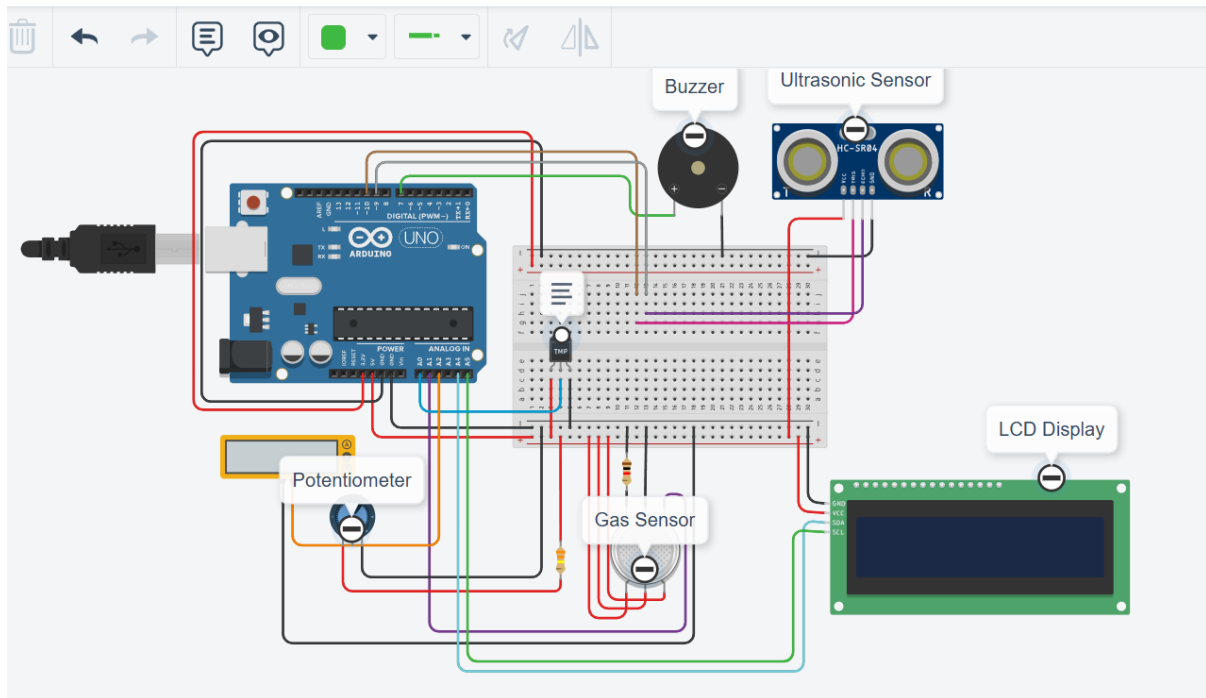


Experiment 9: Develop a program to demonstrate weather station readings using Arduino.

Date : 25.09.2025

Circuit:



Code:

```
#include <Wire.h>

#include <LiquidCrystal_I2C.h> // Import the library for I2C LCD

// Sensor variables
float temp_vout, temp, voltage, rain, V_wind;
int gas_sensor_value, Windspeedint;
bool rainAlert = false, windAlert = false, tempAlert = false, gasAlert = false;

// Pin definitions
const int gas_sensor_port = A1;
```

```
const int triggerPin = 10;
const int echoPin = 9;
const int buzzerPin = 7;
const int temp_sensor_pin = A0;
const int wind_sensor_pin = A2;

// LCD initialization
LiquidCrystal_I2C lcd(0x27, 16, 2);

void setup() {
  pinMode(gas_sensor_port, INPUT);
  pinMode(temp_sensor_pin, INPUT);
  pinMode(wind_sensor_pin, INPUT);
  pinMode(triggerPin, OUTPUT);
  pinMode(echoPin, INPUT);
  pinMode(buzzerPin, OUTPUT);

  lcd.init();
  lcd.backlight();
  Serial.begin(9600);
}

void loop() {
  // Measure Rainfall
  digitalWrite(triggerPin, LOW);
  delayMicroseconds(2);
  digitalWrite(triggerPin, HIGH);
  delayMicroseconds(10);
```

```
digitalWrite(triggerPin, LOW);

long duration = pulseIn(echoPin, HIGH);

rain = 0.01723 * duration;

rainAlert = (rain > 100);


// Measure Wind Speed

V_wind = analogRead(wind_sensor_pin) * (5.0 / 1023.0);

Windspeedint = (V_wind - 0.4) * 20;

windAlert = (Windspeedint > 10);


// Measure Temperature

temp_vout = analogRead(temp_sensor_pin);

voltage = temp_vout * 0.0048828125;

temp = (voltage - 0.5) * 100.0;

tempAlert = (temp > 30);


// Measure Gas Level

gas_sensor_value = analogRead(gas_sensor_port);

gasAlert = (gas_sensor_value > 200);


// Prioritize and Display Alerts

if (gasAlert) {

    lcd.clear();

    lcd.setCursor(0, 0);

    lcd.print("Gas ALERT!");

    tone(buzzerPin, 1200, 2000);

    delay(2000);

}
```

```
if (tempAlert) {  
    lcd.clear();  
    lcd.setCursor(0, 0);  
    lcd.print("Temp ALERT!");  
    tone(buzzerPin, 600, 2000);  
    delay(2000);  
}
```

```
if (rainAlert) {  
    lcd.clear();  
    lcd.setCursor(0, 0);  
    lcd.print("Rain ALERT!");  
    tone(buzzerPin, 1000, 2000);  
    delay(2000);  
}
```

```
if (windAlert) {  
    lcd.clear();  
    lcd.setCursor(0, 0);  
    lcd.print("Wind ALERT!");  
    tone(buzzerPin, 800, 2000);  
    delay(2000);  
}
```

```
// Display Normal Readings
```

```
lcd.clear();  
lcd.setCursor(0, 0);  
lcd.print("Rain: "); lcd.print(rain); lcd.print("mm");  
lcd.setCursor(0, 1);  
lcd.print("Wind: "); lcd.print(Windspeedint); lcd.print("MPH");
```

```
delay(2000);
```

```
lcd.clear();
```

```
lcd.setCursor(0, 0);
```

```
lcd.print("Temp: "); lcd.print(temp); lcd.print("C");
```

```
lcd.setCursor(0, 1);
```

```
lcd.print("Gas: "); lcd.print(gas_sensor_value);
```

```
delay(2000);
```

```
}
```

Output:

