

SPRINT_2

Date	08 November 2022
Team ID	PNT2022TMID08726
Project Name	Smart Farmer - IoT Enabled Smart Farming Application
Maximum Marks	4 Marks

Program:

```
#include <Adafruit_LiquidCrystal.h> //Includes the library for LCD Display
#include <Wire.h>                    //Includes the library for connections
#include <Servo.h>                   //Includes the library for Servo Motor
```

Servo s;

inte = 4; int

t = 5;

int r = 12;

int b = 11;

int g = 10;

int sec= 0;

intSensor

= 0;

intsoil = 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 Moistursensor

  soil = map(Sensor, 0, 1023, 0, 117);
```

```

/* 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(soil);

//'data = 0' indicates total wetness and 'data = 100' indicates total dryness

```

```

// Temperature;

double a = analogRead(A0);

// Reads data fromTemperature sensor

double t = (((a / 1024) * 5) - 0.5) * 100;

Serial.print("Temperature value:");
//Temperature value in Celsius

Serial.println(t);

```

```

// Ultrasonic sensor:

float distance = readDistanceCM(); //Readsdata from Ultrasonicsensor

Serial.print("Measured distance: ");
Serial.println(readDistanceCM());

```

```

// LCD Display;

lcd.setBacklight(1);

//ON thebackground light in LCD

lcd.clear();

```

```

// Conditions:
/*If the temperature is Greater than 20 and less than 35 and also the moistureof soil is less than 60 then the GREEN light will be
turned ON indicating the Normal condition */
if (t >= 20 && t < 35 && soil >= 40 && soil < 50)
{

    digitalWrite(b, 0);

digitalWrite(g, 1);

```

```

    digitalWrite(r, 0);    s.write(90);

digitalWrite(motorPin, HIGH);
lcd.setCursor(3, 0);
lcd.print("ON MOTOR");
delay(1000);

lcd.clear();
Serial.println("Water Partially Flows");

    }
    /*If the temperature is Greater than 35 and less than 45, then the BLUE light will be turned ON indicating the Intermediate risk
    condition due to slightly warm weather */

    else if (t >= 35 && t < 45)
    {
digitalWrite(b, 1);

digitalWrite(g, 0);

digitalWrite(r, 0);

s.write(90);

digitalWrite(motorPin, HIGH);
lcd.setCursor(3, 0);
lcd.print("ON MOTOR");
delay(1000);

lcd.clear();
Serial.println("Water Partially Flows");

    }

    /*If the temperature is Greater than 45 or the moisture of soil is less than 30, then the RED light will be turned ON
    indicating the Critical condition due to highly warm weather or the low moisture content in soil */
    else if (t >= 45 || soil < 30)
    {

```

```

digitalWrite(b, 0);
digitalWrite(g, 0);
digitalWrite(r, 1);

s.write(180);

digitalWrite(motorPin, HIGH);
Serial.println("Water Fully Flows");
lcd.setCursor(2, 0);
lcd.print("ONMOTOR!!!");
lcd.setCursor(3, 1);
lcd.print("Low Water");
delay(1000);
lcd.clear();
}

```

/*If the level of water is MORE in the field it will be indicated by distance sensor for less than 10cm and also the moisture of soil is greater than 80, then the YELLOW light will be turned ON indicating the high water level */

```

else if (distance<10 && soil> 80)
{
    digitalWrite(b, 0);
    digitalWrite(g, 1);
    digitalWrite(r, 1);

    s.write(0);

    digitalWrite(motorPin, LOW);
    Serial.println("Water Does Not Flow");
    lcd.clear();
    lcd.setCursor(3, 0);
    lcd.print("OFF MOTOR");
    delay(1000);
    lcd.clear();

```

```

    lcd.setCursor(1, 0);
    lcd.print("DRAIN WATER!!!");
    delay(1000);
    lcd.clear();
else
    {
digitalWrite(b, 1);
digitalWrite(g, 1);
digitalWrite(r, 0);

s.write(0);

digitalWrite(motorPin, LOW);
lcd.setCursor(3, 0);
lcd.print("OFF MOTOR");
delay(1000);
lcd.clear();
Serial.println("Water Does Not Flow");
    }

```

```

    lcd.setCursor(0, 0);
    lcd.print("Temp:");
    lcd.print(t);
    lcd.print("degree");
    lcd.setCursor(0, 1);
    lcd.print("SoilWetness:");
    lcd.print(soil);    lcd.print("%");

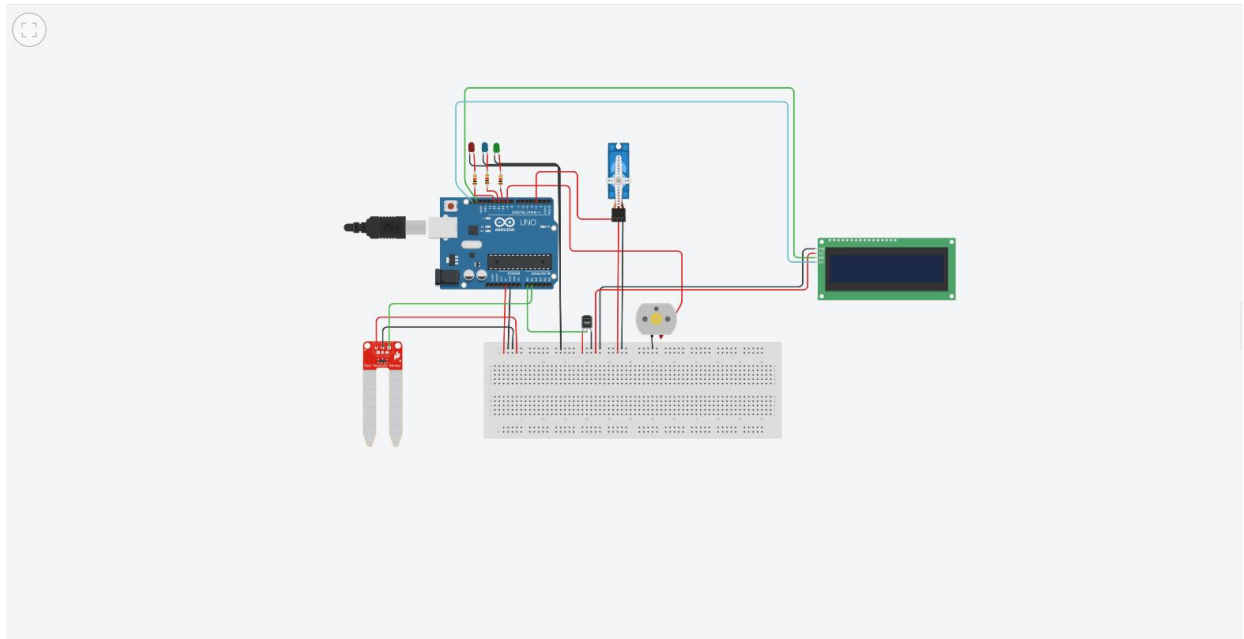
```

```

    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