# SMART CROPPING SYSTEM

| TEAM ID | PNT2022TMID40834 |
|---|---|
| PROJECT NAME | IoT- based smart crop protection system for argiculture |

## Description:

This System is used to help farmers in the irrigation process. The System provides data on the parameters which can be used to monitor the condition of the field to maintain and protect the crops. The parameters like temperature, soil moisture, etc., can be accessed through the system. The sensors in the system monitor the parameters and provide them to the farmer to take the necessary measures.

## Program:

```
#include <Wire.h>
#include <Servo.h>
#include <Adafruit_LiquidCrystal.h>

Servo  s;
int e = 4;
int t = 5;
int r = 12;
int g = 11;
int b = 10;
int sec = 0;
int Sensor = 0;
int data = 0;
int motorPin = 9;
Adafruit_LiquidCrystal lcd(0);

void setup()
{
   Wire.begin();
```

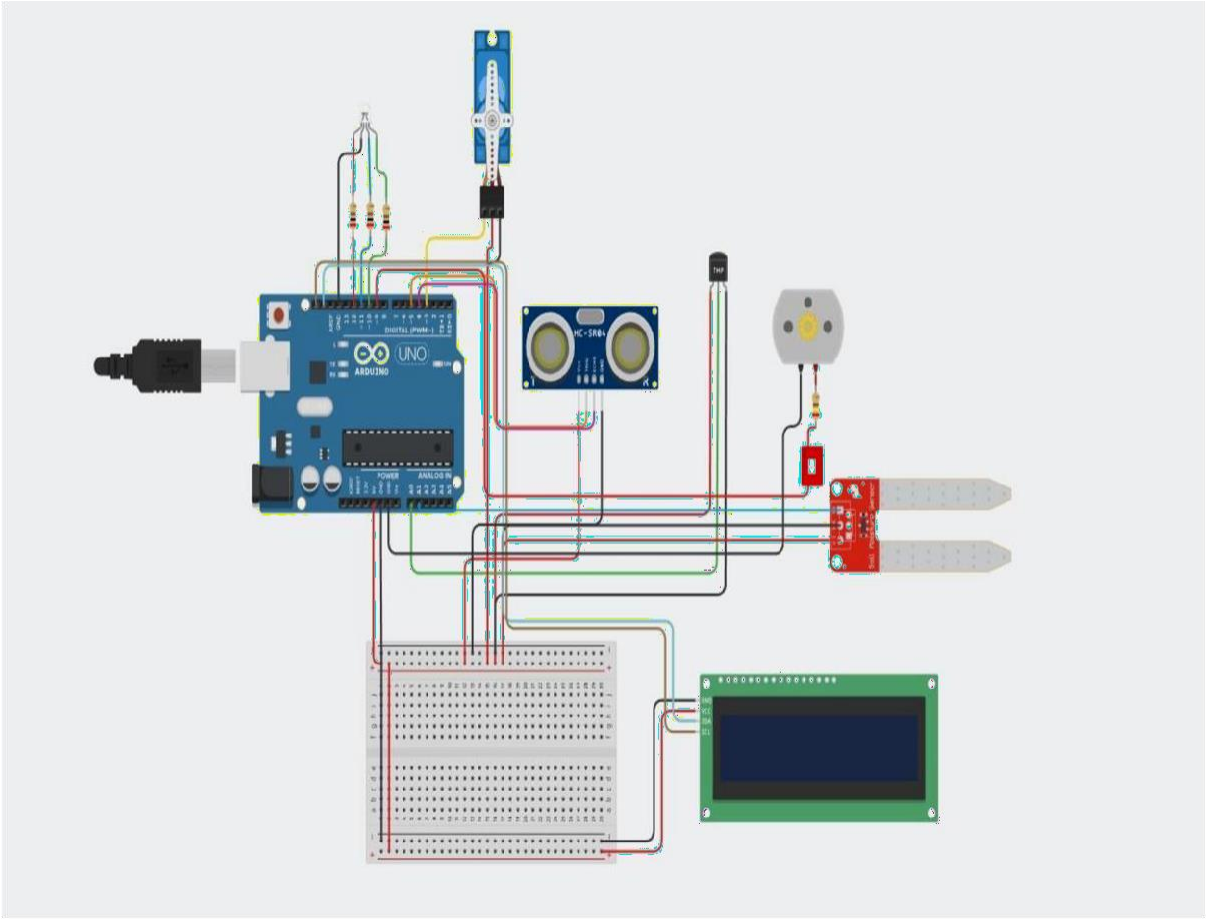
```
  pinMode(A0,INPUT);        //Temperature Sensor
  pinMode(A1,INPUT);        //Soil Moisture Sensor
  pinMode(t,OUTPUT);    //Ultra sonic Trigger
  pinMode(e,INPUT);     //Ultra sonic Echo
  pinMode(b,OUTPUT);       //GREEN light for LED
  pinMode(g,OUTPUT);       //BLUE light for LED
  pinMode(r,OUTPUT);       //RED light for LED
  pinMode(motorPin, OUTPUT); //DC motor
  s.attach(3);              // Servo Motor
  lcd.begin(16, 2);                         //LCD 16x2 Display
  lcd.setBacklight(0);
  Serial.begin(9600);
}

float readDistanceCM(){
  digitalWrite(t, LOW);
  delayMicroseconds(2);
  digitalWrite(t, HIGH);
  delayMicroseconds(10);
  digitalWrite(t, LOW);
  int duration = pulseIn(e, HIGH);
  return duration * 0.034 / 2;
}

void loop(){
  //Soil Moisture:
  Sensor = analogRead(A1);         //Reads data from Soil Moisture sensor
  data = map(Sensor,0, 1023, 0, 100);          //Low analog value indicates HIGH moisture
level and High analog value indicates LOW moisture level
  //data = map(analogValue,fromLOW,fromHIGH,toLOW,toHIGH)
  Serial.print("Soil Moisture value:");
  Serial.println(data);
  //'data = 0' indicates wet and 'data = 100' indicates dry

  //Temperature:
  double a = analogRead (A0);         //Reads data from Temperature sensor
  double t = (((a/1024)*5)-0.5)*100;
```

```
Serial.print("Temperature value:");
Serial.println(t);

