# GeoFacts – World Explorer Dashboard

## Project Overview

GeoFacts is a fullstack, visually rich, and interactive web application that allows users to explore data about countries around the world using a dynamic map interface. The application combines various open APIs to deliver comprehensive insights into each selected country, including real-time weather, air quality, and currency exchange rates. Users can create accounts, track their travel history by marking countries as visited or wishlist, and take personal notes for each country. GeoFacts is built with a focus on responsive, mobile-first design using Tailwind CSS, and includes dark mode for better user experience.

## Tech Stack

- Frontend: HTML5, CSS3, Tailwind CSS (with dark mode and mobile-first design), JavaScript, EJS for templating  
- Backend: Node.js with Express.js for routing and API orchestration  
- Database: PostgreSQL for persistent storage of user data, notes, AQI cache  
- APIs: REST Countries API, OpenWeatherMap, ExchangeRate API, OpenAQ (or IQAir for air quality)  
- Tools & Libraries: Axios for HTTP requests, dotenv for secure API key management, Chart.js for data visualization, Leaflet.js for map integration  
- Deployment: GitHub (source control), Render/Vercel for hosting

## Main Interface: Interactive World Map

The homepage features a full-screen interactive world map created using Leaflet.js. This map allows users to explore countries by clicking directly on the map. Once a country is selected, a dynamic side panel opens displaying live information about the selected country. The user experience includes tooltips on hover, color-coded countries based on AQI/visited/wishlist status, and a seamless responsive layout.

## Features in Detail

### 1. Country Information Panel

Information provided by REST Countries API includes:  
- Country name, capital, region, subregion  
- Flag image  
- Languages, population, timezones, area  
- Currency name, symbol, and ISO code  
Displayed in a well-structured card within a side panel after a country is selected.

### 2. Weather Information

Using OpenWeatherMap API, users can see:  
- Current temperature with weather condition icon  
- Humidity, wind speed, and ‘feels like’ temperature  
- Updated dynamically when a country is selected  
Weather section uses Tailwind utility classes for temperature-based coloring.

### 3. Air Quality Index (AQI)

Fetched via OpenAQ (or IQAir), the AQI feature includes:  
- PM2.5 and PM10 values  
- Categorized health impact (Good, Moderate, Poor, Hazardous)  
- Color-coded warning bars  
- Actionable health suggestions (mask, avoid jogging, use purifier)  
- Cached in PostgreSQL to reduce API rate-limit overhead.

### 4. Currency Exchange

Pulled from ExchangeRate-API, users can:  
- Convert their preferred base currency (USD, INR, etc.) to local currency  
- See exchange rate and currency symbol  
- View historical currency value trends (Chart.js optional enhancement)

### 5. User Dashboard

Accessible after login, the dashboard lets users:  
- ✅ Mark countries as visited  
- 📌 Add to wishlist  
- 📝 Write and save personal travel notes  
- View charts of visited vs wishlist countries by continent  
All data is stored securely in PostgreSQL.

### 6. Search and Filter

- Search by country name (live search with debounce)  
- Filters by continent, population, AQI status, languages  
- Works seamlessly with both map and list view  
- Adds map highlight for matched countries

### 7. Visualizations and Analytics (Optional)

Using Chart.js to plot:  
- Top 10 most visited countries  
- Wishlist heatmap  
- Historical AQI data (if available)  
- Currency conversion trends

### 8. Dark Mode & Mobile Responsiveness

- Tailwind CSS enables responsive breakpoints for all screens  
- Default design is mobile-first  
- Dark mode toggle using Tailwind’s dark theme classes  
- Ensures accessibility and user preference support

## Database Schema (PostgreSQL)

- users(id, name, email, password\_hash)  
- visited(user\_id, country\_code, visited\_on)  
- wishlist(user\_id, country\_code, added\_on)  
- notes(user\_id, country\_code, note, created\_at)  
- aqi\_cache(country\_code, pm25, pm10, status, updated\_at)

## Project Folder Structure

geofacts/  
├── public/  
│ ├── css/  
│ ├── js/  
├── views/  
│ ├── layout.ejs  
│ ├── map.ejs  
│ ├── dashboard.ejs  
│ └── partials/  
├── routes/  
│ ├── auth.js  
│ ├── country.js  
│ └── api.js  
├── models/  
│ └── db.js  
├── utils/  
│ ├── aqiHelper.js  
│ └── weatherHelper.js  
├── .env  
├── app.js  
└── package.json