A project report on

BANASTHALI MAP

Submitted by-

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In the partial fulfilment of award of the degree of

B.Tech (Information Technology)

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Under the supervision of

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(Assistant Professor, Department of Computer Science)

At

BANASTHALI UNIVERSITY

Certificate

Certified that Devgandha, Himanshi Goswami and Juhi Verma have carried out the project work titled "**Banasthali Map**" from **29 Dec, 2022** to **27 April, 2023** for the award of the **CS-311P(IT) (Project)** from **Banasthali Vidyapith** under my supervision. The thesis embodies result of original work and studies carried out by students themself and the contents of the thesis do not form the basis for the award of any other degree to the candidate or to anybody else.

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Place: Banasthali Vidyapith

Date: 12 February, 2023

ABSTRACT

We are basically thinking of building a web app of Banasthali Map, where firstly user have to login or register himself then he can get an optimal path to reach a destination in Banasthali campus. He/She can select any hostel, department, canteen, staff quarter or market from the given list of destinations. There can be multiple routes to reach a particular destination, Banasthali Map will use Google APIs to calculate the most optimal path to the destination from the current location of user. Basically we are trying to solve the problem of people that when they come to Banasthali first time or even after living here for years, they are sometimes not able to find their destination and roam around searching and asking for the paths, so we are building this web app where all the destinations will be marked and user can efficiently reach his destination.

ACKNOWLEDGEMENT

We take this opportunity to express our gratitude towards all those people who in various ways have helped in successful completion of our project. We express our gratitude to our project guide Mr. Sushil Buriya, whose inspiration, suggestion and invaluable guidance enabled us to develop the present software.

We hereby offer our sincere compliment to all our friends for their useful suggestion and cooperation. Last but not the least, we owe debt toward our revered parents for their moral support and constant encouragement that has made it possible for us to attain this stage of academic achievement in our life.

Team Members:

* **Devgandha (2016739)**
* **Himanshi Goswami (2016750)**
* **Juhi Verma (2016757)**

CHAPTER-1

SOFTWARE REQUIREMENT SPECIFICATION

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PROJECT OBJECTIVE

Problem statement-

One of my seniors, who've studied in Banasthali Vidyapith since 9th standard and is now in B.Tech final year. She has spent 8 years of her life in the Banasthali campus. Eight long years are more than enough for anyone to get familiar with all the routes and landmarks of an area. But, last year when she was allotted hostel Shri Shanta Gangotri, she was roaming around searching for the hostel for almost half an hour.

This leads to the wastage of time, which is invaluable.

Recalling the incident and discussing with my other two fellows, we came up to a possible solution, i.e. building a web app that can give the most optimal path to reach any destination within Banasthali Campus. And that's why we are here connecting all the hostel, departments, canteens, markets and staff quarters in our project, Banasthali Map.

Purpose-

This project is designed for the purpose of reducing the loss of user's valuable time, avoid the frustrating situation of not finding a destination in Banasthali campus and efficiently manage time of user by providing optimal path. We've surveyed a set of our target users and according to the result of our survey most of the target users are facing this issue. That's why we have decided to solve this problem of users. Basically, our purpose of building this web app is to provide optimal path between two destinations in Banasthali campus.

SOFTWARE REQUIREMENT SPECIFICATION

2.1 INTRODUCTION

2.1.1. Purpose

The purpose of this document is to describe the software requirement in developing the Web App for "BANASTHALI MAP". This document describes the functionality, requirements, and general interface of the project.

2.1.2. Document Conventions

- **HTML**: HyperText Markup Language is a markup language used to design web pages.
- **CSS**: Cascading Style Sheets are used to style web pages.
- **JS**: JavaScript is used to provide functionality to web pages.
- **HTTP**: HyperText Transfer Protocol is a transaction-oriented client/server protocol between a Web Browser and a Web Server.
- **HTTPS**: Secure HyperText Transfer Protocol is an HTTP over SSL (Secure Socket Layer).
- **WWW**: World Wide Web
- **TCP/IP**: Transmission Control Protocol/Internet Protocol, the suite of communication protocols used to connect hosts on the Internet. TCP/IP uses several protocols, the two main ones being TCP and IP.
- **DB**: Database
- **RAM**: Random Access Memory
- **HDD**: Hard Disk Drive
- **IE**: Internet Explorer
- **OS**: Operating System

2.1.3. Intended Audience and Reading Suggestions

- User
- Admin

2.1.4. Product Scope

"BANASTHALI MAP" is a web-based service that aims to make a map of Banasthali campus which will provide optimal paths to a destination, will be cost effective and time efficient.

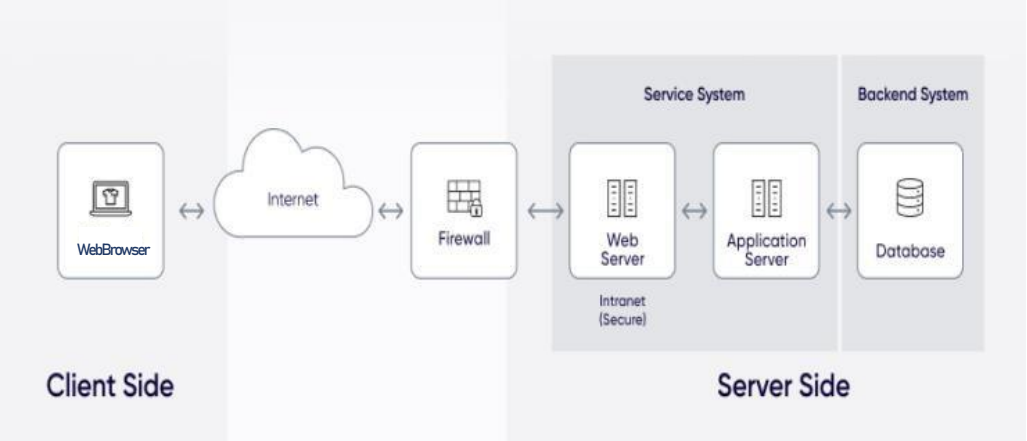
The scope of this project can be listed as under:

* This Website aims to provide special functionality to users (students, guardians, teaching staff, non-teaching staff, visitors etc.) to get the optimal path in Banasthali campus. They can also get to know the traffic density in a particular area.
* Users will enter their desired destination in the search bar to get the optimal path.
* Admin will be responsible to create and update the overall database of the Web App which includes the updating of new buildings, shops, available paths etc.
* Two types of users will be using this website:
    1. **Admin**
    2. **User**

2.2 OVERALL DESCRIPTION

2.2.1. Product Perspective

This website is mainly intended for students, guardians, teaching staff, non-teaching staff, visitors etc. this website will be serviceable, beneficial for users, convenient, in public interest and authentic.



2.2.2. Product Function

"BANASTHALI MAP" will allow:

* A welcome page will redirect the users to avail the displayed functionalities.
* On clicking the My Account button, the user will be redirected to the 'Login With Google' Page.
* After filling up the credentials in 'Login With Google' page, the user will be asked to allow the access to his/her present location.

* After the user allows the access to location, he/she will be redirected to the 'Home Page' of BANASTHALI MAP where different functionalities have been grouped together.
    1. Here the user can click on the Search Bar to search the destination.
    2. After searching the desired destination, the user will be able to get different paths to reach the destination.
    3. The destinations will be divided in 6 different categories:
        - Departments
        - Hostels
        - Markets
        - Canteens
        - Staff Quarters
        - Others (Hospital, Banks etc.)
    4. After getting optimal path to the destination, the user can click on 'Start' button, which will show directions to reach the destination.
    5. After reaching the destination the user will see a "Your Destination Is Here" message.
* The user can switch between multiple languages as per their convenience.

2.2.3. User Classes and Characteristics

* **Admin-**

  These users are responsible for maintaining, updating the database. They administer the whole website. They can update any data at any time without creating any conflict or any confusion for the rest of the users.

* **Users-**

  These users will be able to search for a destination, find optimal path and direction to reach the destination. These users cannot change or update any data in the database.

2.2.4. Operating Environment

Internet, phone/laptop/computer, android/iOS is required to access software.

2.2.5. Design and Implementation Constraints

1. **Google APIs:** The Google Cloud Platform will be used to insert the APIs of Google Maps.
2. **Higher Order Language Functions:** The Python and JS will be used for developing the backend of web pages with the help of VS Code and for the database information SQLite Database will be used.
3. **Criticality of the Application:** The client side and server side will be available for 24*7.

4. **Safety and Security Considerations:** The password and a valid username are the security provision.
5. External users will not be able to gain any functionalities of the website.
6. Any substantial enhancement in website will require approval of the administrator.

Technologies Used:

- **Front End:** CSS and HTML
- **Back End:** Node.JS, JS
- **Design Tool:** Visual Studio Code, Google Cloud Platform
- **Web Browser:** Any Browser
- **Web Server:** Live Server

2.3 OVERALL DESCRIPTION

2.3.1. User Interface

- Login Page
- Sign-up Page
- Home Page

2.3.2. Hardware Interface

Server Side:

- **RAM:** 4GB
- **HDD:** 5GB or more (Free space excluding data size)
- **Processor:** 1-2 GHz (P4) or onwards

Client Side:

- **RAM:** 4 GB
- **HDD:** 1GB or more (Free space excluding data size)
- **Processor:** 450 GHz (P2)

2.3.3. Software Interface

Server Side:

- **OS:** Windows Server 2000 or onwards
- **Web Server:** Live HTTP

Client Side:

- **OS:** Any OS
- **Browser:** Any Browser compatible with IE 5.0 or onwards

2.3.4. Communications Interface

- Client on Internet will be using HTTP/HTTPs protocol.
- Client on Intranet will be using TCP/IP protocol.

2.4 FEASIBILITY STUDY

Feasibility study is a preliminary study undertaken to determine a project's viability. The term feasibility study is also used to refer to the resulting document. These results of the studyare used to make a decision whether to proceed with the project, or not. If it indeed leads to a project being approved it will (before the real work of the proposed project starts) be used to ascertain the likelihood of the project's success. Then it is an analysis of possible alternative solutions to a problem and a recommendation on the best alternative.

Operational Feasibility

We have used a simple user friendly interface that will help the users to search about the optimal paths which will lead them to their desired destination easily.

Technical Feasibility

This involves questions such as whether the technology needed for the system exists, how difficult it will be to build, and whether the firm has enough experience using that technology. This website has been developed on Windows 10 and Windows 11 platform and a high configuration of 8GB RAM on Intel® core i3 processor. This is technically feasible. The project is feasible through the use of a computer which is the hardware.

Financial and Economic Feasibility

User's will need not to handle any extra software or hardware apart from having a stable high speed internet connection and a technical device that is Smartphone, PC or Laptop with minimum requirements. In the fast-paced world today, there is a great need for online facilities. Thus, the benefits of this project in the current scenario make it economically feasible.

