA
PROCESS
REVIEW
VIEW
Microsoft account
Shapes
STENCILS
SEARCH
More Shapes
Quick Shapes
Crow's Foot Database...
Entity
Primary Key Attribute
Primary Key Separator
Attribute
Relationship
Page-1
All
Activate Windows
Go to Settings to activate Windows.
PAGE 1 OF 1
ENGLISH (UNITED STATES)
38%
Type here to search
18°C
11:50
17-Aug-21

Class Diagrams

User class diagram



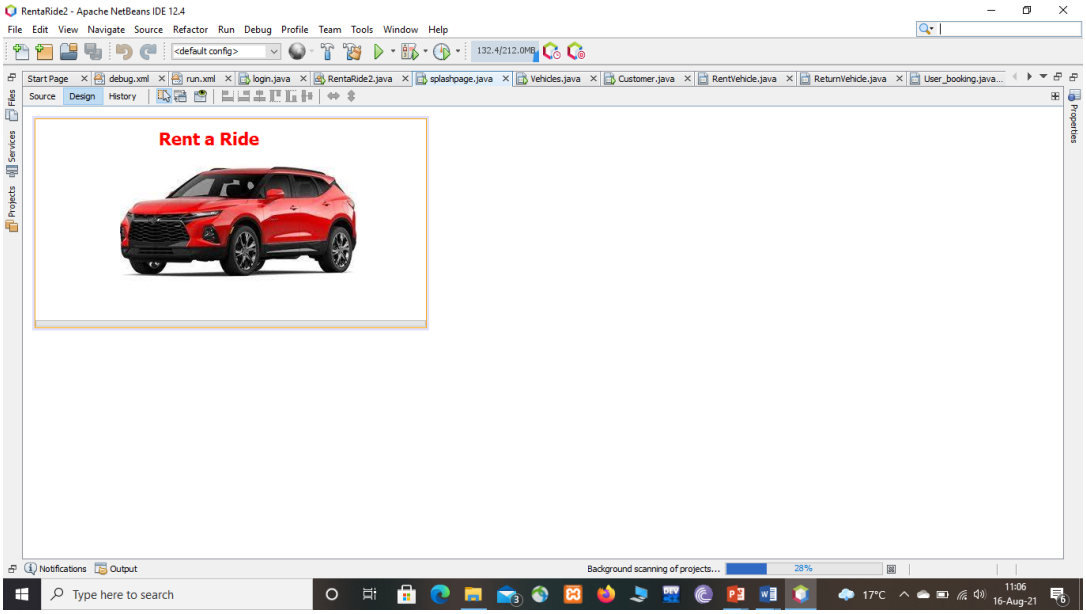
Vehicle class diagram



GUI design

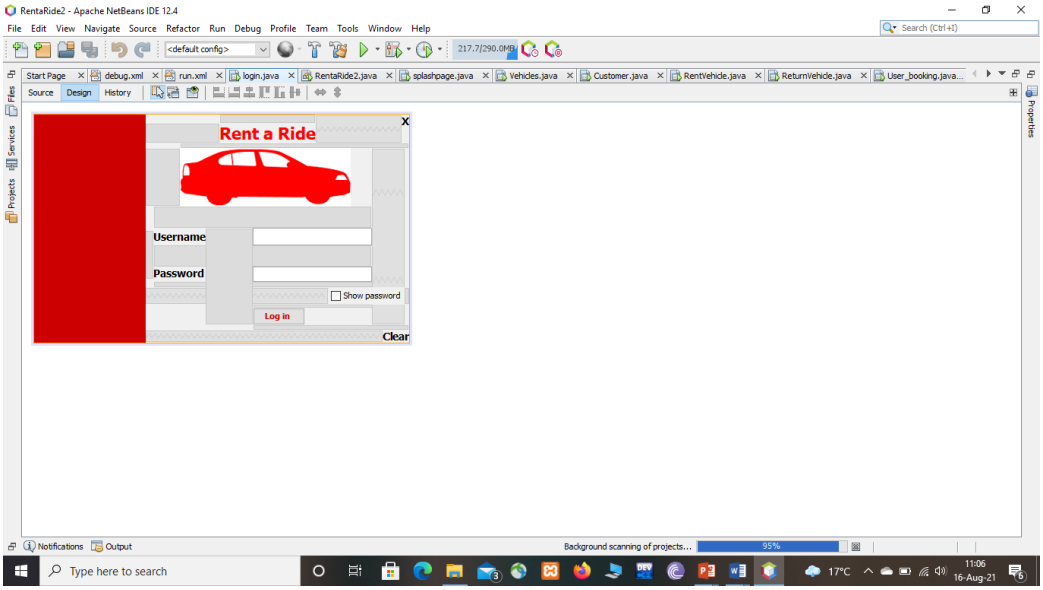
Splash page

This is the page that will start up the software



Log in page

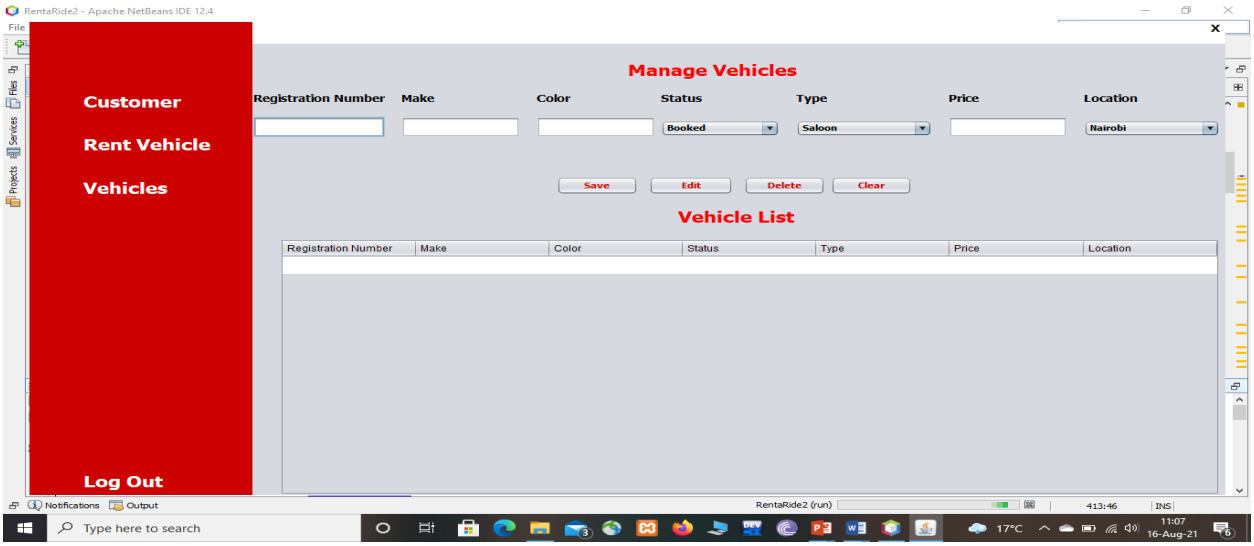
This is the UI that will be displayed after the splash page finishes loading to enable user to log in.



After Admin login

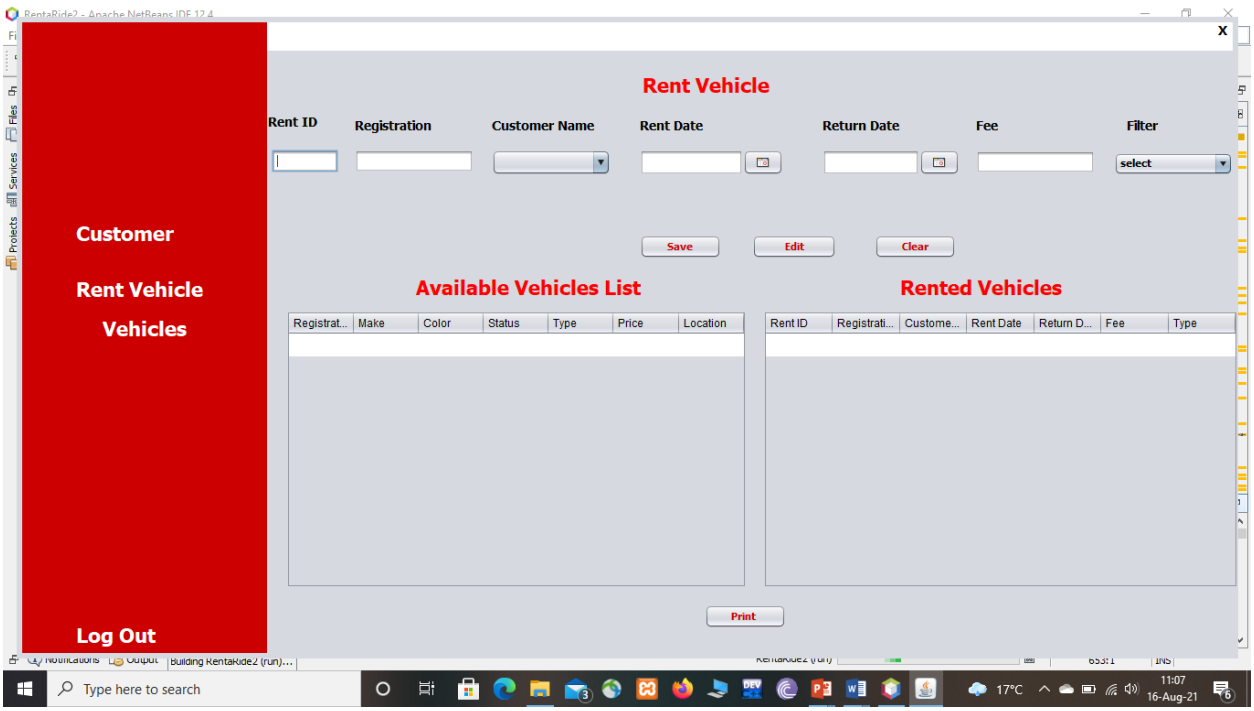
Manage vehicles

This page allows the user (admin) to add, delete and edit the vehicles that are going to be in the system.



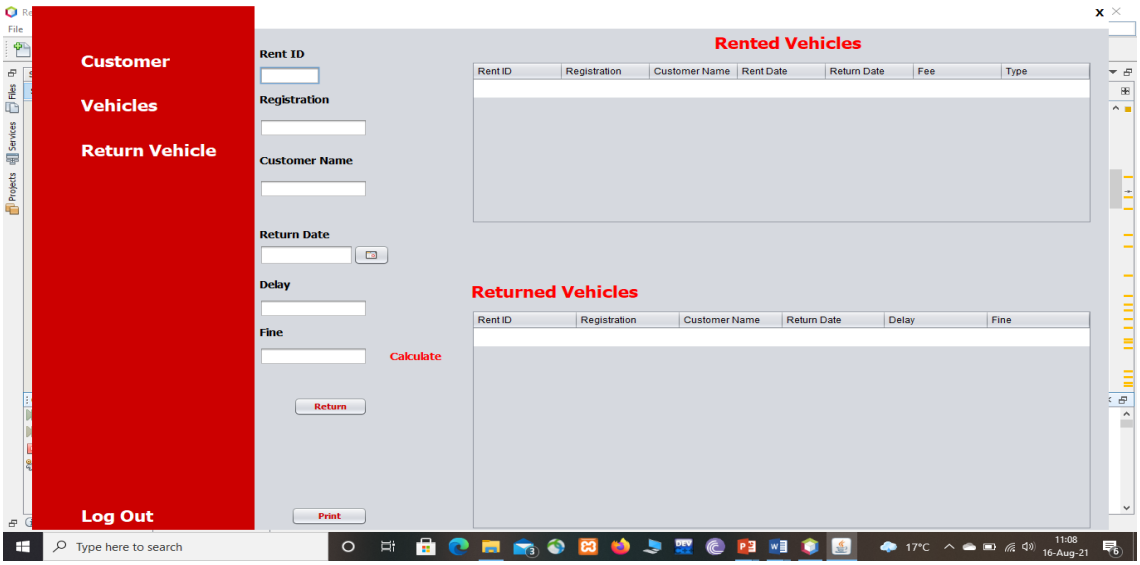
Rent vehicles

to customers already in the system



Return vehicle

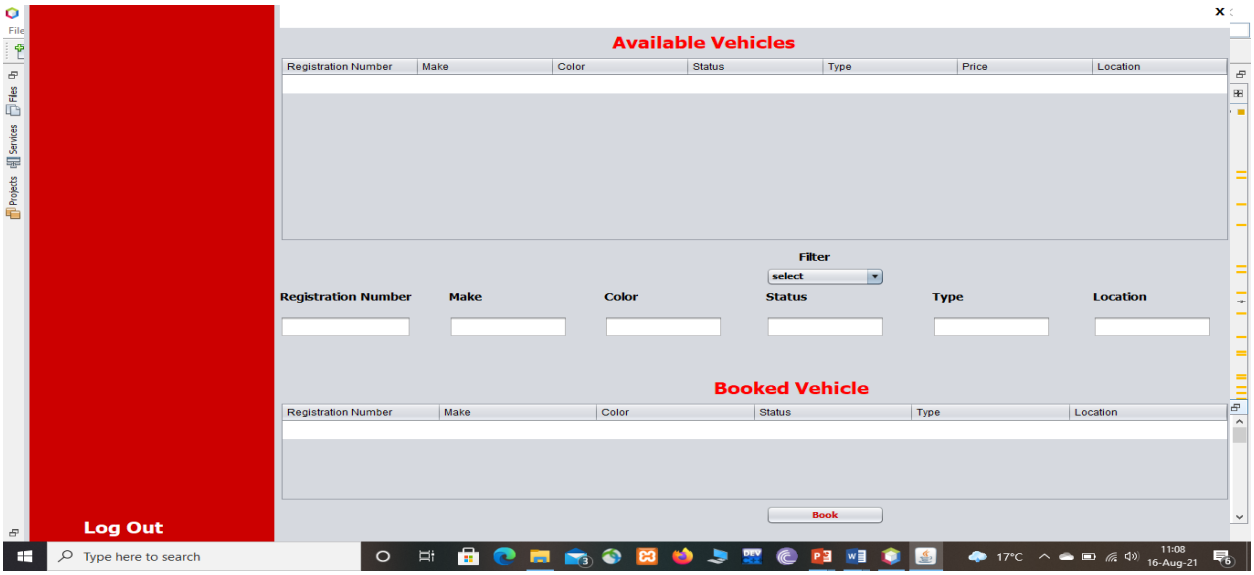
This page allows the admin to be able to have a record of all the returned vehicles and apply a fine where the vehicle has passed the supposed return date



