[INTERNET OF THINGS]

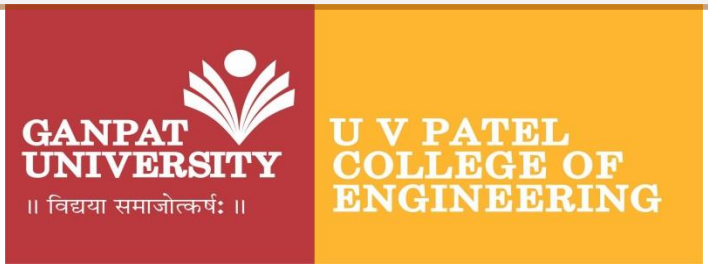
Practical-9

-:AIM:-

Raspberry pi basic Programming with Sensors.

Submitted By: Dharmay Sureja

Enrollment No:17012011056



GANPAT UNIVERSITY

U. V. Patel College of Engineering

Computer Engineering Department

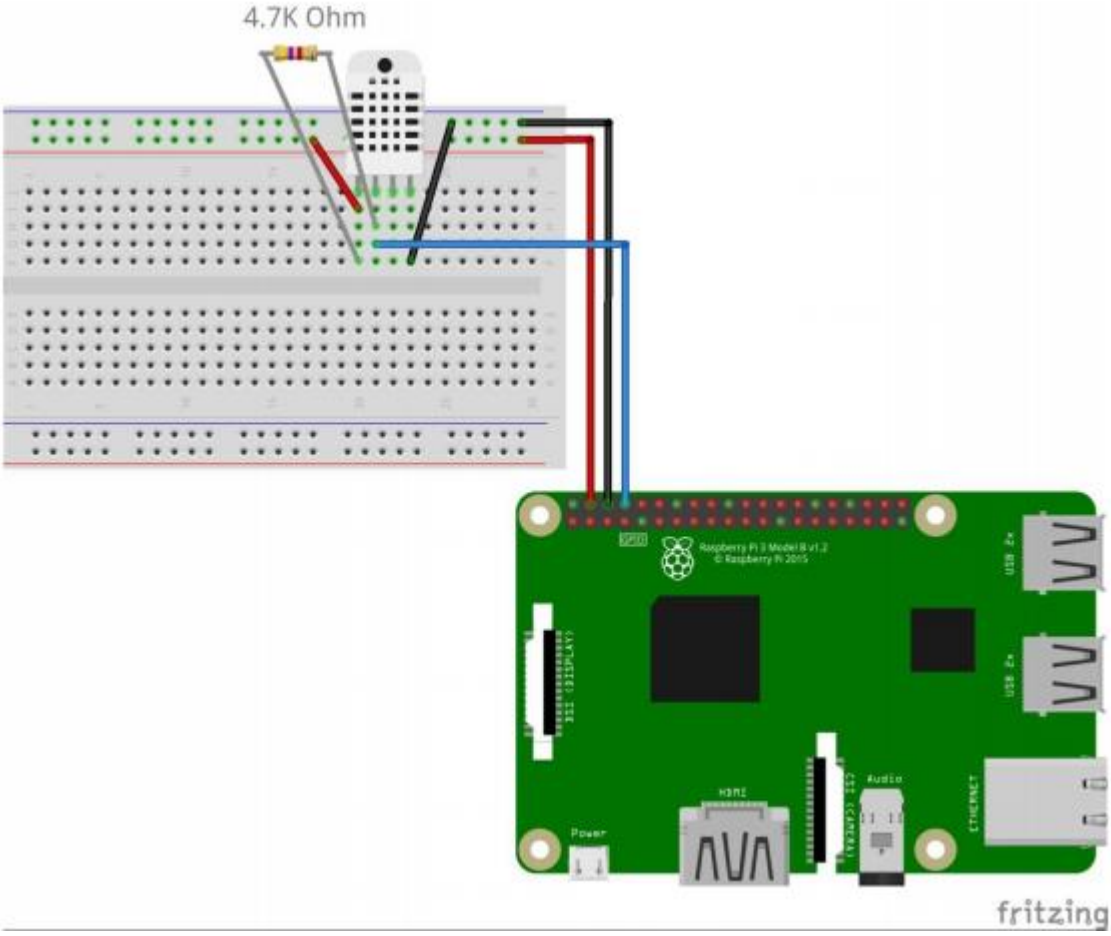
AIM:- Raspbian pi basic programming with Sensors.

