week-6

Aim: write a Program to Interface IR sensors using Arduino using IoT cloud application.

The different cloud applications which integrates IOT are

1. Thingspeak
2. Xively.

1. Thingspeak: It is IOT analytic service that allow you to aggregate, visualize, analyse live data stream from cloud. (in the cloud)

→ MATLAB code supports thingspeak to Perform online analysis and Process the data.

→ MATLAB also supports simulation.

→ Open chrome, open thingspeak

→ Create a new user account

→ A new account contains a new channel.

→ The channel has 8 different fields.

→ It stores the data and Integrates the data with different sensors.

→ channel settings helps us to visualize the data.

→ There are 2 views.

(i) Private View

(ii) Public View (In channels)

→ It contains 2 API keys. (read API key, write API key)

→ Your private data is protected with API keys that you can control.

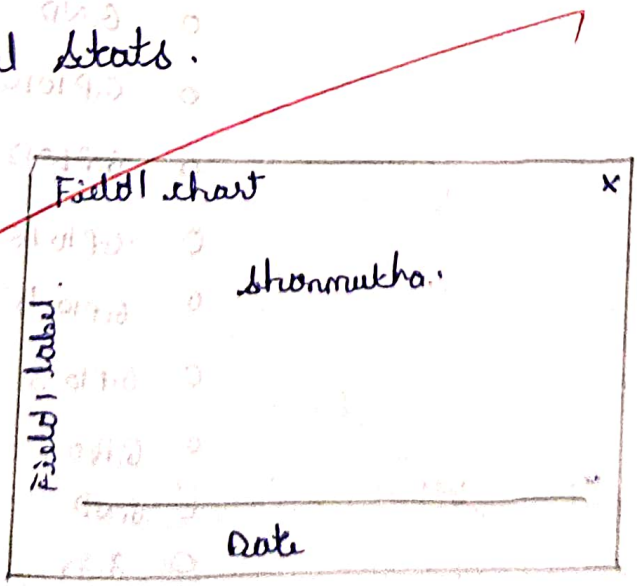
channel ID: 2467173

Author: mwa0000033348795

Access: Private

Private View Public View channel settings sharing API keys.

channel stats.

