Project Description

IOT05B6

Major Project

Internship 2020 (Verzeo)

Problem Statement: - (as given on the mail)

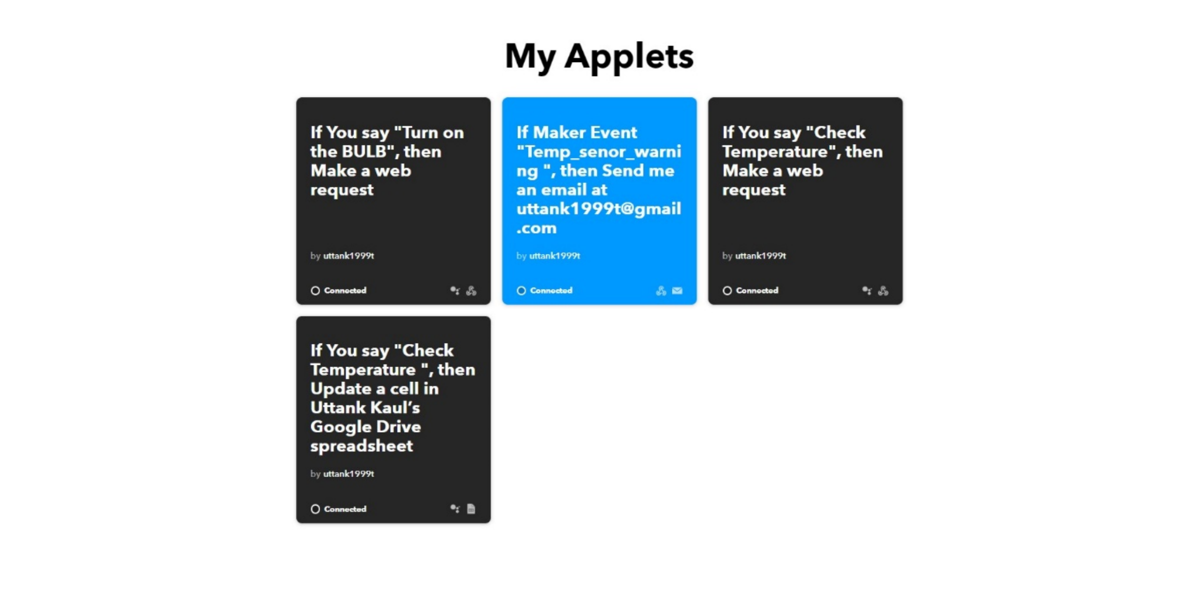
IoT controlled smart home
Setup a Google assistant applet from IFTTT to trigger a web request which will update a field in Thing Speak cloud. Then read the data from Thing Speak cloud using Arduino to control the appliances in your home from anywhere in the world.
Ex:- From your mobile phone, if you say- "ok google" Turn on the light" from anywhere, it should turn on the light in your home.

Required Components: -
1) Arduino Uno with cable
2) Esp8266(Wi-Fi module)
3) 5v Relay two channels
4) 230v bulb along with holder
5) Wires
6) Jumper cables

Project Description: - The project objective is to make IFTTT applet that sends Data to ThinkSpeak channel (using API keys) from Arduino. (using AT commands in the Arduino IDE Serial console). It then reads the data from the ThinkSpeak cloud, in order to control sensor like: - **Temperature Sensor (DHT) or Light (Bulb)**.

Channel and Applets: -

1. **IFTTT channel/applet: -**
   Link :- https://ifttt.com/my_applets



My Applets

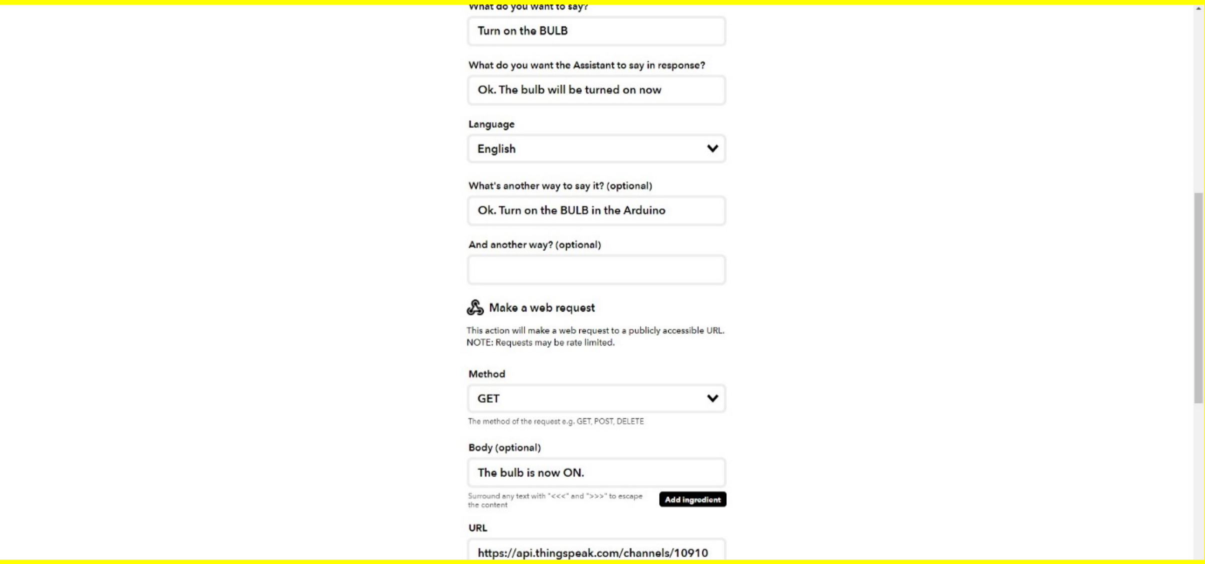
If You say "Turn on the BULB", then Make a web request
by uttank1999t
○ Connected

If Maker Event "Temp_senor_warning ", then Send me an email at uttank1999t@gmail.com
by uttank1999t
○ Connected

If You say "Check Temperature", then Make a web request
by uttank1999t
○ Connected

If You say "Check Temperature ", then Update a cell in Uttank Kaul's Google Drive spreadsheet
by uttank1999t
○ Connected

A. **Light Controller: -** This applet makes web request to ThinkSpeak cloud in order change the value of BULB to 1(**HIGH**) or 0(**LOW**), which will result enable **us to control the lights**



What do you want to say?

