

## **SPRINT - II**

<i>Date</i>	<i>13.11.2022</i>
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<i>Project Name</i>	<i>Smart Farmer - IoT Enabled Smart Farming Application</i>

### **Program:**

**#include <Adafruit\_LiquidCrystal.h>**    //Library    for    LCD  
Display

**#include <Wire.h>**    //Library for connections

**#include <Servo.h>**    //Library    for    Servo  
Motor

**Servo s;**

**int e =**

**4; int t=**

**5;**

**int r =**

**12; int**

**b = 11;**

**int g =**

**10;**

**int**

**sec=0;**

```

int
Sensor=
0;
int  soil
= 0;
int
motor
Pin= 9;

Adafruit_LiquidCrystal lcd(0);

void setup()
{
  Wire.begin();
  pinMode(motorPin, OUTPUT);
  pinMode(A0,INPUT);           //Sensor for temperature
  pinMode(A1,INPUT);           //Sensor for soil moisture
  pinMode(t,OUTPUT);           //Ultra sonic sensor Trigger
  pinMode(e,INPUT);            //Ultra sonic sensor Echo

  pinMode(b,INPUT);            //Green LED
  pinMode(g,OUTPUT);           //Blue LED
  pinMode(r,OUTPUT);           //RED LED

  pinMode(motorPin, OUTPUT);   // DC motor
  s.attach(3);                 // DC motor
  lcd.begin(16,2);

```

```
    lcd.setBackligh  
t(0);  
    Serial.begin(96  
00);  
}
```

```
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);

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 from Temperature 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

Ultrasonic sensor

**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 won't
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("OFFMOTO  
R");**

**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);**

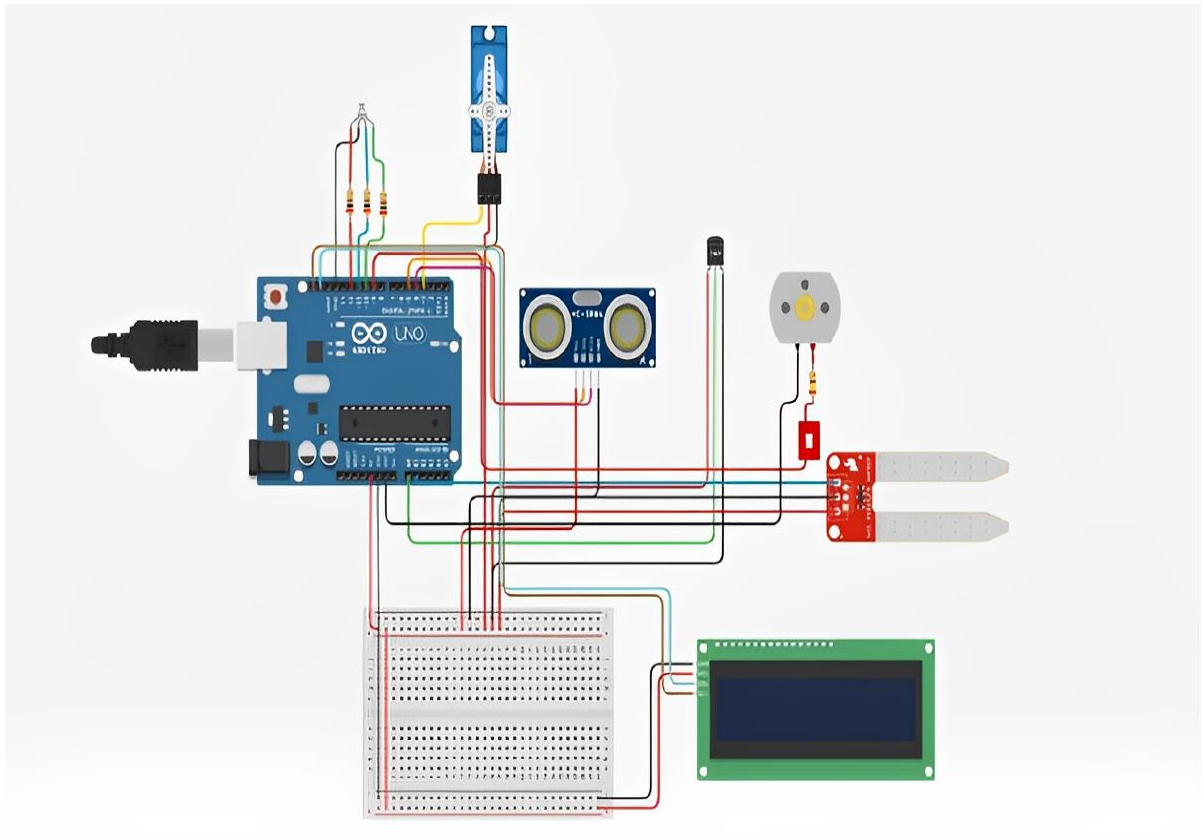
**lcd.print("SoilWetne  
ss");**

**lcd.print(soil);  
lcd.print("%");**

**Serial.println(" ----- ");**

**delay(1000);**

## Circuit flow:



## Components 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 $\Omega$ Resistor
SENSMS	1	Soil Moisture Sensor
MSmall 6V DC Motor	1	DC Motor
RMotor Resistor	1	240 $\Omega$ Resistor
UTS	1	Temperature Sensor [TMP36]
DISTUltrasonic Distance Sensor	1	Ultrasonic Distance Sensor
U3	1	MCP23008-based, 32 LCD 16 x 2 (I2C)
S/WDPST Switch	1	DIP Switch DPST