END SEMESTER ASSESSMENT (ESA)
B.TECH. (CSE)
IV SEMESTER

UE19CS256 – MICROPROCESSOR AND COMPUTER ARCHITECTURE LABORATORY

PROJECT REPORT

ON

AIR QUALITY MONITORING SYSTEM

SUBMITTED BY

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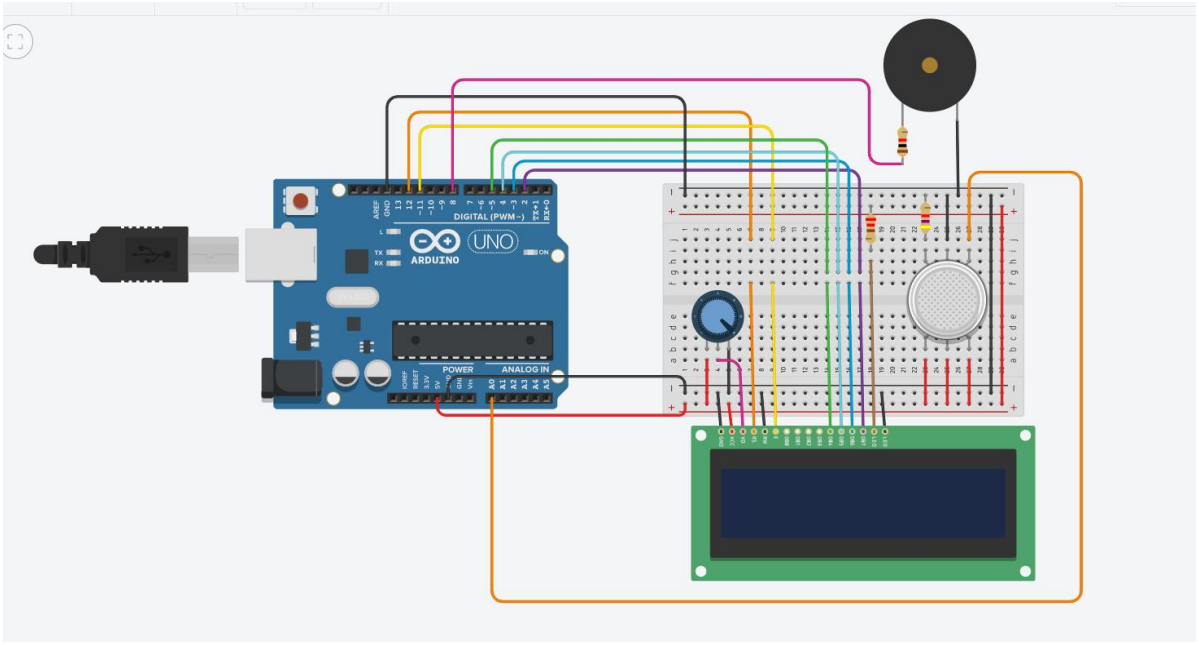
TABLE OF CONTENTS		
Sl.No	TOPIC	PAGE No
1.	ABSTRACT OF THE PROJECT	2
2.	CIRCUIT DIAGRAM	3
3.	ARDUINO CODE	4
4.	SCREENSHOTS OF THE OUTPUT	7
5.	REFERENCES	10

ABSTRACT OF THE PROJECT:

Air pollution has become a common phenomenon all everywhere. Specially within the urban areas, pollution could be a real-life drawback. Within the urban areas, the hyperbolic variety of hydrocarbon and diesel vehicles and therefore the presence of commercial areas at the outskirts of the main cities are the most causes of pollution. The matter is seriously intense within the metropolitan cities. The governments all round the world taking each measure in their capability. Several European countries have aimed to exchange hydrocarbon and diesel vehicles with the electrical vehicles by 2030. Even Asian nation has aimed to try so by 2025.

The main aim of this project is to develop a tool which may monitor PPM in air in real time, tell the standard of air and log knowledge to a distant server (ThingSpeak). The air monitor developed during this project is predicated on Arduino Uno. The Arduino board connects with ThingSpeak platform victimization ESP8266 Wi-Fi module. The detector used for watching the pollution is MQ-135 gas detector. The detector knowledge is additionally displayed on a LCD .

CIRCUIT DIAGRAM:



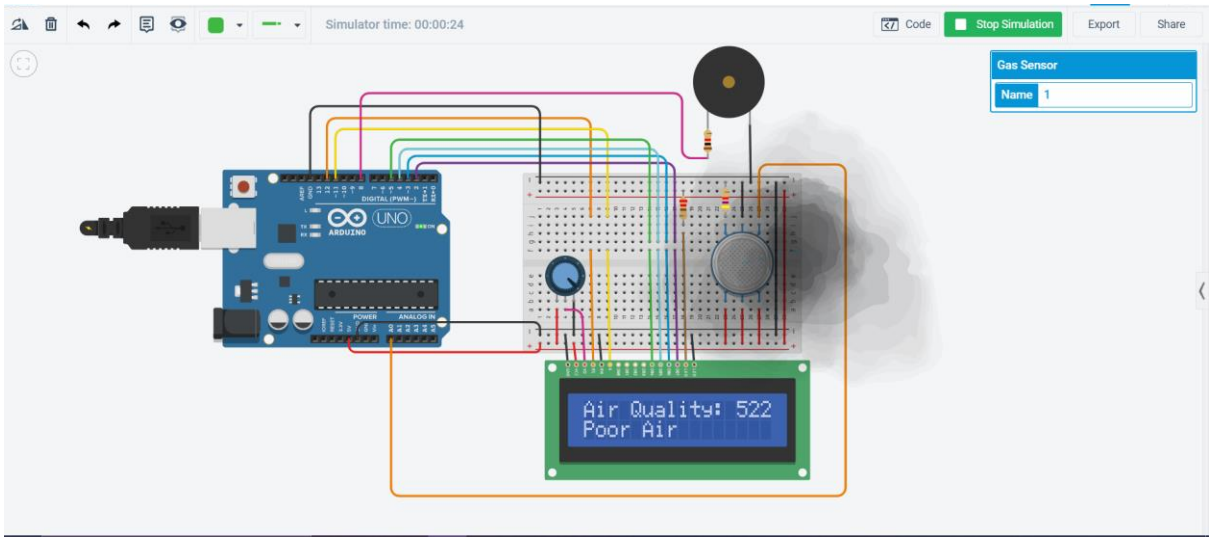
ARDUINO CODE:

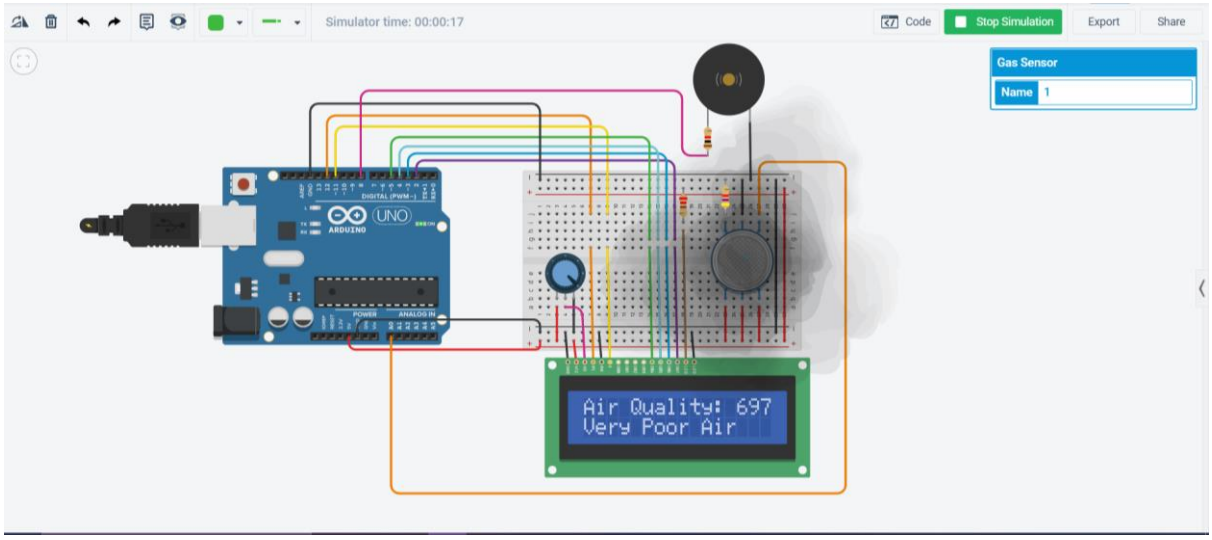
```
// include the library code:
#include <LiquidCrystal.h>
// initialize the library with the numbers of the interface pins
LiquidCrystal lcd(12, 11, 5, 4, 3, 2);


int pin8 = 8;
int analogPin = A0;
int sensorValue = 0;        // store the value read


void setup() {
  pinMode(analogPin, INPUT);
  pinMode(pin8, OUTPUT);
  // set up the LCD's number of columns and rows:
  lcd.begin(16, 2);
  // Print a message to the LCD.
  lcd.print("What is the air ");
  lcd.print("quality today?");
  Serial.begin(9600);
  lcd.display();
}
```

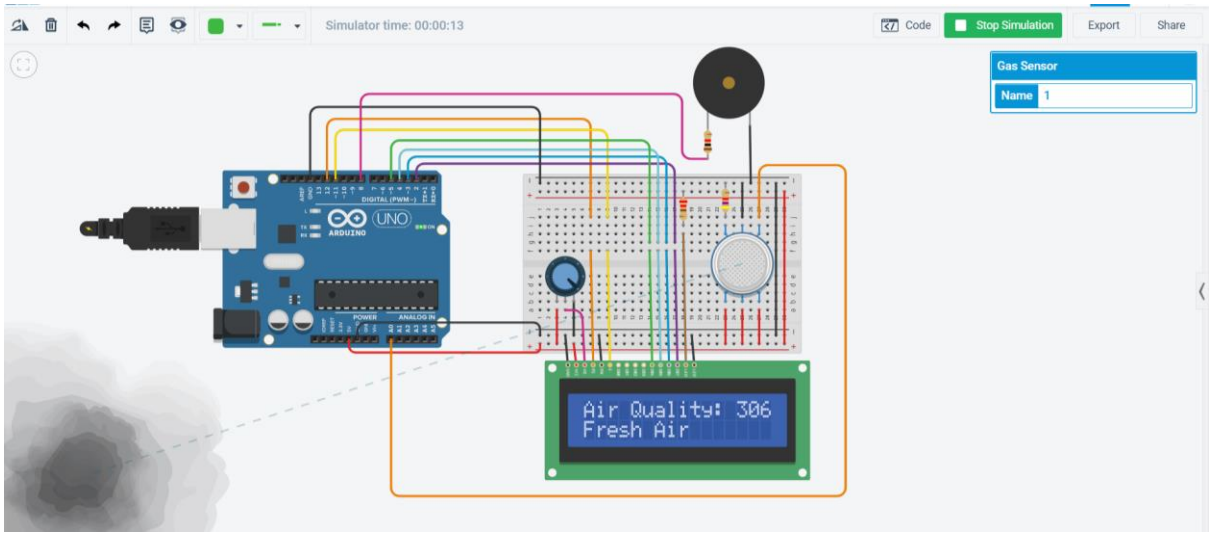
```
void loop() {


 delay(100);
 sensorValue = analogRead(analogPin);     // read the input pin
 Serial.print("Air Quality in PPM = ");
 Serial.println(sensorValue);           // debug value


 lcd.clear();
 lcd.setCursor(0,0);
 lcd.print ("Air Quality: ");
 lcd.print (sensorValue);


 if (sensorValue<=500)
  {
   //displays fresh air
  Serial.print("Fresh Air ");
  Serial.print ("\r\n");
  lcd.setCursor(0,1);
  lcd.print("Fresh Air");
  }
 else if( sensorValue>=500 && sensorValue<=650 )
  {
 //displays poor air
  Serial.print("Poor Air");
  Serial.print ("\r\n");
```

