Project Development

Delivery Of Sprint-2

Date	09 Nov. 22
Team Id	PNT2022TMID14185
Project Name	Smart Farmer - IoT Enabled Smart Farming Application

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;

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 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
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(); //Reads data from Ultrasonic sensor
Serial.print("Measured distance: ");
Serial.println(readDistanceCM());


// LCD Display:
lcd.setBacklight(1);          //ON the background light in LCD
lcd.clear();

// Conditions:
```

```
/*If the temperature is Greater than 20 and less than 35 and also the moisture of 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("ON MOTOR!!!");

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);
}
```

COMPONENTS

S.NO	COMPONENTS	QUANTITY
1	Arduino uno r3	1
2	Micro servo	1
3	Led rgb	1
4	200 Ω Resistor	3
5	Soil Moisture Sensor	1
6	DC Motor	1
7	240Ω Resistor	1
8	Temperature sensor(TMP36)	1
9	Ultrasonic Distance sensor	1
10	32 LCD 16 x 2 (I2C)	1
11	DIP Switch DPST	1

CIRCUIT CONNECTION