

Internet of Things Lab

Digital Assignment 4

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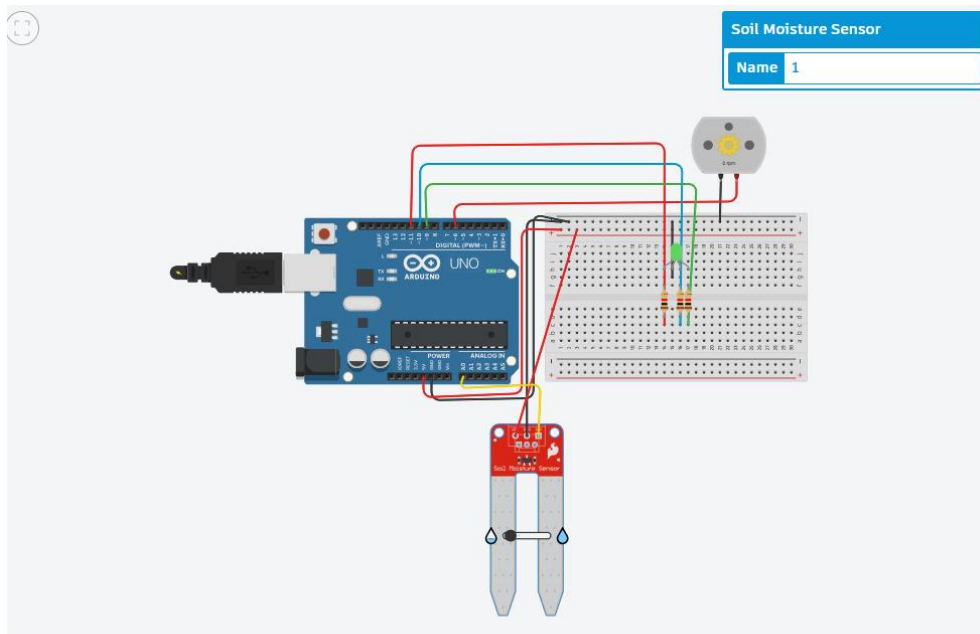
REG NO: 21BEC0256

Experiment 1:

Aim:

To build a circuit to display the soil moisture level and rotate a motor depending upon the level of soil moisture.

Circuit:



Code:

```
const int r= 11;
const int g= 9;
const int b= 10;
const int motor=6 ;
const int sensor = A0;
void setup()
{
    pinMode(r, OUTPUT);
    pinMode(g, OUTPUT);
```

```

pinMode(b, OUTPUT);
pinMode(motor, OUTPUT);
pinMode(sensor, INPUT);
Serial.begin(9600);
}

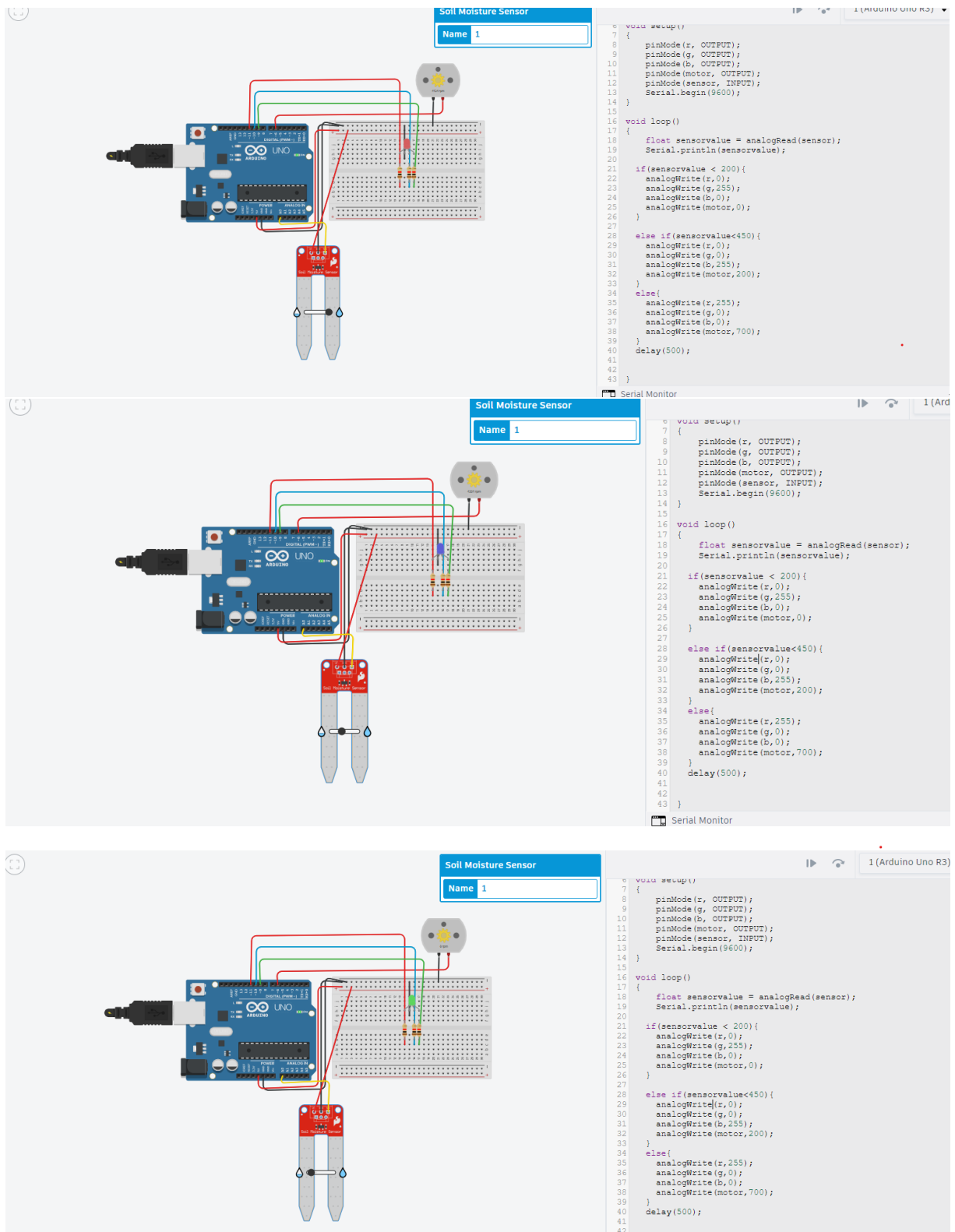
void loop()
{
    float sensorvalue = analogRead(sensor);
    Serial.println(sensorvalue);

    if(sensorvalue < 200){
        analogWrite(r,0);
        analogWrite(g,255);
        analogWrite(b,0);
        analogWrite(motor,0);
    }

    else if(sensorvalue<450){
        analogWrite(r,0);
        analogWrite(g,0);
        analogWrite(b,255);
        analogWrite(motor,200);
    }
    else{
        analogWrite(r,255);
        analogWrite(g,0);
        analogWrite(b,0);
        analogWrite(motor,700);
    }
    delay(500);
}

```

Output:



Result and Inference: The circuit was constructed and run. The result was observed in the LED.

Experiment 2:

