

DEVELOPMENT OF LOCATION TRACKING SYSTEM OF DIU TRANSPORT

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This Report Presented in Partial Fulfillment of the Requirements for the
Degree of Bachelor of Science in Computer Science and Engineering

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DAFFODIL INTERNATIONAL UNIVERSITY

ASHULIA, SAVAR, BANGLADESH

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APPROVAL

This Project titled “**DEVELOPMENT OF LOCATION TRACKING SYSTEM OF DIU TRANSPORT**”, submitted by **Joyanta Kumar Sarkar ID: 142-15-144** to the Department of Computer Science and Engineering, Daffodil International University, has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in Computer Science and Engineering (BSc) and approved as to its style and contents. The presentation has been held on 5th May 2019.

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I hereby declare that, this project has been done by me under the supervision of **Md. Tanvir Rahman, Senior Lecturer, Department of CSE** Daffodil International University. I also declare that neither this project nor any part of this project has been submitted elsewhere for award of any degree or diploma.

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ABSTRACT

Now a days Daffodil International University is an outstanding University in Bangladesh with its huge measure of understudies and offices. As a specific measure of the understudies originate from outside the grounds, they for the most part need to utilize the University Transport office. Be that as it may, the understudies face a few issues with the present Bus Location Tracking System of DIU. All Information with respect to transport calendars, course and driver data scopes to the understudies in a dispersed manner. Abrupt updates and other data now and again make a few problems. Administrators likewise face a rundown of issues to keep up the best possible administration of transport and each individual identified with it. In such manner, an application can be an answer for the majority of the issues Express JS ed above by giving a wide range of data identified with transport, situate the board and simple to get to and keep up for both admin and user.

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CHAPTER 1

INTRODUCTION

DIU Bus Location Tracking System has been produced for the executives of transport segment of DIU. Vehicle tracking system is a miniature model of Global Positioning System (GPS). GPS is used to find out the position or location of the vehicle around the world. This implementation introduces AN web/android based tracking system. With the help of the GPS value; we can calculate the distance with respect to time. The direction and the distance are fed into the microcontroller and that will be transmitted to GSM through digital modulation techniques. At the receiver end the signal will be detected and demodulated with digital demodulation technique. Then the signal will be given to the web/android mobile. The android application specifically designed for this implementation

It is very cost effective mode of transport. Due to reason such as heavy traffic and roadwork etc., Most of the busses delayed in time. Student have to wait for long time in the bus terminals without even knowing when the bus will arrive or not and also don't know the seat availability. Our proposed system provides an interface which provided us direct communication along with these aspects.

1.1 Bus Location System

Bus Location Tracking System which locates all kind of Transport information and an automated process providing higher accuracy and minimizing errors. By this system not only admins are benefitted but also users can also be benefitted. A large part of operations like buses location upgraded all of the systems are included in this facility.

All Information regarding bus schedules, route and driver information reaches to the students in a scattered way. My bus location tracking system designed and implemented to replace that system. My system controls the following information, departure time of the transport, update the new location, add or update the routes, add or update the buses and driver's information, which bus is in which route, location, time etc. The main purpose of this system is to easily accessed by both admin and users.

1.2 Project Initiation Planning

I am the only members for this project. This is a result of my thoughts and hard work. First I had several ideas about what to do as my final project. I was unable to make decide what will be my project. At that point I saw my university provide bus facility for everyone. But we didn't have any fixed source to get all information related to bus. We had no clear information about bus location. Seeing this situation, I had an idea about my project. After consultation with the authority and my supervisor I decided on this particular project because I think it is badly need for all information about Buses

Then I started to build my project. My supervisor had given proper legitimate guidance and information to me.

1.3 Project Motivation

As Bangladesh is a creating nation and each segment are getting digitalized, ICT division likewise acquainted and attempt with develop quick and our college is additionally IT based. In Computer Science and Engineering Department each session turns out a great deal of understudies with their last task. Diverse understudies have distinctive idea and distinctive purpose behind choosing their task. Select an effective undertaking is an astute choice. Since undertaking isn't just for finishing the credit yet in addition appearing social duty. On the off chance that I see my current diverse framework I can see a large portion of the framework are manual, dispersed and have different issues. So I think at any rate I can change over a dispersed framework into one spot, mechanized mechanization for everybody. Despite the fact that numerous understudies attempted it previously yet no one succeed.

Hence I am attempting to make legitimate stride and select a current framework which is my title "Improvement of DIU Bus Location Tracking System". I might want to demonstrate my smart thoughts. I feel in my more profound heart that it would be my obligation to accomplish something Ill for my nation and college which is successful and conceivable, all things considered.

1.4 Objective of this Project

This project is running with various objectives. The most important objective is given below:

- To provide every information in an efficient way.
- To provide each and every updates to the user instantly.
- To maintain the schedule of bus properly.
- To provide an online bus location tracking system.
- To provide a better Trip Location.
- To provide an interactive management for administrators.

CHAPTER 2

METHODOLOGY

The “DEVELOPMENT OF LOCATION TRACKING SYSTEM OF DIU TRANSPORT” is the developed to locate buses of our university in easiest way and locate travelling schedule in efficient way so that both students and faculty/admin can travel from one campus to another campus of this university easily and as if the admin of this system expect to include or remove any bus or route or schedule he/she can easily locate this system. I have developed this system bearing on my mind to serve my university’s Transportation with online system in addition to use this System in various transportation field. As a matter of fact this might be utilized as general transport system.

2.1 Concept

I have used several technologies to develop this app. They are:

- Express JS Framework
- VueJS
- Bootstrap
- HTML & CSS(Markup language)
- MongoDB(Database Engine)
- WEB SERVER
- Font Awesome Icons

2.1.1 Express JS Framework

Express.js, or simply Express, is a web application framework for Node.js, released as free and open-source software under the MIT License. It is designed for building web applications and APIs.[3] It has been called the de facto standard server framework for Node.js.[4]

The original author, TJ Holowaychuk, described it as a Sinatra-inspired server[citation needed], meaning that it is relatively minimal with many features available as plugins.

Express is the backend component of the MEAN stack, together with the MongoDB database software and AngularJS frontend framework.[5]

Express.js was founded by TJ Holowaychuk. The first release, according to Express.js's GitHub repository, was on the 22nd of May, 2010. Version 0.12.0.

In June 2014, rights to manage the project were acquired by StrongLoop.[6] StrongLoop was acquired by IBM in September 2015;[7] in January 2016, IBM announced that it would place Express.js under the stewardship of the Node.js Foundation incubator.[8]

2.1.2 Vue.JS

Vue.js features an incrementally adoptable architecture that focuses on declarative rendering and component composition. Advanced features required for complex applications such as routing, state management and build tooling are offered via officially maintained supporting libraries and packages.[5] Vue was created by Evan You after working for Google using AngularJS in a number of projects. He later summed up his thought process: "I figured, what if I could just extract the part that I really liked about Angular and build something really lightweight." [6] The first source code commit to the project was dated July 2013, and Vue was first released the following February, in 2014.

