

SPRINT -1

Team ID	PNT2022TMID15028
Project Name	Project : SmartFarmer - IoT Enabled Smart Farming Application

To develop a Python Script to publish & subscribe to IBM IoT Platform

PYTHON CODE:

```
#include <Adafruit_LiquidCrystal.h> //Library for LCDDisplay
#include <Wire.h>                    //Library for connections
#include <Servo.h>                   //Library for Servo
MotorServo 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
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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);
lcd.begin(16,2);
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()
{
Sensor = analogRead(A1);
soil = map(Sensor, 0, 1023, 0, 117);
data = map(analogValue,fromLOW,toLOW,toHIGH,toHIGH)
Serial.print("Soil Moisture value:");
Serial.println(soil);
double a = analogRead(A0);
double t = (((a / 1024) * 5) - 0.5) * 100;
Serial.print("Temperature value:");
Serial.println(t);

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float distance = readDistanceCM();
Serial.print("Measured distance: ");
Serial.println(readDistanceCM( ));
lcd.setBacklight(1);
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 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("OFFMOTOR");

  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);
```

Connection of the sensors with Arduino by using Python code:

