INTERN CAREER

WE SPEAK DATA

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Batch: Innovators-0524

Task No.: 02

Task: Geospatial Application Development

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Introduction

This geospatial web application named MapVault, serves as a comprehensive platform for geographic visualization and analysis. The homepage includes three main categories:

1. **Thematic Layered Maps**: Users can explore different map layers with GPS integration and search capabilities.
2. **Route Map Application**: This feature allows users to find and display the path between two locations using OpenStreetMap.
3. **Live Location Tracker**: Users can track their live location in real-time.

Features

- Interactive map with various layers
- GPS integration
- Search functionality
- Route mapping between two locations
- Live location tracking

System Requirements

- **Operating System:** Windows, macOS, or Linux
- **Web Browser:** Chrome, Firefox, Safari, or Edge

Installation Guide

1. Clone the repository:

```
git clone https://github.com/ManishJaagu/InternCareer_Geospatial-Data-Analysis_Task2_Geospatial-Application-Development.git
```

2. Navigate to the project directory:
   ```
   cd InternCareer_Geospatial-Data-Analysis_Task2_Geospatial-Application-Development
   ```

3. Install dependencies (if any):
   ```
   npm install
   ```

4. Start a local development server:
   ```
   npm start
   ```

5. Open the web browser and navigate to `http://localhost:3000` to view the application.

Usage Instructions

Thematic Layered Maps

1. Open the application and click the "Thematic Layered Maps" button.
2. Your Browser asks for your GPS location permission, press “allow”.
3. Use the search bar to find specific locations or map features at the top right corner.

4. Use Layer option in the top right corner to explore various map layers.

Route Map Application

1. Click the " Route Map Application " button on the home page.
2. Your Browser asks for your GPS location permission to marker your position as the starting point, press “allow”.
3. Mark your destination’s locations.
4. The application will display the route between the two points using OpenStreetMap and Leaflet Routing Machine Library.
5. A popup will display in the top right corner to show you navigations.

Live Location Tracker

1. Click the " Route Map Application " button on the home page.
2. Allow the application to access your location.
3. Your current location will be displayed and updated every 5 seconds in real-time on the map.

Code Overview

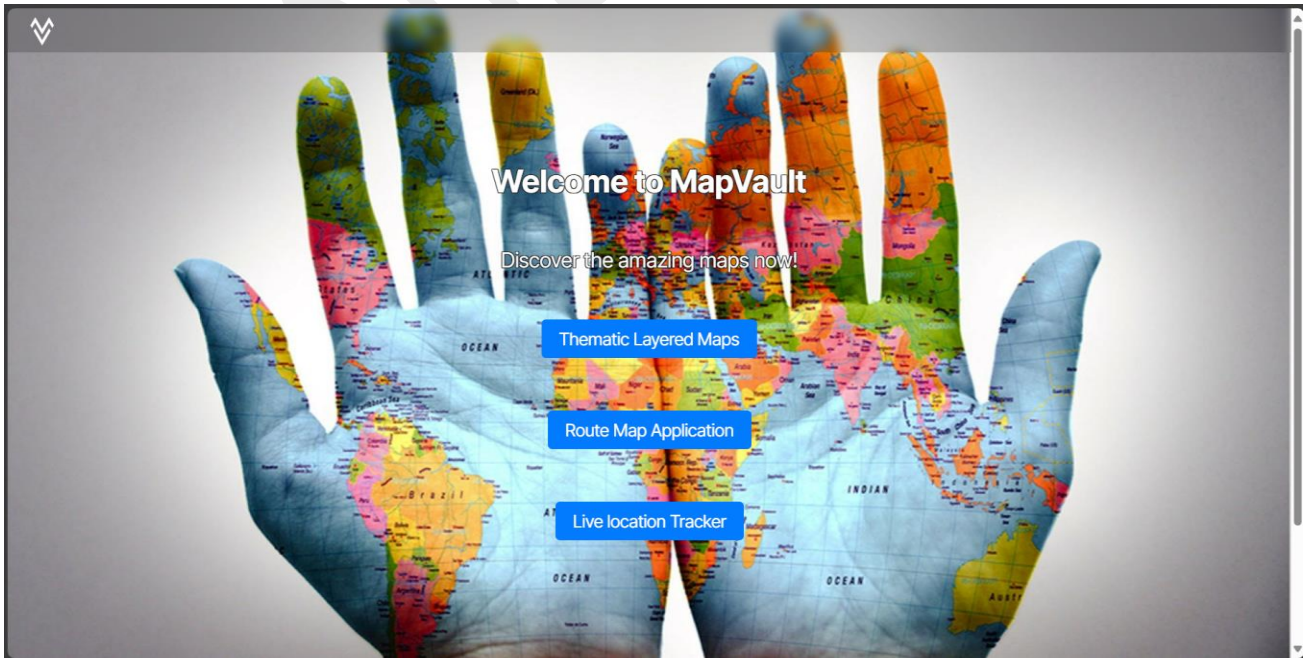
File Structure

- assets/
    - bg.jpg
    - car.png

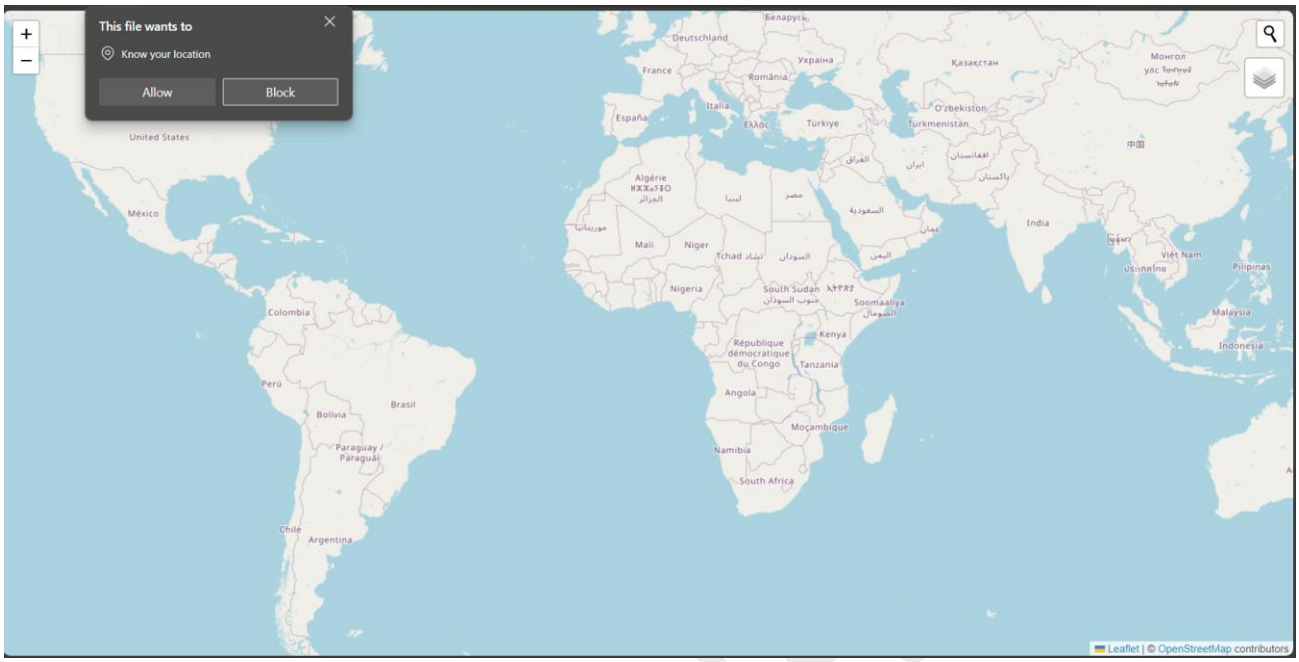
- marker.png
-mv_white.png
-mv3.png
- location_tracker.html
- route_app.html
- thematic_layers.html
- index.html
- styles.css