2.1.3 Bootstrap

In 2011, a social event of Twitter engineers chose to make Bootstrap as an inside solution for their programming issues. Actually, their game plan was to make a mechanical assembly without of certain code structure.

Each coder may have their strategy for making his gems. This by and large prompts a couple of vulnerabilities when another product engineer, assume a student, attempts to examine the code. Consequently, Mark Otto and Jacob Thorton from Twitter organized Bootstrap - a technique for inducing programming designers to tie together their instances of forming the code, and go without making contrasts at the same time. The focal points that Bootstrap passed on to their regular work were simply essential.

Right when people from Twitter comprehended its real potential, they have released it as an open-source adventure. With the help of Github and countless programming

engineers, it took only a few months to check Bootstrap as most celebrated front-end improvement gadget for making responsive, flexible web adventures [3].

2.1.4 HTML & CSS

HTML is the standard markup language for making pages and applications. With Cascading Style Sheets (CSS), and JavaScript, it shapes a gathering of three of establishment headways for the World Wide. programs get HTML records from an Observer or from neighborhood amassing and render them into sight and sound Ib pages. HTML components are the structure squares of HTML pages. With HTML develops, pictures and diverse articles, for example, intuitive structures may be embedded into the rendered page. It gives an approach to make organized records by demonstrating basic semantics for substance, for instance, headings, areas, records, connections, refers to and diverse things [6].

CSS is a template language utilized for depicting the introduction of a report written in a markup language. Alongside HTML and JavaScript, CSS is an establishment advancement used by most Ib locales to make ostensibly charming Ib pages, UIs for Ib applications, and UIs for some flexible applications. CSS is organized mainly to empower the unit of report content from record presentation, including viewpoints, for instance, the design, hues, and text styles [7].

2.1.5 MongoDB

MongoDB is a document database designed for ease of development and scaling. The Manual introduces key concepts in MongoDB, presents the query language, and provides operational and administrative considerations and procedures as well as a comprehensive reference section. The manual is also available as HTML

- MongoDB offers both a Community and an Enterprise version of the database:
- MongoDB Community is the source available and free to use edition of MongoDB.
- MongoDB Enterprise is available as part of the MongoDB Enterprise Advanced subscription and includes comprehensive support for your MongoDB deployment. MongoDB Enterprise also adds enterprise-focused features such as LDAP and Kerberos support, on-disk encryption, and auditing.

The Manual documents both MongoDB Community and Enterprise features and functionality.

2.1.6 Web Server

A Web server is a program that utilizes HTTP (Hypertext Transfer Protocol) to serve the records that shape Web pages to customers, in light of their requesting, which are sent by their PCs' HTTP clients. Committed PCs and devices may be implied as Web servers as well.

The strategy is an instance of the customer/server demonstrate. All PCs that have Web districts must have Web server programs. Driving Web servers incorporate Apache (the most extensively presented Web server), Microsoft's Internet Information Server (IIS) from NGNIX. Other Web servers fuse Novell's NetWare server, Google Web Server (GWS) and IBM's gathering of Domino servers.

In order to replicating this application we took the help by using Virtual Server Called XAMPP.

2.1.7 Font Awesome Icons

Content style Awesome gives us versatile vector images that can in a brief moment be changed — gauge, shading, drop shadow, and anything that should be conceivable with the power of CSS [4].

The main Font Awesome is so far open source and absolutely free for business subjects, modules, and endeavors [5].

CHAPTER 3

TABLES & DIAGRAMS

3.1 Database Design

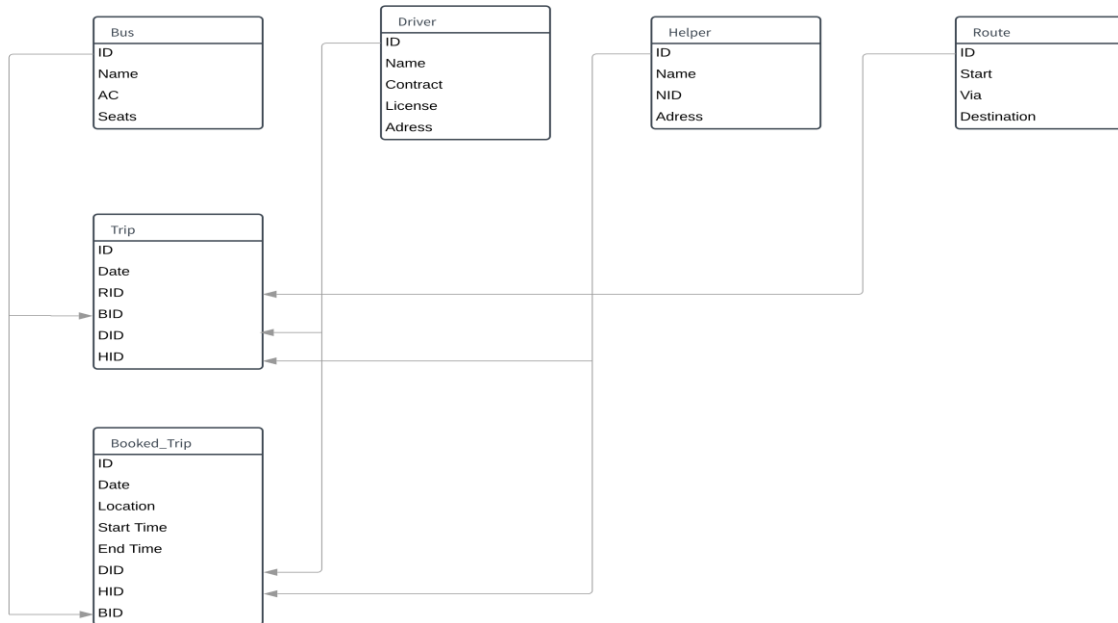
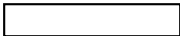




Figure 3.1: Database design of the system.

3.2 Entity Relationship Model

An element relationship model is a graphical portrayal of entities and their relationships to one another. The entire motivation behind ER demonstrating is to make a precise impression of this present reality in a database. The ER display doesn't really give us a database depiction. It gives us a moderate advance from which it is anything but difficult to characterize a database. An ER display is ordinarily actualized as a database. In a basic social database usage, each column of a table speaks to one occasion of a substance type, and each field in a table speaks to a trait type. In a relational database a connection between elements is executed by putting away the essential key of one substance as a pointer or "foreign key" in the table of another element.

The major components of E-R diagram are given below in figure 3.2

-  Rectangles, which represents entity set.
-  Ellipse, which represents attributes.
-  Diamonds, which represents relationship sets.

———— Line, which link attributes to entity sets and entity sets to relationship sets.

Figure 3.2: Entity relationship model symbols.

3.3 Entity Relationship Diagram

Figure: 3.3 representing different relationship between the entities of the system.

