PES UNIVERSITY

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

UE18CS256 – MICROPROCESSOR AND COMPUTER ARCHITECTURE LABORATORY

MINI PROJECT REPORT

ON

ENVIRONMENT MONITORING SYSTEM -DROUGHT

SUBMITTED BY

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1. ABSTRACT OF THE PROJECT:

A drought is an event of prolonged shortages in the water supply, whether atmospheric (below-average precipitation), surface water or ground water. A drought can last for months or years, or may be declared after as few as 15 days.[1] It can have a substantial impact on the ecosystem and agriculture of the affected region[2] and harm to the local economy.[3] Annual dry seasons in the tropics significantly increase the chances of a drought developing and subsequent bush fires. Periods of heat can significantly worsen drought conditions by hastening evaporation of water vapour.

Droughts, an integral part of India's geophysical profile, have registered a steep rise in frequency and ferocity during the past 50 years. To its credit, the scientific community has kept pace by conducting research that can minimize the impact of dry spells. But the government has done precious little to utilize this flood of information for the benefit of the worst affected sector -- agriculture.

DROUGHT IN INDIA DEPENDS ON 5 FACTORS:

1. MOISTURE
   as moisture decreases to around 30% we can predict the can be occurrence of drought
2. RAINFALL
   as rainfall decreases to around 25% we can predict the can be occurrence of drought
3. CARBON DIOXIDE LEVEL
   As carbon dioxide level increases in atmosphere we can predict rainfall so the drought severity might decrease.
4. TEMPERATURE:
   As temperature increases drought severity also increases as moisture gets evaporated.
5. AIR VELOCITY:
   Droughts in California are mainly controlled by wind, not by the amount of evaporated moisture in the air, new research has found.
    So thats the reason so air velocity is more rainfall over those region is less so drought might occur.

