



COLLEGE NAME: PRIYADARSHINI ENGINEERING COLLEGE

COLLEGE CODE : 5119

COURSE NAME: Internet Of Things (IOT)

GROUP NUMBER: 2

PROJECT TITLE: AIR QUALITY MONITORING

PROJECT SUBMITTED TO: SKILL UP ONLINE

YEAR: 3rd

DEPARTMENT: ELECTRONICS AND COMMUNICATION ENGINEERING.

SEMESTER: 5th

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PROJECT DESCRIPTION:

Monitoring air quality and preventing air pollution with the help of IoT (Internet of Things) involves using sensors to measure various air pollutants, collecting data, and taking actions to reduce pollution.

Air Quality Sensors:

- You can use various sensors to measure air quality.

Common sensors include:

- Particulate Matter (PM) sensors for detecting dust and fine particles.
Gas sensors for measuring pollutants like CO, CO₂, NO₂, SO₂, and ozone. Temperature and humidity sensors to monitor environmental conditions.

Data Collection:

- These sensors collect data continuously, and this data is sent to a central control system.

Central Control System:

- An IoT platform or central control system collects, stores, and analyses the data from the sensors. It processes the data to calculate air quality indexes.
- Communication Protocols devices use communication protocols like Wi-Fi, cellular, or Lora to transmit data to the central system.

Data Analysis:

- The central system analyzes the collected data to assess air quality. It may use algorithms to calculate air quality indexes like AQI (Air Quality Index).

- **Alerting and Reporting:**

When air quality deteriorates beyond a certain threshold, the system can send alerts via mobile apps or web interfaces to users or authorities. It can also generate reports.

- **Preventive Measures:**

The system can be integrated with other devices or systems to take preventive measures.

For example: Activating air purifiers or HVAC systems to improve indoor air quality.

Controlling traffic signals to reduce congestion in polluted area. Alerting industries to reduce emissions.
Providing recommendations for individuals to limit outdoor activities during poor air quality days.

Working Models for Devices:

- For a simple working model, you can use Arduino or Raspberry Pi-based microcontrollers along with sensors to measure air quality.
- These devices can be programmed to send data to a central server or cloud platform.

PYTHON PROGRAM :

```
import RPi.GPIO as GPIO
import time

# Set the GPIO mode
GPIO.setmode(GPIO.BCM)

# Define the GPIO pin for the gas sensor
GAS_SENSOR_PIN = 17

# Initialize the GPIO pin
```

```
GPIO.setup(GAS_SENSOR_PIN, GPIO.IN,  
pull_up_down=GPIO.PUD_DOWN)
```

```
try:
```

```
    while True:
```

```
        # Read the sensor value
```

```
        gas_level = GPIO.input(GAS_SENSOR_PIN)
```

```
        if gas_level == 1:
```

```
            print("Danger: High Gas Level Detected!")
```

```
        else:
```

```
            print("Gas level is normal.")
```

```
        time.sleep(1) # Delay for reading
```

```
except KeyboardInterrupt:
```

```
    GPIO.cleanup()
```