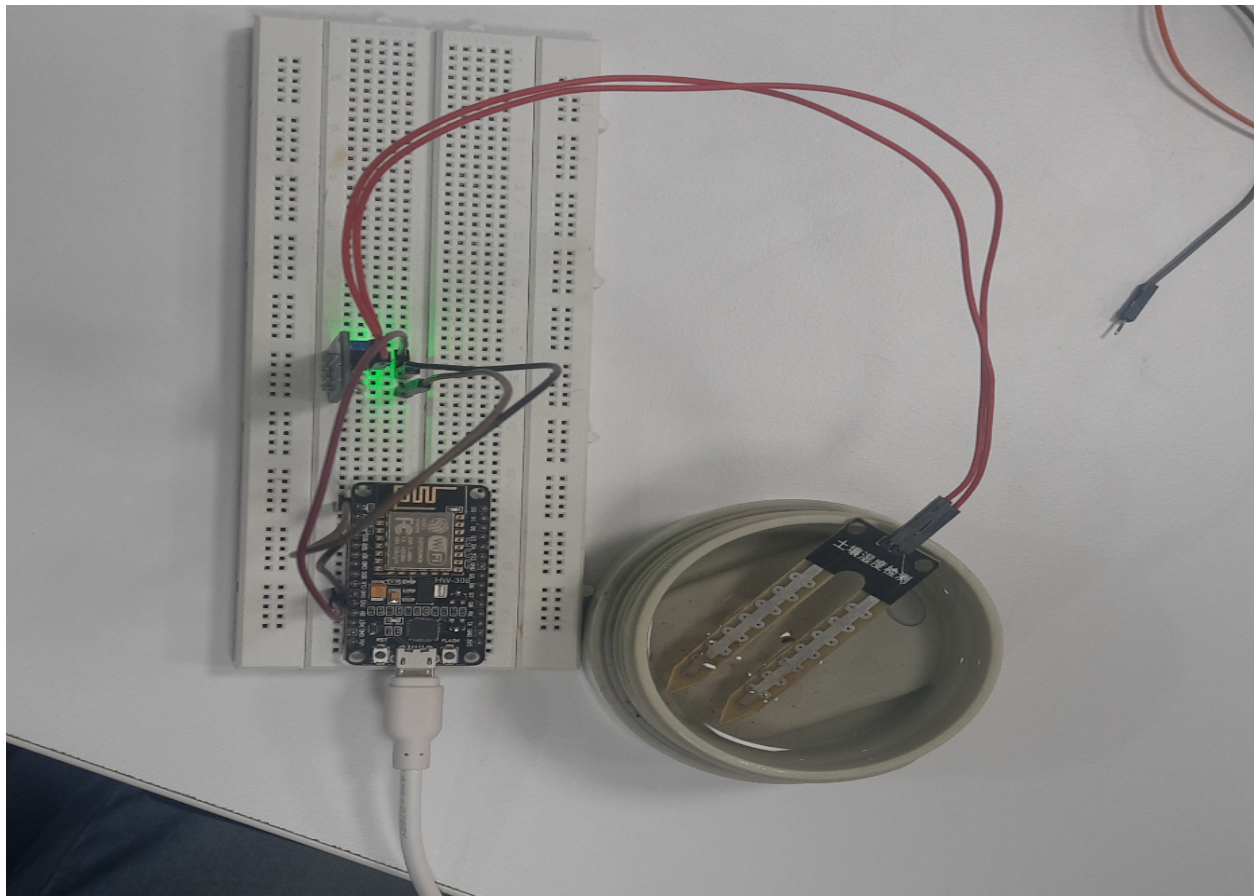
Aim:

To construct a circuit to detect the level of moisture in a sample of soil using Arduino and soil moisture sensor.

Components Required:

Name	Quantity
ESP8266 Node MCU	1
Bread board	1
Soil Moisture Sensor	1
USB Cable	1
Jumper wire	3

CIRCUIT:



CODE:

```
#include <ESP8266WiFi.h>
#include <SPI.h>
#include <Wire.h>

String apiKey = "M1YNTBY8GBKB7N5Z"; // Enter your Write API key from
ThingSpeak

const char *ssid = "PRP108";          //Your Access Point or Personal
Hotspot, cannot be longer than 32 characters!
const char *pass = "iotlab108";
const char* server = "api.thingspeak.com";

#define sensorPower 14
#define sensorPin A0

WiFiClient client;

void setup() {
    pinMode(sensorPower, OUTPUT);
    pinMode(sensorPin, INPUT);
    digitalWrite(sensorPower, LOW);
    Serial.begin(115200);
    Serial.println("Connecting to ");
    Serial.println(ssid);
    WiFi.begin(ssid, pass);

    while (WiFi.status() != WL_CONNECTED)
    {
        delay(500);
        Serial.print(".");
    }

    Serial.println("");
    Serial.println("WiFi connected");
    delay(4000);
}

void loop() {
    int analogSensor = analogRead(sensorPin);
    Serial.print("Moister : ");
    Serial.print(analogSensor);
```

```

Serial.println("  ");
{
if (analogSensor < 500) {
    Serial.println("WET SOIL !!");
    delay(100);
}
if (analogSensor > 750)
{
    Serial.println("DRY SOIL !!");
    delay(100);
}
}
if (client.connect(server, 80)) // "184.106.153.149" or api.thingspeak.com
{
    String postStr = apiKey;
    postStr += "&field1=";
    postStr += String(analogSensor);
    postStr += "r\n";

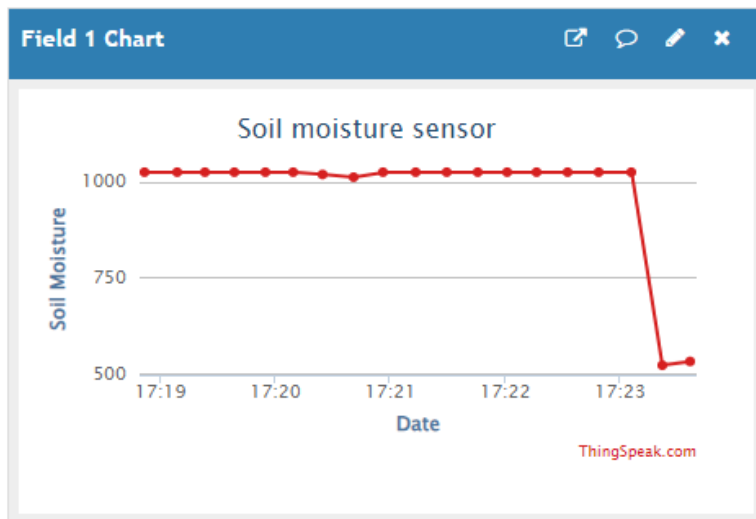
    client.print("POST /update HTTP/1.1\n");
    client.print("Host: api.thingspeak.com\n");
    client.print("Connection: close\n");
    client.print("X-THINGSPEAKAPIKEY: " + apiKey + "\n");
    client.print("Content-Type: application/x-www-form-urlencoded\n");
    client.print("Content-Length: ");
    client.print(postStr.length());
    client.print("\n\n");
    client.print(postStr);

    Serial.println("Data Send to Thingspeak");
}

client.stop();
Serial.println("Waiting...");

delay(1000); // thingspeak needs minimum 15 sec delay between
updates
}

```



```
sketch_jun24a.ino
NodeMCU 1.0 (ESP-12E...)
Serial Monitor x

Data Send to ThingSpeak
Waiting...
Moisture : 645
Data Send to ThingSpeak
Waiting...
Moisture : 646
Data Send to ThingSpeak
Waiting...
Moisture : 646
Data Send to ThingSpeak
Waiting...
Moisture : 648
Data Send to ThingSpeak
Waiting...
Moisture : 648
Data Send to ThingSpeak
Waiting...
Moisture : 649
Data Send to ThingSpeak
Waiting...
Moisture : 650
Data Send to ThingSpeak
Waiting...
Moisture : 653
Data Send to ThingSpeak
Waiting...
Moisture : 654
Data Send to ThingSpeak
Waiting...
Moisture : 654
Data Send to ThingSpeak
Waiting...
Moisture : 655
Data Send to ThingSpeak
```

ThinkVision

Result and Inference:

The circuit was constructed. The results from the sensor were sent to thingspeak where it was observed as a graph.

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