IOT-BASED HUMIDITY AND TEMPERATURE MONITORING USING NODE MCU

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PROJECT NAME: IoT-based humidity and Temperature Monitoring using NODE MCU

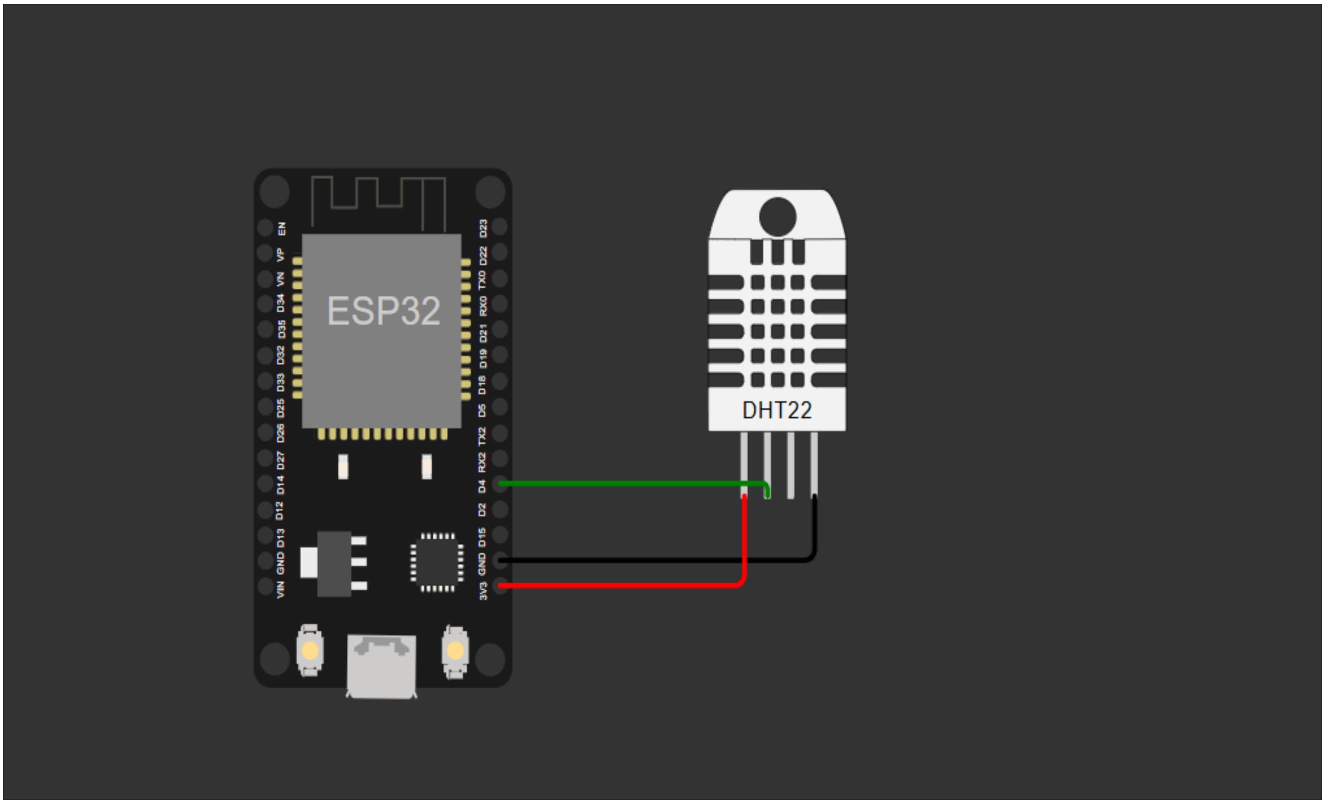
REQUIRED MATERIALS/COMPONENTS

1. **NodeMCU ESP8266** (Wi-Fi-based microcontroller)
2. **DHT11** (Temperature & Humidity Sensor)
3. **Jumper Wires**
4. **Breadboard**
5. **USB Cable** (To connect NodeMCU to PC)

PROJECT RELATED DESCRIPTION

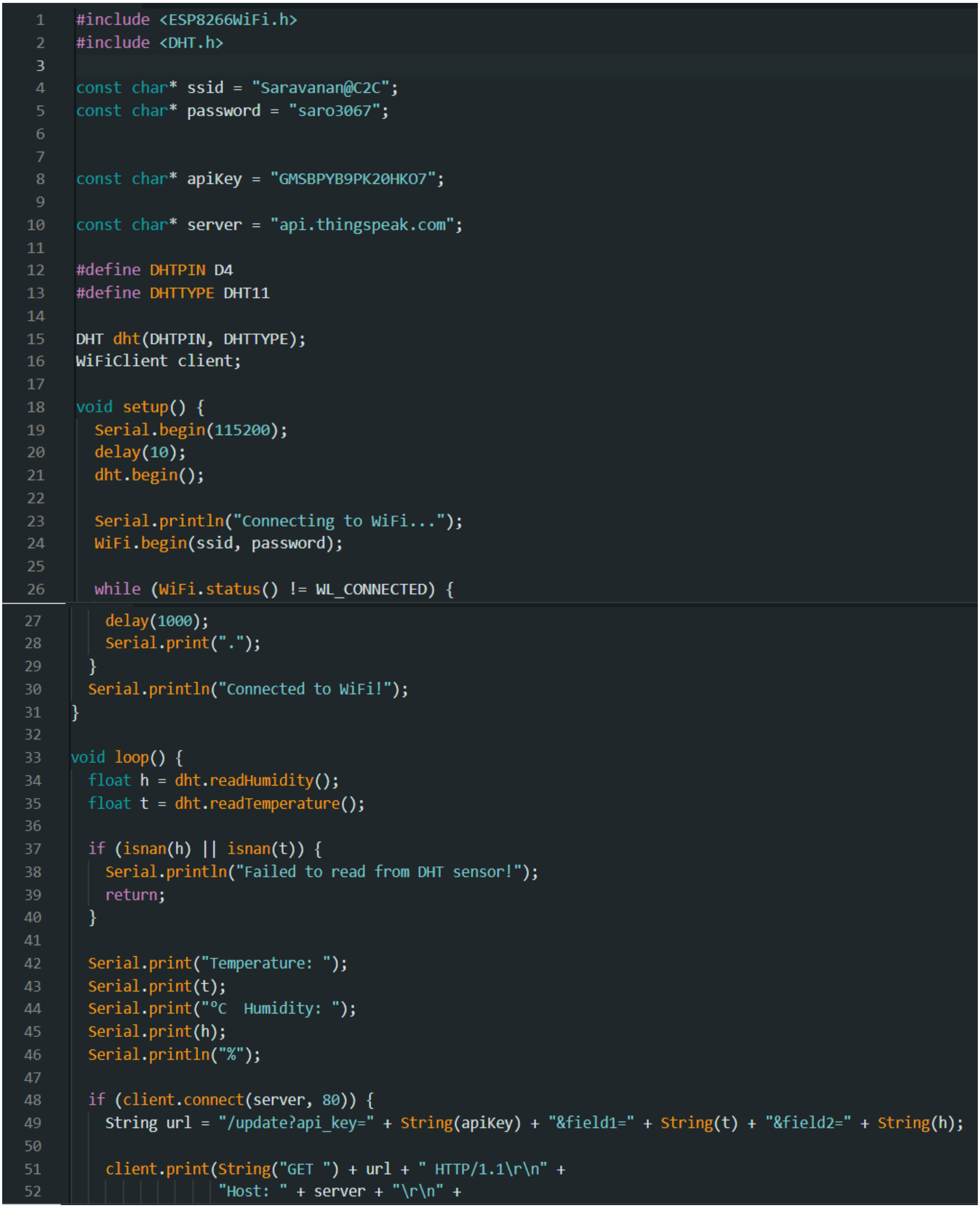
This project is an IoT-based temperature and humidity monitoring system using Node MCU ESP8266, DHT11 sensor, and ThingSpeak cloud platform. The system continuously measures temperature and humidity and sends real-time data to the internet, where it can be accessed remotely via a web dashboard . The DHT11 sensor reads environmental conditions and sends the data to Node MCU, which processes it and transmits it over Wi-Fi to ThingSpeak. The data is updated every 5–15 seconds, allowing users to monitor climate conditions remotely. ThingSpeak then visualizes the readings in graphs, making it easy to analyze trends over time. This project is useful for weather stations, agriculture, smart homes, and industrial applications, where temperature and humidity monitoring is crucial. It helps prevent damage to sensitive equipment, improves storage conditions, and enhances automation in smart environments . The system is easy to implement, cost-effective, and can be expanded with alerts, automation, and mobile app integration. By using IoT and cloud computing, this project provides a real-time, scalable, and smart solution for environmental monitoring.