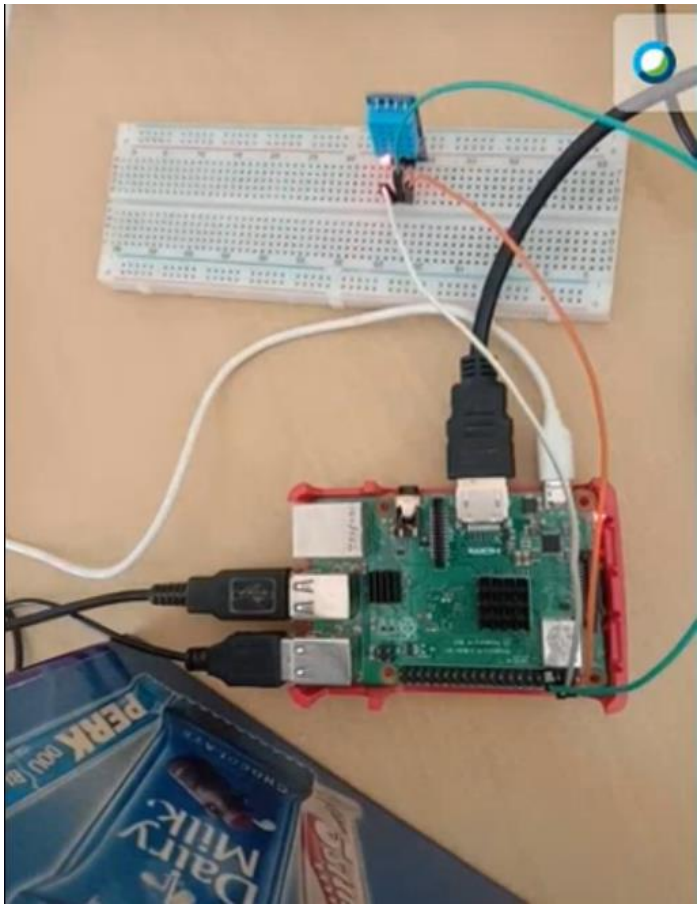
Experiments

1. Display room Temperature

Components used : Breadboard , LED , 4.7K Ohm Resistor , Raspberry pi , USB Cable SD Card & Adapter , Jumper Wire , Temperature Sensor

Circuit:





Python 3.4.2 Shell

File Edit Shell Debug Options Windows Help

```
>>> ================================ RESTART ================================
>>>
Temp=26.00*C  Humidity=44.00%
Temp=26.00*C  Humidity=45.00%
Temp=27.00*C  Humidity=43.00%
Temp=27.00*C  Humidity=43.00%
Temp=27.00*C  Humidity=43.00%
Temp=26.00*C  Humidity=44.00%
Temp=26.00*C  Humidity=44.00%
Temp=26.00*C  Humidity=44.00%
Temp=26.00*C  Humidity=44.00%
Temp=26.00*C  Humidity=44.00%
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Temp=26.00*C  Humidity=45.00%
Temp=26.00*C  Humidity=45.00%
Temp=26.00*C  Humidity=39.00%
Temp=27.00*C  Humidity=43.00%
Temp=27.00*C  Humidity=47.00%
Temp=27.00*C  Humidity=45.00%
Temp=27.00*C  Humidity=47.00%
Temp=27.00*C  Humidity=48.00%
Temp=28.00*C  Humidity=56.00%
Temp=27.00*C  Humidity=53.00%
Temp=27.00*C  Humidity=52.00%
Temp=27.00*C  Humidity=51.00%
Temp=27.00*C  Humidity=51.00%
```

