

DATABASE MANAGEMENT SYSTEM PROJECT REPORT

Semester IV, B.Tech (IT)



VEHICO A VEHICLE MANAGEMENT PORTAL GROUP-22

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INTRODUCTION

Vehicle Management System - Vehico is a desktop application which can be used for car booking and rental purposes. This application allows users to book rides by providing them with different options to travel. It also keeps track of all the rides being taken by the passengers, vehicle and fuel expenses, repair history and vehicles assigned to each driver.

Day to day travel made easy and seamless with the use of Vehico, the vehicle management system. Users can easily book a ride on the click of a button on affordable prices without having to hassle. The application is user friendly and easy to use. Drivers can update their information on the app when they're ready to pick up a passenger, and as soon as a passenger books a ride the driver nearest to them is assigned to the passenger. This allows for efficient fuel consumption and lesser pick up time, which makes the user experience better. The passenger can see their real time location in the application throughout the journey, which assures safety.

The repair history of vehicles and other details are maintained in a database accessible to admin, which makes the system efficient and easy to use.

DEVELOPMENT TOOLS

- ❖ **Java Swing GUI** : Swing in Java is a Graphical User Interface (GUI) toolkit that includes the GUI components. It provides a rich set of widgets and packages to make sophisticated GUI components for Java applications. Swing is a part of Java Foundation Classes(JFC), which is an API for Java programs that provide GUI.
- ❖ **JDBC for MySql (PHPMyAdmin) connectivity** : JDBC drivers are Java library files with the extension .jar used by all Java applications to connect to the database.
- ❖ **SQL (queries)**
- ❖ **JavaFX-SDK-16** : The JavaFX Software Development Kit (SDK) provides the command-line tools and technologies to develop expressive content for applications deployed to browsers, desktops, and mobile devices.

SYSTEM REQUIREMENTS

- ❖ JDK: Latest version
- ❖ Operating System: Any
- ❖ IDE: Java Netbeans / IntelliJ / Eclipse
- ❖ Active Internet connection for accessing google maps.

FEATURES

There are mainly 3 modules in this project.

1. Admin Management

- ☐ Login
- ☐ Add Vehicle
- ☐ View Vehicle Details
- ☐ Delete Vehicle
- ☐ Ban Driver
- ☐ View Rides History
- ☐ Vehicle Repair History
- ☐ Manage Fuel Price

2. Driver Management

- ☐ Login
- ☐ Register
- ☐ Upon signing up, the driver selects the kind of vehicle he/she drives and is allotted a vehicle (if vacant).
- ☐ Option for turning ride status online and start picking rides.
- ☐ View Previous Rides
- ☐ Check for Current Ride and update ride status (AtPickup / Running / Completed).
- ☐ On completion of the ride, distance is noted and Bill is calculated.

3. Passenger Management

- ❑ Passengers need to sign up, and login thereafter.
- ❑ Upon logging in, they can Book Car / Rickshaw / Bus Rides.
- ❑ From the Google Maps (integrated), they can enter From and To locations and begin the ride.
- ❑ Directions are available via Google Maps for various vehicle routes.
- ❑ Car & Driver Details can be viewed anytime.
- ❑ Passengers Ride History

SCHEMA

1. Admin Table

Fields:

- AdminID varchar(8) (*PRIMARY KEY*)
- AdminP varchar(30)

2. Ban Driver Table

Fields:

- ID varchar(50) (*PRIMARY KEY*)
- CarId varchar(50)
- Password varchar(50)
- Name varchar(50)
- FatherName varchar(50)
- Gender varchar(10)
- SecurityQuestion varchar(50)
- Type varchar(8)
- aadhar varchar(15)
- ContactNo varchar(20)

-
- DOB varchar(20)

3. **Bus Table**

Fields:

- BusId int (*PRIMARY KEY*),
- Model varchar(50)
- Version varchar(50)
- Color varchar(50)
- PlateNo varchar(50)
- RegistrationDate varchar(50)
- ExpirationDate varchar(50)
- BusName varchar(50)
- Assigned tinyint
- Fromm varchar(50)
- Too varchar(50)

4. **Car table**

Fields:

- CarId int (*PRIMARY KEY*)
- Model varchar(50)
- Version varchar(50)
- Color varchar(50)
- PlateNo varchar(20)
- RegistrationDate varchar(50)
- ExpirationDate varchar(50)
- CarName varchar(50)
- Assigned tinyint

5. **Driver table**

Fields:

- ID varchar(50) (*PRIMARY KEY*)
- Password varchar(50)
- Name varchar(50)
- FatherName varchar(50)
- Gender varchar(10)
- SecurityQuestion varchar(50)
- Type varchar(8)
- aadhar varchar(15)
- ContactNo varchar(20)
- DOB varchar(20)

6. **Driver Bus ride table**

Fields:

- ID int (*PRIMARY KEY*)
- Username varchar(10) (*FOREIGN KEY*)
- BusId int (*FOREIGN KEY*)
- DriverAvail tinyint
- Fromm varchar(50)
- Too varchar(50)
- Datee varchar(50)
- RideStatus varchar(50)
- StartTime varchar(50)
- EndTime varchar(50)
- BillStatus varchar(50)
- Bill double
- NoOfPassengers tinyint

7. **Driver Bus Table**

Fields:

- SNo int (*PRIMARY KEY*)
- DriverUsername varchar(20) (*FOREIGN KEY*)

-
- BusID int (*FOREIGN KEY*)
 - Fromm varchar(50)
 - Too varchar(50)

8. Driver Car Ride Table

Fields:

- ID tinyint (*PRIMARY KEY*)
- Username varchar(50) (*FOREIGN KEY*)
- CarId int (*FOREIGN KEY*)
- DriverAvail tinyint
- PUsername varchar(50) (*FOREIGN KEY*)
- Fromm varchar(50)
- Too varchar(50)
- Datee varchar(50)
- RideStatus varchar(50)
- StartTime varchar(20)
- EndTime varchar(20)
- BillStatus varchar(50)
- Bill double

9. Driver Car Table

Fields:

- SNo int (*PRIMARY KEY*)
- DriverUsername varchar(50) (*FOREIGN KEY*)
- CarID int (*FOREIGN KEY*)

10. Driver Rickshaw Ride Table

Fields:

- ID tinyint (*PRIMARY KEY*)
- Username varchar(50) (*FOREIGN KEY*)
- RickshawId int (*FOREIGN KEY*)
- DriverAvail tinyint
- PUsername varchar(50) (*FOREIGN KEY*)

-
- Fromm varchar(50)
 - Too varchar(50)
 - Datee varchar(20)
 - RideStatus varchar(50)
 - StartTime varchar(50)
 - EndTime varchar(50)
 - BillStatus varchar(50)
 - Bill float

11. Driver Rickshaw Table

Fields:

- SNo int (*PRIMARY KEY*)
- DriverUsername varchar(50) (*FOREIGN KEY*)
- RickshawID int (*FOREIGN KEY*)

12. Fuel Table

Fields:

- id int (*PRIMARY KEY*)
- price double

13. Passenger Bus Rides Table

Fields:

- SNo int (*PRIMARY KEY*)
- iD int (*FOREIGN KEY*)
- Username varchar(50) (*FOREIGN KEY*)
- VehicleId int (*FOREIGN KEY*)
- PUsername varchar(50) (*FOREIGN KEY*)

14. Passenger Table

Fields:

- PID varchar(50) (*PRIMARY KEY*)
- PPass varchar(50)
- PName varchar(50)
- PFName varchar(50)

-
- PGender varchar(50)
 - PSec varchar(50)
 - aadhar varchar(50)
 - ContactNo varchar(50)
 - DOB varchar(50)

15. Repair History Table

Fields:

- date varchar(50) (*UNIQUE*)
- driver_id varchar(50) (*FOREIGN KEY*)
- carID tinyint
- request varchar(180)

16. Rickshaw Table

Fields:

- RickshawId int (*PRIMARY KEY*)
- Model varchar(50)
- Version varchar(50)
- Color varchar(50)
- PlateNo varchar(20)
- RegistrationDate varchar(50)
- ExpirationDate varchar(50)
- RickshawName varchar(50)
- Assigned tinyint

17. Ride realtime table

Fields:

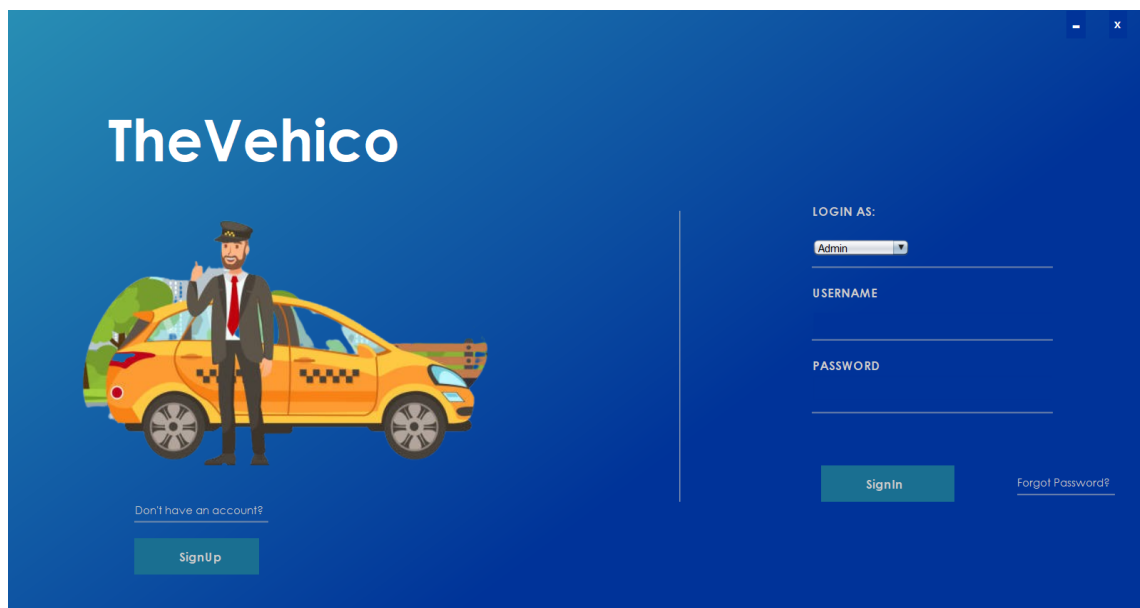
- iD varchar(50) (*PRIMARY KEY*)
- Username varchar(50) (*FOREIGN KEY*)
- VehicleId int
- PUsername varchar(50) (*FOREIGN KEY*)
- Fromm varchar(50)
- Too varchar(50)

-
- Datee varchar(50)
 - RideStatus varchar(50)
 - StartTime varchar(50)
 - EndTime varchar(50)
 - BillStatus varchar(50)
 - Bill double
 - NoOfPassengers tinyint
-

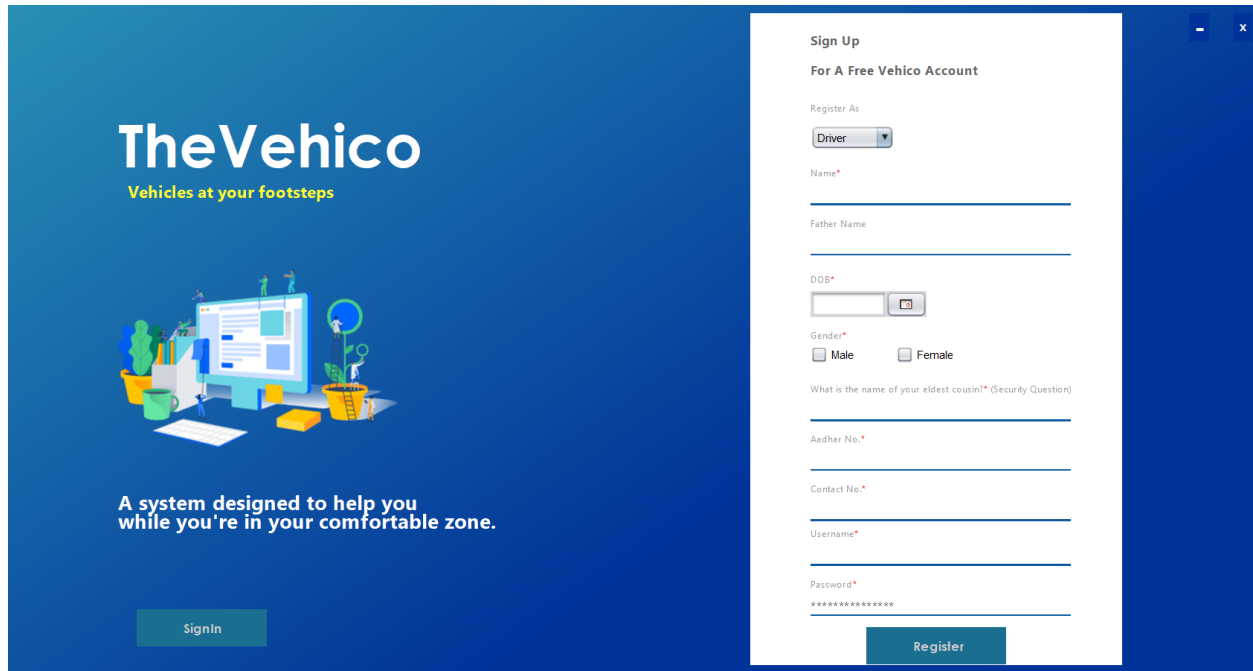
IMPLEMENTATION

The first window which is displayed in the application is the login window.

Login Page: Users can select their role from admin, driver or passenger. On entering username and password, if the entered credentials are correct then the user will be directed to their respective dashboard. If the credentials are incorrect, an error message will be displayed.



Register Page: On this page the user will be able to register himself driver or passenger .



TheVehico
Vehicles at your footsteps

A system designed to help you while you're in your comfortable zone.

Sign In

Sign Up
For A Free Vehico Account

Register As
Driver

Name*

Father Name

DOB*

Gender*
☐ Male ☐ Female

What is the name of your eldest cousin* (Security Question)

Aadhar No.*

Contact No.*

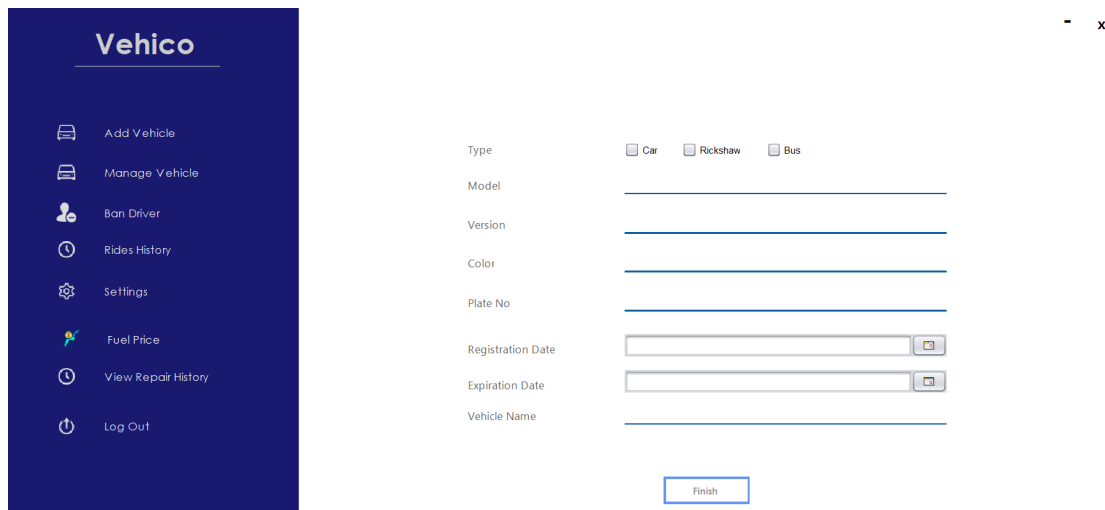
Username*

Password*

Register

Admin

❖ **Add Vehicle:** On this page admin can add vehicle i.e. car, rickshaw or bus.



Vehico

- Add Vehicle
- Manage Vehicle
- Ban Driver
- Rides History
- Settings
- Fuel Price
- View Repair History
- Log Out

Type
☐ Car ☐ Rickshaw ☐ Bus

Model

Version

Color

Plate No

Registration Date

Expiration Date

Vehicle Name

Finish

- ❖ **Remove Vehicle:** On this page admin can view/delete vehicles from the database. The vehicle could be either a car or a rickshaw or a bus.

Vehico

- Add Vehicle
- Manage Vehicle
- Ban Driver
- Rides History
- Settings
- Fuel Price
- View Repair History
- Log Out

[View Cars](#)[View Rickshaws](#)[View Bus](#)

CarId	Model	Version	Color	PlateNo	RegistrationDate	ExpirationDate	CarName	Assigned
1	Sedan	v1.1	Blue	UP1234	02-May-2021	01-May-2031	Honda Civic	1
2	m1	v1	blue	up3456	03-May-2021	08-May-2029	CarNew	1
18	2019	v 1.8	Black	LJK-2004	12-Jun-2020	19-Oct-2029	Mira	1
19	2020	v 6.4	White	IKA-1212	12-May-2021	04-May-2029	Suzuki Swift	1
20	2020	v 5.1	Black	IN	12-May-2021	04-May-2029	Scross	1

Enter the ID of the vehicle to be Deleted

[Delete](#)[Refresh](#)

- ❖ **Ban Driver:** On this page admin can view all the drivers and can also ban one.

Vehico

- Add Vehicle
- Manage Vehicle
- Ban Driver
- Rides History
- Settings
- Fuel Price
- View Repair History
- Log Out

Here's list of Vehico's drivers

ID	Name	FatherName	Gender
123	Driver1	Driver1 Father	Male
alex1	Alex	Patrick	Male
bd2	bd2	bd2d	Male
charlie1	Charlie	Rohn	Male
d11	d11	d11d	Male

Enter the username of the driver you want to ban.

[Ban](#)[Refresh](#)

- ❖ **View Rides:** On this page admin can view all the previous rides.

Vehico

Add Vehicle

Manage Vehicle

Ban Driver

Rides History

Settings

Fuel Price

View Repair History

Log Out

Here's list of Vehico's Rides

Date	RideID	DriverUse...	VehicleId	Vehicle type	Passenge...	From	To	StartTime	EndTime	RideStatus	BillStatus	Bill	NoOfPas...
10/05/2021	B1	testB	2	Bus	abcd	Ghaziabad	Meerut	18:33	18:33	Completed	Paid	626.88	3
10/05/2021	B1	testB	2	Bus	bruce1	Ghaziabad	Meerut	18:33	18:33	Completed	Paid	626.88	3
10/05/2021	B2	testB	2	Bus	bruce1	Ghaziabad	Meerut	18:56	18:53	Running	Paid	877.63200	3
10/05/2021	B2	testB	2	Bus	abcd	Ghaziabad	Meerut	18:56	18:53	Running	Paid	877.63200	3
10/05/2021	C1	nic	26	Car	kane1	Gurugram	Allahabad...	20:57	20:58	Completed	Paid	488.9064	1

- ❖ **Settings:** On this page admin can change his password.

Vehico

Add Vehicle

Manage Vehicle

Ban Driver

Rides History

Settings

Fuel Price

View Repair History

Log Out

Change Password

Old Password

Verify

- ❖ **Fuel Price:** On this page admin can change the fuel price

Vehico

Add Vehicle

Manage Vehicle

Ban Driver

Rides History

Settings

Fuel Price

View Repair History

Log Out

Update New Fuel Price


Current Fuel Price: 50.5

Enter New Fuel Price


Update

❖ **View Repair History:** On this page admin can view the repair history.


Vehico




Add Vehicle




Manage Vehicle




Ban Driver




Rides History




Settings



Fuel Price



View Repair History



Log Out


Here's list of Vehico's Rides

date	driver_id	carID	request
2021-04-28 12:47:08	123	22	abcdef


Driver

❖ **Check Rides:** On this page the driver can view his previous rides.


Vehico




Check Rides




Current Ride



Settings



Repair Request



Log Out

Here's list of Vehico's Rides

Datee	Username	VehiclePlate	PUsername	PassengerC...	Fromm	Too	StartTime	EndTime	RideStatus	BillStatus	Bill	NoOfPasse...
30/04/2021	123	LK-2004	abcd	1	Delhi	Kanpur, Uta...	19:20	19:21	Completed	Paid	8718.84	
06/05/2021	123	LK-2004	abcd	1	Lucknow, Ut...	Prayagraj, U...	17:21	17:21	Completed	Paid	488.9664	

- ❖ **Current Ride:** On this page the driver can check if he has any ongoing current ride. If there is an ongoing ride then he can update the status of the ride. After completion of ride he can enter the total distance covered and can generate a bill. On bill payment he can update the status of payment.

Vehico

Press This To Check If You've Any Current Ride

Update your current Ride Status

☐ At Pickup ☐ Running

Update

Calculate Bill

Km covered: (In Km)

Calculate

The Bill Is _____ (In PKR)

Received

- ❖ **Settings:** On this page the driver can change his password.

Vehico

Change Password

Old Password

Verify

- ❖ **Repair Request:** On this page the driver can apply for a repair request.

Vehico

- Check Rides
- Current Ride
- Settings
- Repair Request
- Log Out

Repair Details

Enter details here:

Submit

Passenger

- ❖ **Book Ride:** On this page the passenger can book a ride by choosing type of vehicle , starting location and final destination.

Vehico

- Book Ride
- My Rides
- Bus Rides
- Log Out

BOOK RIDE

Select your Vehicle:

Car

Rickshaw

Bus

Confirm Booking

- ❖ **My Rides:** On this page Passenger can view all of his previous rides.

