A yellow and black striped sign

Description automatically generatedSAFE-CROSS

“Empowering pedestrians through voice-guided navigation”

**INTRODUCTION**

The Accessible Safe Crossing App project aims to improve the safety and mobility of urban pedestrians, especially those with impaired vision or limited mobility. By using comprehensive user research, advanced technology, and real-time data integration, the app will offer essential features such as GPS-based location detection, route planning, voice guidance, and real-time traffic updates. This project aims to fill the important need for accessible navigation tools, ensuring that all pedestrians can travel through urban areas safely and confidently!

**THE PROBLEM STATEMENT**

In urban areas, pedestrians, especially those with impaired mobility, encounter significant safety obstacles due to the absence of accessible crossing apps. Existing pedestrian crossing apps often lack essential features like audio cues, vibration alerts, and detailed, accessible maps. This technology gap, coupled with the absence of real-time traffic data integration, heightens the risk of accidents for these individuals. Addressing these challenges requires improvements in urban infrastructure, the development of inclusive technologies, and rigorous enforcement of accessibility standards.

**PROPOSED SOLUTION**

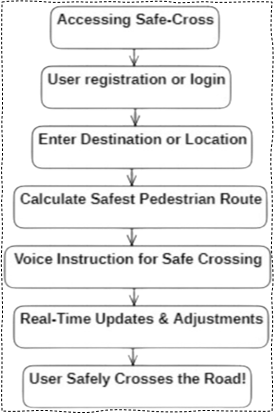
In order to create a user-friendly and secure pedestrian crossing app designed for urban areas, with a focus on individuals with impaired or limited mobility, the process commences with in-depth process user research using surveys, interviews, and observations to comprehend their specific requirements and obstacles.

Subsequently, the requirements and features of the application are established based on this research, ensuring that they offer effective solutions such as audio cues, vibration alerts, and accessible maps. Following this, a prototype design is developed to visualize the app’s layout, navigation flow, and key features, allowing for feedback and refinements.

The technology selection process involves selecting an appropriate technology stack that supports the app's functionality and accessibility requirements. During the development phase, crucial functionalities such as GPS-based location detection, route planning, and voice guidance are integrated and thoroughly tested.

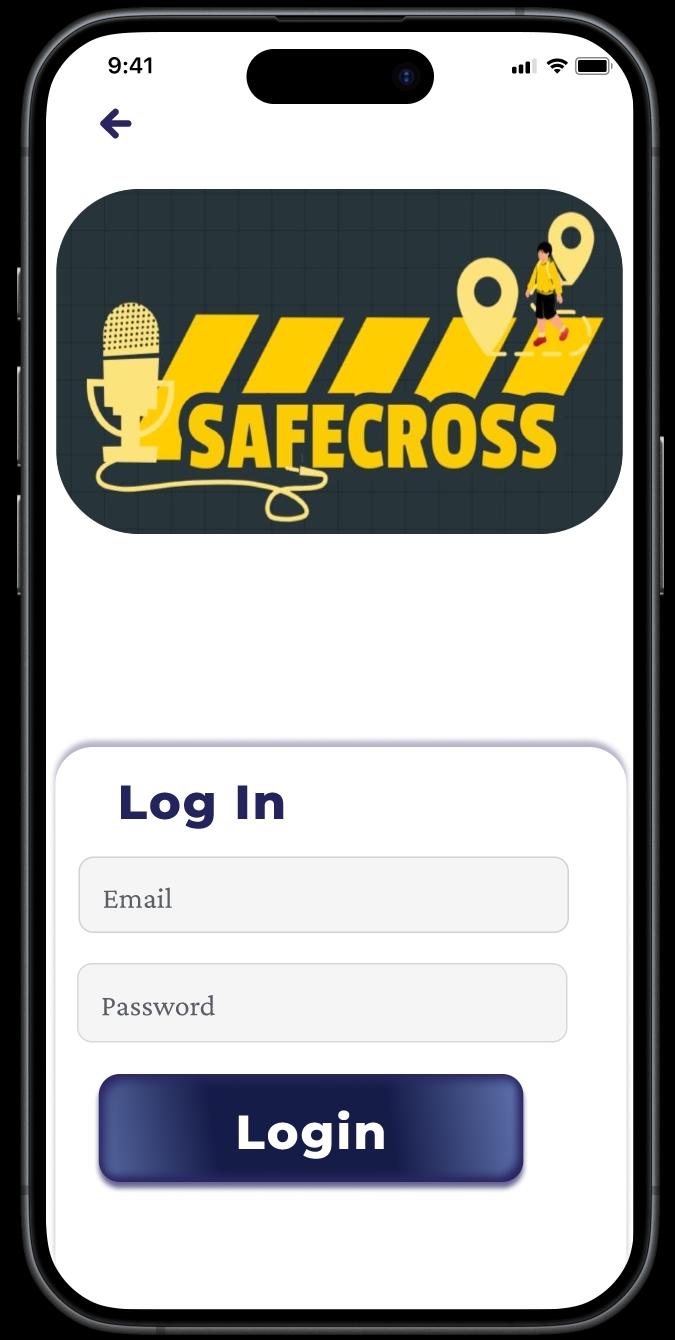
Real-time integration includes the incorporation of APIs for traffic updates and pedestrian signals to provide accurate and up-to-date information. The launch and deployment phase encompasses optimizing performance, implementing robust security measures, and ensuring compliance with app store guidelines for public access.

Finally, continuous improvements are made by monitoring user feedback and app performance post-launch, enabling ongoing enhancements and updates.

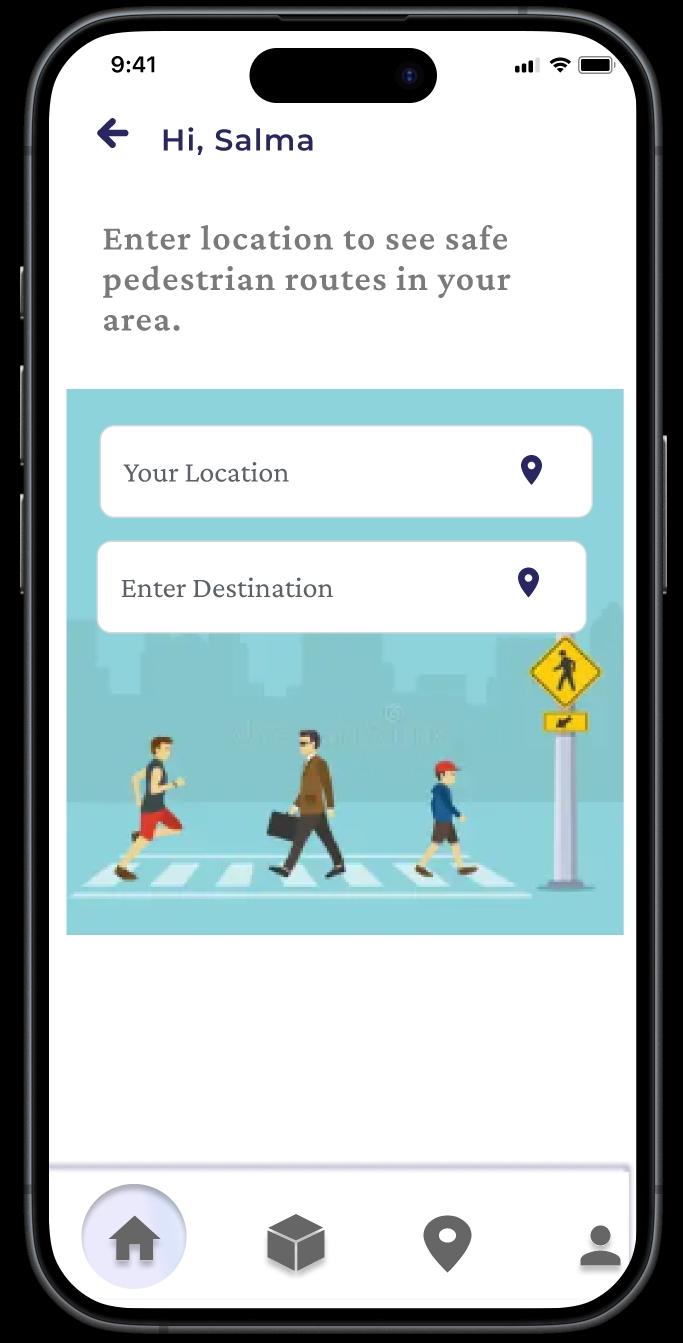
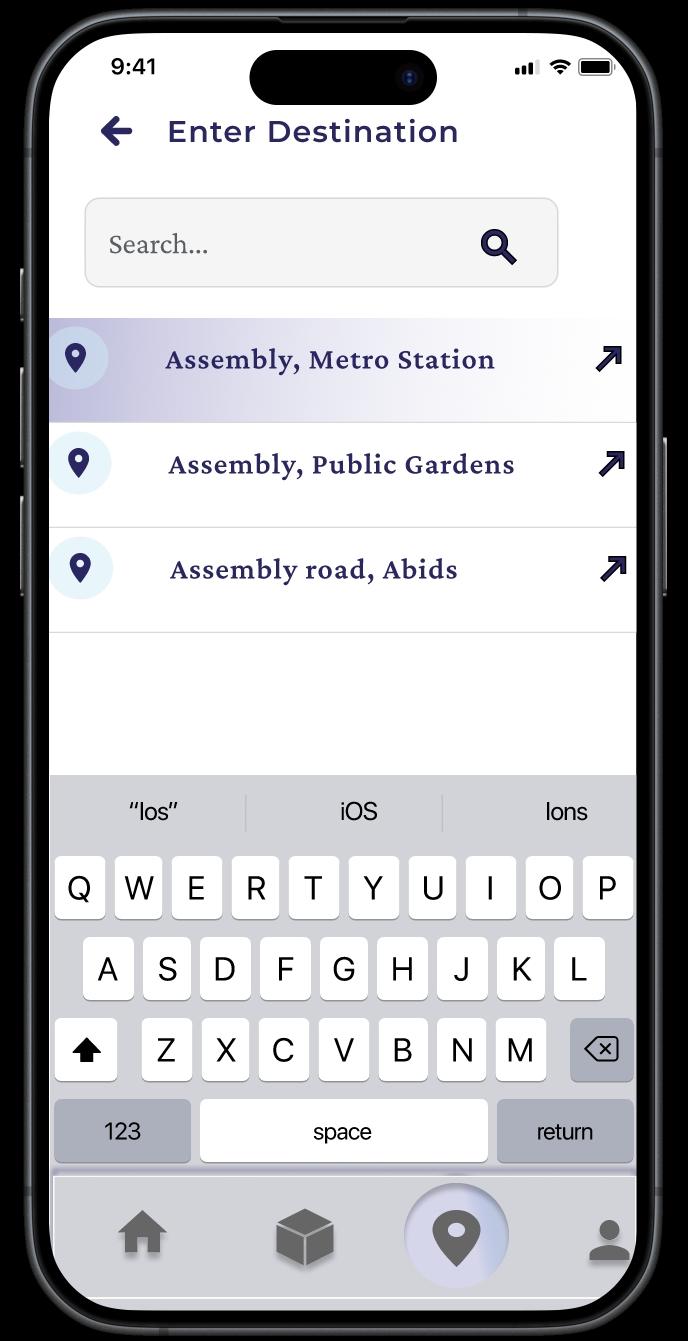


**FLOW OF THE PROJECT**

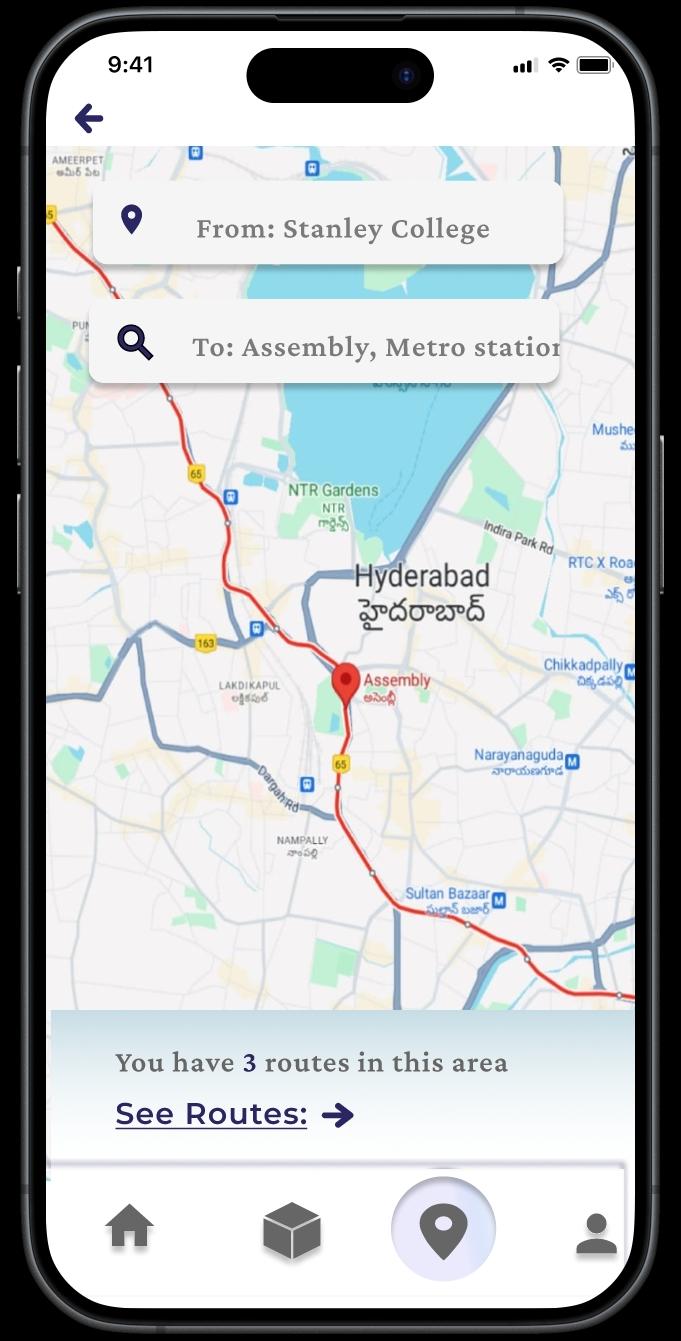