After customer login

Book vehicle

This module allows the user that logged in as customer to book the vehicle from an already existing list entered by the admin.

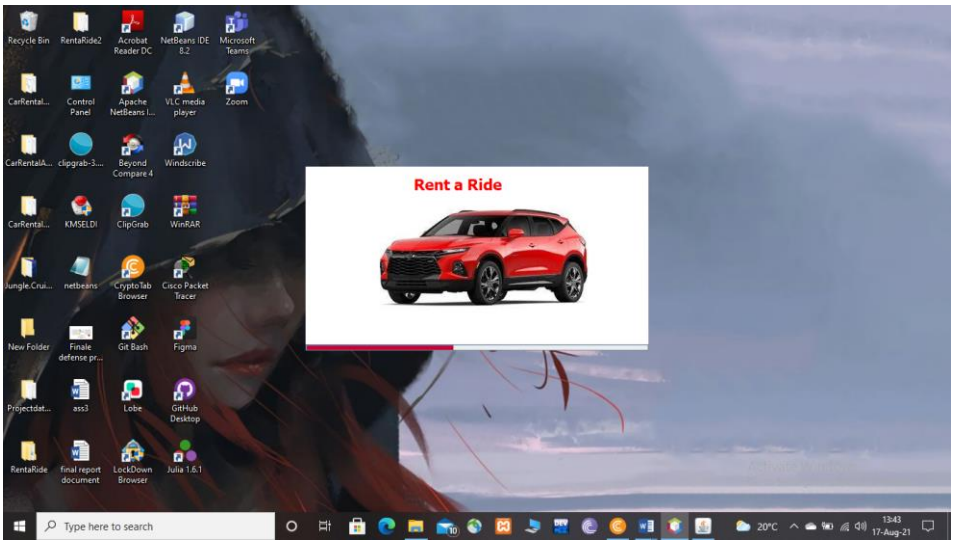


Chapter 5: Implementation and testing

The implementation of the software was done using the apache NetBeans and the back end was implemented using java programming language

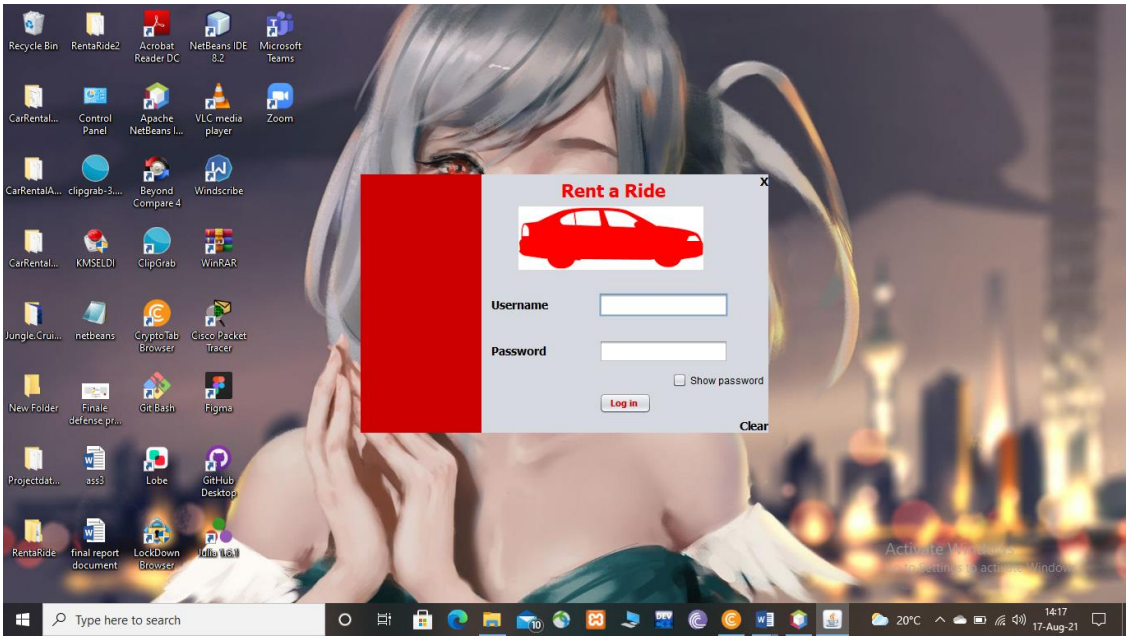
Splash page

The splash page loading

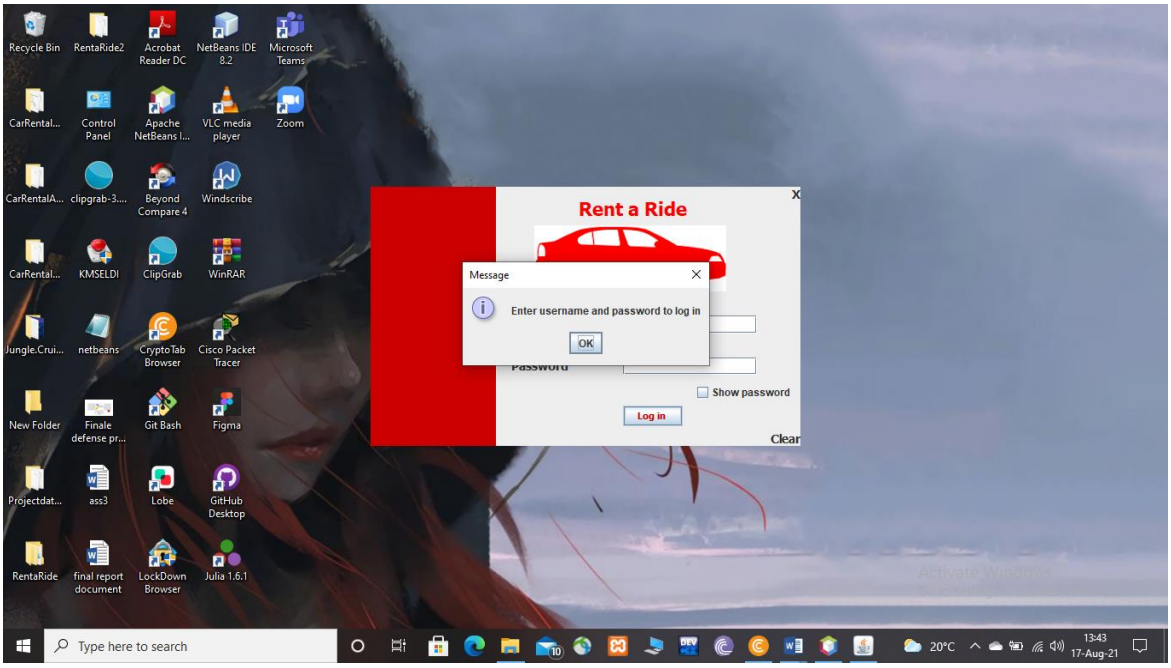


Logging in

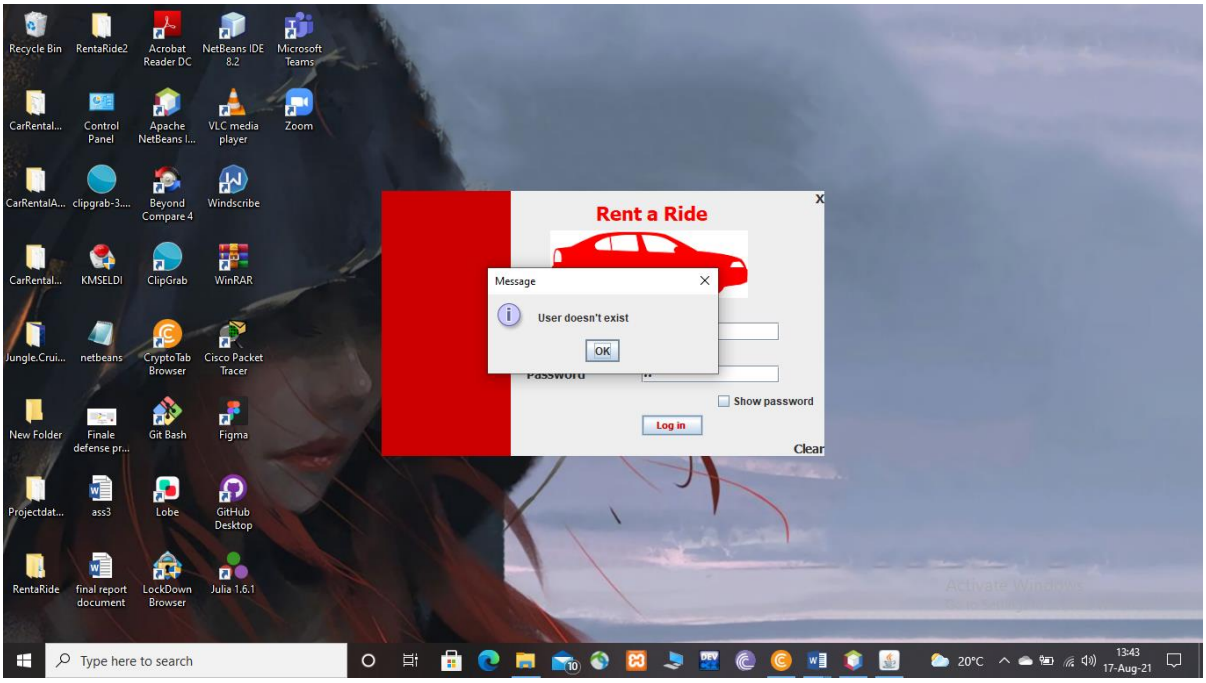
Log in page



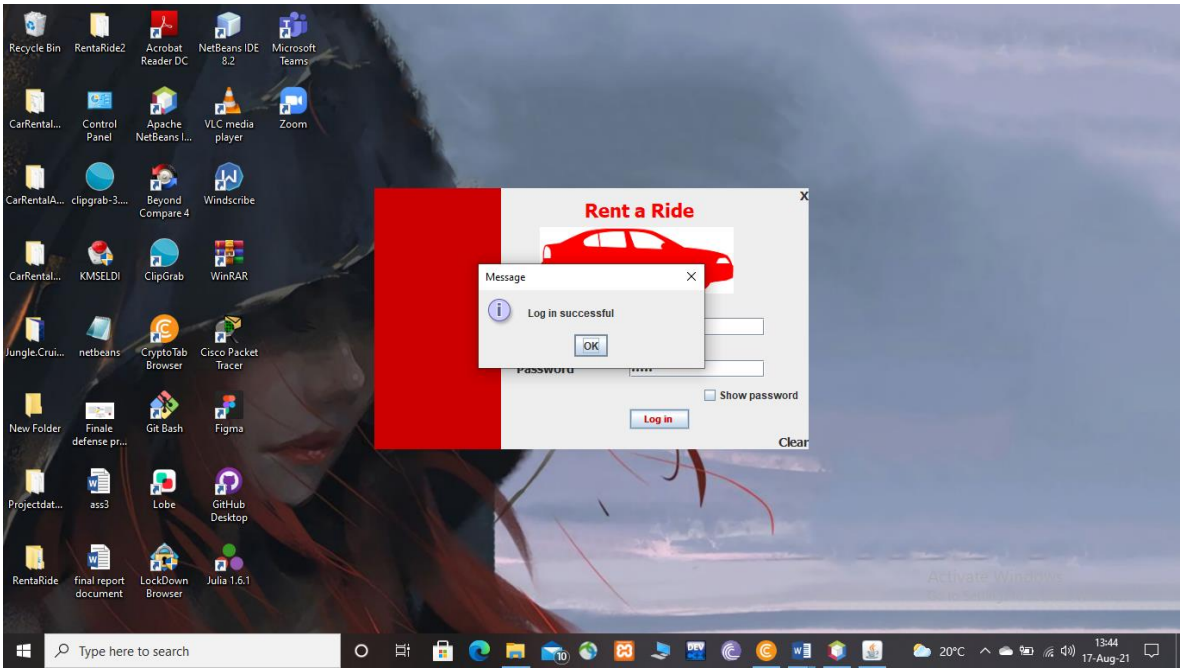
When user presses the log in button without any details present