2.CIRCUIT DIAGRAM:
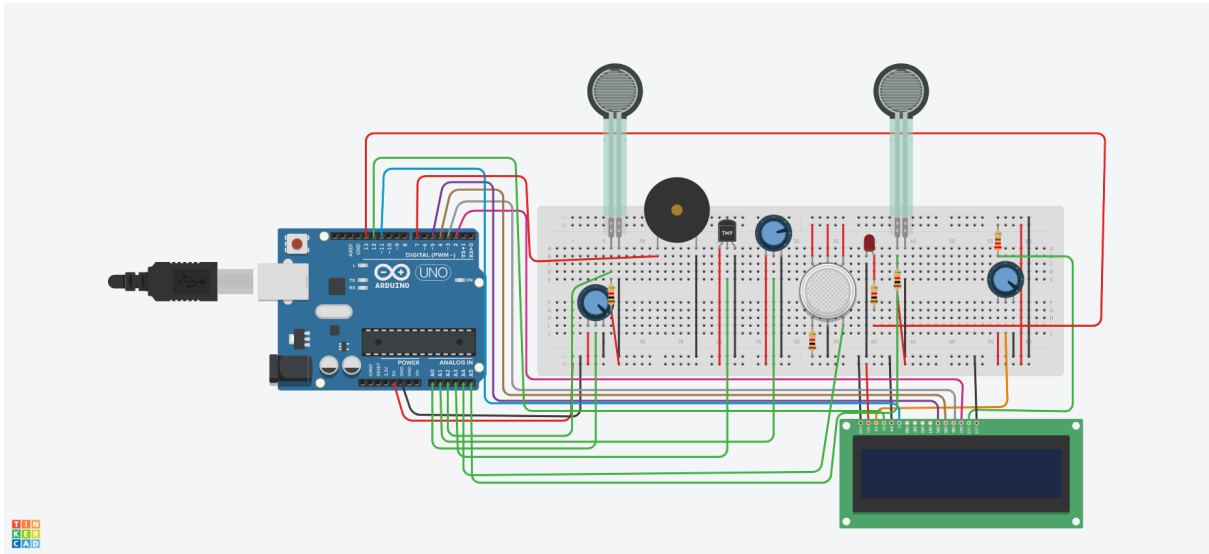
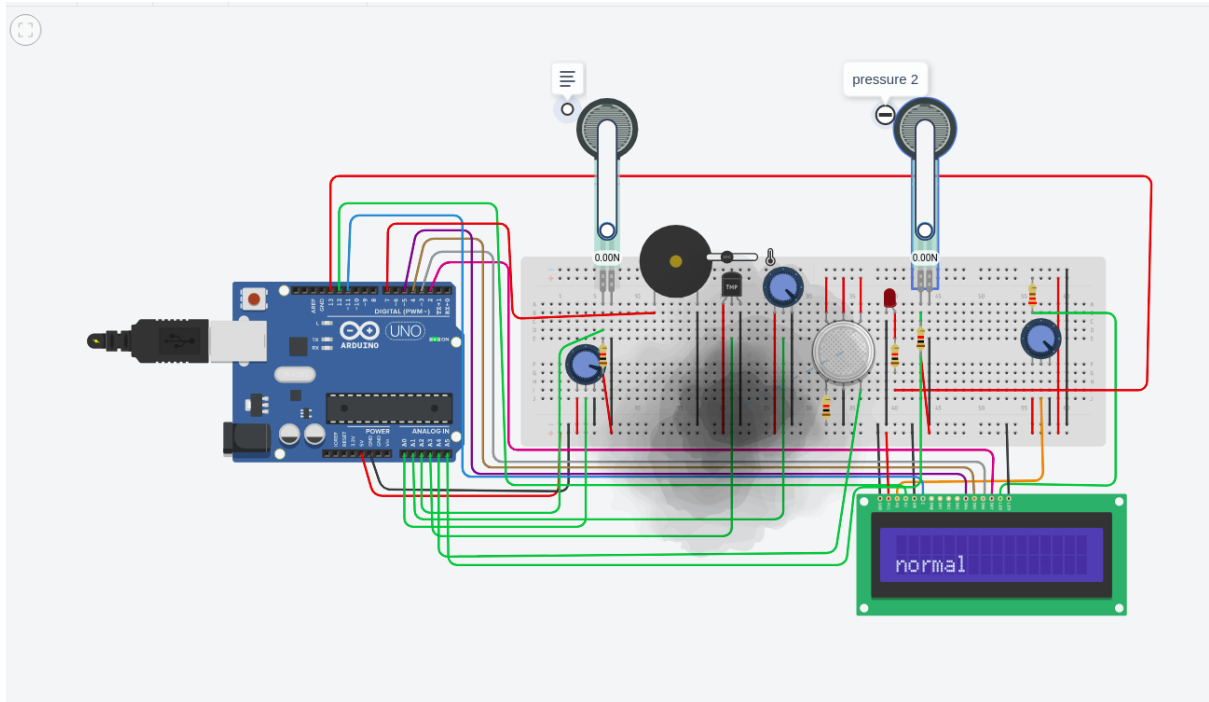# 3.ARDUINO CODE:

```
#include <LiquidCrystal.h>
LiquidCrystal lcd(12, 11, 5, 4, 3, 2);
//INITIALIZE
int temperature = 0;
int gaslevel = 0;
int moist = 0;
int rainfall=0;
//pressure in water
int force1 = 0;
//pressure in Hg
int force2 = 0;
double airvelocity;
//rainfall in precent
int value =0;
//moist in percentage
int moistper=0;
int led = 13;
int piezo=7;
//temporary variables;
double temp;
double pressure1;
double pressure2;
double d;
void setup()
{
Serial.begin(9600);
  lcd.begin(16, 2);
}
void loop()
{
  force1 = analogRead(A2);
  pressure1=(double)force1/1; //calculating pressure for force in water
  force2 = analogRead(A5);
pressure2=(double)force2/1;//calculating pressure for force in Hg
  temperature = analogRead(A3);
  gaslevel = analogRead(A4);
  rainfall = analogRead(A1);
  moist = analogRead(A0);
   d=(double)1.325*(pressure2/temp);
   airvelocity=(double)1096.7*sqrt(pressure1/d);
 airvelocity= airvelocity/197;//converting ft/s to m/s
  Serial.println(airvelocity);
   temp = (double)temperature / 1024;      //find percentage of input reading
  temp = temp * 5;              //multiply by 5V to get voltage
  temp = temp - 0.5;              //Subtract the offset
