NOISE POLLUTION MONITORING

Noise pollution is a growing issue these days. It is necessary to monster quality and keep it under control for a better future and healthy living for all. Here we propose an noise pollution monitoring system that allows us to monitor and check live as noise pollution in the particular area through IOT. Noise pollution is caused by increased use of machinery and resources as a result of industrialization. It hurts both humans and animals. Noise pollution is becoming a bigger problem, therefore it is important to keep an eye on it for a brighter future and a healthier lifestyle for everyone. In recent years, pollution as had a direct impact on people.

COMPONENTS:

1. Arduino UNO
2. MQ135(Gas sensor)
3. LM393(Noise sensor)
4. ESP8266 WIFI Module
5. 16*2 LCD Display
6. LED
7. Buzzar

NOISE POLLUTION OVER IOT SENSOR:

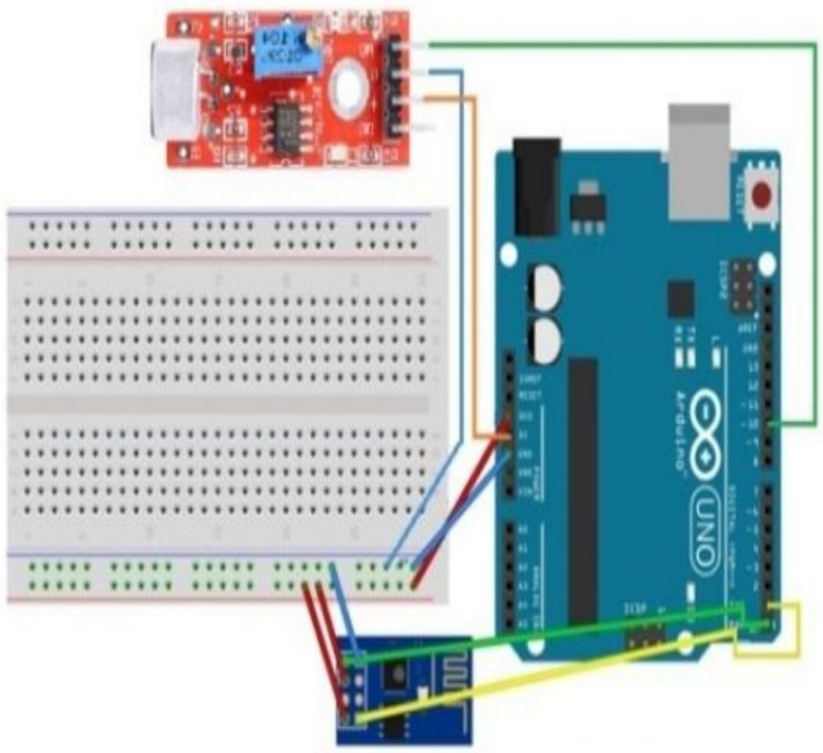
1. CO2 Sensor: The co2 sensor measures the carbon emission levels.

2. Methane Sensor: It measures the level of methane gas in the air.

3. Sound sensor (Microphone): It measures the level of sound pollution.

TABLE CONNECTION AND CIRCUIT:

Module	Arduino Uno
LM 393 Sound Detection Sensor	
A0	10
Vcc or +	5V
G	Gnd
ESP8266 WiFi Module	
Tx	Rx
Rx	Tx
CH_PD	3.3 V
VCC	3.3 V
Gnd	Gnd



CIRCUIT DIAGRAM OF THE PROPOSED SYSTEM

WORKING PRINCIPLE

ARDUINO UNO: Arduino uno arduino is 8 bit microcontroller board based on the atmega328p. The operating voltage is 5v. It has 14 pins digital input output pins (of which can be used 6 as pwm output) oscillator frequency is 16 mhz it contains everything needed to support the microcontroller simply connect it to a computer with usb cable. It has 6 analog input pins.

MQ135:MQ135 gas sensor the MQ135 is a gas sensor it used for detecting or sensing harmful gases in the atmosphere. It has wide detecting scope. It gives fast response and also it high sensitivity sensor. It is simple and long life device. they are used in air quality control equipment for building offices are suitable for detecting of NH3, alcohol, benzene, smoke CO2 etc.

