Car Pooling System

Project report submitted in partial fulfilment of the requirement for the degree of Bachelor of Technology

in

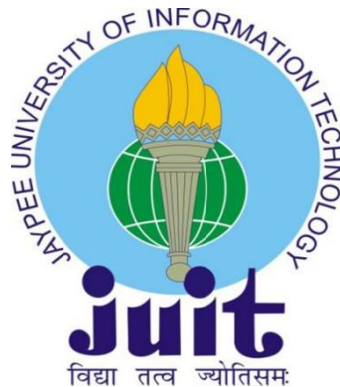## Computer Science and Engineering

By

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Under the supervision of

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to

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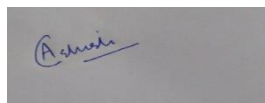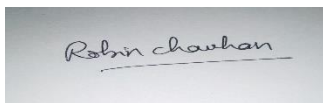
Certificate

Candidate's Declaration

We hereby declare that the work presented in this report entitled **" Car Pooling System"** in partial fulfillment of the requirements for the award of the degree of **Bachelor of Technology** in **Computer Science and Engineering** submitted in the department of Computer Science & Engineering and Information Technology**,** Jaypee University of Information Technology Waknaghat is an authentic record of our own work carried out over a period from August 2019 to December 2019 under the supervision of **Mr Praveen Modi** (Assistant Professor, Department of Computer Science Engineering and Information Technology) .
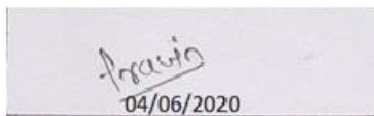
The matter embodied in the report has not been submitted for the award of any other degree or diploma.

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This is to certify that the above statement made by the candidate is true to the best of our knowledge.

04/06/2020

Mr Praveen Modi

Assistant professor

Department of Computer Science and Engineering and Information Technology

Dated:04/06/2020

Acknowledgement

We express my deepest thanks to Mr. Praveen Modi for taking part in useful decision & giving necessary advices and guidance and arranged all facilities to make life easier. I choose this moment to acknowledge his/her contribution gratefully.

We also extend my heartfelt gratitude to the Head of Department of my Institute, Prof. Dr. Samir Dev Gupta and to all the faculty members of Jaypee University Of Information And Technology for providing me with the knowledge that was necessary for me to complete my project work efficiently.

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Abstract

The project shows the implementation of a car pooling system.Car Pooling is defined as the sharing of a vehicle by more than one person to reduce the cost of travel.Car sharing helps the individual in reducing various costs such as fuel cost,stress of driving in many conditions, reduction in toll taxes.Car pooling system also helps in reducing high energy demands. High traffic congestion is one of the issue which is faced by people in their day to day life.Carpooling system may help in reducing unnecessary traffic on roads.Sometime higher authorities encourages people to use carpool system during the period whenever there is a hike in the prices of petroleum products or when the pollution level of that state is going beyond the maximum limits.The main objective of this car pooling system will to enable different persons living in a area to use this system to minimize monthy expenses,no tension of hiring a car at higher cost.This system will help the person to reach their destination at accurate time.

CHAPTER-1

INTRODUCTON

1.1 Introduction

Transportation is one of major issue which is affecting day to day life of people. Roadways traffic is one of the most commonly used network for moving from one place to another place .In road traffic the majority of road transport consists of the single passenger car. These private cars are mostly used with only a single ride for single person.

Since increased traffic causes pollution, traffic jam, time wastage ,more parking space is needed and many more other issues.In modern day world there are numbers of applications

Because of increased level in pollution ,traffic problems, less space for parking, time wastage and many other issues.In present day world there are no of sources which are used by people but they have certain restrictions i.e they are limited to certain area .We have to remove that restriction in areas.so we have developed the system which is easily available among the common people like a social networking site.In modern day world everyone has smartphones and access to fast internet is mostly available to each person in our country.security is one of the most important issue that is faced by every person whosoever rely on internet in today world.we have to deal with these issues with the advancement in security features .we develop a system that is helpful when either the driver or passenger is in trouble.our system will provide a online GPS based tracking system,from which the exact location of the car is known to user and main system controller .the GPS based location system will be shut down after the user has reached to their willingfull location during the travel.furthermore carpooling system has many advantages that include:

- As the car are shared among people,so there may be less no of vehicles on the road.so traffic jam is reduced
- Kilometres of travel for one single vehicle and usage of fuel can be reduced
- Car pooling system mainly aims to increase the occupancy of vehicle as it aims at empty seats.
- Efficient use of parking space as vehicles are less or parking requirement is reduce

Our system is an attempt to make a user friendly system that require minimum efforts to use it and provide many opportunity to share a passenger vehicle that is available at that time on the road.we intent to make a system which is having the advantages like the system can find a common route between a vehicle selected and among several passengers so as to increase the occupancy of the vehicle. In many older system there is a list of cars or drivers from which a user has to choose, there is no other option available to the user if he found something irrelevant or not according to his comfort. Our system automatically calculates the best route among several passengers that are willing to share the ride in one way that is longest common route. The graphical user interface of our system is designed to be more user friendly as possible, because people require one click solution of every problem.so in a short duration of time user can book a ride from one location to whichever destination he wants to go by using very fewer no of steps. In carpooling system location of both the passenger and the person who is driving the vehicle is shown in real time using GPS based tracking system on the Map.This feature helps the driver to determine the accurate location of the passenger to pick him up from the booked location. Every person security who is using this system is the essential need of today, because there are many unidentified persons behind the usernames. Or carpooling system incorporates and enhances the security of user by enhancing privacy and ensuring more and more security to the user.A user need to register his/her self before booking a ride. Our system also allows user to display recommended drop off locations that is added by various users or by themselves to make our system more real updated and dynamic.

1.2 Problem Statement

As we live in a modern day world where people tend to prefer their own vehicle on road for each and every small work.In recent years the no of vehicles on the road has increased tremendously which has created the problem of traffic on the roads.As the number of vehicles on the roads are increasing it give rise to many problems such as increase in pollution level of nearby surroundings.more the number of vehicles on the road more will be the fuel consumption which leads to hike in prices of fuel prices are they are non renewable resource of energy.pollution from these vehicles also has adverse effects on the health of people so car sharing system is a solution but it has certain challenges and issues like security and trust issues.the problem can be solved by mobile based carpool system that enable a new user to ensure the security and safety of ride.Carpooling System must include both type of journeys that include both short term and long distance journeys within the surrounding of the city or outside the city of the user desired location.

1.3 Objective

Our project aims to reduce overall traffic congestion by reducing the number of vehicles and increasing the share mode of transport for people.this carpooling system will allow secure and safely ride for a user in a user friendly online system.This carpooling system will have real time updated information to the user.our system has both types of users i.e registered or non registered.users can search for vehicle in pooling system.if a user wants to book a ride then he has to register his/her name and other information through a login form then he can avail the services of pooling system.

Car pooling system also manage details of its customers, drivers ,details of vehicles, payment of rides, bookings etc.the core purpose of this system is to build a system that helps in reducing the manual work for keeping the information about car, drivers customers etc.our car pooling system aims at enhanced business process automation.Also automation system helps in saving time by satisfying the user requirement.Automation of such systems reduces the cost of collecting and managing the information.these information can be used for resource utilization in a efficient manner.our system will be completely a web based car pooling system.web based system means that the system will be available 24/7 except whenever there is a server related problems.

Benefits of carpooling system:

- System is fully functional and flexible

- Easy to use,time and money saver system

- Eco-friendly system

- 24/7 open system that increases the quality of service to the user in less span of time.

1.4 Methodology

HTML/ CSS

HTML and CSS are the core technologies for building web pages. HTML provides the structure of web page and CSS gives the style to that structure along with scripting and graphics.

HTML (HYPER TEXT MARKUP LANGUAGE) provides headings, text , lists , images , paragraphs etc to web page. Moreover it helps to retrieve the information on web page using hypertext links. It helps to design the forms, Include spread-sheets, video chips etc in the document.

CSS (CASCADING STYLE SHEETS) helps to present the web pages. It helps to present different devices such as large screens, small screens.

JAVASCRIPT

Javascript is one of the most used programming language in the web development field.Javascipt is one of the easiest language that is combined with the HTML to create dynamic web documents.Javascript is available to all and its is the language which is cross platform and runs on every system.Javascript is mostly used to develop froand and backend application in web domain.javascript doesn't need any special platform as it is easily available and runnable on every code editor.

JQUERY

It is a library of JavaScript functions that make it easy for webpage developers to do common tasks like manipulating the webpage, responding to user events, getting data from their servers, building effects and animations and much more. JQUERY builds on top of the functionality that browsers gives via JavaScript DOM API.

AJAX

It stands for asynchronous JavaScript and xml. It inserts the content inside our website from the database or server without to refresh the website each time. It helps when we have a website which has a chat system Example: - Facebook where we need to write message to each other, when we need to see new message from another user, if they want to write something, so the ability to see the message instantly when it just pops up at the bottom, then the technology which is required is something called as AJAX. Without AJAX if we want to see the message which someone has sent, then we need to refresh the browser each time.

ES6

It's also known as modern JavaScript or next generation JavaScript. But at present moment not all the features are compatible with ES6 in all the browsers, but most of the features of ES6 are compatible with the updated features of the browsers. So to make sure all the features of ES6 are compatible with the browser we use TRANSPILER Example: - Babel. TRANSPILER converts the next generation JavaScript code into ES6 code. Chrome supports ES6.

NODEJS

Since JavaScript is limited to the frontend, we can add JavaScript only to the browser but now we can run JavaScript on the server site. Node.js is a JavaScript runtime environment i.e the environment where we can run the JavaScript and this is built on Chrome V8 JavaScript engine (It's an engine built by chrome using the C++ and this engine is used by the chrome as well). This engine converts the JavaScript code to the machine code which can be understand by computer's microprocessor. Node.js can also be used to build the desktop applications. Using Node.js we can read the content of the file, create files, delete files and do all the file management that we want. Example of desktop application built using node.js is THE DAILY PROJECT.com desktop app. This app is used for project management and it comes with features which are all build with node.js.

PHP (HYPERTEXT PREPROCESSOR)

PHP is a scripting language which runs on the server side or the Backend. It was created by Rasmus Lerdorf in 1994. PHP files contains HTML, CSS , JavaScript, and PHP code. It runs on the server side and the result is displayed on the browser as plain HTML. It can be used to encrypt the data, control user access, can add, modify or delete data in database, used to send or receive the cookies, can collect form data. PHP not only gives the result as a plain html, moreover it can display Images, can give PDF files in the output. PHP is platform independent language which means it can run on Windows, Linux, Unix, Mac OS, etc. It is compatible with all servers like Apache, etc. It's used to create the dynamic web pages.

MYSQL

MYSQL is the open source database management which uses SQL (STRUCTURED QUERY LANGUAGE).This is used to store the data in the database, retrieve the data from the database, changes to be made in the database, delete the data from the database. Database is just a structured collection of data. Database is in SQL, these are the relational databases which simply mean they will store the data in the separate tables. MYSQL is very fast, reliable and easy to use. Advantage of SQL is we can embed SQL in many programming languages including PHP.

GOOGLE MAPS API

API stands for application programming Interface. It is used to exchange the data between our website or application and the external application.

WORKING OF API

As a developer we send the request to API'S and the API'S will forward the request to the further application if the request is allowed, sometimes we can have the limit of the number of request per hour or we can have the number of requests per day. Then if the application accepts the request it will output the data. And then we can manipulate our data in our application or website.

We can use GOOGLE MAPS API'S to embed the map on our website. We can customize the map by adding more features including markers , show location, we can use GOOGLE API'S to guess directions between two locations, also we can use API'S to calculate the driving distance between two cities or formats and address, guess the postcode of the certain address, to search near by locations.

IDE USED IN PROJECT

BRACKETS

It is made by Adobe Systems, it is a free and open- source software which is licensed under the MIT License. It is written in HTML, CSS, JavaScript. It is available for macOS, Windows, Linux. The purpose of Brackets is it can give the live editing functionality.

CHAPTER-2

LITERATURE SURVEY

2.1 Overview

India is having the largest market for automobile sector.This sector is full of opportunities and possibilities for further development.Every industry has a certain indicator of market movement which analyses average of high,low and previous day closing prices.In present day world the e tailers which serve the best assures quality at reasonable price ,it leads the consumers whose appetite for heavy discounts to invest in venture capital.The passenger automobile sector is one of the most fasest developing sector in India.mostly many customers seeks the services with comfort,ease and with safety service.the rapidly growing population increases the opportunity to develop, grow and it attracts the investors from other countries and many other son of soil to invest their money in a efficient competitive manner.which in turn provides the affordable rates to the consumers of the country,In last few years there is a rapid growth of taxi providing services like MyTaxi, Gozo Cabs, Cab bazaar, Bharat Taxi Ola, Uber, Rapido etc.There are few on demand taxi companies such as uber,ola etc.these companies don't ows any car or employ drivers.they are just aggregators that connect consumers with the drivers that operate the taxi with the help of a technical platform.According to a report published in newspaper near about 1.7 million passenger vehicles are having licensed to run their services as cabs but the problem they are facing is the lack of quality drivers.It is a very difficult task for aggregator to convince a driver who is operating the cab services.maintaining the supply side is one of the most challenging contest among India's top ridesharing companies.The ride sharing companies like Ola,Uber etc that are backed by global venture capitalist firms are making many other small taxi companies irrelevant.These big venture capitalist invest a huge amount of money in the market and capture a large amount of market share.

Meanwhile making a huge amount of profit is making this market worth challenging.According to a mobile Taxi association of India,this business in the India is growing at the rate of 25 to 30 percent per year.the organized taxi share is about just 5 to 6 percent of this market.This market is having a total business of around $800 million dollar.It is expected that this sector in the market will rise by $7 billion dollar in 2020.Ola was founded in Mumbai in 2010 and this ride sharing company is active in more than 150 cities in India.few months after Ola was started a new company Taxi for Sure started its services in 2011.Uber is a Sanfrancisco based foreign company that was

founded in June 2009 and entered the Indian market in 2013.Uber is providing services in more than 50 cities of India.Meru a Mumbai based company that was started in 2007 had its mostly owned cars.Their business model is based is that they bought an car and hire employees to drive that cars.Meru is active in more than 25 cities of India.Meru shifted to its aggregation model in 2011.many other companies like Ola raise money faster because its first series of funding came from Tiger Global in 2012and second series of funding came from Tiger Global and Matrix Partners in 2013.FastTrack active in more than 25 cities in India is founded in 2001.

2.2 Effective Design and Management of Shared Transport

Opertional research(OP) is a method that consists of wide range of methods that deals with the solution of analytical problems such as simulation, decision making models,optimization models etc.Operational research came into existence during the world war 2 by military efforts that uses its various techniques for to address problems in different fields.while other scientific disciplines focuses on describing the problem first, studying its various properties and causes.While in contrary operational research it dosesnot have descriptive properties but it aims to find the best solution out of the decision making process when having different available feasible solutions.In the sharing economy context operational research is quite useful to solve many problems related to optimization that arises due to various strategic, operational and tactical level.like in car sharing services one of the biggest issue is exact location of station.it is a strategic problem while the other problem arises is the exact determination of fleet size.It a type of tactical problem.The other issue arises is vehicle relocation problem during the day.