Project Overview:

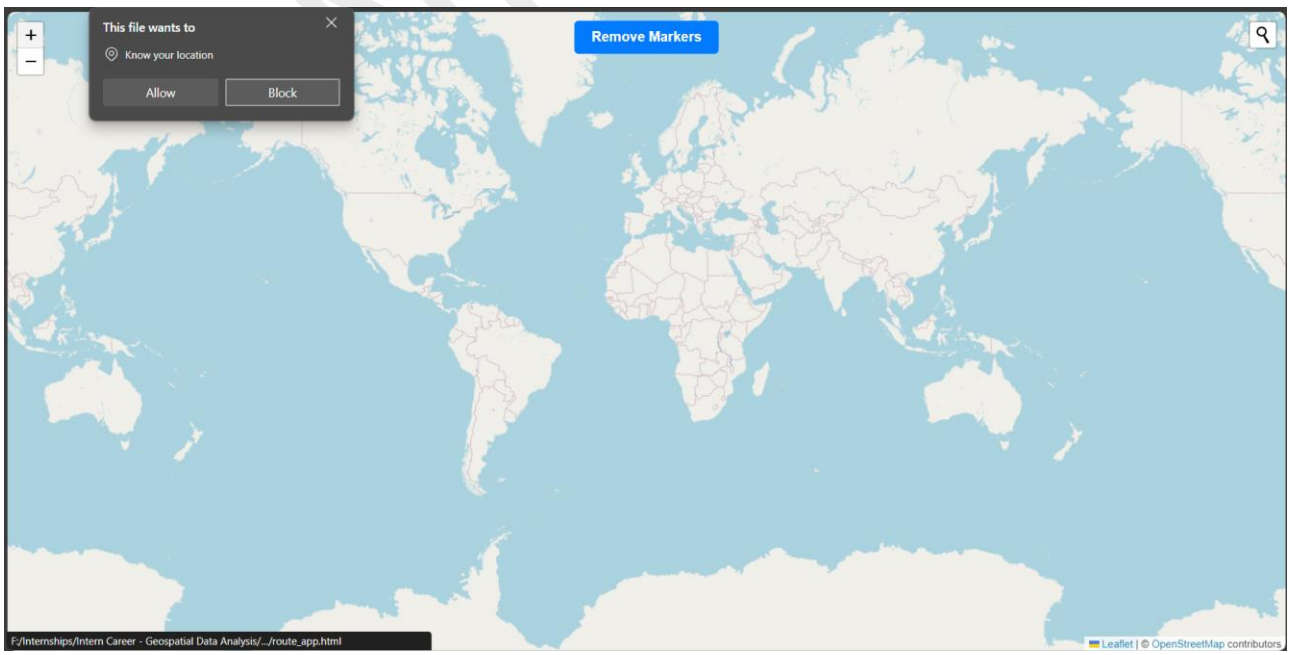
Home Screen:



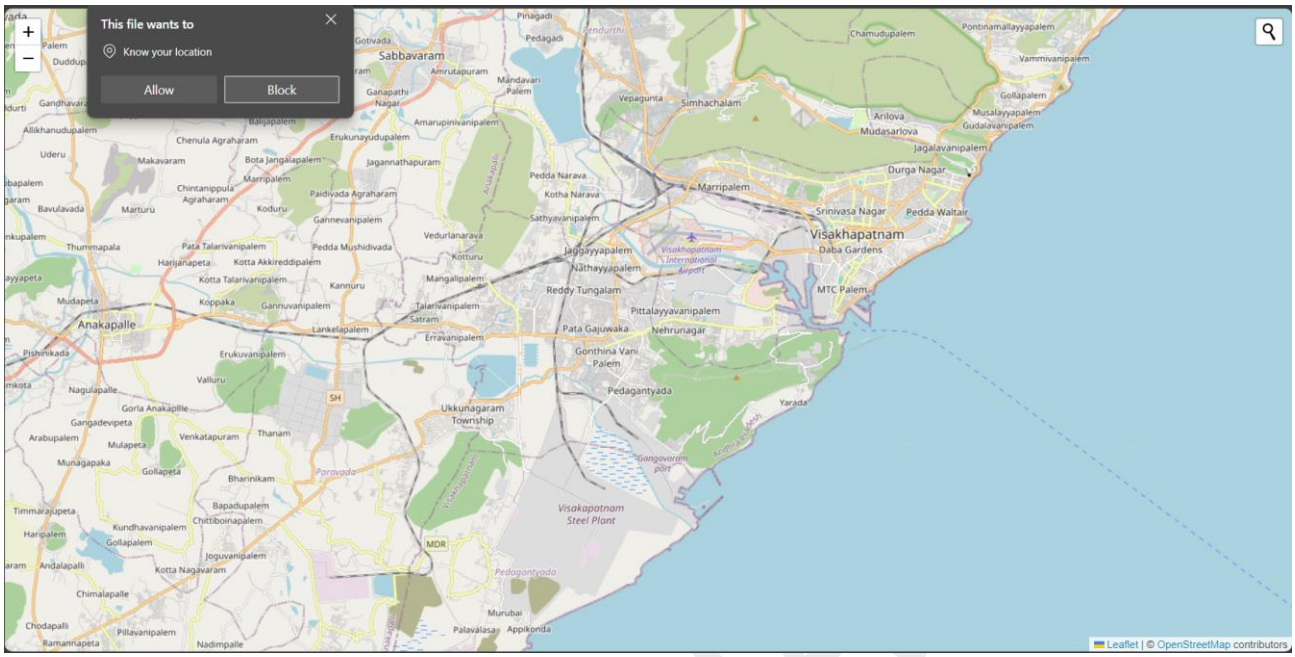
Thematic Layered Maps:



Route map Application:



Live Location Tracker:



Main Files

- **assets:** This folder contains images for the web application.
- **index.html:** The main HTML file that defines the structure of the web application. Acts as a navigational page to the other pages.
- **styles.css:** The main CSS file that contains styles for the web application.
- **location_tracker.html:** This file contains general structure, logic, and styles for the “Live Location Tracker” application.
- **route_app.html:** This file contains general structure, logic, and styles for the “Route Map” application.

- **thematic_layers.html**: This file contains general structure, logic, and styles for the “Route Map” application.

Data Sources

- **Leaflet**: A lightweight, open-source JavaScript library for interactive maps. It provides features like map layers, markers, popups, and more, making it easy to integrate and display custom geospatial data on web applications.

- **Leaflet Routing Machine:**
  Leaflet Routing Machine is a powerful plugin for Leaflet that adds routing functionality to your web map. It enables users to find and display routes between locations with ease.

- **Leaflet Geocoder**: Provides an easy way to add location search and geocoding functionality to Leaflet maps, allowing users to search for and display specific addresses or places on the map.

- **Google Tile Layers**: Offers various map types such as satellite and terrain through Google Maps API.

- **CartoDB**: Enables interactive and customizable maps with data visualization features.

Technical Details

- **Frontend**: HTML, CSS, JavaScript
- **Mapping Library**: Leaflet
- **Additional Libraries**: Leaflet Geocoder, Leaflet Routing Machine, Google Maps JavaScript API.

Troubleshooting

Issue: Map layers not displaying

- **Solution**: Verify data source connections and layer configurations in the source code.

Issue: Application fails to start

- **Solution**: Ensure all dependencies are installed correctly. Check the console for error messages and debug accordingly.

References:

- Leaflet: https://leafletjs.com/download.html
- Leaflet Routing Machine: https://github.com/perliedman/leaflet-routing-machine
- Leaflet Geocoder: https://github.com/perliedman/leaflet-control-geocoder
- Leaflet in Google Maps: https://stackoverflow.com/questions/33343881/leaflet-in-google-maps
- Leaflet providers: https://leaflet-extras.github.io/leaflet-providers/preview/
- CartoDB: https://openlayers.org/en/latest/examples/cartodb.html