Assignment 4

DHT 11 Sensor with ESP 32

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Aim:- To interface a DHT11 temperature and humidity sensor with an ESP 32 module. This experiment will demonstrate the capability of the IoT kit to collect temperature and humidity data from the DHT11 sensor and transmit it to the RasPi for further processing .

Equipment:-

1. Raspberry Pie 4 microprocessor
2. ESP 32
3. DHT11 temperature and humidity sensor
4. Female to female connecting wires
5. HDMI cables
6. B-type connecting cable
7. Desktop

Methodology:-

The GND (ground) pin of DHT 11 sensor is connected to GND (ground) pin of ESP 32, the VCC pin of DHT 11 sensor is connected to 5 volt (5V) pin of ESP 32 and DATA pin of DHT 11 sensor is connected to G0 pin of ESP 32. The B-cable is connected between rpi 4 microprocessor and ESP 32 micro-controller board. Circuit is shown below:-
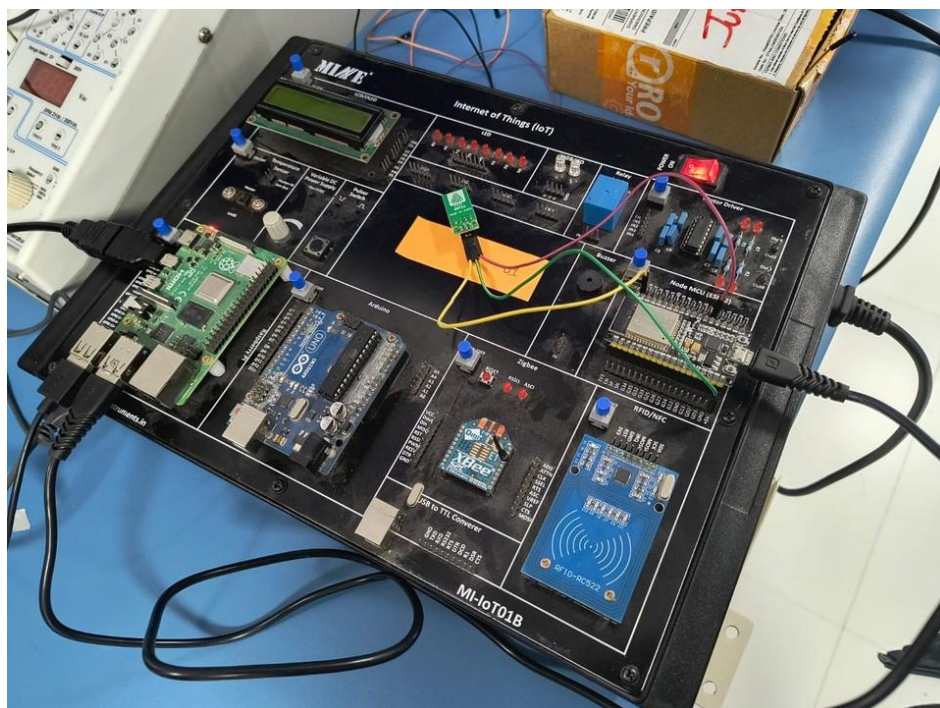
Results:- The output we received are humidity, temperature and heat index on the serial monitor of Arduino IDE on desktop connected to RPI 4 microprocessor.

Below is the drive link attached that contains the image of the output we received on serial monitor of Arduino IDE:-

Drive link:- [Link to the drive](#)

Conclusion:- We learnt about the connections to be installed between sensors like DHT11 sensor with micro-controllers like ESP 32, also learnt about different libraries like Adafruit, DHT11 library, that need to be installed on Arduino IDE, learnt about coding that need to be done to get data from sensor and also understood about the working principle of sensor like DHT11.

Code:- Below is the code that we wrote in Arduino IDE:-

```
// REQUIRES the following Arduino libraries:
// - DHT Sensor Library: https://github.com/adafruit/DHT-sensor-library
// - Adafruit Unified Sensor Lib: https://github.com/adafruit/Adafruit_Sensor

#include "DHT.h"

#define DHTPIN 0 // Digital pin connected to the DHT sensor


#define DHTTYPE DHT11 // DHT 11

DHT dht(DHTPIN, DHTTYPE);

void setup() {
 Serial.begin(9600); Serial.println(F("DHTxx
 test!"));

 dht.begin();
}

void loop() {
 // Wait a few seconds between measurements. delay(2000);

 // Reading temperature or humidity takes about 250 milliseconds!
 // Sensor readings may also be up to 2 seconds 'old' (its a very slow sensor) float h = dht.readHumidity();
 // Read temperature as Celsius (the default) float t =
 dht.readTemperature();
```

```cpp
// Read temperature as Fahrenheit (isFahrenheit = true) float f =
dht.readTemperature(true);

// Check if any reads failed and exit early (to try again). if (isnan(h) ||
isnan(t) || isnan(f)) { Serial.println(F("Failed to read from DHT
sensor!")); return;
}

// Compute heat index in Fahrenheit (the default) float hif =
dht.computeHeatIndex(f, h);
// Compute heat index in Celsius (isFahreheit = false) float hic =
dht.computeHeatIndex(t, h, false);

Serial.print(F("Humidity: ")); Serial.print(h);
Serial.print(F("% Temperature: "));
Serial.print(t); Serial.print(F("°C "));
Serial.print(f);
Serial.print(F("°F Heat index: "));
Serial.print(hic); Serial.print(F("°C "));
Serial.print(hif); Serial.println(F("°F"));
}
```