

## SPRINT 2

Date	5 November 2022
Team ID	PNT2022TMID12911
Project Name	Smart Farmer – IoT Enabled Farming Application
Maximum Marks	8 Marks

The purpose of smart farmer project is to help farmers in the irrigation process. The system provides various parameters like temperature, humidity etc. to monitor the condition of the fields and to protect the crops. Based on the temperature, soil moisture, water level of the field etc., and system will take necessary action and the entire operation can be controlled by the IoT application.

### Sensor Interfacing:

#### 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");  
}
```

### TinketCad Circuit:

