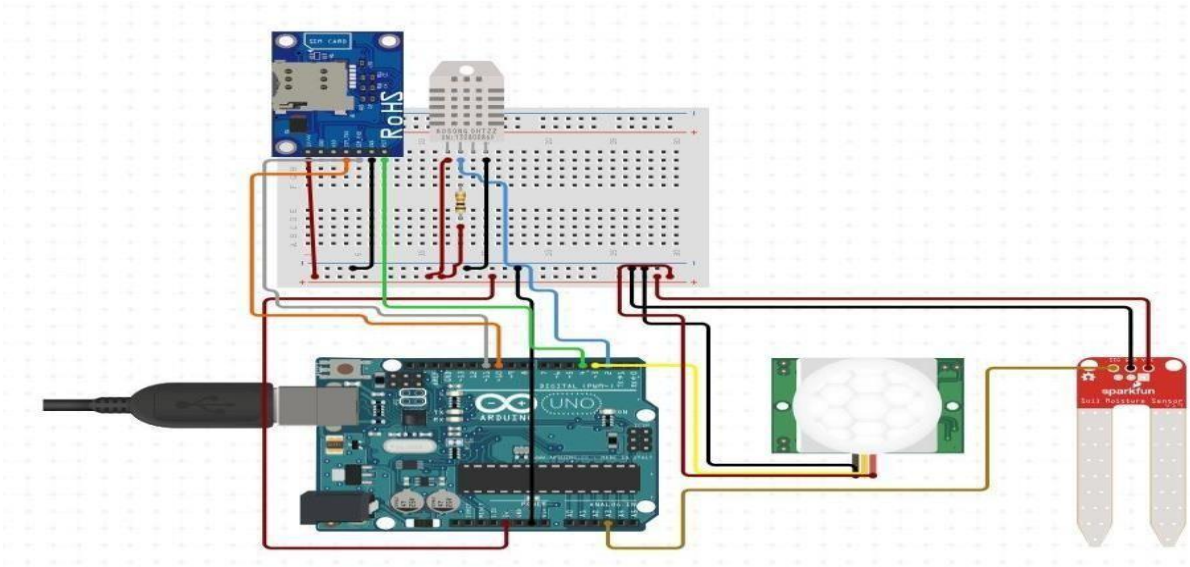
Sprint-1
IoT Devices

Date	28 October 2022
Team ID	PNT2022TMID19113
Project Name	SmartFarmer - IoT Enabled Smart Farming Application

Connectivity and functionality setup of sensors and Wi-fi module

- **Circuit connection:**



- **Coding:**

```
//include libraries
#include <dht.h>
#include <SoftwareSerial.h>
//define pins
#define dht_apin A0 // Analog Pin sensor is connected
SoftwareSerial mySerial(7,8);//serial port of gsm
const int sensor_pin = A1; // Soil moisture sensor O/P pin
int pin_out = 9;
//allocate variables
dht DHT;
int c=0;

void setup()
{
```

```
pinMode(2, INPUT); //Pin 2 as INPUT
pinMode(3, OUTPUT); //PIN 3 as
OUTPUTpinMode(9, OUTPUT);//output
for pump
}
void loop()
{
 if (digitalRead(2) == HIGH)
 {
 digitalWrite(3, HIGH); // turn the LED/Buzz ON
 delay(10000); // wait for 100 msecond
 digitalWrite(3, LOW);  // turn the LED/Buzz OFF
 delay(100);
 }
  Serial.begin(9600);
    delay(1000);
   DHT.read11(dht_apin); //temprature
 float h=DHT.humidity;
 float t=DHT.temperature;
   delay(5000);
   Serial.begin(9600);
    float moisture_percentage;//moistureint
 sensor_analog;
 sensor_analog = analogRead(sensor_pin);
 moisture_percentage = ( 100 - ( (sensor_analog/1023.00) * 100 ) );
 float m=moisture_percentage;delay(1000);
 if(m<40)//pump
 {
 while(m<40)
 {
 digitalWrite(pin_out,HIGH);//open pump
 sensor_analog = analogRead(sensor_pin);
 moisture_percentage = ( 100 - ( (sensor_analog/1023.00) * 100 ) );
 m=moisture_percentage;
 delay(1000);
 }
```

```
  digitalWrite(pin_out,LOW);//closepump
  }
  if(c>=0)
  {
  mySerial.begin(9600);
  delay(15000);
  Serial.begin(9600);
  delay(1000); Serial.print("\r");
  delay(1000);
  Serial.print("AT+CMGF=1\r");
  delay(1000);
  Serial.print("AT+CMGS=\"+XXXXXXXXXX\"\r"); //replace X with 10 digit
mobile number
  delay(1000);
  Serial.print((String)"update-
>"+(String)"Temprature="+t+(String)"Humidity="+h+(String)"Moisture="+m);
  delay(1000);
  Serial.write(0x1A);
  delay(1000);
  mySerial.println("AT+CMGF=1");//Sets the GSM Module in Text
  Modedelay(1000);
  mySerial.println("AT+CMGS=\"+XXXXXXXXXX\"\r"); //replace X with 10
digitmobile number
  delay(1000);
  mySerial.println((String)"update-
>"+(String)"Temprature="+t+(String)"Humidity="+h+(String)"Moisture="+m);//
message format
  mySerial.println();
  delay(100);
  Serial.write(0x1A);
  delay(1000);
  c++;

    }

 }
```

Explanation:

The main aim of this project is to help farmers automate their farms by providing them with a Web App through which they can monitor the parameters of the field like Temperature, soil moisture, humidity and etc and control the equipment like water motor and other devices remotely by the help of Arduino UNO via internet without their actual presence in the field.

Project flow:

- → The parameters like temperature, humidity, and soil moisture are updated to the Watson IoT platform
- → The device will subscribe to the commands from the mobile application and control the motors accordingly
- → APIs are developed using Node-RED service for communicating with Mobile Application
- → A mobile application is developed using the MIT App inventor to monitor the sensor parameters and control the motors.

IoT Simulator:

- → In our project in the place of sensors we are going to use IoT sensor simulator which give random readings to the connected cloud.
- → We need to give the credentials of the created device in IBM Watson IoT Platform to connect cloud to simulator.

OpenWeather API:

- → OpenWeatherMap is an online service that provides weather data. It provides current weather data, forecasts and historical data to more than 2 million customer.
- → **Steps to configure:**
- → Create account in OpenWeather
- → Find the name of your city by searching
- → Create API key to your account
- → Replace “city name” and “your api key” with your city and API key in below red text

→ api.openweathermap.org/data/2.5/weather?q={city name}&appid={your api key}