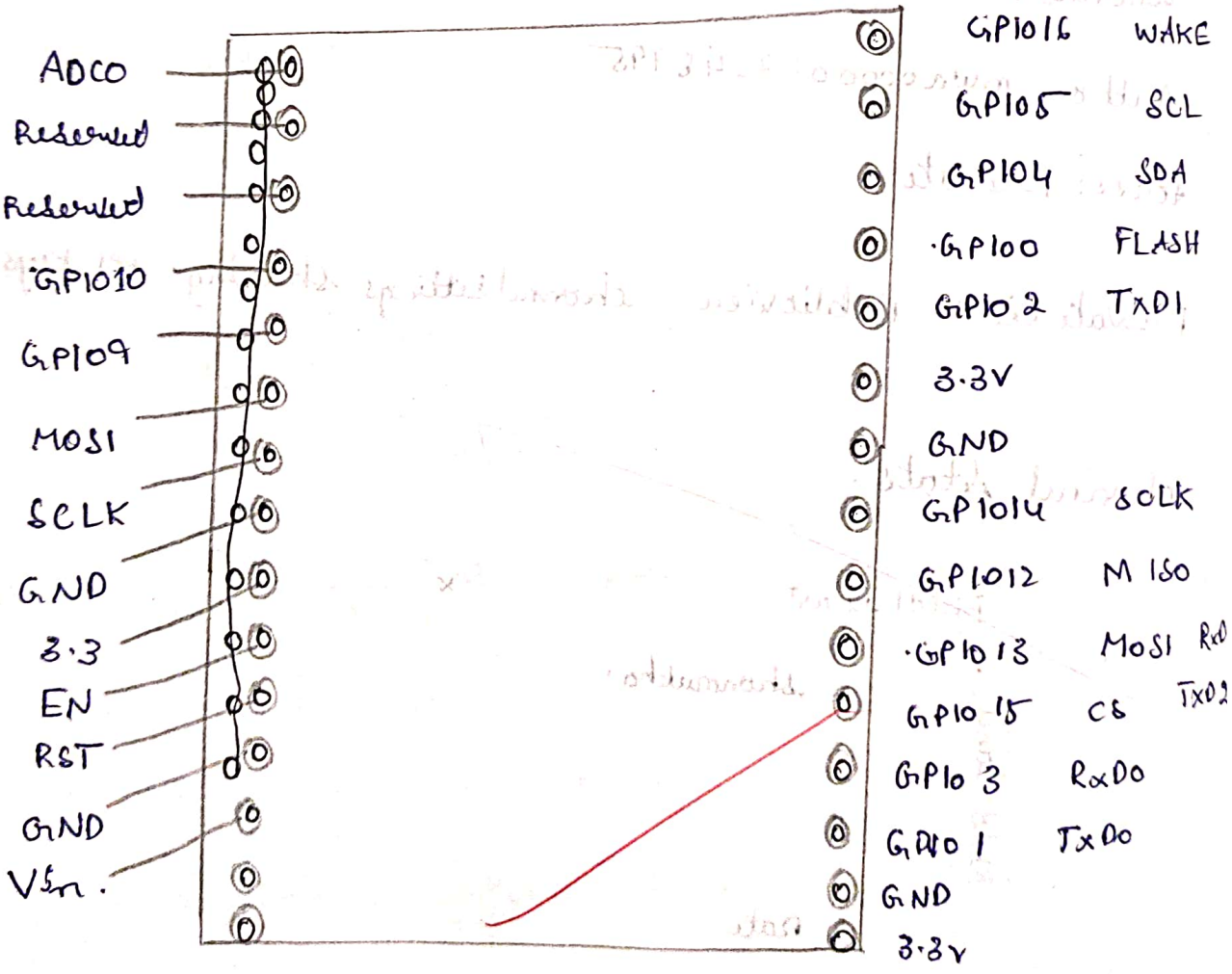


Hardware Requirements:

Node MCU is a micro-controller unit used to develope IOT Applications, It connects devices to Internet. It has built-in wifi and Programming capabilities. facilitating speedy Prototyping and deployment of IOT applications.

(Arduino + WIFI = Node MCU).

Node MCU PIN Diagram:



→ Go to Sketch, click on include library and search in manage libraries ESP8266 and thingspeak

Source code:

```
#include <DHT.h>
#include <ESP8266WiFi.h>
String apiKey = "9KWWHBQ5TFX6C4XP";
const char* ssid = "Ttachi";
const char* pass = "12345678";
const char* server = "api.thingspeak.com";
#define DHTPIN D3
DHT dht(DHTPIN, DHT11);
WiFiClient client;
void setup()
{
 Serial.begin(115200);
 delay(1000);
 dht.begin();
 Serial.println("connecting to");
 Serial.println(ssid);
WiFi.begin(ssid, pass);
while(WiFi.status() != WL_CONNECTED)
{
 delay(2000);
 Serial.print(".");
}
```

```
    Serial.println(" ");
    Serial.println("WiFi connected");
}
Void loop()
{
    float h = dht.readHumidity();
    float t = dht.readTemperature();
    if (isnan(h) || isnan(t))
    {
        Serial.println("Failed to read from DHT Sensor;");
        return;
    }
    if (client.connect(server, 80))
    {
        String Poststr = apikey;
        Poststr += "&field1=";
        Poststr += String(h);
        Poststr += "&field2=";
        Poststr += String(t);
        Poststr += "\r\n\r\n";
        client.Print("Post /update HTTP/1.1\n");
        client.Print("Host: api.thingspeak.com\n");
        client.Print("connection: close\n");
        client.Print("X-THingSpeakAPIKEY: "+apikey+"\n");
        client.Print(Poststr.length());
        client.Print("\n\n");
```

```
client.Print(Poststr);
Serial.Print("Temperature:");
Serial.Print(t).
Serial.Print("degrees Celcius, Humidity: ");
Serial.Print(h);
Serial.Println("%. Send to Thingspeak");
}
client.stop();
Serial.Println("waiting...");
delay(1000);
}
```

output:

Thingspeak

channel Status.

Field1 chart

IR Sensor.