INTERNET OF THINGS (IoT)

INTRODUCTION TO THINGSPEAK CLOUD

Thing Speak Cloud:

ThingSpeak is an IoT analytics platform service that allows you to aggregate, visualize, and analyze live data streams in the cloud. You can send data to ThingSpeak from your devices, create instant visualizations of live data, and send alerts using web services like Twitter® and Twilio®. With MATLAB® analytics inside ThingSpeak, you can write and execute MATLAB code to perform preprocessing, visualizations, and analyses. ThingSpeak enables engineers and scientists to prototype and build IoT systems without setting up servers or developing web software.

How to create account in ThingSpeak

Sign up ThingSpeak

It's simple just enter your email id and verify your account.

Configuring ThingSpeak

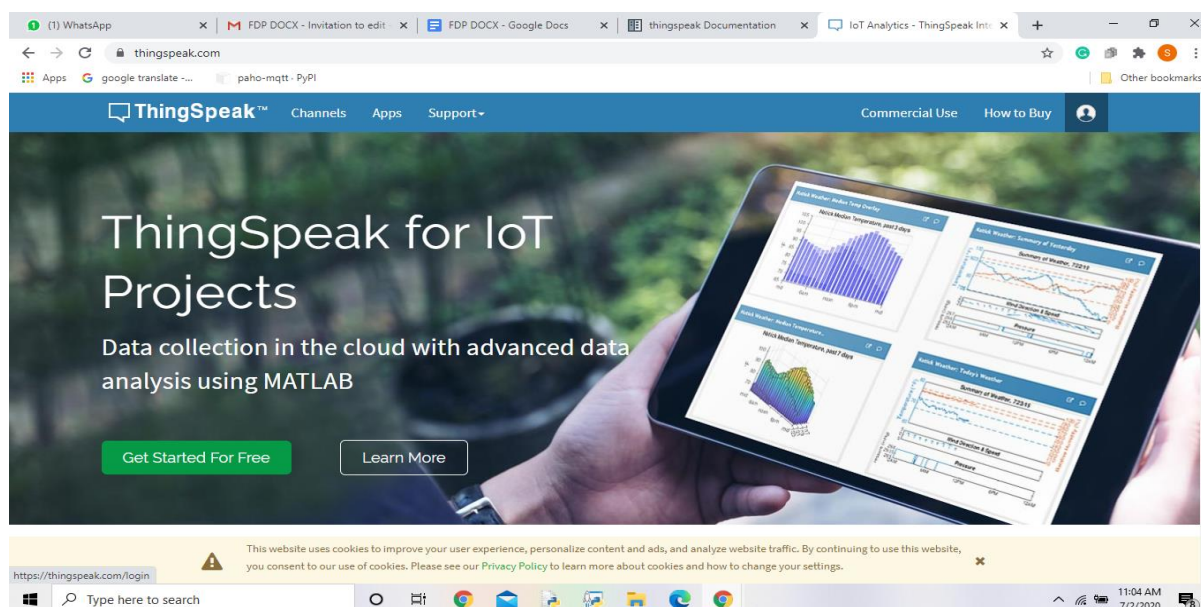Configuration is just few clicks job

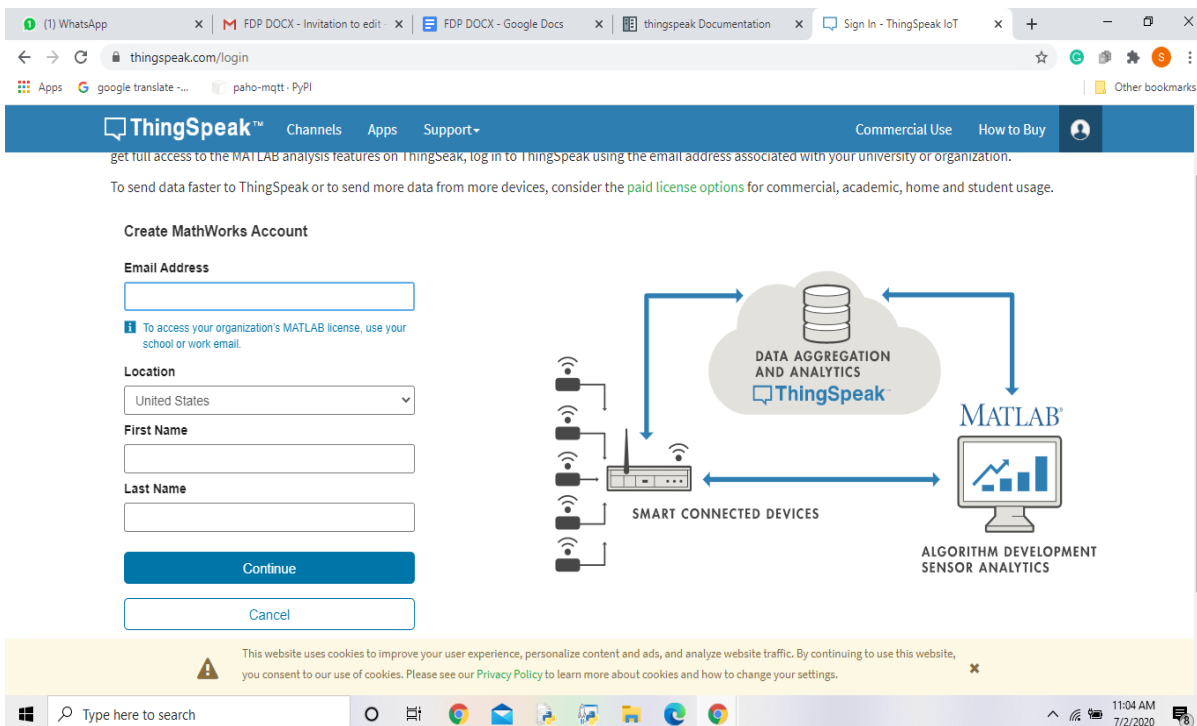Fig:- Click on sign in option which is on top right corner
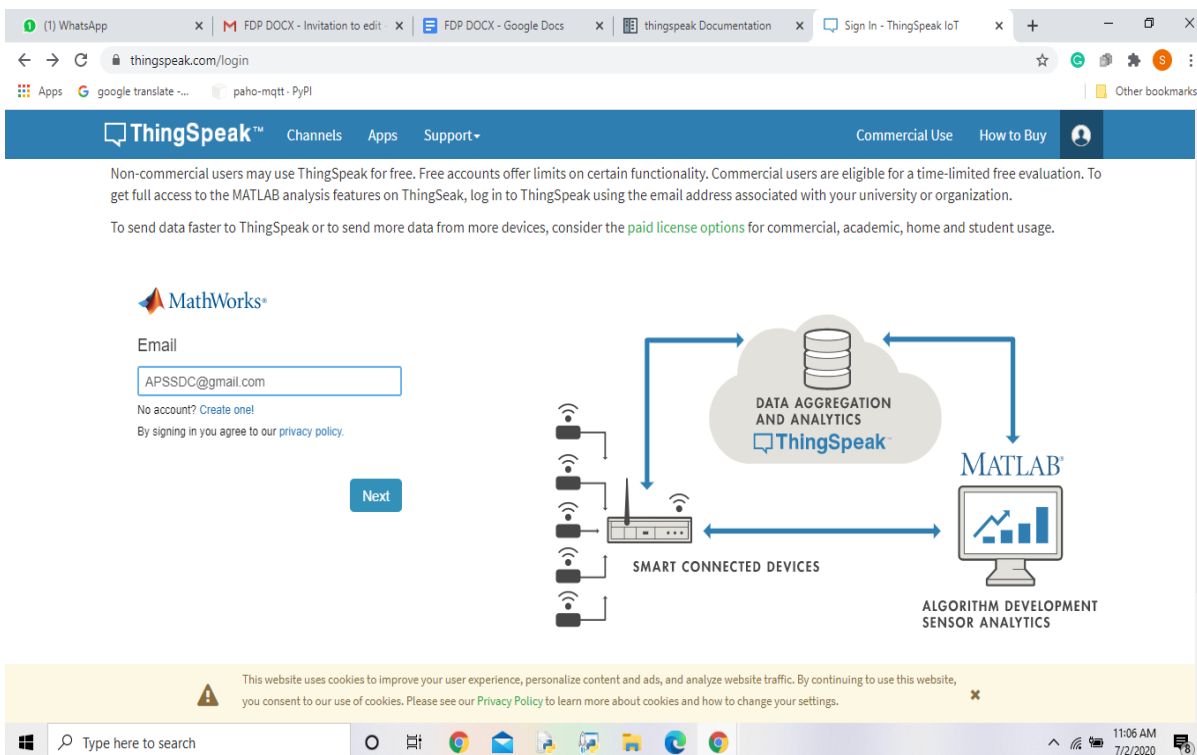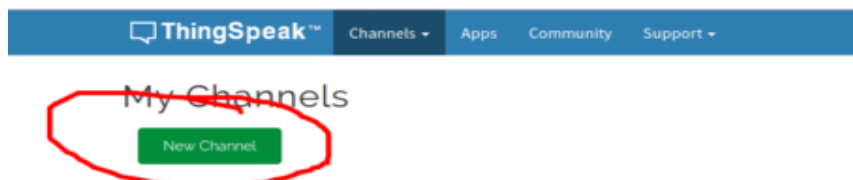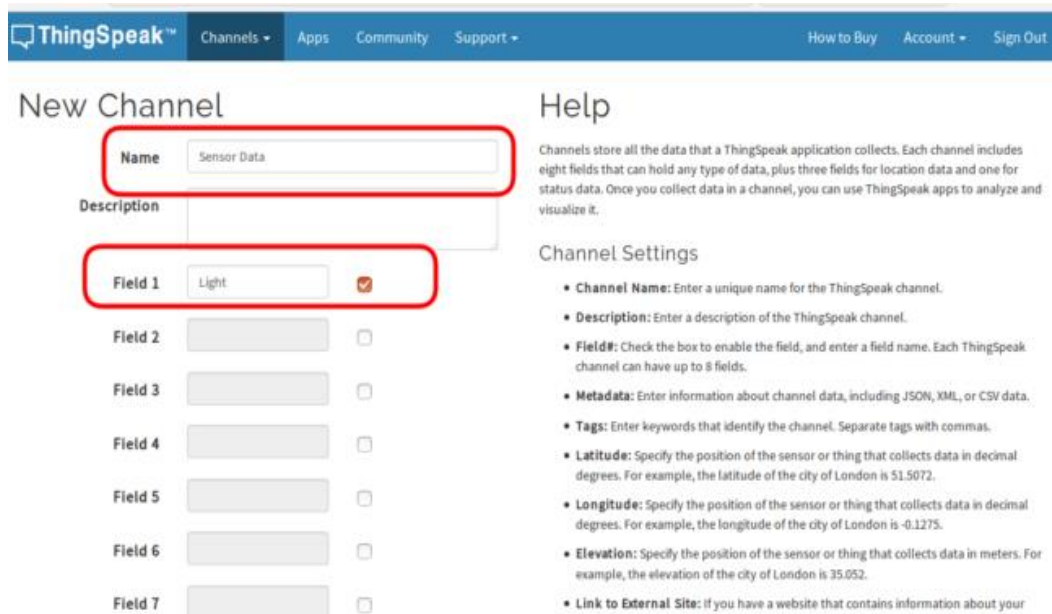
Fig:-Create your account and next continue

