A Major Project Report submitted to the Faculty of Computer Science and Engineering

in partial fulfillment of the requirements for the award of degree of

BACHELOR OF TECHNOLOGY

IN

COMPUTER SCIENCE AND ENGINEERING

Under the esteemed guidance of

Mrs. A. Lalitha Venkatesan

Associate Professor

By

Kavya Reddy. V (12R11A05E5)

Vaishnavi. V (12R11A05G7)

Department of Computer Science & Engineering

Geethanjali College of Engineering & Technology

Cheeryal(V), Keesara(M), RR Dt. , Hyderabad - 501301

(Jawaharlal Nehru Technological University Hyderabad – 500085

Telangana

2015-2016

Geethanjali College of Engineering and Technology

(Affiliated to JNTUH, Hyd., Approved by AICTE, Accredited to NBA)

Cheeryal(V), Keesara(M), R.R.Dist.-501 301.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

DECLARATION BY THE CANDIDATE

We, **Kavya Reddy. V** &**V. Vaishnavi,** bearing Roll Nos. **12R11A05E5, 12R11A05G7**, hereby declare that the project report entitled **"Travel Safe using Python"** is done under the guidance of **Mrs. A. LalithaVenkatesan**, **Associate Professor**, Department of Computer Science and Engineering, Geethanjali College of Engineering and Technology, is submitted in partial fulfilment of the requirements for the award of the degree of **Bachelor of Technology in Computer Science and Engineering**.

This is a record of bonafide work carried out by us in **Geethanjali College of Engineering and Technology** and the results embodied in this project have not been reproduced or copied from any source. The results embodied in this project report have not been submitted to any other University or Institute for the award of any other degree or diploma.

Kavya Reddy. V (12R11A05E5),

V. Vaishnavi (12R11A05G7),

Department of CSE,

Geethanjali College of Engg. And Tech.,

Cheeryal.

Geethanjali College of Engineering and Technology

(Affiliated to JNTUH, Hyd., Approved by AICTE, Accredited to NBA)

Cheeryal(V), Keesara(M), R.R.Dist.-501 301.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

CERTIFICATE

This is to certify that the project work entitled **"Travel Safe using Python"** carried out by Ms. **Kavya Reddy. V,** Ms. **V. Vaishnavi**, bearing Roll No(s). ***12R11A05E5, 12R11A05G7***, in partial fulfillment of the requirements for the award of the degree of Bachelor of Technology in Computer Science and Engineering is a record of bonafide work carried out by them under my guidance.

The results of investigations enclosed in this report have been verified and found satisfactory. The results embodied in this project report have not been submitted to any other University or Institute for the award of any other degree or diploma.

Signature of the Guide

Mrs. A. LalithaVenkatesan

Associate Professor, Department of Computer Science and Engineering

Signature of the HOD

Mr. Nagender Kumar

ABSTRACT

TRAVEL SAFE is an online web application that is developed on a goal to reduce the number of criminals and to ensure the safety of the traveller. This application is developed to mitigate the tension off the parents regarding their children having to travel alone. Here in this application, we have the facility of scanning the QR CODE of the vehicle taken by the user. The application decodes the scanned details and saves the driver and vehicle details in the user's profile. This helps in tracing the location of the victim easily using the number plate and other details. We even expose the driver details which will help the police to find the victim easily and sentence him. This will create a fear in the sinner and makes him think twice before committing to an offensive act. We even have an SOS function included in the application that can notify the user's friends when he/she is in danger. The message will be sent to all the friends added by the user. We have developed this application using python. None of the existing applications have the facility of scanning the QR CODES which makes this application different from the rest. We have provided an easy way to expose the details using a QR code scanner. We have also tried a different way for the logging in process. Instead of the regular login, we have provided the user and all his/her friends with the common password. Therefore, whenever a friend wants to check the scanned details of the user, he can login with his number and the common password that they share. This will directly redirect the friend to the page where the scanned details regarding the vehicle are available. This is our attempt towards reducing the crime rate and increasing the security for the users.

CONTENTS

1. INTRODUCTION

1.1. MOTIVATION

Know safety,no injury. No safety,know injury.Crime rate in India is increasing at an alarming rate. It has become difficult today to travel alone. We will always have our family, back at home, concerned about us until we reach the destination. To state few personal experiences, I was often chided by my group of friends for being “such a mom” about insisting that upon separating, everyone was expected to text a buddy (generally me) when they’d gotten home safe. People would forget or fall asleep and we had no plan if someone failed to text with an all-clear, aside from waiting or alerting a roommate. And whenever I have to go out alone, my parents will first try to look if we can find an alternative, when there is none, they will be worried about me having to travel alone. This was not just confined to me but to all my friends. So, we wanted a way out of this that would keep our parents tension-free and provide us safety. And then came TRAVEL SAFE. We came up with an idea of creating an application that can ensure our safety and keep our parents or friends in touch with us wherever we travel.

1.2. PROBLEM DEFINITION

Safety is one of the biggest concerns nowadays. Every day we come across at least one article in the newspaper about the missing cases taking place around the globe. We find families shattered on losing their beloved in such incidents. As the proverb says “Better a thousand times careful than once dead”, it is wise to be safe than regretting later. By looking at the last few crime incidents against women especially in the national capital, we cannot say that women are safe in India. Women generally feel frightened to go out alone. It is a very sad to wake up to the reality of the country that its citizens are living with fear all time. Personal safety of women has been the topic of importance for every Indian citizen. At the end of the day, the goals are simple: safety and security. So, we came up with an attempt to ensure safety of the

travellers and keep their friends and family updated with their journey information through TRAVEL SAFE.

1.3. OBJECTIVE OF THE PROJECT

Safety of women in India is a vast topic now-a-days. Despite of formation of various effective rules and regulations by the Indian government to handle and control the crimes against women, the number and frequency of crimes against them are increasing day by day. Women status in the country has been more offensive and dreadful in the last few years. It has decreased the confidence level in women for safety in their own country. Women are in doubtful condition for their safety and are afraid to go outside the house (office, market, etc.). We cannot completely blame the government because women safety is not the responsibility of government alone, it is the responsibility of each and every Indian citizen and hence we should take care of ourselves. You don't need to know all the alphabets of safety. The A, B, C, of it will save you if you follow it-Always Be Careful. TRAVEL SAFE is our attempt to ensure the safety of users while travelling. It is not only confined to women but also to children of all ages. Through this web application, family and friends of users will be updated with the location details. They will get to know immediately if their beloved is in danger with just a button click. This project believes in "Better to be safe now than to regret later"

2. LITERATURE SURVEY

2.1. INTRODUCTION

The Safety in India has always been a matter of grave concern. Since the past several centuries, the women of India were never given equal status and opportunities as compared to that of their male counterparts. The patriarchal nature of Indian society, which even though gives respect to women as they are our mothers and sisters, has greatly hampered both the independence as well as the safety of women.

Times have changed but the mentality still prevails in the mind-sets of several narrow minded Indians.The recent incident in which a 23 year old paramedical student was gang-raped by 6 men inside a moving bus near a posh Delhi locality has undoubtedly shocked the nation to its core.

Although it was a most heinous case of cruelty, it is ironical to note that such incidents are not actually rare in our country. There are several such cases happening every day.The existing laws have proved to be inefficient in ensuring swift justice and appropriate punishment to the guilty. As the proverb goes “Do not depend on others for Safety- Help yourself”, we need to take care of ourselves and keep the criminals at bay to ensure our safety.

Here is such an application which will help us in achieving the target.

2.2. EXISTING SYSTEM

There are a few applications to ensure safety of the user which will alert their friends on them being in danger, but none gives the details of the transport that the user has taken which will make the tracing process difficult. Even if the location is traced by the police, these applications do not provide any details of the sinner and hence he is not brought under limelight. Due to this fact he tries to escape with ease and has no fear of punishment and hence continues to do such crimes. This will not stop the

growing crime rate. The sinner has to have a fear of punishment which will make him think twice before committing such acts. We through TRAVEL SAFE bring to you a way to alert the sinner that he will be put in limelight if he tries to do any offensive act. This will make him aware of the future consequences. This is our attempt to reduce the crime rates and to ensure the safety of the travellers.

2.3. DISADVANTAGES OF EXISTING SYSTEM

The existing safety applications do not help in tracing the location of the victim as they do not provide the location details or the vehicle details. Tracing the location based on just the victim's phone number will be difficult as the sinner can throw away the victim's phone and take them to a remoted location. In this situation having to know the vehicle number will be very useful which the existing systems fail to provide. Also these applications do not expose any details of the criminal and due to this, it will take years to find out the criminal and sentence him and with this benefit he tries to escape with ease and continues to perform such offensive acts. These applications do not aim at reducing the crime rates. We have to make the criminals aware that he can be in great danger on trying to perform such acts and this will make him think before doing anything wrong. This will have the scope to reduce the growing number of sinners. None of the existing applications have the function of scanning the QR CODE of the vehicle they are travelling.

2.4. PROPOSED SYSTEM

TRAVEL SAFE is an online web application that is developed on a goal to reduce the number of criminals and to ensure the safety of the traveller. This application is developed to mitigate the tension off the parents regarding their children having to travel alone. Here in this application, we have the facility of scanning the QR CODE of the vehicle taken by the user. The application decodes the scanned details and saves the driver and vehicle details in the user's profile. This helps in tracing the location of the victim easily using the number plate and other details. We even expose the driver details which will help the police to find the victim easily and sentence him. This will create a fear in the sinner and makes him think twice before committing to an offensive act. We even have an SOS function included in the application that can

notify the user’s friends when he/she is in danger. The message will be sent to all the friends added by the user. We have developed this application using python. None of the existing applications have the facility of scanning the QR CODES which makes this application different from the rest. We have provided an easy way to expose the details using a QR code scanner. We have also tried a different way for the logging in process. Instead of the regular login, we have provided the user and all his/her friends with the common password. Therefore, whenever a friend wants to check the scanned details of the user, he can login with his number and the common password that they share. This will directly redirect the friend to the page where the scanned details regarding the vehicle are available. This is our attempt towards reducing the crime rate and increasing the security for the users.