Code : Adafruit_DHT.py

```
import sys
import Adafruit_DHT
sensor_args = { '11' : Adafruit_DHT.DHT11,
                '22' : Adafruit_DHT.DHT22,
                '2302' : Adafruit_DHT.DHT2302
}
if lng(sys.argv) == 3 and sys.args[1] in sensor_args:
   sensor = sensor_args[sys.argv[1]]
   pin = sys.argv[2]
else:
   print("Usage : sudo ./Adafruit_DHT.py [11|22|2302] <GPIO pin number> ")
   print("Example : sudo ./Adafruit_DHT.py 2302 4 - Read From AM2302 Connected
to GPIO pin #4")
   sys.exit()

humidity,temperature = Adafruit_DHT.read_retry(sensor,pin)

if humidity is not None temperature is not None:
   print('Temp: {0:0.1f} C Humidity: {1:0.1f} %'.format(temperature,humidity))
else:
   print('Failed to get Reading. Try Again !')
   sys.exit()
```

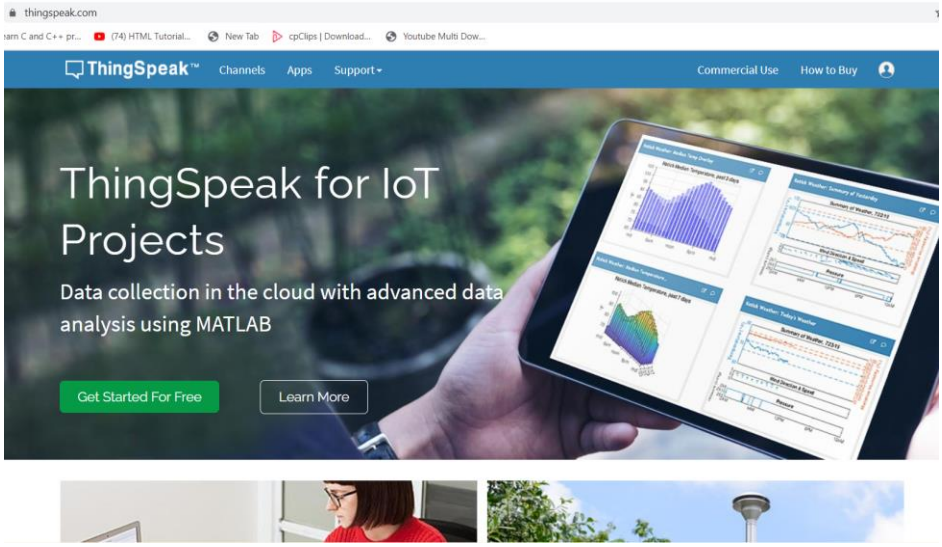
2. Upload room Temperature on Cloud (Thinspeak)

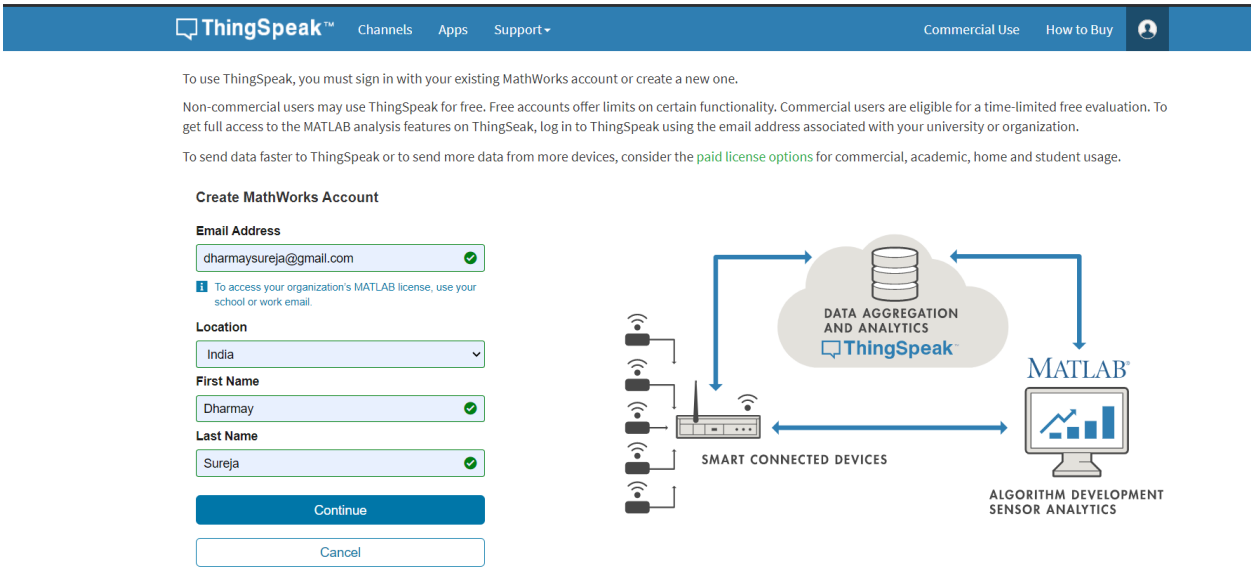
Code : Adafruit_DHT.py

```
import sys
import Adafruit_DHT
import RPi.GPIO as GPIO
import urllib2

myAPI = 'JR0EK9X8Z7VN2LP6'

baseURL = 'https://api.thingspeak.com/update?api_key=%s' %
myAPI

GPIo.setmode(GPIO.BCM)
sensor_args = { '11' : Adafruit_DHT.DHT11,
                '22' : Adafruit_DHT.DHT22,
                '2302' : Adafruit_DHT.DHT2302
}
if lng(sys.argv) == 3 and sys.args[1] in sensor_args:
    sensor = sensor_args[sys.argv[1]]
    pin = sys.argv[2]
else:
    print("Usage : sudo ./Adafruit_DHT.py [11|22|2302] <GPIO
pin number> ")
    print("Example : sudo ./Adafruit_DHT.py 2302 4 - Read
From AM2302 Connected to GPIO pin #4")
    sys.exit()

print("Starting Uplpoading Data . . .")
humidity,temperature = Adafruit_DHT.read_retry(sensor,pin)

while True:
    try:
        print("Uploading Tem[erature %.1f"%temperature)
        print(baseURL +
&field1=%s&field2=%s"%(temperature,humidity))
```

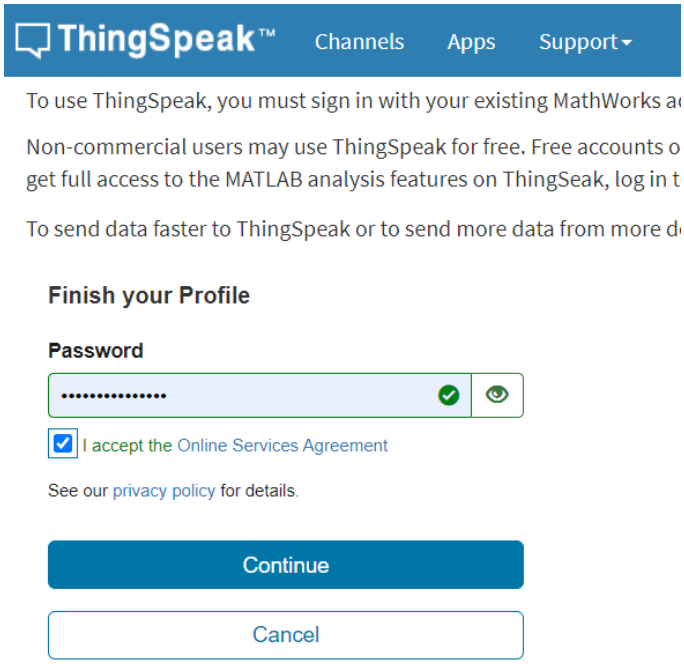
```
        f = urllib2.urlopen(baseURL +
&field1=%s&field2=%s"%(temperature,humidity))
        f.close()
    except:
        print("Exiting .")
        break
```