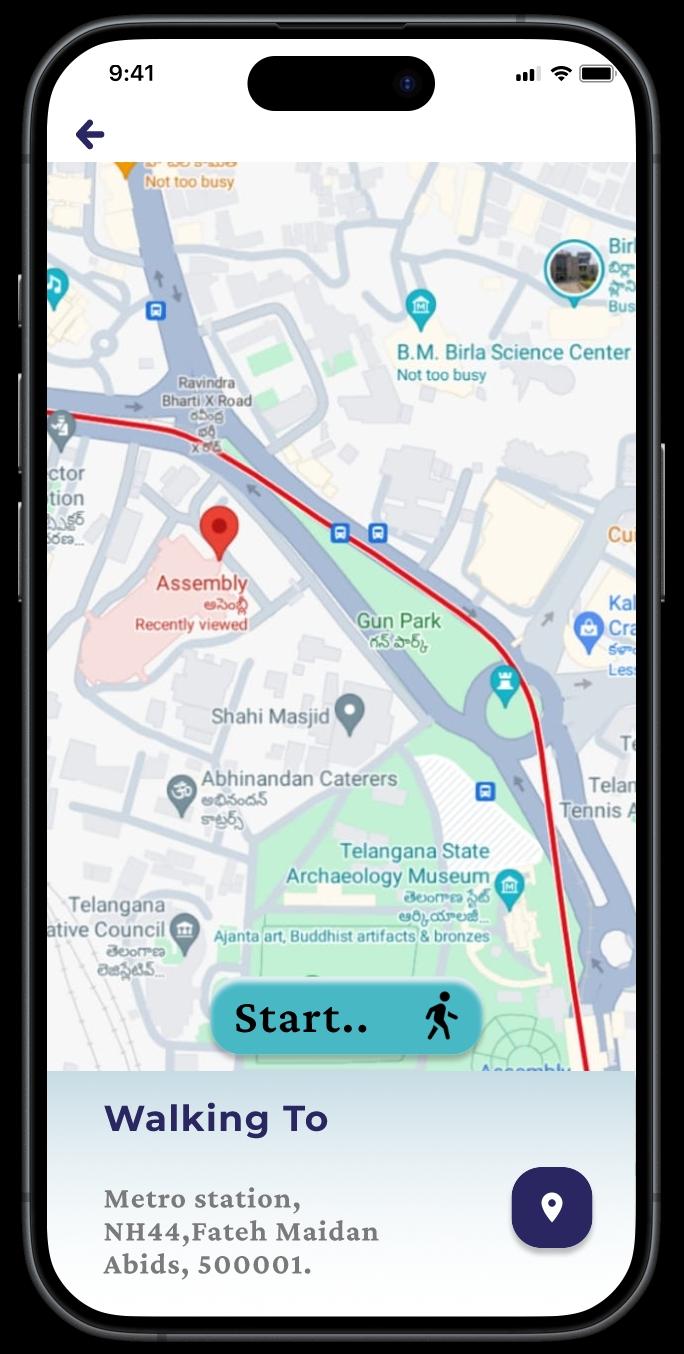
**1ST PAGE: The SafeCross App 2ND PAGE: Login Page**

** **

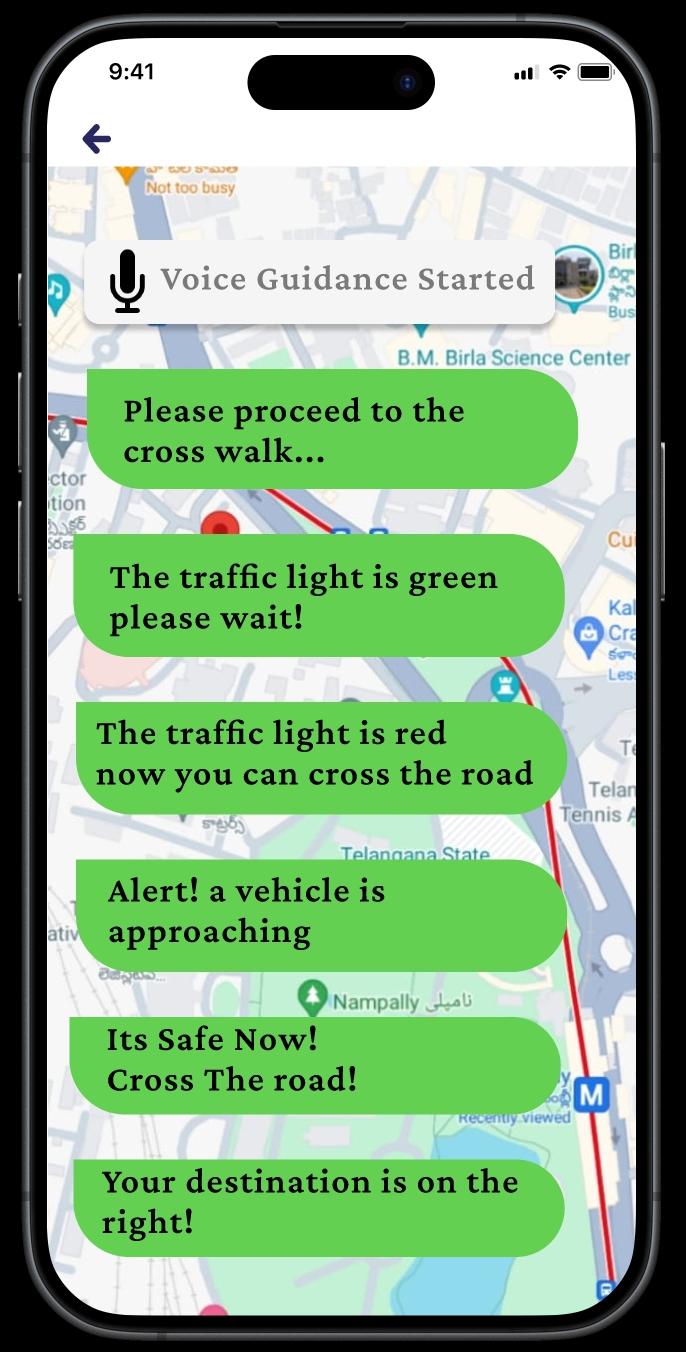
**3RD PAGE: Home Page 4TH PAGE: Destination Input**

**5TH PAGE: Search Results 6TH PAGE: Navigating route**

**7TH PAGE: Voice Guidance 8TH PAGE: Successful Crossing!**

**THE VIDEO EXPLANATION**



**THE SOURCE CODE**

The coding part used to create the prototype including the voice guidance:

HTML CODE:

<!DOCTYPE html>

<html lang="en">

<head>

    <meta charset="UTF-8">

    <meta name="viewport" content="width=device-width, initial-scale=1.0">

    <title>SafeCross</title>

    <link rel="stylesheet" href="styles.css">

</head>

<body>

    <div id="app">

        <div id="login-register">

            <img src="logo.png" alt="SafeCross Logo" id="logo">

            <h2 id="formTitle">Login</h2>

            <form id="loginForm" action="/login" method="POST">

                <input type="email" id="email" name="email" placeholder="Email" required>

                <input type="password" id="password" name="password" placeholder="Password" required>

                <button type="submit" id="loginBtn">Login</button>

                <p>Don't have an account? <a href="#" id="toggleForm">Register here</a></p>

            </form>

            <form id="registerForm" style="display:none;" action="/register" method="POST">

                <input type="email" id="regEmail" name="email" placeholder="Email" required>

                <input type="password" id="regPassword" name="password" placeholder="Password" required>

                <input type="password" id="confirmPassword" name="confirmPassword" placeholder="Confirm Password" required>

                <button type="submit" id="registerBtn">Register</button>

                <p>Already have an account? <a href="#" id="toggleForm">Login here</a></p>

            </form>

        </div>

        <div id="mainApp" style="display:none;">

            <h1>SafeCross</h1>

            <button id="startVoice">Start Voice Guidance</button>

            <div id="instructions"></div>

            <div id="map"></div>

            <div id="trafficData"></div>

        </div>

    </div>

    <script src="https://maps.googleapis.com/maps/api/js?key=AIzaSyCstVESJFxmRLx31mo5DcDGZV0CO61keSo&libraries=places"></script>

    <script src="app.js"></script>

</body>

</html>

CSS CODE:

body {

    font-family: Arial, sans-serif;

    display: flex;

    justify-content: center;

    align-items: center;

    height: 100vh;

    margin: 0;

    background-color: #f0f2f5;

}

#app {

    background: white;

    padding: 30px;

    border-radius: 10px;

    box-shadow: 0 0 20px rgba(0, 0, 0, 0.1);

    width: 550px;

    text-align: center;

}

#logo {

    max-width: 100%;

    width: 150px;

    height: auto;

    margin-bottom: 20px;

}

h2 {

    color: #333;

    margin-bottom: 20px;

    font-weight: normal;

}

form {

    margin-bottom: 20px;

}

input {

    display: block;

    width: calc(100% - 20px);

    padding: 10px;

    margin: 10px auto;

    border: 1px solid #ccc;

    border-radius: 5px;

    font-size: 16px;

}

button {

    width: 100%;

    padding: 10px;

    border: none;

    background: #f0cf17;

    color: rgb(7, 7, 7);

    border-radius: 5px;

    cursor: pointer;

    font-size: 16px;

    transition: background 0.3s;

}

button:hover {

    background: #f0cf17;

}

#mainApp {

    text-align: center;

}

#map {

    width: 100%;

    height: 400px;

    margin-top: 20px;

    border-radius: 5px;

    overflow: hidden;

}

#trafficData {

    margin-top: 20px;

    font-size: 14px;

    color: #333;

    background: #f9f9f9;

    padding: 10px;

    border-radius: 5px;

    box-shadow: 0 0 10px rgba(0, 0, 0, 0.1);

}

JAVASCRIPT CODE:

document.addEventListener('DOMContentLoaded', function() {

    const loginForm = document.getElementById('loginForm');

    const registerForm = document.getElementById('registerForm');

    const formTitle = document.getElementById('formTitle');

    const toggleFormLinks = document.querySelectorAll('#toggleForm');

    // Function to toggle between login and registration forms

    function toggleForms() {

        loginForm.style.display = loginForm.style.display === 'none' ? 'block' : 'none';

        registerForm.style.display = registerForm.style.display === 'none' ? 'block' : 'none';

        const title = loginForm.style.display === 'none' ? 'Register' : 'Login';

        formTitle.textContent = title;

        return false; // Prevent default behavior of anchor tag

    }

    // Event listener for form toggling

    toggleFormLinks.forEach(link => {

        link.addEventListener('click', toggleForms);

    });

    // Login form submission

    loginForm.addEventListener('submit', function(e) {

        e.preventDefault();

        const email = document.getElementById('email').value;

        const password = document.getElementById('password').value;

        if (email && password) {

            alert('You are successfully logged in.');

            document.getElementById('login-register').style.display = 'none';

            document.getElementById('mainApp').style.display = 'block';

            initMap();

        } else {

            alert('Please enter valid credentials.');

        }

    });

    // Registration form submission

    registerForm.addEventListener('submit', function(e) {

        e.preventDefault();

        const regEmail = document.getElementById('regEmail').value;

        const regPassword = document.getElementById('regPassword').value;

        const confirmPassword = document.getElementById('confirmPassword').value;

        if (regEmail && regPassword && confirmPassword && regPassword === confirmPassword) {

            alert('You are successfully registered and logged in.');

            document.getElementById('login-register').style.display = 'none';

            document.getElementById('mainApp').style.display = 'block';

            initMap();

        } else {

            alert('Please enter valid credentials and ensure password match.');

        }

    });

});

document.getElementById('startVoice').addEventListener('click', function() {

    const instructions = document.getElementById('instructions');

    fetchTrafficData();

    instructions.innerHTML = 'Voice guidance started... <br> "Please proceed to the Zebra-Crossing."';

    speak("Voice guidance started. Please proceed to the Zebra-Crossing.");

    setTimeout(() => {

        const message = "Traffic light is red, you can cross the road now.";

        instructions.innerHTML += "Traffic light is red, you can cross the road now." ;

        speak(message);

    }, 5000);

    setTimeout(() => {

        const message = "Traffic light is green, please wait.";

        instructions.innerHTML +=  "Traffic light is green, please wait.";

        speak(message);

    }, 10000);

});

function speak(text) {

    const speechSynthesis = window.speechSynthesis;

    const utterance = new SpeechSynthesisUtterance(text);

    speechSynthesis.speak(utterance);

}

function initMap() {

    const mapOptions = {

        zoom: 15,

        center: { lat: 40.748817, lng: -73.985428 },

        mapTypeId: 'roadmap'

    };

    const map = new google.maps.Map(document.getElementById('map'), mapOptions);

    const trafficLayer = new google.maps.TrafficLayer();

    trafficLayer.setMap(map);

}

function fetchTrafficData() {

    const trafficData = document.getElementById('trafficData');

    trafficData.innerHTML = 'Fetching real-time traffic data...';

    // Simulating fetching traffic data

    setTimeout(() => {

        // Example data

        trafficData.innerHTML = `

            <strong>Real-time Traffic Data:</strong><br>

            Location: Hyderabad, HYD<br>

            Traffic Status: Moderate<br>

            Speed: 25 km/h<br>

        `;

    }, 2000);

}

SERVER CODE(Backend):

const express = require('express');

const bodyParser = require('body-parser');

const app = express();

const port = 3000; // You can change this port if needed

app.use(bodyParser.json());

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

// Serve static files (e.g., your HTML, CSS, and JavaScript files)

app.use(express.static('public'));

// Handle login endpoint

app.post('/login', (req, res) => {

    const { email, password } = req.body;

    // Check email and password (you can add your authentication logic here)

    if (email === 'user@example.com' && password === 'password') {

        res.json({ success: true, message: 'Login successful' });

    } else {

        res.status(401).json({ success: false, message: 'Invalid credentials' });

    }

});

// Handle registration endpoint

app.post('/register', (req, res) => {

    const { email, password } = req.body;

    // Check if email is unique and handle registration (you can add your logic here)

    res.json({ success: true, message: 'Registration successful' });

});

// Start the server

app.listen(port, () => {

    console.log(`Server running on port ${port}`);

});

**THANK YOU!**

“LET’S PAVE THE WAY FOR SAFER ROAD CROSSING!”



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| --- | --- | --- |
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