

PROFESSIONAL TRAINING REPORT

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Sathyabama Institute of Science and Technology

(Deemed to be University)

Submitted in partial fulfillment of the requirements for the award

of Bachelor of Technology Degree in
Information Technology

By

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SCHOOL OF COMPUTING

SATHYABAMA

**INSTITUTE OF SCIENCE AND
TECHNOLOGY (DEEMED TO BE
UNIVERSITY)**

Accredited with Grade "A" by NAAC

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BONAFIDE CERTIFICATE

This is to certify that this Project Report is the bonafide work of **IYER PRIYA ESWAR PADALEESWARAN (37120032)** who carried out the project entitled "**IOT Based Humidity and Temperature Monitoring using Arduino Uno with an feasibility of Sound Decibel Meter**" under our supervision from November 2019 to April 2020.

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Submitted for Viva voce Examination held on _____

Internal Examiner

External Examiner

DECLARATION

I IYER PRIYA ESWAR PADALEESWARAN hereby declare that the Project Report entitled **“IOT Based_Humidity and Temperature Monitoring using Arduino Uno with an feasibility of Sound Decibel Meter”** done by me under the guidance of **Ms. JITHINA JOSE M.E., (PhD)** is submitted in partial fulfillment of the requirements for the award of Bachelor of Technology degree in Information Technology.

DATE: 31/08/2020

PLACE: Chennai

SIGNATURE OF THECANDIDATE

ACKNOWLEDGEMENT

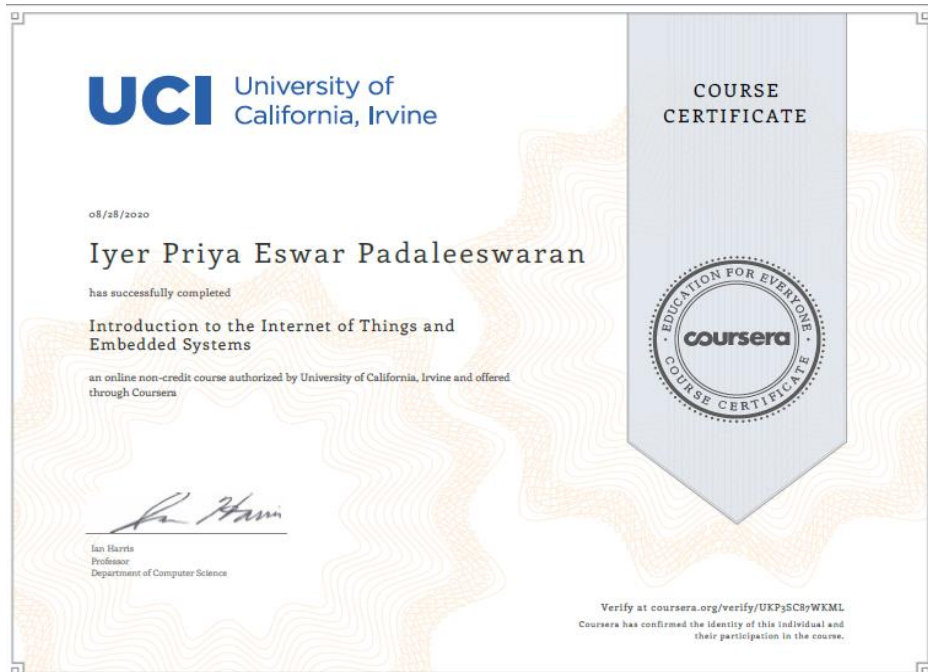
I am pleased to acknowledge my sincere thanks to **Board of Management of SATHYABAMA INSTITUTE OF SCIENCE AND TECHNOLOGY** for their kind encouragement in doing this project and for completing it successfully. I am grateful to them.

