**1. Project Overview**

* **Objective**: Develop an ID scanner wristband that links to a backend to verify IDs against a DMV database.
* **Main Components**:
  + ESP32-CAM module for barcode scanning
  + ESP32-CAM Adapter
  + SQLite for the database
  + Flask for the backend server
  + Mini LEDs for status indication (green for verified, red for unverified)
  + Power management (H31 battery and voltage regulators)

**2. Component Procurement**

* Necessary components:
  + ESP32-CAM module
  + H31 3.7V 500mAh LiPo battery (with charger)
  + 3.3V LD1117V33 linear voltage regulators
  + Green and red LEDs
  + Resistors
  + Breadboard
  + Jumper wires
  + Multimeter
  + JSON files for a database

**3. Setup and Configuration**

* **Power Management**:
  + Connect the H31 battery to the voltage regulator to provide a stable 3.3V to the ESP32.
* **ESP32-CAM Setup**:
  + Connect the camera module and ensure it's operational.
* **LED Setup**:
  + Connect LEDs to the ESP32 for status indication.
* **Database Setup**:
  + Create a database using JSON to store sample IDs.
  + Use Mockaroo for generating test data.

**4. Development Phase**

* **Backend Development**:
  + Set up Flask application:
    - Create API endpoints for verifying IDs.
    - Integrate the database for testing.
* **Frontend Development**:
  + Implement the scanning logic in the ESP32 to read barcodes using the camera.
  + Send scanned data to the Flask backend for verification.
* **LED Logic**:
  + Write code to control the LEDs based on verification results.

**5. Testing Phase**

* **Functional Testing**:
  + Test each component individually (ensure the ESP32 can scan barcodes and the LEDs respond correctly).
* **Integration Testing**:
  + Test the complete workflow from scanning an ID to verifying it against the database and updating the LEDs accordingly.
* **Debugging**:
  + Use a multimeter to check connections and voltages.
  + Use tools like Postman to test API endpoints.

**6. Finalization**

* **Refinement**:
  + Make adjustments based on testing results, ensuring all components work harmoniously.
* **Documentation**:
  + Document the code, circuit diagrams, and setup instructions for future reference or presentation.

**Timeline**

* **Week 1**: Procurement of components and initial setup.
* **Week 2**: Development of the backend and testing with a database.
* **Week 3**: Integration of the camera and LED functionality.
* **Week 4**: Final testing and preparation of the presentation.