3. ANALYSIS

3.1. INTRODUCTION

TRAVEL SAFE is an online web application. The two important functionalities of this application are:

- Scanning the QR CODE
- Sending the SOS message

The other functionalities include:

- Adding friends with a common password
- Changing the passwords
- Map that points the current location and gives latitude and longitude positions

The user is asked to scan the QR CODE as soon as he enters the cab. The QR CODE is decoded and the vehicle and driver details like number plate, driver name, phone number are stored in the database. Whenever a user feels suspicious, he/she can click on the SOS button to alert their friends. A message will be sent to the friends saying that the user is in danger. The message also includes the current latitude and longitude positions of the user to make the tracing process easy. When a friend receives this message, he can log into the account using his mobile number and the common password they share and can view the recently scanned vehicle details which contains all the vehicle information that the user has taken. This makes it easy to trace the victim's location and rescue them.

3.2. SOFTWARE REQUIREMENT SPECIFICATION

A software requirements specification (SRS) is a description of a software system to be developed. It lays out functional and non-functional requirements, and may include a set of use cases that describe user interactions that the software must provide.

Software requirements specification establishes the basis for an agreement between customers and contractors or suppliers (in market-driven projects, these roles may be played by the marketing and development divisions) on what the software product is to do as well as what it is not expected to do. Software requirements specification

permits a rigorous assessment of requirements before design can begin and reduces later redesign. It should also provide a realistic basis for estimating product costs, risks, and schedules.

The software requirements specification document enlists enough and necessary requirements that are required for the project development. To derive the requirements we need to have clear and thorough understanding of the products to be developed or being developed. This is achieved and refined with detailed and continuous communications with the project team and customer till the completion of the software.

The SRS may be one of a contract deliverable Data Item Descriptions or have other forms of organizationally-mandated content.

Goals of SRS:

The Software Requirements Specification (SRS) is a communication tool between stakeholders and software designers. The specific goals of the SRS are:

- Facilitating reviews
- Describing the scope of work
- Providing a reference to software designers (i.e. navigation aids, document structure)
- Providing a framework for testing primary and secondary use cases
- Linking features to customer requirements
- Providing a platform for ongoing refinement (via incomplete specs or questions)

3.2.1. Functional Requirements:

A functional requirement defines a function of a system or its component. A function is described as a set of inputs, the behavior, and outputs.

In this application, uploading of QR CODE and sending SOS message forms the basic functional requirements. The user has to upload the QR CODE and the application will scan and decode the qr code for you. It will then save the decoded

details into the database for future reference. Regarding the SOS thing, a message has to be sent to the mobile phone of registered friends when a button is clicked.

3.2.2. Non-Functional Requirements:

In systems engineering and requirements engineering, a non-functional requirement is a requirement that specifies criteria that can be used to judge the operation of a system, rather than specific behaviors. They are contrasted with functional requirements that define specific behavior or functions.

In our “Travel Safe”, the application must be able to display all the scanned details and added friends when viewed by the user. This forms the non-functional requirement of our project. When the user logs in and checks for his recent scans, the database will show all the scanned details showing the recently scanned vehicle details at the top. It also shows the list of added friends in an order. This updation is done by the database. The application will work under proper network connection.

3.3. USER REQUIREMENT

“Better to be safe than sorry” is a popular proverb that everyone knows. Users require applications that will ensure their safety with an ease without having to take much difficulty. Travel Safe is such an application that provides security to the users with minimal effort from them. All they have to do is to scan the QR Code as soon as they enter a cab and click on a button when they are suspicious about the driver.

Once the user scans the QR code, it will be decoded and the vehicle details will be uploaded into the database. This makes the tracking process easy for the police. The main objective of this project is to store the vehicle details beforehand which will aware the driver that his details are being stored. This may give us a chance to decrease the crime rates to some extent. This application also gives the user a facility to notify their friends when they are in danger through an SOS message. Travel Safe can be run in any browser on a PC, laptop or a mobile phone which has internet connection.

3.4. SOFTWARE REQUIREMENT

A software requirements specification (SRS) is a description of asoftware system to be developed. It lays out functional and non-functional requirements, and may include a set of use cases that describe user interactions that the software must provide.

The front-end of the project is designed using CSS, JS, HTML and the back-end is programmed using FLASK- a micro framework of python.

3.5. HARDWARE REQUIREMENT:

The most common set of requirements defined by any operating system or software application is the physical computer resources, also known as hardware, A hardware requirements list is often accompanied by a hardware compatibility list (HCL), especially in case of operating systems. An HCL lists tested, compatible, and sometimes incompatible hardware devices for a particular operating system or application. The following sub-sections discuss the various aspects of hardware requirements.

3.5.1. Operating System:

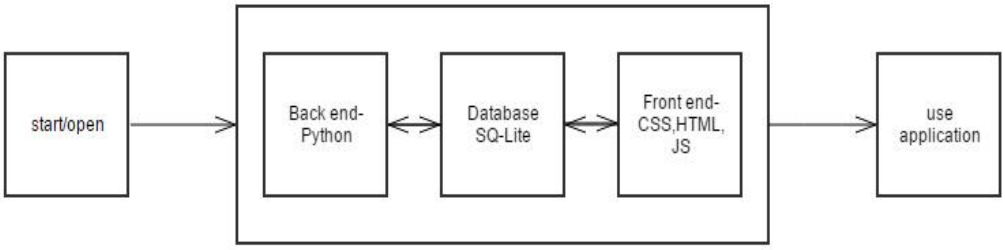
All computer operating systems are designed for a particular computer architecture. Most software applications are limited to particular operating systems running on particular architectures. Although architecture-independent operating systems and applications exist, most need to be recompiled to run on a new architecture. See also a list of common operating systems and their supporting architectures.Travel Safe requires an Operating System of windows 7 or above.

3.5.2. Memory:

All software, when run, resides in the random access memory (RAM) of a computer. Memory requirements are defined after considering demands of the application, operating system, supporting software and files, and other running processes. Optimal performance of other unrelated software running on a multi-tasking computer system is also considered when defining this requirement. Travel Safe requires a minimum of 1GB RAM.

3.6. CONTEXT DIAGRAM OF THE PROJECT:

A system context diagram (SCD) in software engineering and systems engineering is a diagram that defines the boundary between the system, or part of a system, and its environment, showing the entities that interact with it. This diagram is a high level view of a system.



System architecture of “Travel Safe with Python” has a front end displayed using CSS, JS, and HTML. Flask framework of Python is used for coding the functionality of this application. The combination of both results in this application with effective designing and coding.

3.7. ALGORITHMS AND FLOWCHARTS

3.7.1. ALGORITHM:

Step: 1. Start

Step: 2. Open the application in web browser.

Step: 3. Sign Up if you are a new user.

Step: 4. Log in with the correct credentials.

Step: 5. Upload the QR CODE as you enter the cab.

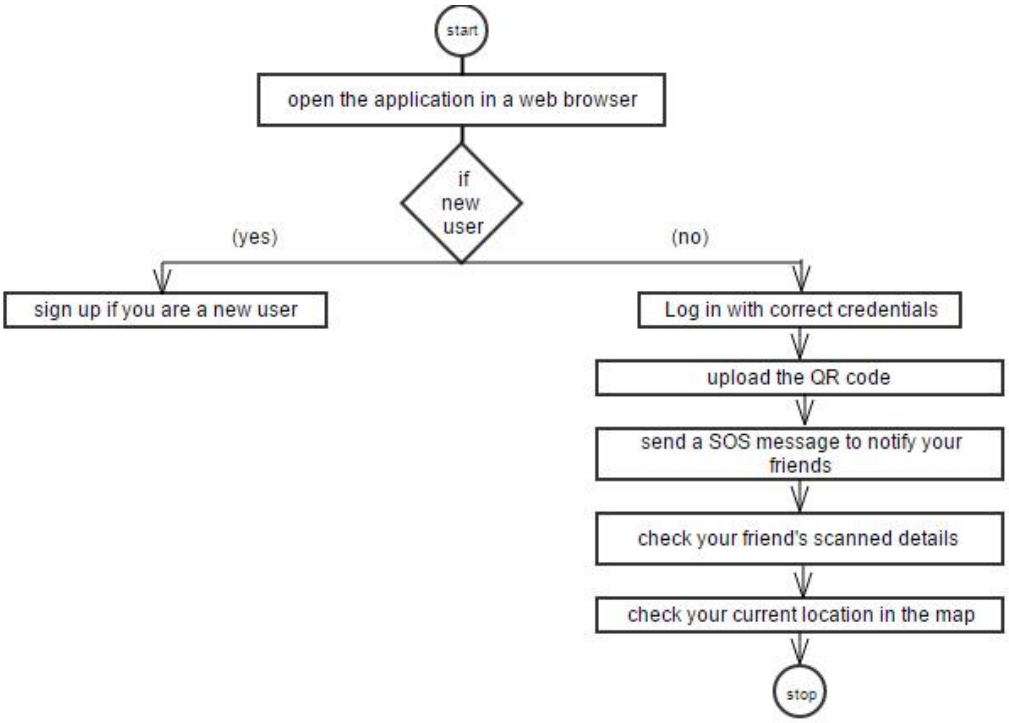
Step: 6. Send an SOS message to notify your friends when you are suspicious about the driver.

Step: 7. Check your friend’s scanned details to keep an account of the vehicle details they are using.

Step: 8. Check your current location in the map.

Step: 9. Stop

3.7.2. FLOWCHART:



4. DESIGN

4.1. INTRODUCTION:

The unified modeling is a standard language for specifying, visualizing, constructing and documenting the system and its components is a graphical language which provides a vocabulary and set of semantics and rules. The UML focuses on the conceptual and physical representation of the system. It captures the decisions and understandings about systems that must be constructed. It is used to understand, design, configure and control information about the systems. Depending on the development culture, some of these artifacts are treated more or less formally than others. Such artifacts are not only the deliverables of a project but also critical in controlling, measuring, and communicating about a system during its development and after its deployment. The UML addresses the documentation of a system's architecture and all of its details. The UML also provides a language for expressing requirements and for tests. Finally, the UML provides a language for modeling the activities of project planning and release management.

4.2. DFD, ER AND UML DIAGRAMS:

4.2.1. DATA FLOW DIAGRAM:

A data flow diagram (DFD) is a graphical representation of the "flow" of data through an information system, modelling its *process* aspects. A DFD is often used as a preliminary step to create an overview of the system, which can later be elaborated. DFDs can also be used for the visualization of data processing (structured design).

A DFD shows what kind of information will be input to and output from the system, where the data will come from and go to, and where the data will be stored. It does not show information about the timing of process or information about whether processes will operate in sequence or in parallel (which is shown on a flowchart).