2.5 SYSTEM FEATURES

2.5.1. Use-Case Diagrams

Figure 1- Use-Case Diagram of Admin

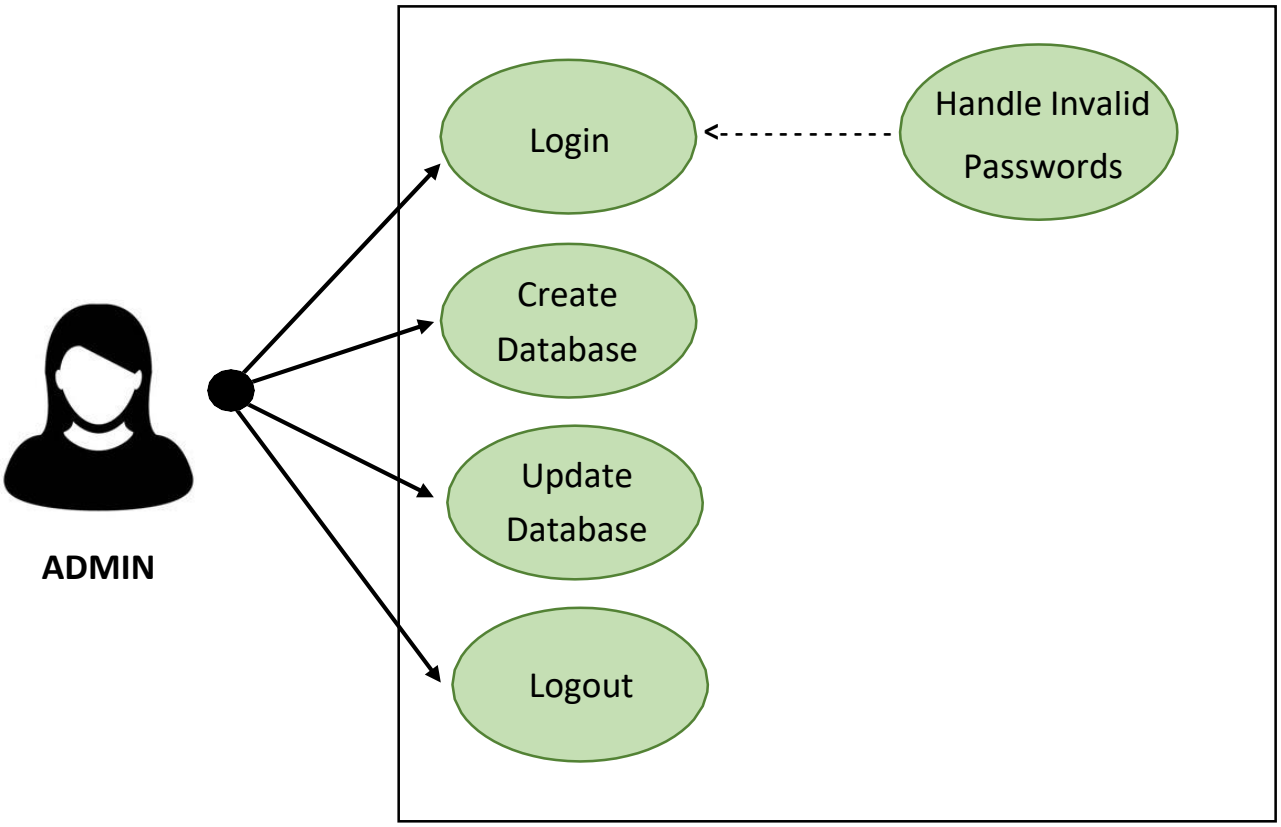


Figure 2- Use-Case Diagram of Users

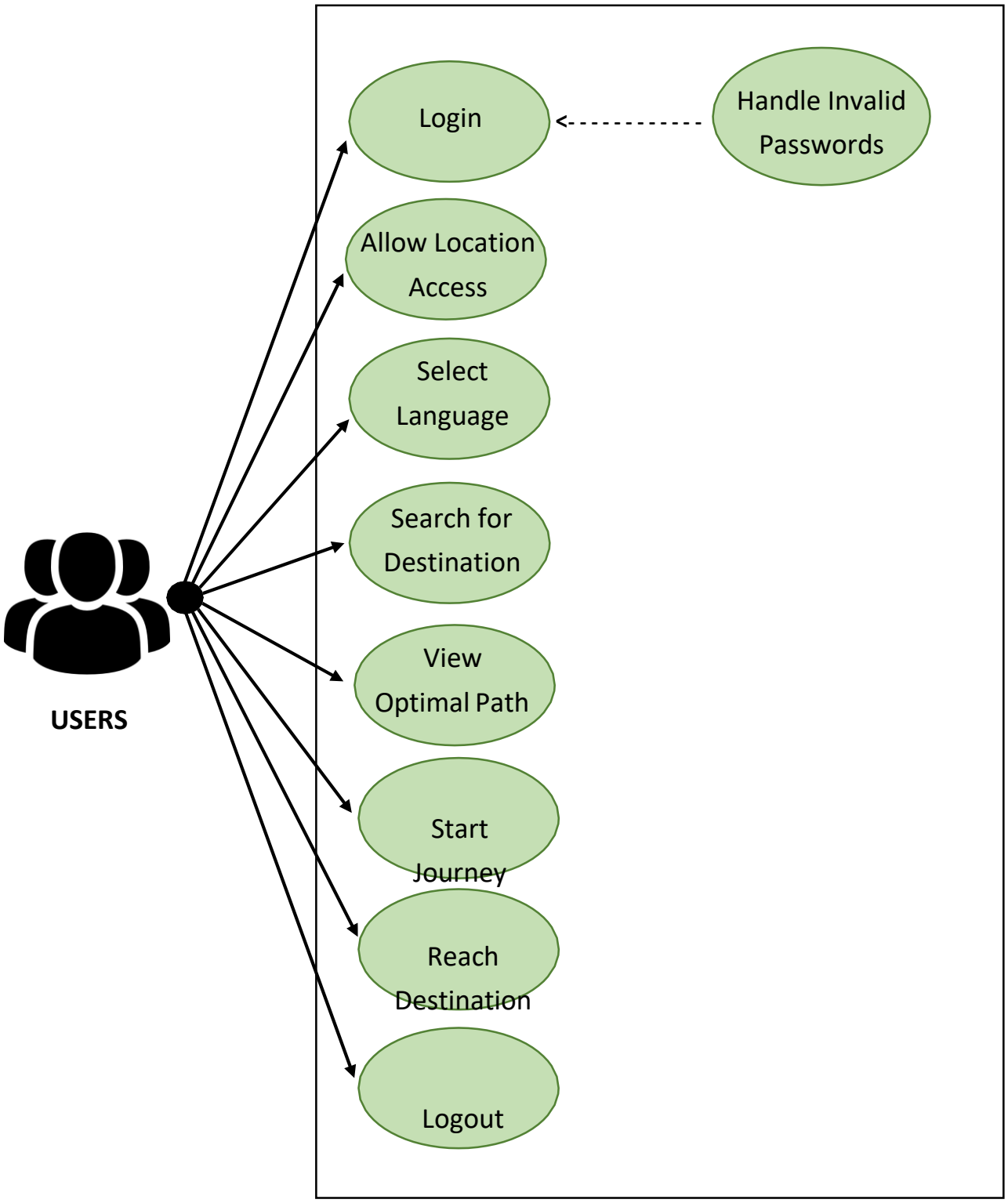
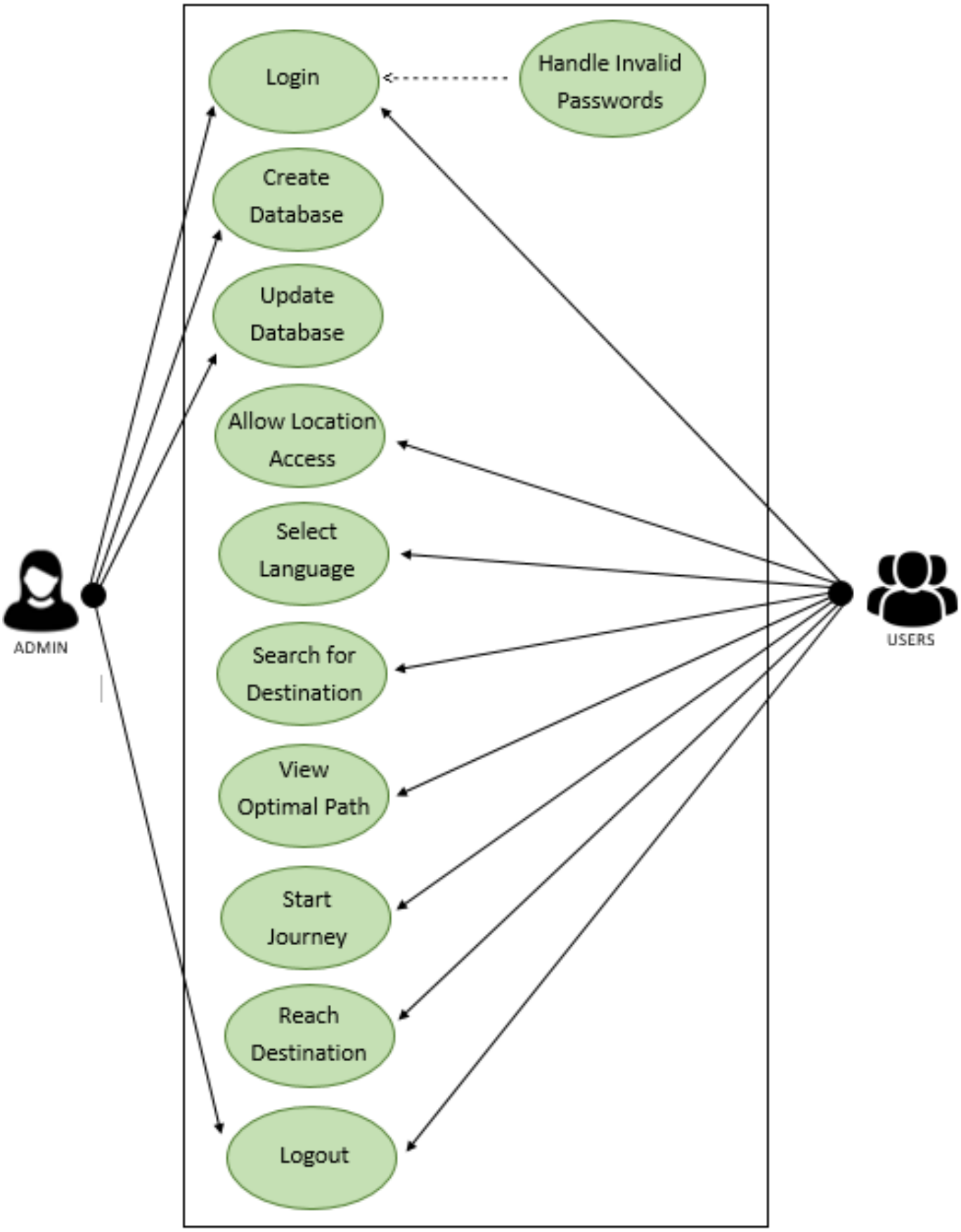


Figure 3-Overall Use-Case Diagram of Product



2.6 OTHER NON-FUNCTIONAL REQUIREMENTS

2.6.1. Performance Requirements

* This will be working 24*7.
* The admin must have an account to enter the system.
* The user should also sign up, if they don’t have an account they won’t be able to useand see the website.

2.6.2. Security Requirements

The authorization mechanism of the system will block the unauthorized attempts to the server and also the system will authorize privileges to the user. For different types of users(admin and user), there are different levels of authorization. Only those users who are present in Banasthali campus can login to access the website. The confidentiality of the user will be guaranteed.

Reliability

A backup file is maintained so that in case of system crash, the data will not be affected.

CHAPTER-2

SOFTWARE DESIGN SPECIFICATION

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SOFTWARE DESIGN SPECIFICATION OUTLINE

1.1. INTRODUCTION

1.1.1. Purpose of this Document

* The purpose of the Software Design Document is to provide a description of the design of a system fully enough to allow for software development to proceed with an understanding of what is to be built and how it is expected to build.
* The SDS shows how the software system will be structured to satisfy the requirements identified in the SRS.
* It is a translation of requirements into a description of software structure, software components, interfaces and data necessary for the implementation phase.
* Thus, SDS is the blueprint for the implementation activity.

