Experiment Number 2.2

Name ::	Rishabh Anand	UID ::	19BCS4525
Branch ::	CSE - IoT	Sec/Grp ::	1/A
Semester ::	5th	Date ::	14th Oct, 2021
Subject ::	DIOT Lab	CODE ::	CSD-337

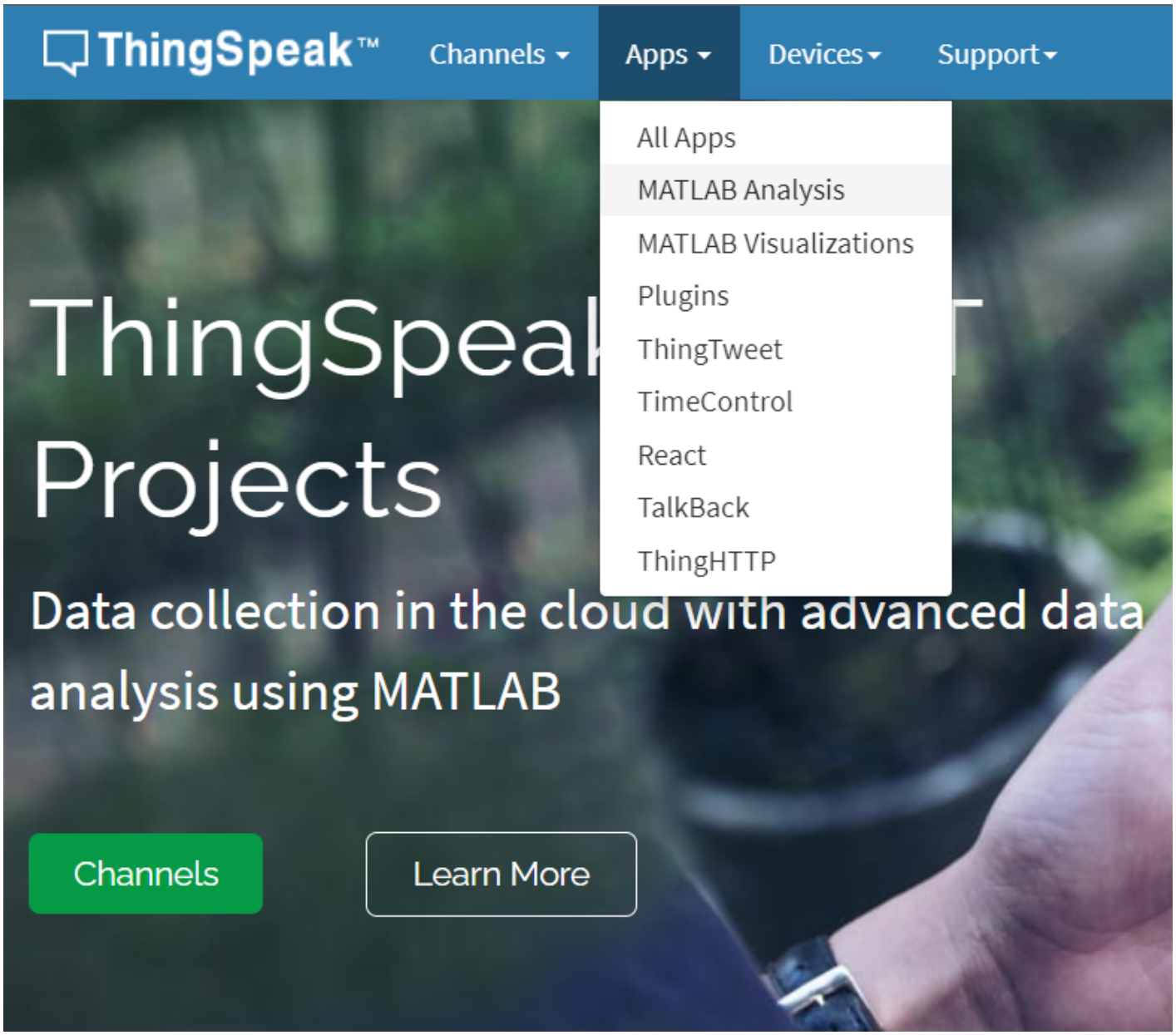
1. Aim :

To understand the procedure of MATLAB analysis of a ThingSpeak Channel.