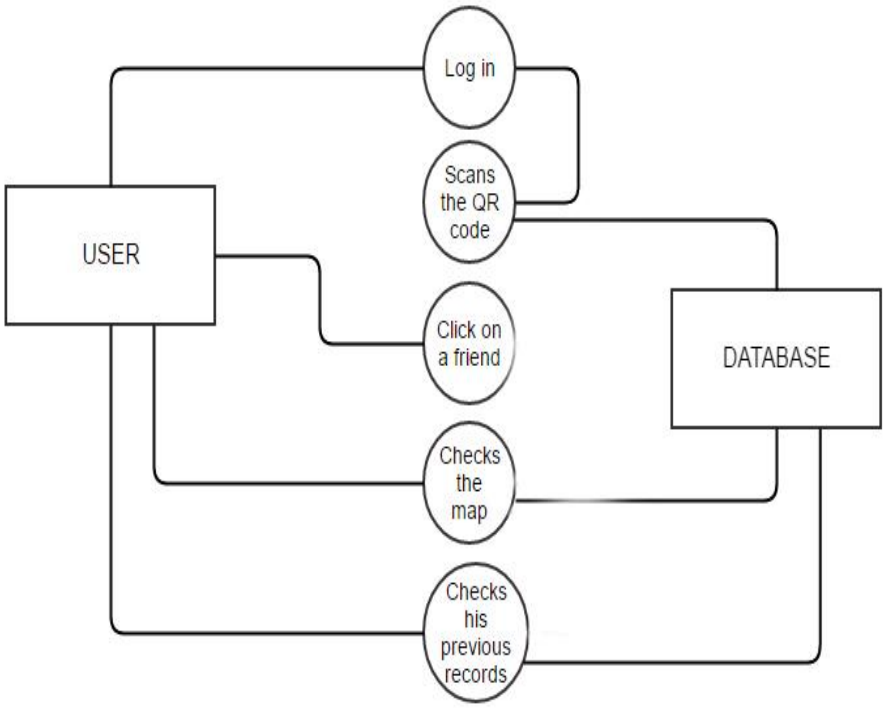


Figure 4.2. 1

4.2.2. ER DIAGRAM:

An Entity Relationship Diagram (ERD) is a visual representation of different data using conventions that describe how these data are related to each other. For example, the elements writer, novel, and consumer may be described using ER diagrams this way: ER diagram with basic objects.