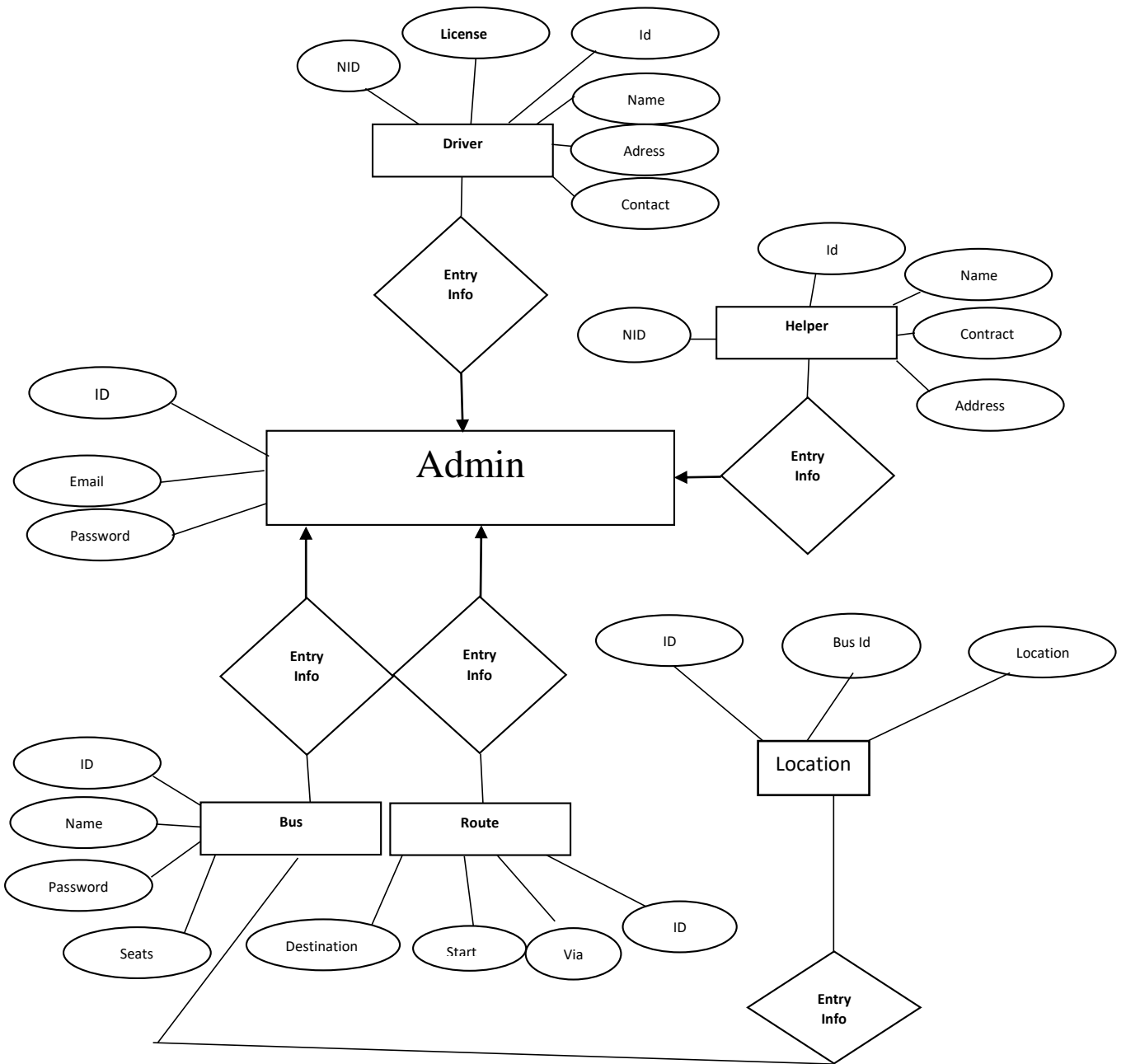


Figure 3.3: Entity relationship diagram of the system

3.4 Use Case Diagram

Actors

Admin: Admin can update information.

Students: Students can view all the information related to transport.

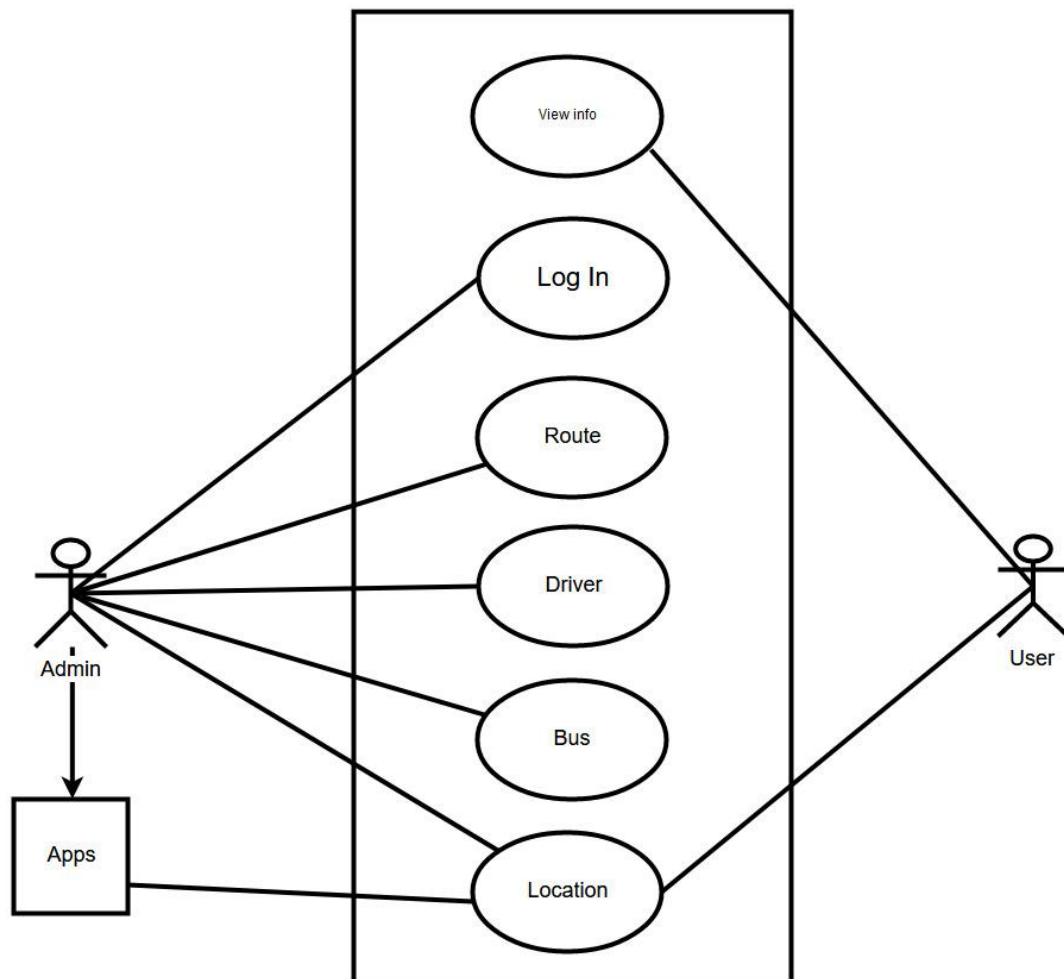


Figure 3.4: Use case Diagram of the System.

3.4.1 Use Case List:

UC 1- View info

Students can view information.