1.1.2. Scope of the Development Project

"BANASTHALI MAP" is a web-based service that aims to make a map of Banasthali campus which will provide optimal paths to a destination, will be cost effective and time efficient.

The scope of this project can be listed as under:

* This site aims to provide 24*7 service to the users.
* In order to enjoy the service, the user has to login.
* This Website aims to provide special functionality to users (students, guardians, teaching staff, non-teaching staff, visitors etc.) to get the optimal path in Banasthali campus. They can also get to know the traffic density in a particular area.
* Users will enter their desired destination in the search bar to get the optimal path.
* User can also find different categories of destinations in Banasthali Campus.
* Two types of users will be using this website:

1. **Admin**
2. **User**

1.1.3. Definitions, Acronyms and Abbreviations

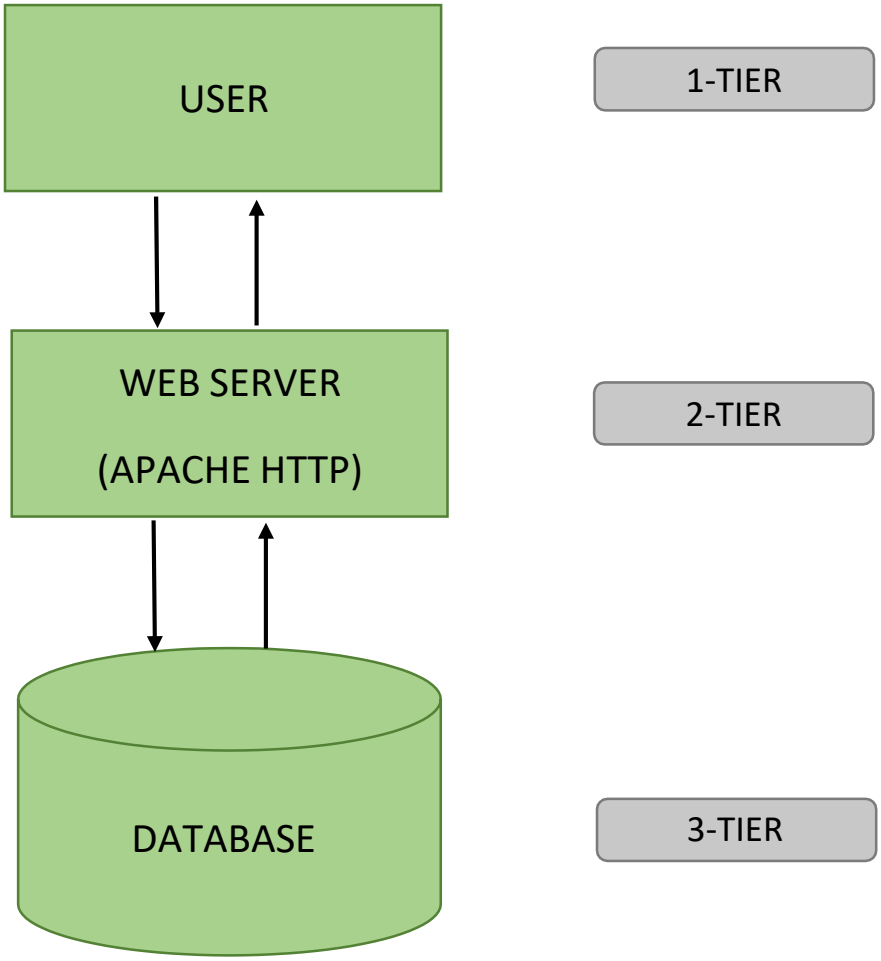
* **DFD**- Data Flow Diagram
* **CD**- Class Diagram
* **SDS**- Software design specifications
* **Admin**- The person who can access all areas of website. He is the person who maintains the software and has the maximum rights.
* **Database**- Collection of interrelated data that provide a way to look at and interact with all the information on the World Wide Web.

1.1.4. Overview of Document

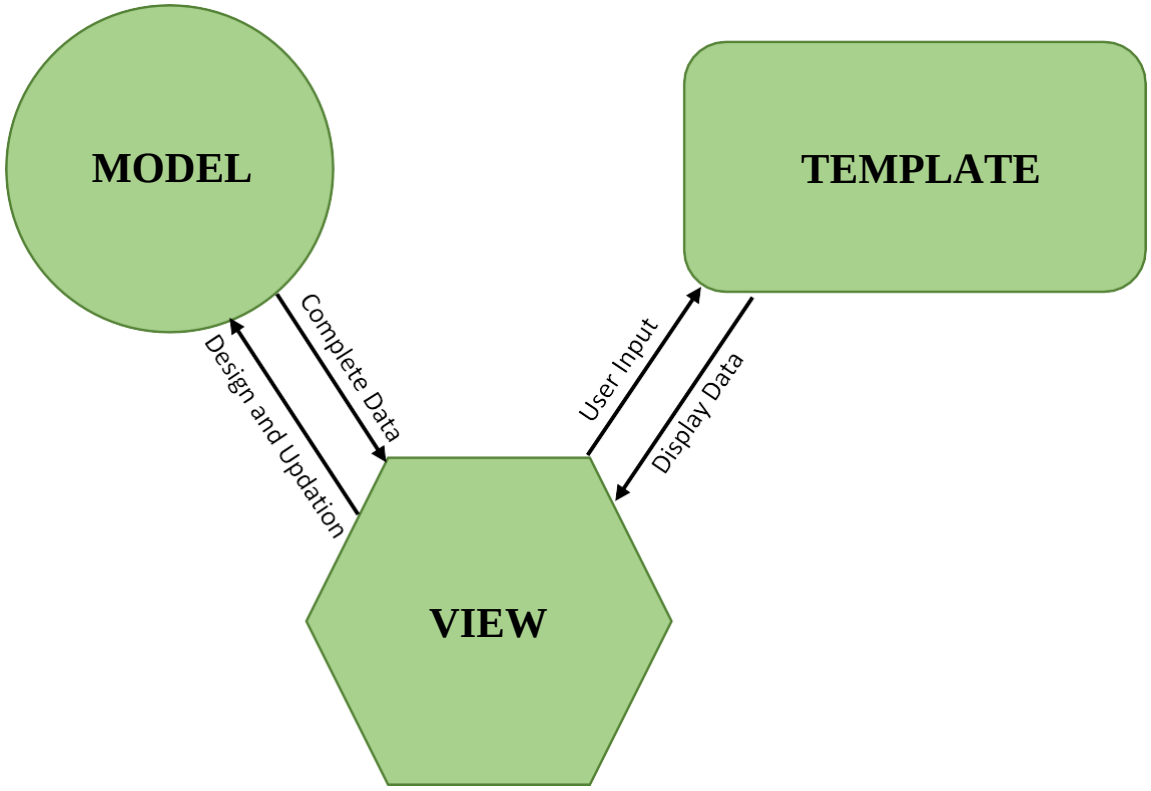
The rest of the SDS consists of the following parts:

* System Architecture Design includes Architectural Design, Structure Chart and DFD.
* Data Design includes CD and Database Description.
* User Interface Design.

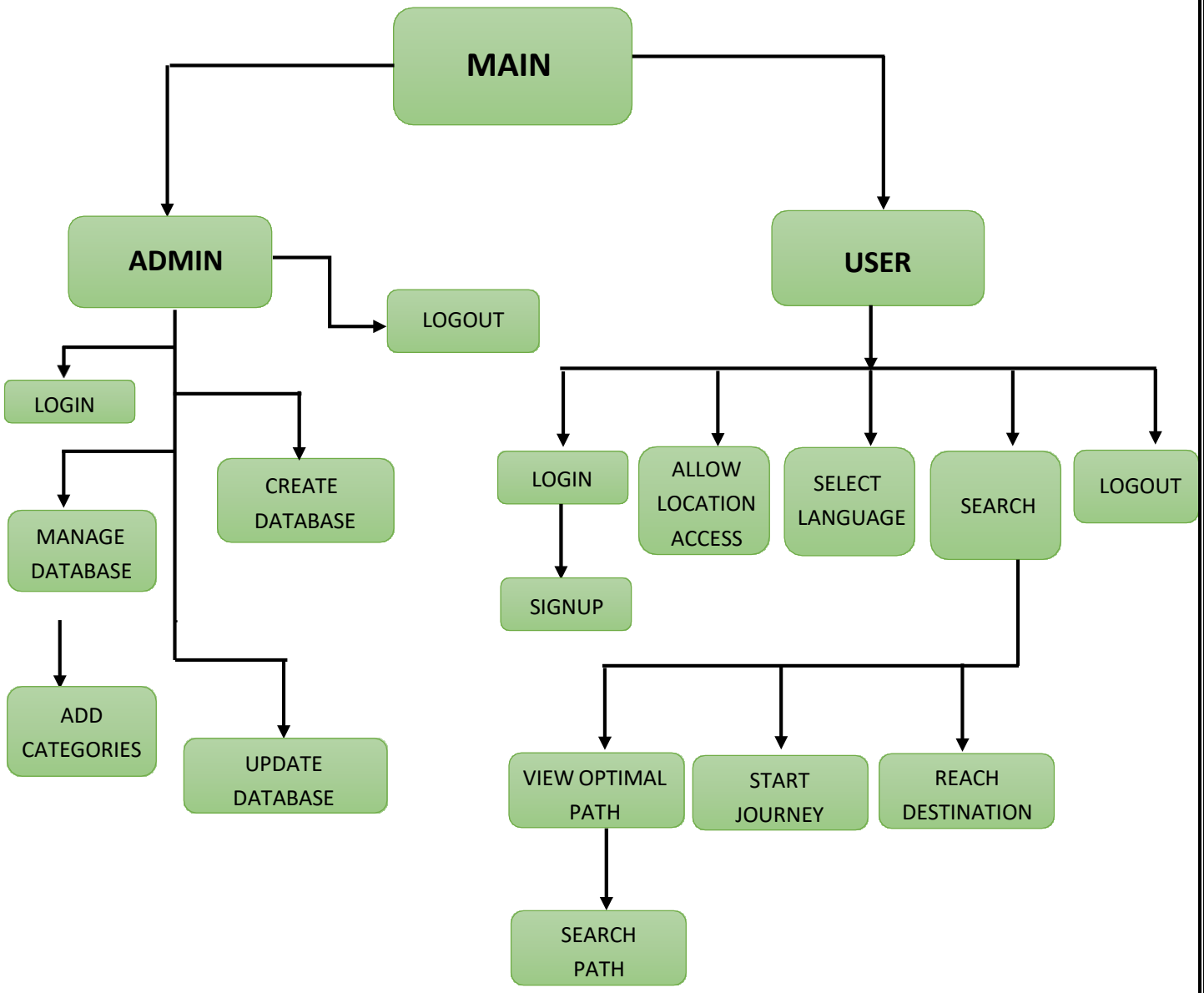
1.2. SYSTEM ARCHITECTURE DESCRIPTION



1.2.1. Model View Template



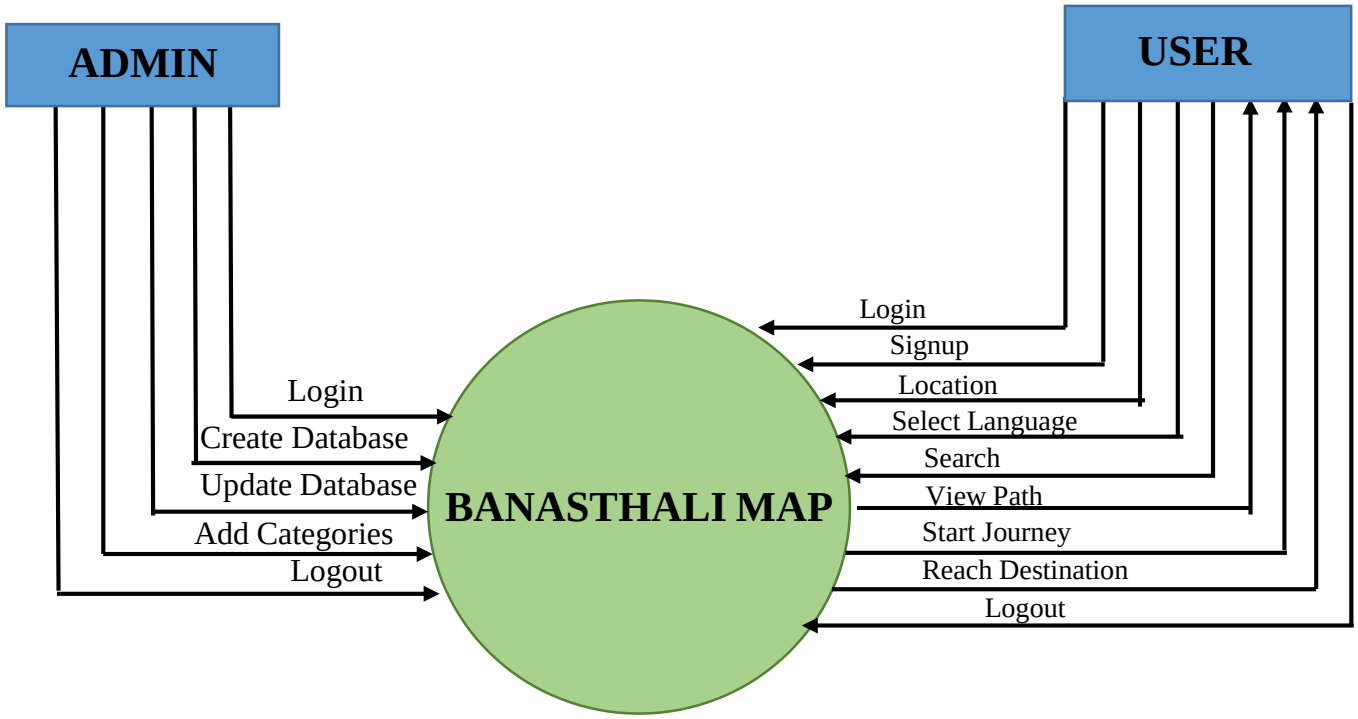
1.2.2. Structure Chart



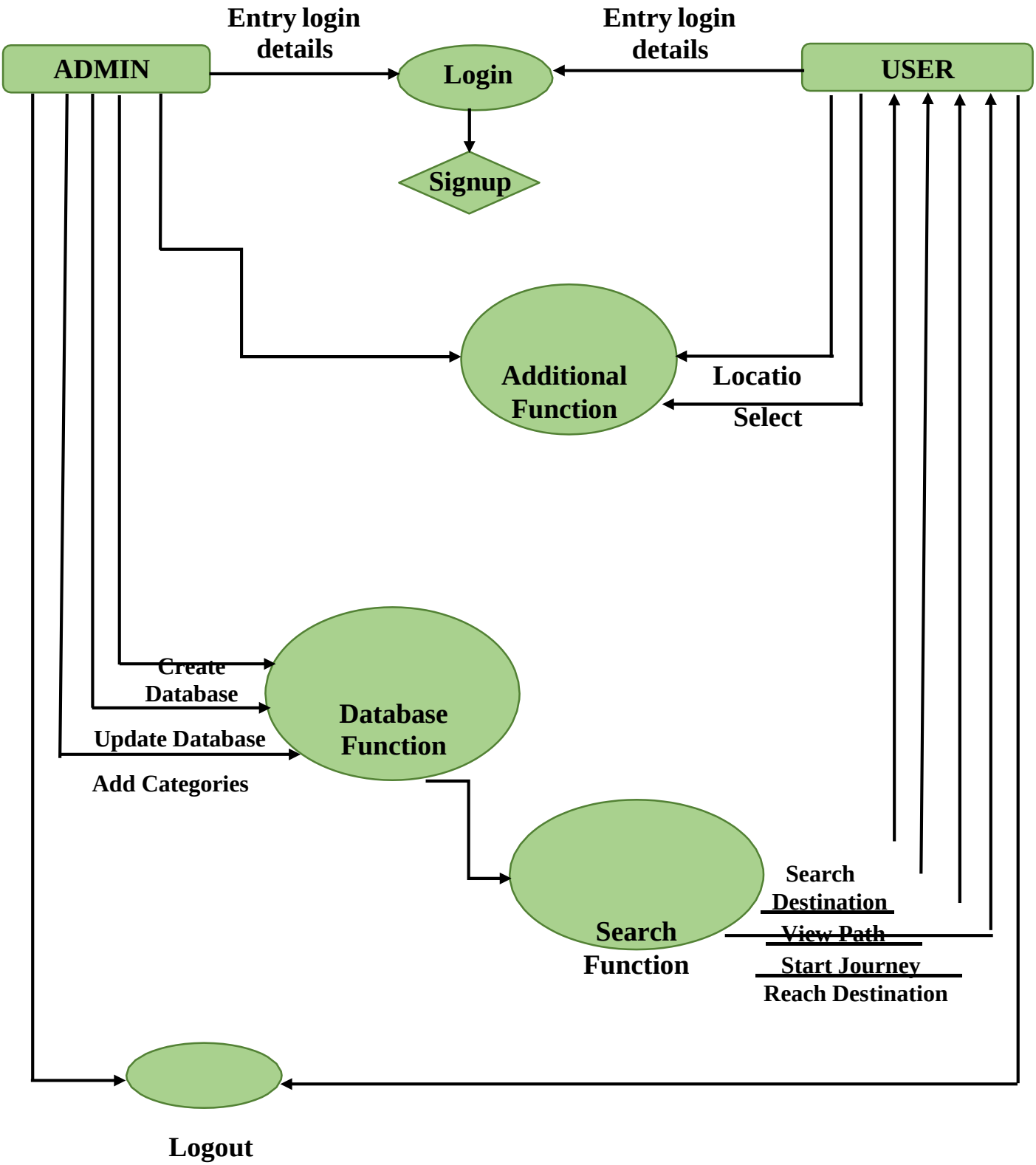
1.2.3. Decomposition Description

1.2.3.1. Data Flow Diagram

A data-flow diagram (DFD) is a way of representing a flow of a data of a process or a system (usually an information system). The DFD also provides information about the outputs and inputs of each entity and the process itself.
0-Level DFD is also known as fundamental system model, or context diagram represents the entire software requirement as a single bubble with input and output data denoted by incoming and outgoing arrows.



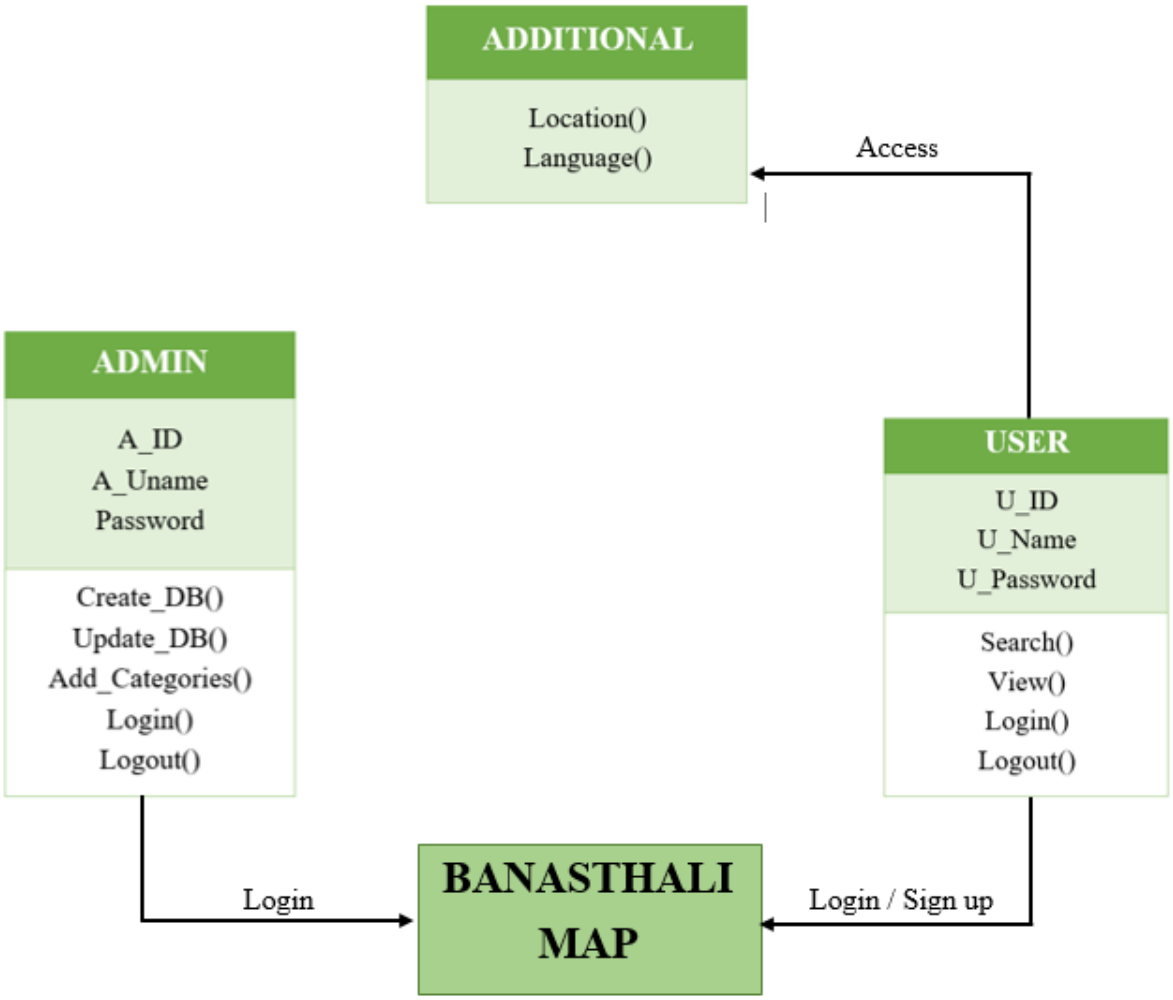
(0-Level Data Flow Diagram)



(1-Level Data Flow Diagram)

DATA DESIGN

2.1. Class Diagram



2.2. Databases

* In this we include, maintain and format databases and its tables.
* The tables corresponding to each of the entity, holding the information about them are designed.
* The tables have the fields, their description, and their data types as well as integrity constraints.

Tables for Entity Sets

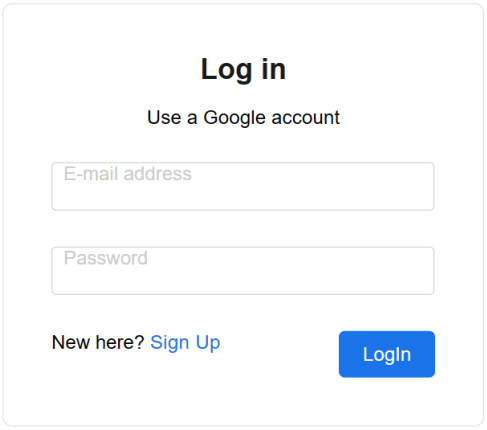
LOCATION TABLE			
FIELD	**TYPE**	**CONSTRAINTS**	**DESCRIPTION**
B_NAME	Varchar (50)	Primary Key	Name of the Building
B_LONG	Numeric (20)	Not Null	Longitude of the Building
B_LAT	Numeric (20)	Not Null	Latitude of the Building

USER TABLE			
FIELD	**TYPE**	**CONSTRAINTS**	**DESCRIPTION**
U_NAME	Varchar (50)	Not Null	Name of the User
U_ID	Numeric (20)	Primary Key	ID of the user

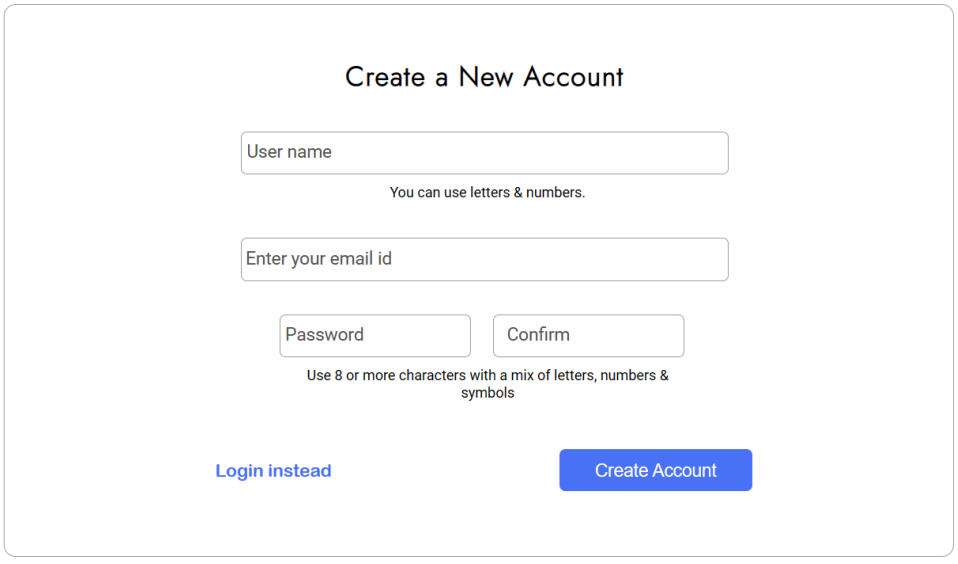
MARKER TABLE			
FIELD	**TYPE**	**CONSTRAINTS**	**DESCRIPTION**
M_ID	Numeric (20)	Primary Key	ID of the marker
M_LONG	Numeric (20)	Not Null	Longitude of marker
M_LAT	Numeric (20)	Not Null	Latitude of Marker

USER INTERFACE

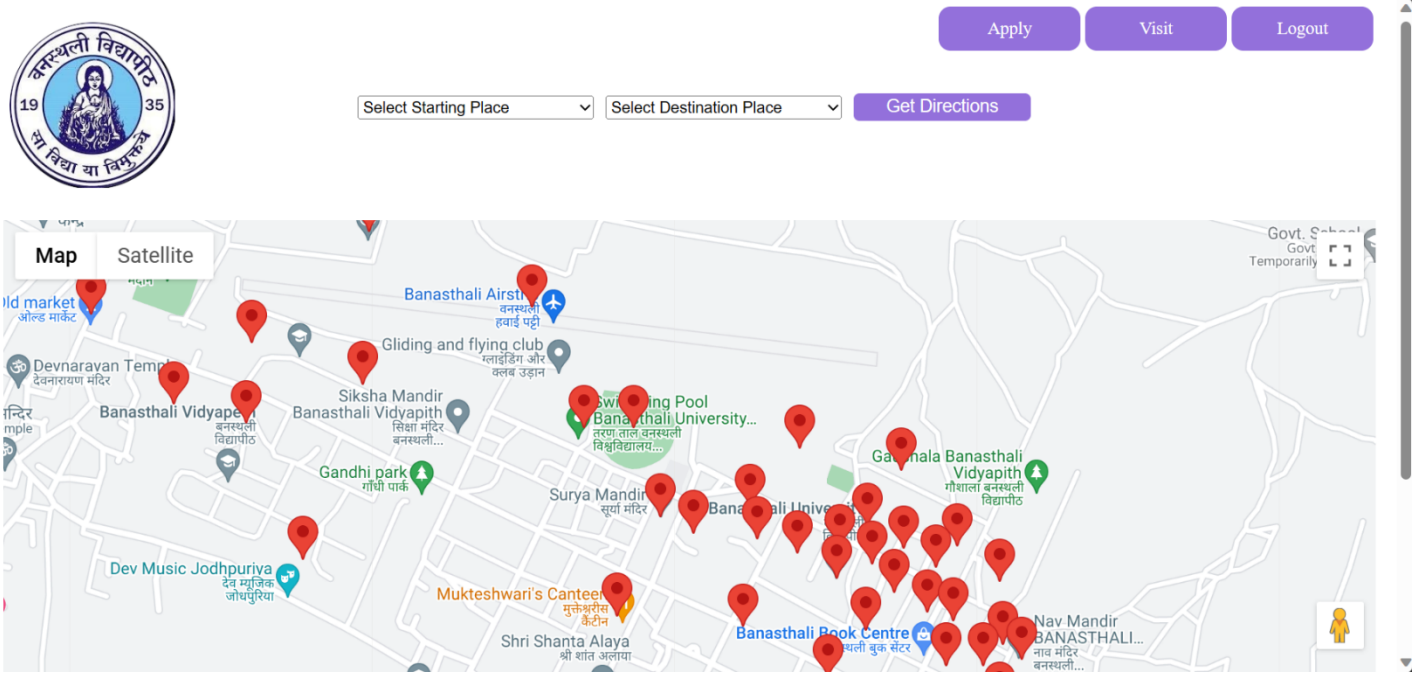
3.3. LOGIN PAGE

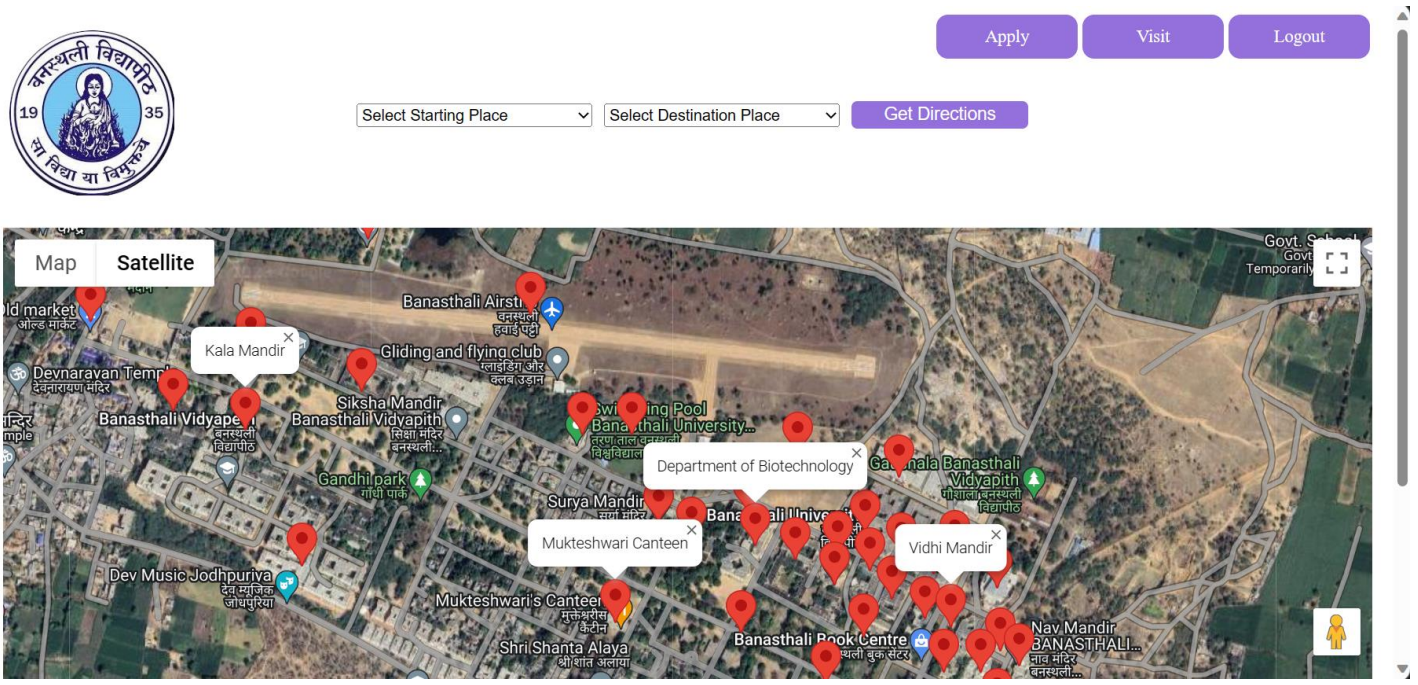


3.4. SIGN-UP PAGE



3.5. HOME PAGE

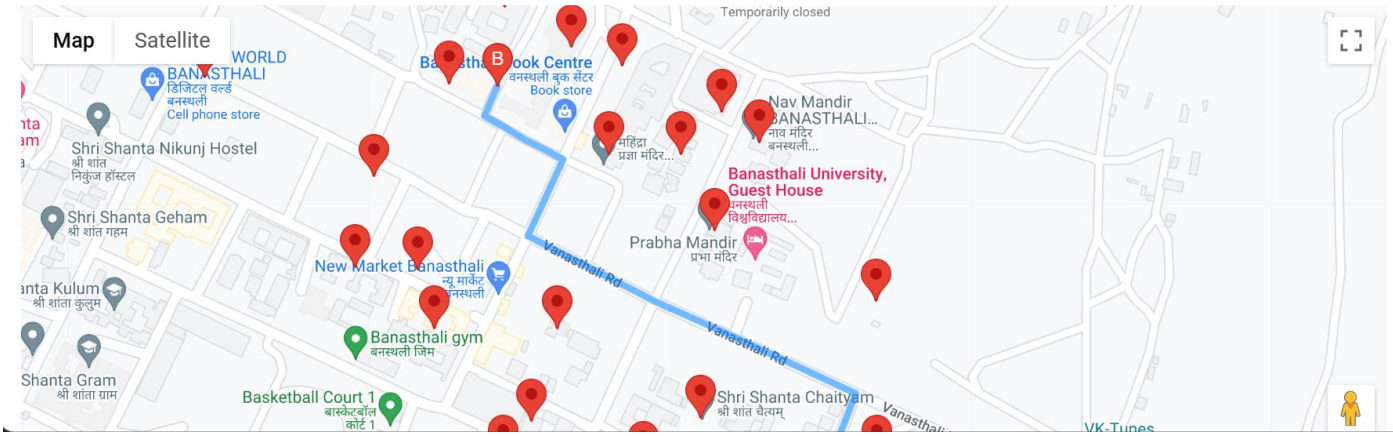

Apply
Visit
Logout
Select Starting Place
Select Destination Place
Get Directions
Map
Satellite
Banasthali Airstr
Gliding and flying club
Devnaravan Temp
Banasthali Vidyape
Siksha Mandir
Banasthali Vidyapith
Gandhi park
Surya Mandir
Dev Music Jodhpuriya
Mukteshwari's Canteen
Shri Shanta Alaya
Banasthali Book Centre
Nav Mandir
BANASTHALI...


Apply
Visit
Logout
Select Starting Place
Select Destination Place
Get Directions
Map
Satellite
Kala Mandir
Department of Biotechnology
Mukteshwari Canteen
Vidhi Mandir
Banasthali Airstr
Gliding and flying club
Devnaravan Temp
Banasthali Vidyape
Siksha Mandir
Banasthali Vidyapith
Gandhi park
Surya Mandir
Dev Music Jodhpuriya
Mukteshwari's Canteen
Shri Shanta Alaya
Banasthali Book Centre
Nav Mandir
BANASTHALI...

Apply Visit Logout

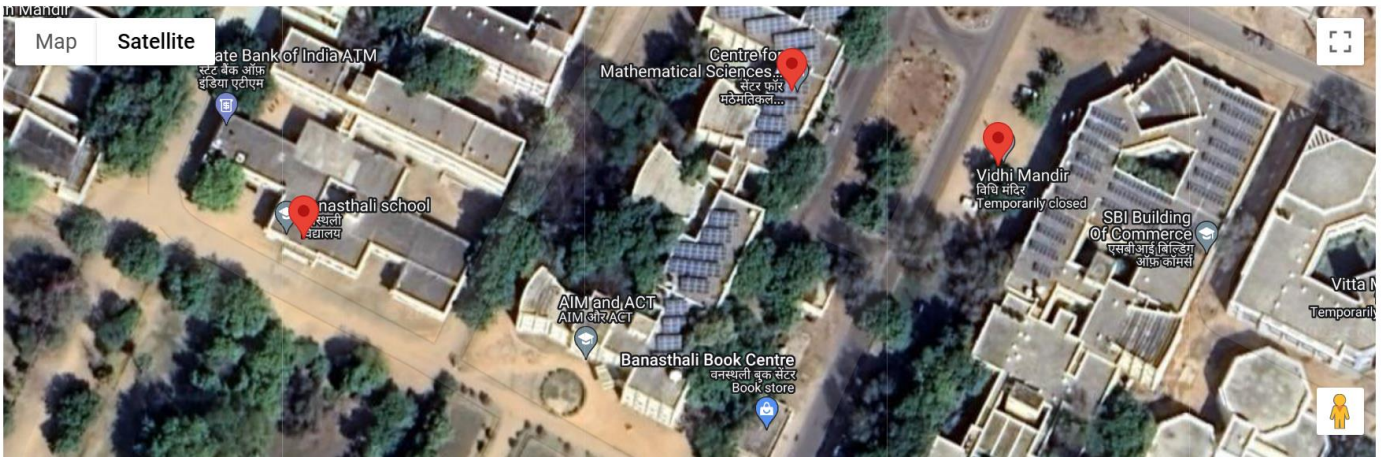
Shri Shanta Sanjavnam | Aim and Act | Get Directions

Shortest path: 0.709 km



Apply Visit Logout

Select Starting Place | Select Destination Place | Get Directions



CHAPTER-3

CODING

1. Login Page

```
<body>
   <div class="box">
      <h2>Log in</h2>
      <p>Use a Google account</p>
      <form action="" method="POST">
         <div class="inputBox">
            <input type="email" name="email" required value=""
onkeyup="this.setAttribute('value',this.value); ">
            <label for="email">E-mail address</label>
         </div>
         <div class="inputBox">
            <input type="password" name="password" required value=""
               onkeyup="this.setAttribute('value',this.value); ">
            <label for="password">Password</label>
         </div>

         <input type="submit" name="Log-in" value="LogIn">
      </form>
      <div class="SignUp">
         New here?
         <a href="http://127.0.0.1:7000/"><input type="button" name="Sign-Up" value="Sign Up"></a>
      </div>
   </div>
</body>
```

2. Sign-up Page

```
<body>
   <div class="main">
      <table>
         <tr>
            <td align="center">
```

```
            <form action="" method="POST">
                <div class="head">
                    <img src="images/googlelogo.png" alt="" class="logo">
                    <h3>Create a New Account</h3>
                </div>
                <div class="name">
                    <input type="text" id="name" name="name" required>
                    <label>User name</label>
                    <a class="line1">You can use letters & numbers.</a>
                    <div id="uname"></div>
                </div>

                <div class="user-name">
                    <input type="email" id="email" name="email" required>
                    <label>Enter your email id</label>
                </div>

                <div class="pass">
                    <input type="password" class="password" name="password" id="pass1" required>
                    <label>Password</label>
                    <div id="pas"></div>
                </div>
                <div class="pass">
                    <input type="password" class="password" name="cpassword" id="pass2" required>
                    <label>Confirm</label>
                </div>
                <a class="line3">Use 8 or more characters with a mix of letters, numbers & symbols</a>
                <a href="http://127.0.0.1:5000/" class="line4">Login instead</a>
                <input type="submit" value="Create Account">
            </form>
        </td>
    </tr>
</table>

</div>
```

3. Home Page

```
<script
src="https://maps.googleapis.com/maps/api/js?key=AIzaSyAJhVe0mFhRdUNqibCNRBaSTgcZi4Wey6M&callback=initMap"
    async defer></script>

  <script>

    var map;

    var directionsService;

    var directionsDisplay;


    function initMap() {

      // Create a map object

      map = new google.maps.Map(document.getElementById('map'), {

        center: { lat: 26.40456027309141, lng: 75.87186878147038 }, // Set default latitude and longitude

        zoom: 16

      });


      // Create a directions service object

      directionsService = new google.maps.DirectionsService();

      directionsDisplay = new google.maps.DirectionsRenderer();
```

```
directionsDisplay.setMap(map);

// Add event listener to the "Get Directions" button
document.getElementById('getDirectionsBtn').addEventListener('click', function () {
    calculateAndDisplayRoute();
});
var markers = [
    {
        title: 'School of Nursing',
        position: { lat: 26.4009125, lng: 75.8789531 },
        content: 'School of Nursing'
    },
    {
        title: 'Prabha Mandir',
        position: { lat: 26.4014875, lng: 75.8774844 },
        content: 'Prabha Mandir'
    },
……..
```

```
markers.forEach(function (markerData) {
            var marker = new google.maps.Marker({
               position: markerData.position,
               map: map,
               title: markerData.title
            });

            var infoWindow = new google.maps.InfoWindow({
               content: markerData.content
            });

            marker.addListener('click', function () {
               infoWindow.open(map, marker);
            });
         });
      }

      function calculateAndDisplayRoute() {
         var start = document.getElementById('start').value;  // Get start address from input
         //     selectElement = document.querySelector('#start');
```

```
// var start = selectElement.value;
var end = document.getElementById('end').value; // Get end address from input

var request = {
    origin: start,
    destination: end,
    travelMode: 'DRIVING' // You can change the travel mode as needed
};

directionsService.route(request, function (result, status) {
    if (status == 'OK') {
        directionsDisplay.setDirections(result);
        var shortestPath = 0;
        var legs = result.routes[0].legs;
        for (var i = 0; i < legs.length; i++) {
            shortestPath += legs[i].distance.value;
        }
        shortestPath /= 1000; // Convert distance to kilometers
        document.getElementById("output").innerHTML = "Shortest path: " + shortestPath + " km";
```

```
            } else {

                alert('Directions request failed due to ' + status);

            }

        });

    }

</script>
```

4. Building connection with database

```
var mysql = require("mysql");

var con = mysql.createConnection({
    host: "localhost",
    user: "root",
    password: "Juhi@07verma",
    database: "banasthalimap"
});

module.exports = con;
```

5. Deploying webpages to port

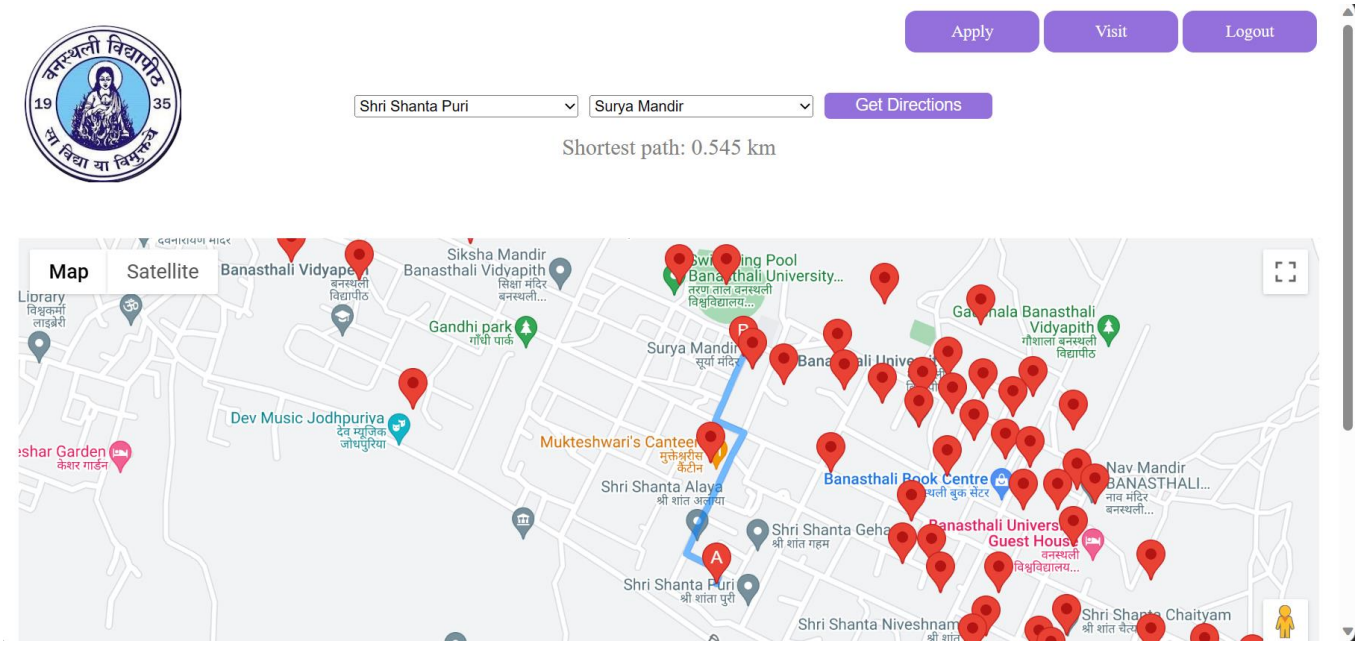
```
var con = require("./connection ");

var express = require('express');
var app = express();

var bodyParser = require('body-parser');
```

```
app.use(bodyParser.json());
app.use(express.json());

app.use(bodyParser.urlencoded({extended:true}));

app.get('/',function(req,res){
   res.sendFile(__dirname+'/signup_page.html');
});

app.post('/',function(req,res){
   var name = req.body.name;
   var email = req.body.email;
   var password = req.body.password;
   var cpassword = req.body.cpassword;

   con.connect(function(error){
      if (error) throw error;

      var sql = "INSERT INTO registerdb(Uname,email,password,cpassword) VALUES (?,?,?,?)";

      con.query(sql,[name,email,password,cpassword], function(error,result){
         if (error) throw error;

         // res.send("Successfully registered!");
         res.redirect("http://127.0.0.1:5000/");
      });
   });
});
app.listen(7000,function(error){
   if (error) throw error;
});
```