1. Sign Up on www.thingspeak.com using your email id





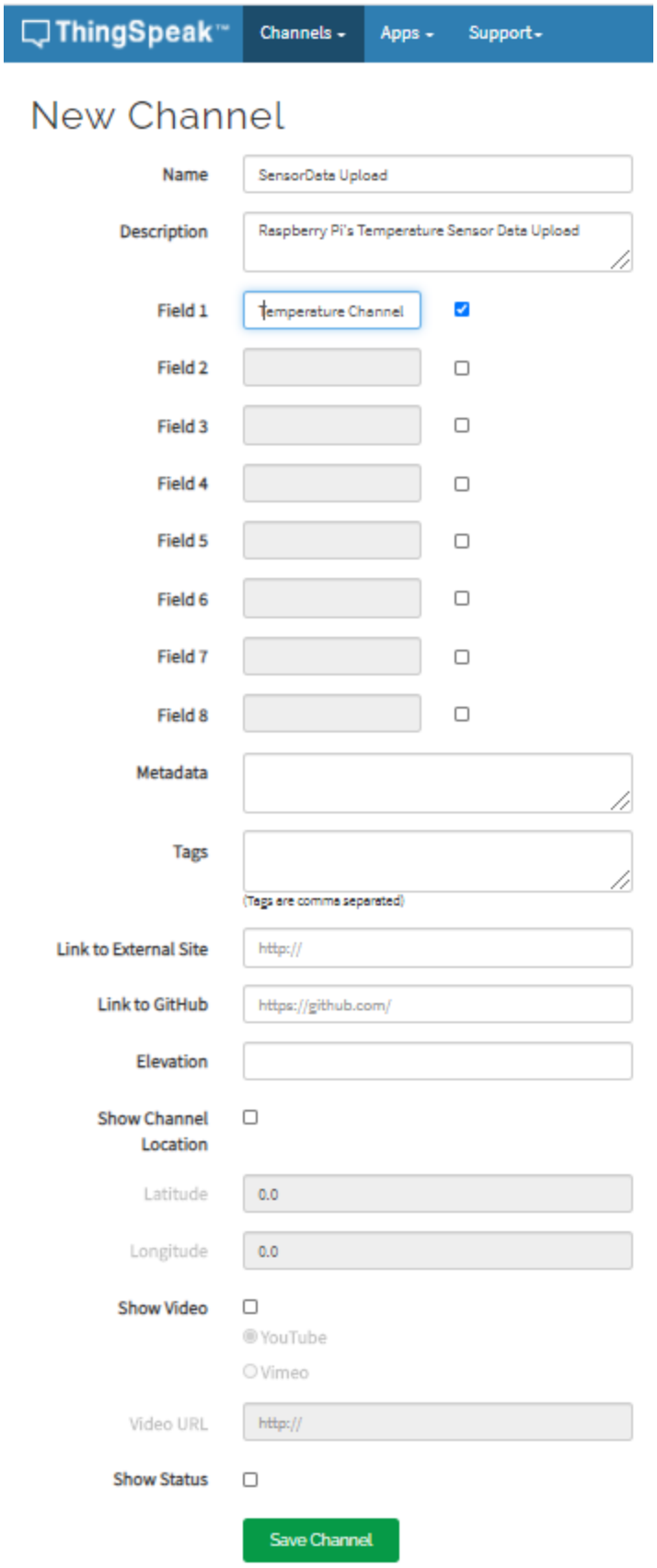
2. Make sure to click the checkbox saying "By signing up, you agree to the Terms of Use and Privacy Policy".



3. Goto Channels and Create a New Channel

4. Fill the following Details
    1. Any Name for Your Channel
    2. Description : if you have any description like “Temperature Channel”
    3. Field 1 Label as “Temperature ” Since we are going to upload .

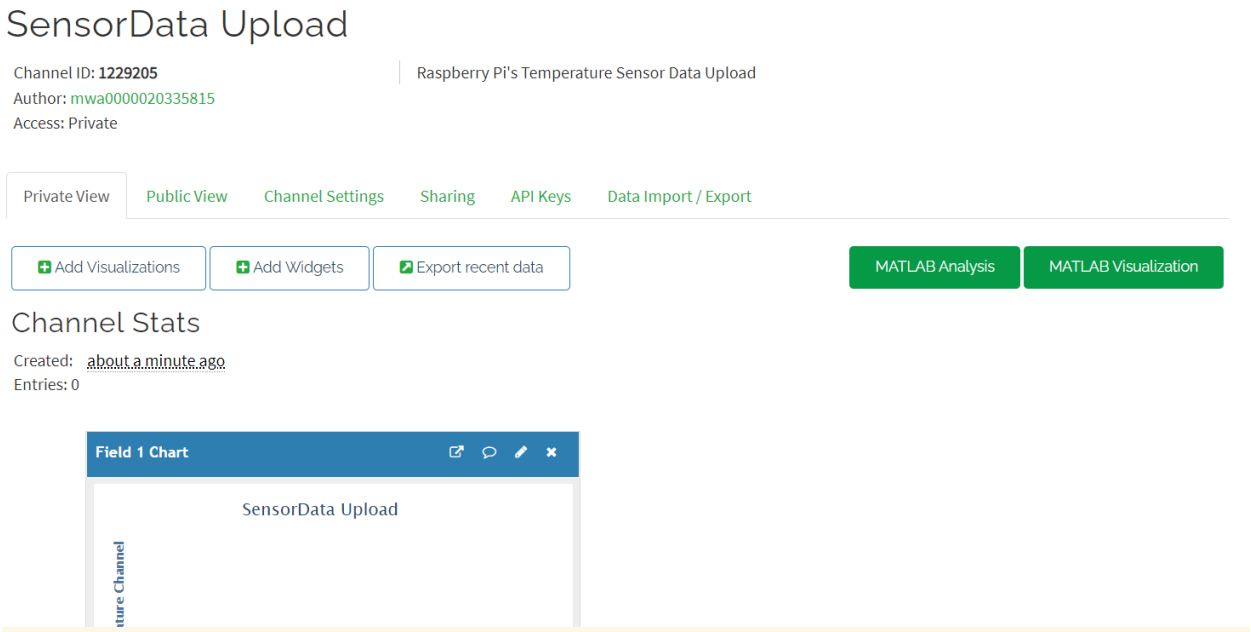
5. Save Channel


ThingSpeak™
Channels
Apps
Support
New Channel
Name
SensorData Upload
Description
Raspberry Pi's Temperature Sensor Data Upload
Field 1
Temperature Channel
Field 2
Field 3
Field 4
Field 5
Field 6
Field 7
Field 8
Metadata
Tags
(Tags are comma separated)
Link to External Site
http://
Link to GitHub
https://github.com/
Elevation
Show Channel Location
Latitude
0.0
Longitude
0.0
Show Video
YouTube
Vimeo
Video URL
http://
Show Status
Save Channel

