**Project Objectives:**

The primary objectives of this project appear to be:

1.Monitoring and managing air quality by measuring temperature and humidity.

2.Providing real-time data visualization and analysis using the ThingSpeak platform.

3.Implementing a visual indicator (LEDs) to display air quality conditions.

4.Enabling remote monitoring of air quality using an IoT device.

**IoT Device Setup:**

The IoT device setup involves the following components and configurations:

**Hardware Components:**

1.A microcontroller or development board (not specified in the code).

2.DHT22 sensor for measuring temperature and humidity.

3.Two LEDs (LED1 and LED2) for visual feedback on air quality.

4.Connections to GPIO pins for the DHT22 sensor and LEDs.

5.A Wi-Fi module for connecting to a Wi-Fi network.

**Wi-Fi Configuration:**

The code includes Wi-Fi settings, including the SSID and password of the network the device will connect to. This allows the IoT device to establish an internet connection for data transmission.

**Sensor Data Retrieval:**

The DHT22 sensor is used to collect temperature and humidity data from the environment.

**Platform Development:**

The platform development aspect of the project involves using the ThingSpeak platform for data storage and visualization. This platform allows users to create IoT applications and collect data from connected devices. In this project, the following ThingSpeak-related details are specified:

**ThingSpeak API Key:**

The project uses a ThingSpeak API key for authentication when sending data to the ThingSpeak platform.

ThingSpeak URL and Field Configuration:

The code includes the ThingSpeak URL for data submission and field names for the data to be stored on the ThingSpeak platform. The data includes temperature (field1) and humidity (field2).

**Code Implementation:**

The code implements the following key functionalities:

**1.Connecting to Wi-Fi:**

The connect\_to\_wifi function is responsible for connecting the IoT device to the specified Wi-Fi network.

**2.Sensor Data Reading:**

The read\_sensor\_data function reads temperature and humidity data from the DHT22 sensor.

**3.Publishing Data to ThingSpeak:**

The publish\_to\_thingspeak function constructs a URL with the collected temperature and humidity data, then sends an HTTP GET request to ThingSpeak for data submission.

**4.LED Control Based on Sensor Data:**

The control\_leds function adjusts the brightness of LEDs (LED1 and LED2) based on temperature and humidity conditions, providing a visual indication of air quality.

**5.Main Function:**

The main function is the core of the program, responsible for orchestrating the entire process. It connects to Wi-Fi, reads sensor data, publishes data to ThingSpeak, controls LEDs, and introduces a delay between measurements.

**6.Program Entry Point:**

The code's main execution is initiated when the script is run (the if \_\_name\_\_ == "\_\_main\_\_": block). It calls the main function to start the continuous monitoring and data transmission process.

In summary, this project involves an IoT device that measures temperature and humidity, sends this data to the ThingSpeak platform for storage and visualization, and uses LEDs to provide visual feedback on air quality conditions. It is designed for remote air quality monitoring and control.

**DIAGRAM OF THE SENSORS**



**DATA SHARING OF THE DATA SHARING PLATFORM**



**PUBLIC AWARNESS:**

**1.Visible and Accessible Data:**

By providing real-time air quality data that is easily accessible to the public through websites, mobile apps, or public displays, individuals can quickly and easily check the current air quality in their area. This makes air quality information more visible and readily available.

**2.Alerts and Notifications:**

These systems can send alerts and notifications to individuals when air quality levels are poor or reach a certain threshold. This immediate feedback can prompt people to take actions to protect their health, such as staying indoors on days with high pollution levels.

**3.Education and Information:**

Real-time monitoring systems often provide information about the pollutants present in the air, their sources, and the associated health risks. This educational component can help the public better understand the connection between air quality and health.

**4.Behavioral Changes:**

When individuals are aware of poor air quality conditions, they may be more likely to make behavioral changes. For example, people might choose to limit outdoor activities, use public transportation instead of driving, or reduce the use of wood-burning stoves on days with poor air quality.

**5.Policy Advocacy:**

Access to real-time air quality data empowers individuals and organizations to advocate for policies that improve air quality. Communities can use this information to push for stricter regulations on air pollution sources.

**6.Health Precautions:**

For individuals with respiratory conditions or other health vulnerabilities, real-time air quality data can be critical. It allows them to take precautions to minimize exposure to harmful pollutants, such as using air purifiers or wearing masks.

**7.Community Engagement:**

Real-time monitoring systems can foster community engagement and citizen science. People can participate in data collection or raise awareness about local air quality issues.

**8.Public Pressure:**

When the public is informed and concerned about air quality, it can put pressure on businesses and industries to reduce emissions and pollution. This can lead to improved air quality over time.

**9.Research and Studies:**

Researchers can access the data from real-time monitoring systems to conduct studies on the links between air quality and health. This can lead to more evidence-based health recommendations and policy changes.

**10.Global Awareness:**

In the age of the internet, air quality data from real-time monitoring systems can be shared globally. This helps raise awareness not only locally but also at the national and international levels, promoting global efforts to address air quality issues.

In summary, a real-time air quality monitoring system serves as a valuable tool for informing the public about air quality conditions and their health impacts. It empowers individuals to make informed decisions, advocate for change, and take precautions to protect their health and the environment. It also contributes to a collective effort to address air quality issues on local, national, and global scales.