Turn on the BULB

What do you want the Assistant to say in response?

Ok. The bulb will be turned on now

Language

English

What's another way to say it? (optional)

Ok. Turn on the BULB in the Arduino

And another way? (optional)

Make a web request

This action will make a web request to a publicly accessible URL. NOTE: Requests may be rate limited.

Method

GET

The method of the request e.g. GET, POST, DELETE

Body (optional)

The bulb is now ON.

Surround any text with "<<<" and ">>>" to escape the content

Add ingredient

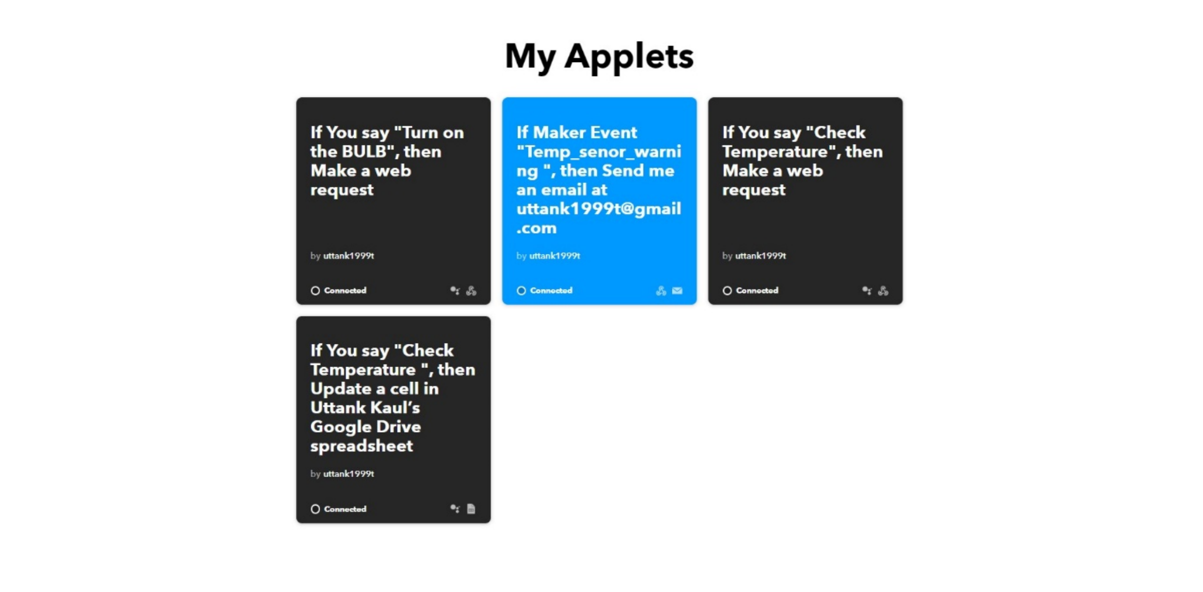
URL

https://api.thingspeak.com/channels/10910

B. **DHT Senor: -**

This Following IFTTT applet updates the value of given by DHT sensor (using Arduino), to the ThinkSpeak Channel.

It then updates the same value to **Google Spreadsheets. (log).**



My Applets

If You say "Turn on the BULB", then Make a web request

by uttank1999t

○ Connected

If Maker Event "Temp_senor_warning ", then Send me an email at uttank1999t@gmail.com

by uttank1999t

○ Connected

If You say "Check Temperature", then Make a web request

by uttank1999t

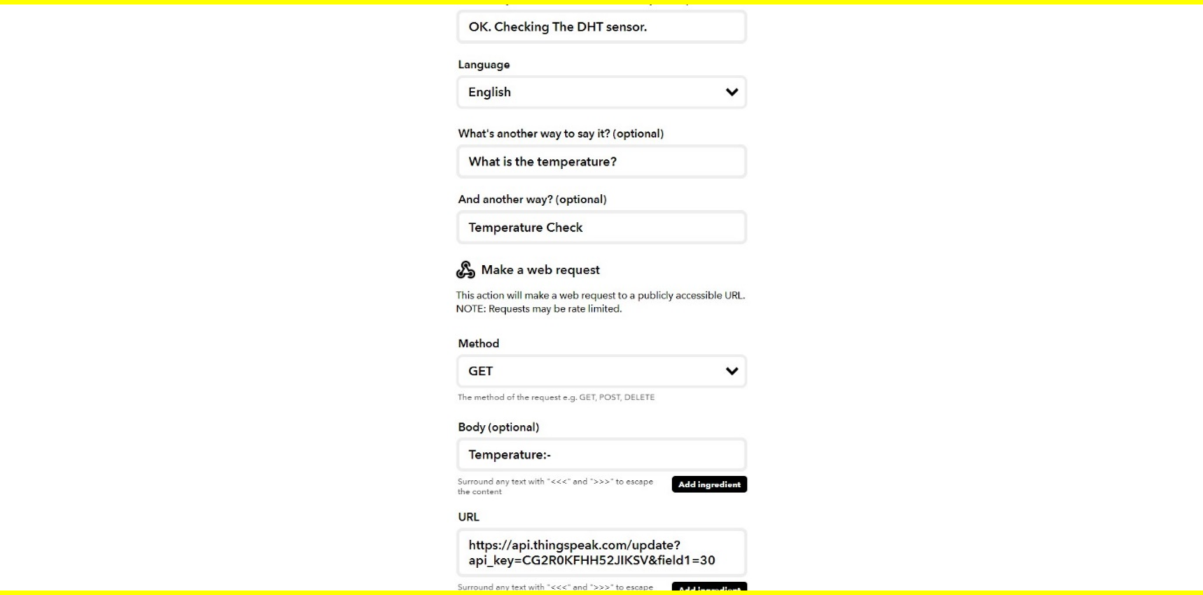
○ Connected

If You say "Check Temperature ", then Update a cell in Uttank Kaul's Google Drive spreadsheet

by uttank1999t

○ Connected

Thus, if you say **"Check Temperature**" to the Google Assistant, the value will update from DHT Controller.



OK. Checking The DHT sensor.

Language

English

What's another way to say it? (optional)

What is the temperature?

And another way? (optional)

Temperature Check

Make a web request

This action will make a web request to a publicly accessible URL.
NOTE: Requests may be rate limited.

Method

GET

The method of the request e.g. GET, POST, DELETE

Body (optional)

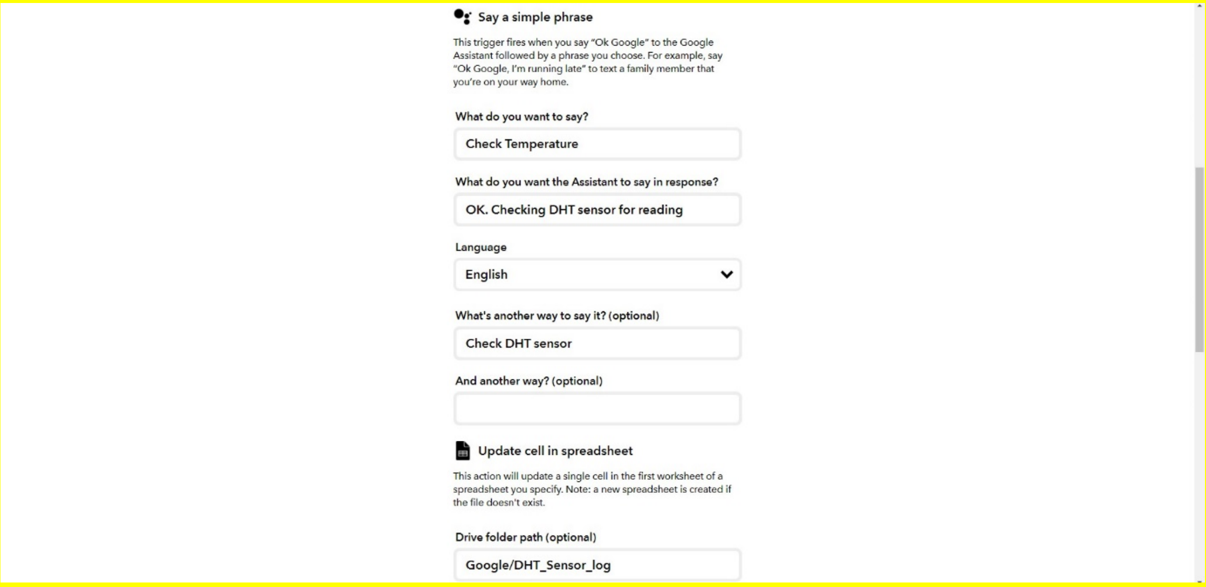
Temperature:-

Surround any text with "<<<" and ">>>" to escape the content

URL

https://api.thingspeak.com/update?api_key=CG2R0KFHH52JIKSV&field1=30

Surround any text with "<<<" and ">>>" to escape



Say a simple phrase

This trigger fires when you say "Ok Google" to the Google Assistant followed by a phrase you choose. For example, say "Ok Google, I'm running late" to text a family member that you're on your way home.

What do you want to say?

Check Temperature

What do you want the Assistant to say in response?

OK. Checking DHT sensor for reading

Language

English

What's another way to say it? (optional)

Check DHT sensor

And another way? (optional)

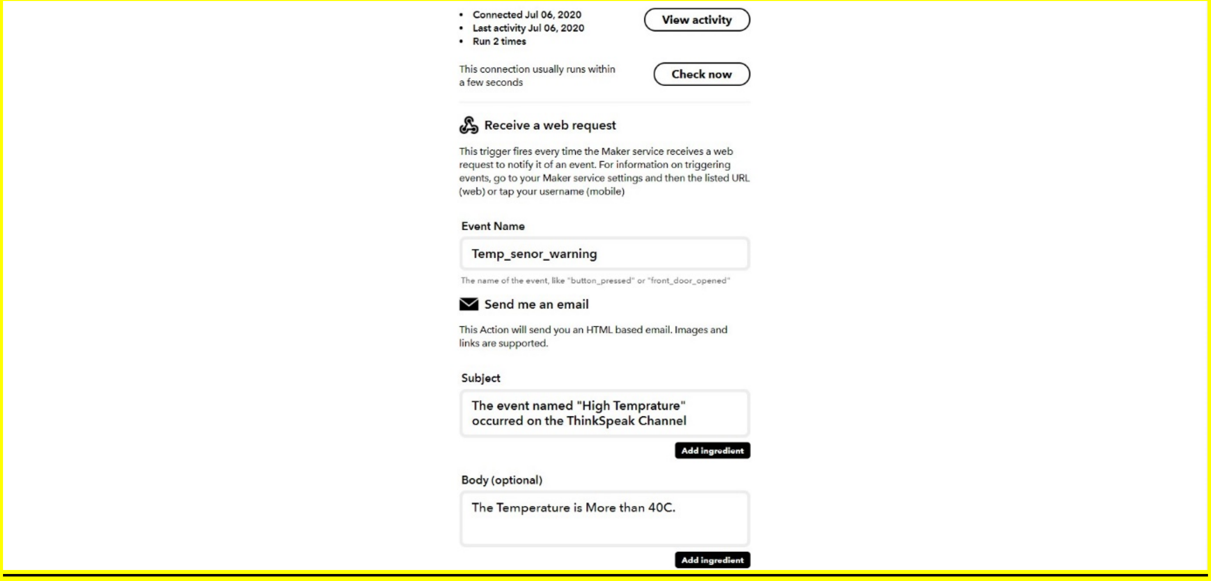
Update cell in spreadsheet

This action will update a single cell in the first worksheet of a spreadsheet you specify. Note: a new spreadsheet is created if the file doesn't exist.

Drive folder path (optional)

Google/DHT_Sensor_log

C. Webhooks Email service: -



- Connected Jul 06, 2020
- Last activity Jul 06, 2020
- Run 2 times

This connection usually runs within a few seconds

Receive a web request

This trigger fires every time the Maker service receives a web request to notify it of an event. For information on triggering events, go to your Maker service settings and then the listed URL (web) or tap your username (mobile)

Event Name

Temp_senor_warning

The name of the event, like "button_pressed" or "front_door_opened"

Send me an email

This Action will send you an HTML based email. Images and links are supported.

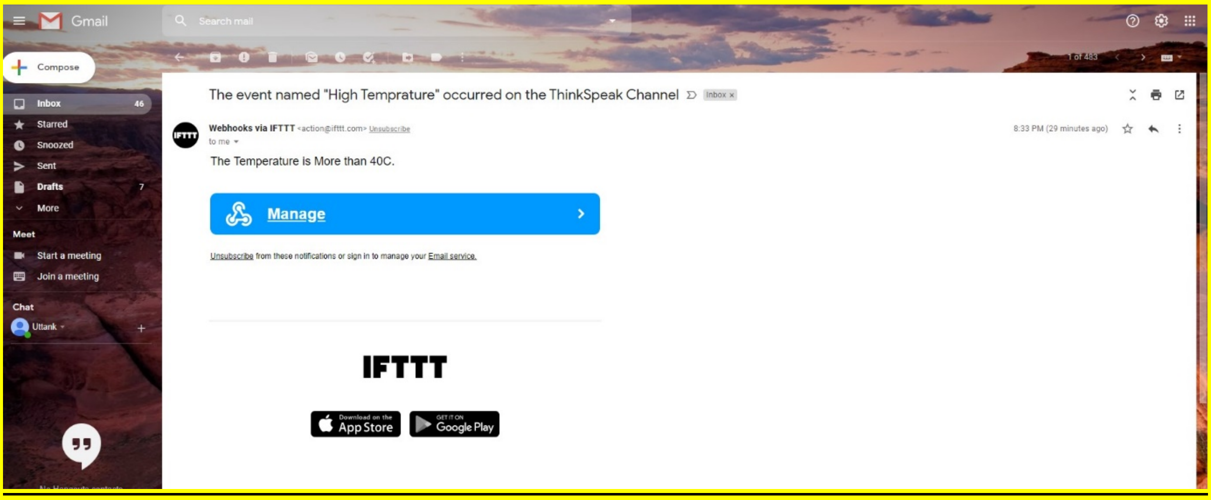
Subject

The event named "High Temprature" occurred on the ThinkSpeak Channel

Body (optional)

The Temperature is More than 40C.

Note: - If the Temprature **greater than 40**. It will trigger an alarm in form of email, that will send to your Email address. (that was linked with IFTTT account).



The event named "High Temprature" occurred on the ThinkSpeak Channel

Webhooks via IFTTT <action@ifttt.com> Unsubscribe
to me

8:33 PM (29 minutes ago)

The Temperature is More than 40C.

Unsubscribe from these notifications or sign in to manage your Email service.

You will receive a mail, similar to the above.

Note: - The Temprature reading is acquired from DHT senor using **ThinkSpeak channel.**

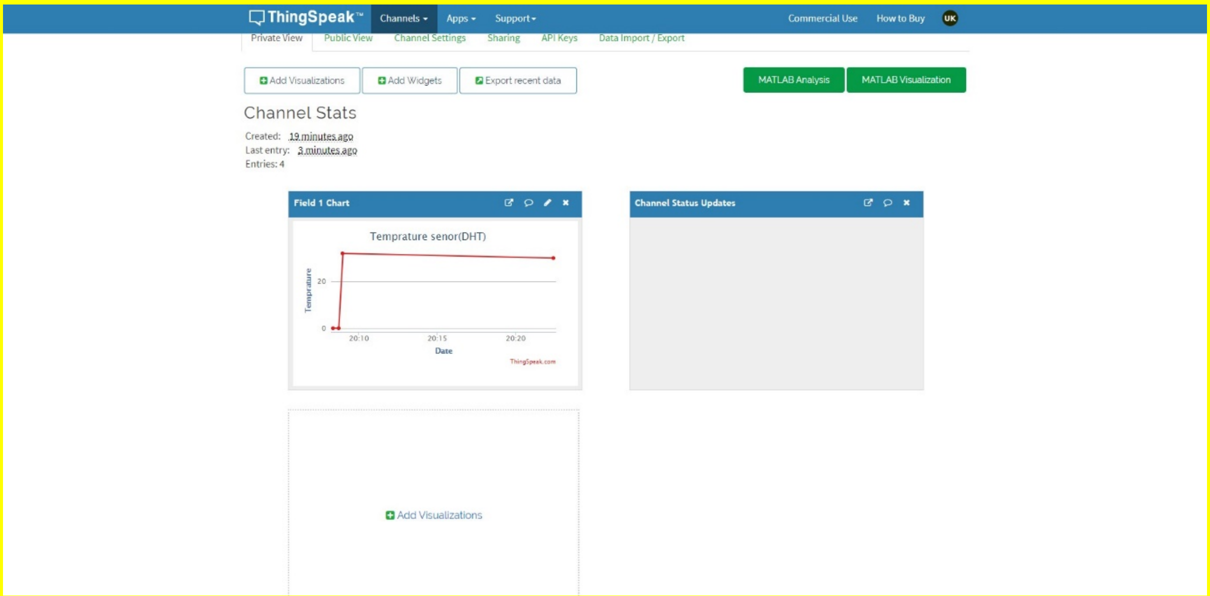
2. **ThinkSpeak Channel: -** This channel is made in order to update the value given from the IFTTT applet (say. DHT sensor).

Arduino device then reads data from the ThinkSpeak Channel below

Channel id: - 1091001.

Link: - https://thingspeak.com/channels/1091001

Note: - API keys can be found in **Channel API keys.txt** file in ThinkSpeak Channel folder.



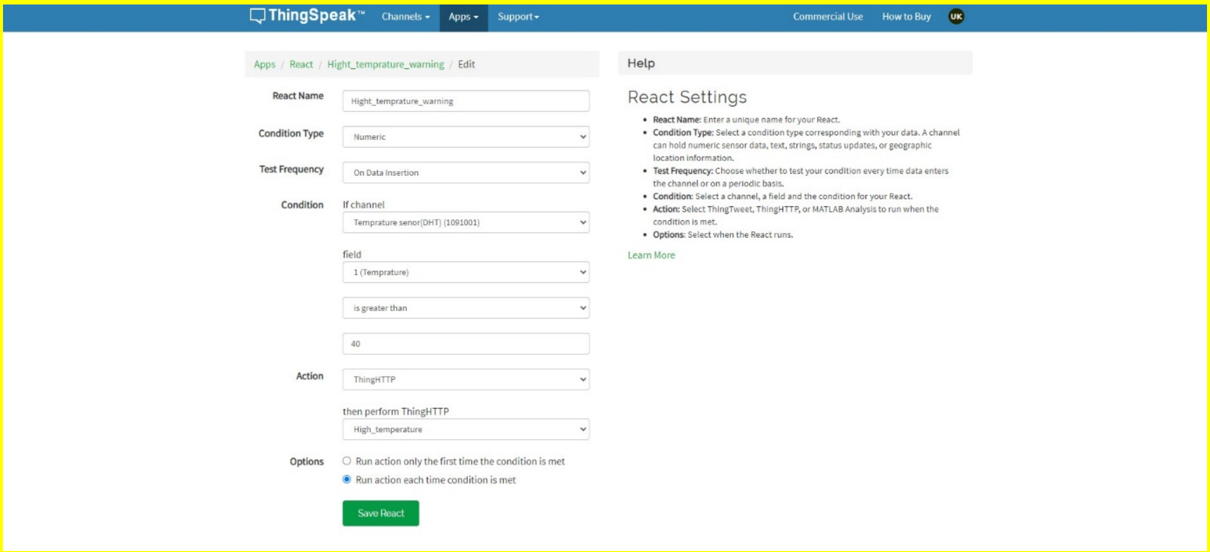
Channel Stats

Created: 19 minutes ago
Last entry: 3 minutes ago
Entries: 4

After reading the values, the Arduino uses these values to **control devices in the home.**

If the detected Temprature from the DHT senor is greater than **40C.** it will **initiate an event through IFTTT applet**, which then sends an email to the user.

Note: - React option is used to initialize the request to the IFTTT applet.



React Name: Hight_temprature_warning

Condition Type: Numeric

Test Frequency: On Data Insertion

Condition: If channel Temprature senor(DHT) (1091001)

field 1 (Temprature)

is greater than

40

Action: ThingHTTP

then perform ThingHTTP High_temperature

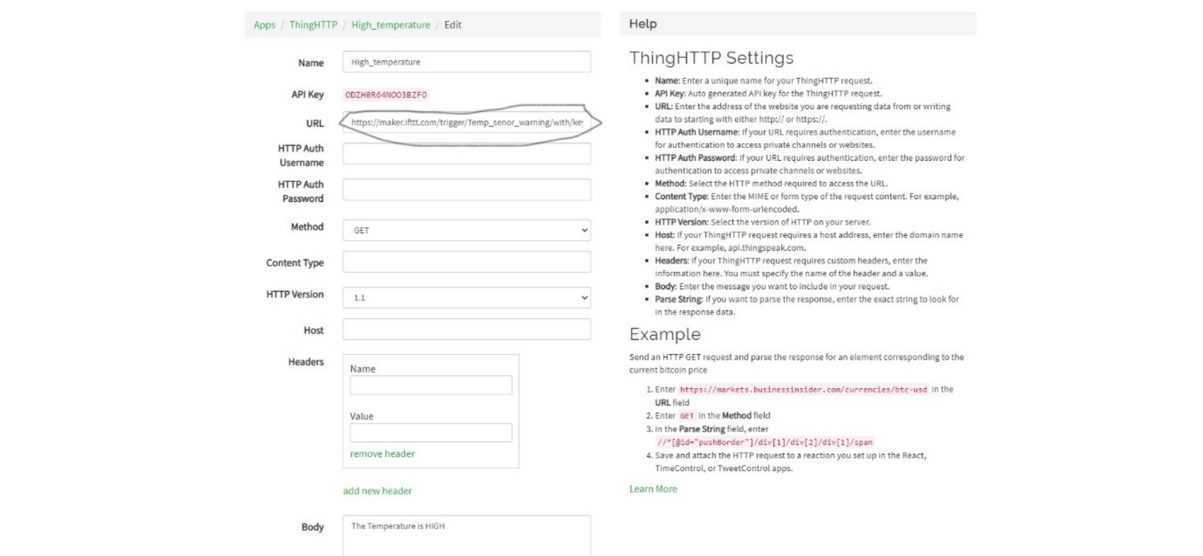
Options:
○ Run action only the first time the condition is met
● Run action each time condition is met

Help

React Settings

- **React Name:** Enter a unique name for your React.
- **Condition Type:** Select a condition type corresponding with your data. A channel can hold numeric sensor data, text, strings, status updates, or geographic location information.
- **Test Frequency:** Choose whether to test your condition every time data enters the channel or on a periodic basis.
- **Condition:** Select a channel, a field and the condition for your React.
- **Action:** Select ThingTweet, ThingHTTP, or MATLAB Analysis to run when the condition is met.
- **Options:** Select when the React runs.

It also triggers a **think HTTP** action to make the request for the applet.



Name	High_temperature
API Key	ODZH0R64NOO3BZFO
URL	https://maker.ifttt.com/trigger/Temp_senor_warning/with/key
HTTP Auth Username	
HTTP Auth Password	
Method	GET
Content Type	
HTTP Version	1.1
Host	
Headers	Name Value
Body	The Temperature is HIGH

Help

ThingHTTP Settings

- **Name:** Enter a unique name for your ThingHTTP request.
- **API Key:** Auto generated API key for the ThingHTTP request.
- **URL:** Enter the address of the website you are requesting data from or writing data to starting with either http:// or https://.
- **HTTP Auth Username:** If your URL requires authentication, enter the username for authentication to access private channels or websites.
- **HTTP Auth Password:** If your URL requires authentication, enter the password for authentication to access private channels or websites.
- **Method:** Select the HTTP method required to access the URL.
- **Content Type:** Enter the MIME or form type of the request content. For example, application/x-www-form-urlencoded.
- **HTTP Version:** Select the version of HTTP on your server.
- **Host:** If your ThingHTTP request requires a host address, enter the domain name here. For example, api.thingspeak.com.
- **Headers:** If your ThingHTTP request requires custom headers, enter the information here. You must specify the name of the header and a value.
- **Body:** Enter the message you want to include in your request.
- **Parse String:** If you want to parse the response, enter the exact string to look for in the response data.

