

# Lab 7 — ThingSpeak and Google Sheets

- Study the GitHub [repository](#) Lesson 7
- Sign up and log in MathWorks ThingSpeak
- Run `thingspeak_cpu_loop.py` or `thingspeak_feed.py` in a demo folder
- Install `gsread` and `oauth2client`
- Log in the Google Cloud Platform Identity and Access Management, create a project `cpudata`, enable both Drive API and Sheets API, create and download service account JSON key file
- Start a new Google sheet `cpudata`, share it with the client email in the JSON file, delete Rows 2 to 1000, and edit the header cells
- Run `cpu_spreadsheet.py` with the JSON key file in a demo folder

```
pi@raspberrypi: ~/demo
File Edit Tabs Help
2.0
2500.5234375
Mon, 25 Apr 2022 12:30:02
200 OK
22.1
2345.53515625
Mon, 25 Apr 2022 12:31:02
200 OK
13.5
2210.26171875
Mon, 25 Apr 2022 12:32:02
200 OK
29.8
2385.30859375
Mon, 25 Apr 2022 12:33:03
200 OK
19.5
2379.8359375
Mon, 25 Apr 2022 12:34:03
200 OK
```


```

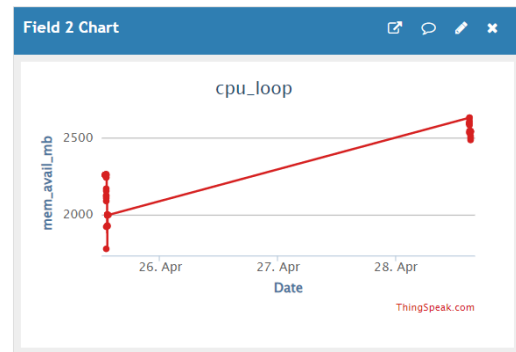
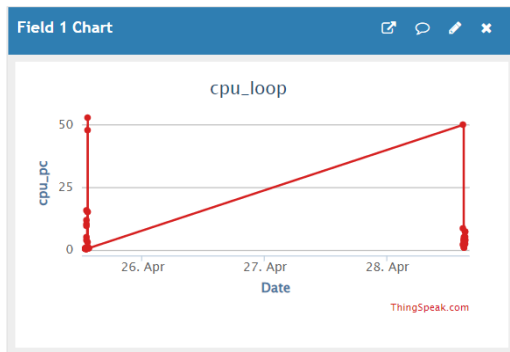
pi@raspberrypi:~/demo $ ls
API_KEY.pickle  rpi_spreadsheet.py  system_info.py  thingspeak_cpu_loop.py  thingspeak_feed.py
pi@raspberrypi:~/demo $ nano rpi_spreadsheet.py
Use "fg" to return to nano.

[1]+  Stopped                  nano rpi_spreadsheet.py
pi@raspberrypi:~/demo $ nano rpi_spreadsheet.py
pi@raspberrypi:~/demo $ nano rpi_spreadsheet.py
pi@raspberrypi:~/demo $ ls
API_KEY.pickle  rpdata-348316-0e3554e10cea.json  rpi_spreadsheet.py  system_info.py  thingspeak_cpu_loop.py  thingspeak_feed.py
pi@raspberrypi:~/demo $ python3 rpi_spreadsheet.py
Free RAM: 90 (3827)
Number of processes: 177
Up time: 57 min
Number of connections: 7
Temperature in C: 46.7
IP-address: 192.168.1.252
CPU speed in MHz: arm_freq=1500

Logging sensor measurements to rpdata every 10 seconds.
Press Ctrl-C to quit.
2022-04-28 15:14:17.148265
CPU Usage: 24.9 %
Temperature: 46.7 C
Wrote a row to rpdata
2022-04-28 15:14:27.388446
CPU Usage: 4.4 %
Temperature: 44.8 C
Wrote a row to rpdata
2022-04-28 15:14:37.617319
CPU Usage: 5.7 %
Temperature: 45.2 C
Wrote a row to rpdata
2022-04-28 15:14:47.767602
CPU Usage: 4.2 %
Temperature: 45.2 C
Wrote a row to rpdata

```

<div>  <div> <div>rpidata</div> <div> <span>☆</span> <span>📁</span> <span>🔗</span> </div> </div> <div>File Edit View Insert Format Data</div> </div>			
<div> <div>↶ ↷ 🖨️ 📋</div> <div>100% ▾ \$ % .0 .00 1</div> </div>			
A1	<div>fx</div>	Date / Time	
	A	B	C
1	Date / Time	CPU Usage %	Temperature C
2	2022-04-28 15:1	24.9	46.7
3	2022-04-28 15:1	4.4	44.8
4	2022-04-28 15:1	5.7	45.2
5	2022-04-28 15:1	4.2	45.2
6	2022-04-28 15:1	3.9	45.2
7	2022-04-28 15:1	3.5	44.3
8	2022-04-28 15:1	1.7	45.7
9	2022-04-28 15:1	3.3	45.2
10	2022-04-28 15:1	3.5	45.2
11	2022-04-28 15:1	3.1	44.3
12	2022-04-28 15:1	3.8	44.8
13	2022-04-28 15:1	3	44.8
14			



Sudden jump due to a prolonged down time of 3 days between uploading data