CIRCUIT DIAGRAM USING WOKWI

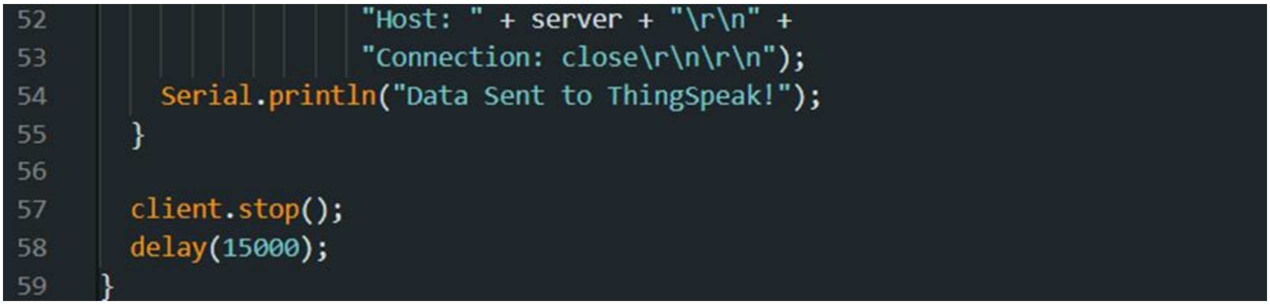


USED ESP32 AND DHT22 INSTEAD OF NODE MCU AND DHT11 AS IT WAS NOT AVAILABLE BUT THE CIRCUIT CONNECTIONS ARE SAME

NODE MCU CODE



```
#include <ESP8266WiFi.h>
#include <DHT.h>

const char* ssid = "Saravanan@C2C";
const char* password = "saro3067";


const char* apiKey = "GMSBPYB9PK20HK07";

const char* server = "api.thingspeak.com";

#define DHTPIN D4
#define DHTTYPE DHT11

DHT dht(DHTPIN, DHTTYPE);
WiFiClient client;

void setup() {
  Serial.begin(115200);
  delay(10);
  dht.begin();

  Serial.println("Connecting to WiFi...");
  WiFi.begin(ssid, password);

  while (WiFi.status() != WL_CONNECTED) {
    delay(1000);
    Serial.print(".");
  }
  Serial.println("Connected to WiFi!");
}

void loop() {
  float h = dht.readHumidity();
  float t = dht.readTemperature();

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

  Serial.print("Temperature: ");
  Serial.print(t);
  Serial.print("°C  Humidity: ");
  Serial.print(h);
  Serial.println("%");

  if (client.connect(server, 80)) {
    String url = "/update?api_key=" + String(apiKey) + "&field1=" + String(t) + "&field2=" + String(h);

    client.print(String("GET ") + url + " HTTP/1.1\r\n" +
                 "Host: " + server + "\r\n" +
```



```
                 "Host: " + server + "\r\n" +
                 "Connection: close\r\n\r\n");
    Serial.println("Data Sent to ThingSpeak!");
  }

  client.stop();
  delay(15000);
}
```

CODE ENDS HERE

THANK YOU