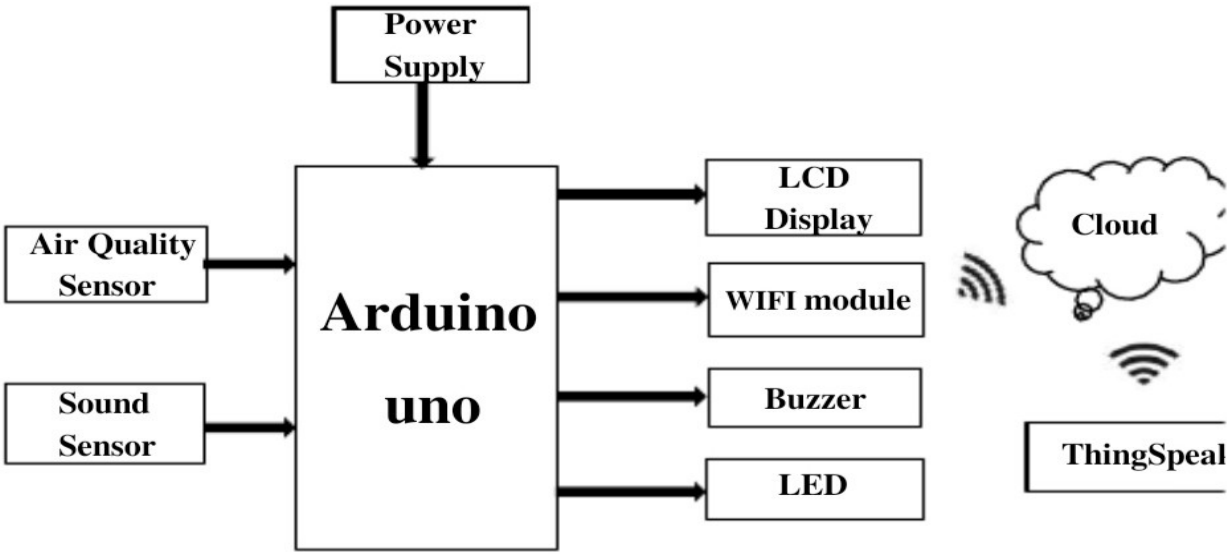
LM393: LM393 sound sensor the sound sensor module provide an easy way to detect sound and it generally used for detecting sound intensity. Module detect the sound has exceeded a threshold value. Sound is detected via microphone and fed into an lm393 opamp. The sound level adjust through pot. The sound increases set value output is low. These module work on DC 3.3-5 voltage.

ESP8266: The esp8266 WIFI module is a self containedsoc with integrated TCP/IP protocol stack that can give any microcontroller access to your WIFI network. The ESP8266 is capable of either hosting an application or offloading all WIFI networking functions from another application processor.

16*2LCD DISPLAY: LCD is used for to display the condition there are three conditions in air pollution and three conditions in noise pollution

means air and sound is clear, moderately polluted or highly polluted that is displayed on LED.

BLOCK DIAGRAM:



APPLICATIONS:

1. To estimate the pollution.

2. Indoor Air Quality Monitoring.

3. To design server and upload data on that server with date and time.

4. We can use it at industrial area as there is lot of noise pollution.

5. In city roads traffic noise.

6. IOT based noise pollution monitoring system using raspberry pi can be used as a sub-system for smart cities.

7. We can monitor the real time of sound pollution levels in any area.

SOURCE CODE:

```
#define BLYNK_PRINT Serial

#include <WiFi.h>

#include <BlynkSimpleEsp32.h>

#include <Wire.h>

#include <Adafruit_GFX.h>

#include <Adafruit_SSD1306.h>

#define AO 34

Adafruit_SSD1306 display = Adafruit_SSD1306(128, 64, &Wire, -1);

unsigned int output;

int Decibels;

char auth[] = "eO3YD5N52-kdPn3-Ttqu6AfnG0Ik**";

char ssid[] = "YOUR_SSID";

char pass[] = "YOUR_PASSWORD";

BLYNK_READ(V0)

{

  Blynk.virtualWrite(V0, Decibels);

}

void setup() {
```

```
  Serial.begin(115200);
  pinMode (AO, INPUT);
  display.begin(SSD1306_SWITCHCAPVCC, 0x3C);
if(!display.begin(SSD1306_SWITCHCAPVCC, 0x3C)) {
  Serial.println(F("SSD1306 allocation failed"));
  for(;;);
}
  delay(2000);
display.clearDisplay();
display.setTextColor(WHITE);
  Blynk.begin(auth, ssid, pass);
}
void loop() {
  Blynk.run();
  unsigned long start_time = millis();
  float PeakToPeak = 0;
  unsigned int maximum_signal = 0;  //minimum value
  unsigned int minimum_signal = 4095;  //maximum value
  while (millis() - start_time < 50)
  {
```

```
 output = analogRead(AO);
  if (output < 4095)
  {
    if (output > maximum_signal)
    {
      maximum_signal = output;
    }
    else if (output < minimum_signal)
    {
      minimum_signal = output;
    }
  }
}
 PeakToPeak = maximum_signal - minimum_signal;
 Serial.println(PeakToPeak);
 Decibels = map(PeakToPeak, 50, 500, 49.5, 90);
display.setTextSize(2);
 display.setCursor(0,10);
 display.print(Decibels);
 display.setTextSize(2);
```

```
display.setCursor(40,10);
display.print("db");
display.display();
if (Decibels <= 50)
{ display.setTextSize(2);
  display.setCursor(0,30);
  display.print("LOW");
  display.display();
}
else if (Decibels > 50 && Decibels < 75)
{
  display.setTextSize(2);
  display.setCursor(0,30);
  display.print("Moderate");
  display.display();
}
else if (Decibels >= 75)
{
  display.setTextSize(2);
  display.setCursor(0,30);
```

```
   display.print("HIGH");
    display.display();
  }
  delay(1000);
  display.clearDisplay();
}
```

ADVANTAGES:

1. Sensors are easily available.
2. Sensors are effortlessly accessible.
3. Detecting of wide range of gases.
4. Simple, compact and easy to handle.