  temp = temp * 100;              //Convert to degrees
  lcd.setCursor(0, 1);
 value =(rainfall)*100L/1023;
 moistper =(moist)*100L/1023;
```
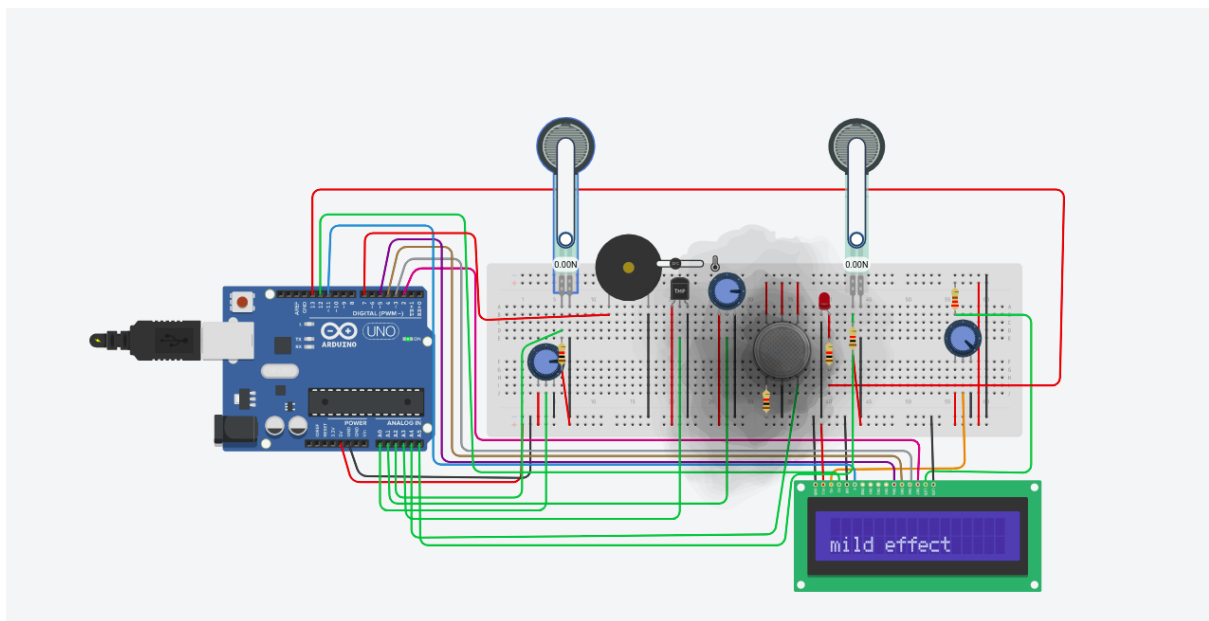
```
  if (gaslevel>100){
    value=value+10;
  }
 if(temperature>40){
   moistper=moistper-10;}
 if(airvelocity>25)
 {value=value-25; }
  if ((moistper<30) && (value<25))
{lcd.print("severe       ");
  digitalWrite(led, HIGH);
    tone(7, 247, 10);
}
  else if ((moistper<50)&& (value<40))
  {      lcd.setCursor(0, 1);
   lcd.print("mild effect  ");
   digitalWrite(led, HIGH);
   noTone(7);
 }
 else{
   lcd.setCursor(0, 1);
   lcd.print("normal        ");
   digitalWrite(led, LOW);
   noTone(7);
 }
}
```
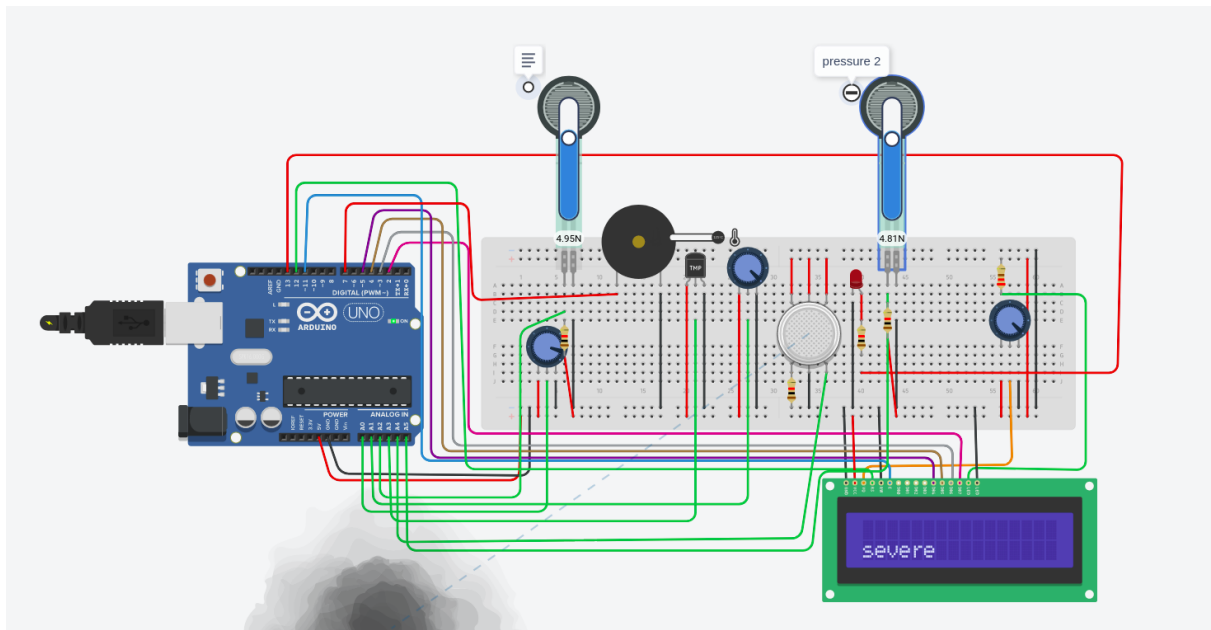
4. SCREENSHOTS OF THE OUTPUT:

normal condition

mild condition

conditions of drought

REFERENCES

1. https://www.downtoearth.org.in/indepth/drought-monitoring-untapped-data-15118

2. https://www.sciencedaily.com/releases/2016/07/160705102640.htm

3. https://extension.okstate.edu/fact-sheets/tracking-drought-using-soil-moisture-information.html#:~:text=Agricultural%20drought%20refers%20to%20shortages,crops%20in%20sensitive%20growth%20stages.

4. https://www.nrdc.org/stories/drought-everything-you-need-know