Experiment 6

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Semester: 5th **Date of Performance: 21/08/2024**
Subject Name: Internet of Things Architecture and its Protocol Lab
Subject Code: 22CSP-329

1. **Aim-** To Investigate real-time relationship between humidity and temperature in IoT.

2. **Objective:**
   1. Learn about interfacing.
   2. Learn about IoT programming.

3. **Equipment Used-**
   1 × Arduino Uno R3
   3 × Male to Female Jumper Wires
   DH11 Temperature and Humidity Sensor

4. **Procedure-**
   - **i.** Connect the VCC and GND of the module to the 5V and GND pins of the Arduino.
   - **ii.** Connect the DATA pin to the Arduino's digital pin 2. We communicate with DHT11 through this pin.
   - **iii.** Open the arduino uno software and install the Adafruit's DHT sensor library and Adafruit Unified Sensor Driver through the library manager.
   - **iv.** Connect the positive terminal of the LEDs to the pins 10,13 and 8respectively.
   - **v.** Create a new sketch and upload the following code in the arduino board.

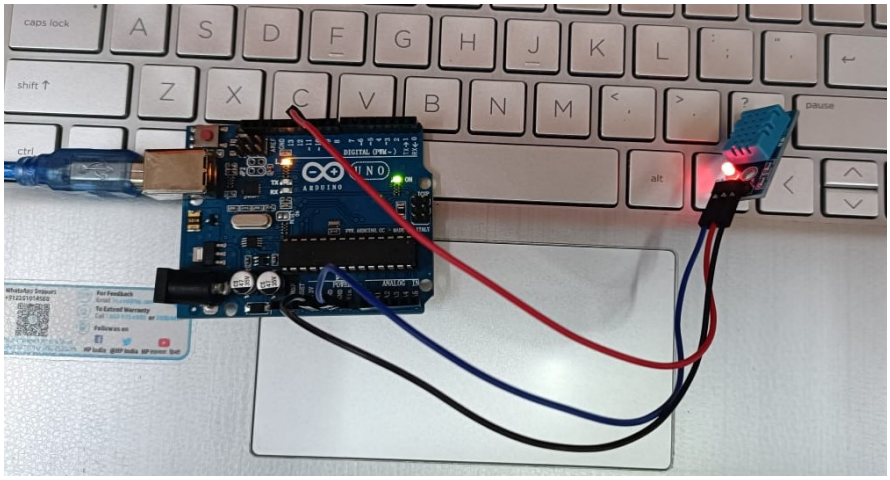
5. Code:

```
#include <Adafruit_Sensor.h>
#include <DHT.h>
#include <DHT_U.h>
#define DHTTYPE DHT11 // DHT 11 #define DHTPIN 2
DHT_Unified dht(8, DHTTYPE);
uint32_t delayMS;

void setup() {
Serial.begin(9600);
dht.begin();
sensor_t sensor;
delayMS = sensor.min_delay / 1000;
}
void loop()
{
sensors_event_t event;
dht.temperature().getEvent(&event);
Serial.print(F("TEMPERATURE: "));
Serial.print(event.temperature);
Serial.println(F("°C"));
dht.humidity().getEvent(&event);
Serial.print(F("HUMIDITY: "));
Serial.print(event.relative_humidity);
Serial.println(F("%"));
delay(1000);
}
```

6. **Result-**

You will see the temperature and humidity display on serial port monitor which is updated every 2 seconds.



```
TEMPERATURE: 28.70 'C
HUMIDITY: 36 %
TEMPERATURE: 28.70 'C
HUMIDITY: 36 %
TEMPERATURE: 28.70 'C
HUMIDITY: 36 %
```

7. **Conclusion-**

The experiment using the DHT11 sensor successfully captured real-time temperature and humidity data. The data output was consistent and accurate, demonstrating the sensor's capability to provide regular updates on environmental conditions. By analyzing the real-time data, one can observe the relationship between temperature and humidity, which is critical for various applications in IoT, such as climate control systems and environmental monitoring.