UC 2- Login

Admin can login.

UC 3- Route

Admin can set, update and delete route.

UC 4- Driver

Admin can set, update and delete driver.

UC 5- Bus

Admin can set, update and delete bus.

UC 6- Location

update Location by Apps.

3.4.2 Use Case Description:

Table 3.4.2.1 Use case 1

Use Case Id:	1
Use Case Name:	View Info
Created By:	Joyanta Kumar Sarkar
Date Of Creation:	25-07-2019
Description:	This use case will allow user and admin to view information of schedule trips of the system
Primary Actor:	Admin User
Secondary Actor:	Apps
Precondition:	None
Post condition:	The system will display the Home page

Table 3.4.2.2 Use case 2

Use Case Id:	2
Use Case Name:	Log In
Created By:	Joyanta Kumar Sarkar
Date Of Creation:	26-07-2019
Description:	This use case will allow admin to log in the system.
Primary Actor:	Admin
Secondary Actor:	None
Precondition:	None
Post condition:	The system will display the Log In page

Table 3.4.2.3 Use case 3

Use Case Id:	3
Use Case Name:	Route
Created By:	Joyanta Kumar Sarkar
Date Of Creation:	26-07-2019
Description:	This use case will allow admin to change route in the system.
Primary Actor:	Admin
Secondary Actor:	None
Precondition:	None
Post condition:	The system will display the Route page

Table 3.4.2.4 Use case 4

Use Case Id:	4
Use Case Name:	Driver
Created By:	Joyanta Kumar Sarkar
Date Of Creation:	26-07-2019
Description:	This use case will allow admin to change driver in the system.
Primary Actor:	Admin
Secondary Actor:	None
Precondition:	None
Post condition:	The system will display the Driver page

Table 3.4.2.5 Use case 5

Use Case Id:	5
Use Case Name:	Bus
Created By:	Joyanta Kumar Sarkar
Date Of Creation:	26-07-2019
Description:	This use case will allow admin to change bus information in the system.
Primary Actor:	Admin
Secondary Actor:	None
Precondition:	None
Post condition:	The system will display the Bus page

Table 3.4.2.6 Use case 6

Use Case Id:	6
Use Case Name:	Location
Created By:	Joyanta Kumar Sarkar
Date Of Creation:	26-07-2019
Description:	This use case will allow apps to update location in the system.
Primary Actor:	Apps

Secondary Actor:	None
Precondition:	None
Post condition:	The system will display the schedule trip page

3.5 Tables

Table 3.5.1: Admin.

In Admin table, there are six columns. They are; Id (data type int), Email (data type varchar), password (data type varchar), Remember token (data type varchar), Created at (data type Timestamp) and Updated_at (data type Timestamp) where Id is primary key.

Existing admin information is shown in Figure 3.5.1

Field Name	Data Type	Primary Key	Default Value	Description
Id	Int.	Primary key		
Email	Varchar			
Password	Varchar			
Remember token	Varchar			
Created at	Timestamp			
Updated at	Timestamp			

The screenshot shows a database table with columns: id, email, password, remember_token, created_at, and updated_at. A single row is displayed with the following values: id=1, email=admin@gmail.com, password=123456, remember_token=123456, created_at=NULL, and updated_at=NULL. The interface includes a toolbar with options like Edit, Copy, and Delete.

id	email	password	remember_token	created_at	updated_at
1	admin@gmail.com	123456	123456	NULL	NULL

Figure 3.5.1: Admin Table.

Table 3.5.2: Bus.

In Bus table, there are six columns. They are; Id (data type int), Name (data type varchar), AC (data type Varchar), Seat (data type double), Created_at (data type Timestamp) and Updated_at (data type Timestamp), where Id is primary key.

Existing bus information is shown in Figure 3.7.2

Field Name	Data Type	Primary Key	Default Value	Description
Id	Int.	Primary key		Bus identification
Name	Varchar			

AC	Varchar			
Seat	Double			
Created at	Timestamp			
Updated at	Timestamp			

+ Options

	id	name	ac	seat	created_at	updated_at
<input type="checkbox"/> Edit Copy Delete	1	Sun	Yes	50.00	NULL	2018-10-26 14:25:28
<input type="checkbox"/> Edit Copy Delete	8	ab	No	76.00	2018-07-23 23:25:10	2018-07-23 23:25:10
<input type="checkbox"/> Edit Copy Delete	9	test 2	Yes	55.00	2018-07-24 00:30:53	2018-07-24 00:30:53
<input type="checkbox"/> Edit Copy Delete	10	ffgh	Yes	34.00	2018-07-29 17:54:15	2018-07-29 17:54:15

↑ Check all With selected: Edit Copy Delete Export

Figure 3.5.2: Bus Table.

Table 3.5.3: Driver.

In Driver table, there are eight columns. They are; Id (data type int), Name (data type varchar), Contact (data type varchar), and License (data type Varchar), Address (data type Varchar), NID (data type varchar), Created at (data type Timestamp) and Updated at (data type Timestamp), where Id is primary key.

Existing driver information is shown in Figure 3.5.3

Field Name	Data Type	Primary Key	Default Value	Description
Id	Int.	Primary key		Driver identification
Name	Varchar			
Contact	Varchar			
License	Varchar			
Address	Varchar			
NID	Varchar			
Created at	Timestamp			
Updated at	Timestamp			

+ Options											
← T →											
		id	name	contact	license	address		nid	created_at	updated_at	
<input type="checkbox"/>				2	test 2	7866666355	NULL	fvfvg	4555	2018-07-23 12:36:49	2018-07-23 12:36:49
<input type="checkbox"/>				3	cr	6867897	NULL	dfgd	444444	2018-07-23 12:38:53	2018-07-23 12:38:53
<input type="checkbox"/>				4	cr	6867897	NULL	ghhfd	6687998778	2018-07-23 22:56:17	2018-07-23 22:56:17
<input type="checkbox"/>				5	ef	0196776242376238	sjhdvbdhzc nbz cbm,nc mnzx czmzx zmnx zm zx z	1234567890123456789	2018-07-29 08:51:02	2018-10-26 14:25:05	

Check all With selected: Edit Copy Delete Export

Figure 3.5.3: Driver Table.

Table 3.5.5: Route.

In Route table, there are three columns. They are; Id (data type int), Start (data type varchar), Via (data type varchar), Destination (data type varchar), Created_at (data type Timestamp) and Updated_at (data type Timestamp), where Id is primary key.

Field Name	Data Type	Primary Key	Default Value	Description
Id	Int	Primary key		Route identification
Start	Varchar			
Via	Varchar			
Destination	Varchar			
Created at	Timestamp			
Updated at	Timestamp			

Existing route information is shown in Figure 3.5.5.

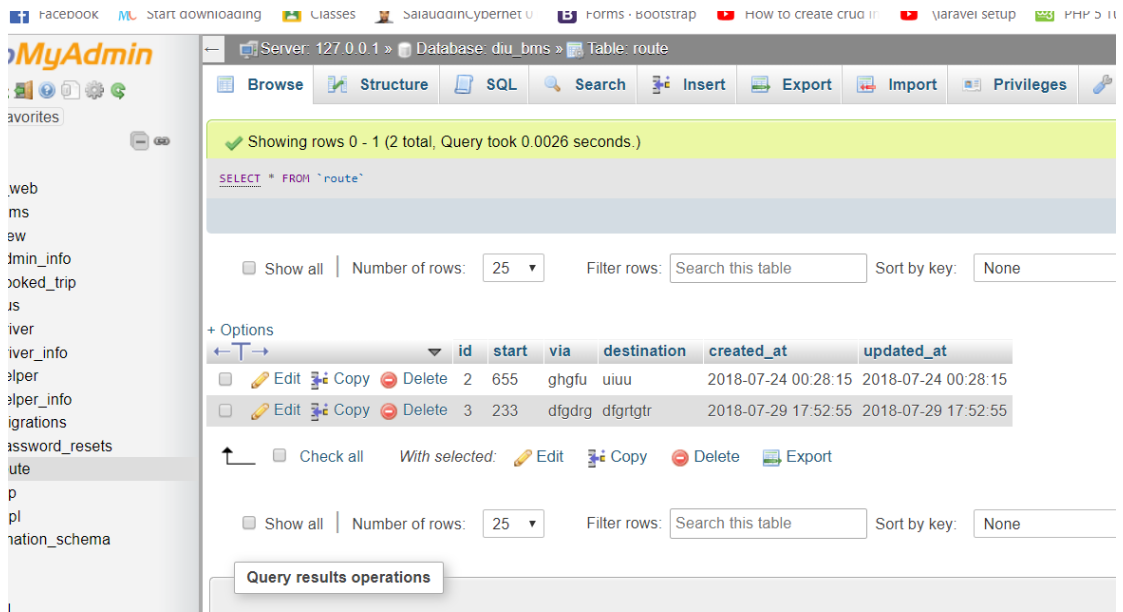


Figure 3.5.5: Route Table.

Table 3.5.6: Location.

In Location Table, there are Nine columns. They are; Id (data type int), Day (data type Varchar), Start_time (data type Varchar), Route_id (data type int), Bus_id (data type int) and Driver_ id (data type int), Helper id (data type int), Created_ at (data type Timestamp) and Updated at (data type Timestamp), where id is primary key.

Field Name	Data Type	Primary Key	Default Value	Description
Id	Int.	Primary key		Trip identification
Day	Varchar			
Start_time	Varchar			
Route_id	Int			
Bus_id	Int			
Location	Varchar			
Created_at	Timestamp			
Updated_at	Timestamp			

Existing schedule information is shown in Figure 3.7.6

CHAPTER 4

APPLICATION DESIGN AND DESCRIPTION

In this part, it will be depicted the application that are intended for the venture. It is expounded graphically so anybody can comprehend it effectively.

Graphical portrayal and depiction of the structure:

4.1 Home

After visiting the website, the first page is welcome page. Both admin and students have to visit this page, from this page user can go to any page they want and from this page admin has to login to update information.

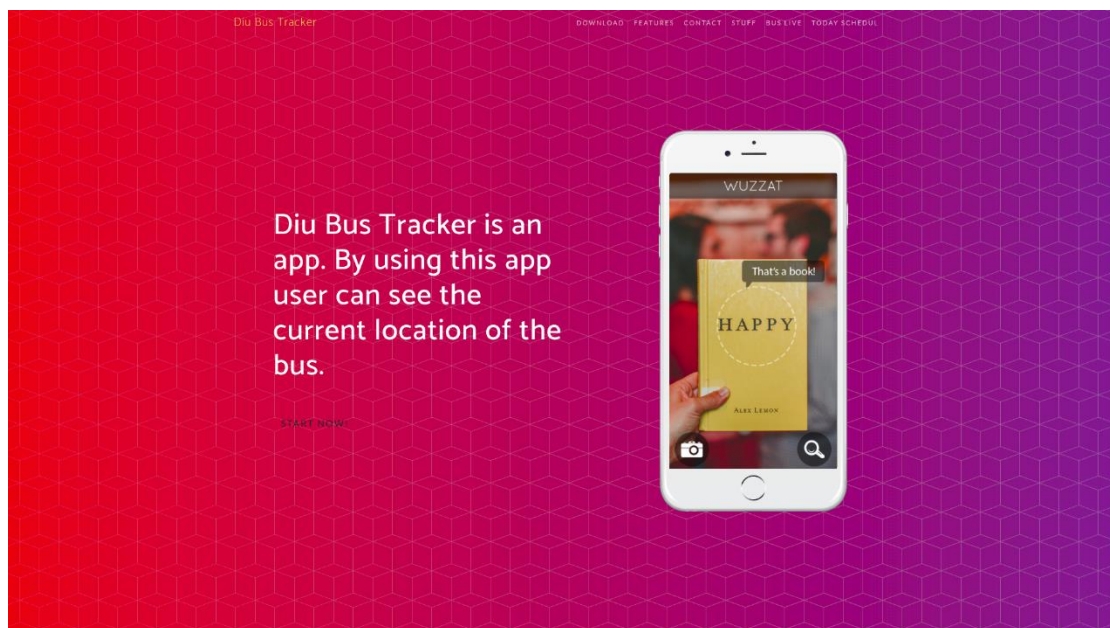


Figure 4.1: Home Page.

4.2 Schedule

From schedule trip link user can check all the schedule of transport

#	From	To	Time	Bus Num	Added By
1	Ashulia	Dhammondi	2.30	Surjomakhi-23	Stuff
2	Dhammondi	Utara	5.15	AC-2	Stuff

Figure 4.2: Schedule page.

4.3 Add New Schedule

In 'Add New Schedule' page, user need to add from data, then he will add new schedule and See Updated schedule in page

From:

To:

Time:

Bus Name:

Figure 4.3: Add New Schedule

4.4 Admin Login

From welcome page admin has to press login option. Then he has to enter his fixed email and password and he can change whatever he wants

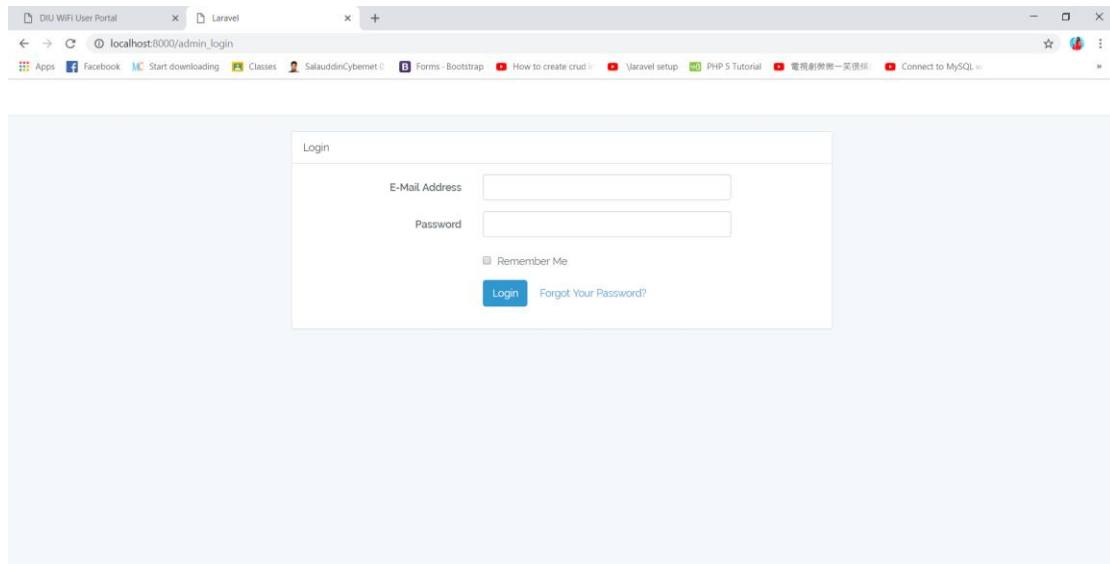


Figure 4.4: Admin Login Page.