Fig:- Add your mail and click on next

Create New Channel
Click on New Channel

Enter Name and Field. You may have multiple Fields depending on number of sensors and create multiple fields such as Light

programming ESP8266 to upload data to ThingSpeak cloud server

Make Changes in program for API KEY, SSID and PASSWORD

Check Data on ThingSpeak Server
Open Your ThingSpeak Account and Click on Private View of Your Channel

Data logging to Thingspeak Cloud

LDR Sensor with Thing Speak Cloud:

In this tutorial, we will be using an LDR to plot its light Intensity level on ThingSpeak using NodeMCU. We will program the NodeMCU to read and store the LDR data into a variable and then upload it to ThingSpeak using its channel name and API key. The NodeMCU should be connected to the internet via Wi-Fi. We will see how to create ThingSpeak Channels and configure it on NodeMCU.

ThingSpeak is an IoT analytics cloud platform service that allows you to aggregate, visualize and analyze live data streams in the cloud. ThingSpeak provides instant visualizations of data posted by ESP8266 to ThingSpeak. ThingSpeak is often used for prototyping and proof of concept IoT systems that require analytics.

We will learn following things
- How to Configure ThingSpeak Cloud server Account ?
- How to program ESP8266 to upload sensor data ?

Lets understand the cloud concept first. Uploading of ESP8266 sensor data is done using the Internet.
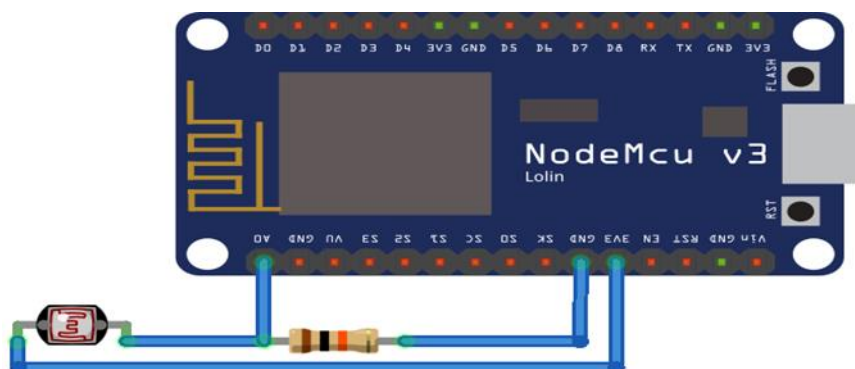
It is a three step process.
- Connect to your WiFi hot spot having internet access.
- Read Sensor data
- Upload data to ThingSpeak

Hardware Required:

- NodeMCU
- LDR Module
- 10K Ohm Resistor
- Jumper Wires
- Breadboard (Optional)

Circuit Diagram:

Once the hardware is set up, We can go ahead and create our ThingSpeak Channel and copy Write API keys


Now we are ready to write the code

```
#include<ESP8266WiFi.h>
#include<ESP8266HTTPClient.h>
WiFiClient bal;
HTTPClient ht;
String st="http://api.thingspeak.com/update?";
String s;
int ldr=A0;
void setup()
{
pinMode(A0,INPUT);
Serial.begin(9600);
//WiFi.begin("u'r wifi user name","password");
WiFi.begin("xxxxxxx","xxxxxxx");
while(!(WiFi.status()==WL_CONNECTED))//a==b;(!(a==b));a!=b
{
  delay(20);
}
Serial.println("Wifi connected");
}
void loop()
{
  if(bal.connect("api.thingspeak.com",80))
    {
s=st;
```

```
s+="key=";
s+="xxxxxxxxx";//u'r thingspeak Write api
s+="&field1=";
s+=analogRead(A0);
Serial.println(analogRead(A0));
ht.begin(s);
ht.GET();
ht.end();
  }
}
```

Upload the code to nodemcu board
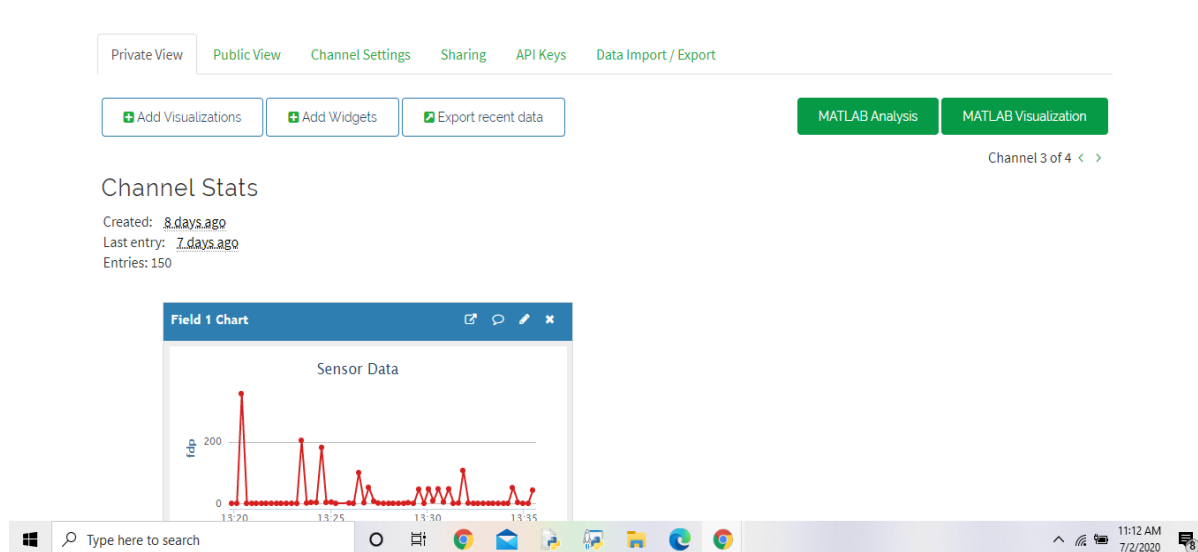
Check Data on ThingSpeak Server

    Open Your ThingSpeak Account and Click on Private View of Your Channel

    You did it well….That's it….You can Create multiple Fields and Upload multiple sensor data. and also you can create multiple channels for multiple Data Nodes.