6. Saving Process might Take a While

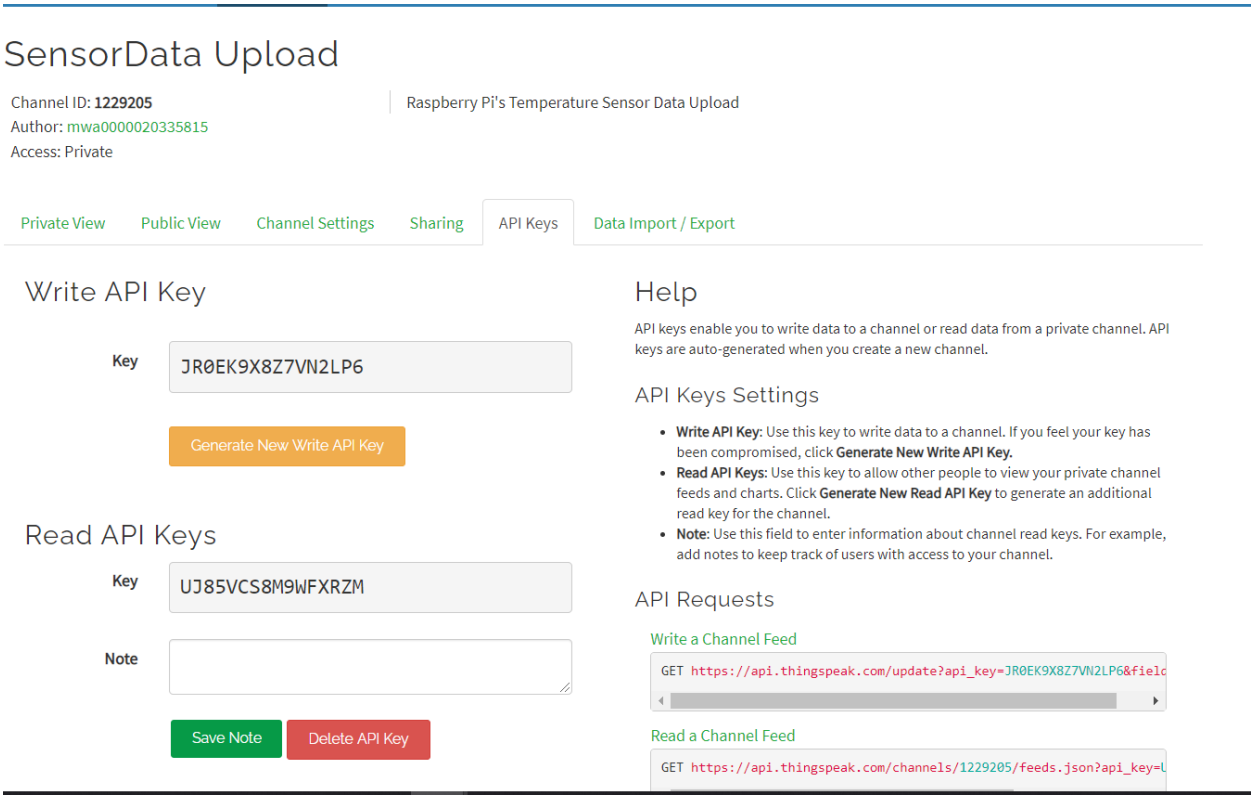
7. Please Select Your Channel.

8. You would see tabs like
    1. Private View
    2. Public View
    3. Channel Settings
    4. API Keys
    5. Data Import/Export



