**IOT\_PHASE2(INNOVATION)**

**Noise monitoring system**

**Project Overview:**

A noise monitoring system is designed to capture, analyze, and manage environmental noise levels. It helps measure and control noise pollution in various settings, including urban areas, industrial sites, and public spaces

**Key Features and Components:**

**IoT Devices:**

Raspberry Pi: A versatile single-board computer with built-in connectivity options.

Arduino: A widely used microcontroller platform that can be equipped with IoT shields or modules.

ESP8266/ESP32: Low-cost microcontrollers with Wi-Fi capabilities, ideal for IoT applications

**IoT Connectivity:**

Implement connectivity to transmit noise data to Azure IoT Hub. Options include:

Wi-Fi: Use onboard Wi-Fi capabilities of microcontrollers.

Cellular: If remote locations are involved, consider using cellular IoT modules.

LoRa: For long-range communication in low-power scenarios, LoRaWAN can be suitable.

Integrate the Azure IoT Device SDK to establish secure communication with Azure IoT Hub. This SDK helps manage device identity, security, and data transmission.

**Power Source:**

Deployment scenario, power your IoT device with a suitable power source. This could be a standard power outlet, battery, or energy harvesting solutions for low-power, remote deployments.

**Traffic Data Integration :**

Incorporate traffic data sources such as traffic cameras, GPS, or traffic flow sensors to obtain information about vehicle counts, speeds, and congestion in the same areas.

Data analytics is crucial for noise monitoring as it helps in extracting valuable insights from the collected noise data.

**Alert Response:**

Plan for appropriate responses to alerts, such as dispatching noise control teams, notifying residents of possible disturbances, or making real-time traffic management adjustments.

***Import random***

***Import time***

***From azure.iot.device import IoTHubDeviceClient, Message***

***# Define your IoT Hub connection string and device ID***

***CONNECTION\_STRING = “Your IoT Hub Connection String”***

***DEVICE\_ID = “Your Device ID”***

***# Create an instance of the IoT Hub client***

***Client = IoTHubDeviceClient.create\_from\_connection\_string(CONNECTION\_STRING)***

***# Connect to the IoT Hub***

***Client.connect()***

***While True:***

***# Simulate noise sensor data (replace with real sensor data)***

***Noise\_level = random.randint(50, 100) # Simulate noise level between 50 and 100 dB***

***# Create a message with noise data***

***Data = {***

***“noise\_level”: noise\_level***

***}***

***Message = Message(data)***

***# Send the message to the IoT Hub***

***Client.send\_message(message)***

***Print(f”Noise Data Sent: {data}”)***

***Time.sleep(5) # Send data every 5 seconds (adjust as needed)***

**Conclusion:**

This code connects to Azure IoT Hub and sends simulated sensor data (temperature and humidity). It replace the simulated data with real data from your sensors. The code sends data every 5 seconds, It can adjust the interval as needed.