# Air Quality Monitoring Dashboard (Arduino IoT Device)

This repository contains the Arduino-based IoT device for a real-time air quality monitoring dashboard. It collects data from multiple environmental sensors and sends the data for visualization and analysis in a web-based dashboard (to be developed in the future).

## Features

- **Multi-Sensor Integration:**
  - **MQ-7:** Carbon monoxide detection.
  - **MQ-8:** Hydrogen gas detection.
  - **AM2302 (DHT22):** Temperature and humidity monitoring.
  - **Raindrops Detection Sensor:** Detects rainfall intensity.
- **IoT Ready:** Sends sensor data to a remote server for further analysis and visualization.
- **PlatformIO:** Developed using PlatformIO in Visual Studio Code for efficient development and cross-platform compatibility.

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## Project Structure

```
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├── src
│   ├── main.cpp          # Main Arduino sketch
├── include
│   ├── config.h          # Configuration file for sensor pins and
parameters
├── lib                   # Custom libraries (if any)
├── platformio.ini        # PlatformIO project configuration file
├── README.md             # Project documentation
```

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## Getting Started

### Prerequisites

- **Hardware:**
  - Arduino-compatible microcontroller (e.g., Arduino Uno, Mega, ESP32, etc.)
  - Sensors:
    - MQ-7 Carbon Monoxide Sensor
    - MQ-8 Hydrogen Sensor
    - AM2302 DHT22 Temperature & Humidity Sensor
    - Raindrops Detection Sensor
  - Breadboard, jumper wires, and power supply

- **Software:**
  - PlatformIO (installed in Visual Studio Code)
  - Arduino drivers for your microcontroller

### Installation

1. Clone this repository:

```
git clone https://github.com/yourusername/air-quality-arduino.git
cd air-quality-arduino
```

2. Open the project in Visual Studio Code with PlatformIO installed.
3. Connect your Arduino-compatible device to your computer.
4. Modify `src/config.h` to set your sensor pins and any specific parameters.
5. Upload the code to your microcontroller:

```
pio run --target upload
```

6. Open the serial monitor in PlatformIO to verify the sensor readings.

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## Future Enhancements

- Develop a web-based dashboard for real-time visualization of sensor data.
- Add additional sensors for more environmental parameters (e.g., PM2.5, PM10).
- Implement MQTT or HTTP for data transmission to the cloud.
- Integrate alert notifications for critical air quality levels.

PROF

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## License



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## Acknowledgments

- PlatformIO for simplifying the development process.
- Open-source libraries and contributors who make projects like this possible.

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## Contact

For questions or suggestions, please reach out to:

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Thank you for exploring this project! Stay tuned for the web dashboard implementation. 🚀