Project Title: IoT Air Quality Monitor (AQM)

Overview:

The IoT Air Quality Monitor (AQM) is designed to measure and monitor air quality in real-time. It collects data on various air pollutants and provides this information through a user-friendly interface for both local and remote monitoring.

Components :

Hardware :

Air quality sensors (e.g., MQ series sensors for CO2, CO, and PM2.5)

Microcontroller (e.g., Arduino or Raspberry Pi)

Wi-Fi/Cellular module (for IoT connectivity)

Power supply

Enclosure

Software:

Embedded firmware for data collection

Cloud platform (e.g., AWS, Azure, or Google Cloud) for data storage and analysis

Mobile/web application for user interface

Project Steps:

Hardware Setup :

Connect the air quality sensors to the microcontroller.

Power the system appropriately.

Firmware Development:

Write firmware to read data from the sensors.

Implement Wi-Fi/Cellular connectivity to transmit data.

Cloud Integration :

Create an account on a cloud platform and set up a database.

Develop a script to send sensor data to the cloud.

Data Analysis :

Use cloud services to analyze and visualize air quality data.

Set up alerts for abnormal readings.

User Interface :

Develop a mobile app or web interface to access air quality data.

Display real-time data and historical trends.

Allow users to set preferences and receive notifications.

Testing and Calibration :

Calibrate the sensors to ensure accurate readings.

Test the system in various environments.

Deployment :

Install the AQM in locations of interest, such as homes, offices, or public spaces.

Optional Enhancements :

Add GPS for location-specific data.

Include additional sensors for humidity and temperature.

Implement machine learning for predictive analysis