9. Click API Keys Tab

10. You will Find API Key similar to this **:** **“**7BMH83M0KARON75Z**”**

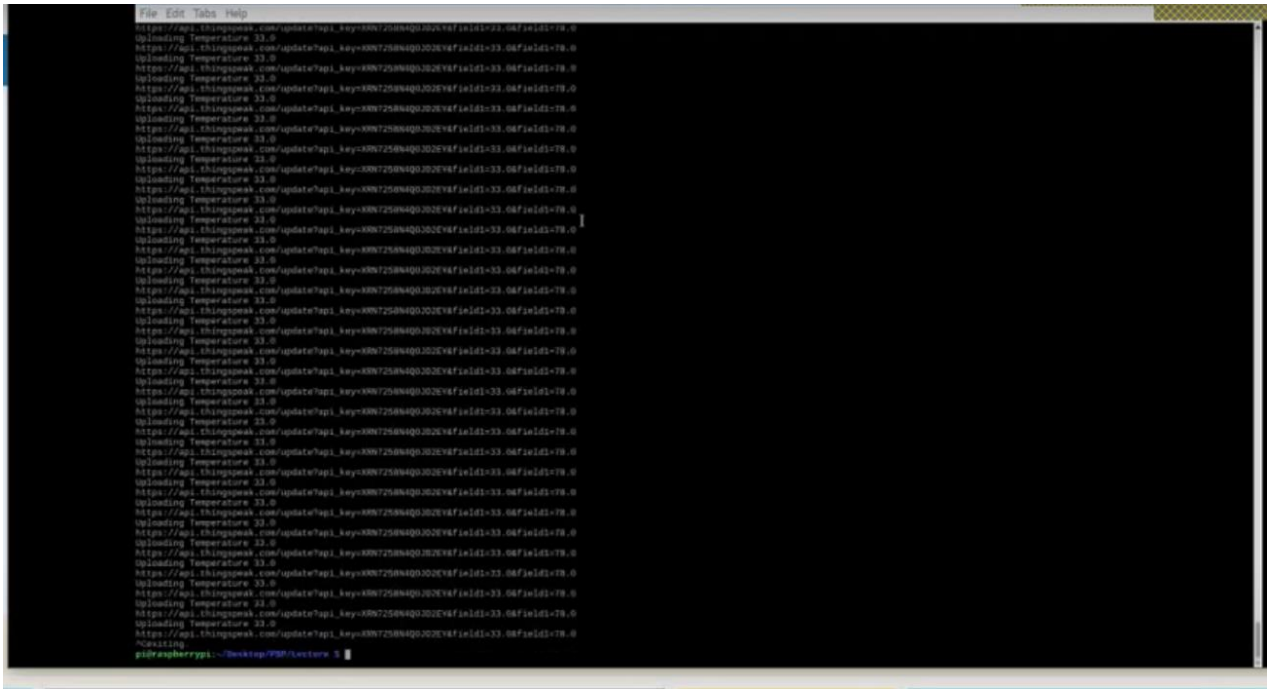


11. Please run the following commands in Your SSH Connection .

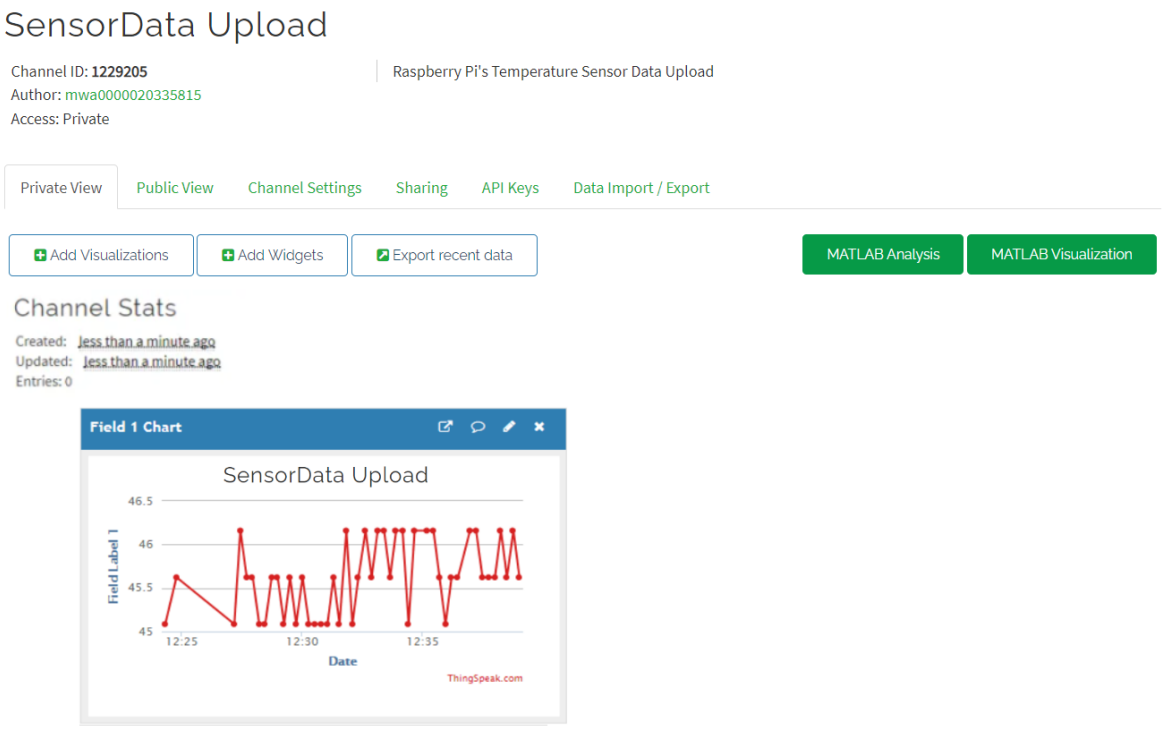
sudo python ~/Projects/temp_upload.py YOURWRITEAPIKEY

```
~/raspberrypi$ ls
Adafruit_DHT.py
~/raspberrypi$ sudo python Adafruit_DHT.py JR0EK9X8Z7VN2LP6
```

12. Once the script starts running it will upload the temperature values of the room.



13. Click Private View Tab to see the graph with temperature vs Time



14. You can change the values by changing room temperature.