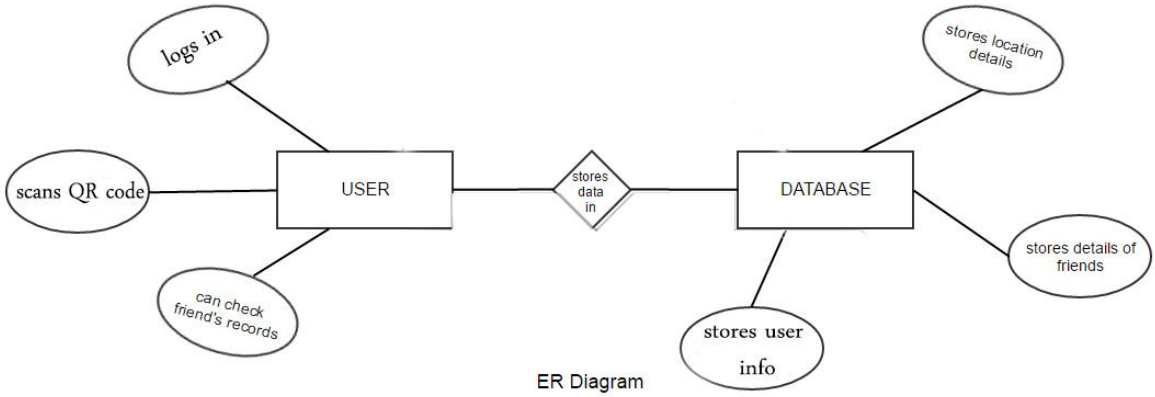


Figure 4.2. 2

4.2.3. UML DIAGRAMS:

4.2.3.1. CLASS DIAGRAM:

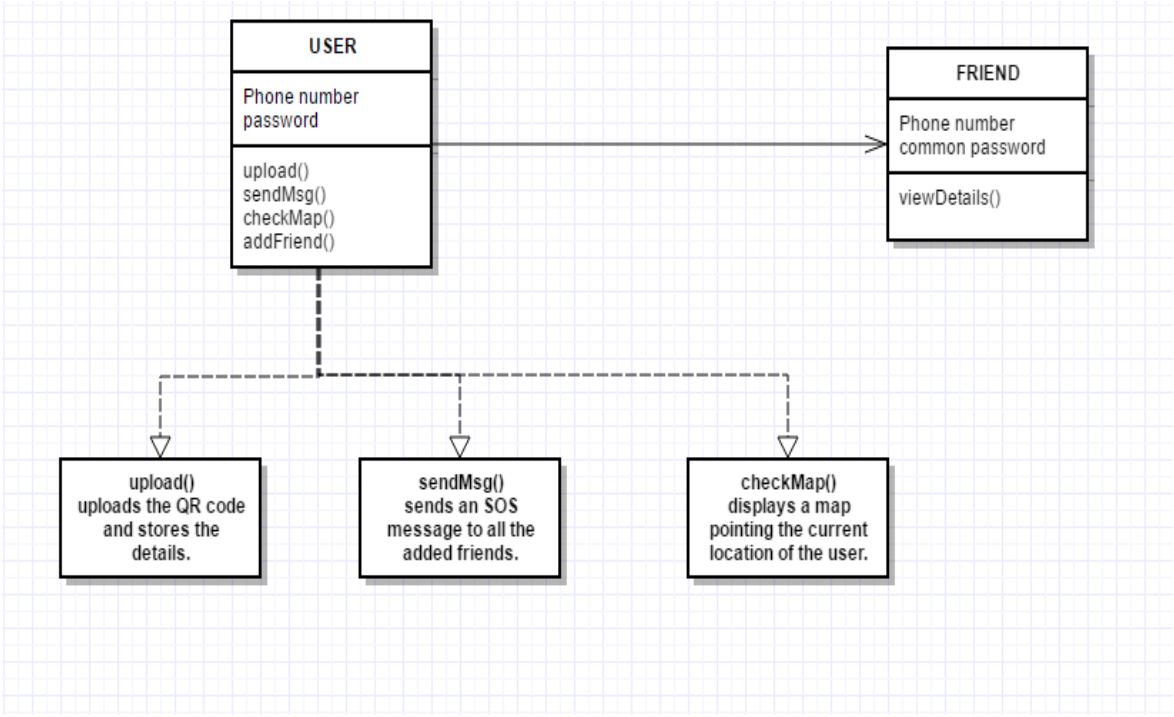


Figure 4.2.3.1

4.2.3.2. USE CASE DIAGRAM:

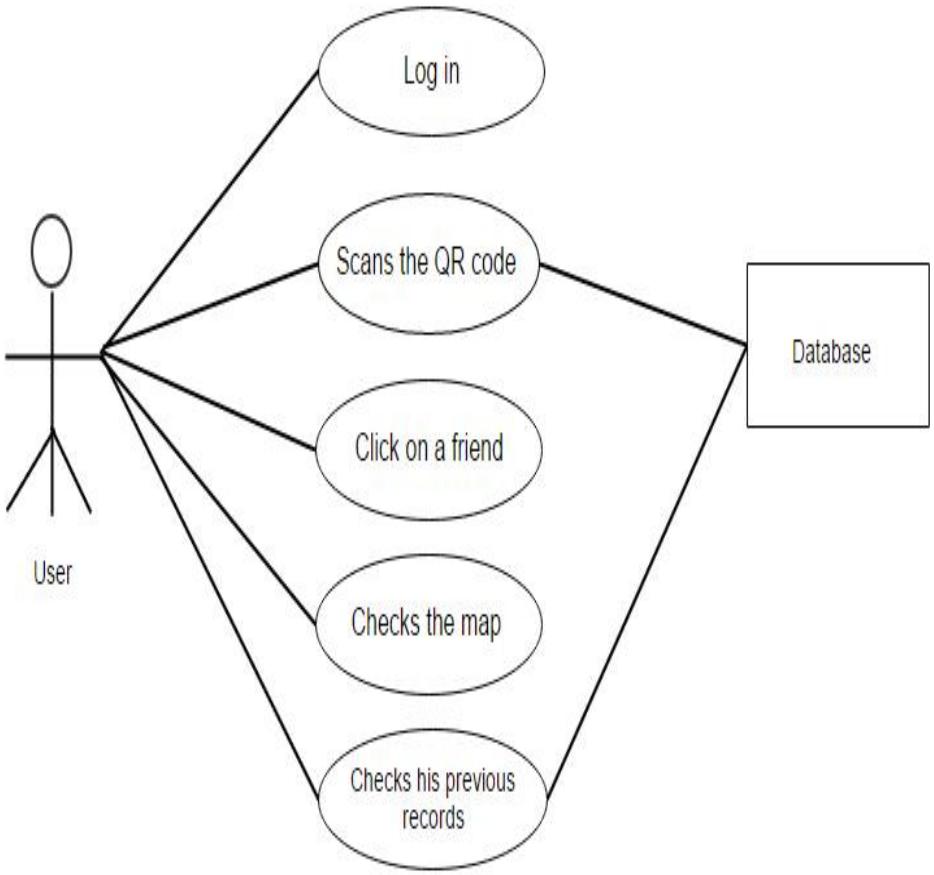


Figure 4.2.3.2

4.2.3.3. SEQUENCE DIAGRAM:

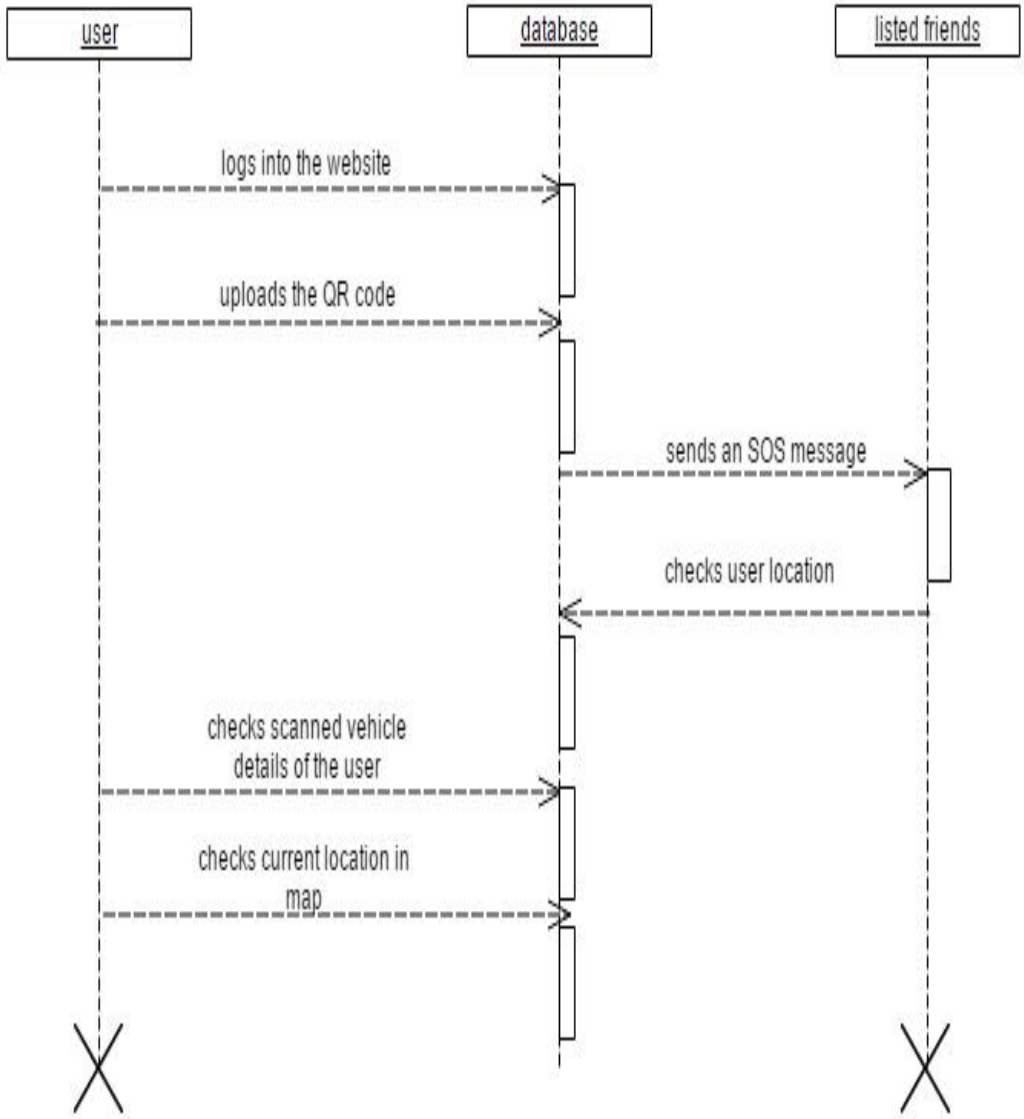


Figure 4.2.3.3

4.2.3.4. ACTIVITY DIAGRAM:

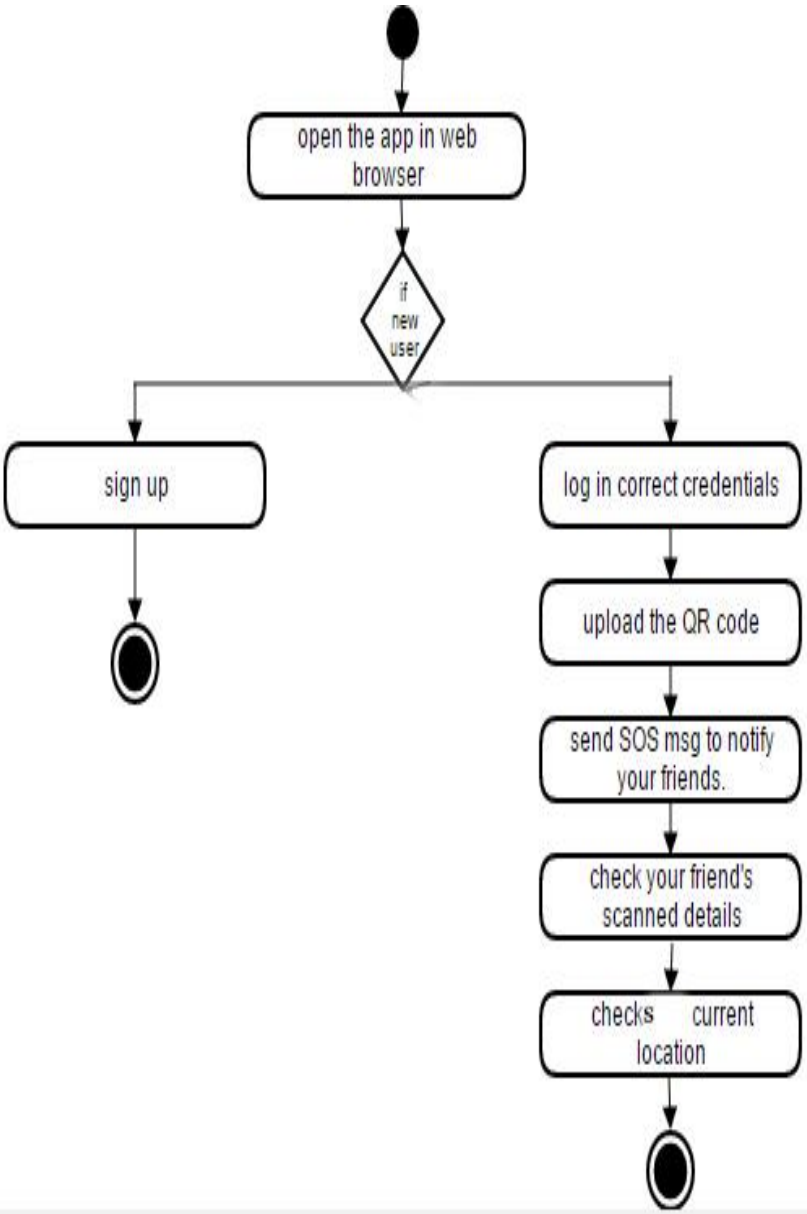


Figure 4.2.3.4

4.2.3.5. DATABASE DIAGRAMS:

4.2.3.5.1. Database Structure:

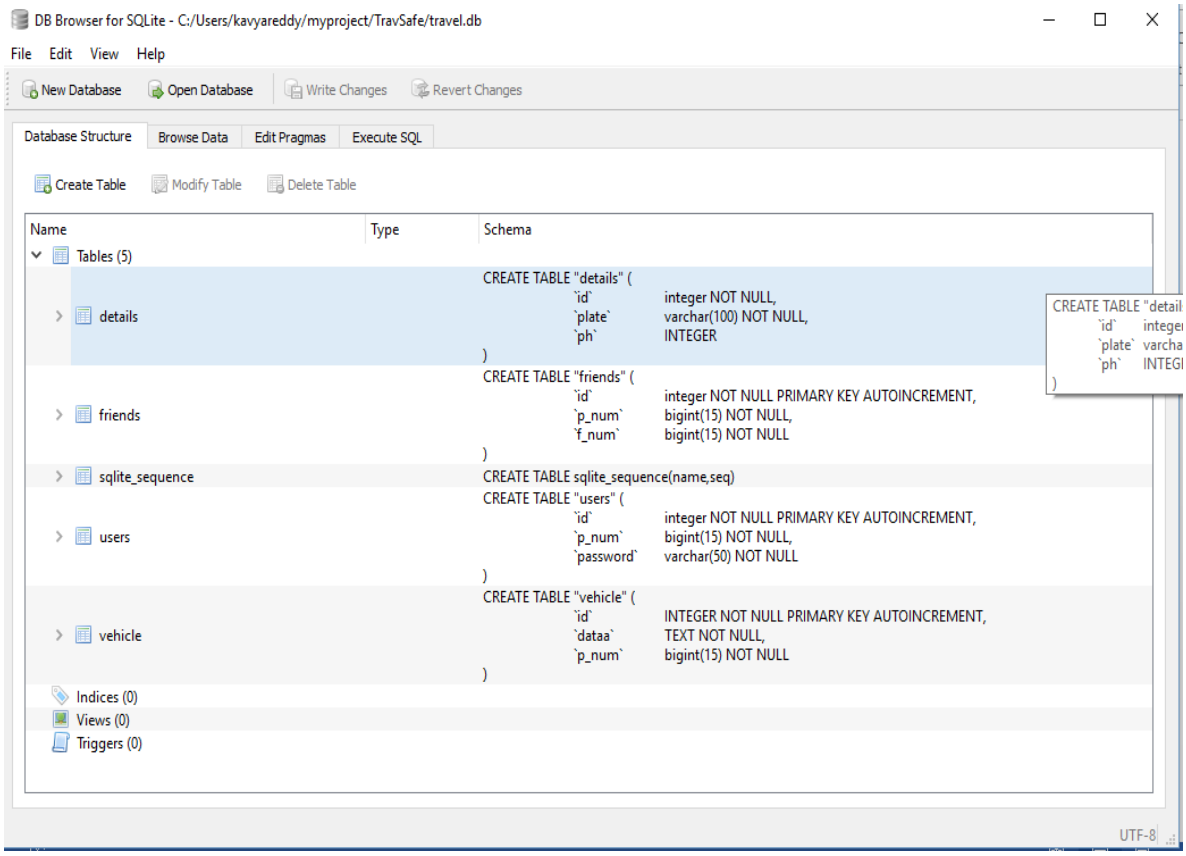


Figure 4.2.3.5.1

4.2.3.5.2. Users Table:

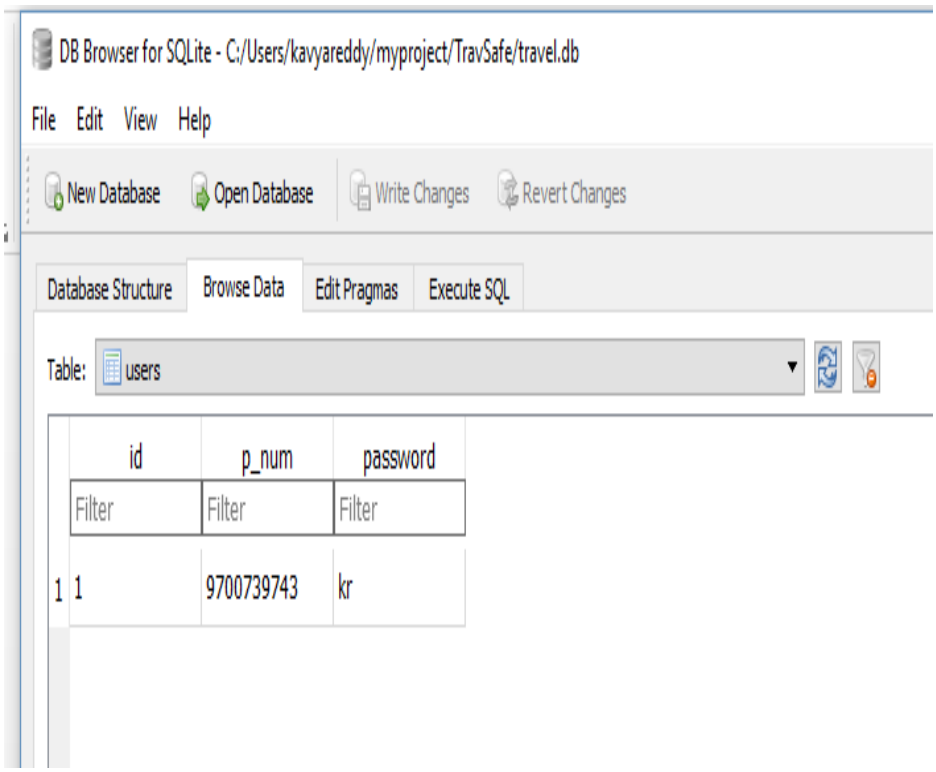


Figure 4.2.3.5.2.