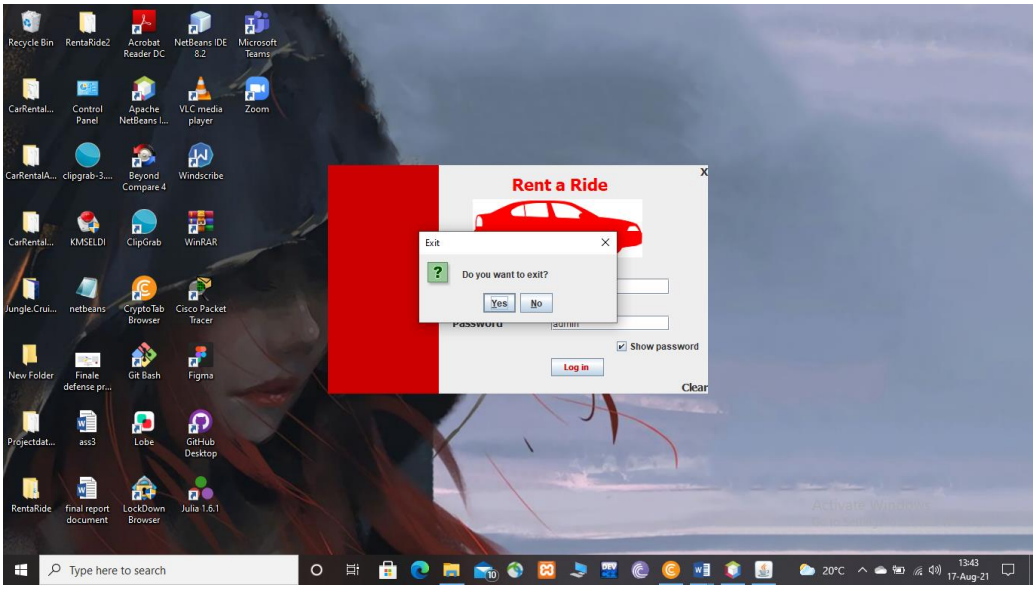
When the details entered don’t exist in the database



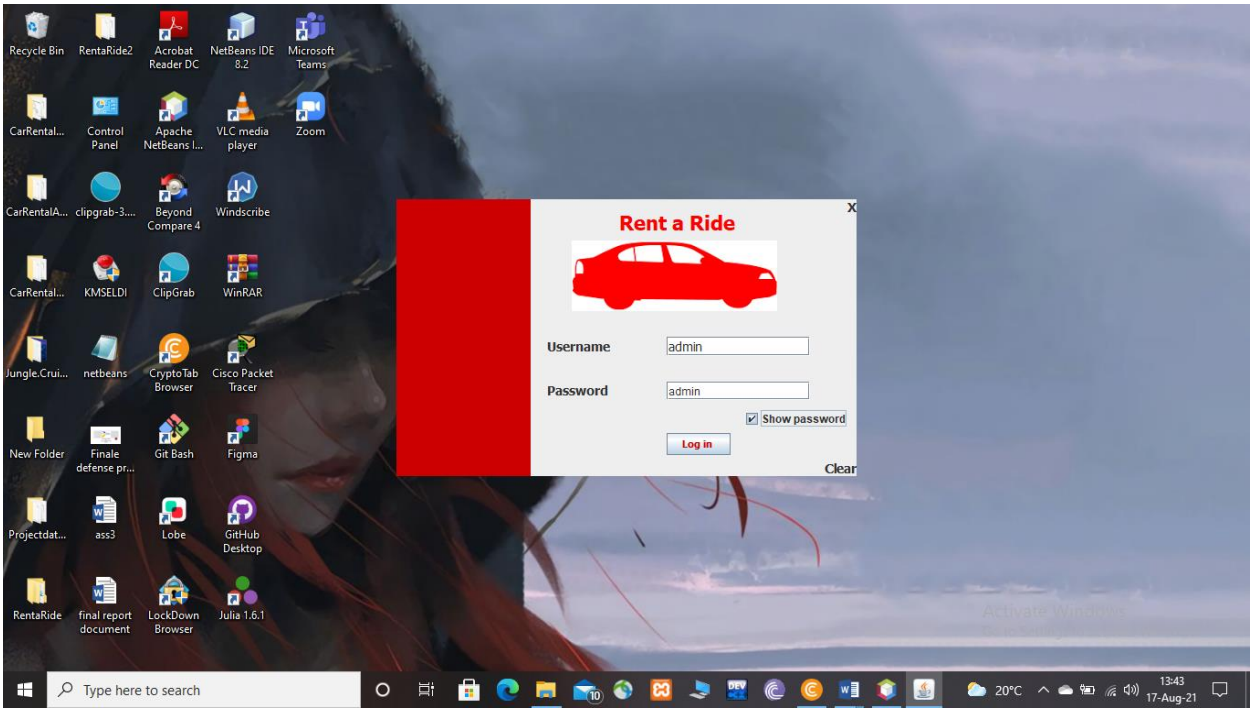
When details entered are in the database and user is verified



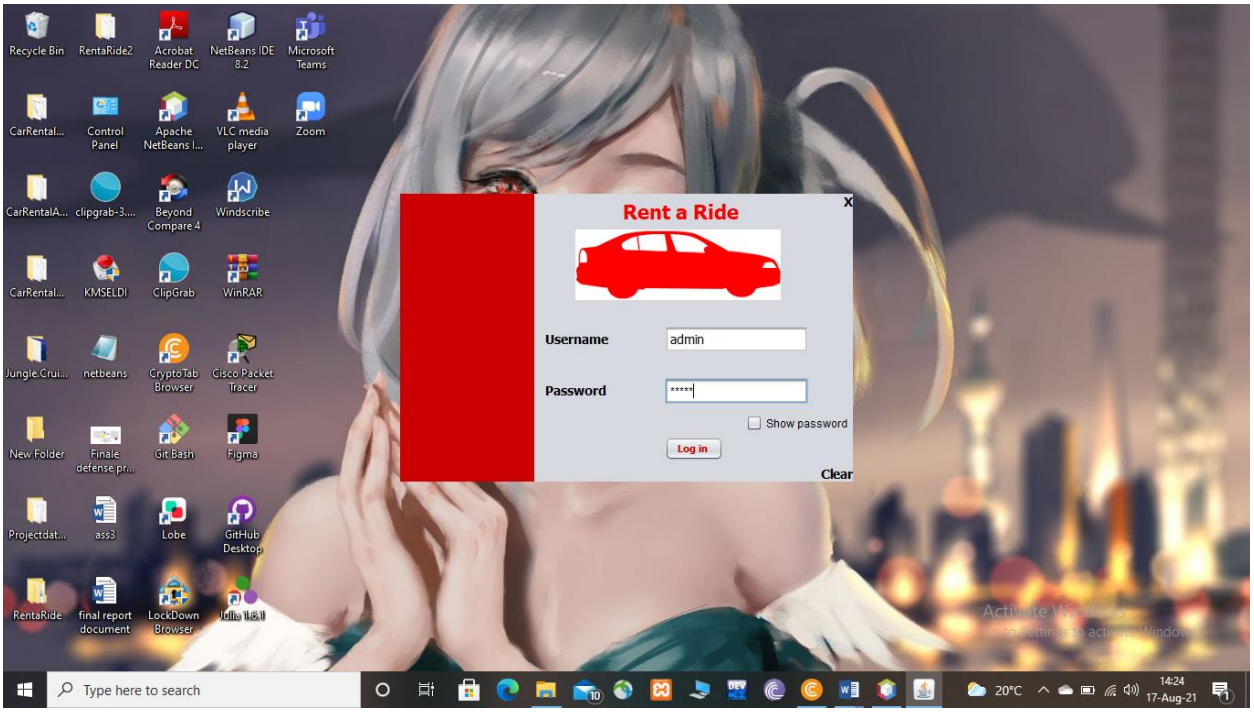
When user clicks on the close button confirmation message is displayed



