**Noise pollution monitoring**

**1. Hardware Setup:**

Raspberry Pi.

USB sound sensor.

Internet connection.

**2. Install Required Libraries:**

Ensure we have the necessary Python libraries installed. We may need to install sound device, numpy library.

**3. Python Program:**

import sounddevice as sd

import numpy as np

import time

# Configuration

SAMPLE\_RATE = 44100 # You can adjust this based on your sensor

DURATION = 10 # Duration of each measurement in seconds

# Function to record and analyze sound levels

def monitor\_noise():

print("Starting noise monitoring...")

while True:

# Record audio data for the specified duration

audio\_data = sd.rec(int(SAMPLE\_RATE \* DURATION), samplerate=SAMPLE\_RATE, channels=1, dtype='int16')

sd.wait()

# Calculate the root mean square (RMS) of the audio data to estimate sound level

rms = np.sqrt(np.mean(np.square(audio\_data)))

# Convert RMS value to dB (calibration may be needed)

dB = 20 \* np.log10(rms)

print(f"Sound Level: {dB:.2f} dB")

# You can add code here to store, send, or act upon the noise level data

time.sleep(1) # Adjust the sampling rate as needed

try:

monitor\_noise()

except KeyboardInterrupt:

    pass

**4. Run the Program:**

Run the Python script on your Raspberry Pi or IoT device, and it will record noise levels and send data to ThingSpeak.