University Institute of Engineering

Department of Computer Science & Engineering

Experiment: Design a cloud based weather monitoring system using IoT platform and relevant sensors.

Student Name: UID:
Branch: Computer Science & Engineering Section/Group:
Semester: 2nd

1. **Aim of the practical:** To design weather based monitoring system.

2. **Tool and Platform Used:** Arduino, Ubidots, BMP-280, ESP-32, Temperature and Pressure sensors.

3. **Basic Concept/ Command Description:** In this experiment, we have to make a cloud based weather monitoring system using above mentioned platforms. In order to do this , firstly, we make our circuits on Arduino using BMP-280 and ESP-32 and then we connect it to Arduino software. Then we create a device named '**weather monitoring device'** on ubidots and add widgets of temperature and pressure. After that we add its token number in Arduino.

4. **Code:**

```
/*
* Board: DOIT ESP32 DEVKIT v1
```

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```
 *
* BMP280 - https://components101.com/sensors/gy-bmp280-module
* BMP280 Library - https://github.com/adafruit/Adafruit_BMP280_Library
* ArduinoSensor Library - https://github.com/adafruit/Adafruit_Sensor
* UBIDOTS MQTT Library - https://github.com/brendanvanbreda/ubidots-mqtt-esp
* PubSubClient - https://github.com/knolleary/pubsubclient
 *
* CSB -> HIGH for configuring BMP280 to I2C communication mode.
 */
#include <Adafruit_BMP280.h>  // for temp. sensor BMP280 IC
#include <UbidotsESPMQTT.h>   // for ubidots


#define BMP_SDA 21  // Defining PIN 21 for variable BMP_SDA
#define BMP_SCL 22 // Defining PIN 22 for variable BMP_SCL

#define TOKEN "BBFF-EBM4IJjdvzxyv5XDGKFihSKzLS17yt"     // Your Ubidots TOKEN
#define WIFISSID "your wifi"  // Your SSID
#define WIFIPASS "your password"  // Your Wifi Pass

Adafruit_BMP280 bmp280;
Ubidotsclient(TOKEN);

void callback(char* topic, byte* payload, unsigned int length) {
Serial.print("Message arrived [");
Serial.print(topic);   Serial.print("]
");
  for (int i = 0; i < length; i++) {
Serial.print((char)payload[i]);
  }
Serial.println();
}
void setup() {
Serial.begin(9600);   Serial.println("Init...
T2_Weather");


Serial.println("Initializing BMP280");
boolean status = bmp280.begin(0x76);   if
(!status) {
Serial.println("BMP280 Not connected!");
  }
Serial.println("Done");

Serial.print("Connecting to SSID:M02s8096");
Serial.print(M02s8096);
```

```
Serial.print(", Password:krqb7927 ");   Serial.println(krqb7927);
client.wifiConnection(M02s8096,krqb7927);
Serial.println("Done");

Serial.println(" Initializing Ubidots Connection...");
client.ubidotsSetBroker("industrial.api.ubidots.com");  // Sets the broker
properly for the business account
client.setDebug(true);                          // Pass a true or false bool
value to activate debug messages   client.begin(callback);
Serial.println("Done");


Serial.println("DONE");
}
void loop() {

Serial.print("Temperature: ");
Serial.print(temperature);  // variable
Serial.println(" Â°C");
Serial.print("Pressure: ");
Serial.print(pressure);  // variable
Serial.println(" Pa");