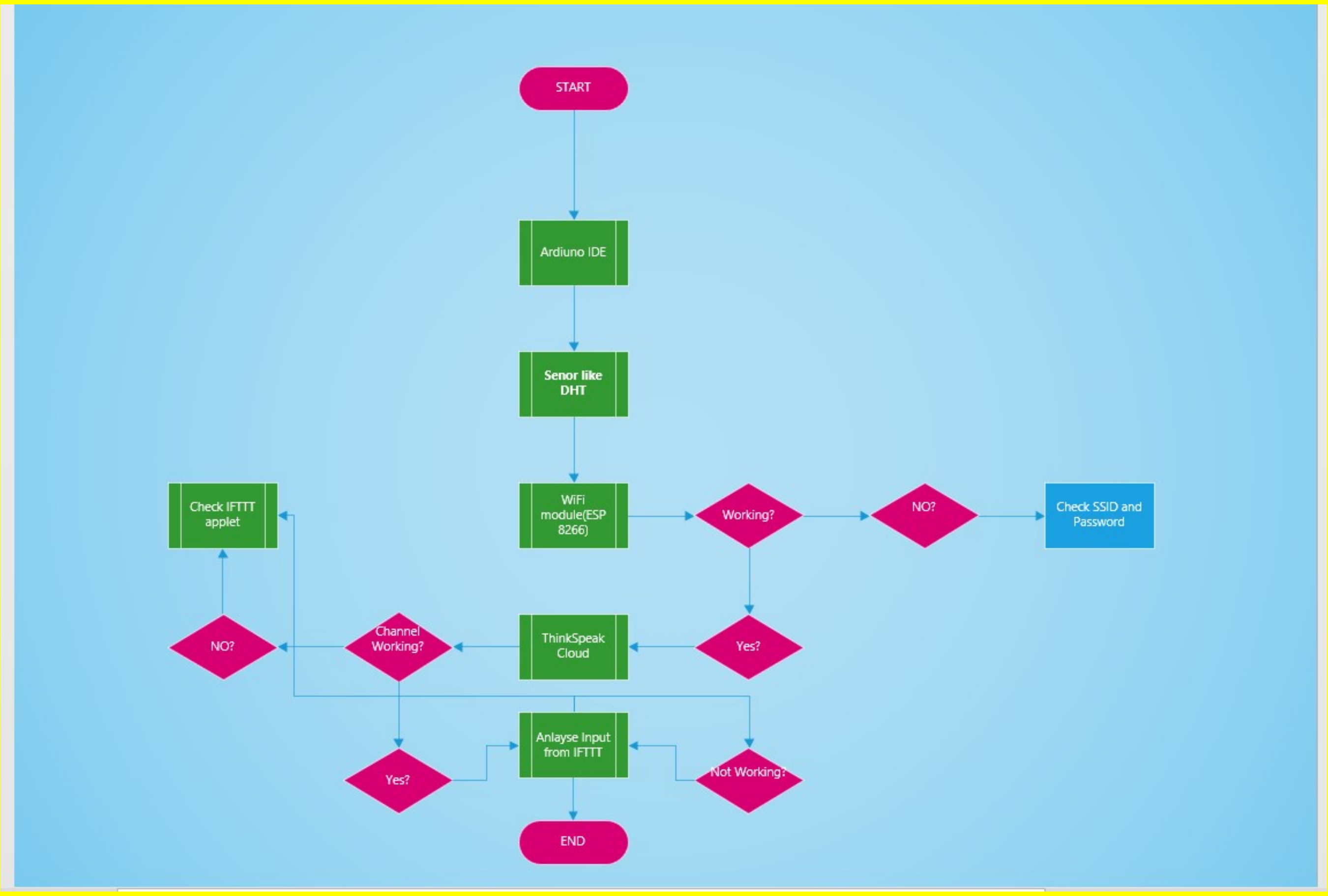
Example

Send an HTTP GET request and parse the response for an element corresponding to the current bitcoin price

1. Enter `https://markets.businessinsider.com/currencies/btc-usd` in the **URL** field
2. Enter `GET` in the **Method** field
3. In the **Parse String** field, enter `//*[@id="pushBorder"]/div[1]/div[2]/div[1]/span`
4. Save and attach the HTTP request to a reaction you set up in the React, TimeControl, or TweetControl apps.

Note: - The URL highlighted is for making request to the IFTTT email applet. **(Webhooks)**

