

SMART CROPPING SYSTEM

TEAM ID	PNT2022TMID40891
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);
```

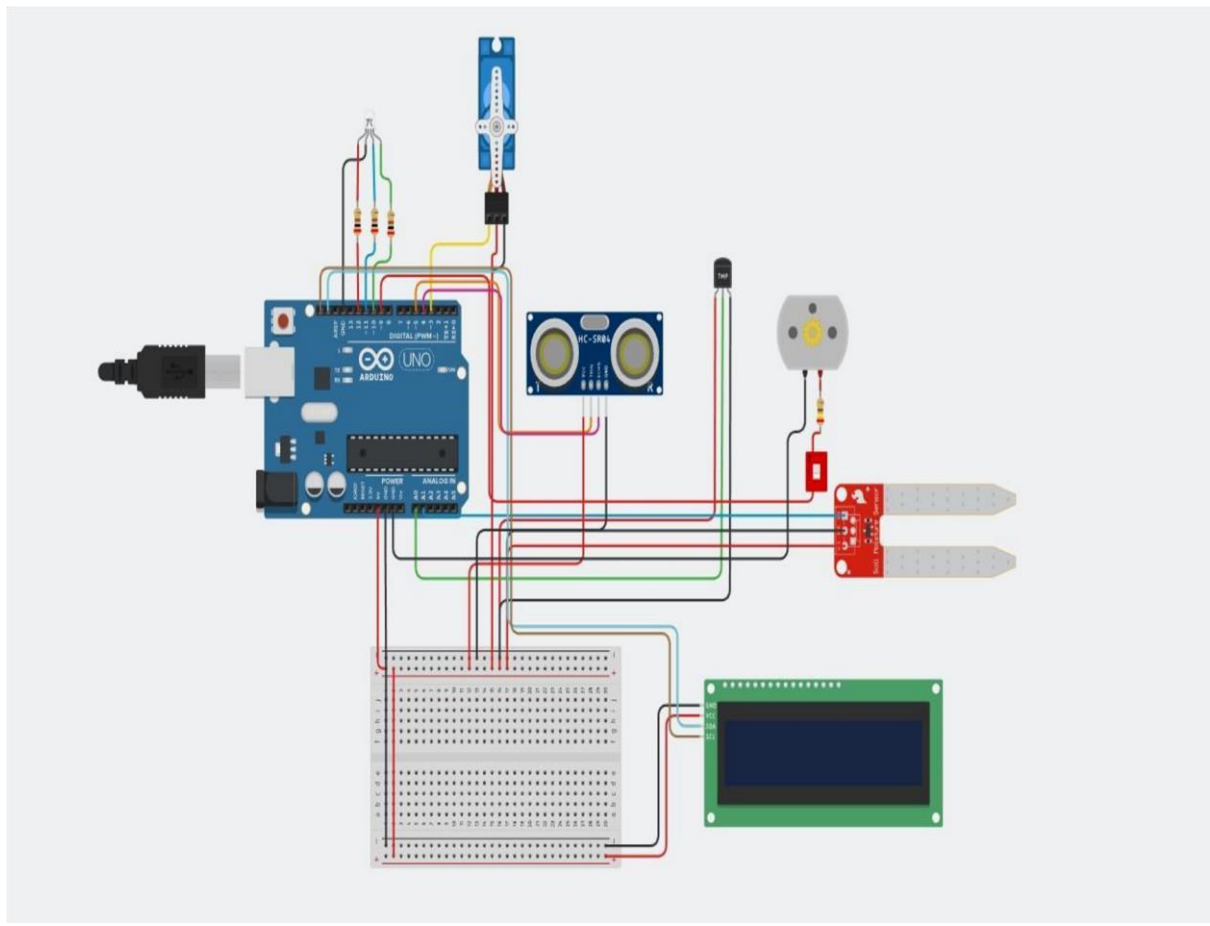
```

        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 RRed LED Resistor 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
U3	1	MCP23008-based, 32 LCD 16 x 2 (I2C)
SWDPST Switch	1	DIP Switch DPST

OUTPUT:

Tremendous Esboo-Luulia

All changes saved

Simulator time: 00:00:03.659

Code Stop Simulation Send To

1 (Arduino Uno R3)

```
1 #include <Wire.h>
2 #include <Servo.h>
3 #include <Adafruit_LiquidCrystal.h>
4
5 Servo s;
6 int e = 4;
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8 int r = 12;
9 int g = 11;
10 int b = 10;
11 int sec = 0;
12 int Sensor = 0;
13 int data = 0;
14
```

Serial Monitor

Soil moisture value:100
Temperature value:449.51
Measured distance: 0.00
Water fully flows

Soil Moisture value:100
Temperature value:449.51
Measured distance:

Send Clear