4.2.3.5.3. Vehicle Details:

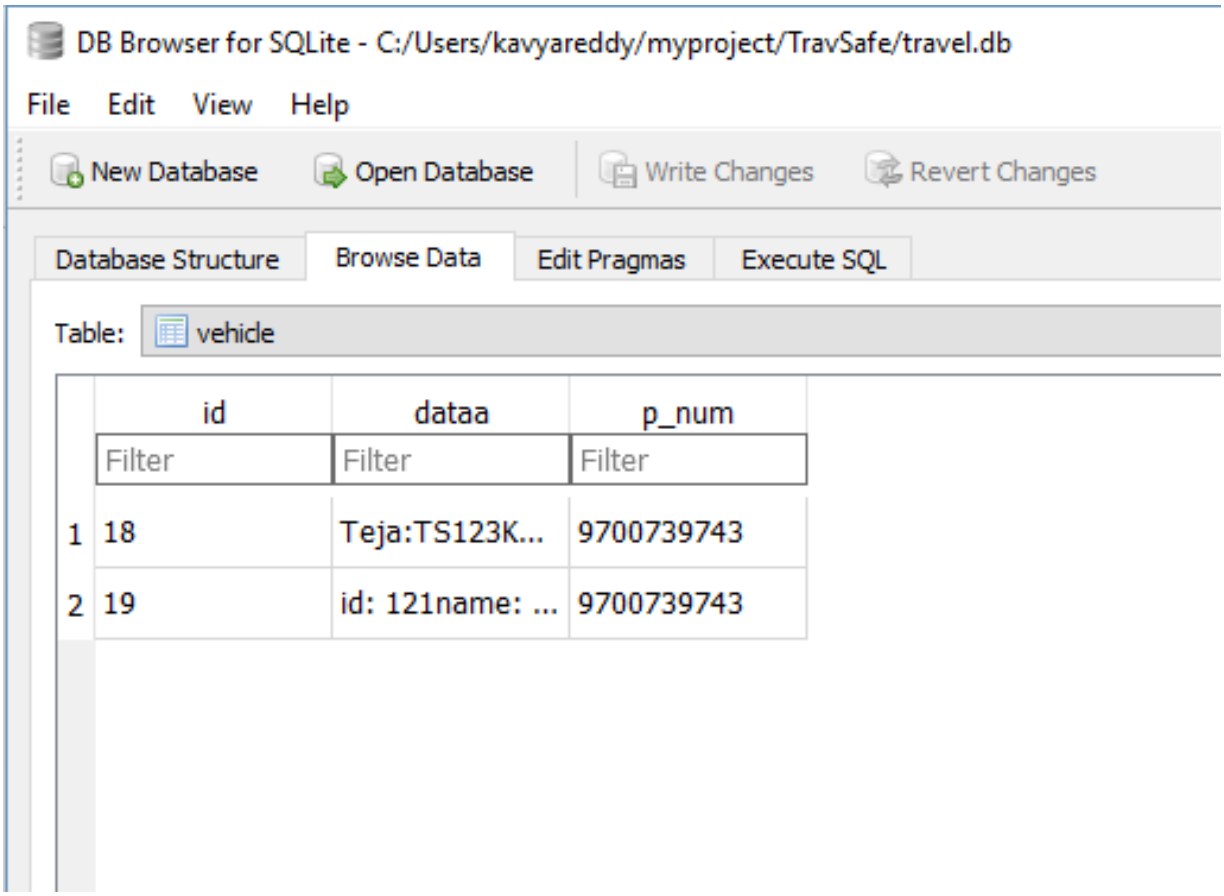


Figure 4.2.3.5.3.

4.2.3.5.4. Friends details:

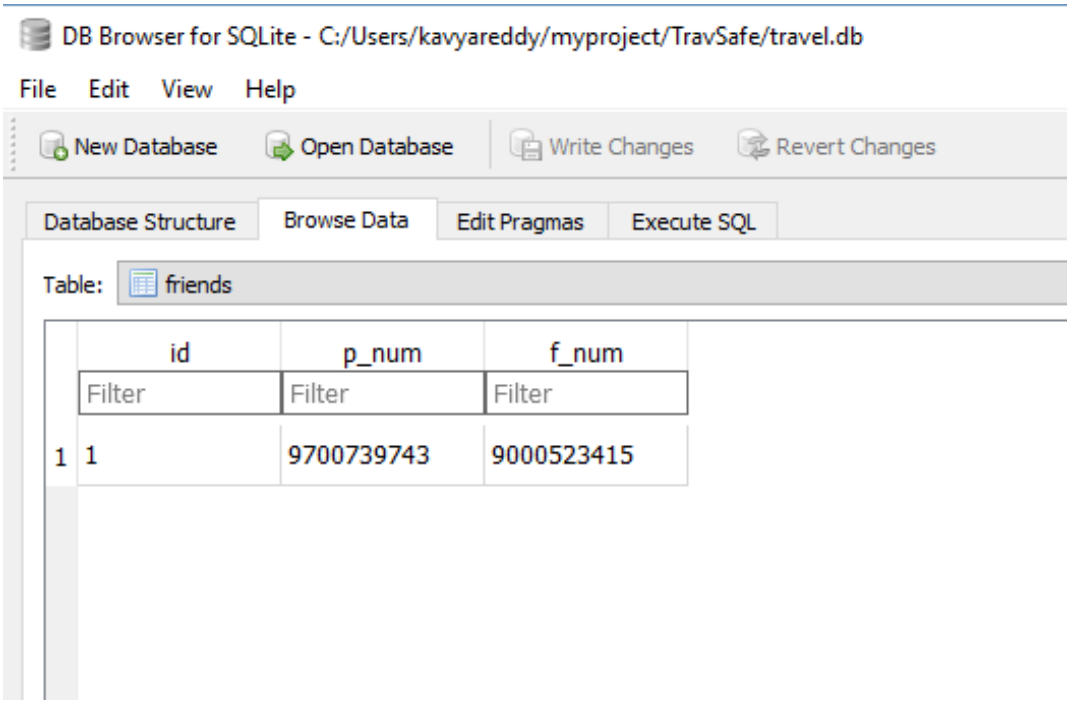


Figure 4.2.3.5.4.

4.3. MODULE DESIGN AND ORGANIZATION:

The modules included in Travel Safe are:

- Adding Friends
- Uploading QR CODE
- View Friends
- Checking your current location in the map
- Sending SOS message.

The user is allowed to select his friends who can view his scanned details by adding them into his profile by sharing his password. Once he uploads the QR CODE, the scanned details will be visible to him and his friends. When the user feels suspicious about his travel, he can notify his friends by sending a message which includes current latitude and longitude positions of the user.

5. IMPLEMENTATION AND RESULTS:

5.1. INTRODUCTION:

Implementation is the carrying out, execution, or practice of a plan, a method, or any design, idea, model, specification, standard or policy for doing something. As such, implementation is the action that must follow any preliminary thinking in order for something to actually happen.

5.2. EXPLANATION OF KEY FUNCTIONS:

There are two most important functions in this application:

- Scanning the QR code of the cab
- Sending an SOS message

Scanning the QR CODE: The user is required to scan the qr code of the vehicle he is travelling. Our application will decode it and reveal the driver and vehicle details. The coding of this function is done using the QR tools available in Python. These scanned details are stored into the database. The user and his friends can view these details whenever required. This keeps a track of all the vehicles used and stores the driver details too.

Sending an SOS message: Whenever the user feels suspicious about the driver, he can send an SOS message and notify his friends that he is in danger. The message contains a note and the current latitude and longitude positions of the user. This makes the tracking process simple. We have designed the message functionality using way2sms. Whenever a user clicks the SOS button, a message will be sent from his way2sms account and therefore no charges will be applied for sending the message.

There are other functions also in this application which includes changing the passwords, viewing the current location in the map, adding friends, viewing friends. We have included a different log in credentials in this application to make our application different from others. The user and his friends will have the same password and hence when a friend wants to check the user’s vehicle details, he will have to login with his mobile number and the common password they share. This will redirect the friend to the page where he can view the scanned details.

5.3. METHOD OF IMPLEMENTATION:

Travel Safe was implemented using many programming languages. The front-end was designed using CSS, JS, and HTML. The back-end was designed using Python with the help of SQLITE database.

5.3.1. CASCADING STYLE SHEETS:

Cascading Style Sheets (CSS) is a style sheet language used for describing the presentation of a document written in a markup language. Although most often used to set the visual style of web pages and user interfaces written in HTML and XHTML, the language can be applied to any XML document, including plain XML, SVG and XUL, and is applicable to rendering in speech, or on other media. Along with HTML and JavaScript, CSS is a cornerstone technology used by most websites to create visually engaging webpages, user interfaces for web applications, and user interfaces for many mobile applications.

CSS is designed primarily to enable the separation of document content from document presentation, including aspects such as the layout, colors, and fonts. This separation can improve content accessibility, provide more flexibility and control in the specification of presentation characteristics, enable multiple HTML pages to share formatting by specifying the relevant CSS in a separate .css file, and reduce complexity and repetition in the structural content.

5.3.2. JAVA SCRIPT:

JavaScript ("JS" for short) is a full-fledged dynamic programming language that, when applied to an HTML document, can provide dynamic interactivity on websites. It was invented by Brendan Eich, co-founder of the Mozilla project, the Mozilla Foundation, and the Mozilla Corporation. JavaScript is a high-level, dynamic, untyped, and interpreted programming language. It has been standardized in the ECMAScriptlanguage specification. Alongside HTML and CSS, it is one of the three essential technologies of World Wide Web content production; the majority of websites employ it and it is supported by all modern Web browsers without plug-ins. JavaScript is prototype-based with first-class functions, making it a multi-paradigm language, supporting object-oriented, imperative, and functional programming styles. It has an API for working with text, arrays, dates

and regular expressions, but does not include any I/O, such as networking, storage, or graphics facilities, relying for these upon the host environment in which it is embedded.

5.3.3. HYPERTEXT MARKUP LANGUAGE:

HyperTextMarkup Language, commonly referred to as HTML, is the standard markup language used to create web pages. Along with CSS, and JavaScript, HTML is a cornerstone technology used to create web pages as well as to create user interfaces for mobile and web applications. Web browsers can read HTML files and render them into visible or audible web pages. HTML describes the structure of a website semantically and, before the advent of Cascading Style Sheets (CSS), included cues for the presentation or appearance of the document (web page), making it a markup language, rather than a programming language.

5.3.4. PYTHON

Python is a widely used high-level, general-purpose, interpreted, dynamic programming language. Its design philosophy emphasizes code readability, and its syntax allows programmers to express concepts in fewer lines of code than would be possible in languages such as C++ or Java. The language provides constructs intended to enable clear programs on both a small and large scale.

Python supports multiple programming paradigms, including object-oriented, imperative and functional programming or procedural styles. It features a dynamic type system and automatic memory management and has a large and comprehensive standard library.

The design of Python offers some support for functional programming in the Lisp tradition. The language has map(), reduce() and filter() functions; comprehensions for lists, dictionaries, and sets; and generator expressions. The standard library has two modules (itertools and functools) that implement functional tools borrowed from Haskell and Standard ML.

Python is intended to be a highly readable language. It is designed to have an uncluttered visual layout, frequently using English keywords where other languages use punctuation. Furthermore, Python has a smaller number of syntactic exceptions and special cases than C or Pascal.

Python uses whitespace indentation, rather than curly braces or keywords, to delimit blocks; this feature is also termed the off-side rule.

Flask is a micro web framework written in Python and based on the Werkzeug toolkit and Jinja2 template engine. It is BSD licensed. Examples of applications that make use of the Flask framework are Pinterest, LinkedIn, as well as the community web page for Flask itself. Flask is called a micro framework because it does not presume or force a developer to use a particular tool or library. It has no database abstraction layer, form validation, or any other components where pre-existing third-party libraries provide common functions. However, Flask supports extensions that can add application features as if they were implemented in Flask itself. Extensions exist for object-relational mappers, form validation, upload handling, various open authentication technologies and several common framework related tools. Extensions are updated far more regularly than the core Flask program.

5.3.5. SQLITE:

SQLite is a relational database management system contained in a C programming library. In contrast to many other database management systems, SQLite is not a client–server database engine. Rather, it is embedded into the end program.

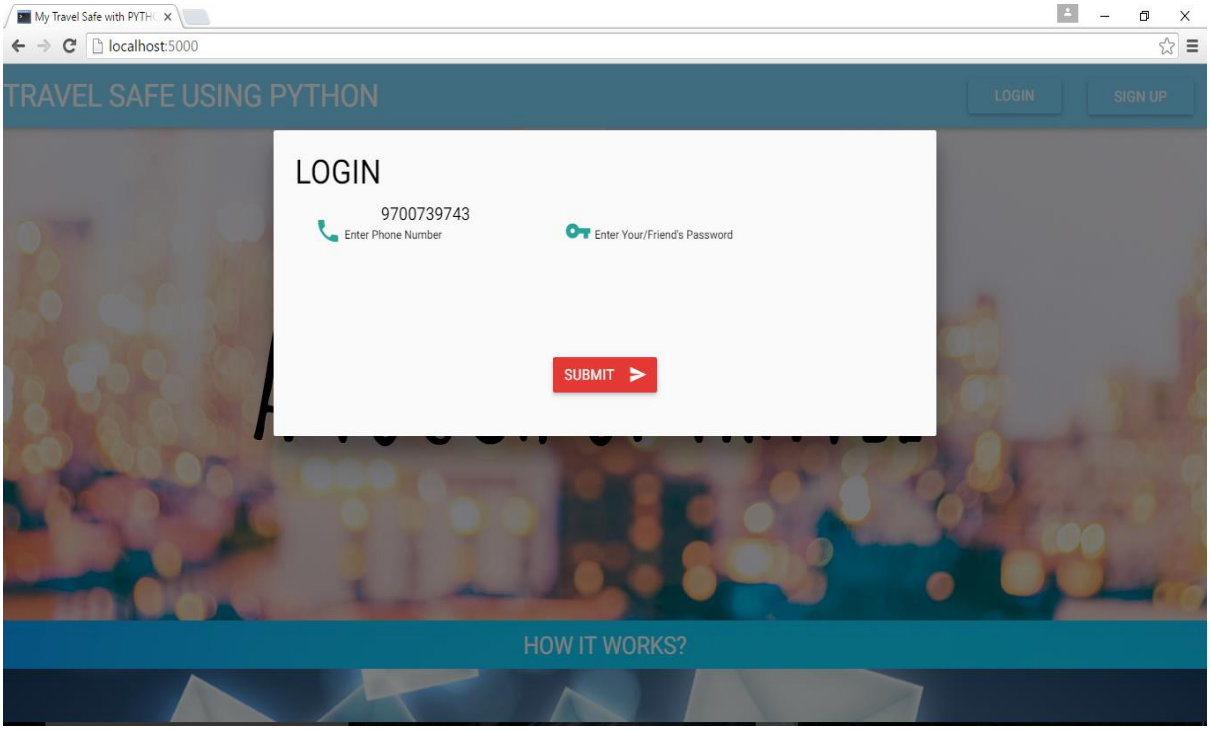
SQLite is ACID-compliant and implements most of the SQL standard, using a dynamically and weakly typed SQL syntax that does not guarantee the domain integrity.

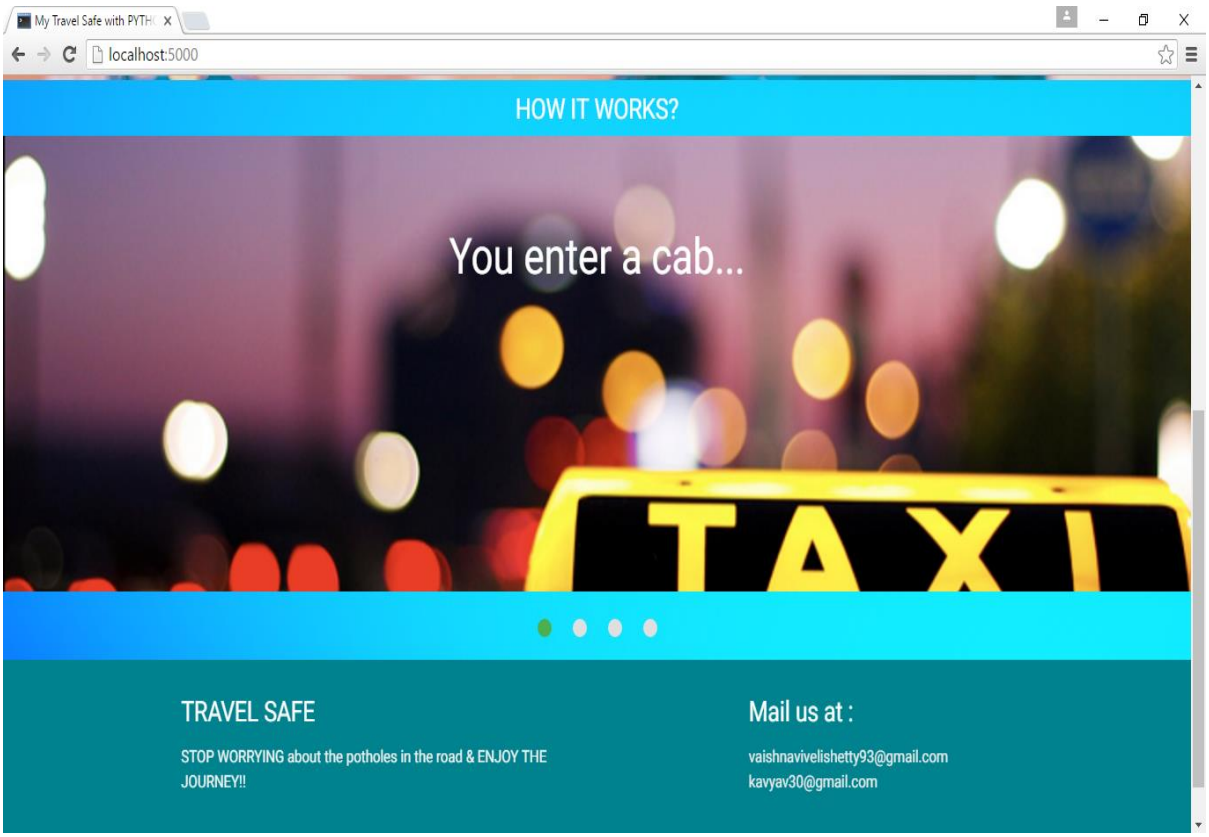
SQLite is a popular choice as embedded database software for local/client storage in application software such as web browsers. It is arguably the most widely deployed database engine, as it is used today by several widespread browsers, operating systems, and embedded systems, among others. SQLite has bindings to many programming languages. Unlike client–server database management systems, the SQLite engine has no standalone processes with which the application program communicates. Instead, the SQLite library is linked in and thus becomes an integral part of the application program. The library can also be called dynamically. The application program uses SQLite's functionality through simple function calls, which reduce latency in database access: function calls within a single process are more efficient than inter-process communication. SQLite stores the