2. Task :

1. Create Thingspeak Channel Sign in to your ThingSpeak account.
2. Click on ‘Channels¿My Channels’ option of menu bar.
3. Select the channel for which you want to do analysis.
4. Click on the tab ‘Apps’ of the menu bar and choose the option ‘MATLAB Analysis’

3. Steps :


ThingSpeak™
Channels
Apps
Devices
Support
All Apps
MATLAB Analysis
MATLAB Visualizations
Plugins
ThingTweet
TimeControl
React
TalkBack
ThingHTTP
Projects
Data collection in the cloud with advanced data analysis using MATLAB
Channels
Learn More

Apps / MATLAB Analysis

Click **New** and choose a template to get started. Templates contain sample MATLAB® code for analyzing data.

New

Name	Created
Calculate high and low temperatures 1	2021-10-08

Help

MATLAB Analysis

- Explore data collected in a channel or scraped from a website
- Find and remove bad data
- Convert data to different units
- Calculate new data
- Build data models

In your analysis code, you can also use functionality from any of the MATLAB Toolboxes supported on ThingSpeak that you are licensed to use. After analysis, you can write data to the channel or publish it to share your results.

Learn More

4. Source Code :

MATLAB Code

```
% Read temperature data from a ThingSpeak channel over the past 24 hours
% to calculate the high and low temperatures and write to another channel.

% Channel 12397 contains data from the MathWorks Weather Station, located
% in Natick, Massachusetts. The data is collected once every minute. Field
% 4 contains temperature data.

% Channel ID to read data from
readChannelID = 1525750;
% Temperature Field ID
TemperatureFieldID = 1;

% Channel Read API Key
% If your channel is private, then enter the read API Key between the '' below:
readAPIKey = 'AS19PK9C2A77MQU2';

% Read temperature data for the last 24 hours from the MathWorks weather
% station channel. Learn more about the thingSpeakRead function by going to
% the Documentation tab on the right side pane of this page.

[tempF,timeStamp] = thingSpeakRead(readChannelID,'Fields',TemperatureFieldID, ...
                                                 'numDays',180,'ReadKey',readAPIKey);

% Calculate the maximum and minimum temperatures
[maxTempF,maxTempIndex] = max(tempF);
[minTempF,minTempIndex] = min(tempF);

% Select the timestamps at which the maximum and minimum temperatures were measured
timeMaxTemp = timeStamp(maxTempIndex);
timeMinTemp = timeStamp(minTempIndex);
```

```
31
32 display(maxTempF,'Maximum Temperature for the past 24 hours is');
33 display(minTempF,'Minimum Temperature for the past 24 hours is');
34
35 fprintf(['Note: To write data to another channel, assign the write channel ID \n',...
36     'andAPI Key to ''writeChannelID'' and  ''writeAPIKey'' variables. Also \n',...
37     'uncomment the line of code containing ''thingSpeakWrite'' \n',...
38     '(remove ''%%'' sign at the beginning of the line.)']);
39
40 % To store the maximum temperature, write it to a channel other than
41 % the one used for reading data. To write to a channel, assign the write
42 % channel ID to the 'writeChannelID' variable, and the write API Key to the
43 % 'writeAPIKey' variable below. Find the write API Key in the right side pane
44 % of this page.
45
46 % Replace the [] with channel ID to write data to:
47 writeChannelID = [];
48 % Enter the Write API Key between the '' below:
49 writeAPIKey = '';
50
51 % Learn more about the thingSpeakWrite function by going to the Documentation tab on
52 % the right side pane of this page.
53
54 %thingSpeakWrite(writeChannelID,maxTempF,'timestamp',timeMaxTemp,'WriteKey',writeAPIKey);
```

Save and Run Save*

5. Observations :

Output

```
Maximum Temperature for the past 24 hours is =

    9.8800


Minimum Temperature for the past 24 hours is =

    0.1900

Note: To write data to another channel, assign the write channel ID
andAPI Key to 'writeChannelID' and  'writeAPIKey' variables. Also
uncomment the line of code containing 'thingSpeakWrite'
```

Learning Outcomes :

- Matlab and its basic functioning functioning through thingspeak
- Data visualization via matlab to gain insights of useful data and get profitable benefits out of it.
- Reading and writing channel data of thingspeak channel to apply in the program to get the things done.

S. No.	Parameters	Marks Obtained	Maximum Marks
1.			
2.			
3.			