When the show password is selected

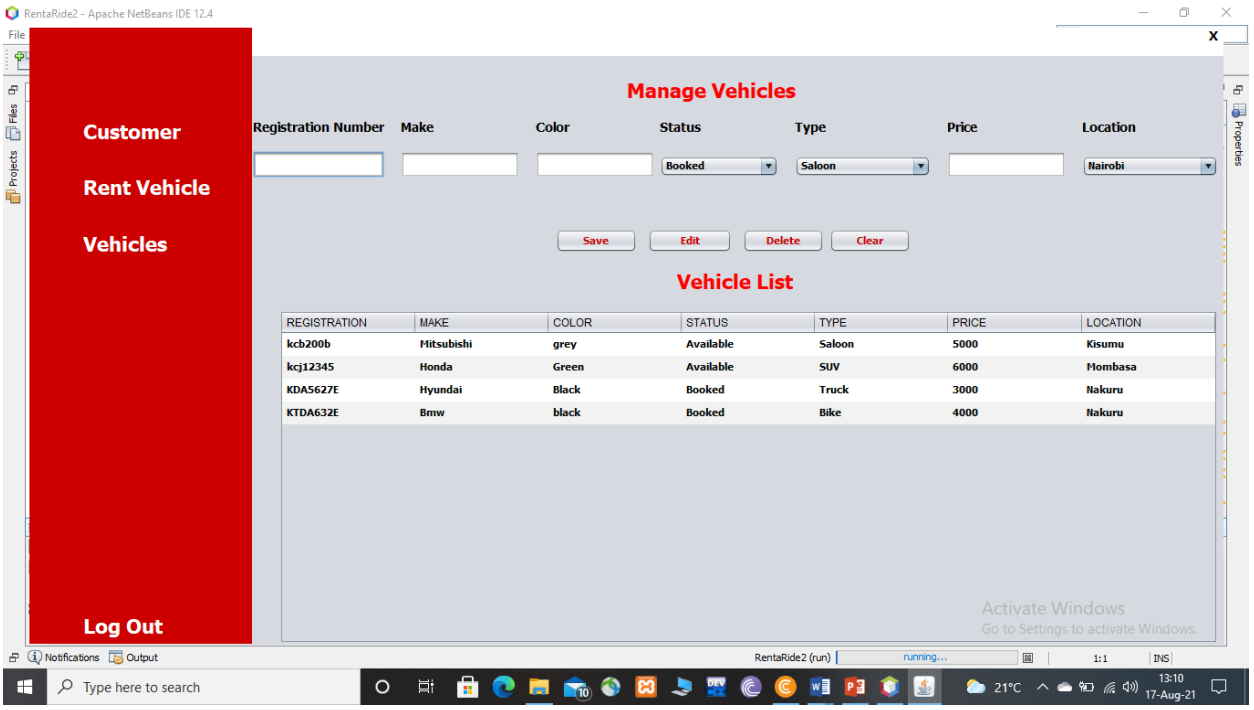


When show password checkbox is not selected



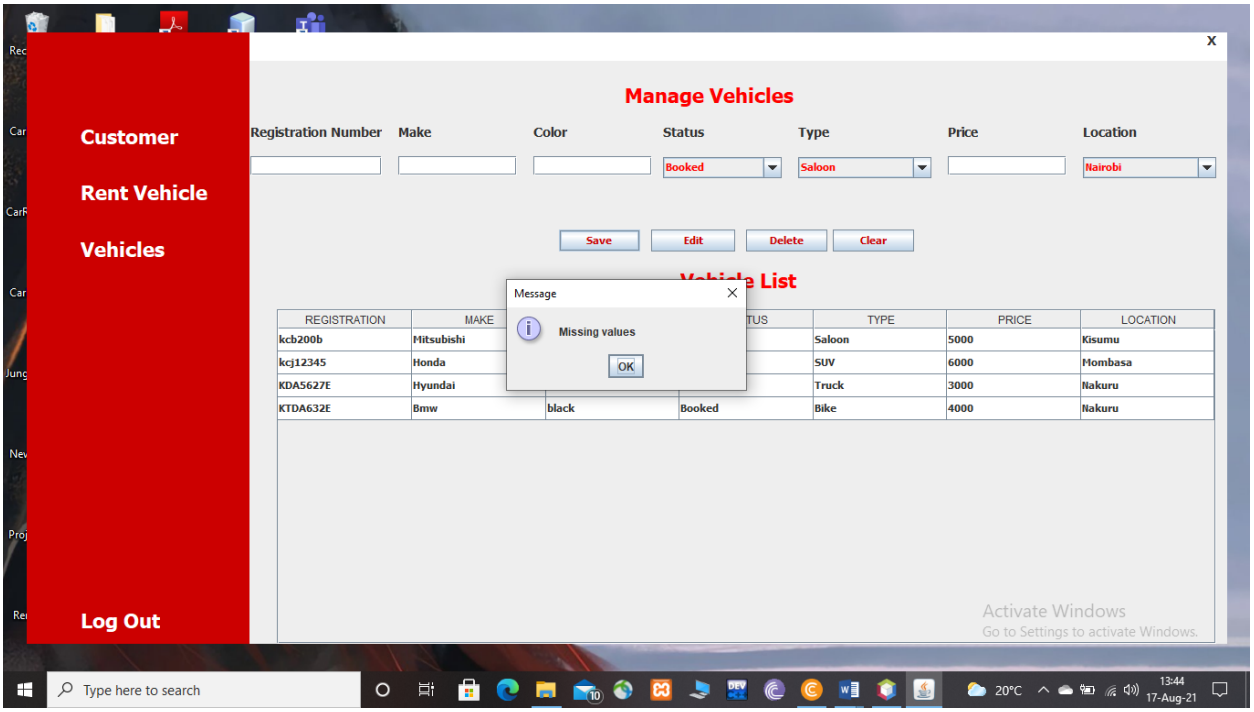
Managing vehicles

The vehicles are displayed

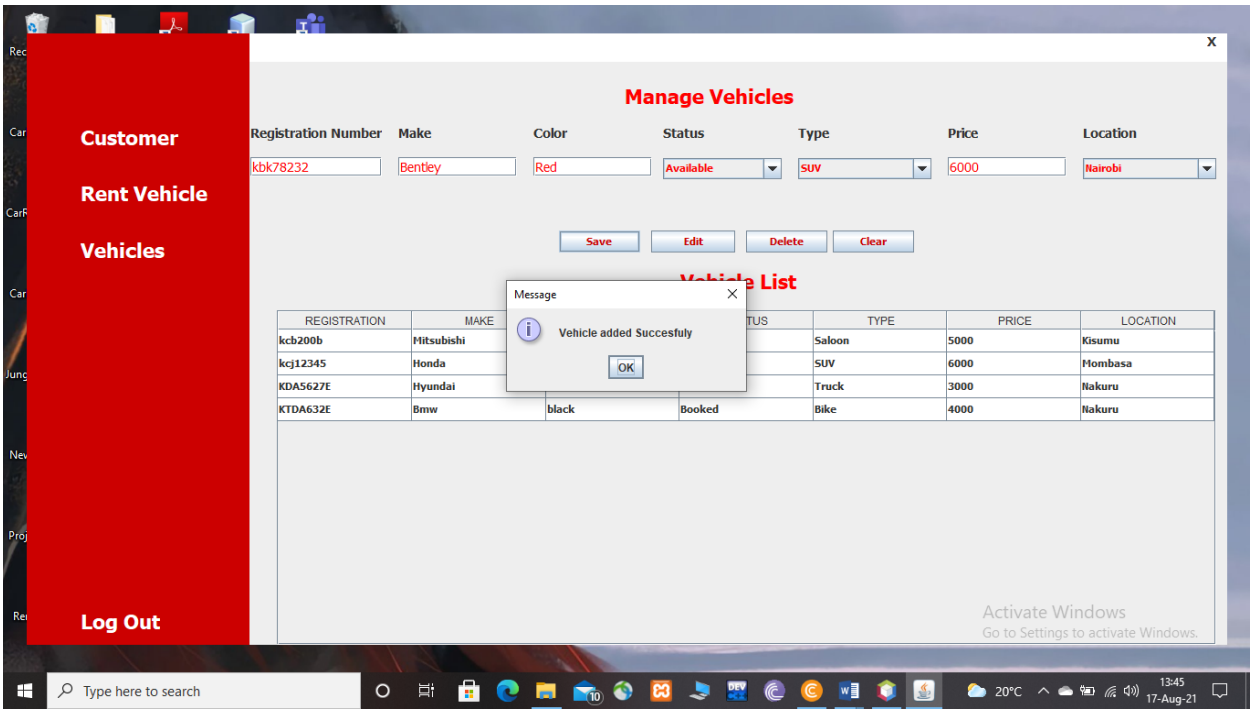


Adding vehicle

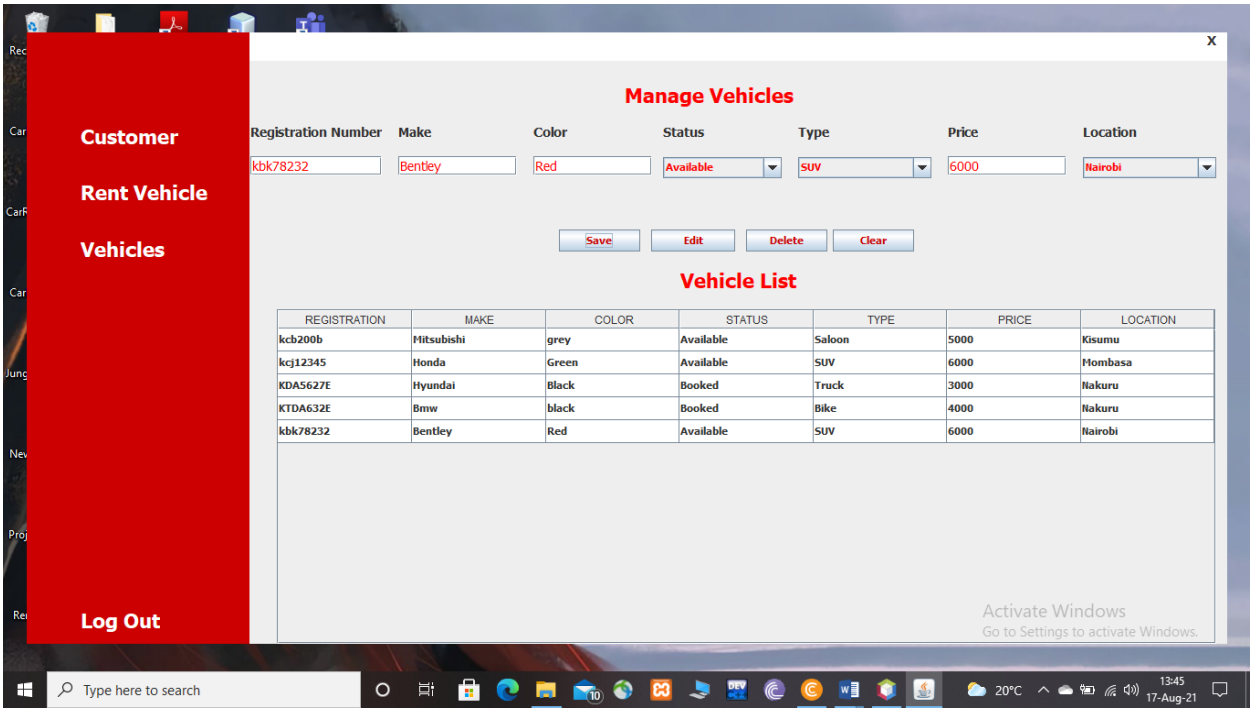
When user adds vehicle with missing values error message is shown