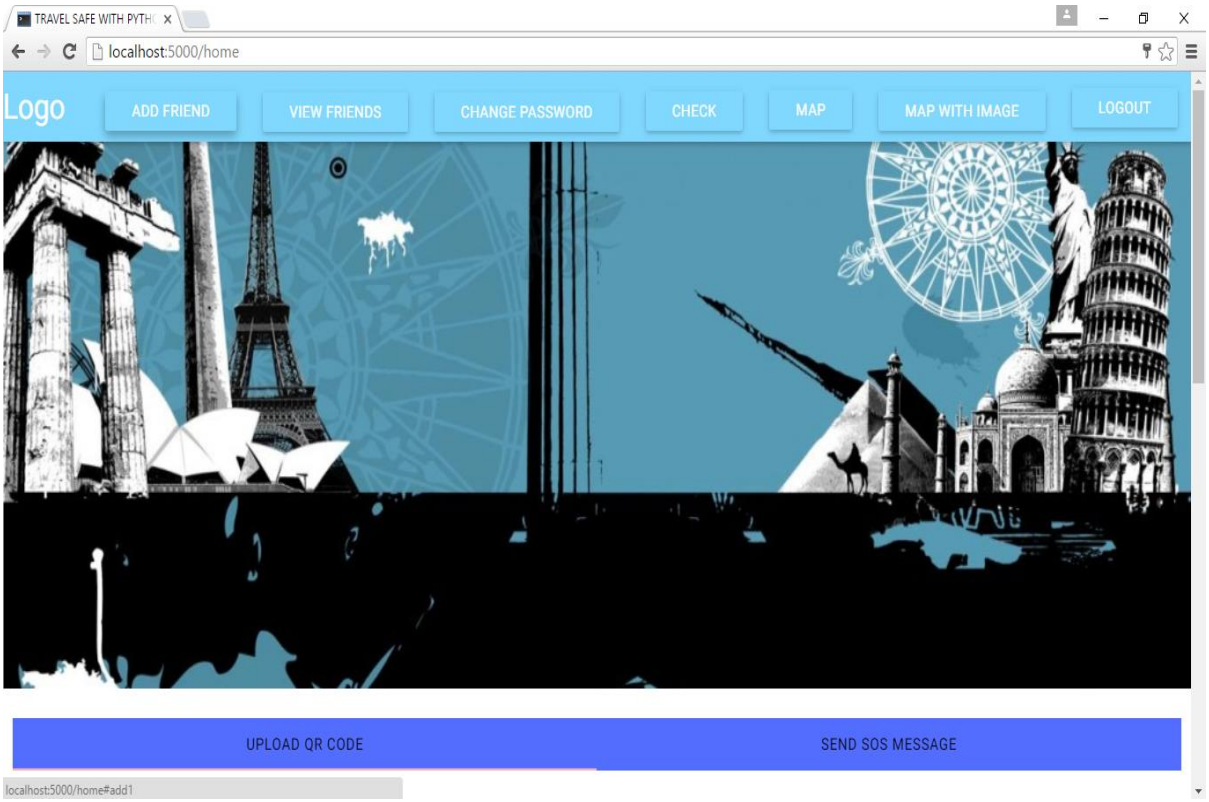
entire database (definitions, tables, indices, and the data itself) as a single cross-platform file on a host machine. It implements this simple design by locking the entire database file during writing. SQLite read operations can be multitasked, though writes can only be performed sequentially.

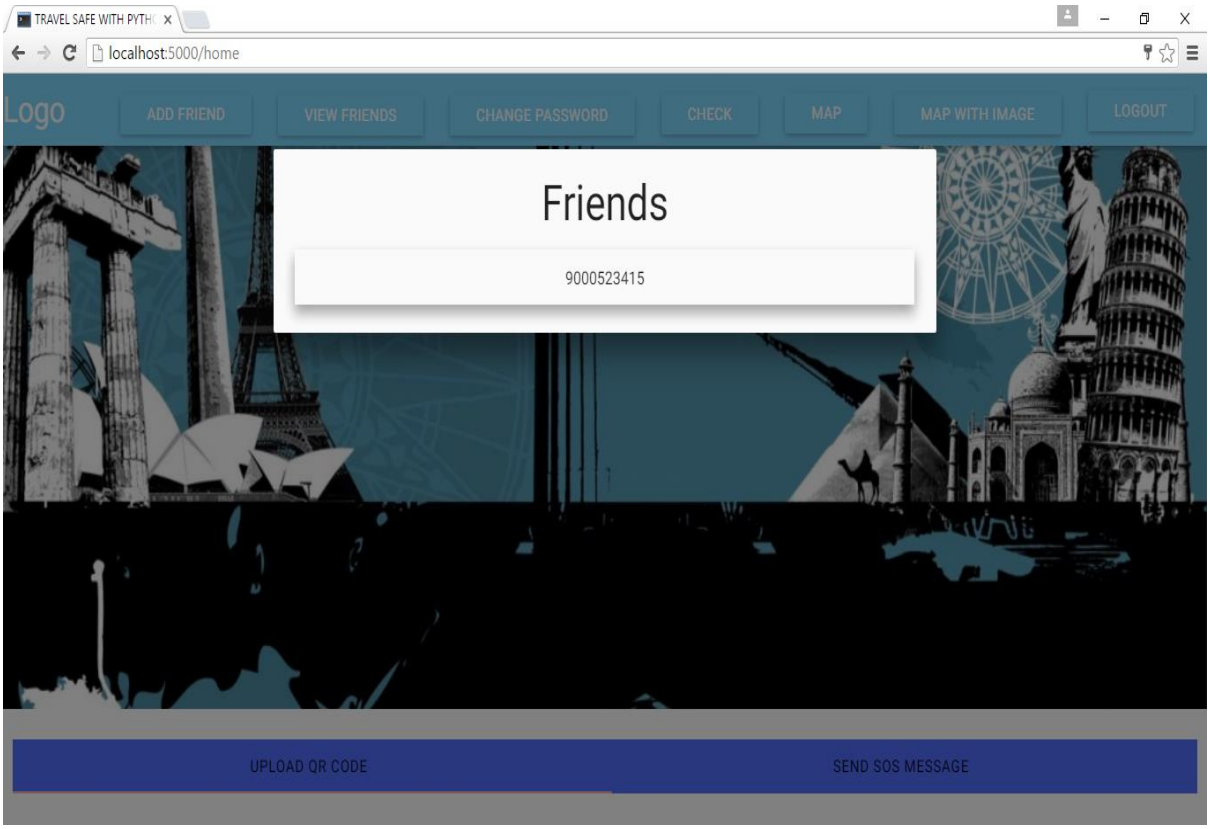
Due to the server-less design, SQLite applications require less configuration than client-server databases. SQLite is called *zero-conf* because it does not require service management (such as startup scripts) or access control based on GRANT and passwords. Access control is handled by means of File system permissions given to the database file itself. Databases in client-server systems use file system permissions which give access to the database files only to the daemon process. SQLite uses an unusual type system for an SQL-compatible DBMS; instead of assigning a type to a column as in most SQL database systems, types are assigned to individual values; in language terms it is *dynamically typed*. Moreover, it is *weakly typed* in some of the same ways that Perl is: one can insert a string into an integer column (although SQLite will try to convert the string to an integer first, if the column's preferred type is integer). This adds flexibility to columns, especially when bound to a dynamically typed scripting language. However, the technique is not portable to other SQL products. A common criticism is that SQLite's type system lacks the data integrity mechanism provided by statically typed columns in other products.

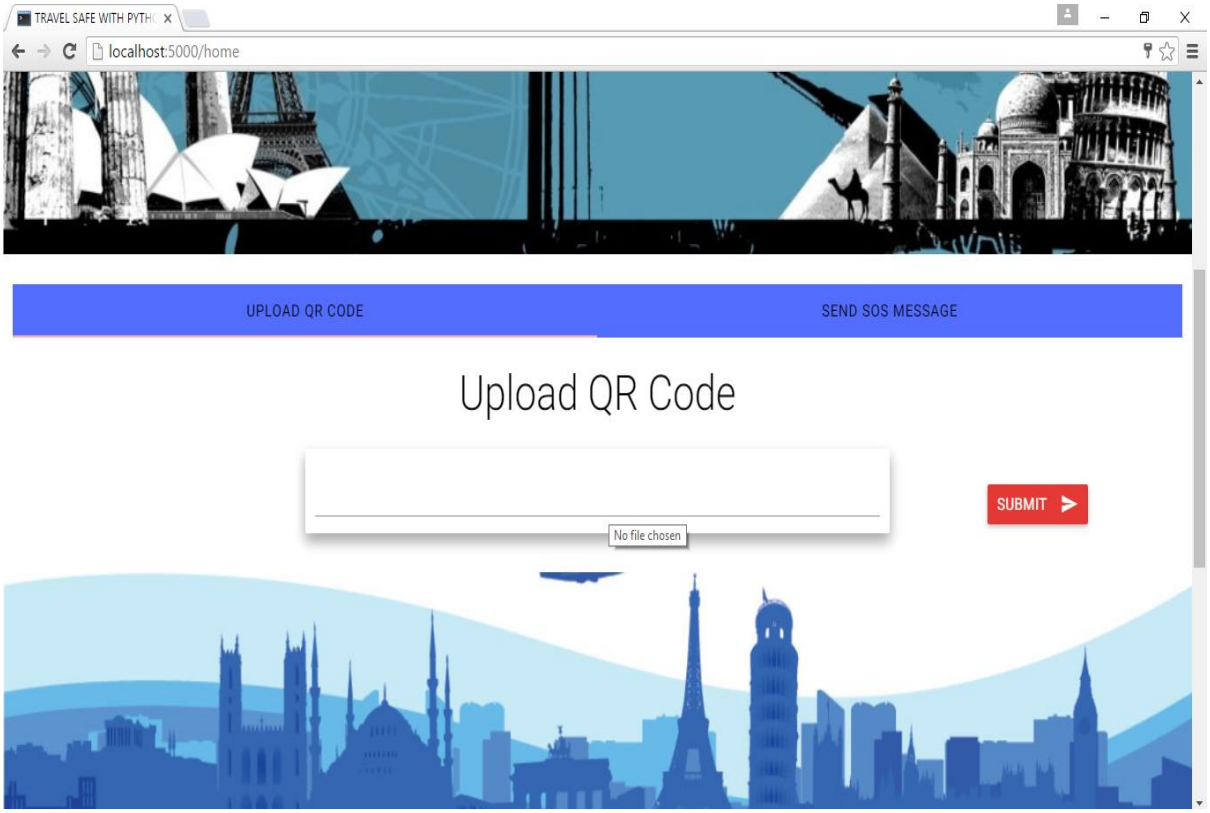
5.5 OUTPUT SCREENS:

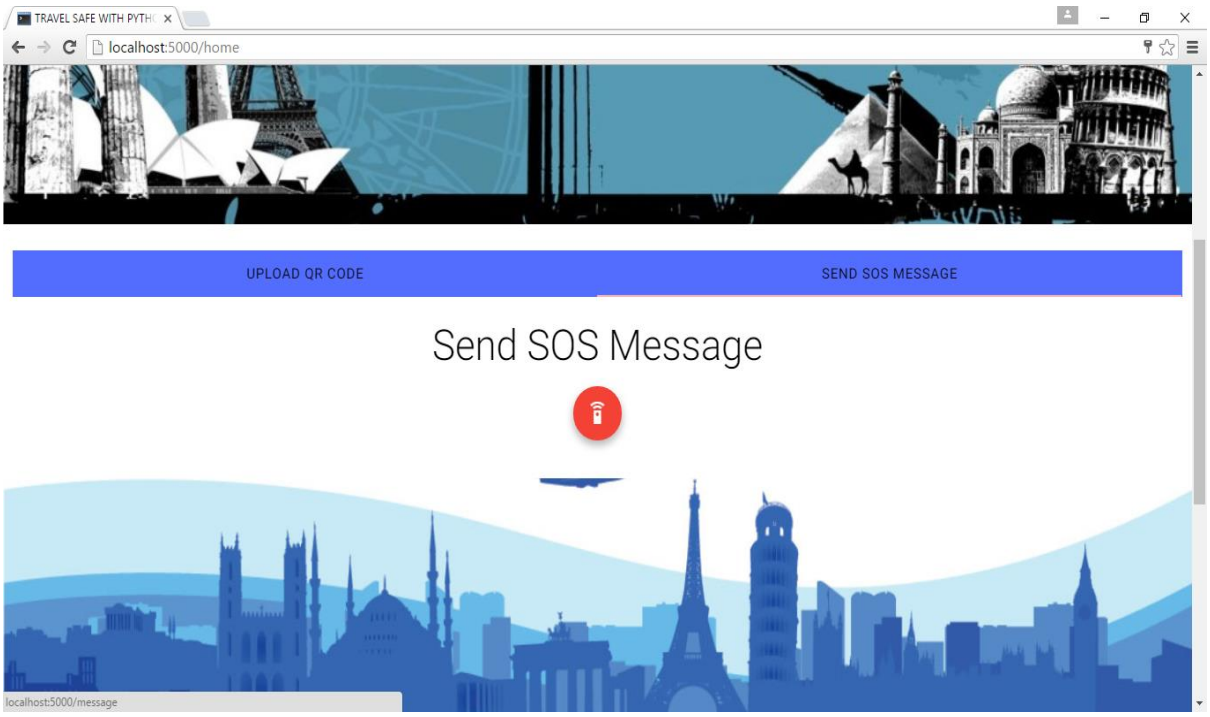





TRAVEL SAFE WITH PYTH
localhost:5000/home
Logo
ADD FRIEND
VIEW FRIENDS
CHANGE PASSWORD
CHECK
MAP
MAP WITH IMAGE
LOGOUT
UPLOAD QR CODE
SEND SOS MESSAGE
localhost:5000/home#add1


TRAVEL SAFE WITH PYTH
localhost:5000/home
Logo
ADD FRIEND
VIEW FRIENDS
CHANGE PASSWORD
CHECK
MAP
MAP WITH IMAGE
LOGOUT
Friends
9000523415
UPLOAD QR CODE
SEND SOS MESSAGE


TRAVEL SAFE WITH PYTH
localhost:5000/home
UPLOAD QR CODE
SEND SOS MESSAGE
Upload QR Code
No file chosen
SUBMIT


TRAVEL SAFE WITH PYTH
localhost:5000/home
UPLOAD QR CODE
SEND SOS MESSAGE
Send SOS Message
localhost:5000/message

5.6. RESULT ANALYSIS:

“Travel Safe using python” has been successful in delivering its functionalities. The QR codes are scanned and decoded with correct results and stored in database. The SOS button when clicked is sending a message to the user’s friends which includes a note and the current latitude and longitude positions of the user. The safety of the user is ensured.

6. TESTING AND VALIDATION:

6.1. INTRODUCTION:

Software testing is a critical element of software quality and assurance which represents ultimate review of specifications, design and coding. Testing is an exposure of the system to trial input to see whether it produces correct output or not.

Types of testing:

1. Inspecting Components: This finds faults in the individual component through the manual inspection of its source code.

2. Unit Testing: This find faults by isolating an individual component using test stubs and drivers and by exercising the components using a test case.

3. Integration Testing: This finds faults by integrating several components together. System testing focuses on the complete system, its functional and non-functional requirements and its target environment.

Unit testing focuses on the building blocks of the software system, that is, objects and subsystems. They are three motivations behind focusing on components. First, unit testing reduces the complexity of the overall test activities, allowing us to focus on smaller units of the system. Unit testing makes it easier to pinpoint and correct faults that are given by few computers involved in this test. Unit testing allows parallelism in the testing activities in which each component can be tested independently of one another.The specific components for unit testing are chosen from the object model and the system decomposition of the system. In principle, all the objects developed during the development process should be tested which is often not feasible because of time and budget.

Test Case Design: The design of tests for software and other engineering products can be as challenging as the initial design of the product. Test case methods provide the developer with a systematic approach to testing. Moreover, these methods provide a mechanism that can help to ensure the completeness of tests and provide the highest like hood for uncovering errors in software. Any engineered product can be tested in either of the two ways:

1. Knowing the specified function that a product has been designed to perform, tests can be conducted. These tests demonstrate whether each function is fully operational and at the same time searches for errors in each function.

2. Knowing the internal workings of a product, tests can be conducted to ensure that internal operations are performed according to specifications and all internal components hence been adequately exercised.

Test case design methods are divided into two types:

1. White-box testing

2. Black-box testing

White-box testing: White –box testing, sometimes called glass-box testing is a test, case designed method that uses the control structure of the procedural design to derive test cases. Using white-box testing methods, the s/w engineer can derive test cases that guarantee that all independent paths within a module have been exercised at least once. Exercise all logical decisions on their true and false sides. Execute all loops at their boundaries and within their operational bounds. Exercise internal data structures to ensure their validity. Basis path testing is a white-box testing technique. The basis path method enables the test case designer to derive a logical complexity measure of a procedural design and use this measure as a guide for defining a basis set are guaranteed to exercise every statement in the program at least one time during testing.

Black-box testing: Black-box testing,also called behavioural testing, focuses on the functional requirements of the s/w. Black-box testing enables the software engineer to derive sets of input conditions that will fully exercise all functional requirements of a program. It is a complementary approach that is likely to uncover a different class of errors that white-box methods could not. Black-box testing attempted to find errors in the following categories.

- Incorrect or missing functions.
- Interface errors.
- Errors in data structures or external data base access.
- Behaviour or performance errors.

- Initialization and termination errors.

Black-box testing purposely disregards control structure; attention is focused on information domain. By applying black-box techniques, we derive a set of cases that satisfies the criteria test cases that reduce, by a count that is greater than one, the number of additional test cases that must be designed to achieve reasonable testing. Test cases that tell us something about the presence or absence of classes of errors, rather than an error associated only with the specified test.

6.2. DESIGN OF TEST CASES AND SCENARIOS:

Test cases: A test case is a software testing document, which consists of event, action, input, output, expected result and actual result. Larger test cases may also contain prerequisite states or steps, and descriptions. A test case should also contain a place for the actual result. These steps can be stored in a word processor document, spreadsheet, database or other common repository

Test case 3: To see if the current location is shown in map.	Priority (H, L): High
Test Objective: To display the map of the given location.	
Test Description: When clicked on a button, a map must be shown pointing the current location.	
Requirements Verified: Yes	
Test Environment: Website must be deployed in a web browser of mobile phone or PC.	
Test Setup/Pre-Conditions: internet connection is important.	
Actions	Expected Results
The user clicks on a button.	Map is displayed showing the current location.
Pass: Yes Conditions pass: Yes	Fail: No
Problems / Issues: NIL	
Notes: Successfully Executed	

Test case 5: To check if the scanned details are stored in the database.	Priority (H, L): High
Test Objective: To display the scanned vehicle details.	
Test Description: When user clicks on check button, scanned details should be available.	
Requirements Verified: Yes	
Test Environment: Website must be deployed in a web browser of mobile phone or PC.	
Test Setup/Pre-Conditions: internet connection is important.	
Actions	Expected Results
To display the vehicle details	Details are displayed.
Pass: Yes Conditions pass: Yes	Fail: No
Problems / Issues: NIL	
Notes: Successfully Executed	

Test case 1: Logging in with correct credentials	Priority (H, L): High
Test Objective: display the home page and logs in only if the credentials entered are correct.	
Test Description: the user will be logged into the website if correct details are entered.	
Requirements Verified: Yes	
Test Environment: Website must be deployed in a web browser of a PC or a mobile.	
Test Setup/Pre-Conditions: internet connection is important.	
Actions	Expected Results
The user enters correct credentials.	Successfully logged in.
Pass: Yes Conditions pass: Yes Fail: No	
Problems / Issues: NIL	
Notes: Successfully Executed	

Test case 4: To check if the upload button is scanning the QR Code.	Priority (H, L): High
Test Objective: To decode the QR Code.	
Test Description: On clicking the submit button, the QR code of the vehicle must be scanned and decoded.	
Requirements Verified: Yes	
Test Environment: Website must be deployed in a web browser of mobile phone or PC.	
Test Setup/Pre-Conditions: internet connection is important.	
Actions	Expected Results
User uploads the QR code and clicks on submit button.	The QR code is scanned and decoded.
Pass: Yes Conditions pass: Yes	Fail: No
Problems / Issues: NIL	
Notes: Successfully Executed	

Test case 6: To check if the message is sent when the button is clicked.	Priority (H, L): High
Test Objective: To send the message on a button click.	
Test Description: The registered friend should receive a message on his mobile.	
Requirements Verified: Yes	
Test Environment: Website must be deployed in a web browser of mobile phone or PC.	
Test Setup/Pre-Conditions: internet connection is important.	
Actions	Expected Results
To click on SOS button	Message is received on the mobile.
Pass: Yes Conditions pass: Yes	Fail: No
Problems / Issues: NIL	
Notes: Successfully Executed	

Test case 2: To check if the friend can view the scanned details.	Priority (H, L): High
Test Objective: Re-directing the friend to a page where vehicle details of the user are stored.	
Test Description: Vehicle details must be displayed when a friend logs in with his mobile number and their common password.	
Requirements Verified: Yes	
Test Environment: Website must be deployed in a web browser of a mobile phone or PC.	
Test Setup/Pre-Conditions: internet connection is important.	
Actions	Expected Results
The friend logs in with his mobile number and their common password.	Views the scanned vehicle details of the user.
Pass: Yes Conditions pass: Yes	Fail: No
Problems / Issues: NIL	
Notes: Successfully Executed	