

GIS Web Application - Final Project

Overview

For your final project, you will develop a full-stack GIS (Geographic Information System) web application using the MERN stack. This project will demonstrate your ability to integrate spatial data visualization and analysis with modern web development technologies.

Project Requirements

Core Components

1. MongoDB Database

- Store spatial data using GeoJSON format
- Implement at least two collections with geographic features
- Design appropriate schemas with geospatial indexes

2. Express.js Backend

- Develop RESTful API endpoints for spatial data operations
- Implement geospatial queries (e.g., proximity search, within boundary)

3. React Frontend

- Create an interactive map interface using Leaflet or OpenLayers
- Implement layer controls for toggling different spatial datasets
- Design responsive UI components for search, filtering, and data display

4. Node.js Server

- Configure server environment for handling geospatial operations
- Optimize performance for spatial data processing

Project Ideas (Choose One)

- **Community Resource Locator:** Map showing public resources with proximity search
- **Environmental Monitoring Dashboard:** Visualization of environmental data points
- **Real Estate Property Explorer:** Interactive property search with spatial filters
- **Transportation Analysis Tool:** Route planning and transit visualization
- **Disaster Management System:** Emergency response coordination and resource mapping

Technical Requirements

- Implement geospatial indexing in MongoDB
- Use React Hooks for state management
- Include at least one third-party mapping library (Leaflet/openlayers)
- Create at least three RESTful API endpoints for spatial operations

Deliverables

1. **Source Code**
 - GitHub repository with clear README
 - Well-structured project organization
2. **Presentation**
 - Demonstration of your application
 - **Date:** April 28th at the Webiks office

Resources

- [MongoDB Geospatial Documentation](#)
- [Leaflet Documentation](#)
- [Openlayers Documentation](#)
- [GeoJSON Specification](#)

Good luck!