Industrial IoT Minor

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Experiment - 6

AIM: Write a program on ESP32/Raspberry Pi to retrieve temperature and humidity data from DTH11/DTH22 to thingspeak cloud.

OBJECTIVE: To write a code on ESP32 to retrieve temperature and humidity data from DTH11/DTH22 to thingspeak cloud.

THEORY: DHT11/22: The DHT11 detects water vapor by measuring the electrical resistance between two electrodes. The humidity sensing component is a moisture holding substrate with electrodes applied to the surface. When water vapor is absorbed by the substrate, ions are released by the substrate which increases the conductivity between the electrodes.

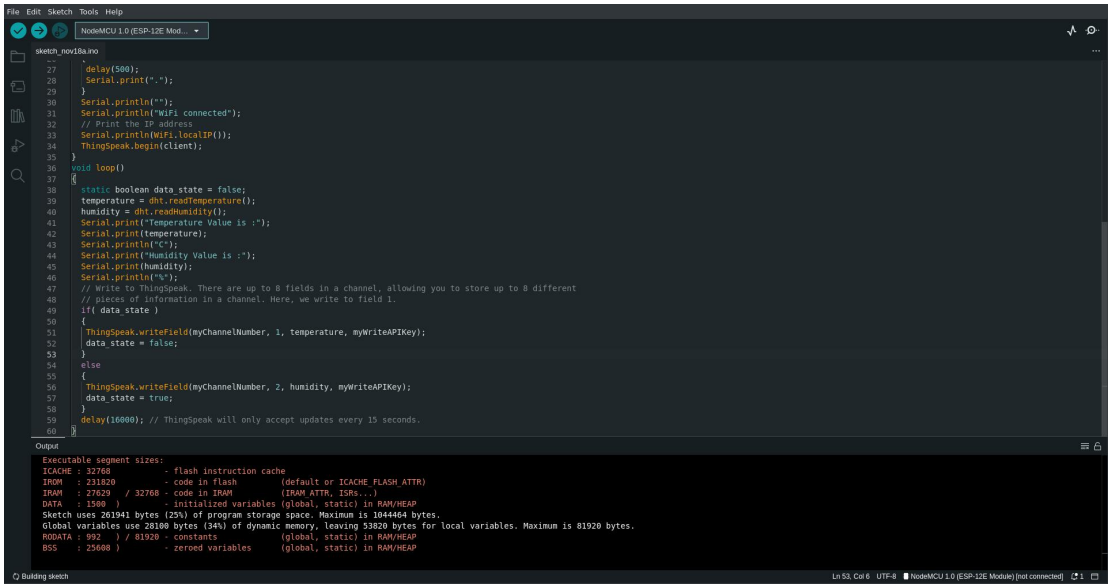
Thingspeak: ThingSpeak is an open-source software written in Ruby which allows users to communicate with internet enabled devices. It facilitates data access, retrieval and logging of data by providing an API to both the devices and social network websites.

SIMULATION CODE:

```
#include <DHT.h>
#include <ESP8266WiFi.h>
#include <WiFiClient.h>
#include <ThingSpeak.h>
#define DHTPIN 0
#define DHTTYPE DHT11
DHT dht(DHTPIN, DHTTYPE);
const char* ssid = ".....";
const char* password = "....";
WiFiClient client;
unsigned long myChannelNumber = 1682481; // your channel number
const char * myWriteAPIKey = "7YXRHX583B7L73ZU"; // your API key
uint8_t temperature, humidity;
void setup()
{
Serial.begin(115200);
dht.begin();
delay(10);
// Connect to WiFi network
Serial.println();
Serial.println();
Serial.print("Connecting to ");
Serial.println(ssid);
```

```
WiFi.begin(ssid, password);
while (WiFi.status() != WL_CONNECTED)
{
delay(500);
Serial.print(".");
}
Serial.println("");
Serial.println("WiFi connected");
// Print the IP address
Serial.println(WiFi.localIP());
ThingSpeak.begin(client);
}
void loop()
{
static boolean data_state = false;
temperature = dht.readTemperature();
humidity = dht.readHumidity();
Serial.print("Temperature Value is :");
Serial.print(temperature);
Serial.println("C");
Serial.print("Humidity Value is :");
Serial.print(humidity);
Serial.println("%");
// Write to ThingSpeak. There are up to 8 fields in a channel, allowing you to store up
to 8 different
// pieces of information in a channel. Here, we write to field 1.
if( data_state )
{
ThingSpeak.writeField(myChannelNumber, 1, temperature, myWriteAPIKey);
data_state = false;
}
else
{
ThingSpeak.writeField(myChannelNumber, 2, humidity, myWriteAPIKey);
data_state = true;
}
delay(16000); // ThingSpeak will only accept updates every 15 seconds.
}
```

SIMULATION RESULT:



CONCLUSION: After performing this experiment we were able to to retrieve temperature and humidity data from DTH11/DTH22 to thingspeak cloud.

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