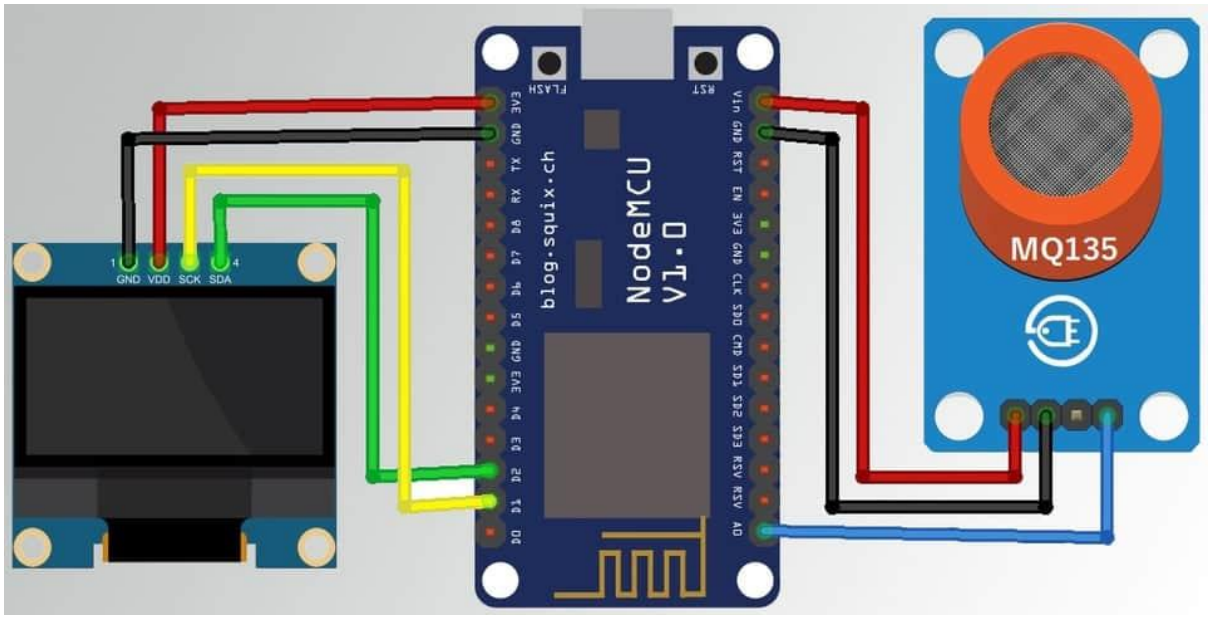
AIR QUALITY MONITORING SYSTEM

INTRODUCTION

The project involves setting up IoT devices to measure air quality parameters and make the data publicly available for raising awareness about air quality and its impact on public health. The objective is to create a platform that provides real-time air quality information to the public. This project includes defining objectives, designing the IoT monitoring system, developing the data-sharing platform, and integrating them using IoT technology.

DESIGN

Now let us assemble the hardware and do the coding for the great IoT project. We will interface MQ135 Air Quality Sensor with NodeMCU ESP8266 Board and 0.96" I2C OLED Display. The circuit diagram is given below.



COMPONENTS

S.N.	Components Name	Quantity
1	NodeMCU ESP8266	1
2	0.96" I2C OLED Display	1
3	Connecting Wires	As required
4	Breadboard	1
5	MQ-135 Air Quality Sensor	1

INOVATIONS IN AIR CONTROL MONITORING SYSTEM

➢ AI can gather data from sensors and satellites and assist scientists in blending climate models. These AI-based sensors detect the levels of pollutants in the air, such as particulate matter, volatile organic compounds (VOCs), and gases.

➢ Renewable energy sources like solar, wind, and hydro power – shifting away from fossil fuels can significantly help to reduce the amount of pollution generated by traditional power plants. The use of electric vehicles can also help reduce pollution generated by transportation.

➢ Unmanned aerial vehicles (UAVs) equipped with air quality sensors can fly over specific areas, providing real-time data for localized monitoring and emergency response.

➢ By understanding about the sources of pollution, AI can be further used to track and predict the growth and reduction of air pollution. For example, we could monitor whether an increase in industrial production is directly proportional to air pollution, or a decrease in vehicles is related to a reduction.

➢ A continuous monitoring system is comprised of sampling, conditioning, and analytical components and software designed to provide direct, real- time, continuous measurements of pollution by analyzing representative sample(s) of air and water to be monitored.

INOVATIONS IN DESIGNS

- Using a mobile monitoring system to give a more accurate value of air quality on streets and neighborhoods across the city. They attach air

quality sensors to vehicles that “measure air pollution on a block-by-block level during different times, days, and seasons”.

- Can be used for CO2 source apportionment, and measuring alongside NO and NO2 can allow for emissions profiles for different locations to be determined. This means the combustion contributing to the pollution can be specifically identified; such as whether there is either gas or diesel traffic, which is only possible with such accurate data.
- Smart-Air has been developed based on the IoT technology to efficiently monitor the air quality and transmit the data to a web server via LTE in real time. The device is composed of a microcontroller, pollutant detection sensors, and LTE modem.
- The sensor values are evaluated for the Air Quality Index (AQI) and display it on the ThingSpeak IoT platform. Vrituino app has used for a virtual screen with widgets on the mobile phone to monitor the system using the web.
- An IoT-based air pollution monitoring system is an ideal solution that can provide real-time data and insights about the air quality in a particular area. An IoT based air pollution monitoring system consists of several hardware and software components that work together to collect and process data.

Smart Connectivity: Wi-Fi/Bluetooth: Enable the fountain with Wi-Fi or Bluetooth connectivity for remote monitoring and control via a dedicated mobile app.

Data Analytics: Utilize data analytics to track usage patterns, water consumption, and environmental impact. This data can be valuable for both users and fountain operators.

User Feedback and Iteration: Feedback Mechanism: Implement a feedback system, either through the app or physical buttons, allowing users to report issues and suggest improvements. Continuous Improvement: Use user feedback and data analysis to continuously improve the fountain's functionality and user experience through software updates. By combining these elements, you can create a smart water fountain that not only provides a convenient and sustainable source of hydration but also contributes positively to the environment and the well-being of the users.