4.5 Dashboard:

In Dashboard has create all buses, all helpers, all drivers information. when the admin want to see the all buses, helpers, drivers information then he click the Dashboard and he will see it.

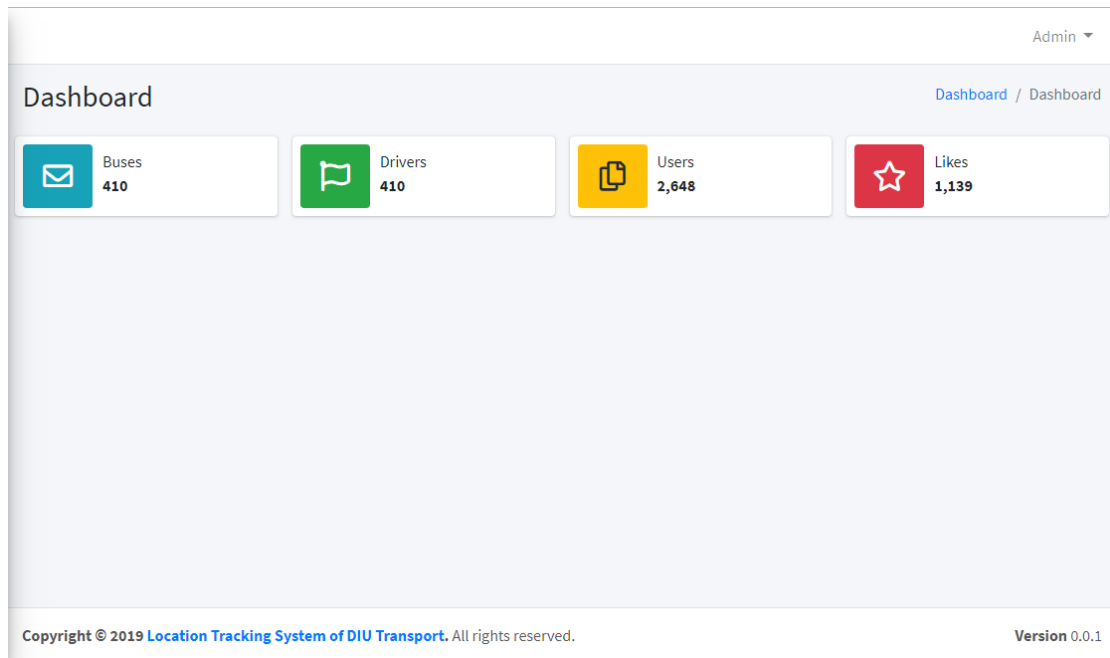


Figure 4.5: Dashboard

4.6 Drivers

In driver's option admin can update, delete and create driver information.

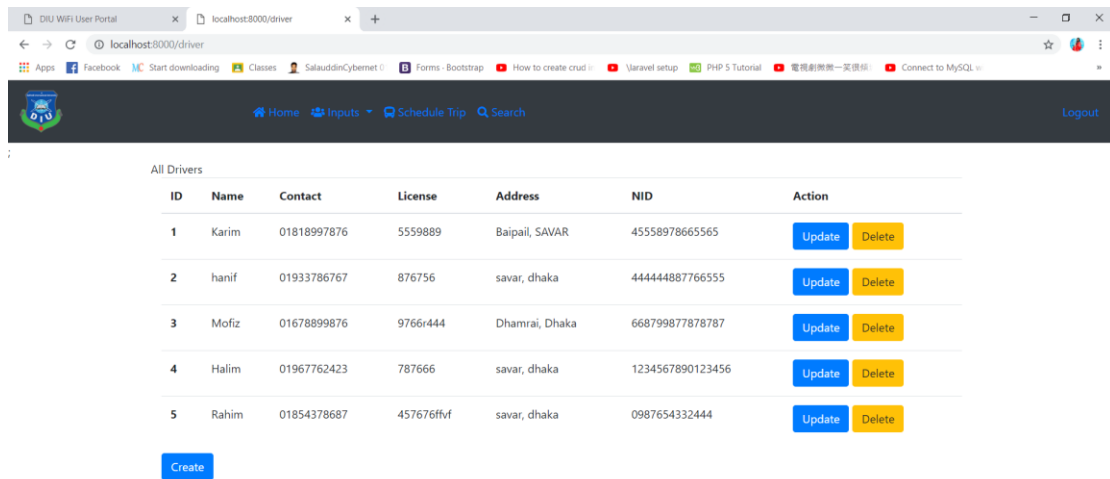


Figure 4.7: Drivers information

4.7.1 Drivers Information Create

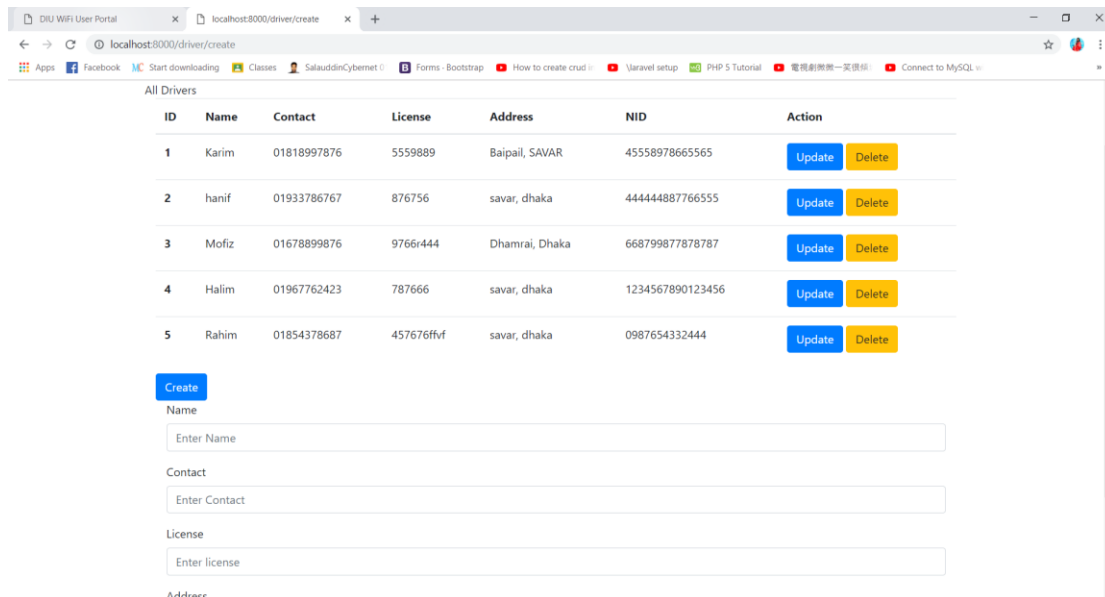


Figure 4.7.1: Drivers information create

4.7.2 Drivers Information Update

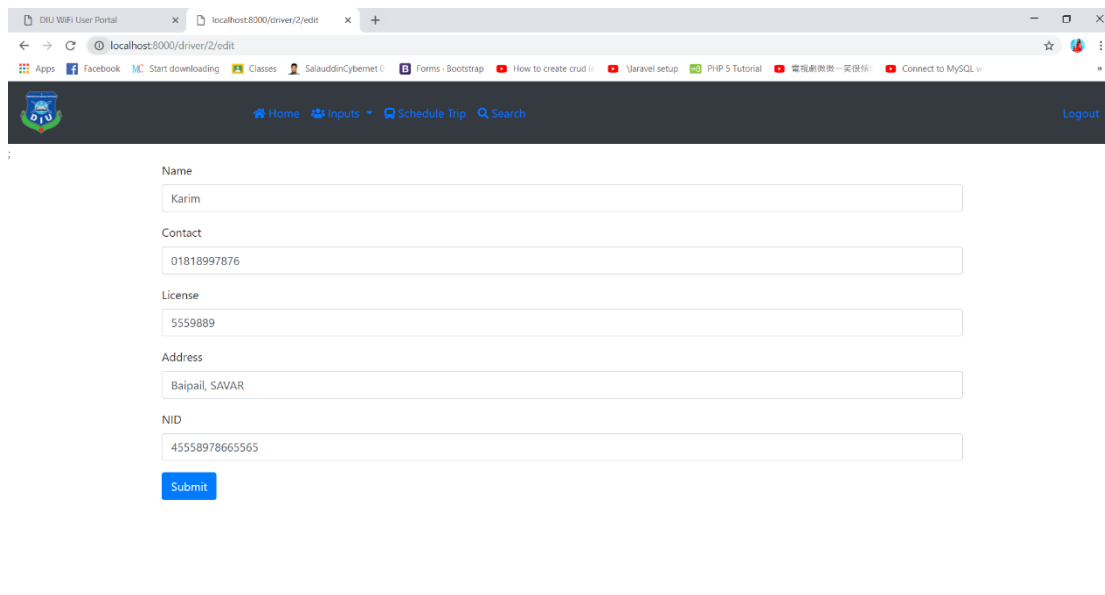


Figure 4.7.2: Drivers information Update

4.7.3 Drivers Information Delete

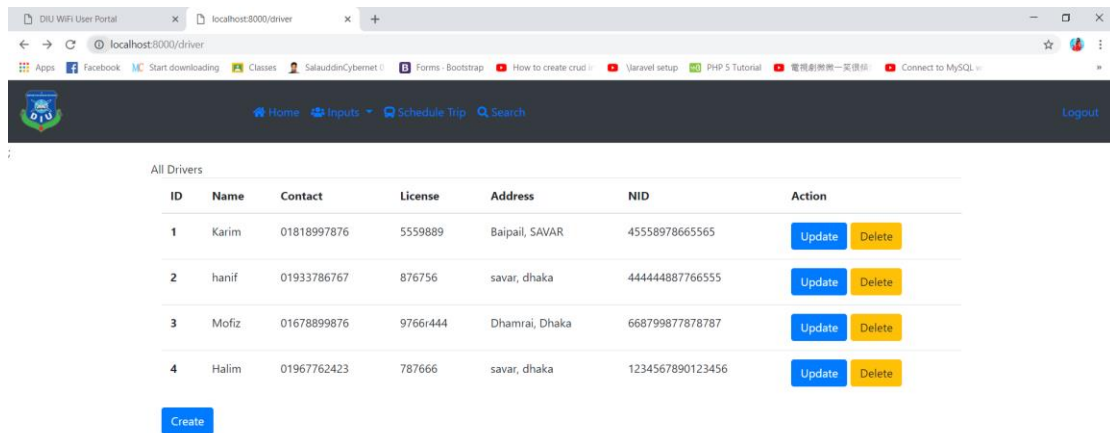


Figure 4.7.3: Drivers information Delete

4.8 Location

In Bus Location option user can see updated location.

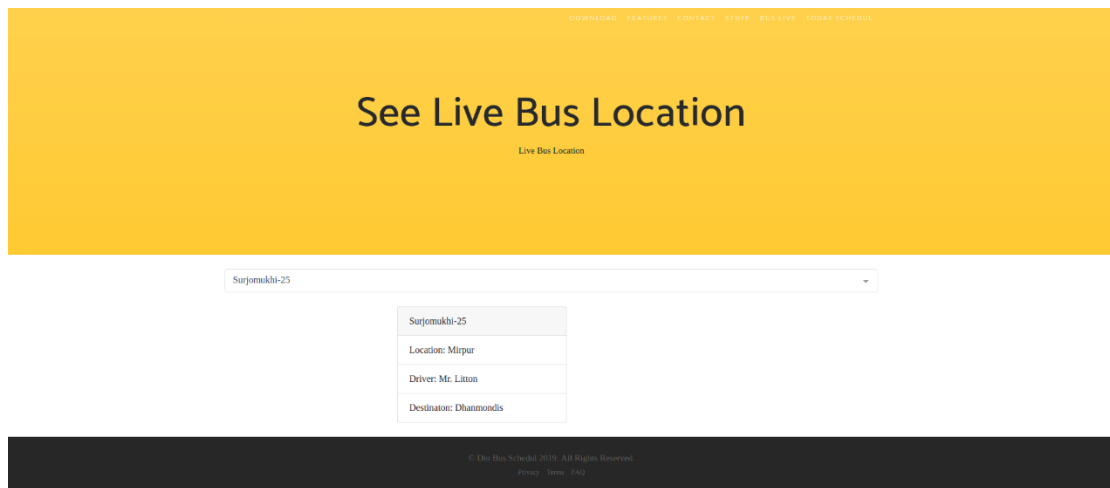


Figure 4.8: Location

Location:

In location option it has only use the google map for developer site and it can use to work for android app. when the drivers are use this app and he create her username, password and click the start button and it ip address are generate to provide her locaton for 5 seconds again and again updates.