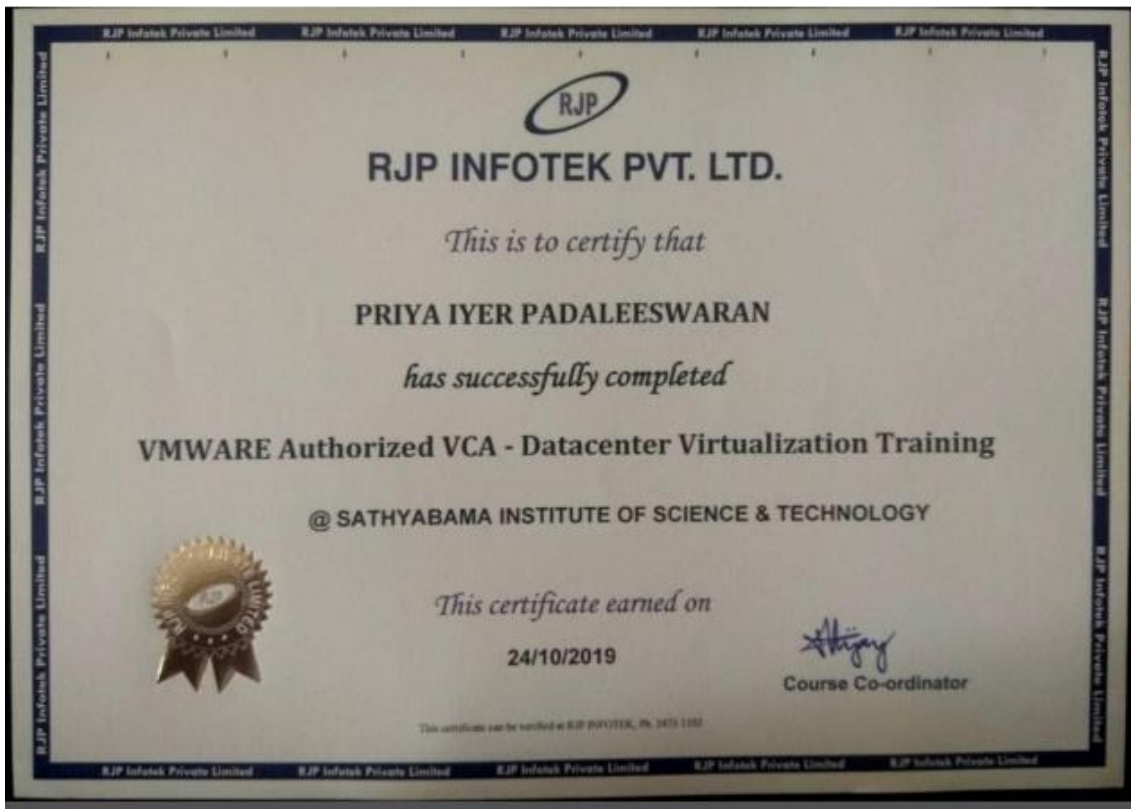
I convey my thanks to **Dr. T.Sasikala M.E., Ph.D, Dean**, School of Computing , **Dr.SUBHASHINI M.E., Ph.D.** , Head of the Department of Information and Technology for providing me necessary support and details at the right time during the progressive reviews.

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I wish to express my thanks to all Teaching and Non-teaching staff members of the **Department of Information Technology** who were helpful in many ways for the completion of the project.

TRAINING CERTIFICATE





ABSTRACT

Internet of Things (IOT) conceptualizes the idea of remotely connecting and monitoring real world objects (things) through the Internet. The IOT based Interactive and Controlling and Monitoring System for industrial and home automation is a new Technological advancement which can control and monitor devices not only for Industrial and home automation but any real time life appliances remotely. We can read a data from any sensor and analyse it graphically from anywhere in the world. Here, we can read temperature and humidity data from DHT11 sensor and upload it to a ThingSpeak cloud which is an open IOT platform using Arduino Uno and ESP8266-01 module. Arduino Uno is a Microcontroller which would fetch a data of humidity and temperature from DHT11 sensor and process it and give it to an ESP8266 Module. ESP8266 is a WIFI module. It can transfer a data to IOT cloud. So here we are adding a feasibility of an Sound Decibel Meter. It can sense a sound level using mic, convert that sound into its corresponding dB, and then upload it to the cloud. People celebrate various joyous events of life which call for bursting crackers but some welfare associations of many societies put up a no cracker. The government often explains to the common man the danger of bursting crackers both health wise in terms of the noise and air pollution it causes. Firecrackers are extremely harmful for senior citizen and small children. Firecracker can cause hearing loss, high blood pressure, sleeping disturbances and sudden exposure to loud noise can cause temporary or permanent deafness or even result in heart attack. Environment Protection act states that the noise produced are exceeding 145db. We are designing a device which can reduce the noise pollution caused by crackers and which will help people to live in an safer environment without any kind of health disorders. So, the sound from the environment is sensed using high sensitivity microphone. The measured value is in the form of voltage. The voltage is given to the controller which will convert the voltage into its corresponding dB value. Once the conversion process is done then that value is sent to nearby mobile by bluetooth module. The Bluetooth used here is HC-05 series which will give way for two way communication. From the mobile, the data is uploaded in the cloud using IOT technology. The advantage of using bluetooth is that the user can view the value of sound from the distance and this can avoid the user to make contact with

cracker while it is bursting.

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LIST OF ABBREVIATIONS

S.NO	ABBREVIATIONS	EXPANSIONS
1.	ESP8266	WIFI MODULE
2.	DHT11	TEMPERATURE AND HUMIDITY SENSOR
3.	IOT	INTERNET OF THINGS

CHAPTER 1

INTRODUCTION

1.1 GENERAL

Internet of Things (IOT) is influencing our lifestyle from the way we react to the way we behave. IOT can bring big benefits which can help us to optimise time and boost productivity. The IOT is a system of interrelated computing devices , mechanical and digital machines, objects or people that are provided with unique identifiers(UIDs) and the ability to transfer data over human or human-to-computer interaction. The definition of Internet of Things has evolved due to the convergence of multiple technologies and embedded systems. Embedded Systems, wireless sensor network, control system, automation and others all contribute to enable Internet of Things.

