Project Title:

Smart Air Quality Monitoring and Alert System

Project Description:

The Smart Air Quality Monitoring and Alert System is an IoT project aimed at continuously monitoring air quality in various locations and providing real-time data and alerts to the Department of AQM. This project can help in assessing and managing air quality more effectively.

Components and Features:

Air Quality Sensors:

Install air quality sensors at strategic locations throughout the city. These sensors should measure various pollutants, including PM2.5, PM10, CO2, VOCs, NO2, and O3.

Data Transmission:

Connect the sensors to a central IoT gateway or cloud platform to collect and transmit the data in real-time.

Data Analysis:

Implement data analytics to process the sensor data, calculate Air Quality Index (AQI), and identify pollution trends.

Alert System:

Set up an alert system that triggers notifications when air quality falls below certain thresholds, indicating poor air quality.

Data Visualization:

Create a user-friendly dashboard for the Department of AQM and the public to visualize air quality data, historical trends, and current conditions.

Mobile App:

Develop a mobile app for citizens to access real-time air quality information in their area, receive alerts, and make informed decisions.

Historical Data Storage:

Store historical air quality data for trend analysis and policymaking.

API for Developers:

Provide an API for developers to access air quality data, encouraging the development of third-party applications.

Integration with Weather Data:

Integrate weather data to assess the impact of weather conditions on air quality.

Public Awareness:

Run awareness campaigns to educate the public about air quality and its impact on health.

Benefits:

Early detection of air quality issues.

Informed decision-making for citizens and policymakers.

Better management and mitigation of air pollution.

Long-term data for policy planning and environmental studies.

Challenges:

Sensor calibration and maintenance.

Data security and privacy concerns.

Ensuring public accessibility and usability of the system.