Experiment No: 7

Title: DHT11 sensor interfacing with NodeMCU.

Objective:

To interface a DHT11 temperature and humidity sensor with NodeMCU (ESP8266) and read sensor data using Arduino IDE.

Components Needed:

1. NodeMCU (ESP8266)
2. DHT11 Temperature and Humidity Sensor
3. USB Cable for NodeMCU
4. Breadboard and Jumper Wires

Procedure:

Install Required Libraries in Arduino IDE:

- Open Arduino IDE.
- Go to Sketch -> Include Library -> Manage Libraries.
- Search for "DHT sensor library" by Adafruit and install it.

Connect NodeMCU and DHT11 Sensor:

- Connect the DHT11 sensor to NodeMCU as per the circuit diagram above.

Program**:**

```
#include <DHT.h>

#define DHTPIN D2
#define DHTTYPE DHT11
```

```
DHT dht(DHTPIN, DHTTYPE);

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

void loop() {
  delay(2000);  // Delay between sensor readings

  float humidity = dht.readHumidity();
  float temperature = dht.readTemperature();

  if (isnan(humidity) || isnan(temperature)) {
   Serial.println("Failed to read from DHT sensor!");
   return;
  }

  Serial.print("Humidity: ");
  Serial.print(humidity);
  Serial.print(" %\t");
  Serial.print("Temperature: ");
  Serial.print(temperature);
  Serial.println(" *C");
}
```

Upload the Sketch:
- Connect NodeMCU to your computer via USB.
- Select the correct board and port in Arduino IDE.
- Click on the upload button to upload the sketch to NodeMCU.

Open Serial Monitor:

- After uploading the sketch, open the Serial Monitor in Arduino IDE (Tools -> Serial Monitor).
- You should see temperature and humidity readings printed in the Serial Monitor.

Circuit Diagram:
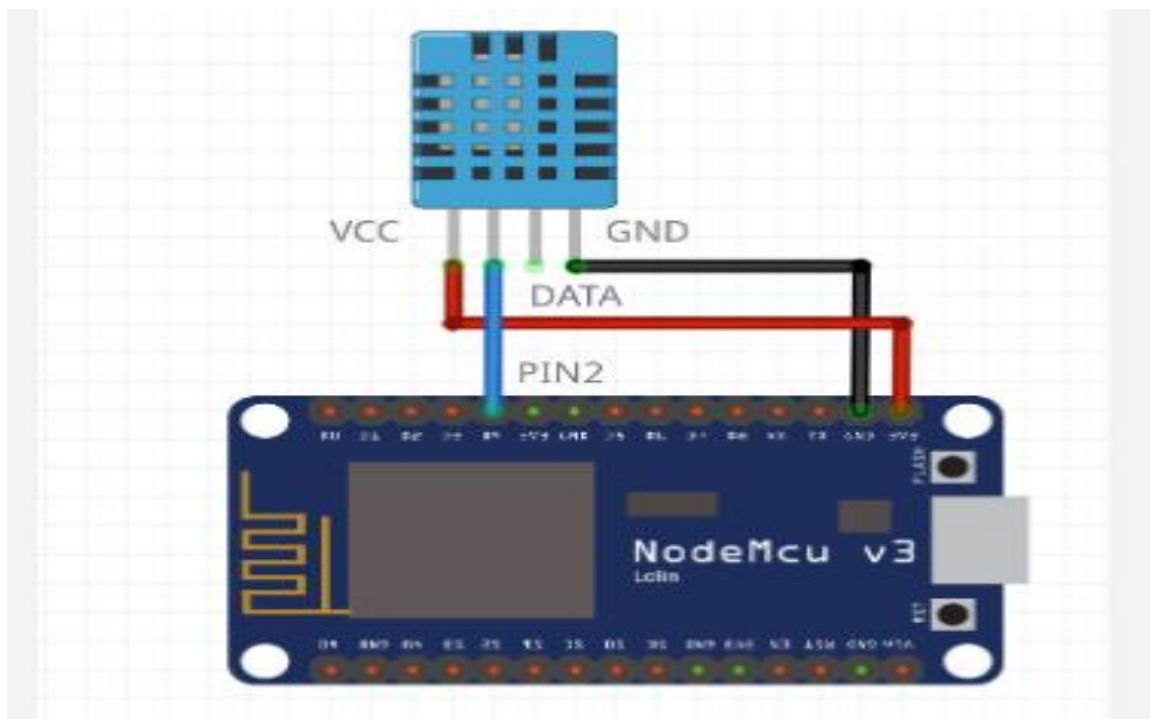
Conclusion:

You have successfully interfaced a DHT11 temperature and humidity sensor with NodeMCU and read sensor data using Arduino IDE. You can further enhance this project by integrating NodeMCU with other components or platforms for IoT applications.