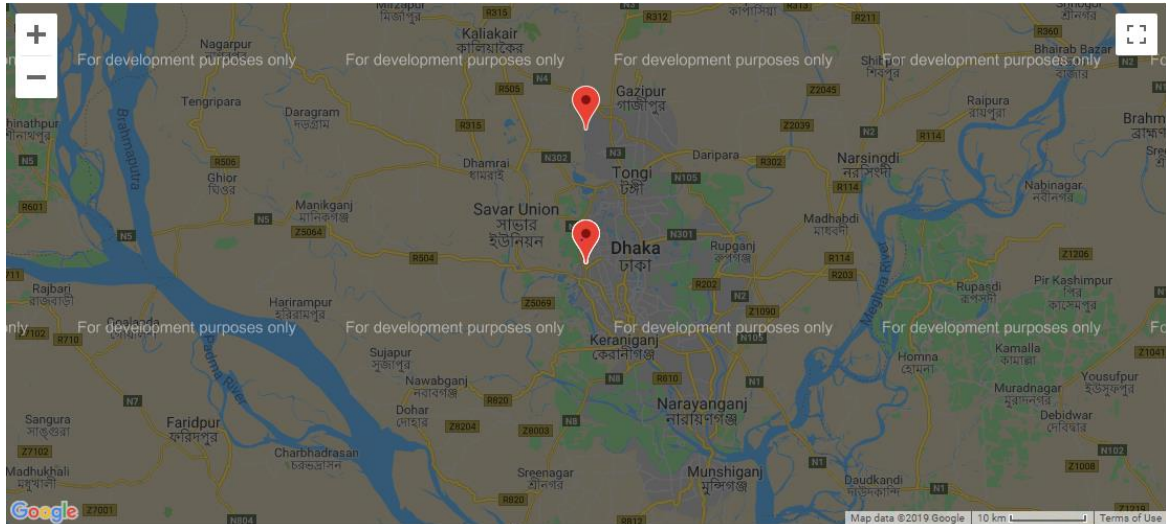


Figure 4.6: location tracker

Login for Android APP:

It's a login platform. when the driver can be going another place like pc to uc then he can login her Email and password.

Driver Information:

Driver can see her information when he will login and that's a moment the option of click start then app are going to work her process.

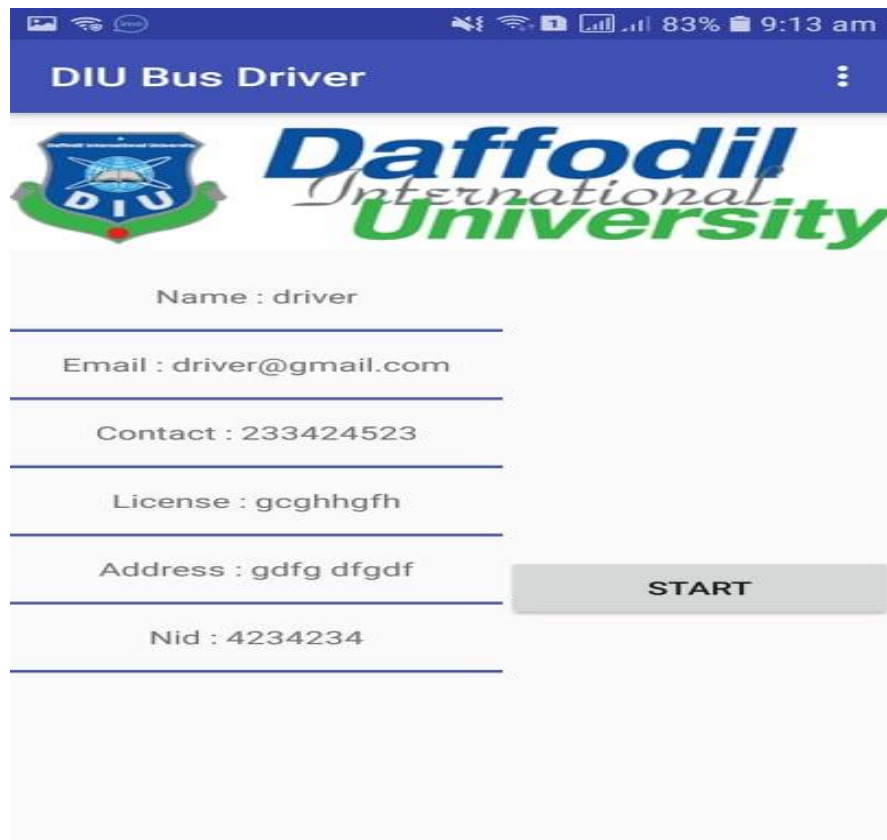


Fig 4.8: Driver Information

4.9 Logout

After completing changes admin has to logout.

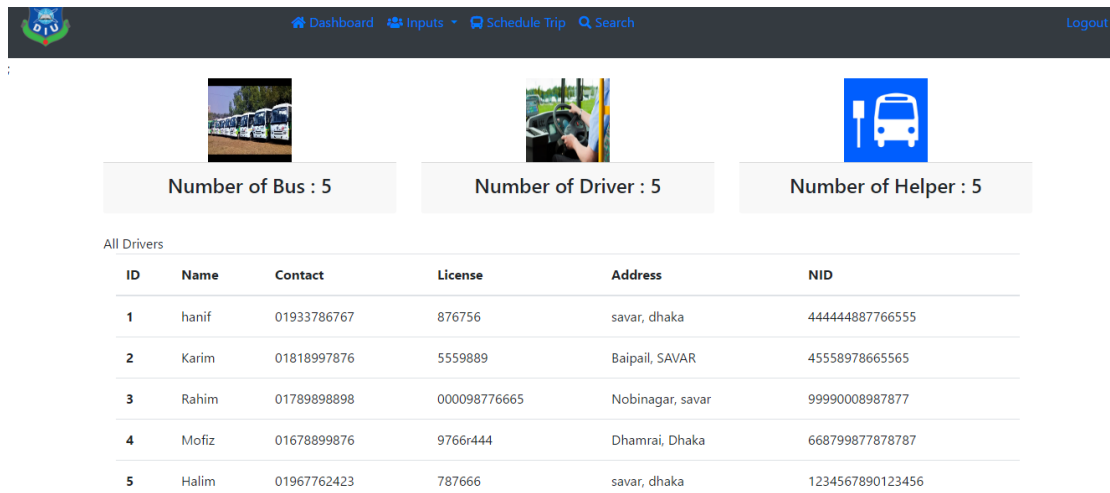


Figure 4.9: Logout

CONCLUSION

In this cutting edge life the world is in hands. As everything have been digitalized, site page plan and its online procedure are getting well known step by step. As of now human wards on hold showcase. They need satisfy their everything requests from on the web. Furthermore, as our college is a famous college and it give increasingly essential in IT so I figure my task will keep a value making. I am attempting to serve my nation as additional as could reasonably be expected. In this Site from User can see Updated Location of Bus. My great wishes, thoughts and learning are endeavor to apply in this task. Despite the fact that my venture is being created keeping in my brain to serve "DIU" transport area, it tends to be conveyed adequately to utilize wherever in our nation where transport is running. It's extremely brilliant and productive approach to get want data.

Human prerequisites are getting expanded step by step, by the assistance of innovation. So I am building up my site sought after of tomorrow's reality.

In future I might want to include this task both additional highlights in android application likewise, with the goal that it turns out to be anything but difficult to get to.

At long last, in future I will attempt to include more highlights in this site as per request.

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