When all details are entered as required and save button is pressed

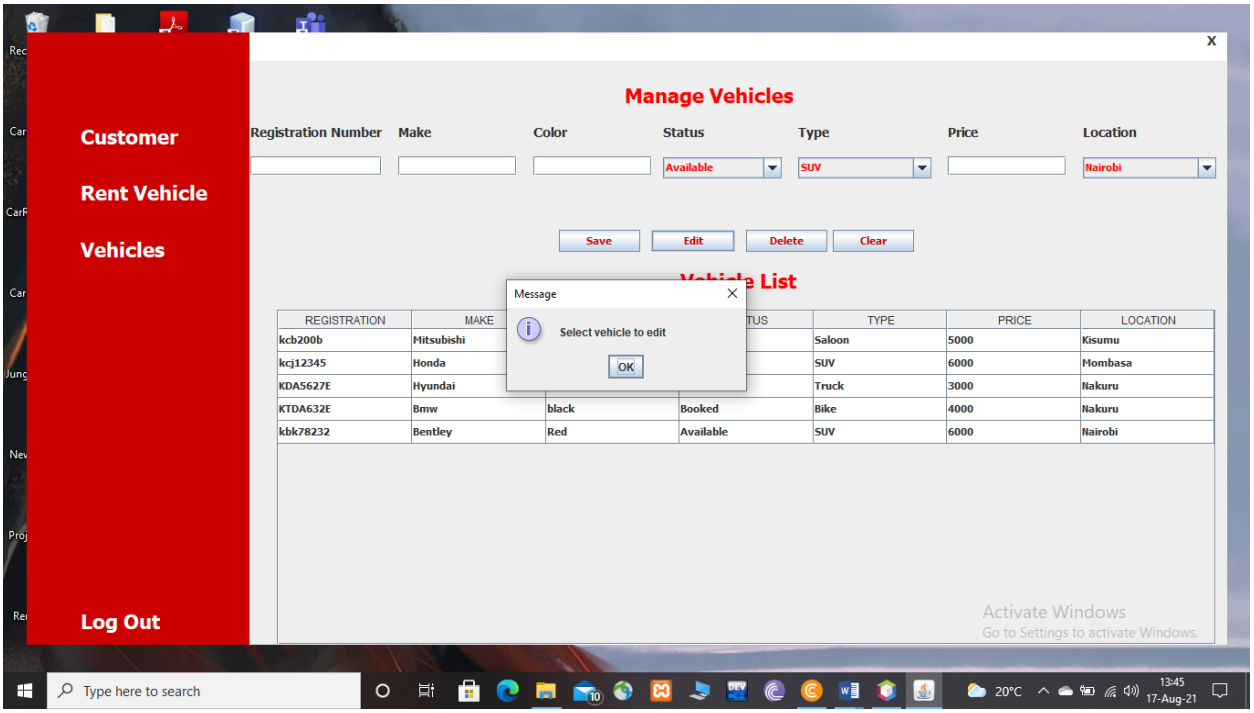


Vehicle is then added to the vehicle list table



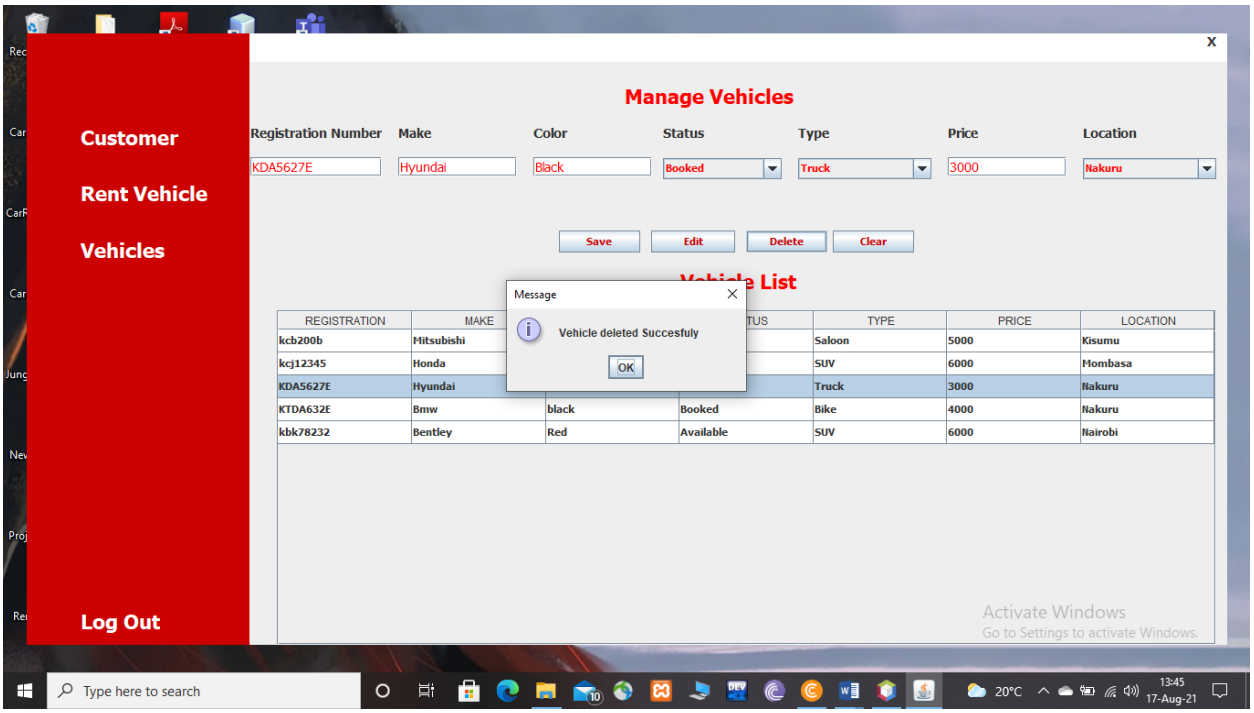
Editing vehicles

Press edit button without selecting row on table

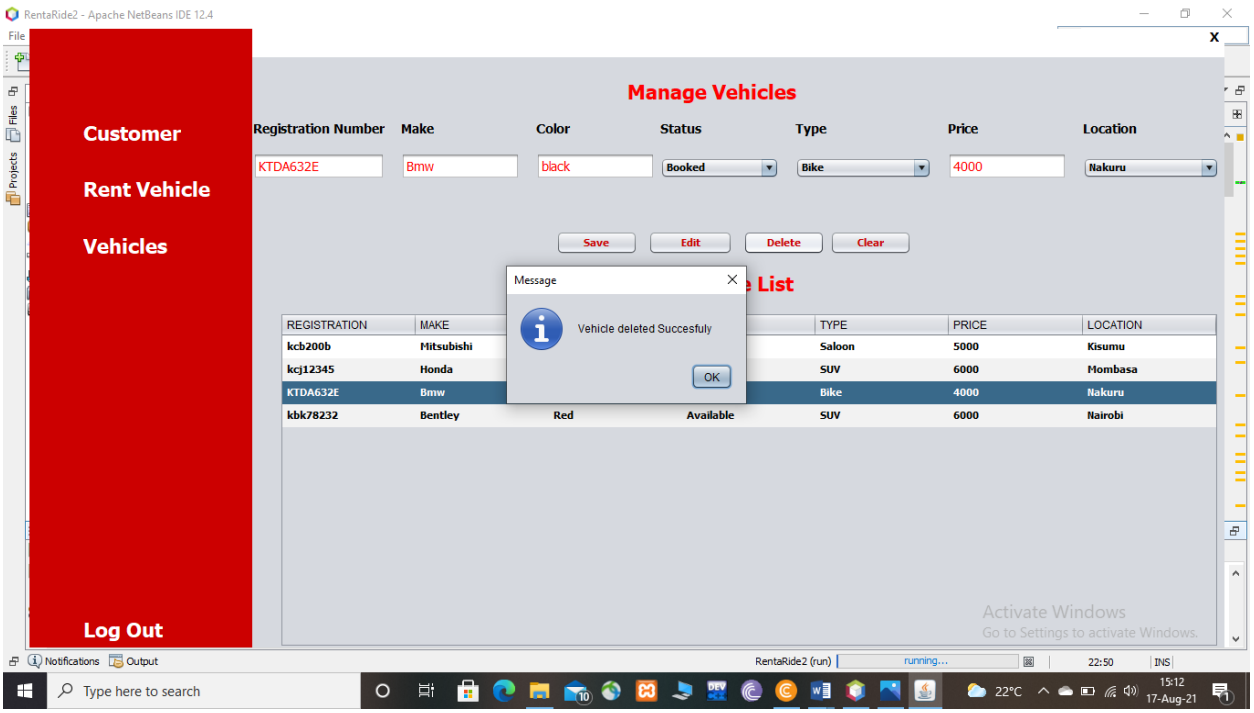


Deleting vehicle

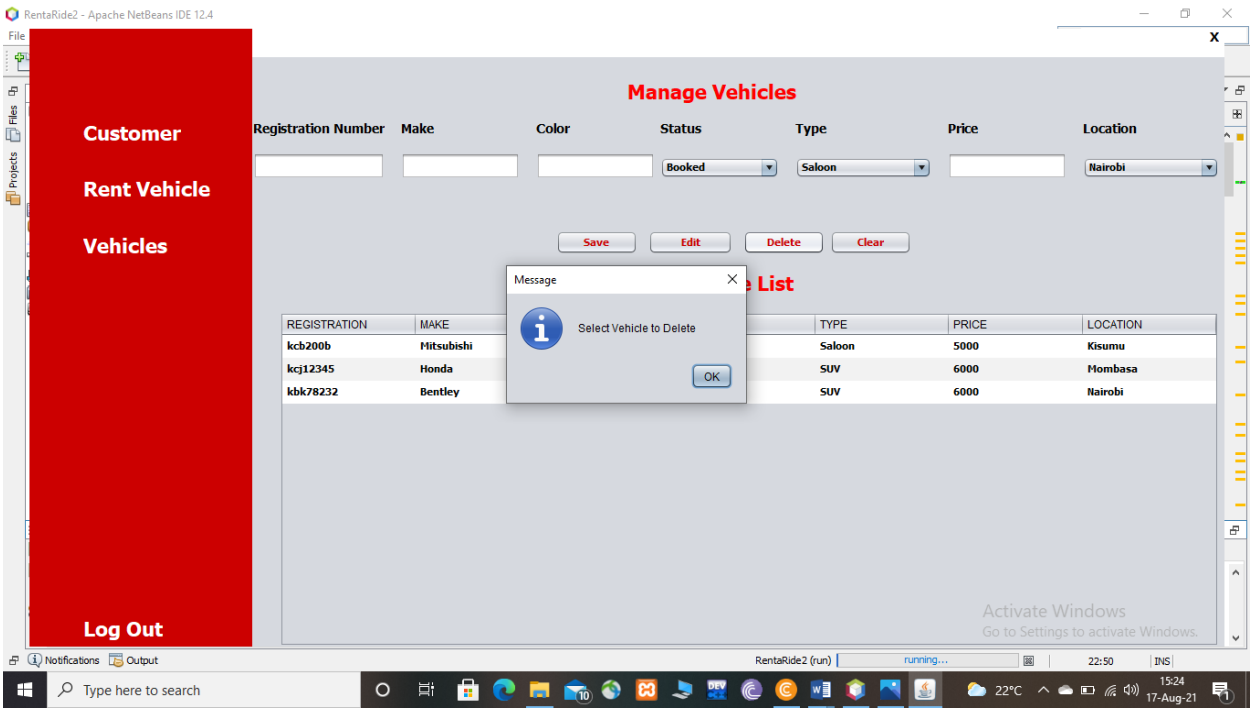
Deleting a record in the vehicles