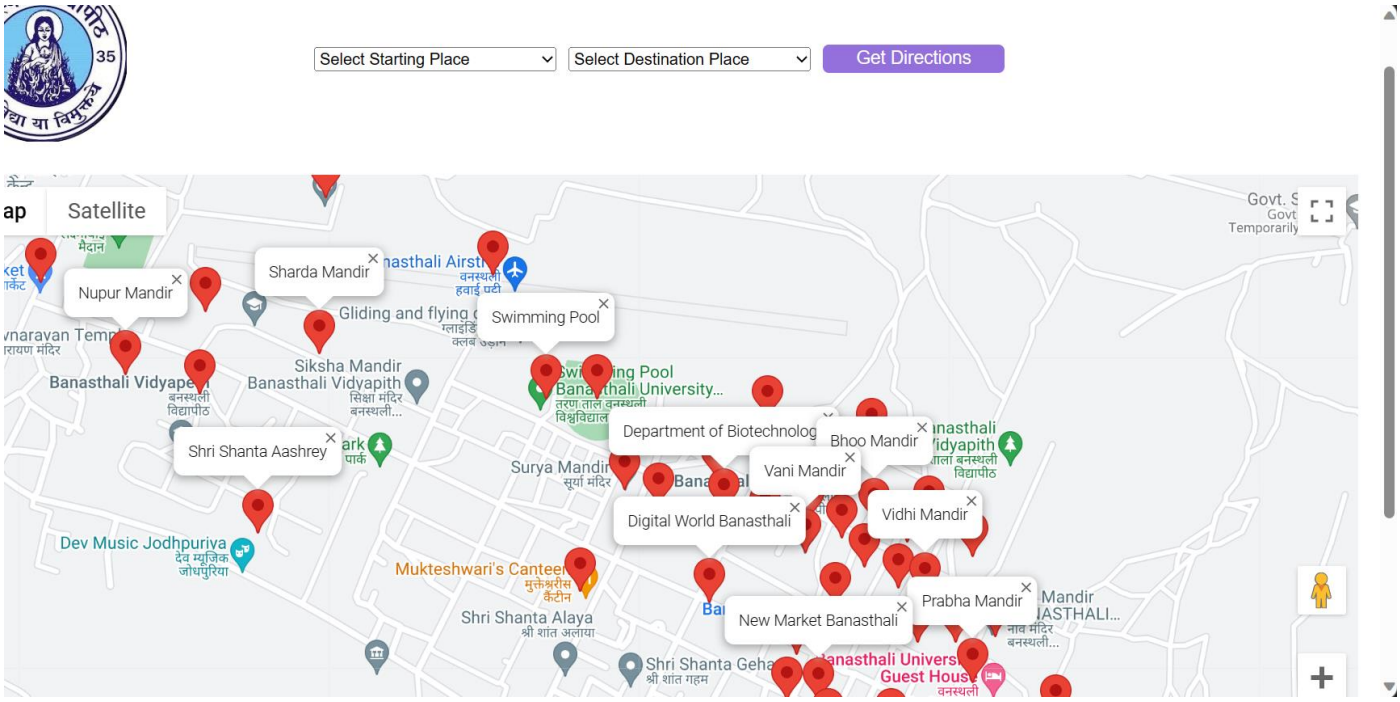
CHAPTER-4

TEST CASES

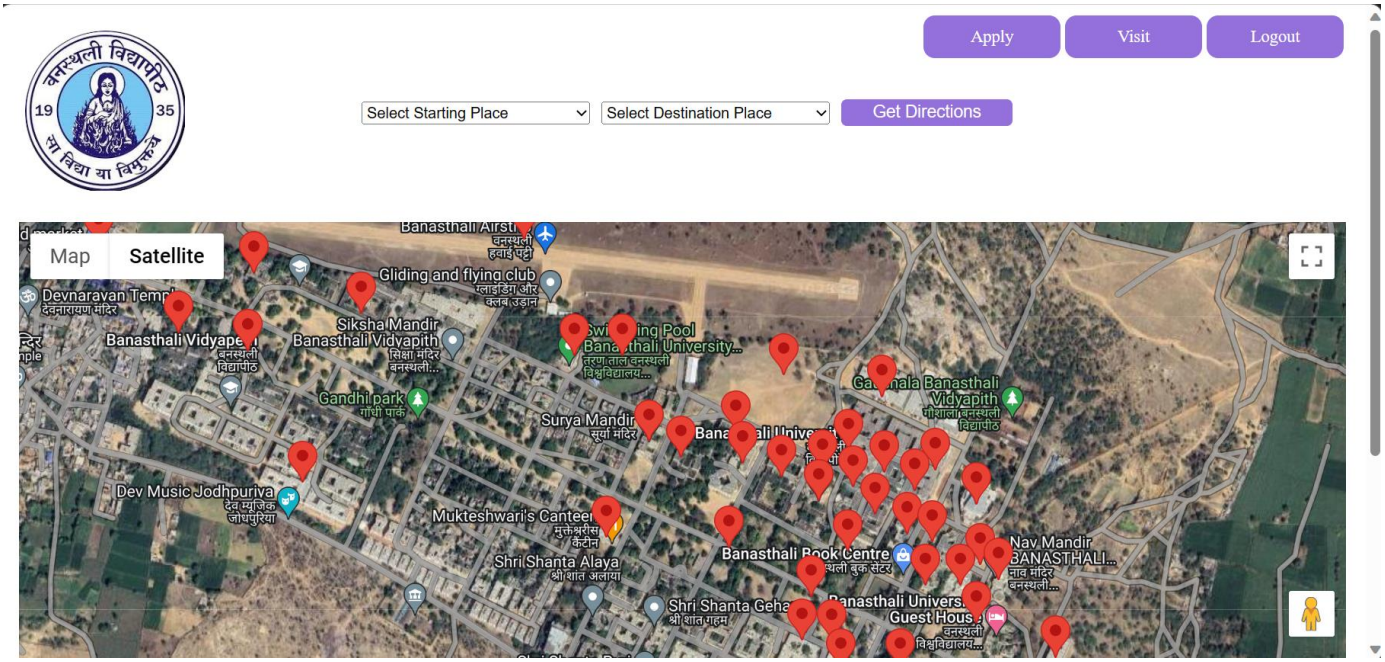
1. Optimal Path and Distance



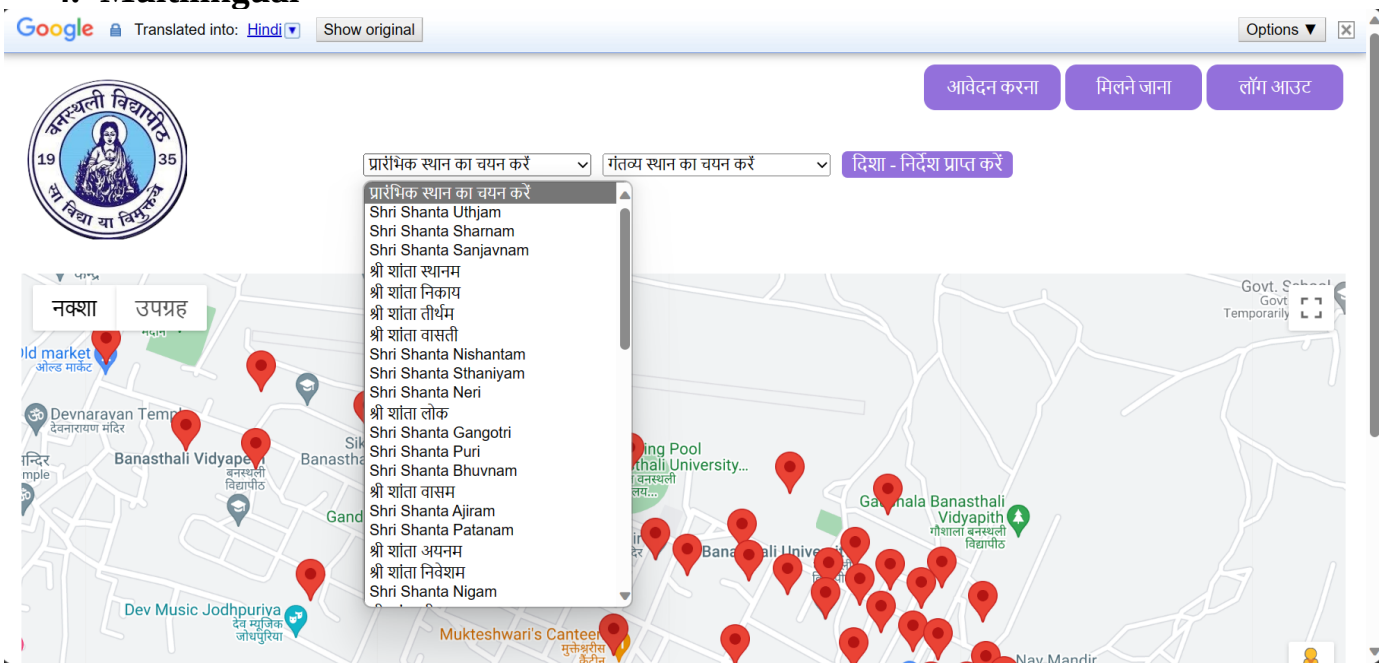
2. Markers



3. Satellite View



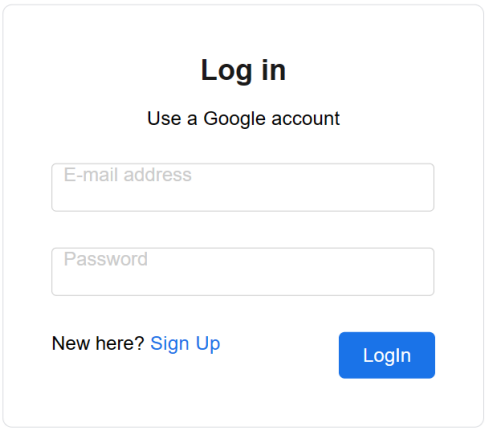
4. Multilingual



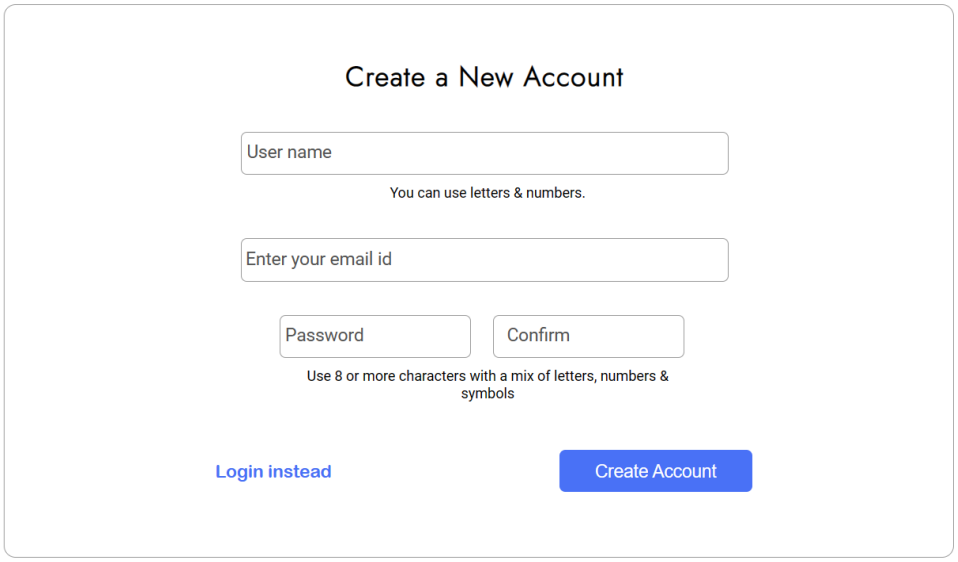
CHAPTER-5

USER INTERFACE

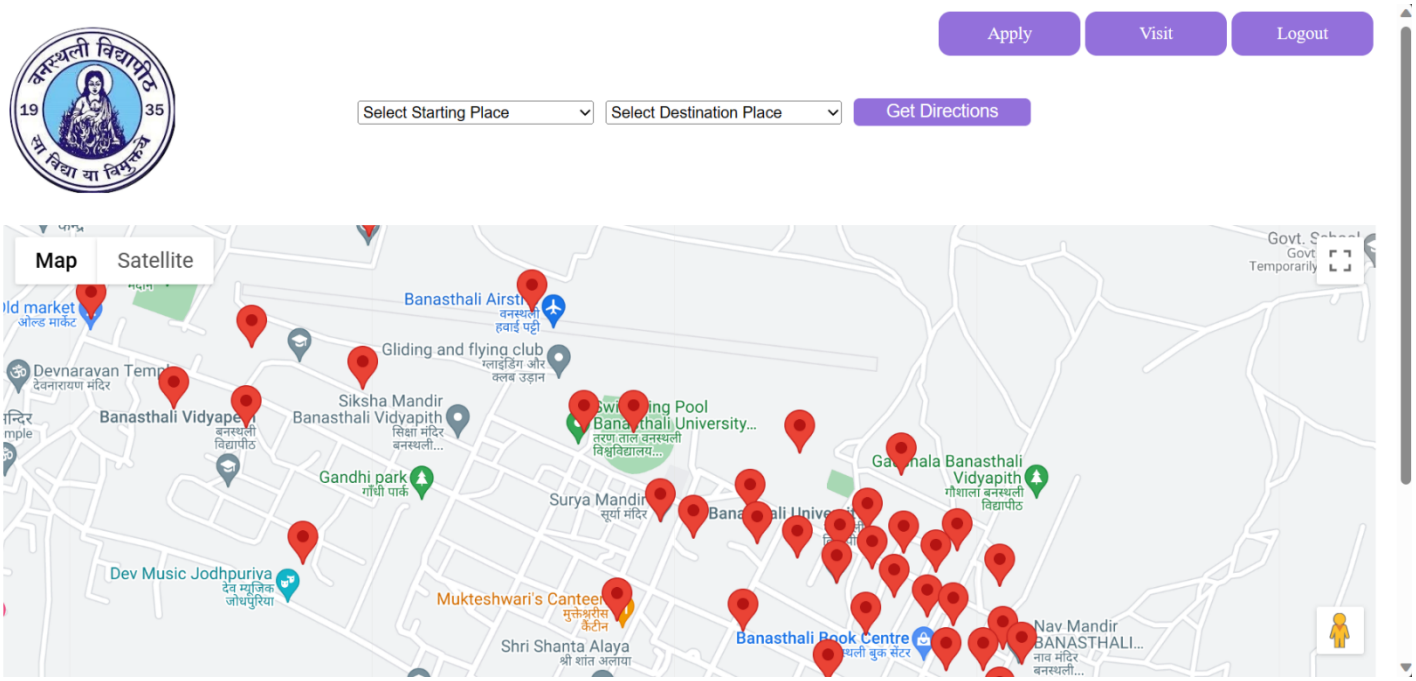
1. LOGIN PAGE

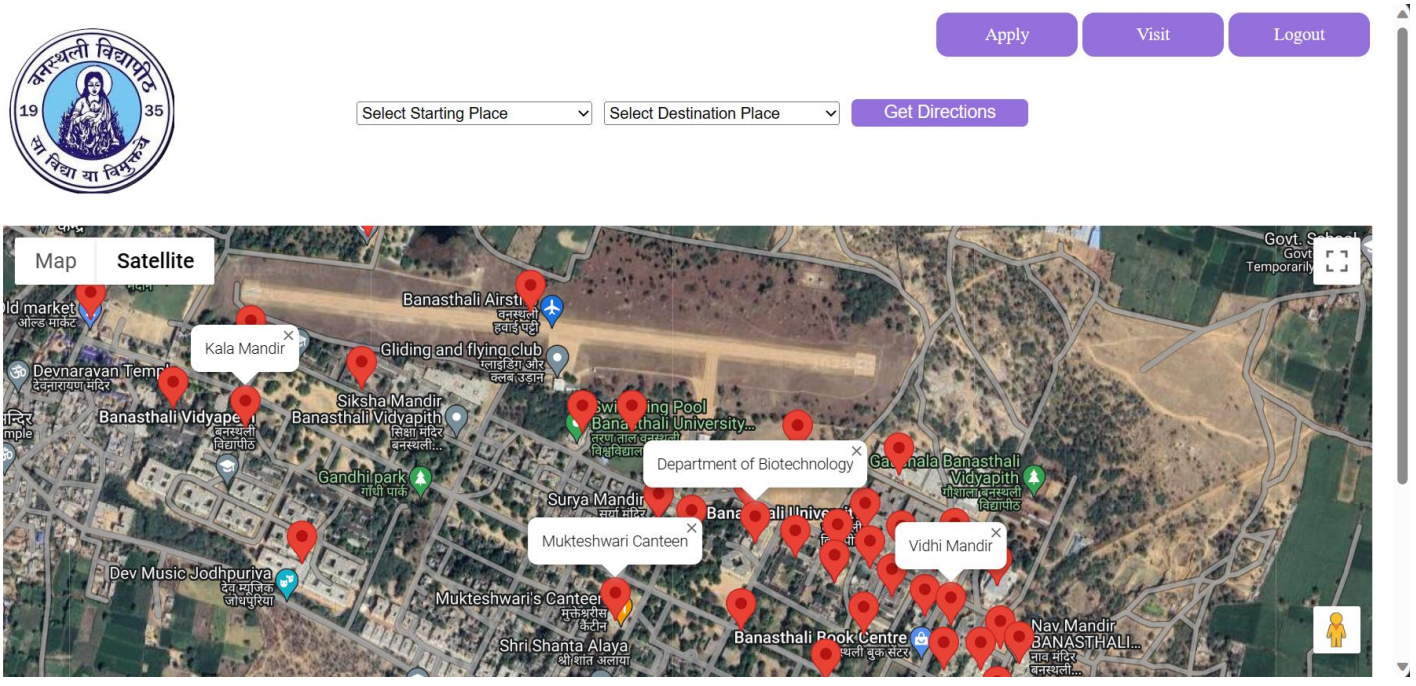


2. SIGN-UP PAGE



3. HOME PAGE

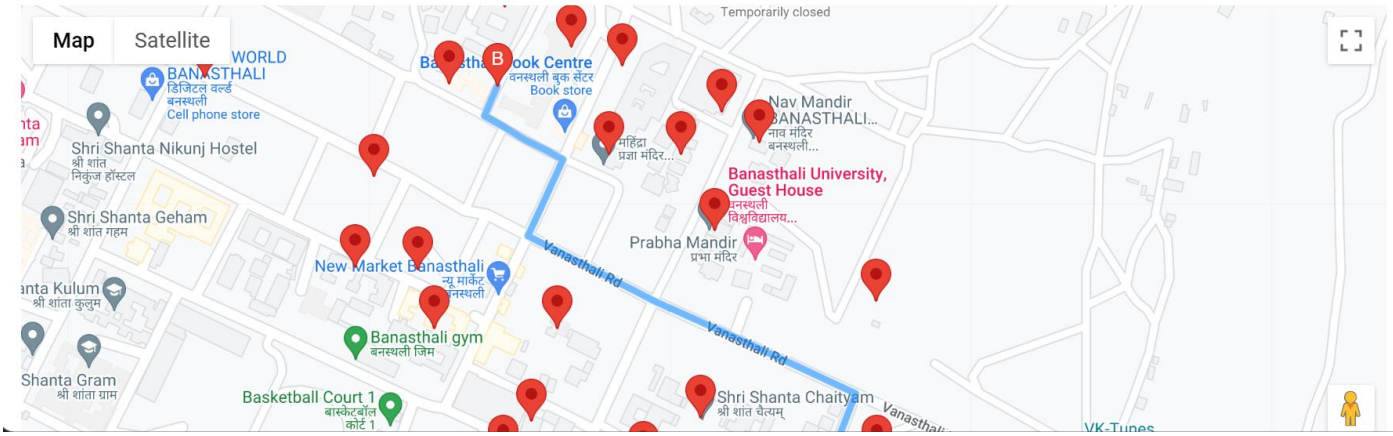

Apply
Visit
Logout
Select Starting Place
Select Destination Place
Get Directions
Map
Satellite
Banasthali Airstr
Gliding and flying club
Devnaravan Temp
Banasthali Vidyape
Siksha Mandir
Banasthali Vidyapith
Gandhi park
Surya Mandir
Dev Music Jodhpuriya
Mukteshwari's Canteen
Shri Shanta Alaya
Banasthali Book Centre
Nav Mandir
BANASTHALI...


Apply
Visit
Logout
Select Starting Place
Select Destination Place
Get Directions
Map
Satellite
Kala Mandir
Department of Biotechnology
Mukteshwari Canteen
Vidhi Mandir
Banasthali Airstr
Gliding and flying club
Devnaravan Temp
Banasthali Vidyape
Siksha Mandir
Banasthali Vidyapith
Gandhi park
Surya Mandir
Dev Music Jodhpuriya
Mukteshwari's Canteen
Shri Shanta Alaya
Banasthali Book Centre
Nav Mandir
BANASTHALI...

Apply Visit Logout

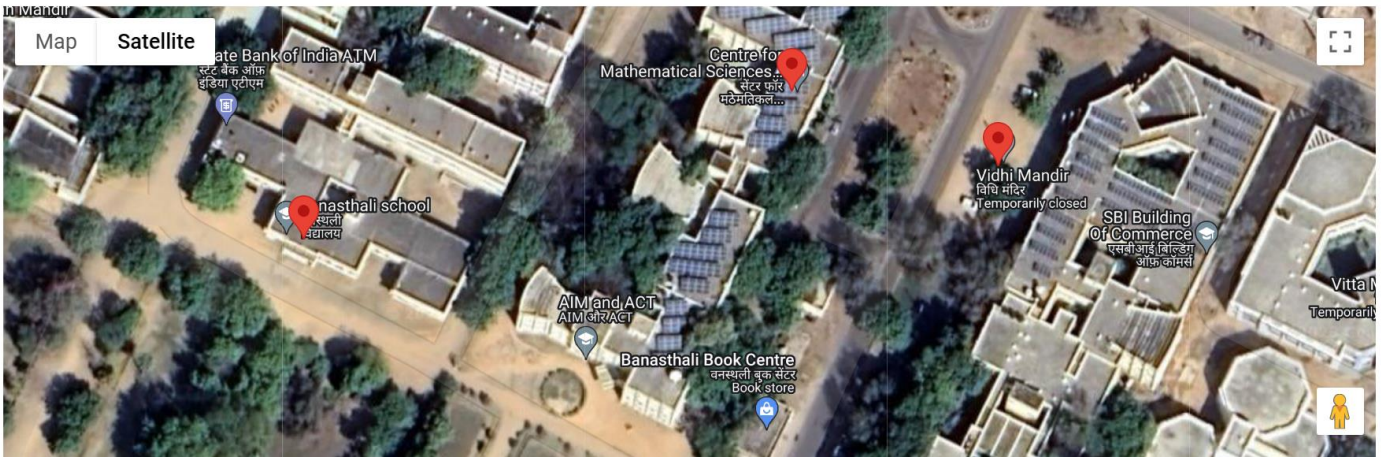
Shri Shanta Sanjavnam | Aim and Act | Get Directions

Shortest path: 0.709 km



Apply Visit Logout

Select Starting Place | Select Destination Place | Get Directions



REFERENCES

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* https://youtu.be/tAVv4hyNrfo