My project, IOT Based Humidity and Temperature Monitoring using an Arduino Uno with an Feasibility of Sound Decibel Meter depends upon how Temperature and Humidity can be read using an DHT 11 sensor and uploading the data to an cloud where we can store multiple data and we can have an account of how many entries have been made in a certain amount of time interval. Geneareally, uploading of the data is done by an WiFi module. There are two types of WiFi module. They are ESP8266 and Node MCU. I am here using the Wifi module named ESP8266. It is an build in microcontroller chip which is embedded with all kind of facilities. ESP8266 is the device which transfers and uploads the data in the cloud. Thingspeak is the platform where the cloud is storing its data. It is an open IOT platform.

I am adding an feasibility of Sound Decibel Meter. It can sense the sound and indicate when the sound crosses more than the threshold value.

1.2 OUTLINE OF THE PROJECT

The project is about Monitoring Temperature and Humidity and also the sound using two different types of sensors. For Temperature and Humidity monitoring system we have the DHT11 sensor which is specially designed for monitoring the temperature and humidity in an specific area. For measuring the sound we have the Sound sensor which consist of an in build MIC system which can record the noise or the sound. Once, the mic records the signals it shows whether the sound is less or more than the threshold frequency value. If the frequency is more than the threshold frequency then the bulb would glow and if the frequency is less than the threshold frequency then the bulb would not glow.

CHAPTER 2

AIM AND SCOPE

2.1 AIM

The main objective of the project is monitoring Humidity and Temperature monitoring using an Arduino Uno with an Feasibility of Sound Decibel Meter.

2.2 PROBLEM STATEMENT

My project is about monitoring the Humidity and Temperature using an Arduino Uno with an Feasibility of Sound Decibel Meter.

2.3 LITERATURE REVIEW

In this project, we are monitoring the Humidity and Temperature using an Arduino Uno Board with an Feasibility of Sound Decibel Meter. This is all about using an DHT11 sensor for monitoring an Humidity and Temperature and an Sound sensor for measuring the Sound Decibel Meter. It includes the code map of C. We need to have an Arduino software installed in our computer with the version 1.8.7. We need to download certain library functions such as Thingspeak, DHT sensor, sound sensor, ESP8266. For the temperature and humidity the output would be shown in the serial monitor as well as in the cloud. For uploading the data in the cloud we need to have an Thingspeak account so that we can upload our data in our account and we can make it public so that everyone can utilize it. As, far as Sound Decibel Meter is concerned we would get out desired output when the bulb glows on/off.

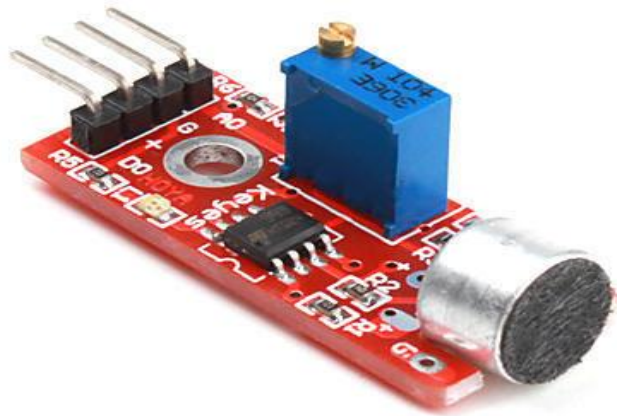


FIG 2.3.1



FIG 2.3.2

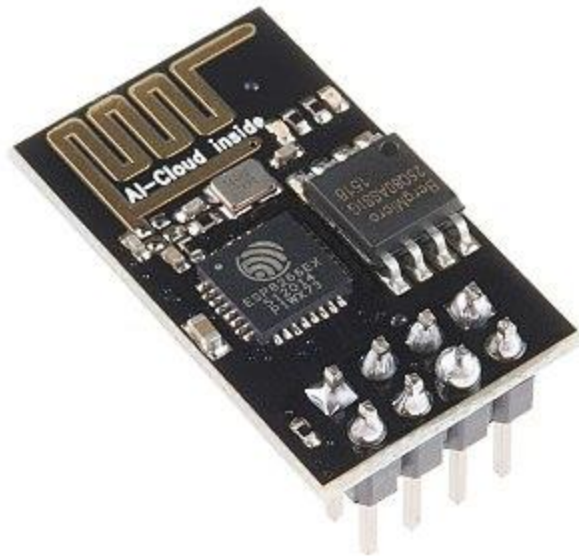
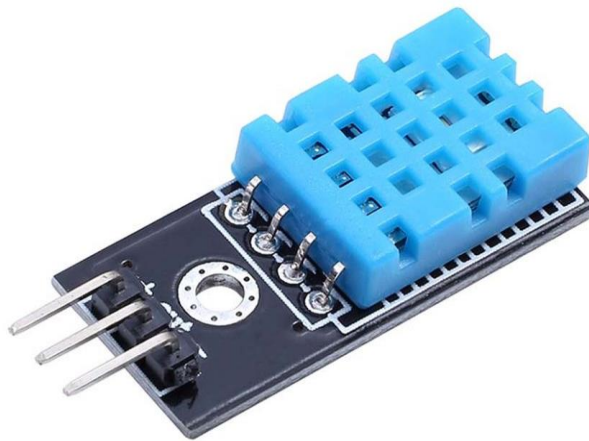