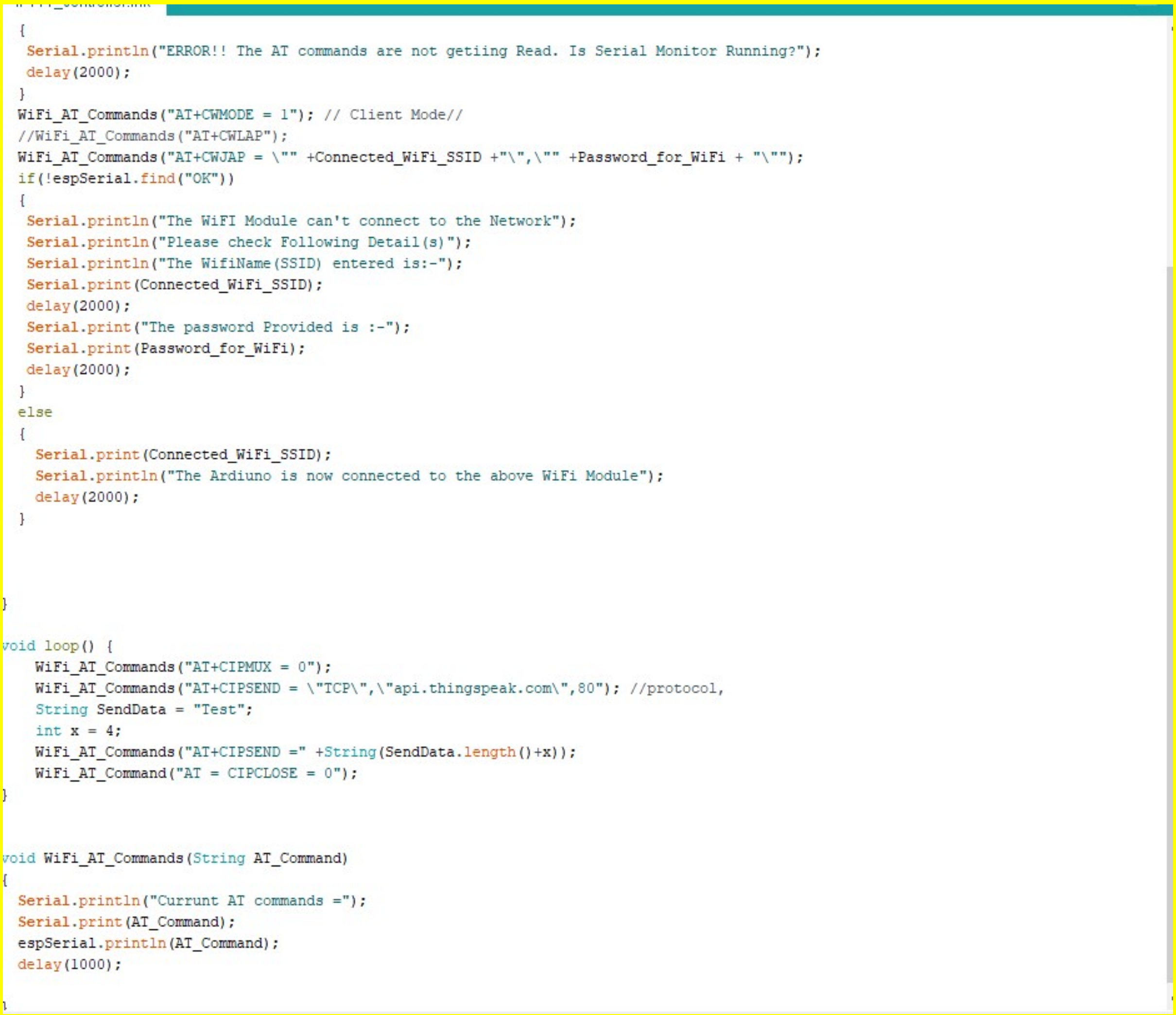
Working Flowchart: -



Code Description: -

Note: - Full codes can be found in codes Folder.

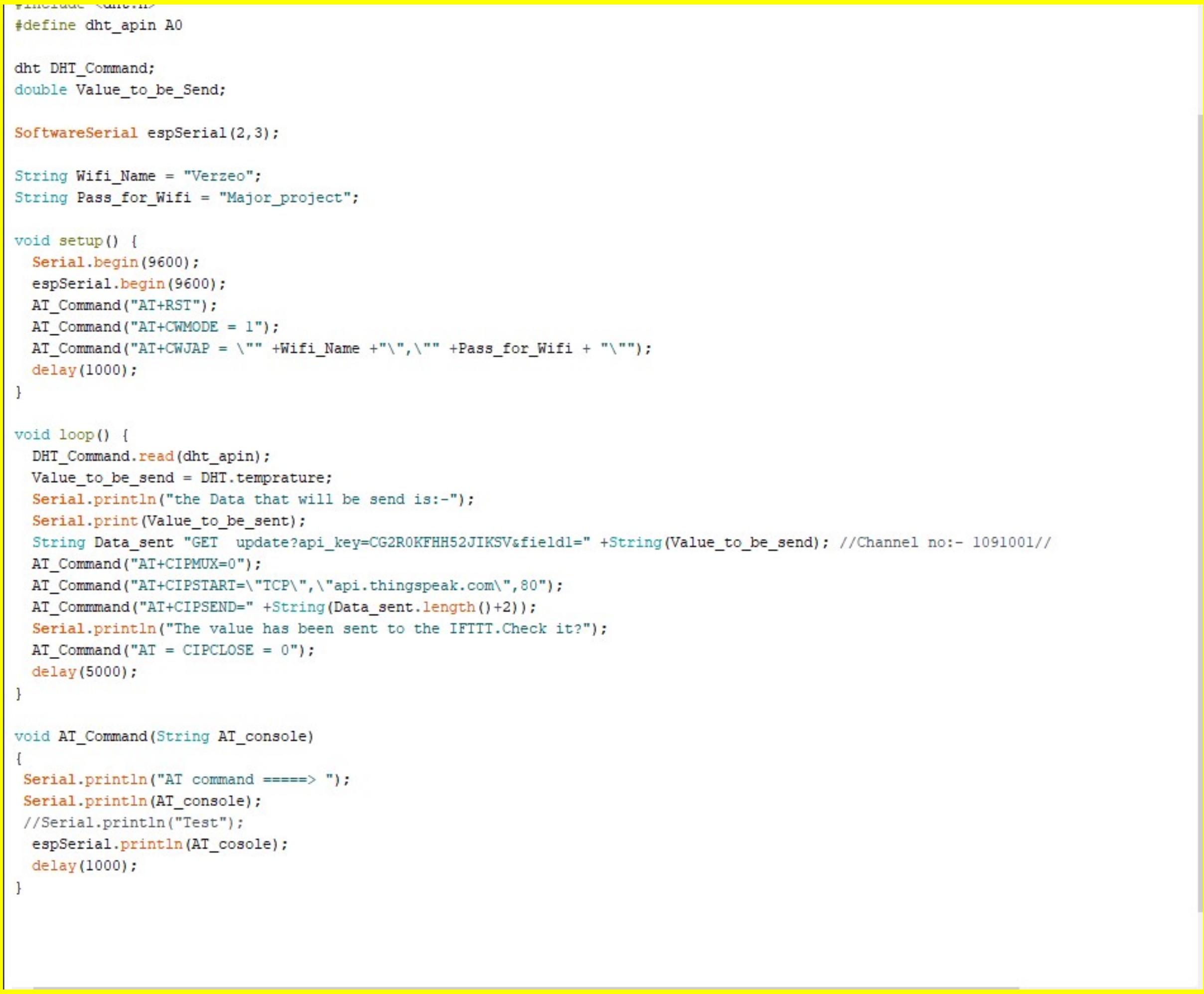
1. **IFTTT/Wi-Fi controller: -** The code tries to establish a Wi-Fi connection with the AT commands in the Arduino. After establishing a successful connection, it connects to the ThinkSpeak Cloud in order to send test Data.



```
 {
  Serial.println("ERROR!! The AT commands are not getiing Read. Is Serial Monitor Running?");
  delay(2000);
 }
 WiFi_AT_Commands("AT+CWMODE = 1"); // Client Mode//
 //WiFi_AT_Commands("AT+CWLAP");
 WiFi_AT_Commands("AT+CWJAP = \"" +Connected_WiFi_SSID +"\",\"" +Password_for_WiFi + "\"");
 if(!espSerial.find("OK"))
 {
  Serial.println("The WiFI Module can't connect to the Network");
  Serial.println("Please check Following Detail(s)");
  Serial.println("The WifiName(SSID) entered is:-");
  Serial.print(Connected_WiFi_SSID);
  delay(2000);
  Serial.print("The password Provided is :-");
  Serial.print(Password_for_WiFi);
  delay(2000);
 }
 else
 {
   Serial.print(Connected_WiFi_SSID);
   Serial.println("The Ardiuno is now connected to the above WiFi Module");
   delay(2000);
 }



}

void loop() {
    WiFi_AT_Commands("AT+CIPMUX = 0");
    WiFi_AT_Commands("AT+CIPSEND = \"TCP\",\"api.thingspeak.com\",80"); //protocol,
    String SendData = "Test";
    int x = 4;
    WiFi_AT_Commands("AT+CIPSEND =" +String(SendData.length()+x));
    WiFi_AT_Command("AT = CIPCLOSE = 0");
}


void WiFi_AT_Commands(String AT_Command)
{
  Serial.println("Currunt AT commands =");
  Serial.print(AT_Command);
  espSerial.println(AT_Command);
  delay(1000);

}
```