Deleting vehicle

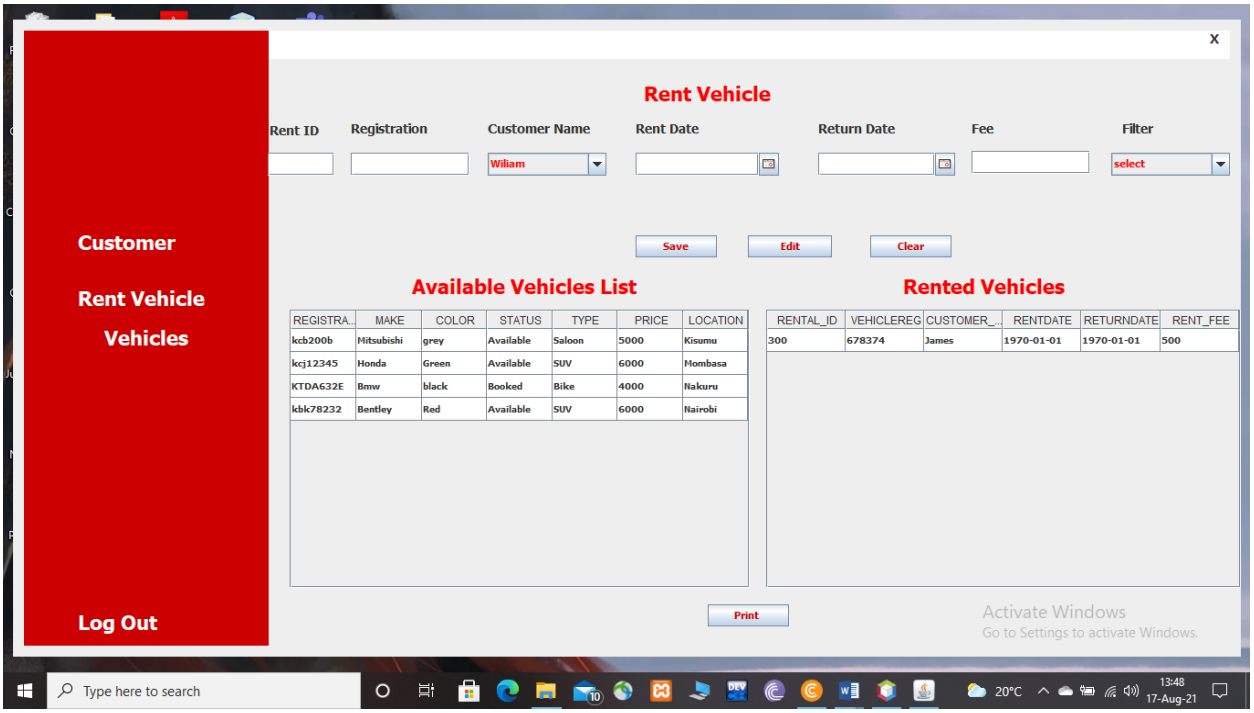


Trying to delete without selecting

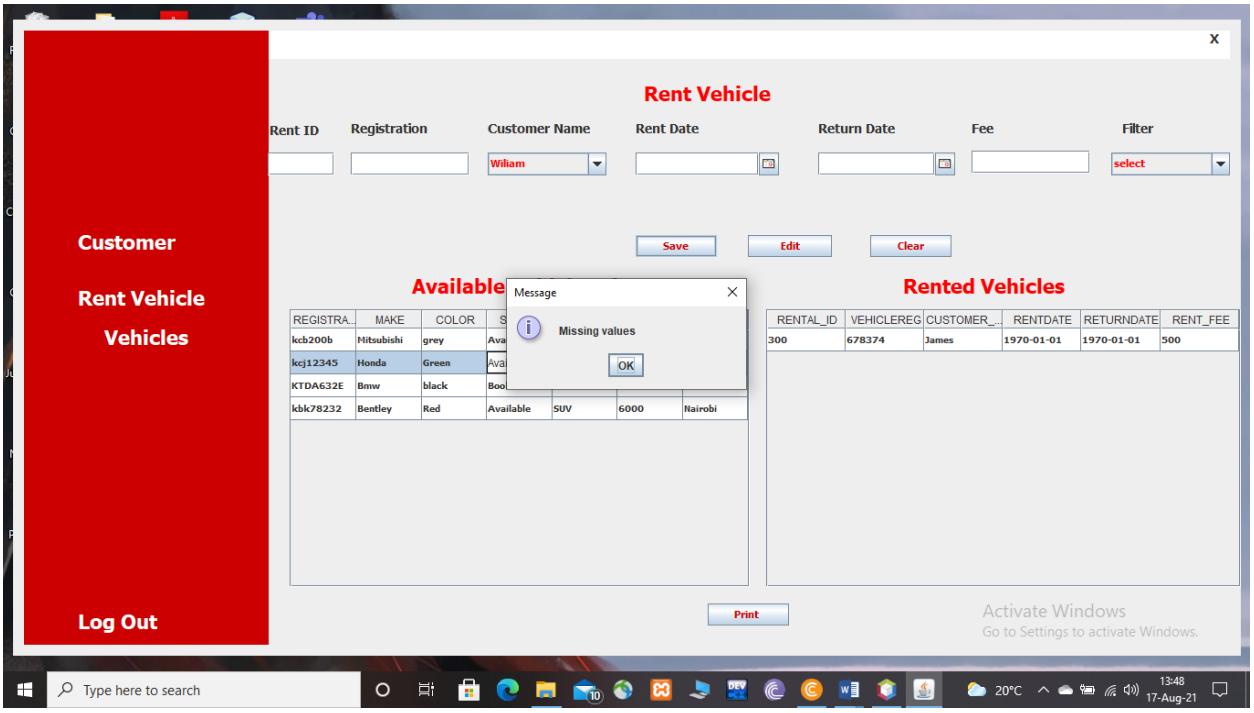


Renting vehicles

Displayed available vehicles

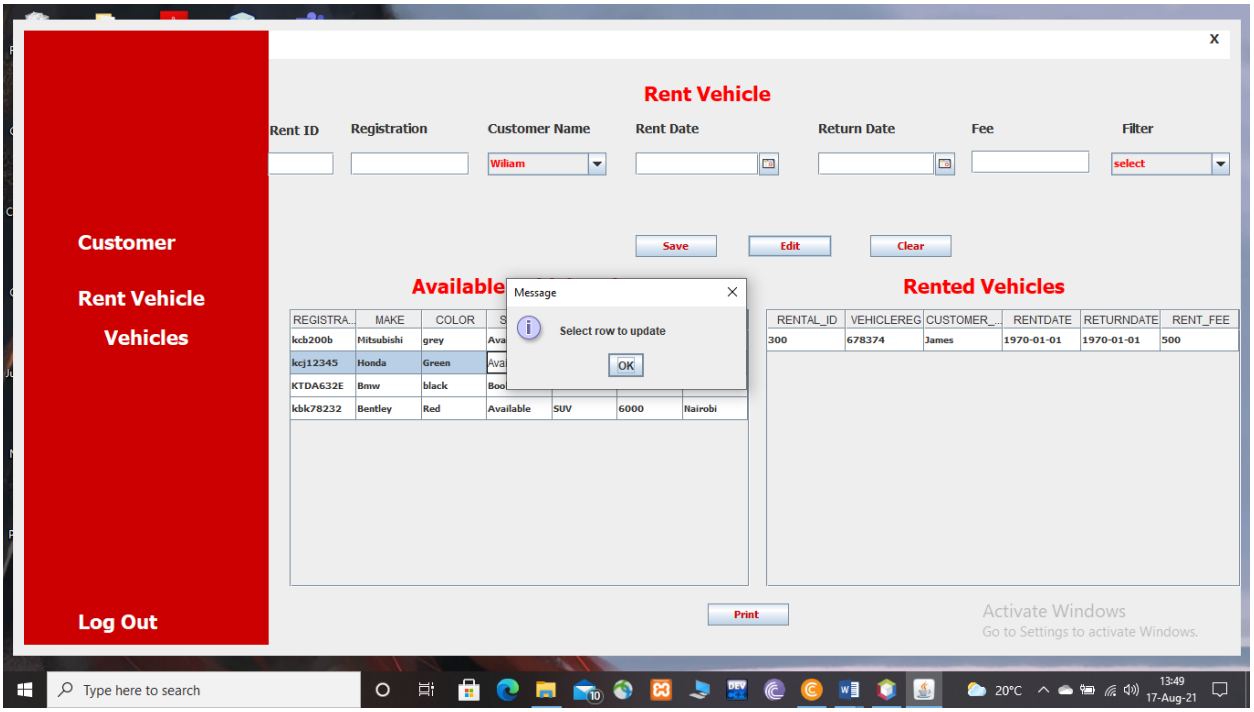


Missing values

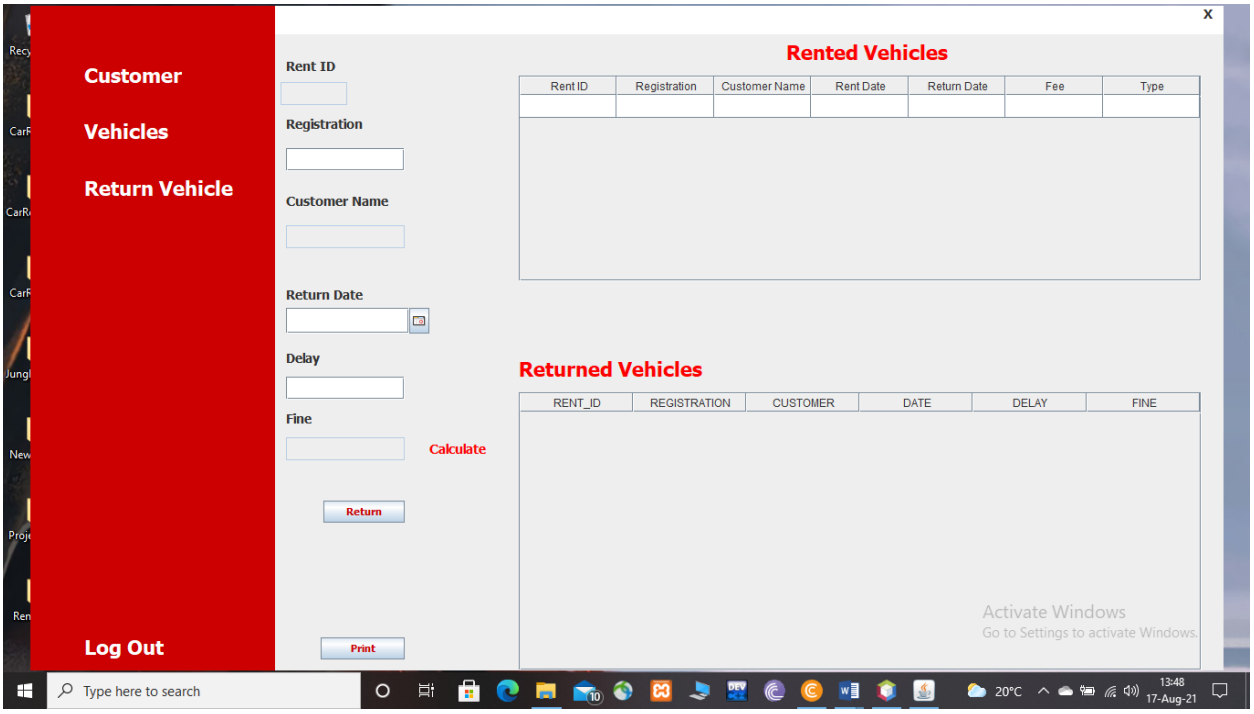


Updating rented car

Missing values

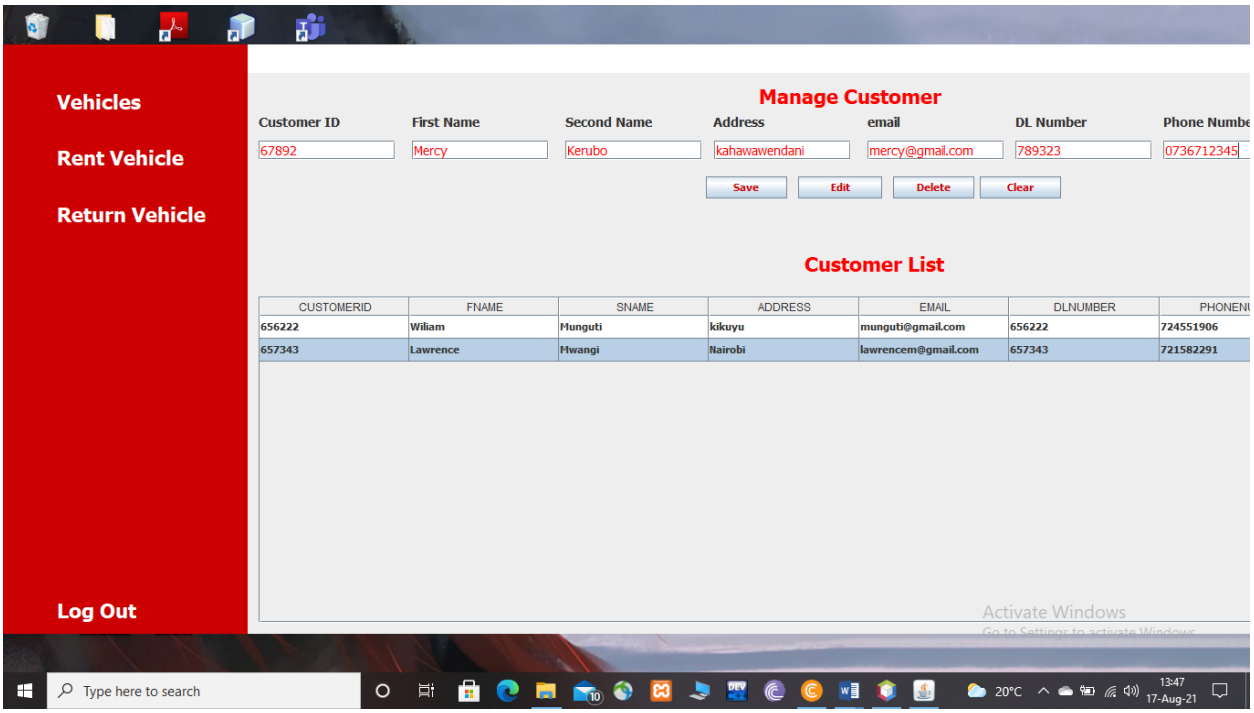


Returning car

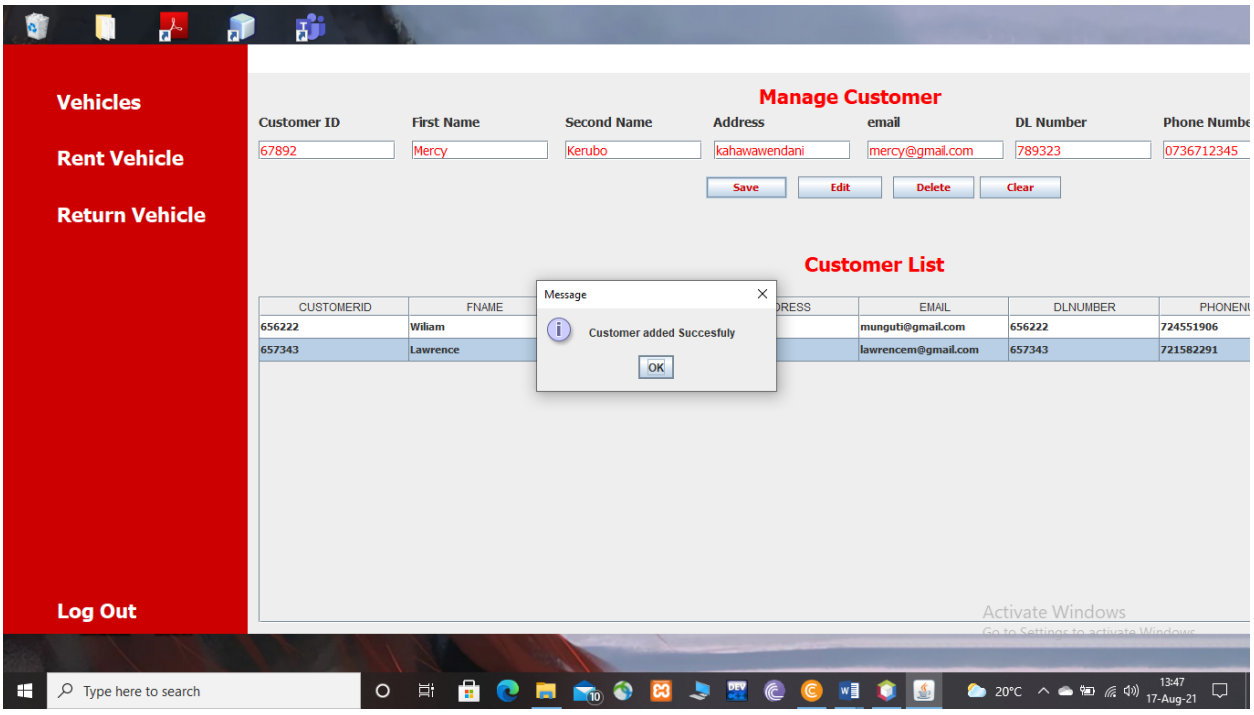


Managing customer

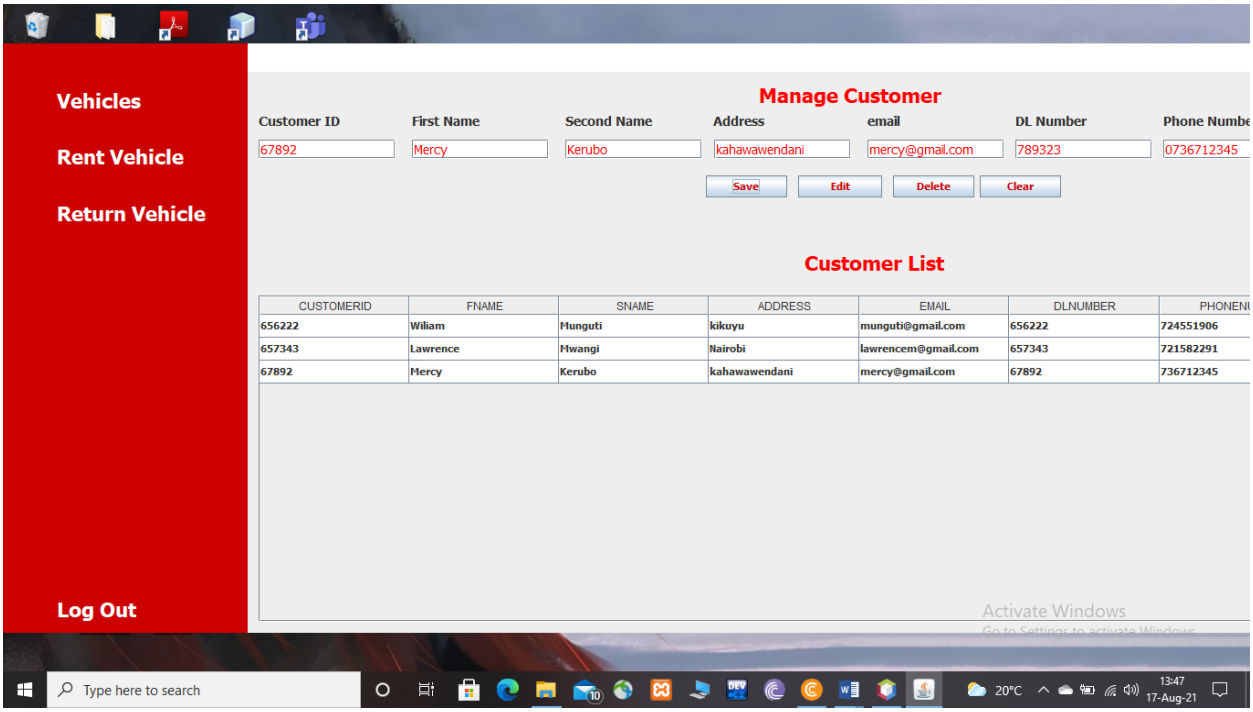
Display customers in system



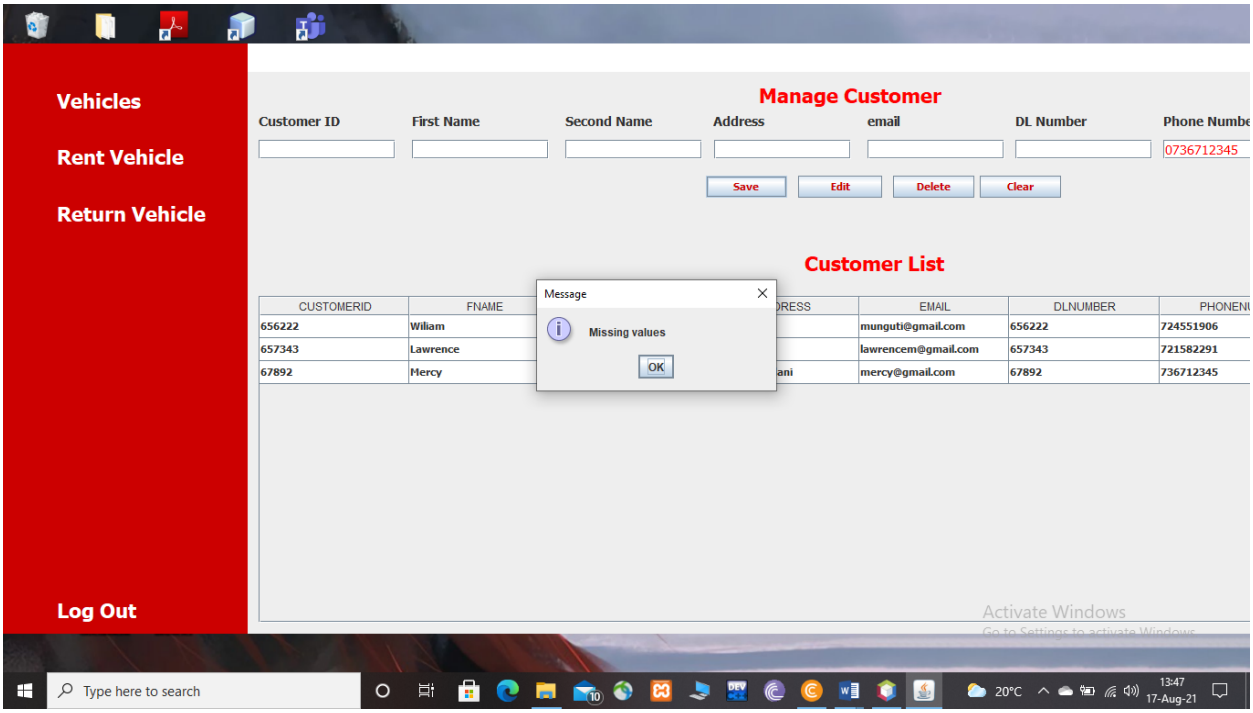
Adding customer



Added customer displayed

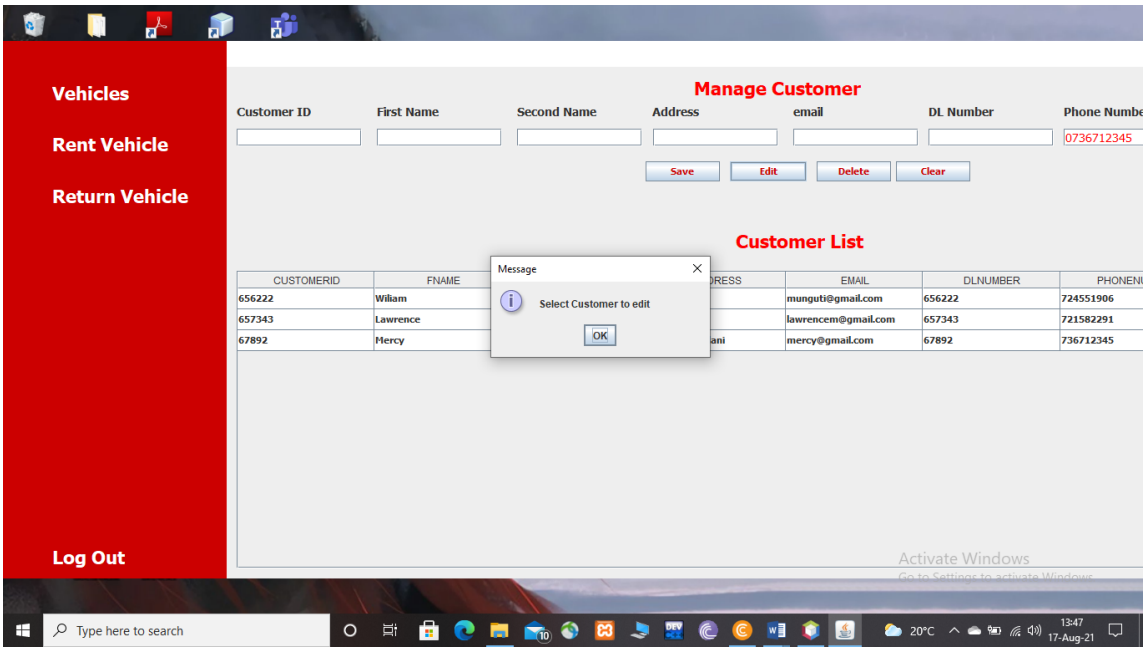


If required fields are not empty

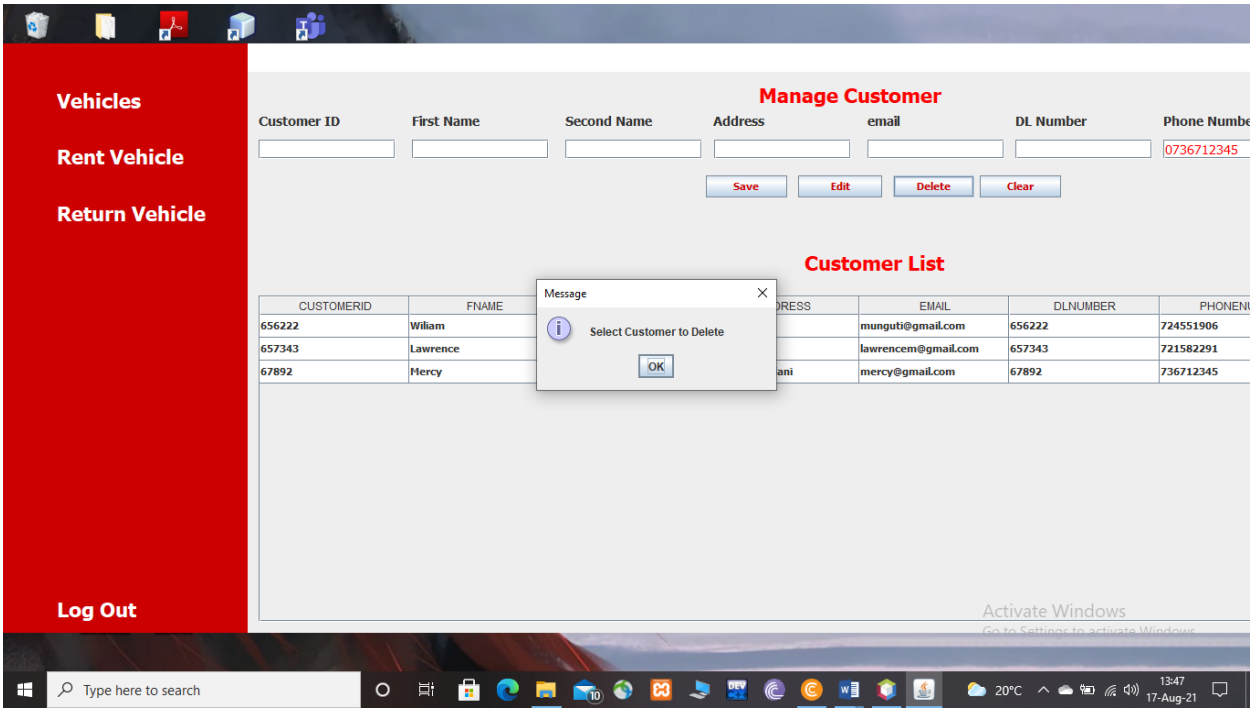


Editing customer

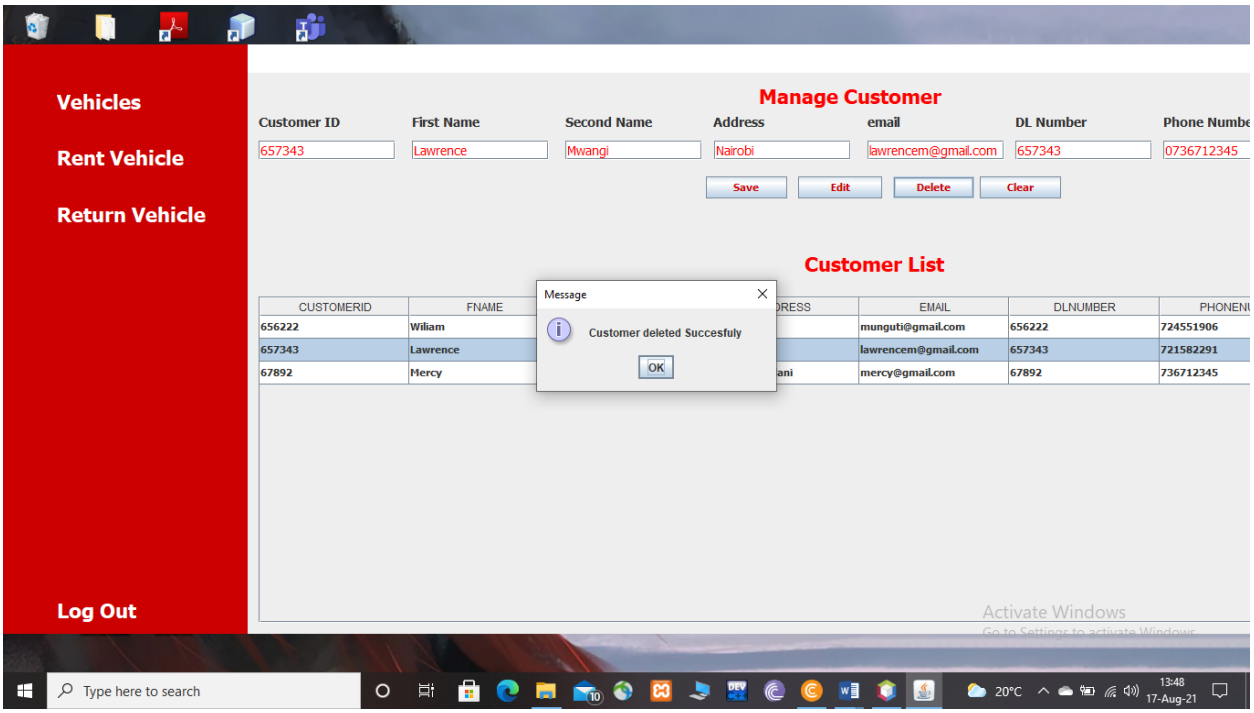
Trying to edit without selecting row on table



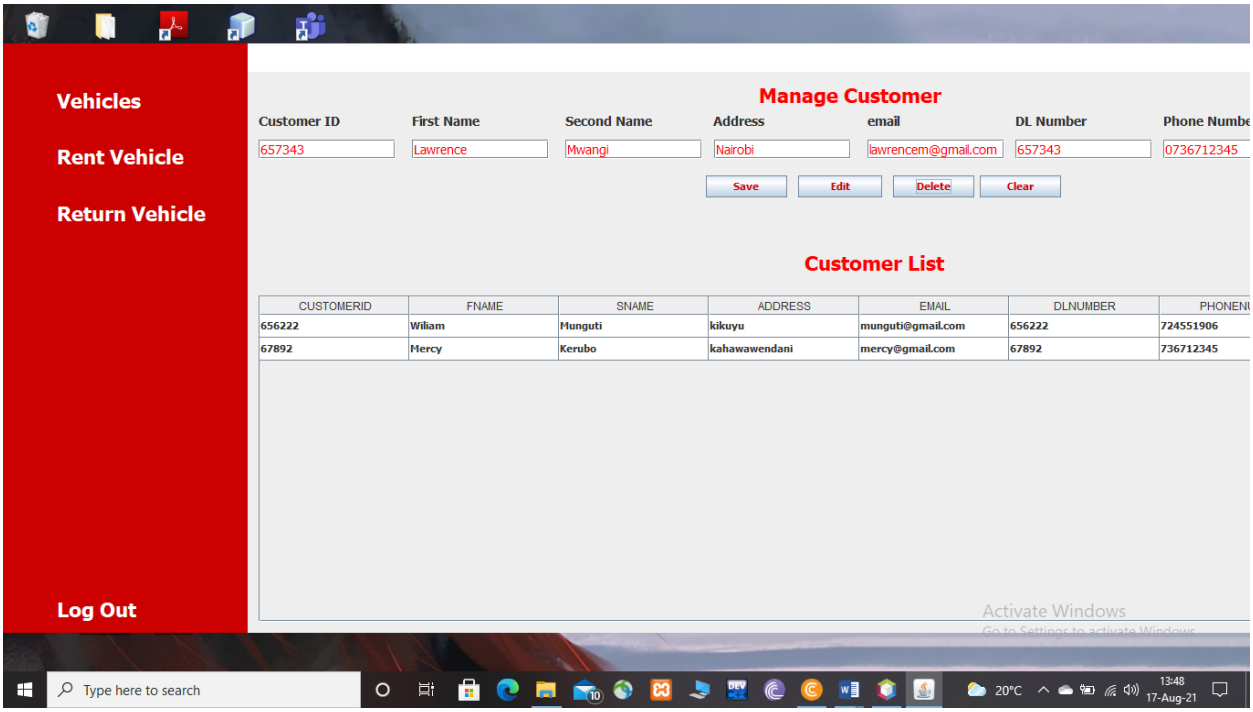
Deleting customer



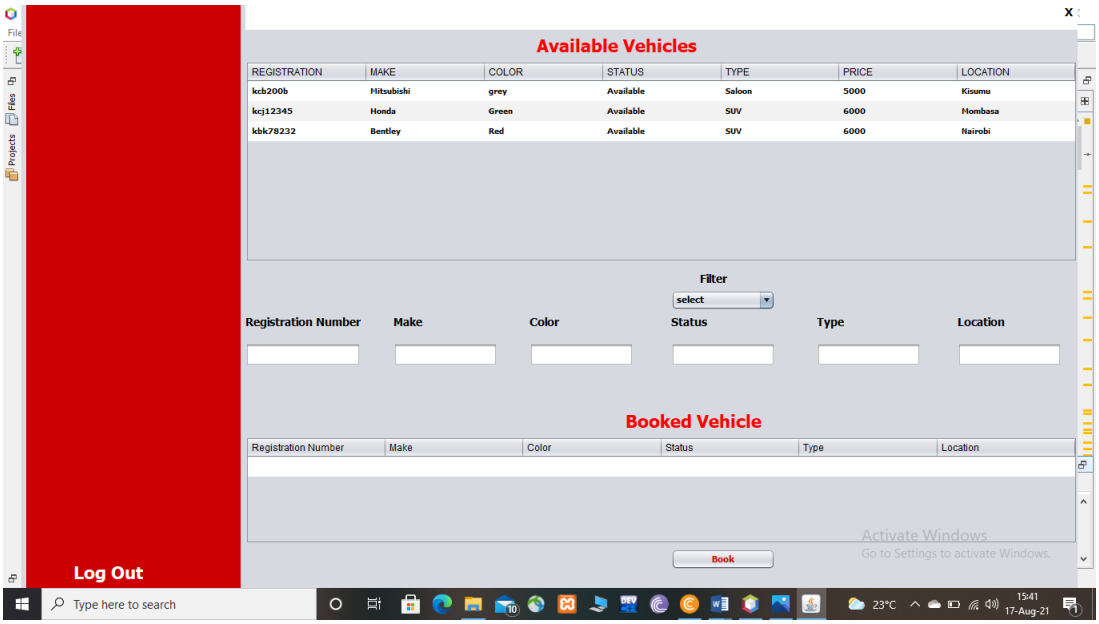
Message shows after deleting



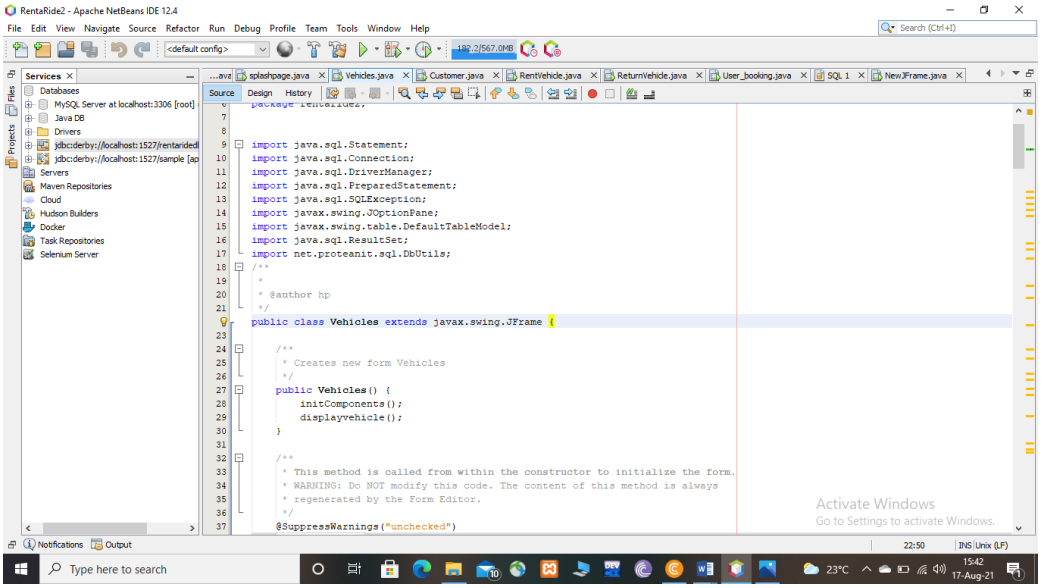
Deleted customer removed from list

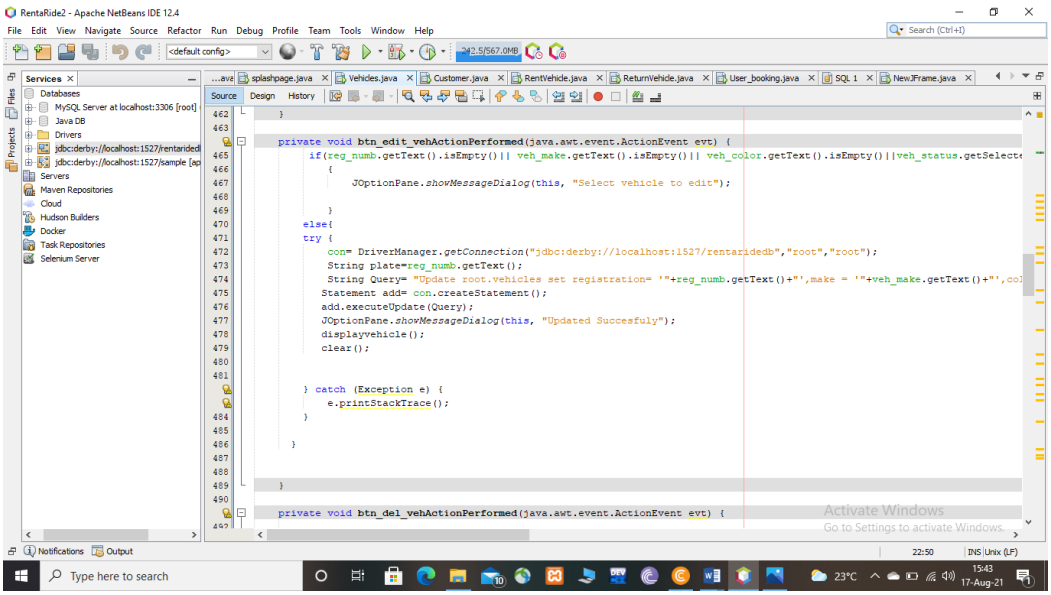


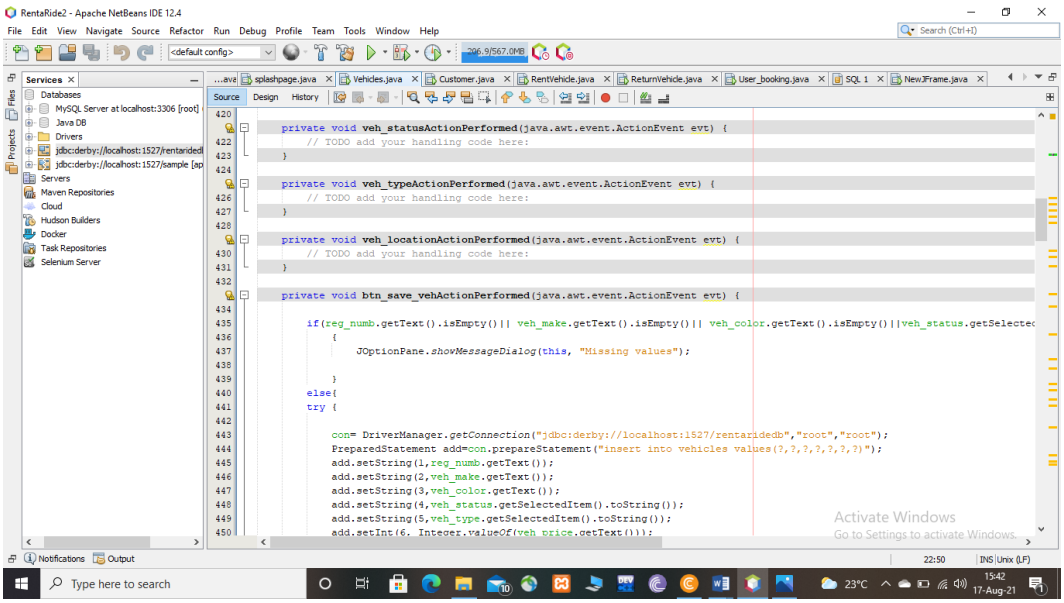
Customer after login



Back end examples







Conclusion and recommendations

The conclusion is that every software required a considerable amount of planning and excecuting in order for it to be a success or else it will not be properly developed. Moreover, factors should be considered when choosing the IDE to implement since the database will also affect the IDE that one is going to chose in implementing the software.

The development process also doesn't always go as planned and therefore the using of agile methods is the best for application and software development in order to have the best version of the final product.

References

M, K., 2021. *Car Rental Software: The Best Guide 2021 Car Rental Software: The Best Guide 2021*. [online] Fleetroot.com. Available at: <https://fleetroot.com/blog/car-rental-software-the-best-guide-2020/> [Accessed 2 June 2021].

TestMyPrep.com. 2021. *Car Hire System Literature Review*. [online] Available at: <https://testmyprep.com/subject/computer-science/car-hire-system-literature-review> [Accessed 2 June 2021].

Design, 1., & Yalanska, M. (2021). 17 Inspiring Examples of Mobile Interaction Design | Design4Users. Retrieved 22 June 2021, from https://design4users.com/mobile-interaction-design-examples/

UML - Use Case Diagrams - Tutorialspoint. (2021). Retrieved 22 June 2021, from https://www.tutorialspoint.com/uml/uml_use_case_diagram.htm

creately.com. (2021). Retrieved 22 June 2021, from https://creately.com/blog/diagrams/uml-diagram-types-examples/