FIG 2.3.3



DFRobot.com bulemon

FIG 2.3.4

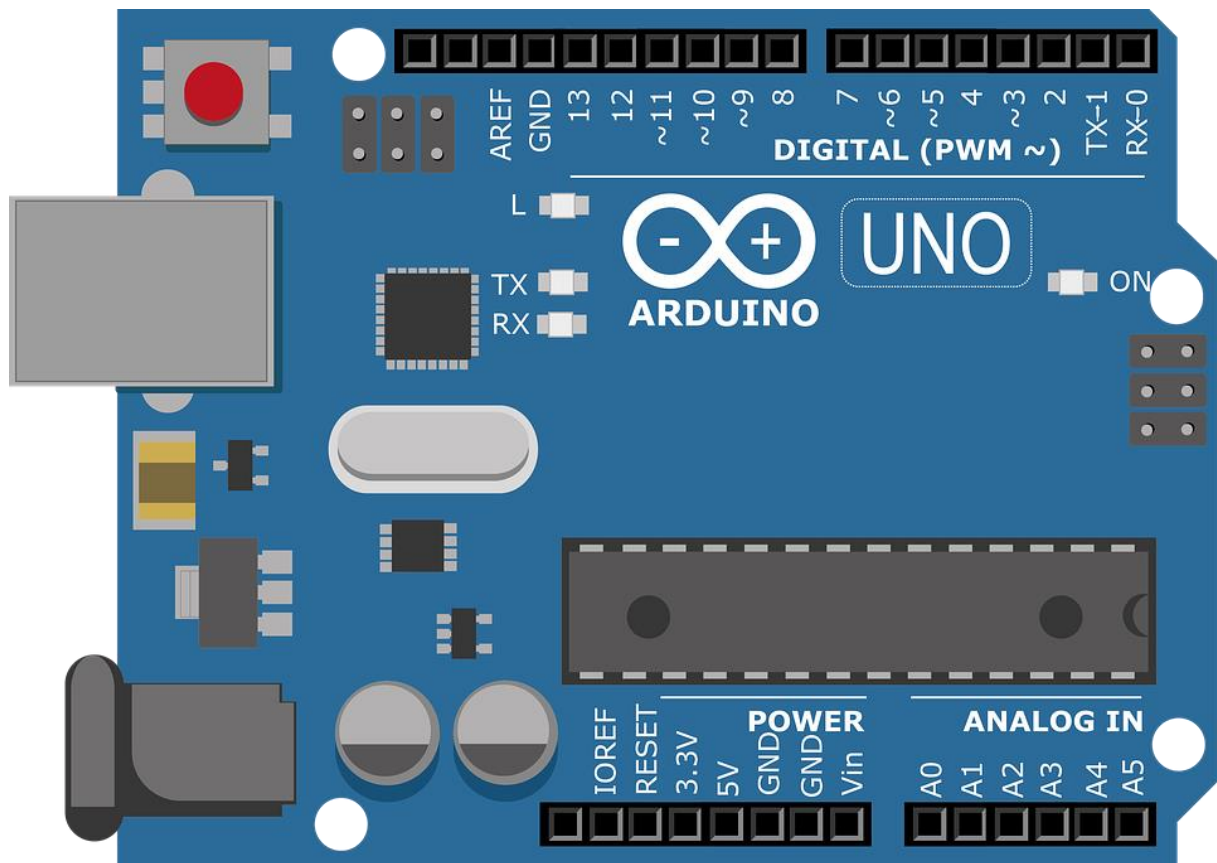


FIG 2.3.5

2.4 SCOPE

C is the language used in the monitoring and displaying of the Humidity and Temperature Sensor using an Arduino Uno Board with the feasibility of Sound Decibel Meter. C is an computer programming language. A scope in any programming is a region of the programming where a defined variable can have its existence and beyond that the variable it cannot be accesed. There are two places where the variables can be declared. They are LOCAL VARIABLES and GLOBAL VARIABLES.

CHAPTER 3

ALGORITHMS AND METHODS

3.1 GENERAL

In this project, we are monitoring the Humidity and Temperature using an Arduino Uno Board with an Feasibility of Sound Decibel Meter. This is all about using an DHT11 sensor for monitoring an Humidity and Temperature and an Sound sensor for measuring the Sound Decibel Meter. It includes the code map of C. We need to have an Arduino software installed in our computer with the version 1.8.7. We need to download certain library functions such as Thingspeak, DHT sensor, sound sensor, ESP8266. For the temperature and humidity the output would be shown in the serial monitor as well as in the cloud. For uploading the data in the cloud we need to have an Thingspeak account so that we can upload our data in our account and we can make it public so that everyone can utilize it. As, far as Sound Decibel Meter is concerned we would get out desired output when the bulb glows on/off.