//Ultrasonic sensor:
float distance = readDistanceCM();
Serial.print("Measured distance: ");
Serial.println(readDistanceCM());

      //LCD Display:
      lcd.setBacklight(1);
      lcd.clear();

//Conditions:
if (t>40 & t<50){
   digitalWrite(b,0);
   digitalWrite(g,1);
   digitalWrite(r,0);
   s.write(90);
   digitalWrite(motorPin, HIGH);
   Serial.println("Water Partially Flows");
}

else if (t>50){
   digitalWrite(b,1);
   digitalWrite(g,1);
   digitalWrite(r,0);
   s.write(180);
   digitalWrite(motorPin, HIGH);
   Serial.println("Water Fully Flows");
}

else if (t>30 & data<30){
   digitalWrite(b,1);
   digitalWrite(g,1);
   digitalWrite(r,0);
         s.write(90);
   digitalWrite(motorPin, HIGH);
```

```
    Serial.println("Water Partially Flows");
}

else if (data<50){
    digitalWrite(b,0);
    digitalWrite(g,0);
    digitalWrite(r,1);
    s.write(90);
    digitalWrite(motorPin, HIGH);
    Serial.println("Water Partially Flows");
}

else if (distance < 10){
   digitalWrite(b, 0);
    digitalWrite(g, 0);
    digitalWrite(r, 1);
    s.write(0);
    digitalWrite(motorPin, LOW);
    Serial.println("Water Does Not Flow");
    lcd.clear();
        lcd.println("Drain the water");
}

else{
    digitalWrite(b,1);
    digitalWrite(g,0);
    digitalWrite(r,0);
    s.write(0);
    digitalWrite(motorPin,              LOW);
    Serial.println("Water Does Not Flow");
}

        lcd.setCursor(0,0);
        lcd.print("Temp:");
lcd.println(t);
        lcd.println("degree");
        lcd.setCursor(0,1);
```

```
        lcd.print("Soil Moisture:");
    lcd.println(data);
        lcd.println("%");

    Serial.println("----------");
    delay(1000);
}
```

## Circuit Diagram:



# Component Used:

| Name | Quantity | Component |
|---|---|---|
| UAU | 1 | Arduino Uno R3 |
| SERVOMS | 1 | Positional Micro Servo |
| DLED | 1 | LED RGB |
| RGreen LED Resistor<br>RRed LED Resistor<br>RBlue LED Resistor | 3 | 200 Ω Resistor |
| SENSMS | 1 | Soil Moisture Sensor |
| MSmall 6V DC Motor | 1 | DC Motor |
| RMotor Resistor | 1 | 240 Ω Resistor |
| UTS | 1 | Temperature Sensor (TMP36) |
| DISTUltrasonic Distance Sensor | 1 | Ultrasonic Distance Sensor |
| LI3 | 1 | MCP23008-based 32 LCD 16 x 2 (I2C) |
| SWDPST Switch | 1 | DIP Switch DPST |

# OUTPUT: