**Project Prompt: Momentum (Time-Tracking App)**

**1. Project Overview:**

* **Project Name:** Momentum
* **Description:** A corporate-grade web and mobile PWA for employee time and attendance management. The application will enable secure and accurate "Punch In" and "Punch Out" from designated geographical locations (geofencing) and provide a powerful analytics dashboard for administrators.
* **Target Audience:** Companies with in-office and hybrid workforces.
* **Core Philosophy:** The application must be professional, intuitive, and highly reliable. Data integrity and reporting accuracy are paramount to keeping the company's "momentum."

**2. Core Technologies:**

* **Frontend:** React with **Material-UI** (for components) and a state management library (e.g., Redux Toolkit).
* **Backend:** Node.js with Express.js.
* **Database:** **PostgreSQL**.
* **Mobile Functionality:** Capacitor.js to wrap the PWA for native mobile features like geolocation.
* **Geofencing:** Mapbox GL JS for map visualization and geofencing logic.

**3. Application Modules & Features (User Stories):**

* **User Authentication & Profiles:**
  + As an admin, I can securely create, view, edit, and deactivate employee profiles. Each profile will include name, employee ID, role, department, and assigned geofence location.
  + As an employee, I can log in and out using my unique credentials.
* **Employee Time Clock:**
  + As an employee, I can see a simple and clear interface to "Punch In" and "Punch Out."
  + When I punch in, the app automatically captures my current date, time, and **geographical coordinates**.
  + The "Punch In" button will only be active if my location is within the assigned geofence. If not, a clear message will be displayed.
  + I can view my daily, weekly, and monthly punch history.
* **Geofencing Administration:**
  + As an admin, I can create, view, edit, and delete geographical locations (geofences) on a map.
  + Each geofence will be defined by a central coordinate and a specified radius.
  + I can assign a specific geofence to one or more employees.
* **Admin Dashboard & Reporting:**
  + As an admin, I can see a real-time summary of who is currently punched in.
  + I can filter employee time records by date range, department, and employee name.
  + I can generate and export reports (CSV format) that show:
    - Total hours worked per employee for a given period.
    - Overtime hours.
    - Off-site punch attempts.

**4. Database Schema (PostgreSQL):**

* **users table:** id, employee\_id, name, email, password\_hash, role (admin or employee), department\_id, geofence\_id.
* **departments table:** id, name.
* **geofences table:** id, name, latitude, longitude, radius\_meters.
* **punches table:** id, user\_id, punch\_in\_time, punch\_out\_time, punch\_in\_lat, punch\_in\_lon, is\_valid\_geofence, notes.

**5. User Interface (Material-UI Specific):**

* The application will use Material-UI components for a professional, consistent, and clean corporate look.
* The design must be fully responsive for both desktop and mobile views.
* We will use standard Material-UI components such as **Tables** for reports, **Cards** for summaries, and **Forms** for data entry.

**6. Deployment & Hosting (Initial Plan):**

* **Frontend:** Vercel or Netlify.
* **Backend & Database:** A cloud provider like Heroku or AWS.