2.3 Optimization Problems

Shared mobile vehicle services has grown rapidly in recent few years.At present more than 70,000 fleet of cars are shared by top five car sharing cities that includes Tokyo,Moscow,Bejing,Shangai and Ghuangzhou(China).According to a survey the related literate can be classified into three different main headings:station location,fleet dimensioning ,Station Inventory and vehicle reallocation.

2.3.1 Station Location

Station location are concerned with effective car sharing system.developing a best mathematical model that is used to locate various cars sharing stations.this developed model takes into the account of how attractive or busy the station is.It helps to users to find thuer nearby station located in their surroundings.from this model the users can find useful recommendations in order to search for the location they want to go.

2.3.2 Fleet Dimension

Considering the management of car sharing system,it is addressable to answer the question that how many cars should be deployed at particular station location for capturing the people and to meet the demand of cars at that location.It ensures system viability.For a given time varying travel patterns from different persons it becomes important how to distribute or locate the cars at that particular location.for this purpose we have developed a stochastic network flow model that under many suitable circumstances that formulate a linear program.It carries out numerical data from the previous transist.It is important to deploy the right no of vehicles at right or demanded locations because it affects the system utilization rate and the method in which they flow in the given system.

2.3.4 Station Inventory

Station inventory helps in determining the ideal number of vehicles required to deployed at particular location in order to fullfill the requirement.Ina car sharing system the we can search for number of different times in a day a car reallocates and its cost.This problem can be modeled as a chance-constrained stochastic optimization problem.It can be also modelled as dynamic inventory system.with the help of simulation and local search methods it can tackle the imabalace problem of various stations.

2.3.5 Vehicle Reallocation

Another important feature of car sharing system that has increased its popularity in recent few years is its flexibility. Mostly passengers or users are required to pick a location and vehicles reaches that station that has been choosen by the user.If there are more number of users in that path or route than it is useful for both the customer and driver.the customer ha stopay lower amount for renting the car pool where as the driver of cab may get full occupancy during this drive.But sometimes this vehicle reallocation introduces the management complexities and thus it increases the management cost of the system.In carpooling system the balance between distribution of cabs among various stations must be guaranteed through a well maintained and defined reallocation mechanism.Two important statergies are found in car distribution stratergies they are either operator based and user based statergies.In order to support the system management with many key issues and to make the system more user friendy vehicle reallocation should be done in a proper manner.

CHAPTER-3

SYSTEM DEVELOPMENT

3.1 Analysis

Software designing sits at the one end that is technical kernel of the software engineering process.this step is applied to every software development process regardless of the development area and its use in application .In software development life cycle design is the first step in its development phase for developing a software.The software designer goal is to produce a unique and required model of an entity that later will be processed and build by the developer.From the beginning of software development life cycle once the system requirements have been analysed and known to the developer,System designing is the basic step of first three technical steps that are needed to develop a software.They are designing of software,coding of software and testing of software that is needed to build and validate the software.

The importance can be defined with the one word that is "Quality" .Designing is the phase where quality is encouraged to be developed by the developer. Designing phase provides the view of software representation that can check or assures for quality of software product.Design is the only method that can efficiently and accurately transform a customer requirements or views to a well finished product.software design serves as a foundation for all the other software processes and steps that are followed to develop a software.if we are having a strong design of the software we want to develop then the system will be stable and it can be efficient.If the system is unstable then the software will be difficult to test and the quality of the software cannot be known until the last stage.

 During design phase there is a progesss in the refinement of programming structure,data structure and various procedural details   that are developed,reviewed and at the end they are documented.Sytem designing can be taken as either from project management prespective or either from technical prespective.From the technical prespective ,the designing of the software system consists of four different activities.They are basic architecture design,data structure method used ,design used to build interface and procedural design.

3..1.2 Requirement Engineering

Requirement engineering is the method in developing the software. This method consist of defining the requirement. Maintaining the requirement and making it documented for ease of use to the developer. It can also be define as the method of collecting and defining services to the user that are provided by the system. This method of engineering process has following activities.

Requirement Elicitation

Requirement Elicitation is defined as the requirement engineering method that is used to gather the knowledge about the project domain and its specifications and requirements. The knowledge include about knowing its customer, users, business models on which it is based .From existing software the knowledge can be gathered in order to improve the features in developing the software. Different techniques are used for this method of requirement engineering. Some of techniques that are used include task analysis, prototyping of software, defining the requirement by brainstorming by arranging meeting with the teams that are related with the software development etc. Main objective of this step is to get the basic idea of the system that are needed by the user. In this stage list will be created to simplify the what necessarily thing are needed . Describing the technical environment ,user platforms and requirement list are the part of this phase. This phase helps in improving the knowledge of the analyser and it is the next step to the further process of task in requirement engineering.

Requirement Specification

In this stage of software requirement engineering it is required to develop the software model requirements.These requirements includes all the functional and non functional requirement requirement and many constraints that are needed and specified by the software model in final.During this phase more knowledge about the project domain specifications is needed so that it can trigger the previous process i.e elicitation process.The various model that are used at this stage of software requirement engineering are Entity Relationships Diagrams known as ER diagrams,Data Flow diagrams(DFD) and many other models like function decomposition diagrams etc.

Elaboration Task

In this phase the information collected from specification and elicitation phase are combined and redefined in a new way to ease of understanding. This phase creates a model that clearly describes the various different conditions of the functionalities of the software. It describes how the users will be interacted with the website .In this phase attributes are defined and it also describes how the each function inside the software interacts with the other.

Negotiation Task

In this phase ,the clients comes with lots of requirements and specifications.The developer goes through each of specifications cited by the customers.If there are lot of specifications it is necessary to prioritize them.requirements that are having higer priority are keep at the top and lower priority at bottom.Lower priorty requirements can be wiped away and it helps in saving money and time.

Verification Task

Verification task ensures that the given developed software efficiently and correctly implements the function that is defined by the developer.

Validation Task

In this phase of software requirement engineering ,it is used to emnsure that all the requirements that are defined by the stakeholder should clearly defined.It should not contain any miss-interpretation in defining the requirement.if there is some miss-interpretation it should be resolved timely otherwise our system may lack in efficiency issues.All the sources that are used in the project should be accurate and the input that is provided by them should be 100 % valid and it should be ready to use.There should not be any conflict between the requirements if it is then it should be resolved.the requirements that are defined by the client should be complete and it must be practically achievable. All the system requirements should match with the overall objective of the system.All these requirements should be easily understandable by the developer.If there is some issue in understanding the requirement it should be rewritten again to make it clear to the developer.moreover it can be discussed further with the team members.Making review,checks and defining the test cases are used for validation purpose.

Requirement Management

Requirement management is the process in requirement engineering that analyses the requirement,document ,it track the requirement ,prioritize the requirement ,assuring the requirement and making a control between the stakeholder and the developer.This phase of requirement engineering keep care of the changing needs and requirements as cited from the client side.It should ensure that the software requirement specification should be modifiable in any circumstance as the developer wants to add the new requirement so it should handle it in a efficient manner.the process to modify the software as per given requirement should be done in a systematic way and it should be controlled in a well defined way to adjust the changes that are made at the end time in the requirement enginnering process.

3.1.3 External Interface Requirements

User Interface

Different users will see the same page when they search for this car sharing website.the website provides the interface to enter the present location and destination of the trip.After entering these details it asks the user to fill a login form to continue the trip.After authentication with database it shows the users different number of cars available and the sitting occupancy in that car of the desired route.The user platfrom is simple and easy to use for every person who can access the internet.

Hardware Interface

For our system no extra hardware is needed.our system will be able to use on the basic standard hardware that is available in the common.Our system will use standard network connections at both sites that is server site as well as hosting site and many other network related tools.

System Interface

Operating System: Windows 7,8.1,10

Web Browser: The system that we have designed is a web based that runs on any of the web browser such as Chrome, Safari, Mozilla Firefox, Internet Explorer and Opera. Internet connection is must required to access the system. For communication purposes our system is not limited to HTTP with the browsers and servers. User can request the server side through a request. It can be done with the help of a HTTP service function.

3.1.4 Functional Requirements

Functional requirements are the services that are provided by the system. It ensures that in what way the system is going to handle the different inputs that are provided from outside environment. It checks the behaviour of the system for particular kind of input in different scenarios. It checks the system functionality in different cases and develop the stable product that enable various users to fulfil their need as per requirement.

Booking a Car

The user enter the his/her location and final destination in the user interface.the system tracks the route with the help of google maps API.The system shows the numbers of cars that are available in the route with the no of vacant seats and total calculated fare for the ride.the users books the car by logging in.The system allows the user to add trips if required by the user in upcoming time.

Sign Up

If the user is not registered with the sytem then he cannot book a trip.for booking a trip he should sign up the details.User has to enter his email id for further processing.A activation is send on that email id.By cliciing on that activation link the user gets registered with the system.

Log In

The system allows the customer to login into the system by entering his email or username and password.The username and password is then authenticated with the database server and the access is granted to the user if it is correct.The user is allowed to recover his password if he forgots his password.

Fare Calculation

The system shows the fare calculated on the given distance between the two locations.There is a certain minimum amount that a user has to pay.After few kiolmeters the fare are calculated on the kilometere basis.

3.1.5 Non-Functional Requirements

Non functional requirements in developing the system for the user are the needs or features that are not in touch with the facility executed by the developed project by the developer to user.They are also known as quality attribute of the system under development.They describe how the given

system should work under different circumstances.Non functional requirements are further categorised into different categories such as reliability,security,performace,usability,storage efficiency etc.These functionalities define many constraints during the implementation of the system so that it perfoms more accurately and efficiently.

Usability

The system developed by us provides the support system and help system in interface.whenever the user interacts with the system and problem arises in the system then he can resolve it by reading out the guidelines in the help and support system.

Security

The system comes with authentic security to protect the system from unauthorized access.every user who wants to book a ride must have account on the system. After completing the details during signup he has authorization to use the system by logging in.The system accepts only valid password that match with the database of the system.

Performance

A system is said to be a good system if it performs the given instruction in less time.It should not take more time to complete that instruction.The system msut have good efficiency and performance while execting the user commands.for a small task it should not take more than 10-15 seconds while for a larger and complicated task it may take time upto few seconds.

Availability

The system should be accessible 24/7.if the system failure occurs due to any circumstance it should recover from it in 1 or 2 days so that the peak hours of the business is not affected.

Error Handling

Error Minimization is one of the issue that are most important among different non functional requirements.Error message is displayed whenever the users enters the wrong information in the system. Time that is taken to recover from error of the system should be less for proper system.

Ease of Use

System should be designed in such a way that it should be easily operable by one. All depends on the quality of the system interface .

3.2 Design

The framework is worked in a customer server model, which permits us to spare immeasurably significant and private data remotely on the server, rather than locally on the cell phone. The gadget itself holds just client inclinations. So as to make the product straightforward, we planned it in a secluded methodology, in which the segments of the application are partitioned by their point. The fundamental segment contains the coordinating calculation, furthermore, the capacity to get to the web administration, and associate with Google maps API. Furthermore, there are the part that is in charge of the info/yield stream from/to the database, what's more, the GUI area that handles the presentation, as indicated by the presumption that the product's showcase must be isolated from the rationale or usage of the application. The relations between these parts are depicted in the accompanying object outline
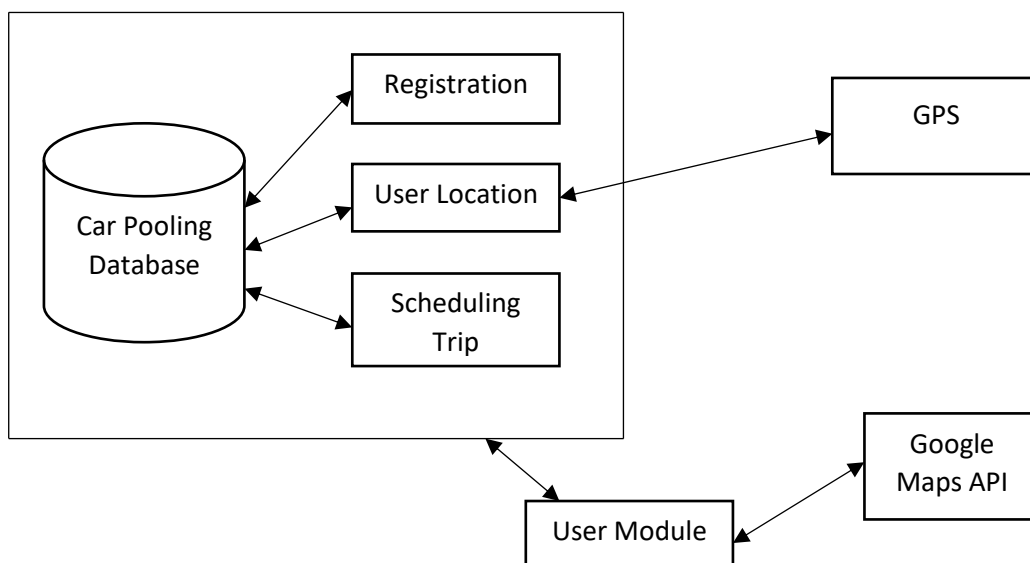
Fig: System Architecture

3.3 Algorithm and Functionalities Used

Google maps are used for navigation applications. It is one of the most famous geospatial navigation application ever. Google Maps has transformed the traditional way of navigation and made has possible to use everything digital even the map to move from one point to another point. Before Google Maps has come people are dependent on paper maps for navigation and as the time passes with the improvement in technology people have shifted from traditional method to use of digital platforms for the navigation purpose.

Digital Maps has many advantages over the traditional maps. Digital Maps have different features such as different zoom levels, and other navigation features etc. Google maps API has one of the most important feature that made it popular allover the world i.e. the ability of Google Maps on your smartphone and other system to calculate the shortest path form a given point A to the final destination B without having the prior knowledge of that area.

Google Maps Basic:

The google map always need an hyper text markup language element to hold the map in the device or the system.It describes the height ,width ratio of the map and also it makes it flexible as per the system requirement.In google maps API the mapProp variable is used to define the various properties of the map.the Center property describes where to center the map using the longitude and latitude coordinates of tha map.It also have zoom property to zoom the map upto a specific level.

Google allows the user to use various google API for free ,thousand of times a day .After a certain no of free requests when the user has finished the free requests it starts charging money from the user.Google Maps API uses an API key parameter for the successful operation while loading an API.

Overlays in Google Maps:overlays are the different objects on the map that are related to latitude and longitude coordinates. Google Maps has different types of overlays in the API.Some of the overlays in google maps are Marker, polygon, polyline, Circle ,Rectangle ,info windows that displays various contents on the map. Localization is one of the best feature of the google maps. With the use of localization the user can change the the language in which the information is written. Generally it is written in English i.e city names, street names are written in English by default.

Default Available Controls in Google Maps:

There are some default controls provided by google in google maps.

Zoom:it enables the user to zoom in or zoom out on the map using +/- controls buttons.

Pan:it allows the user to have a pan control for panning the google map.

Maptype:it allows the user to switch between the different map types view

Streetview:it anbale the user to have a street view

In addition to above default controls the google maps also have many other controls such as scale rotate overview map

Types of Google maps:

Google maps API provide four different types of google map versions for user to use in different applications.