Vehico





-  Book Ride
-  My Rides
-  Bus Rides
-  Log Out

Here's list of Vehico's Rides

Date	Username	DriverName	DriverCon...	VehiclePla...	VehicleNa...	Fromm	To	StartTime	EndTime	RideStatus	BillStatus	Bill
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- ❖ **Bus Rides:** On this page the passenger can view all of his previous bus rides.

Vehico

-  Book Ride
-  My Rides
-  Bus Rides
-  Log Out

Here's list of your Bus Rides

Date	DriverUsername	DriverName	VehiclePlate	VehicleId	From	To
10/05/2021	testB	Bus_test	HR1234	2	Ghaziabad	Meerut
10/05/2021	testB	Bus_test	HR1234	2	Ghaziabad	Meerut

CONVERTING TABLES IN 3rd NORMAL FORM :

- ❖ Since there are no multi-valued attributes in any of the defined tables, *all tables are already in 1NF form.*
- ❖ Also, since there is no table where candidate key is composite, *there wouldn't be cases for failing 2NF form.*
- ❖ We have a table CarT where we have the information regarding the Car which is added by the Admin. Also, when the driver registers, he/she will only be able to register if the corresponding type of vehicle that they drive has a vacant availability. Now, post successful registration, the details for the driver are stored in the Driver table.

We also have a table DriverCarT where the driver and the corresponding car details are stored. Initially we had stored CarId, CarName, CarPlateNo (out of which Name & PlateNo can be derived from Id) and from Driver table, DriverUsername & DriverName (name can be derived from username).

So, DriverUsername & CarId act as Foreign Keys.

But since DriverUsername can derive all other attributes, it actually becomes a Primary Key.

DriverUsername -> CarId

CarId -> CarPlateNo

DriverUsername -> CarPlateNo

We can clearly see that there is a case of Transitive Dependency, hence making the table fail in satisfying the conditions for 3rd Normal Form.

In order to rectify the anomaly, the best option is to keep only the DriverUsername & CarId and retrieve attributes DriverName (from Driver) and CarName, CarPlateNo (from CarT by specifying CarId).

Hence we now have a table which satisfies the conditions for 3NF.

Similarly, the same thing was done for the Rickshaw and Bus tables (RickshawT, DriverRickshawT, BusT, DriverBusT,) in the database.

-
- ❖ Let us now look at the other huge tables, one of them being DriverCarRT.

Similar to the anomalies present in the above stated tables, in DriverCarRT too, we have multiple attribute pairs which can be derived from each other apart from the primary key.

Earlier in this table we had attributes DriverUsername along with DriverName and similarly CarId along with CarName and CarPlateNo.

Now, since the candidate key is ID, it will derive all other attributes.

But,

ID -> DriverUsername

DriverUsername -> DriverName

CarId -> CarPlateNo

CarId -> CarName

Therefore in order to remove anomalies, we remove all columns that could be derived from DriverUsername or CarId or any other attribute resulting in failing of 3NF form.

Similarly, the same is done for the tables DriverBusRT, DriverRickshawRT, RideRealtime, PassengerBusRides.

Now, it is ensured that there is *no Transitive dependency and all tables are in 3NF*.



PROCEDURE TO RUN

- ❑ Install Netbeans & import this project.
- ❑ Install JavaFX-SDK-16
- ❑ Add all libraries situated in the [link](#).
- ❑ Add Libraries from the lib folder (inside JavaFX folder) after installing JavaFX-SDK-16.
- ❑ Add `--module-path "PATH to lib folder in JavaFX-SDK-16"`
`--add-modules=javafx.controls,javafx.fxml,javafx.web,javafx.media,javafx.swing` in VM options.
- ❑ Open the file `DbConnection.java`, alter URL depending upon your MySQL Server, Username and Password.
- ❑ Database (SQL file) is present in the `/Database` folder.
- ❑ Admin account username: **1** & Admin account password : **y**
- ❑ For Driver & Passenger, register and proceed.

FUTURE SCOPE

The application can be further modified to accommodate other types of vehicles and increased functionality for the users. It can be used to maintain and help with the functioning of larger public transport systems like buses and cabs for interstate travel. The use of this application will allow the work to be digital and rely on less paperwork which would mean more efficient, less time consuming and error free work.

REFERENCES

- ❑ Designing a SWING GUI in Netbeans
- ❑ Connect To MySQL Database
- ❑ Stack OverFlow
- ❑ JavaFX-SDK-16 Webview