



Experiment 2.2

Student Name: Nabha Varshney

Branch: B.E.-CSE

Semester: 6th

Subject Name: Internet of Things Lab

UID: 20BCS4995

Section/Group: 20BCS704-A

Date of Performance: 04/04/2023

Subject Code: 20CSP-358

1. Aim:

Interfacing of Arduino/Raspberry Pi with temperature and humidity sensor with real time application.

2. Objective:

- Learn about interfacing.
- Learn about IoT programming.

3. Requirements:

- Raspberry Pi3 Model B`s with installed Raspbian or Arduino Board
- 8 GB microSD cards
- Internet connection (Wired or Wireless) to access Pi Desktop
- VNC client on a wired or wireless device
- Breadboard
- Jumper Wires
- DHT11 Temperature and Humidity Sensor
- USB or 5V Power Supply

4. Procedure:

About DHT11 Sensor:

DHT11 Module features a temperature & humidity sensor complex with a calibrated digital signal output. The exclusive digital-signal-acquisition technique and temperature & humidity sensing technology ensure high reliability and excellent long-term stability. This sensor includes an NTC for temperature measurement and a resistive-type humidity measurement component for humidity measurement. These are connected to a high-performance 8-bit microcontroller, offering excellent quality, fast response, anti-interference ability, and cost-effectiveness.

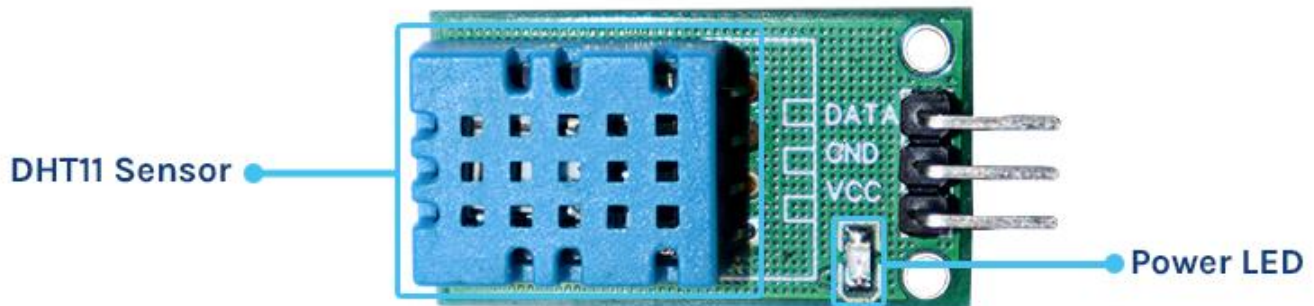
DHT11 Module Pinout

The DHT11 module has a total of 3 pins. In which two are for power and one is for communication. The pinout of a DHT11 Sensor module is as follows:

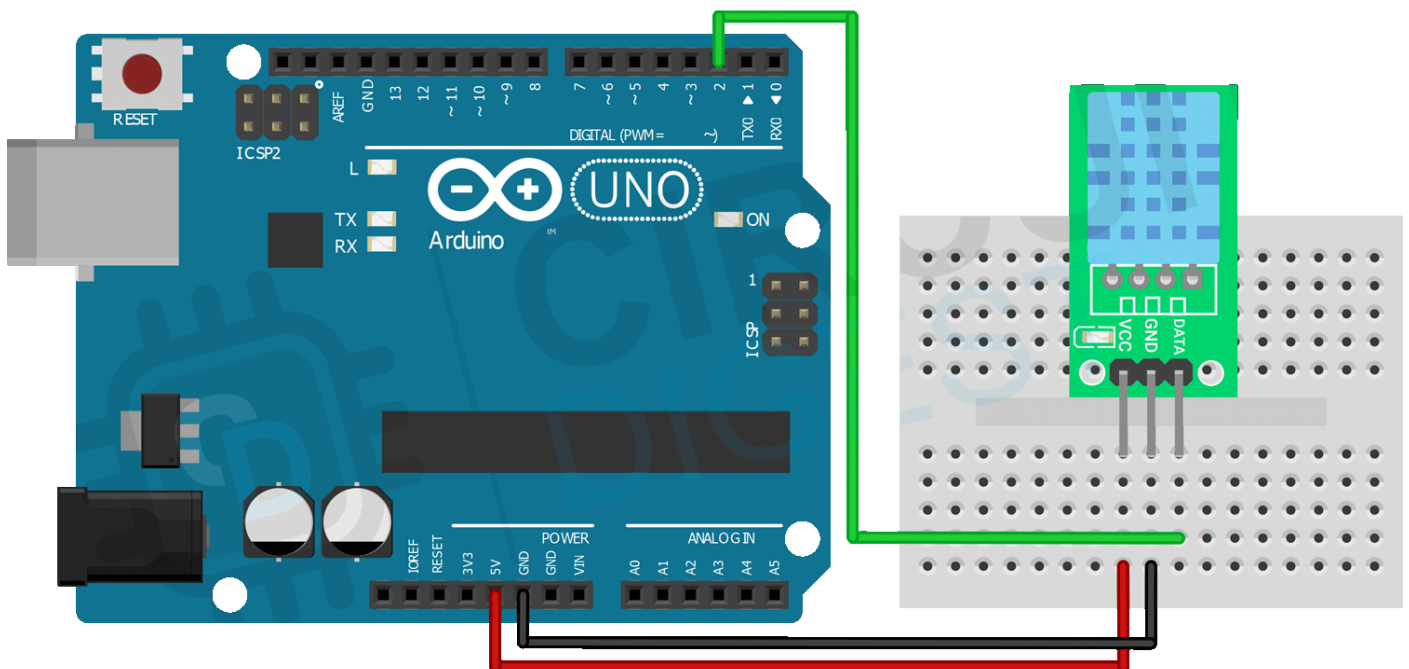
- DATA Data pin for 1-wire communication.
- GND Ground Connected to Ground pin of the Arduino.
- VCC Provides power for the module, Connect to the 5V pin of the Arduino.

DHT11 Module Parts

The DHT11 module has only a very low number of parts that includes the DHT11, pullup resistor, bypass capacitor, and power led with a current limiting resistor.



The following image shows the circuit diagram for interfacing the DHT11 sensor module with Arduino.



5. Code/Program:

```
#include <DHT.h>
```

```
dht DHT;
```

```
#define DHT11_PIN 7
```

```
#define tone_PIN 8
```

```
void setup()
{
  Serial.begin(9600);
}

void loop()
{
  int chk=DHT.read11(DHT11_PIN);
  Serial.print("Temperature: ");
  Serial.print(DHT.temperature);
  Serial.print("Humidity: ");
  Serial.print(DHT.humidity);
  delay(1000);

  if(DHT.temperature>=30)
  {
    tone(8,1000);
    delay(1000);
  }
}
```

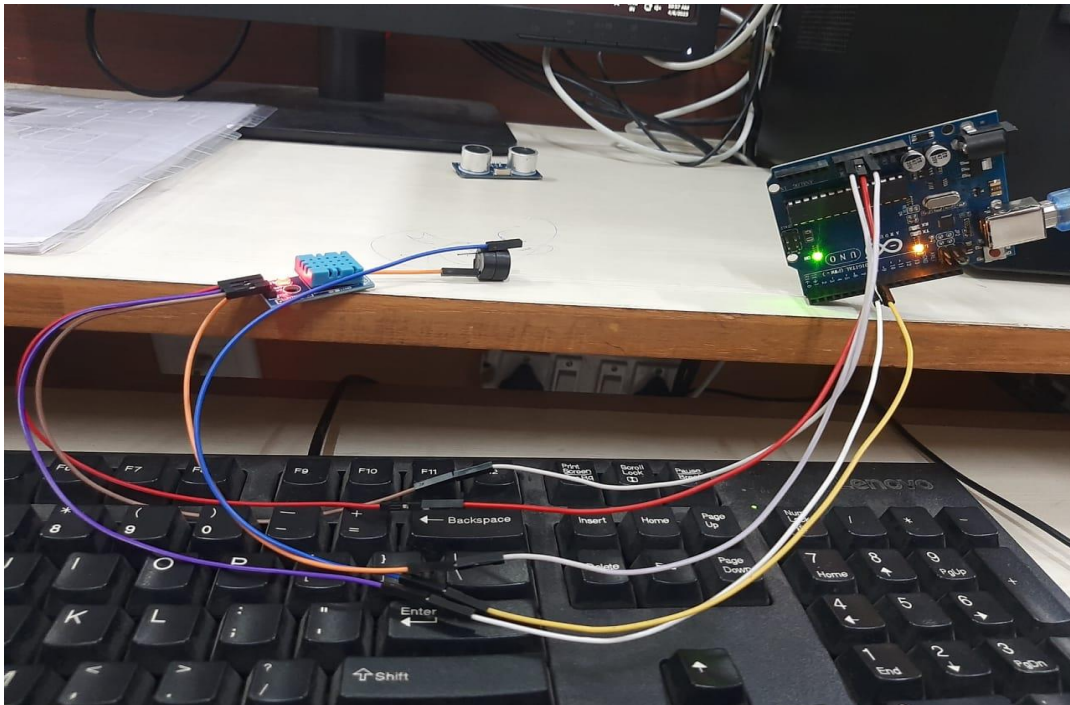


FIGURE: CIRCUIT

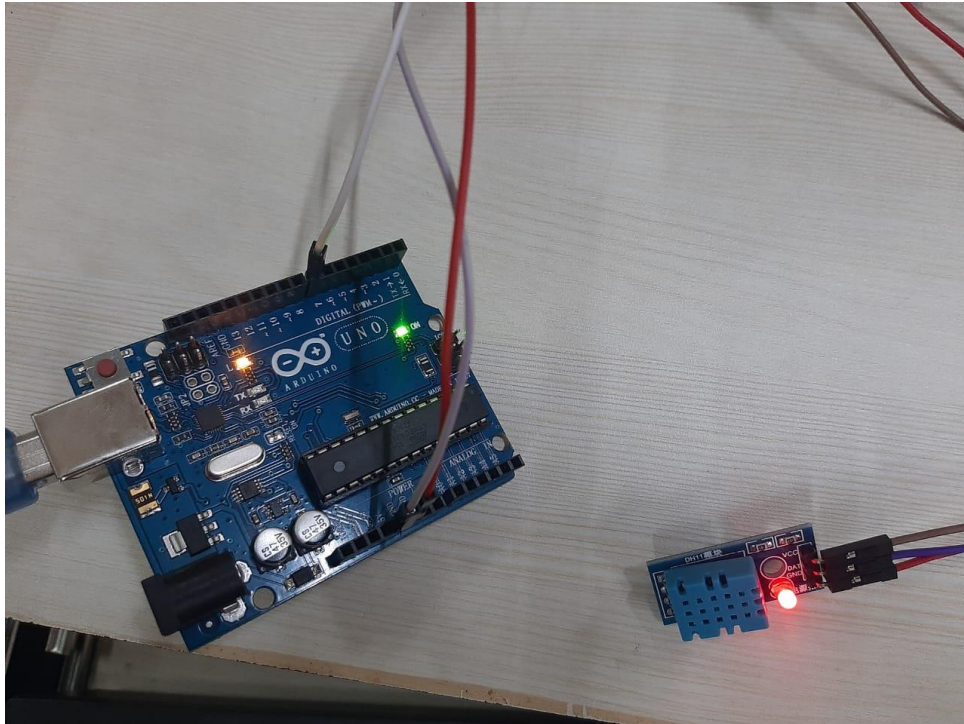
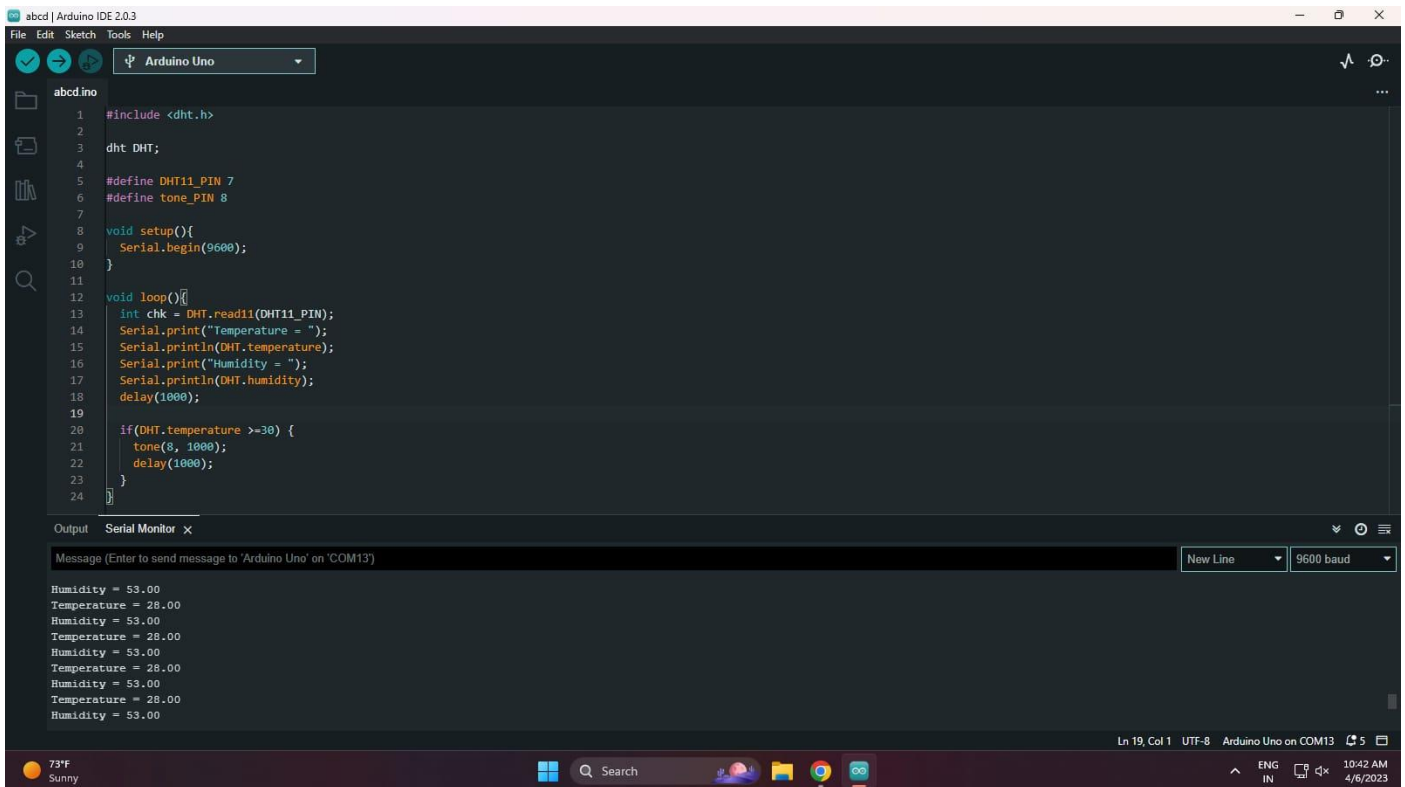


FIGURE: CIRCUIT



```
1 #include <dht.h>
2
3 dht DHT;
4
5 #define DHT11_PIN 7
6 #define tone_PIN 8
7
8 void setup(){
9   Serial.begin(9600);
10 }
11
12 void loop(){
13   int chk = DHT.read11(DHT11_PIN);
14   Serial.print("Temperature = ");
15   Serial.println(DHT.temperature);
16   Serial.print("Humidity = ");
17   Serial.println(DHT.humidity);
18   delay(1000);
19
20   if(DHT.temperature >=30) {
21     tone(8, 1000);
22     delay(1000);
23   }
24 }
```

Output Serial Monitor x

Message (Enter to send message to 'Arduino Uno' on 'COM13')

New Line 9600 baud

Humidity = 53.00
Temperature = 28.00
Humidity = 53.00
Temperature = 28.00
Humidity = 53.00
Temperature = 28.00
Humidity = 53.00
Temperature = 28.00
Humidity = 53.00

Ln 19, Col 1 UTF-8 Arduino Uno on COM13 5

73°F Sunny 10:42 AM 4/6/2023

FIGURE: Temperature and Humidity



DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

Discover. Learn. Empower.

Learning outcomes (What I have learnt):

- Learnt how to use humidity sensor with real time application.
- Learnt how to code to read the data from the sensor.

Evaluation Grid (To be created as per the SOP and Assessment guidelines by the faculty):

Sr. No.	Parameters	Marks Obtained	Maximum Marks
1.			