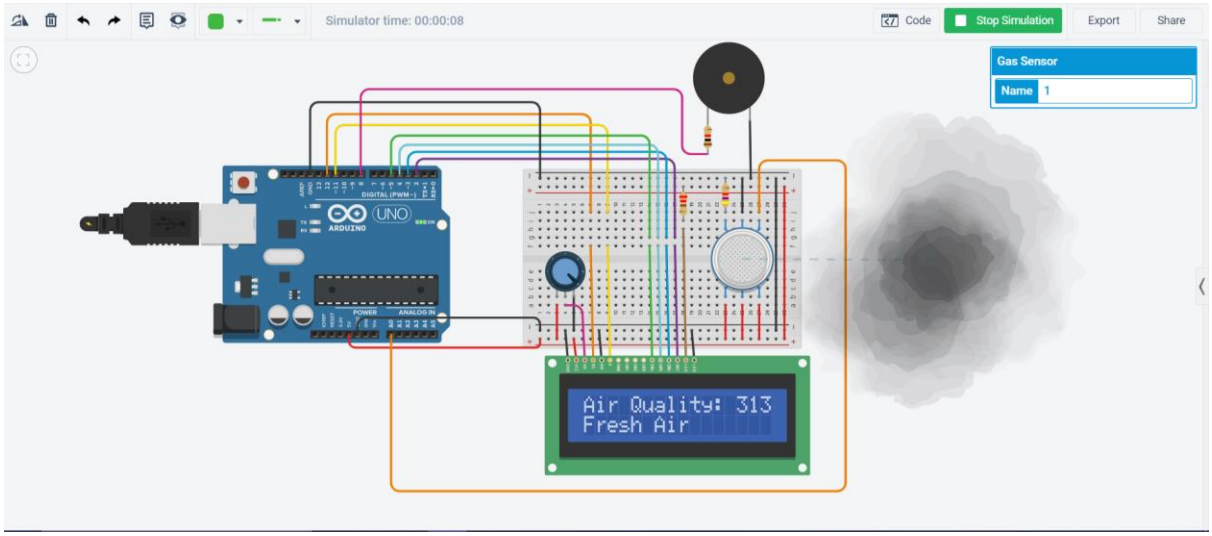
```
 lcd.setCursor(0,1);
 lcd.print("Poor Air");
 }
else if (sensorValue>=650 )
 {
  //displays very poor air
 Serial.print("Very Poor Air");
 Serial.print ("\r\n");
 lcd.setCursor(0,1);
 lcd.print("Very Poor Air");
 }

if (sensorValue >650) {
  // Activate digital output
  digitalWrite(pin8, HIGH);
}
else {
  // Deactivate digital output
  digitalWrite(pin8, LOW);
}
}
```

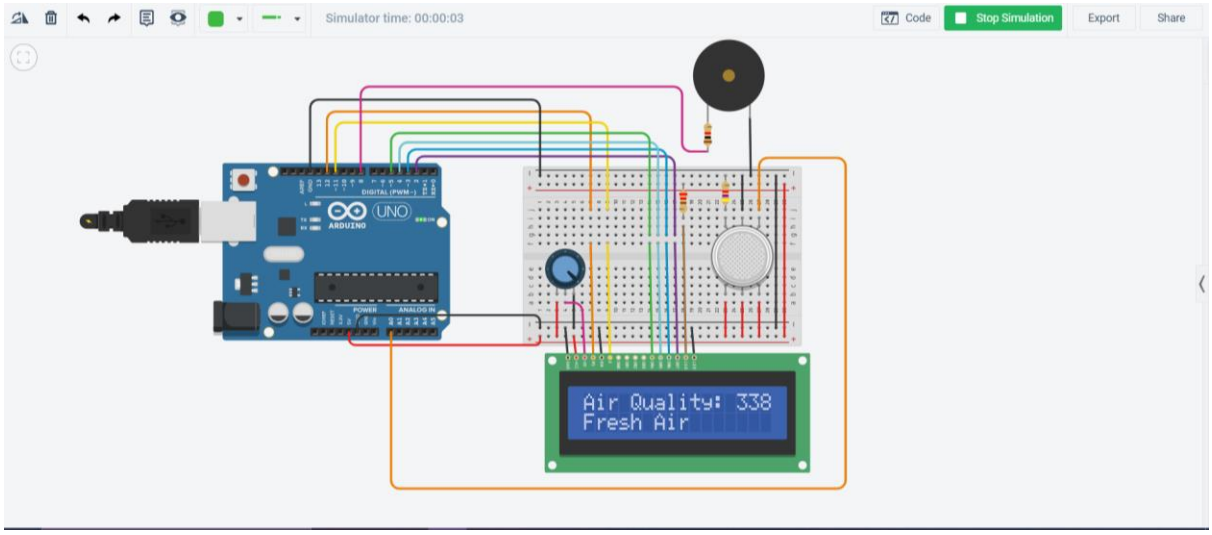
SCREENSHOTS OF THE OUTPUT:






Simulator time: 00:00:13
Code
Stop Simulation
Export
Share
Gas Sensor
Name 1
Air Quality: 306
Fresh Air


Simulator time: 00:00:08
Code
Stop Simulation
Export
Share
Gas Sensor
Name 1
Air Quality: 313
Fresh Air


Simulator time: 00:00:03
Code
Stop Simulation
Export
Share
Air Quality: 338
Fresh Air

REFERENCES

- https://www.tinkercad.com/things/ikdA3Clop1f-working-with-piezo-buzzer
- https://www.tinkercad.com/things/8Ci8AMZXvVZ-gas-sensor-value-analog-read
- https://www.youtube.com/results?search_query=tinkercad+gas+sensor