3.2 ALGORITHM

- ❖ Install an Arduino Software version 1.8.7 in our computer for our Arduino Uno Circuit Board.
- ❖ Assign each segment correspondingly as per our requirement.
- ❖ Fix the delay time of 1 second in the program.
- ❖ Type the source code in the computer.
- ❖ We have different circuit connections for Humidity and Temperature Sensore and Sound Decibel Meter.
- ❖ For Humidity and Temperature sensor we Connect:
 - VCC of the WiFi module to 3.3V of Arduino Board.
 - IN of WiFi module to 3.3V of Arduino Board.
 - GND of Wifi module to GND of Arduino.
 - RX of Wifi module to TX of Arduino
 - TX of Wifi module to RX of Arduino.

- ❖ For Sound Decibel Meter we Connect:
 - GND pin of Sound sensor to GND of Arduino.
 - VCC pin of Sound sensor to 5V of Arduino.
 - Digital pin of Sound sensor to A0 of Arduino.

3.3 PROJECT DESCRIPTION

C is the language used for monitoring and displaying the Temperature and Humidity Sensor with an feasibility of Sound Decibel Meter.

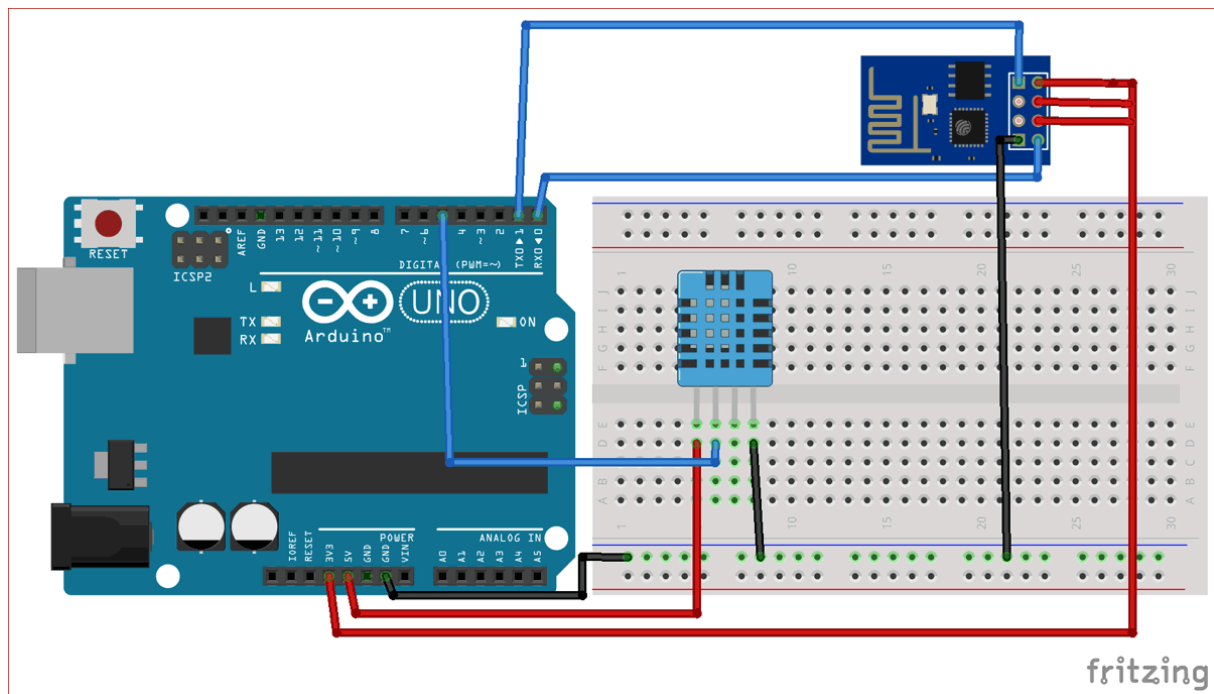


FIG 3.3.1

The above diagram shows the connection of an IOT based Humidity and Temperature sensor using an feasibility of Sound Decibel Meter.

3.4 SUMMARY

By using an C program we are able to display an IOT based Humidity and Temperature Sensor using an feasibility of Sound Decibel Meter. This devicde is used for monitoring the amount of Humidity and Temperature in the city and in parallel the amount of sound pollution caused in the society. This project can be used in many ways as an alarm systems in traffic signals and during certain occasions such as Diwali. It shows how much amount of Sound is being getting produced. Hence, we can use it as an barrier as not to produce sound pollution more than certain decibel limit.

CHAPTER 4

SYSTEM IMPLEMENTATION

4.1 REQUIREMENTS

I.HARDWARE REQUIREMENTS:

- System with 2GB of RAM
- KEYBOARD
- MOUSE
- A cable connecting with the system and the Arduino board.
- DHT 11 Sensor.
- Sound Sensor.
- ESP8266 (WIFI MODULE)
- Resistors.
- Wires.
- LED Bulbs.

II. SOFTWARE IMPLEMENTATION

- An ArduinoGenuino 1.8.7 version software for the Arduino Uno Board.

4.2 ROLE OF C

C is the language used in the displaying of the IOT based Humidity and Temperature Sensor using a Feasibility of Sound Decibel Meter. C is an computer programming language. C is a program in which it consist of both user defined standard library functions and pre defined standard library functions. An scope in any programming is a region of the programming where a defined variable can have its existence and beyond that the variable it cannot be accesed. There are two places where the variables can be declared. They are LOCAL VARIABLES and GLOBAL VARIABLES. There are many advantages in an C programming like,

- It improves the reusability of the code.
- Same function can be used in any program rather than writing the same code from scratch.

- Debugging of the code would be easier.
- Errors are easily been traced.
- It reduces the size of the statements and are replaced by function calls in C.

4.3 RESULTS AND DISCUSSION

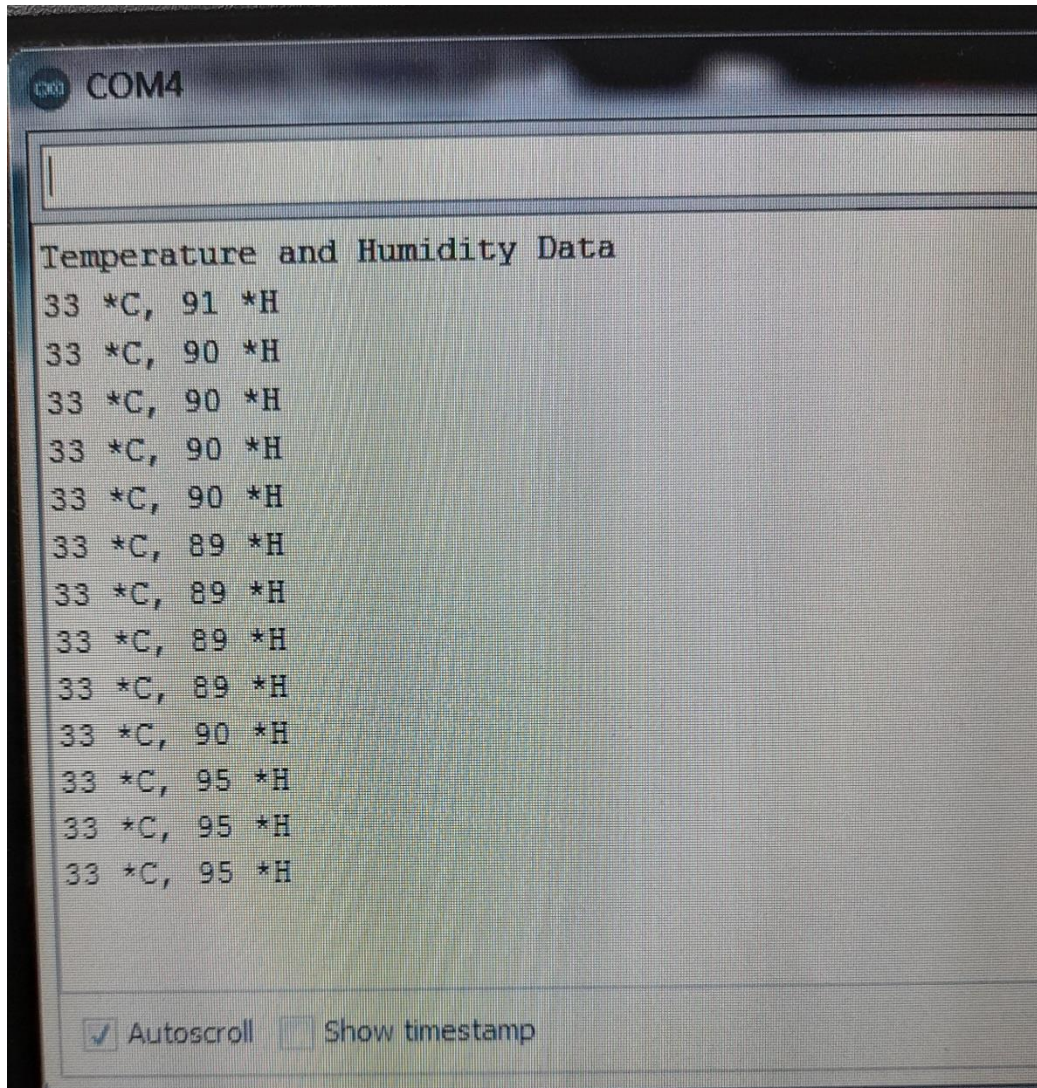


FIG 4.3.1

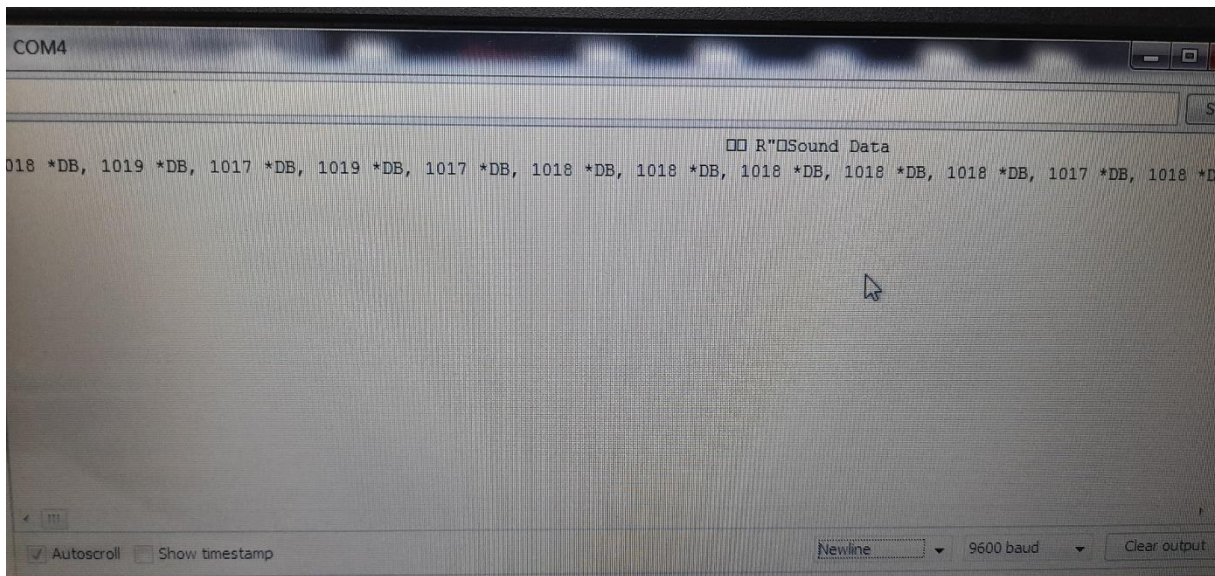


Fig 4.3.2

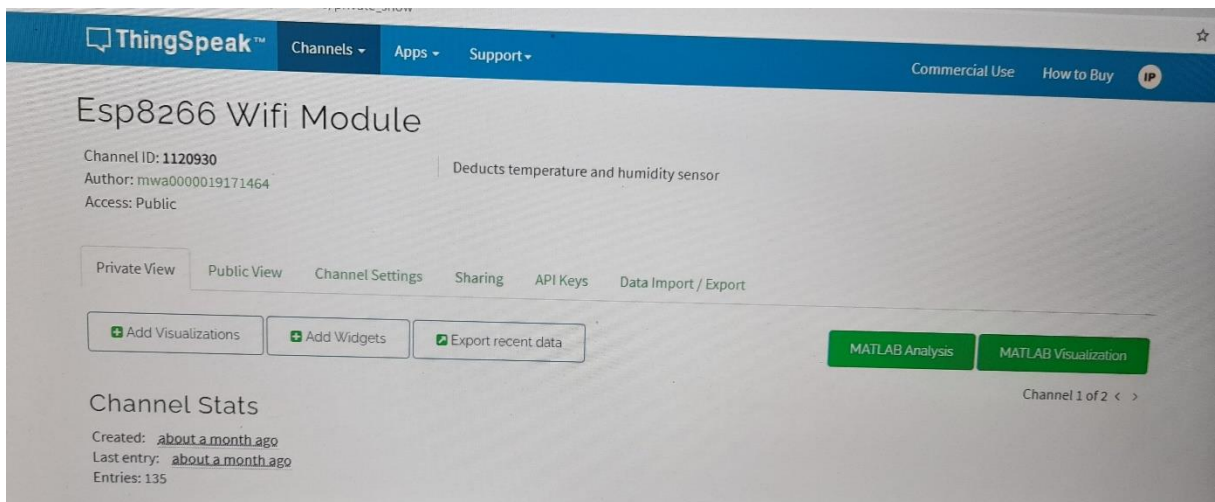


Fig 4.3.3

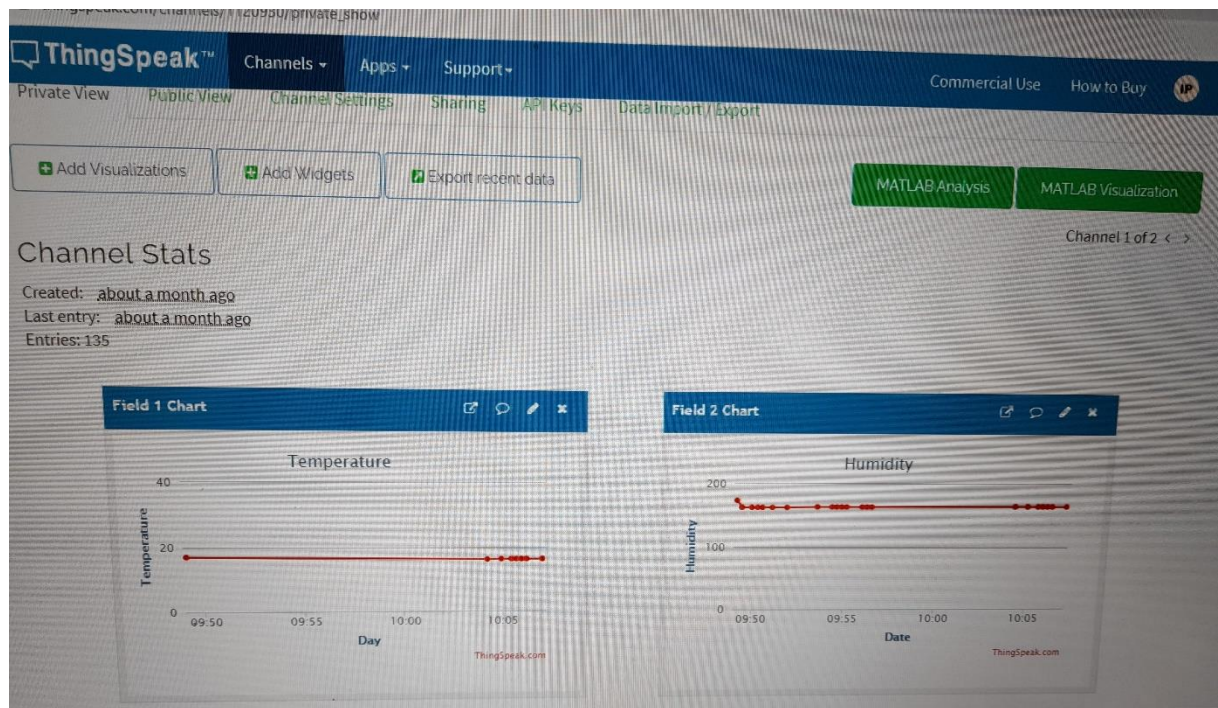


Fig 4.3.4

CHAPTER 5

CONCLUSION AND FUTURE WORK

5.1 CONCLUSION

Displaying of an IOT based Humidity and Temperature monitoring system with the feasibility of Sound Decibel meter is an easy short project which can be done by anyone who has an good knowledge about the embedded technologies and how an wifi system is getting connected to cloud and its system settings. If a person knows about the connection then it is a very easy project to be executed.

5.2 FUTURE WORK

In this project, we can try to make a device consiting of DHT11 sensor, sound sensor and the wifi module (ESP8266). We, can try making so that we do not need two different devices for monitoring IOT based Humidity and Temperature and Sound sensor.

REFERENCES

1. Tinker cad - www.tinkercad.com.
2. Arduino –www.arduino.cc.
3. Programming in C – Zamlya Chan.

APPENDICIES

SOURCE CODE FOR DHT11 SENSOR

For DHT 11

```
#include <SimpleDHT.h>
```

```
// for DHT11,
```

```
//   VCC: 5V or 3V
```

```
//   GND: GND
```

```
//   DATA: 5
```

```
int pinDHT11 = 5;
```

```
SimpleDHT11 dht11;
```

```
void setup() {
```

```
    //start working...
```

```
    Serial.begin(9600);
```

```
    Serial.println("Temperature and Humidity Data");
```

```
}
```

```
void loop() {
```

```
    delay(250);
```

```

    // read without samples.
    byte temperature = 0;
    byte humidity = 0;
    int err = SimpleDHTErrSuccess;
    if ((err = dht11.read(pinDHT11, &temperature, &humidity, NULL)) !=
SimpleDHTErrSuccess) {
        Serial.print("Read DHT11 failed, err="); Serial.println(err);delay(1000);
        return;
    }
    Serial.print((int)temperature); Serial.print(" *C, ");
    Serial.print((int)humidity); Serial.println(" *H");

    // DHT11 sampling rate is 1HZ.
    delay(1500);
}

```

SOURCE FOR SOUND SENSOR

```

const int ledpin=13;
const int soundpin=A2;
const int threshold=2000;
void setup() {
    Serial.begin(9600);
    Serial.println("Sound Data");
    pinMode(ledpin,OUTPUT);
    pinMode(soundpin,INPUT);
}

void loop() {

    int soundsens=analogRead(soundpin);
    if (soundsens>=threshold) {

```

```

    digitalWrite(ledpin,HIGH);
    delay(1000);
}
else{
    digitalWrite(ledpin,LOW);
}
Serial.print(int(soundsens)); Serial.print(" *DB, ");
}

```

SOURCE CODE FOR ESP8266

```

#include <ThingSpeak.h>

#include <DHT.h>

#define DHTPIN 5      // DHT data pin connected to Arduino pin 5

#define DHTTYPE DHT11  // DHT11 (DHT Sensor Type )

DHT dht(DHTPIN, DHTTYPE); // Initialize the DHT sensor

#define SSID "Priyuuu"  // "WiFi Name"

#define PASS "12345678"  // "Password"

#define IP "184.106.153.149"// thingspeak.com ip

String msg = "GET /update?key=WOE21WEJKA2ZSIDS"; //change it with your
key...

```

```
float temp;

int hum;

String tempC;

int error;

void setup()

{

    Serial.begin(115200); // use default 115200.

    Serial.println("AT");

    delay(5000);

    if(Serial.find("OK")){

        connectWiFi();

    }

}
```