Project Documentation

- # Actual Implementation
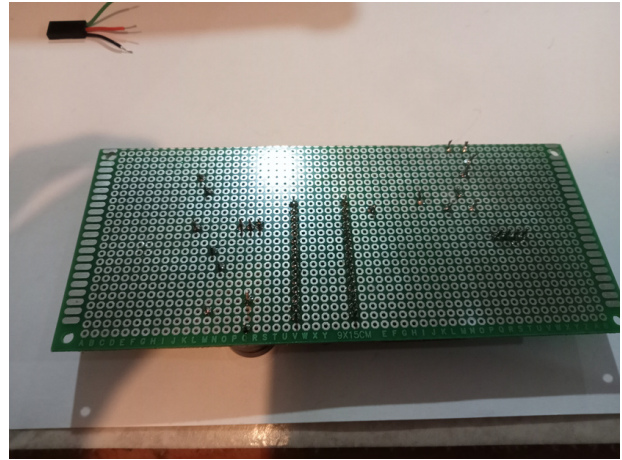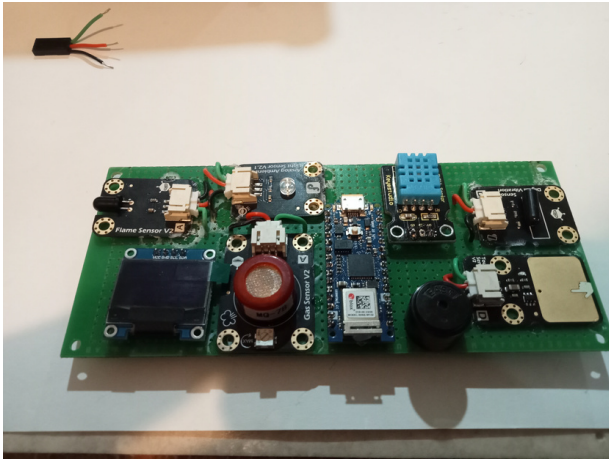
- # Visual Diagram

- **Overall Dataflow**

Data Collection By Sensor's → **Arduino**

Arduino → (Sent Via Wifi or Sim Dongle) → **DataBase eg. Google Firebase or MongoDB**

Mobile Application → (Fetch Data) → **DataBase eg. Google Firebase or MongoDB**

Web Dev → (Fetch Data) → **DataBase eg. Google Firebase or MongoDB**

After Processing and Cleaning the Data

Mobile Application → **User**

Web Dev → **User**
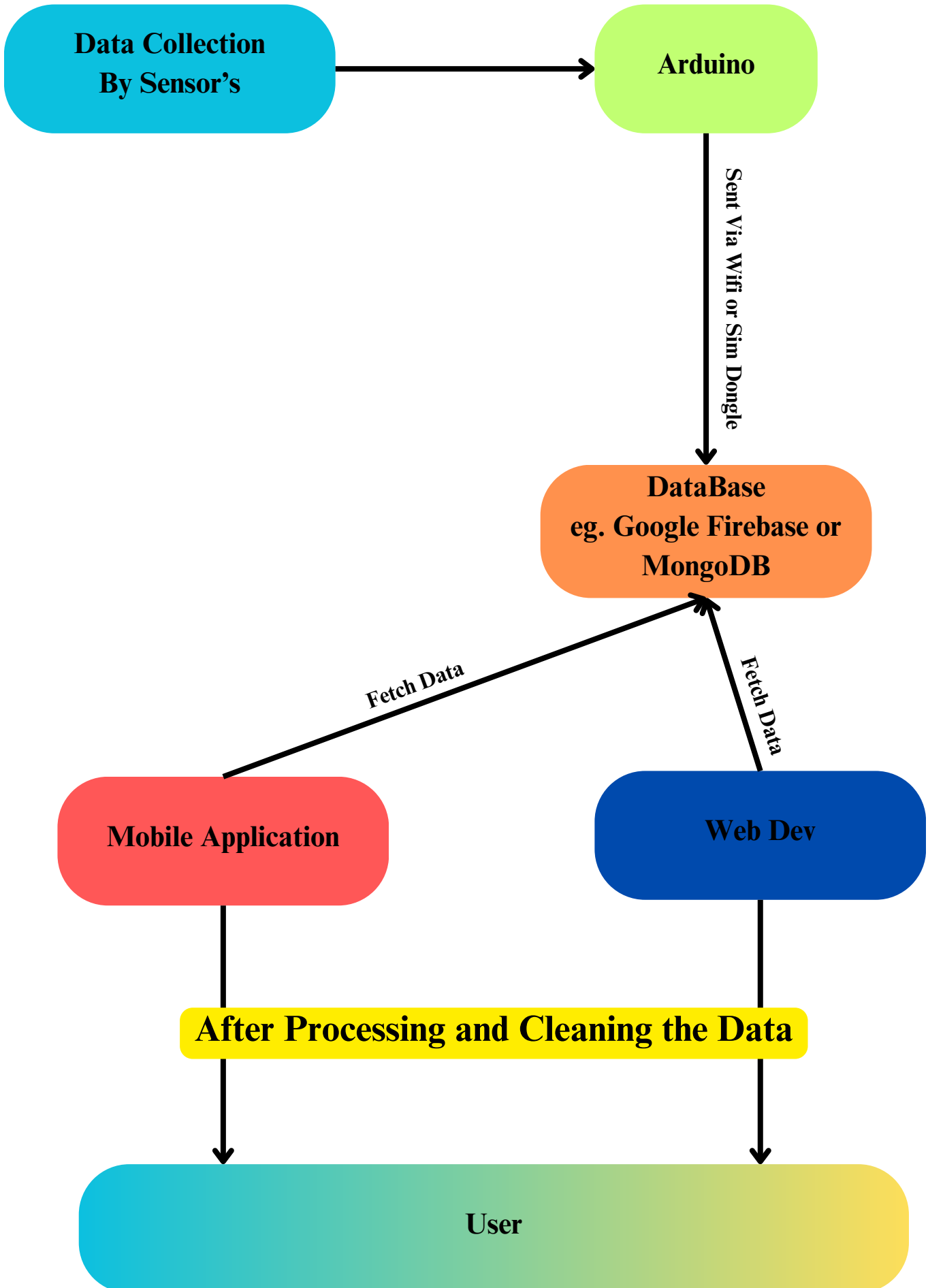
Data Format

The key components of this system are:

Arduino Nano 33 IoT Development Board
Microcontroller: SAMD21 Cortex®-M0+ 32bit low power ARM MCU

Sensors

1. <u>DHT22 Temperature and Humidity Sensor</u>
   - Work: Measures temperature and relative humidity
   - Data Format: Temperature (float), Humidity (float)

2. <u>LM35DZ Body Temperature Sensor</u>
   - Work: Measures body temperature
   - Data Format: Temperature (float)

3. <u>MAX30102 Heart Rate Sensor</u>
   - Work: Measures heart rate
   - Data Format: Heart Rate (integer)

4. <u>Gas Sensor V2</u>
   - Work: Detects carbon monoxide concentration
   - Data Format: CO Concentration (integer)

5. <u>Analog Ambient Light Sensor V2.1</u>
   - Work: Measures ambient light intensity
   - Data Format: Light Intensity (float)

6. <u>Digital Vibration Sensor V2</u>
   - Work: Detects vibrations
   - Data Format: Vibration (boolean)

7. Flame Sensor V2
   - Work: Detects flames
   - Data Format: Flame Detected (boolean)

8. Digital Tilt Sensor V2
   - Work: Detects tilt
   - Data Format: Tilt (boolean)

9. Touch Sensor V2
   - Work: Detects touch input
   - Data Format: Touch Detected (boolean)

The system also includes a white I2C OLED display, a buzzer, a green LED, a resettable fuse, a power switch, and a battery holder.

Protocols
The key communication protocols used by the sensors in this system are:
- I2C (Inter-Integrated Circuit): The OLED display, Ambient Light Sensor, and potentially other sensors communicate using the I2C protocol. I2C is a widely used serial communication protocol that allows multiple devices to communicate with a single master controller.
- Analog: The Gas Sensor V2 and LM35DZ Body Temperature Sensor use analog interfaces to communicate their sensor data.

- Digital: The Digital Vibration Sensor V2, Digital Tilt Sensor V2, and Touch Sensor V2 use digital interfaces to communicate their sensor data.
- I2C and Analog: The MAX30102 Heart Rate Sensor communicates using both I2C and analog interfaces.

Pseudo Code