client.ubidotsPublish("weather-monitoring-device"); // insert your device label
here   client.loop();   delay(5000);
}
```

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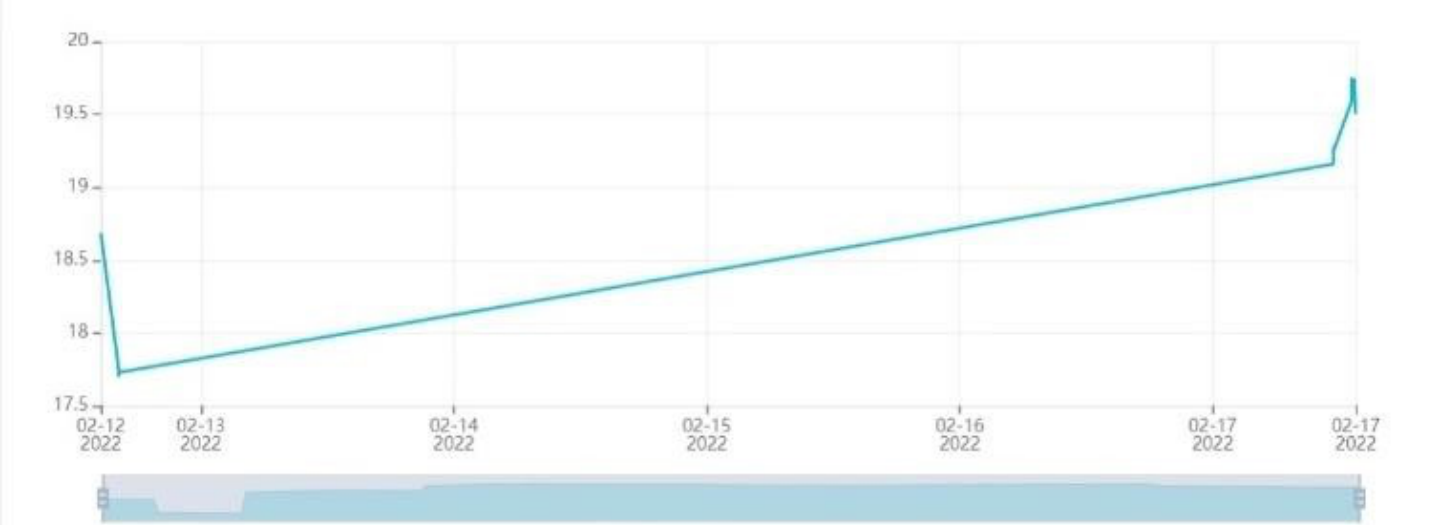
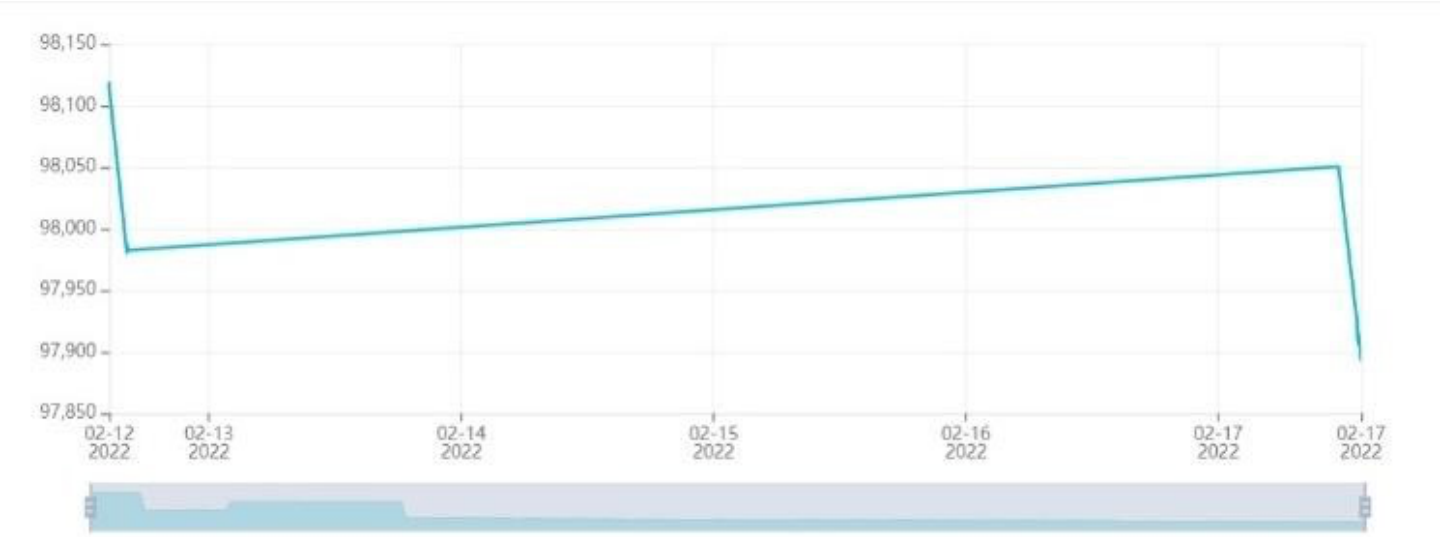
5. Observations, Simulation Screen Shots and Discussions:

For Temperature:-



For Pressure:-



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6. Result and Summary:

7. Additional Creative Inputs (If Any):

Learning outcomes (What I have learnt):

1.How to use Arduino .

2.How to use Ubidots for making any sensor.

3.How to connect Arduino with Ubidots and how to do programming setup on that.

4.How to get data on ubidots.

5.How to setup wifi for programming setup.

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Evaluation Grid (To be filled by Faculty):

Sr. No.	Parameters	Marks Obtained	Maximum Marks
1.	Worksheet completion including writinglearning objectives/Outcomes.(To besubmitted at the end of the day)		10
2.	Post Lab Quiz Result.		5
3.	Student Engagement in Simulation/Demonstration/Performance and Controls/Pre-Lab Questions.		5
	Signature of Faculty (with Date):	**Total Marks Obtained:**	**20**