Road map: Road map is the default map of the google maps. If the user has not selected none of the options available then this map is displayed. It is normal 2 Dimensional map.
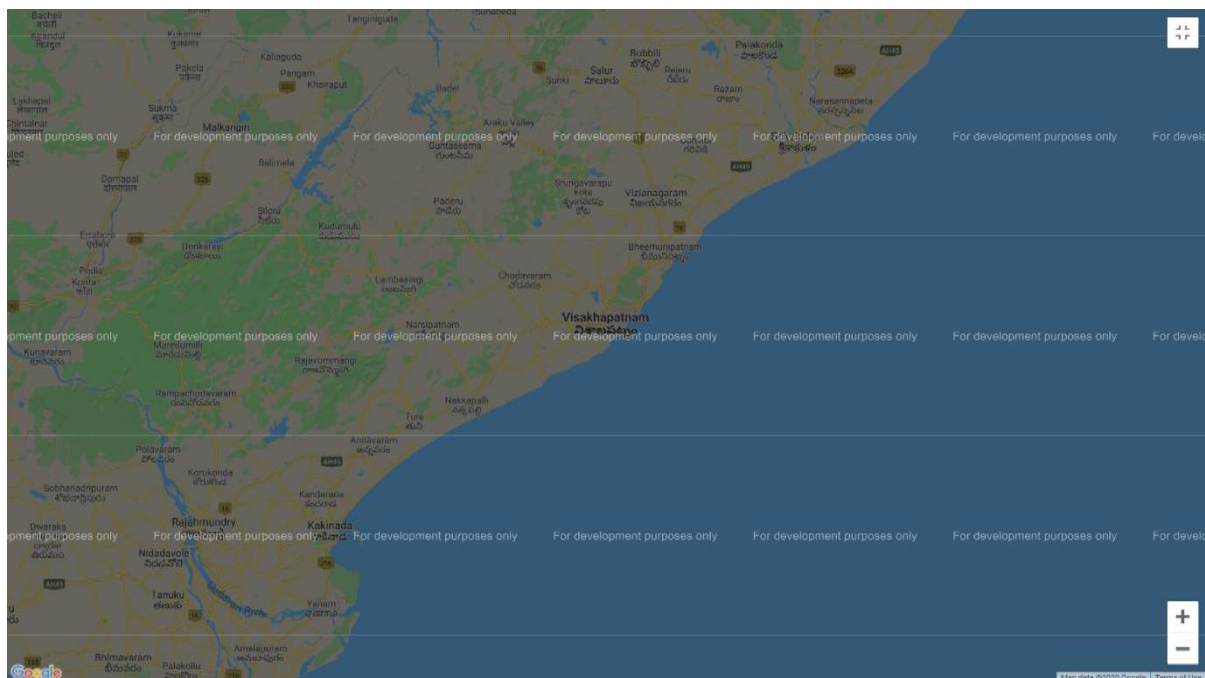
Fig 3.3.1:Roadmap

Satellite Map:Satellite map shows the user the satellite images of the selected region which is refered by the user.

Fig 3.3.2:Satellite map

Hybrid map: This map is the combination of the two maps .ie road map and satellite map.it shows the various major streets on the satellite image

Fig 3.3.3:Hybrid Map

Terrain map: This map shows the vegetation and terrain over a specific region.
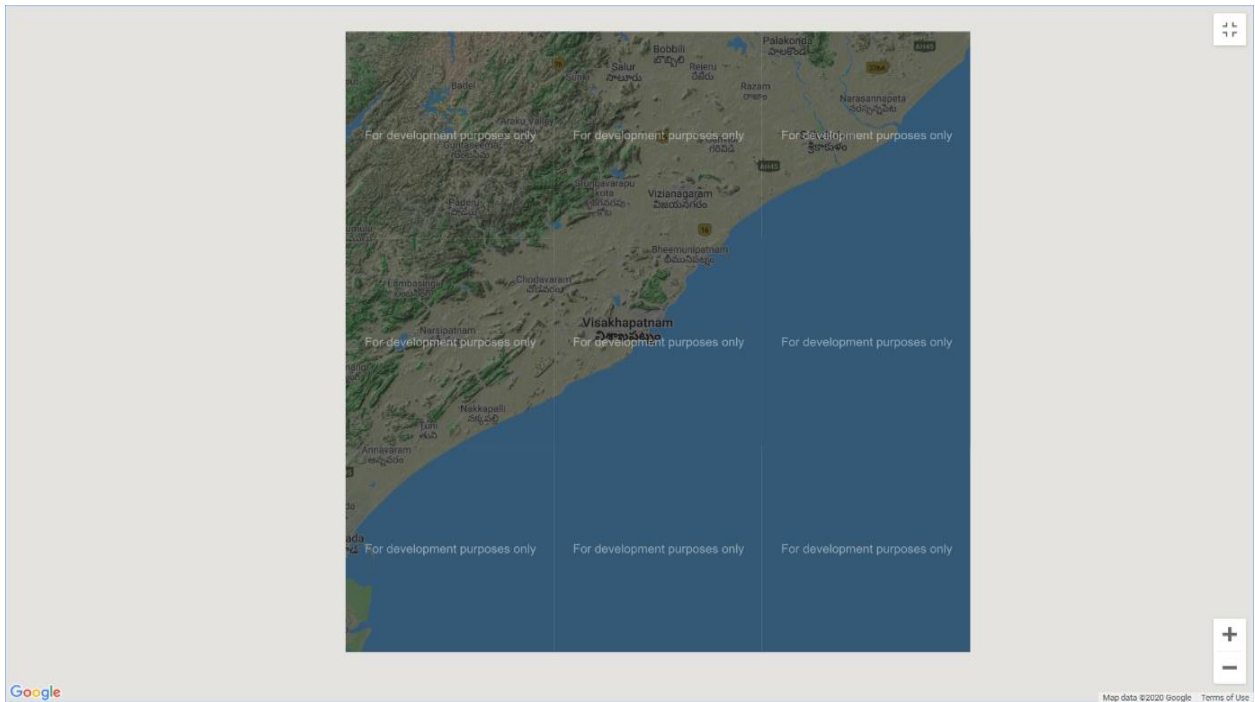
Fig 3.3.4: Terrain Map

3.3.1 Google Maps Algorithm:

Google maps works on one of the most effective shortest path finding algorithm i.e Dijkstra algorithm.Dijistra algorithm is a greedy algorithm which is more likely used to find the minimum spanning tree in the graph. In minimum spanning tree we are provided with root vertex which is also starting vertex and all other vertices in the graph to evaluate the shortest path among each vertex from the root vertex. It is different from other minimum spanning tree algorithm in the manner that shortest path between the two given points may not include all the points that are in the graph.

How Dijkstra works:

Step 1:Lets initialize the weighted graph
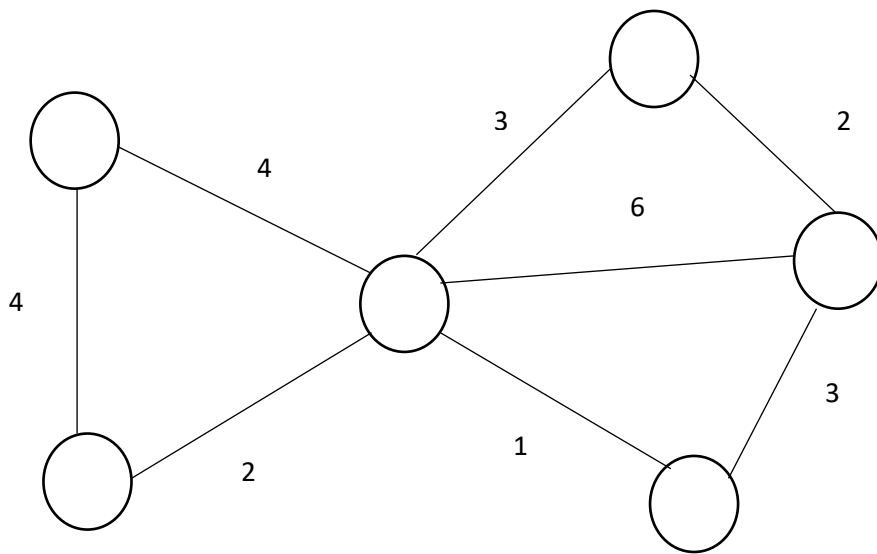
Fig 3.3.1.1

Step 2:Choose the initial or root vertex to start the minimum path finding process
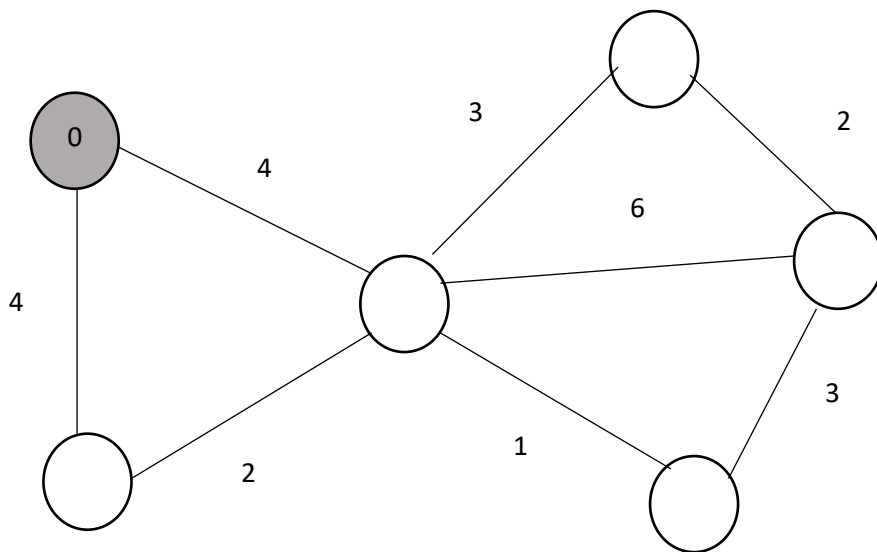
Fig :3.3.1.2

Step 3:Allot the infinite value to the given set of vertices in the graph
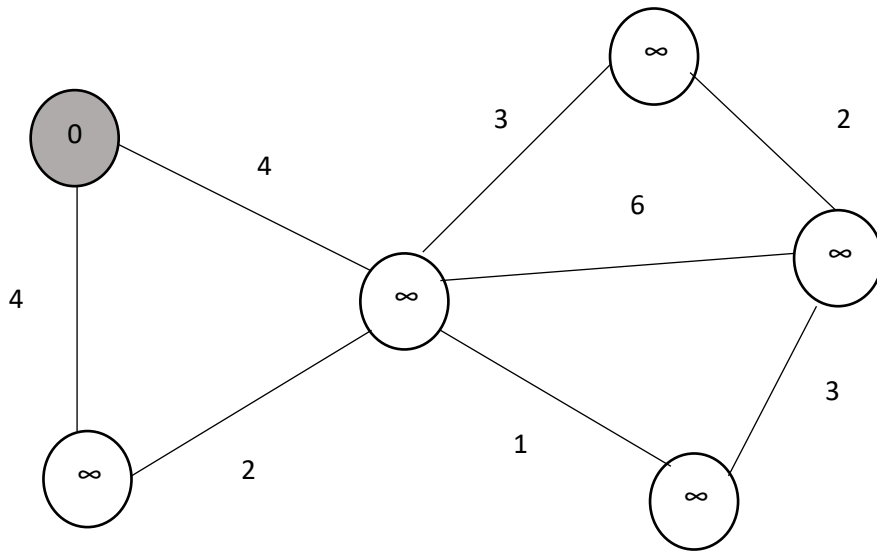
Fig: 3.3.1.3

Step 4:Trace the every vertex adjacent to the initial staring vertex and start valuing its path values.
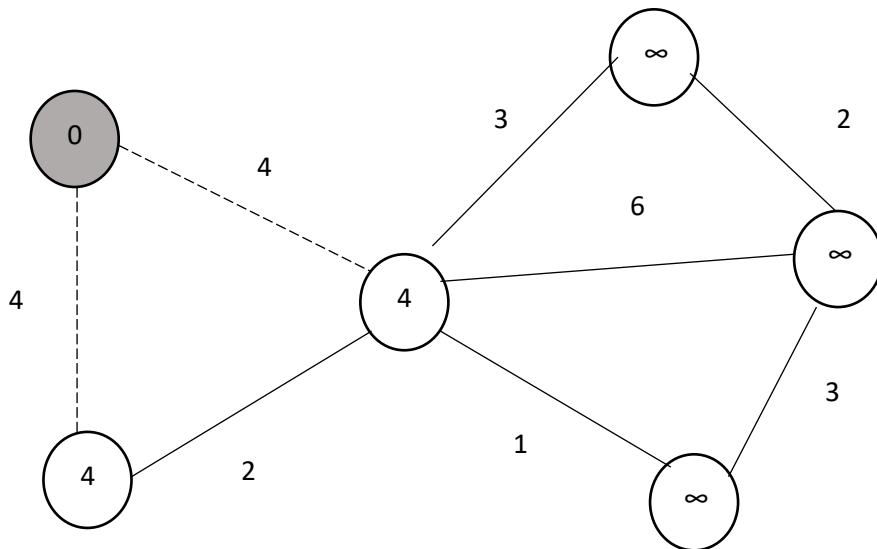
Fig 3.3.1.4

Step5:If the route length of nearby vertex is lesser then new route path there is no need to update its values of the vertex.
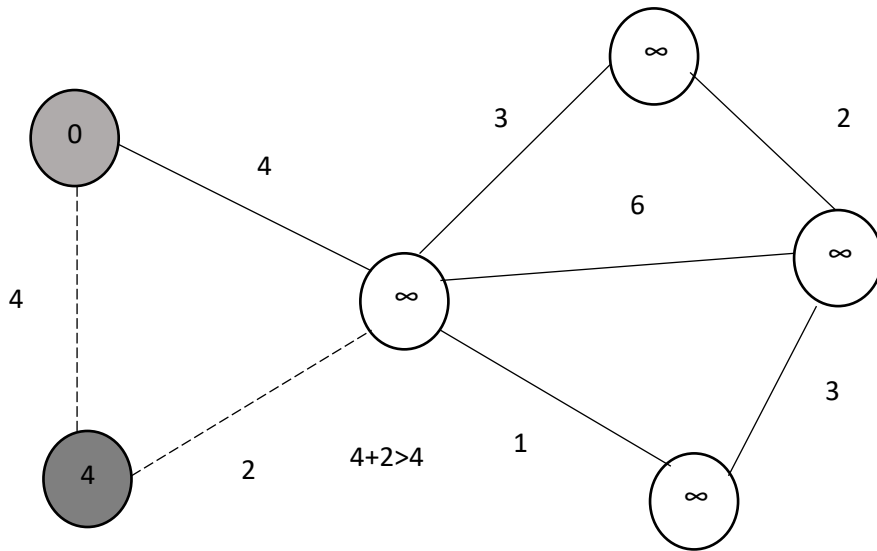
Fig:3.3.1.5

Step 6:Don't update the route length of already traced vertices.
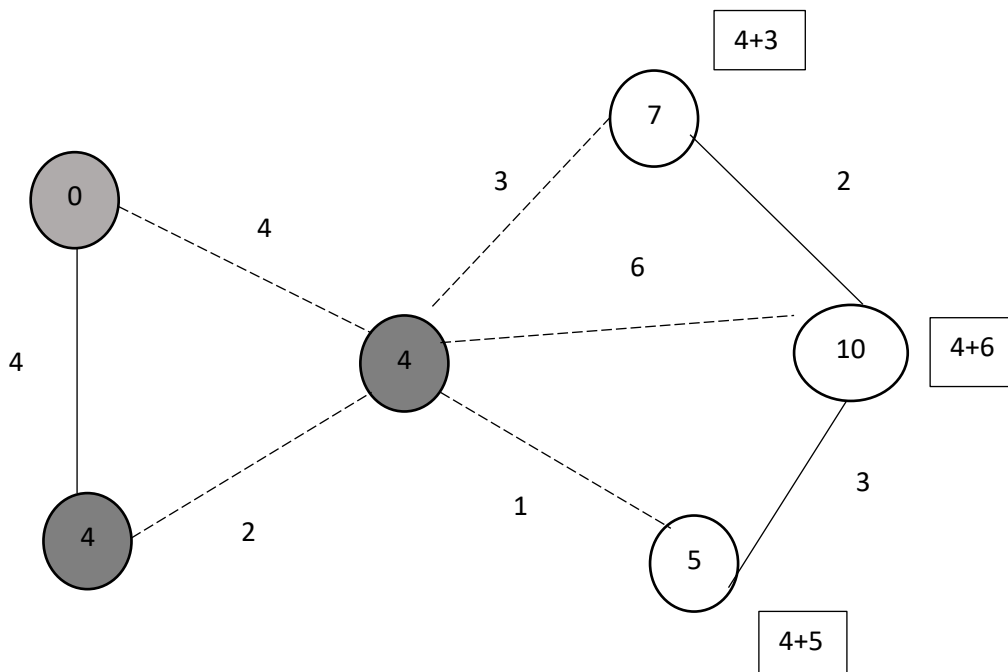
Fig:3.3.1.6

Step 7:Choose the unvisited vertex with minimum route length which is shown in below figures
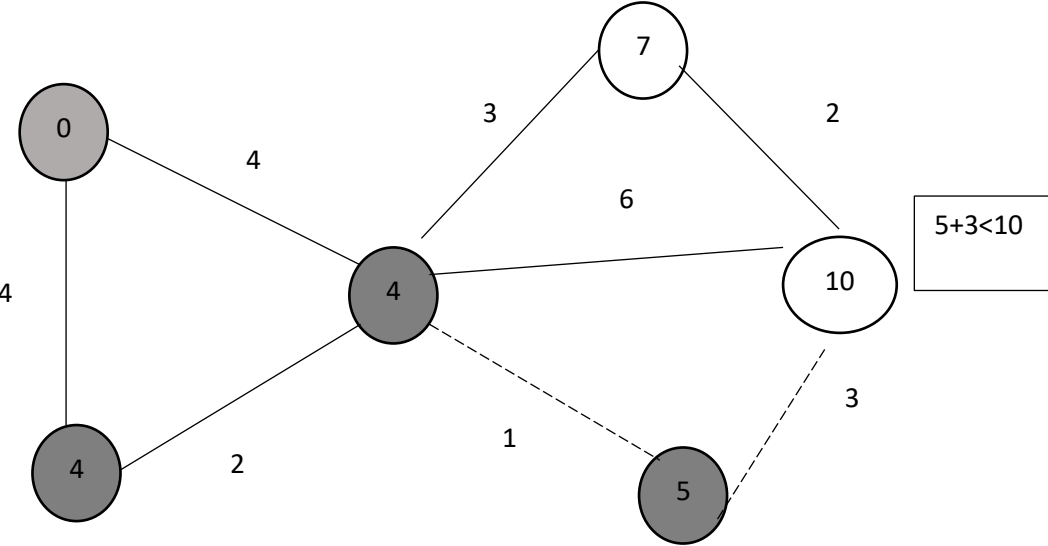
Fig:3.3.1.7
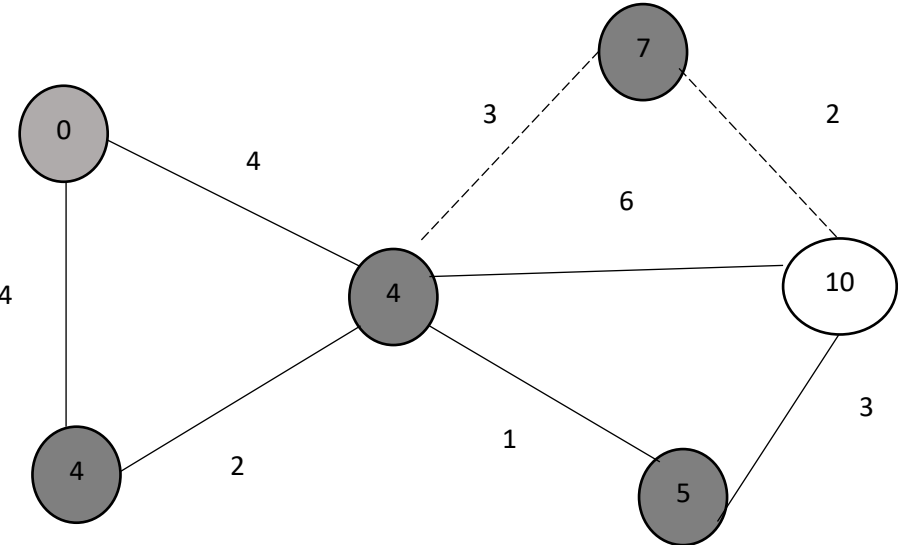
Fig:3.3.1.8

Step 8:Repeat this route tracing process until each and every vertex of the graph is traced.
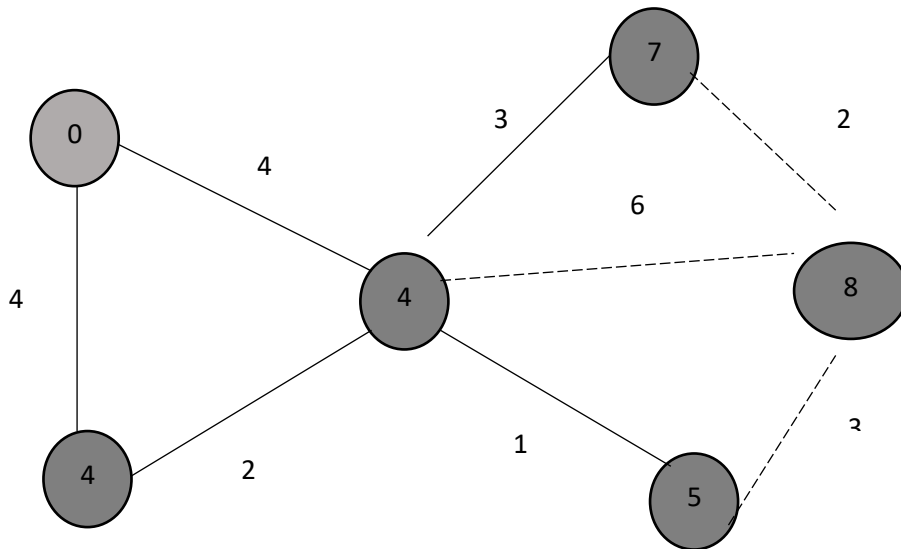
Fig:3.3.1.9

A* search Algorithm:

In real life scenarios there can be many situations where the route finding applications have to face problem such as obstacles and hinderances in the route of the specified destination.
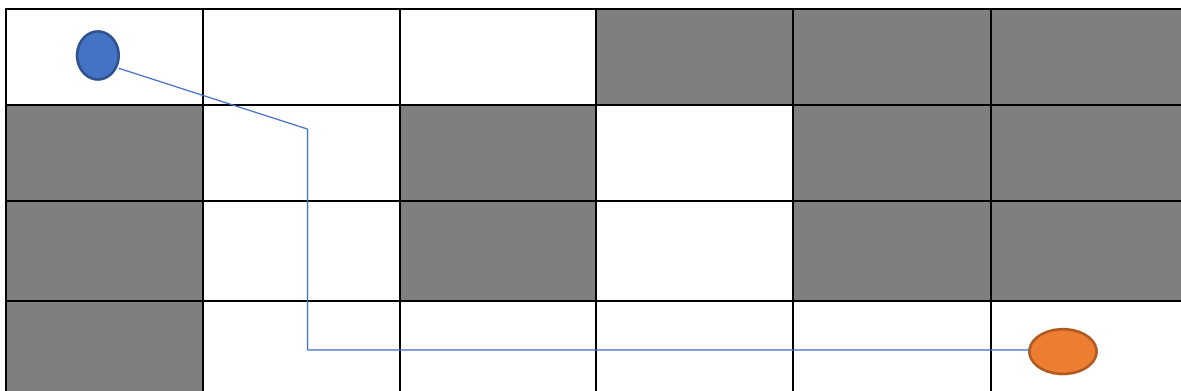
Fig :3.3.1.10

A* algorithm is one of the most intelligent algorithms used in path findings for the shortest route on the graph and real life scenarios.Consider the above figure having the source point and final destination point.A* algorithm uses a approach and three parametres in which one parameter is

equall to the sum of other two parameters. At each cell in the figure as shown above the algorithm chooses a such a point in the cell having the lowest value which helps in finding the shortest route among the various point given. The two given parameters is responsible for calculation of value of cost of moving from one cell to other cell.It is mostly same as Dijkstra shortest path algorithm but it is more intelligent than the Dijkstra algorithm.

3.4 Workflow of System

Activity diagrams represents an action outline depicts the control stream from a beginning point to a completion point indicating the different choice ways that exist while the action is being executed. We can portray both successive handling and simultaneous preparing of exercises utilizing an action outline. They are utilized in business and procedure displaying where their essential use is to portray the dynamic parts of a framework.

Activity Diagram Notations

Initial State:

The beginning state before a movement happens is portrayed utilizing the underlying state

Action State

Action state represents the progress of an action that is initiated on the objects.This state is repsented by rectangle with rounded corners.

Action or Control Flow

The control or action flow is used to show the execution path of one state to another state.

Decision Node

Decision node is used to make decision to decide the flow of execution control when multiple activities are there.

Fork

Fork is used to support many activities occurring at the same time.

Join

The Join is used to support multiple activities that is happening in the control flow graph.It is represented by more than two income g nodes and single outgoing node.

Final State

It is the state when the system reaches to the end of a particular process or activity.
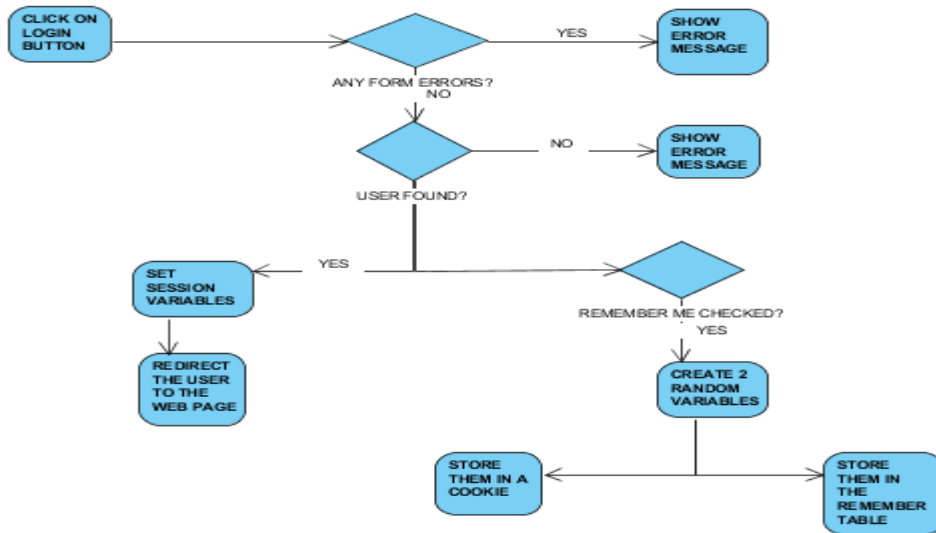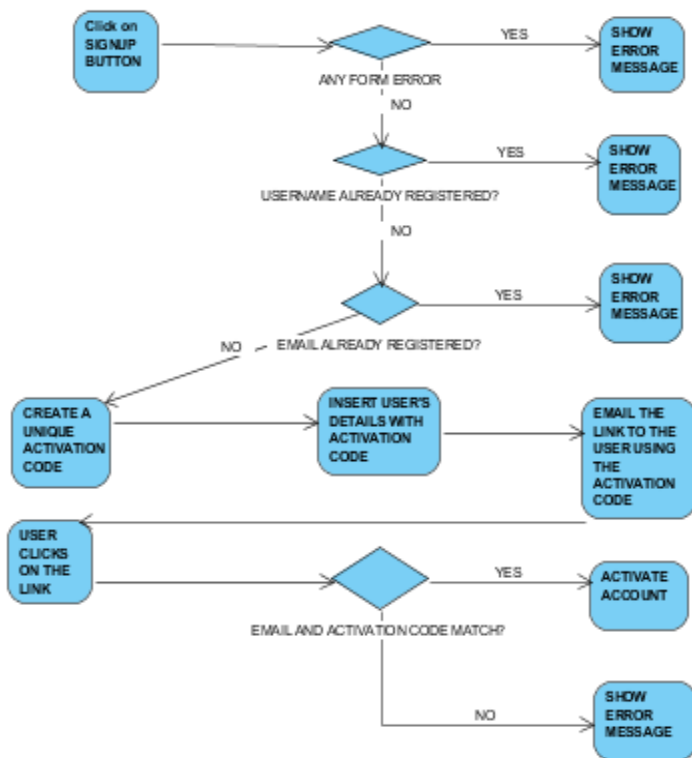

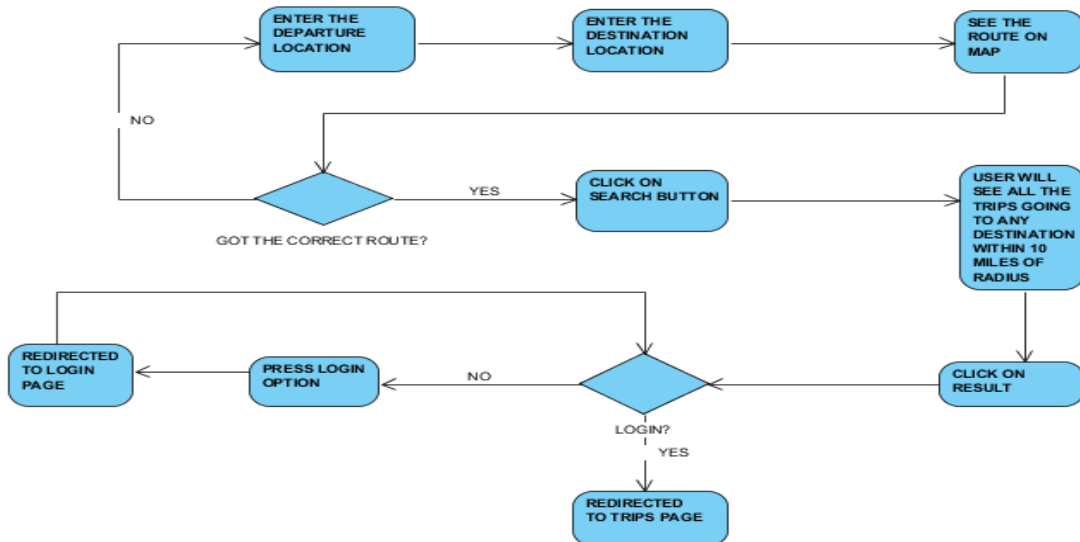Fig 3.4.1:Login form

Fig 3.4.2:Sign up form

Fig:3.4.3: Booking a Ride through system
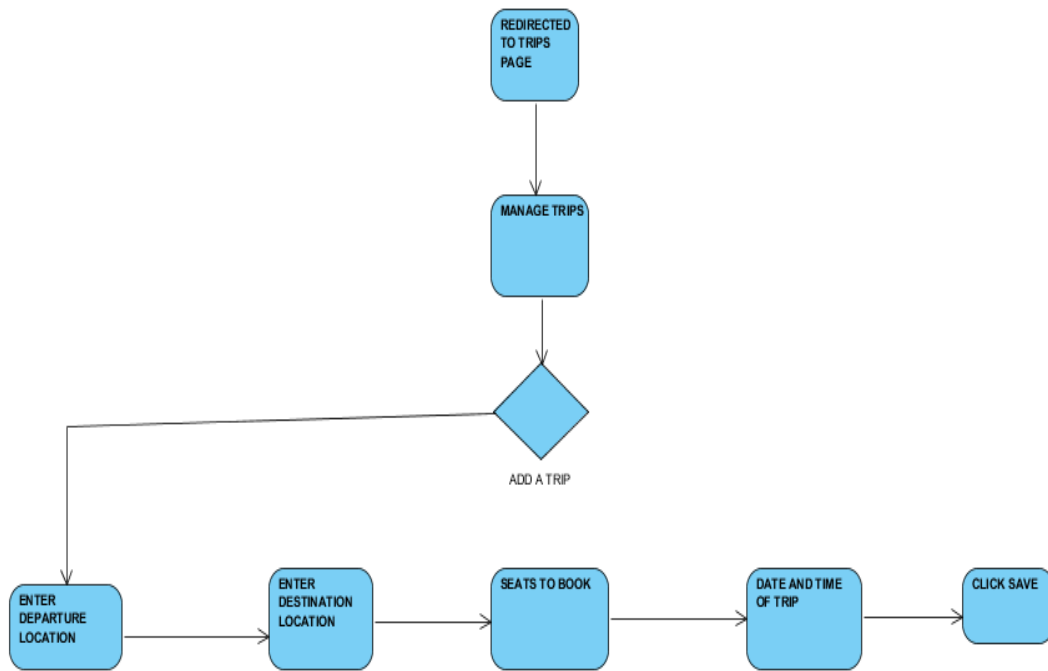
Fig:3.4.4: Adding a Trip

Fig:3.4.5: Delete a Trip

REDIRECTED
TO TRIPS
PAGE

MANAGE
TRIP

EDIT A TRIP

ENTER NEW
DEPARTURE
LOCATION

ENTER NEW
DESTINATION
LOCATION

ENTER HOW
MANY SEATS U
WANT

CLICK
SAVE

Fig:3.4.6:Edit a Trip

COME BACK TO WEBSITE

REMEMBERME COOKIE AND NO SESSION USER_ID

EXTRACT AUTHENTICATION 1&2 FROM THE COOKIE

LOOK FOR $AUTHENTIFICATOR1 IN THE TABLE

GET CORRESPONDING F2 AUTHENTICATOR2

F2AUTHENTICATOR2 =F2(AUTHENTICATOR1)?

SHOW ERROR MESSAGE

NO

YES

SET SESSION VARIABLES AND REDIRECT TO WEBSITE

STORE IN COOKIE AND TABLE

CREATE NEW AUTHENTICATORS 1&2

Fig:3.4.7:Remember me

Fig:3.4.8 :Reset Password Form
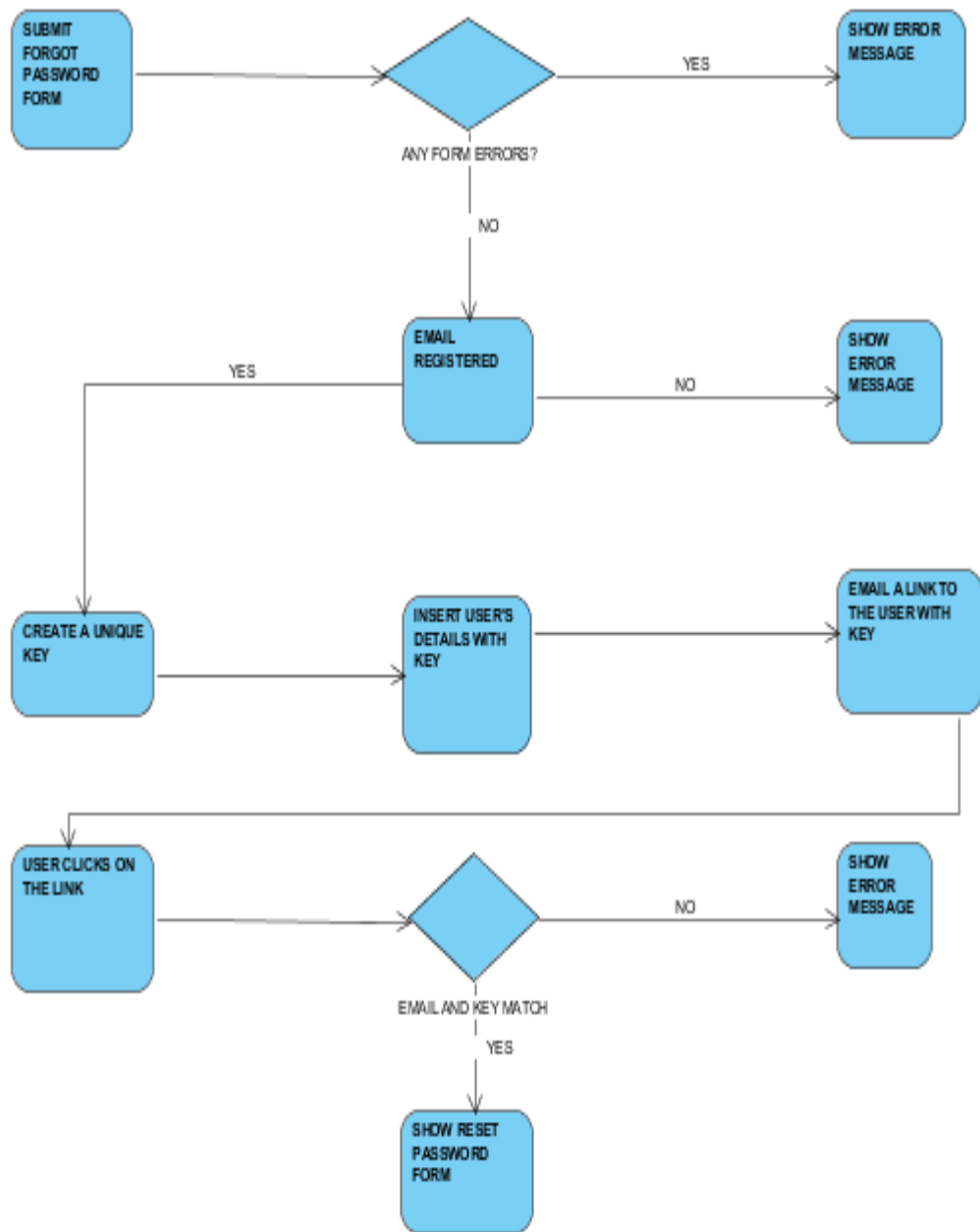
Fig:3.4.9:Forgot Password

CHAPTER-4

PERFORMANCE ANALYSIS

4.1 Introduction

Software testing is one of the most critical aspect of a quality software assurance.software testing represents the finest review of design,specifications and coding of a software.This step in software engineering process can be concepted as a destructive step rather than constructive one.In software development life cycle(SDLC) a stratergy for testing the software includes integration of various small software test cases and combine these test case methods into a series of well defined steps that can help in successful contruction and fault tolerant software.Testing can be defined as the set of various activities which are planned in advance before handing the software to the client.The series of test cases are conducted one by one and all together systematically.the basic motivation to test a program is to confirm the software quality with the already defined methods that can be effectively and economically apply to both the small and larger scale system that are developed.

The process of software engineering can be viewed as a spiral where the different roles are assigned to the each functionality in different sector of a spiral.Basically software engineering defines the role of the software that is developed and it meets the software requirement analysis in which the functions,behaviours,performance ,information domain and various other validation criteria for software are defined.firstly entering into the spiral ,the first sector or phase inside the spiral is design and coding.It starts from designing the software to meet the user specified requirement to coding phase where all the specified requirements are meet. For developing a software we move along the streamlines that may affect the level of abstraction in each round.

A strategy for testing the software can also be viewed as spiral. Unit testing begins starts from the vertex of the spiral and it focuses on separate unit of the software which is implemented in the source code. Progress of testing can be measured by moving in the outward direction of the spiral with the integration testing. The focus is mainly on the design and the construction of software architecture. When we are moving around a spiral on the outward turn then one can encounter the phase called validation testing. In this phase the requirements that are demanded by the client as the part of software are validated against the software that has been constructed by the developer.In

the final step we reach at a point called system testing.In system testing the software is tested and other systems elements are also tested in a complete manner.

Stages of Testing Process

```
Unit Testing

Module Testing

Sub System Testing

System Testing

Acceptance Testing
```
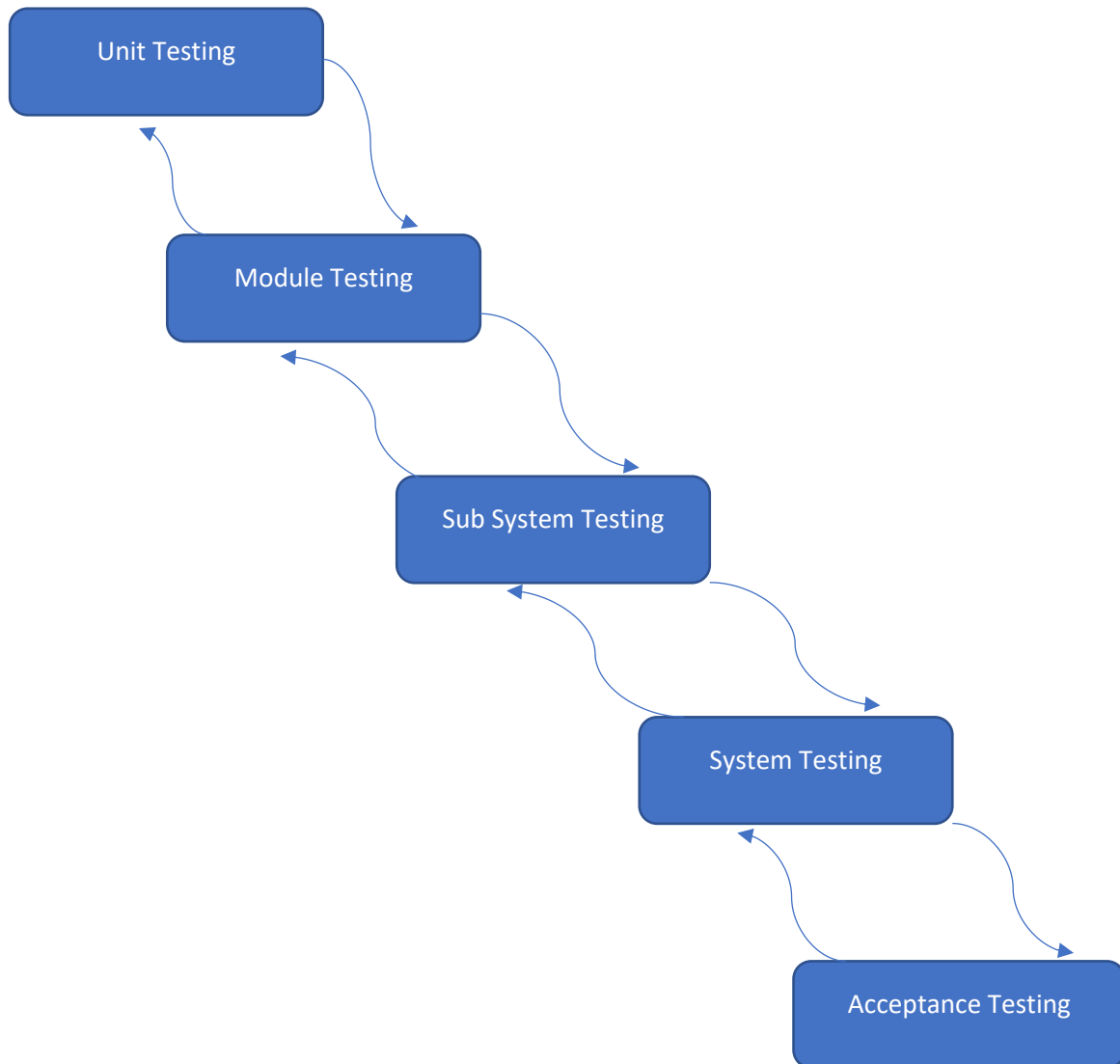
Stages of testing process can be majorly into four levels:

Unit Testing

In Unit testing while testing a developed system software each single piece of software is tested for performance .how each individual unit of system software is performing. The main focus of this type of testing is to cross validate the each and every unit of system software which are designed.

Integration Testing

Integration testing is a level of testing process where the different individual units of software of the same system developed are aggregated and then tested as a combined group for the fully functional testing.This type of testing process helps in finding the error or mistake in the software when different single units are combined and allowed to perform as a whole.It exposes faults in integrated units.

System Testing

System testing is used for the testing where the complete intehrated or fully developed software by the system developer is functioning to its defined requirement or not. The main purpose of this type of testing is to meet the needs of the system specifications with the client defined requirements.

Acceptance Testing

In acceptance testing the system is tested for suitableness of the system that is developed for the client need.. The main purpose of this type of testing is to check and validate the given developed software with the defined business enviornment requirements and checks whether the quality that is developed by the developer fulfill the given standards and whether it is ready to be delivered to the customer and perform as per specific need.

Types of Testing

In software testing process there are different methods that are used for testing the software to make it free from various errors and faults .The software testing methods are chosen by different testers as per their needs and methodology. Mostly three types of testing are done by before handling the product to the client.

4.2 Blackbox Testing

This testing of testing is also called as behavioural testing. In black box testing it is used to verify and validate the hidden structure of the product.It is also used for testing the design and implementation of the user interface of the product that is being tested. The user interface is usually not known to the tester. Black box testing is either functional or non functional,but mostly it is usually functional testing.It is called black box because the software that is developed by the developer is not known to the tester in advance and hence we can say that the eye of tester is like a black box from which you can see nothing inside. The black box testing tends to find the errors from inaccurate functioning of software, errors in interface, structure, database, behavioural and many errors related to starting and termination of product.

Black Box testing can be implemented by following methods

4.2.1 Syntax Driven Testing

In this testing it is applied to those systems that can be represented syntactically in some language.compilers languages which are represented using context free grammar uses this type of testing.The test cases are generated so the context free grammar having different rules should be used atleast once.

4.2.2 Equivalence Partitioning

Equivalence partitioning is also known as equivalence clas partitioning.It is also called as ECP.This Blackbox software testing technique divides the input testing data which is under consideration into different partitions and atleast once of the equivalent data is such that from which test cases

can be derived.this testing approach is advantageous because it reduces the time required for doing the testing on the software dues to less no of available test cases.

The ECP involves two steps :

Identification of Equivalence Class:

Whenever we partition the any input domain we classify it into two sets.One is Valid set and other is Invalid set.

Generation of Test Cases:

In black box testing a valid unique identification number is assigned to a set of valid and invalid classes.secondly a test case is written in such a way that it should cover all the test cases including valid and invalid set.

4.2.3 Boundary Value Analysis

In boundary value analysis the testing is performed on boundary values.Since the chances of error to occur is more at boundary.Hence the test cases are designed in a efficient manner to find the error at the boundary value.Efficiency of testing increases and also the probability of finding the errors also increase.

4.2.4 Cause Effect Graphing

Cause effect graphing is another black box testing technique that is used to illustrate graphically the relation between logical output and all the factors that affect or influence that may affect this output.Logical input is called as cause and corresponding action is called as effect.These both are represented with the help of Boolean graph. This testing helps testers to find the root cause of the problem. The cause effect graph can be established by following some steps

- Firstly identify input and output
- Second step is the development of cause effect graph
- Convert this graph into decision table
- Last step is to convert the rules that are in decision table to test cases.
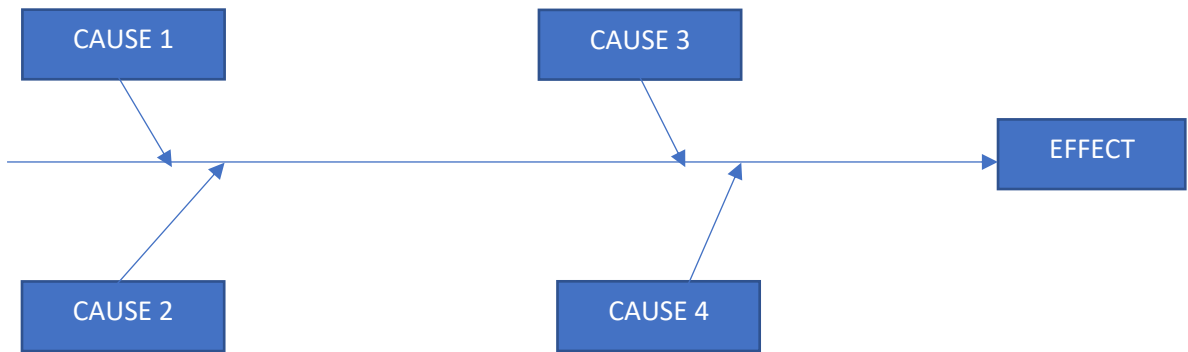
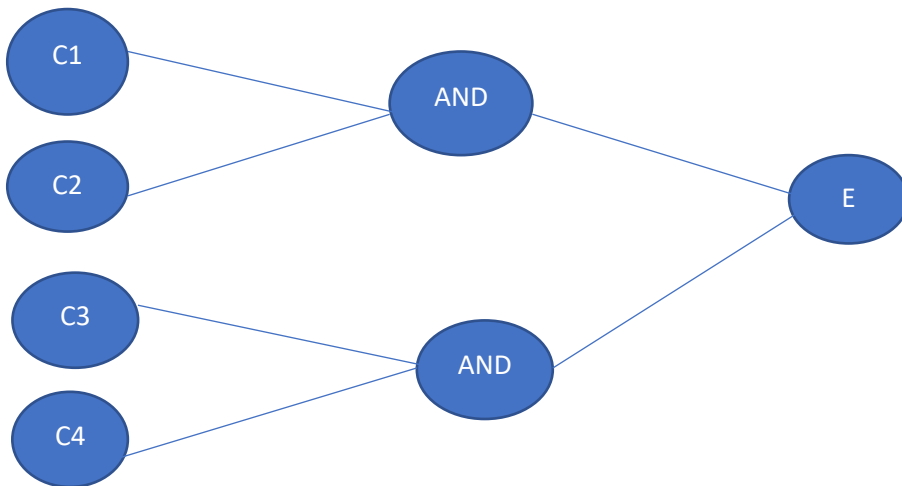Fig:4.2.4.1: Cause Effect Flow Diagram

Fig:4.2.4.2:Cause Effect Graph

Converting the Cause Effect Eraph into Decision Table

		T1	T2	T3	T4	T5	T6
	C1	1	1	1	0	1	0
Causes	C2	1	1	1	0	0	1
	C3	0	1	0	1	1	1
	C4	0	0	1	1	1	1
Effects	E	1	1	1	1	1	1

4.3 White Box Testing

White box testing is also known is Glass Box testing.It is also known as transparent box testing or open box testing.from a software system developer view it is also termed as code- oriented testing.White box testing deals with the logic design,internal structure of the module.It also deals with the implementation of the different modules of the system.In this type of testing ,the tester prefers his choice of input via code for determining the well known output or exact output in order to test its proper functionality.Since it is known as code oriented testing it also contains many technical based testing during its testing phase.white box testing is used to analyse the internal structure of the code.working process of white box testing contains input, processing, proper test planning and output.

Whitebox Testing Techniques can be implemented in following ways

4.3.1 Statement Coverage

Statement coverage technique ensures that the it should traverse all the statements of the code atleast once.by this method each line of the code is tested.Through diagram it can be represented in the form of flowchart and all the nodes must be traversed at least once. In this technique all the lines that are included in the code are covered so if there is a fault in any line of the code it points out the faulty line of code.

4.3.2 Branch coverage

In this type of testing ,the test cases are designed in such a manner such that each branch from all of its decision points must be traversed atleast once a time.In a flowchart representation ,the edges must be traversed at least once.

4.3.3 Condition Coverage

In conditional coverage testing all the conditions that is stated must be tested for both positive and negative aspects. Also all the paths that comes to play in forming the result is tested so that on each path traversal on checking the condition ,it should cover all the possible chances of errors.

4.3.4 Basic Path Testing

In basic path testing, Control flow graph are made from the flowchart.Control flow graph is a directed graph which consist of nodes and edges.A node in control flow graph represent a decision point. From the Control flow Graph cyclomatic complexity is calculated. Cyclomatic complexity is the measure of the total number of independent paths such that a minimal number of test cases is designed.

Let us consider a graph G,then cyclomatic complexity of this graph is V(G) then to calculate the cyclomatic complexity we can determine it different formulas

1.v(g)=p+1,here p is total number of predicate nodes in Control flow graph

2. v(g)=e-n+2 ,where e indicates the total number of edges in control flow graph and n is the total no of nodes.

3.v(g)=total no of overlapping regions I the control flow graph.

4.3.5 Loop Testing

Loops are widely in white box testing techniques.Since loops are very fundamental in designing an application so it is necessary to check their functionality during testing.error may occur at the starting or termination of loops.

For simple loops of size n, test cases are designed in a manner such that it entirely skips the loop. Or only one test case pass through the loop.There may be m passes ,where m<n

In Nested loops, all the loops that are present inside the flow graph are set to their minimum count.In the testing process we start from innermost loop.simple testing process are conducted for innermost loop and this starts working towards outside until all the loops that are present inside are tested.

Concatenated loops are independent loops,they exist like one after another.simply a basic testing is applied to them.if the loops are not independent treat them like a nested loop

4.4 Test Setup

The test setup is already embedded in our system.the basic testing process takes when the user enters his/her email id in a wrong manner.The system checks for the entered email id and searches it in the datatbase.if it is found in database then the user is granted to access the system.It is a type of flow testing in which every user or driver that is connected with that system is authenticated before moving to next segment.For a new user registerion it should be properly ensured that the all the details filled by him should be authentic in registration section.If the user forget his password then he may recover it through his registered email id with the system.All the confidential data that are entered by the user are submitted through secured protocol that is HTTPS.The user password is masked with input type == password to enhance the security.For session management testing no data is stored in cookies.For password testing it is strongly recommended to use a combinatorics rule.There is a time limit that is set for expiration of the password reset link so that no ther can use this link for other purposes.

CHAPTER-5

RESULTS

In this report we have presented a design and how to implement the car pooling system or car ride sharing system among the common people.Our system works In real time and it is dynamic in nature.Our System matches the rides of many users in one way and it helps in occupying the vacant seats in the longest common ride.Our system is interactive with the user unlike the previous systemwhich were static and not interactive and easy to use.Old systems doesn't contain information about the exact location of pickup of a customer and also the dropping point location of a customer.Our system is based on real time updates in which the exact location of pick up and drop off point is known to the driver with the help of advancement in technology like exact location based on GPS reading and GIS system coordinates.The interaction among the different type of users and the route matching algorithm enable the user as well as system to match the suitable ride share according to different users in the way.Our system builds the new routes from more than two routes dynamically with attention to the customer and it prefers maximum deviation from the original path of ride in order to catcg more customers in the single ride on the way.We believe that the growing attention towards the increase in environmental conditions such as pollution level and other issues like increase in the density and volume of transportation system in the cities as well as villages.These type of system are going to save the people time,money and ither things that are beneficial to the human beings that are living in the system surroundings.

Output Screens

When for the First time any user visits our site it looks like this: -
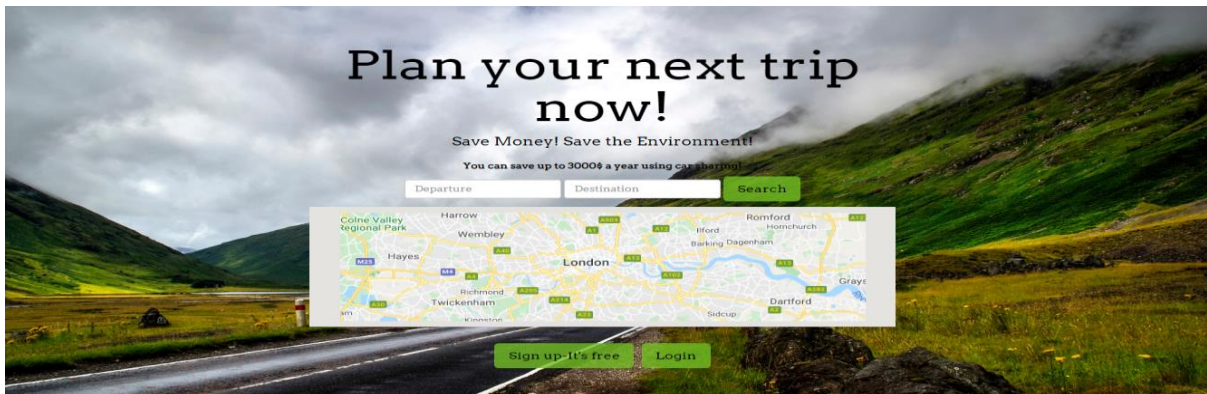
Fig:5.1

Now , if a user wants to become driver , then he needs to do formalities and then he will be registered as driver, he can't sign up directly. Let say he registered and was given the credentials to access the website , so login form looks like : -
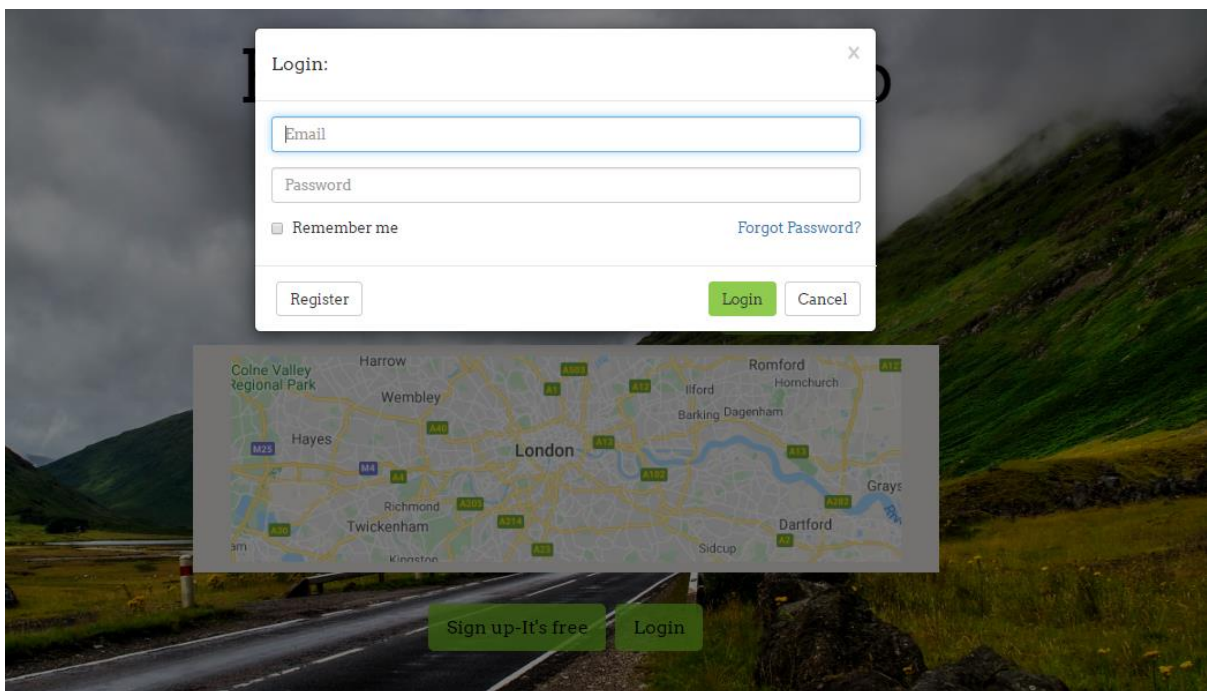
Fig:5.2

Driver enters login details and then home page looks like :-
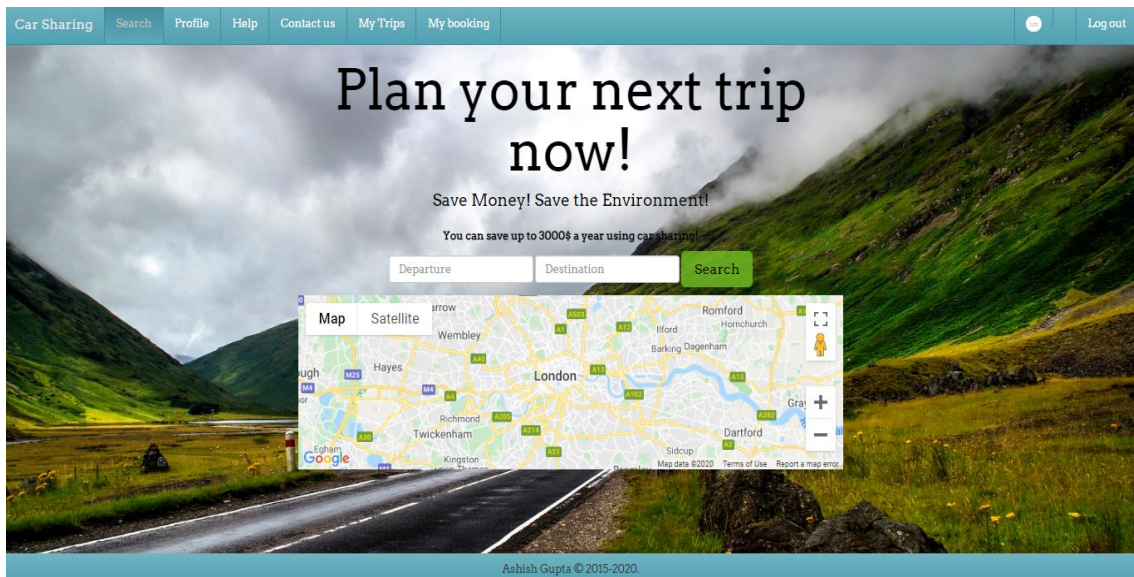
Fig:5.3

So he just need to add the trips i.e from which particular location he is available : -
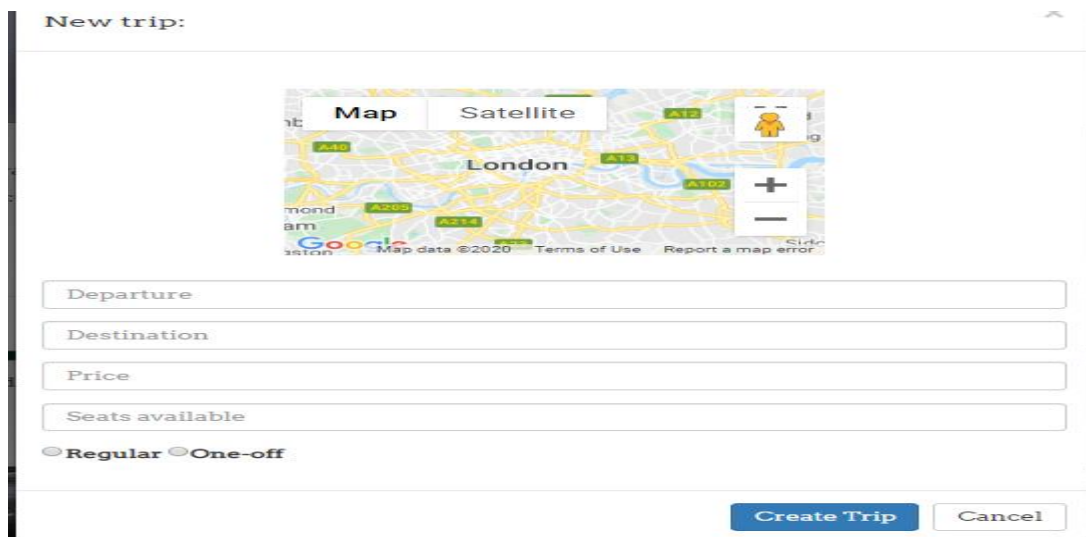
Fig:5.4

In this he will enter the departure and the destination , he will set the price and No of seats available.

Lets say he entered the trip from Chandigarh to Shimla , the process to add the trip is :-
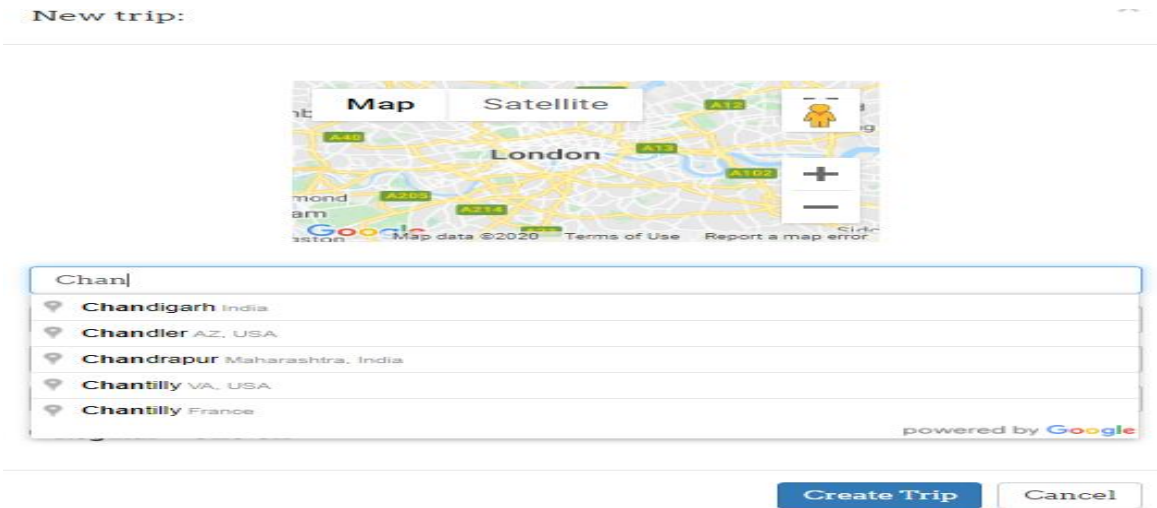
Fig:5.5
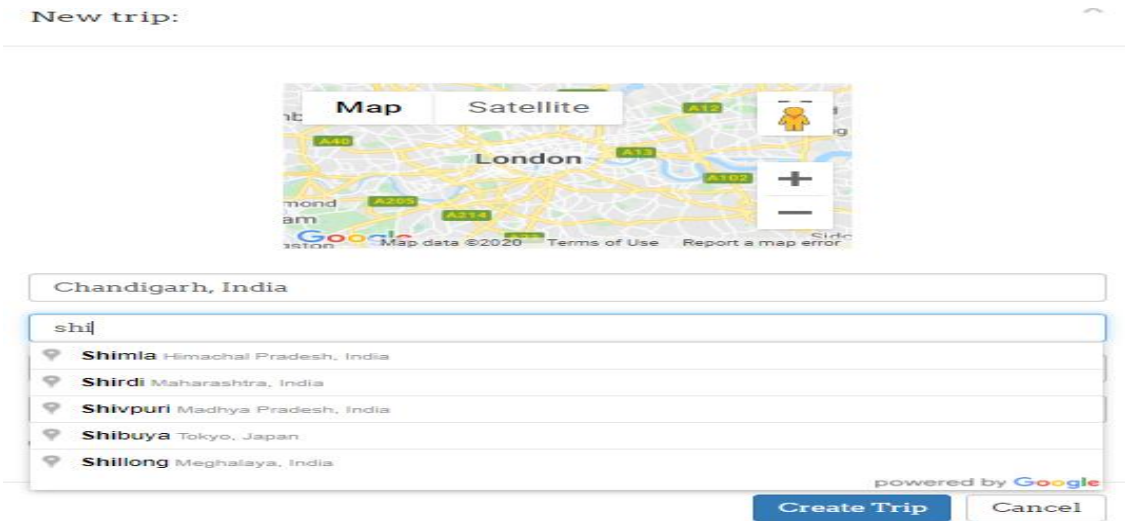
Fig:5.6

Now when he will enter the source and the destination using google maps he will be given the entire map i.e all the directions:-

Fig:5.7

Now he will enter the price per seat and the no of seats available and on which date he is availaible :-

Fig:5.8

Now he will enter the date and the time of the trip :-

Fig:5.9

So the trip will look like : -

Fig:5.10

1. Now coming to the customer side :-
a> Customer will register by filling signup form : -

Fig:5.11

Now after registering he will login and the home page for customer remains the same but he can make booking.Now he will create the trip let say from chandigarh to Shimla , so he will enter departure and the destination , So he will be shown a path and since the driver created the trip from chandigarh to Shimla , hence the customer will see all the bookings available:-

|
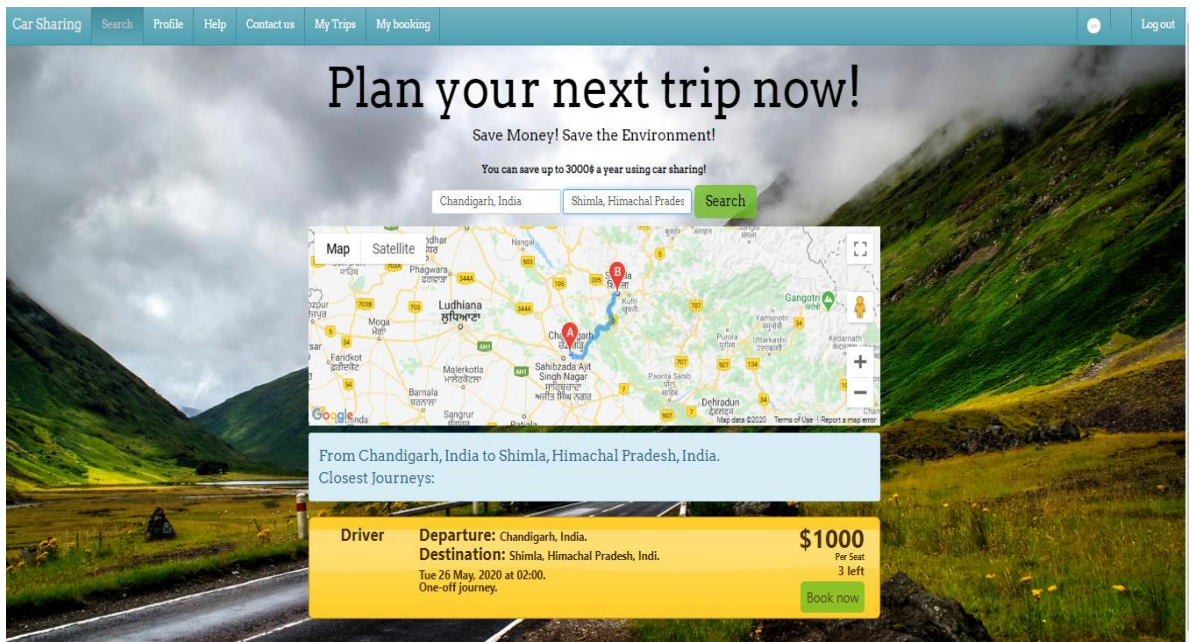
Fig:5.12

Now he will click book now:
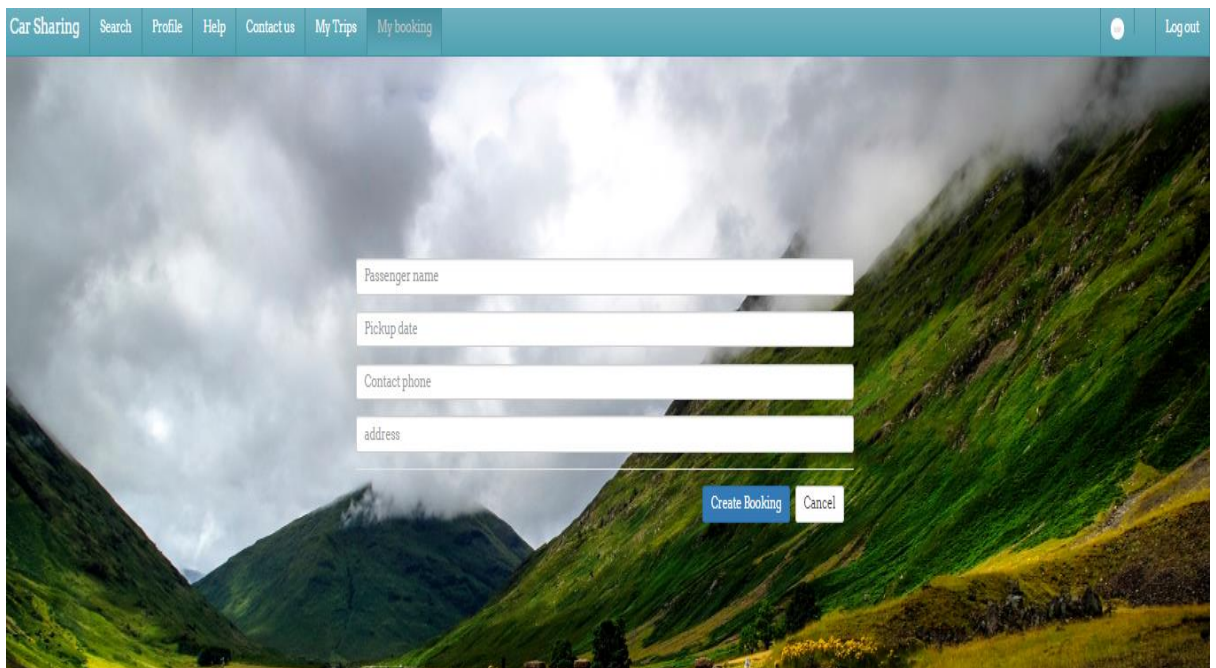
Fig:5.13

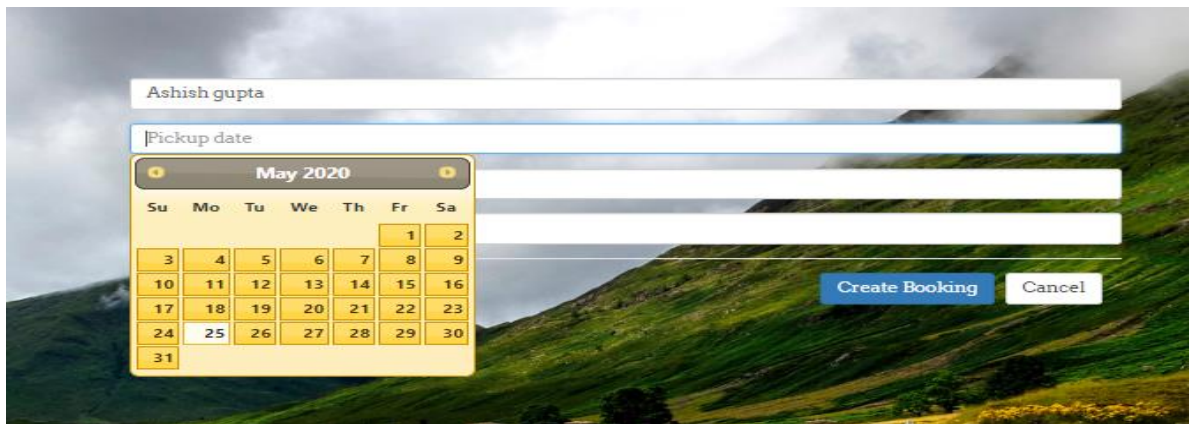In this form he will enter the passenger name , pickup date, phone number and the address

Fig:5.14

Now he will be shown a status like this:-

Fig:5.15

His booking is pending and this will be approved when driver approves the booking . So on the driver side :-

Fig:5.16

Now let say he accept the booking : -

On driver side:-

Fig:5.17

Customer side :-

Fig:5.18

He has an option to pay , but till now when he the booking will be completed he will pay when the ride will be completed, let say he clicked pay , so he/ she will get the status which shows PAID. And driver too will get the confirmation whether customer paid or not.

Customer side :-

Fig:5.19

Driver side : -

Fig:5.20

CHAPTER-6

CONCLUSION

6.1 Conclusion

Carpooling system can be helpful in order to reduce the pollution and the disturbance that is created due to traffic congestion by automobiles that are moving on the roads.carppoling system is an eco-friendly method of travelling from one destination to another.In carpooling system one can have the chances of meeting peoples from different states origins etc.In present day life most of the people opt for their private vehicle since less no of public transport are available and mostly of them are not in time.Registering the personal information before booking ensures the person security during his trip.Registering the personal information establish a trust between other passegers or users .These type of system helps in reducing the pollution level of the environement of surroundings ,also provides security to citizens since the information of driver and cab is already known to the customer in any circumstance.also these systems helps in saving the time of travel of a person from one location to other.It reduces dependency on many factors such as fuel and traffic as well.Carpooling system saves the users money that are speneded on toll taxes, maintenance of his personal car and many other expenses.Stress reduction is one of the benefit of car pooling system.So drive economical and make a good gesture to reduce the pollution level in environment.