2. **<u>DHT Controller: -</u>** The code tries to establish a connection with DHT controller, in order to send values/readings to ThinkSpeak cloud Channel using Wi-Fi module (ESP 8266)

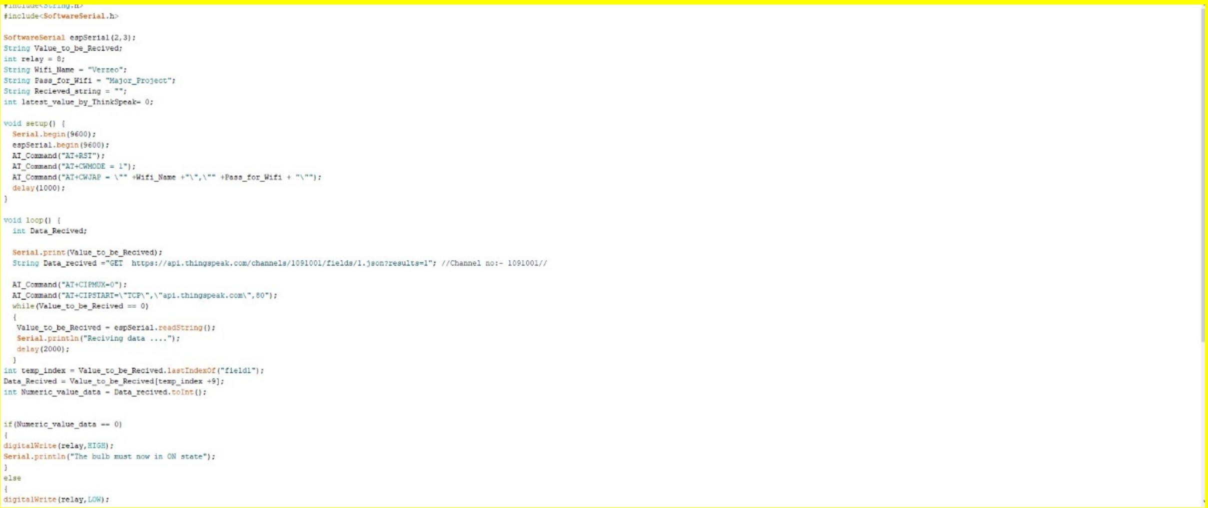
Note: - Channel API keys can be found in ThinkSpeak channel Folder.



```
#include <dht.h>
#define dht_apin A0

dht DHT_Command;
double Value_to_be_Send;

SoftwareSerial espSerial(2,3);

String Wifi_Name = "Verzeo";
String Pass_for_Wifi = "Major_project";

void setup() {
  Serial.begin(9600);
  espSerial.begin(9600);
  AT_Command("AT+RST");
  AT_Command("AT+CWMODE = 1");
  AT_Command("AT+CWJAP = \"" +Wifi_Name +"\",\"" +Pass_for_Wifi + "\"");
  delay(1000);
}

void loop() {
  DHT_Command.read(dht_apin);
  Value_to_be_send = DHT.temprature;
  Serial.println("the Data that will be send is:-");
  Serial.print(Value_to_be_sent);
  String Data_sent "GET  update?api_key=CG2R0KFHH52JIKSV&field1=" +String(Value_to_be_send); //Channel no:- 1091001//
  AT_Command("AT+CIPMUX=0");
  AT_Command("AT+CIPSTART=\"TCP\",\"api.thingspeak.com\",80");
  AT_Commmand("AT+CIPSEND=" +String(Data_sent.length()+2));
  Serial.println("The value has been sent to the IFTTT.Check it?");
  AT_Command("AT = CIPCLOSE = 0");
  delay(5000);
}

void AT_Command(String AT_console)
{
 Serial.println("AT command =====> ");
 Serial.println(AT_console);
 //Serial.println("Test");
  espSerial.println(AT_cosole);
  delay(1000);
}
```

3. **ThinkSpeak read code: -** This code tries to extract data from the ThinkSpeak channel, which is then used to control of the status of the BULB.

Note: - Use WiFi_IFTTT controller in order to connect to WIFI. This code is in present in the WiFi_IFTTT folder.



```
#include<String.h>
#include<SoftwareSerial.h>

SoftwareSerial espSerial(2,3);
String Value_to_be_Recived;
int relay = 8;
String Wifi_Name = "Verzeo";
String Pass_for_Wifi = "Major_Project";
String Recieved_string = "";
int latest_value_by_ThinkSpeak= 0;

void setup() {
  Serial.begin(9600);
  espSerial.begin(9600);
  AT_Command("AT+RST");
  AT_Command("AT+CWMODE = 1");
  AT_Command("AT+CWJAP = \"" +Wifi_Name +"\",\"" +Pass_for_Wifi + "\"");
  delay(1000);
}

void loop() {
  int Data_Recived;

  Serial.print(Value_to_be_Recived);
  String Data_recived ="GET  https://api.thingspeak.com/channels/1091001/fields/1.json?results=1"; //Channel no:- 1091001//

  AT_Command("AT+CIPMUX=0");
  AT_Command("AT+CIPSTART=\"TCP\",\"api.thingspeak.com\",80");
  while(Value_to_be_Recived == 0)
  {
   Value_to_be_Recived = espSerial.readString();
   Serial.println("Reciving data ....");
   delay(2000);
  }
int temp_index = Value_to_be_Recived.lastIndexOf("field1");
Data_Recived = Value_to_be_Recived[temp_index +9];
int Numeric_value_data = Data_recived.toInt();


if(Numeric_value_data == 0)
{
digitalWrite(relay,HIGH);
Serial.println("The bulb must now in ON state");
}
else
{
digitalWrite(relay,LOW);
```

.

.

.

.

.

Google classroom code :-**IOT05B6**

Link :- https://classroom.google.com/u/1/c/MTE0NDcwNjM5NDc0