LECTURE 28

MATPLOTLIB

MCS 275 Spring 2022

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LECTURE 28: MATPLOTLIB

Course bulletins:

- Project 3 due 6pm on Friday 18 March.
- Remaining office hours before deadline:
  - Joyce, 3:00-4:00pm Wednesday
  - Dumas, 12:00-12:50pm Friday
- I will not be reachable at all over the weekend. After that, $\sim$48 hour response time until 4 April.
- Except for spring break, Johnny Joyce's availability unchanged.

- Project 4 will allow you to choose a topic, use arbitrary online resources, and collaborate if you want.
- Project 4's focus is on documentation. Half of the grade will be how well you document:
  - Your project topic
  - How I should test your project
  - What sources you used
  - What your individual contribution was

INSTALL

You don't need to install anything if you want to use matplotlib in Google Colab. However, it's hard to work will file I/O in Colab, which can make that approach a pain. To install locally:

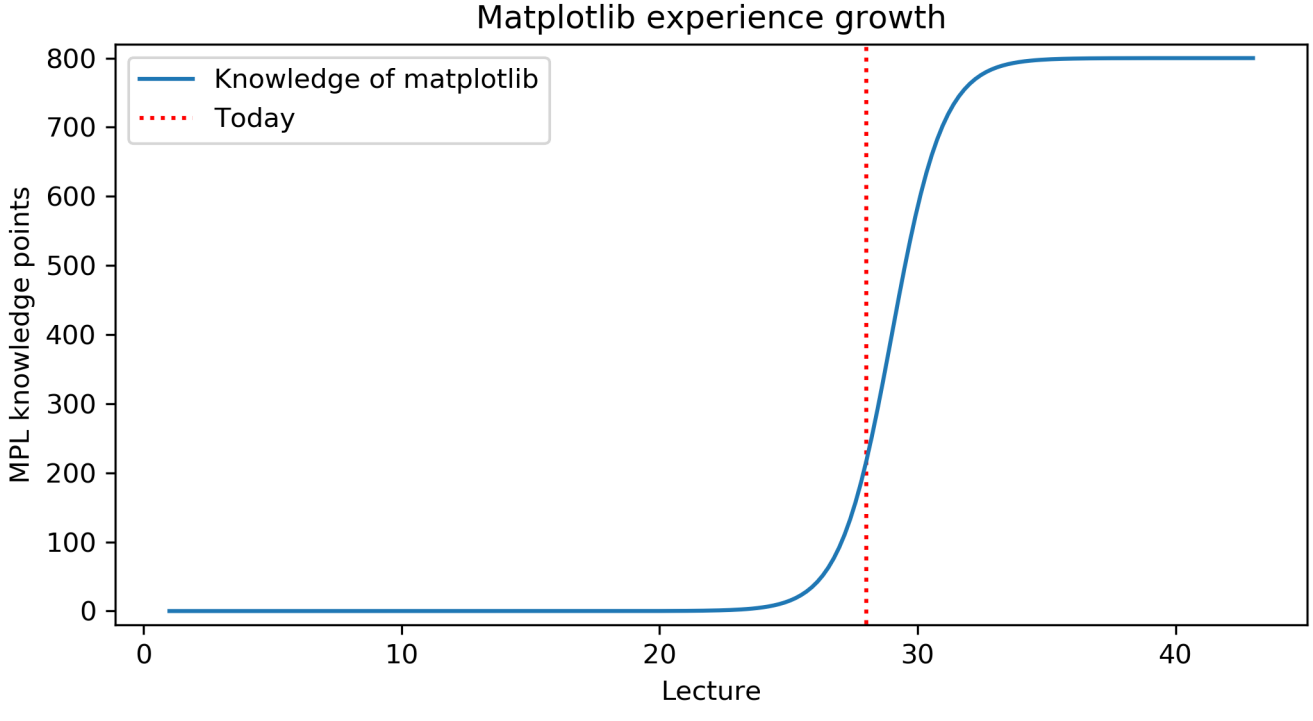
```
python3 -m pip install matplotlib
```

Often paired with:

```
python3 -m pip install numpy
python3 -m pip install notebook
```

See official matplotlib install help.

PLOTS


Matplotlib experience growth
Knowledge of matplotlib
Today
MPL knowledge points
800
700
600
500
400
300
200
100
0
0
10
20
30
40
Lecture

MATLAB

MATLAB is a proprietary software package for numerical computation. It has its own language, and is popular in engineering and applied sciences. It was first released in 1984.

It quickly developed a reputation for making it easy to generate nice plots.

MATPLOTLIB

matplotlib is a library for making 2D plots in Python. It was developed starting in 2003 by John Hunter (then a neurobiology postdoc), inspired by the plotting interface of MATLAB.

Today it is the most widely used plotting package for Python, and the Python+numpy+matplotlib "stack" is increasingly popular for applications where MATLAB was once dominant.

WAYS TO USE MATPLOTLIB

Matplotlib can be used in several ways:

- In scripts, with output to a file
- In REPL, with plots opening in a GUI
- In IPython notebook, where plots are shown directly in the notebook

NOTEBOOK

As with numpy, I'll do most of the intro as a series of coding demos in a notebook.

→ Matplotlib intro notebook ←

While I'll post the updated notebook after lecture, I suggest using Chapter 4 of VanderPlas as your primary reference because it has detailed explanatory text and sample code notebooks.

REFERENCES

- Python Data Science Handbook by Jake VanderPlas
  - Chapter 2: Numpy
  - Chapter 4: Matplotlib
- matplotlib home page, including documentation.

REVISION HISTORY

- 2022-03-16 Initial publication