6.2 Future Scope

As we live in a fast moving world where new technology is introduced everyday and the previous technologies become outdated.Mass population shifts on new technology as they are suitable for fast accessing of the application.As every new edition of book is printed with some modifications and the errors that are made during the previous publication are removed.Same is the case with the modern technology.In every update to the software new functionalities are added for smooth running of the system.It enhances its flexibility and provides interactive interface for the user.Future enhancement of the system will be Accurate positioning of vehicle and designing an algorithm in such a way that each driver must get plenty of trips during his work.

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APPENDICES

Code for Login

```php
?php
//Start session
session_start();
//Connect to the database
include("connection.php");
//Check user inputs
//Define error messages
$missingEmail = '<p><stong>Please enter your email address!</strong></p>';
$missingPassword = '<p><stong>Please enter your password!</strong></p>';
//Get email and password
//Store errors in errors variable
if(empty($_POST["loginemail"])){
$errors .= $missingEmail;
}else{
$email = filter_var($_POST["loginemail"], FILTER_SANITIZE_EMAIL);}
if(empty($_POST["loginpassword"])){
$errors .= $missingPassword;
}else{
$password = filter_var($_POST["loginpassword"], FILTER_SANITIZE_STRING);
}
//If there are any errors
if($errors){
//print error message
$resultMessage = '<div class="alert alert-danger">' . $errors .'</div>';
echo $resultMessage;
}else{
//else: No errors
//Prepare variables for the query
$email = mysqli_real_escape_string($link, $email);
```

```php
$password = mysqli_real_escape_string($link, $password);

$password = hash('sha256', $password);

//Run query: Check combinaton of email & password exists

$sql = "SELECT * FROM users WHERE email='$email' AND password='$password' AND activation='activated'";

$result = mysqli_query($link, $sql);

if(!$result){

echo '<div class="alert alert-danger">Error running the query!</div>';

exit;

}

//If email & password don't match print error

$count = mysqli_num_rows($result);

if($count !== 1){

echo '<div class="alert alert-danger">Wrong Username or Password</div>';

}

else {

//log the user in: Set session variables

$row = mysqli_fetch_array($result, MYSQLI_ASSOC);

$_SESSION['user_id']=$row['user_id'];

$_SESSION['username']=$row['username'];

$_SESSION['email']=$row['email'];

if(empty($_POST['rememberme'])){

//If remember me is not checked

echo "success";

}else{

//Create two variables $authentificator1 and $authentificator2

$authentificator1 = bin2hex(openssl_random_pseudo_bytes(10));

//2*2*...*2

$authentificator2 = openssl_random_pseudo_bytes(20);

//Store them in a cookie

function f1($a, $b){

$c = $a . "," . bin2hex($b);
```

```php
return $c;

}

$cookieValue = f1($authentificator1, $authentificator2);

setcookie(

"rememberme",

$cookieValue,

time() + 1296000

);


//Run query to store them in rememberme table

function f2($a){

$b = hash('sha256', $a);

return $b;

}

$f2authentificator2 = f2($authentificator2);

$user_id = $_SESSION['user_id'];

$expiration = date('Y-m-d H:i:s', time() + 1296000);

$sql = "INSERT INTO rememberme

(`authentificator1`, `f2authentificator2`, `user_id`, `expires`)

VALUES

('$authentificator1', '$f2authentificator2', '$user_id', '$expiration')";

$result = mysqli_query($link, $sql);

if(!$result){

echo  '<div class="alert alert-danger">There was an error storing data to remember you next time.</div>';

}else{

echo "success";

}

}

}}
```

Code for Sign Up

```php
<?php
//<!--Start session-->
session_start();
include('connection.php');

//<!--Check user inputs-->
//   <!--Define error messages-->
$missingUsername = '<p><strong>Please enter a username!</strong></p>';
$missingEmail = '<p><strong>Please enter your email address!</strong></p>';
$invalidEmail = '<p><strong>Please enter a valid email address!</strong></p>';
$missingPassword = '<p><strong>Please enter a Password!</strong></p>';
$invalidPassword = '<p><strong>Your password should be at least 6 characters long and inlcude one capital letter and one number!</strong></p>';
$differentPassword = '<p><strong>Passwords don\'t match!</strong></p>';
$missingPassword2 = '<p><strong>Please confirm your password</strong></p>';
$missingfirstname = '<p><strong>Please enter your firstname!</strong></p>';
$missinglastname = '<p><strong>Please enter your lastname!</strong></p>';
$missingPhone = '<p><strong>Please enter your phone number!</strong></p>';
$invalidPhoneNumber = '<p><strong>Please enter a valid phone number (digits only and less than 15 long)!</strong></p>';
$invalidEmail = '<p><strong>Please enter a valid email address!</strong></p>';
$missinggender = '<p><strong>Please select your gender</strong></p>';
$missinginformaton = '<p><strong>Please share a few more words about yourself.</strong></p>';
//   <!--Get username, email, password, password2-->
//Get username
if(empty($_POST["username"])){
$errors .= $missingUsername;
}else{
$username = filter_var($_POST["username"], FILTER_SANITIZE_STRING);
}
//Get firstname
if(empty($_POST["firstname"])){
```

```php
$errors .= $missingfirstname;
}else{
$firstname = filter_var($_POST["firstname"], FILTER_SANITIZE_STRING);
}
//Get lastname
if(empty($_POST["lastname"])){
$errors .= $missinglastname;
}else{
$lastname = filter_var($_POST["lastname"], FILTER_SANITIZE_STRING);
}
//Get email
if(empty($_POST["email"])){
$errors .= $missingEmail;
}else{
$email = filter_var($_POST["email"], FILTER_SANITIZE_EMAIL);
if(!filter_var($email, FILTER_VALIDATE_EMAIL)){
$errors .= $invalidEmail;
}}
//Get passwords
if(empty($_POST["password"])){
$errors .= $missingPassword;
}elseif(!(strlen($_POST["password"])>6
and preg_match('/[A-Z]/',$_POST["password"])
and preg_match('/[0-9]/',$_POST["password"])
)){
$errors .= $invalidPassword;
}else{
$password = filter_var($_POST["password"], FILTER_SANITIZE_STRING);
if(empty($_POST["password2"])){
$errors .= $missingPassword2;
}else{
$password2 = filter_var($_POST["password2"], FILTER_SANITIZE_STRING);
if($password !== $password2){
$errors .= $differentPassword;
```

```php
}}}
//Get phone number
if(empty($_POST["phonenumber"])){
$errors .= $missingPhone;
}elseif(preg_match('/\D/',$_POST["phonenumber"])){
$errors .= $invalidPhoneNumber;
}else{
$phonenumber = filter_var($_POST["phonenumber"], FILTER_SANITIZE_STRING);
}
//Get gender
if(empty($_POST["gender"])){
$errors .= $missinggender;
}else{
$gender = $_POST["gender"];
}
//Get moreinformation
if(empty($_POST["moreinformation"])){
$errors .= $missinginformaton;
}else{
$moreinformation = filter_var($_POST["moreinformation"], FILTER_SANITIZE_STRING);
}
//If there are any errors print error
if($errors){
$resultMessage = '<div class="alert alert-danger">' . $errors .'</div>';
echo $resultMessage;
exit;
}
//no errors
//Prepare variables for the queries
$username = mysqli_real_escape_string($link, $username);
$email = mysqli_real_escape_string($link, $email);
$password = mysqli_real_escape_string($link, $password);
//$password = md5($password);
$password = hash('sha256', $password);
```

```php
//128 bits -> 32 characters
//256 bits -> 64 characters
//If username exists in the users table print error
$sql = "SELECT * FROM users WHERE username = '$username'";
$result = mysqli_query($link, $sql);
if(!$result){
echo '<div class="alert alert-danger">Error running the query!</div>';
//    echo '<div class="alert alert-danger">' . mysqli_error($link) . '</div>';
exit;
}
$results = mysqli_num_rows($result);
if($results){
echo '<div class="alert alert-danger">That username is already registered. Do you want to log in?</div>';  exit;
}
//If email exists in the users table print error
$sql = "SELECT * FROM users WHERE email = '$email'";
$result = mysqli_query($link, $sql);
if(!$result){
echo '<div class="alert alert-danger">Error running the query!</div>'; exit;
}
$results = mysqli_num_rows($result);
if($results){
echo '<div class="alert alert-danger">That email is already registered. Do you want to log in?</div>';  exit;
}
//Create a unique  activation code
$activationKey = bin2hex(openssl_random_pseudo_bytes(16));
//byte: unit of data = 8 bits
//bit: 0 or 1
//16 bytes = 16*8 = 128 bits
//(2*2*2*2)*2*2*2*2*...*2
//16*16*...*16
//32 characters
```

//Insert user details and activation code in the users table

```php
$sql = "INSERT INTO users (`username`, `email`, `password`, `activation`, `first_name`, `last_name`, `phonenumber`, `gender`, `moreinformation`) VALUES ('$username', '$email', '$password', '$activationKey', '$firstname', '$lastname', '$phonenumber', '$gender', '$moreinformation')";
$result = mysqli_query($link, $sql);
if(!$result){
echo '<div class="alert alert-danger">There was an error inserting the users details in the database!</div>';
exit;
}

//Send the user an email with a link to activate.php with their email and activation code
$message = "Please click on this link to activate your account:\n\n";
$message .= "http://carSharing.thecompletewebhosting.com/activate.php?email=" . urlencode($email) . "&key=$activationKey";
if(mail($email, 'Confirm your Registration', $message, 'From:'.'ashshgupta@gmail.com')){
echo "<div class='alert alert-success'>Thank for your registring! A confirmation email has been sent to $email. Please click on the activation link to activate your account.</div>";
}
?>
```

Code for Adding a Trip

```php
<?php
//start session and connect
session_start();
include('connection.php');
//define error messages
$missingdeparture = '<p><strong>Please enter your departure!</strong></p>';
$invaliddeparture = '<p><strong>Please enter a valid departure!</strong></p>';
$missingdestination = '<p><strong>Please enter your destination!</strong></p>';
$invaliddestination = '<p><strong>Please enter a valid destination!</strong></p>';
```

```php
$missingprice = '<p><strong>Please choose a price per seat!</strong></p>';
$invalidprice = '<p><strong>Please choose a valid price per seat using numbers only!!</strong></p>';
$missingseatsavailable = '<p><strong>Please select the number of available seats!</strong></p>';
$invalidseatsavailable = '<p><strong>The number of available seats should contain digits only!</strong></p>';
$missingfrequency = '<p><strong>Please select a frequency!</strong></p>';
$missingdays = '<p><strong>Please select at least one weekday!</strong></p>';
$missingdate = '<p><strong>Please choose a date for your trip!</strong></p>';
$missingtime = '<p><strong>Please choose a time for your trip!</strong></p>';

//Get inputs:
$departure = $_POST["departure"];
$destination = $_POST["destination"];
$price = $_POST["price"];
$seatsavailable = $_POST["seatsavailable"];
$regular = $_POST["regular"];
$date = $_POST["date"];
$time = $_POST["time"];
$monday = $_POST["monday"];
$tuesday = $_POST["tuesday"];
$wednesday = $_POST["wednesday"];
$thursday = $_POST["thursday"];
$friday = $_POST["friday"];
$saturday = $_POST["saturday"];
$sunday = $_POST["sunday"];
//check coordinates
if(!isset($_POST["departureLatitude"]) or !isset($_POST["departureLongitude"])){
$errors .= $invaliddeparture;
}else{
$departureLatitude = $_POST["departureLatitude"];
$departureLongitude = $_POST["departureLongitude"];
}
if(!isset($_POST["destinationLatitude"]) or !isset($_POST["destinationLongitude"])){
```

```php
$errors .= $invaliddestination;
}else{
$destinationLatitude = $_POST["destinationLatitude"];
$destinationLongitude = $_POST["destinationLongitude"];
}
//Check departure:
if(!$departure){
$errors .= $missingdeparture;
}else{
$departure = filter_var($departure, FILTER_SANITIZE_STRING);
}
//Check destination:
if(!$destination){
$errors .= $missingdestination;
}else{
$destination = filter_var($destination, FILTER_SANITIZE_STRING);
}
//Check Price
if(!$price){
$errors .= $missingprice;
}elseif(preg_match('/\D/', $price) // you can use ctype_digit($price)
){
$errors .= $invalidprice;
}else{
$price = filter_var($price, FILTER_SANITIZE_STRING);
}
//Check Seats Available
if(!$seatsavailable){
$errors .= $missingseatsavailable;
}elseif(preg_match('/\D/', $seatsavailable) // you can use ctype_digit($seatsavailable)
){
$errors .= $invalidseatsavailable;
}else{
$seatsavailable = filter_var($seatsavailable, FILTER_SANITIZE_STRING);
```

```php
}
//Check regular
if(!$regular){
$errors .= $missingfrequency;
}elseif($regular == "Y"){
if(!$monday && !$tuesday && !$wednesday && !$thursday && !$friday && !$saturday &&
!$sunday ){
$errors .= $missingdays;
}
if(!$time){
$errors .= $missingtime;
}
}elseif($regular == "N"){
if(!$date){
$errors.= $missingdate;
}
if(!$time){
$errors .= $missingtime;
}
}
//if there is an error print error message
if($errors){
$resultMessage = "<div class='alert alert-danger'>$errors</div>";
echo $resultMessage;
}else{
//no errors, prepare variables for the query
$tbl_name = 'carsharetrips';
$departure = mysqli_real_escape_string($link, $departure);
$destination = mysqli_real_escape_string($link, $destination);
if($regular == "Y"){
//query for a regular trip
$sql   =   "INSERT   INTO   $tbl_name   (`user_id`,`departure`,   `departureLongitude`,
`departureLatitude`,   `destination`,   `destinationLongitude`,   `destinationLatitude`,   `price`,
`seatsavailable`, `regular`, `monday`, `tuesday`, `wednesday`, `thursday`, `friday`, `saturday`,
```

```php
`sunday`,          `time`)          VALUES          ("'.$_SESSION['user_id']."'",
'$departure','$departureLongitude','$departureLatitude','$destination','$destinationLongitude','$destinationLatitude','$price','$seatsavailable','$regular','$monday','$tuesday','$wednesday','$thursday','$friday','$saturday','$sunday','$time')";
}else{
//query for a one off trip
$sql    =    "INSERT    INTO    $tbl_name    (`user_id`,`departure`,    `departureLongitude`,
`departureLatitude`,    `destination`,    `destinationLongitude`,    `destinationLatitude`,    `price`,
`seatsavailable`,    `regular`,    `date`,    `time`)    VALUES    ("'.$_SESSION['user_id']."'",
'$departure','$departureLongitude','$departureLatitude','$destination','$destinationLongitude','$destinationLatitude','$price','$seatsavailable','$regular','$date','$time')";
}
$results = mysqli_query($link, $sql);
//check if query is successful
if(!$results){
echo '<div class=" alert alert-danger">There was an error! The trip could not be added to database!</div>';
}
}

?>
```

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