

LECTURE 25

MATPLOTLIB

MCS 275 Spring 2023

David Dumas

LECTURE 25: MATPLOTLIB

Reminders and announcements:

- **Project 3** due 6pm on Friday.
- Homework 10 will be assigned on Thursday or Friday but won't be due until Tuesday after the break.

- 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 can 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 with files in Colab, which be a problem. To install locally:

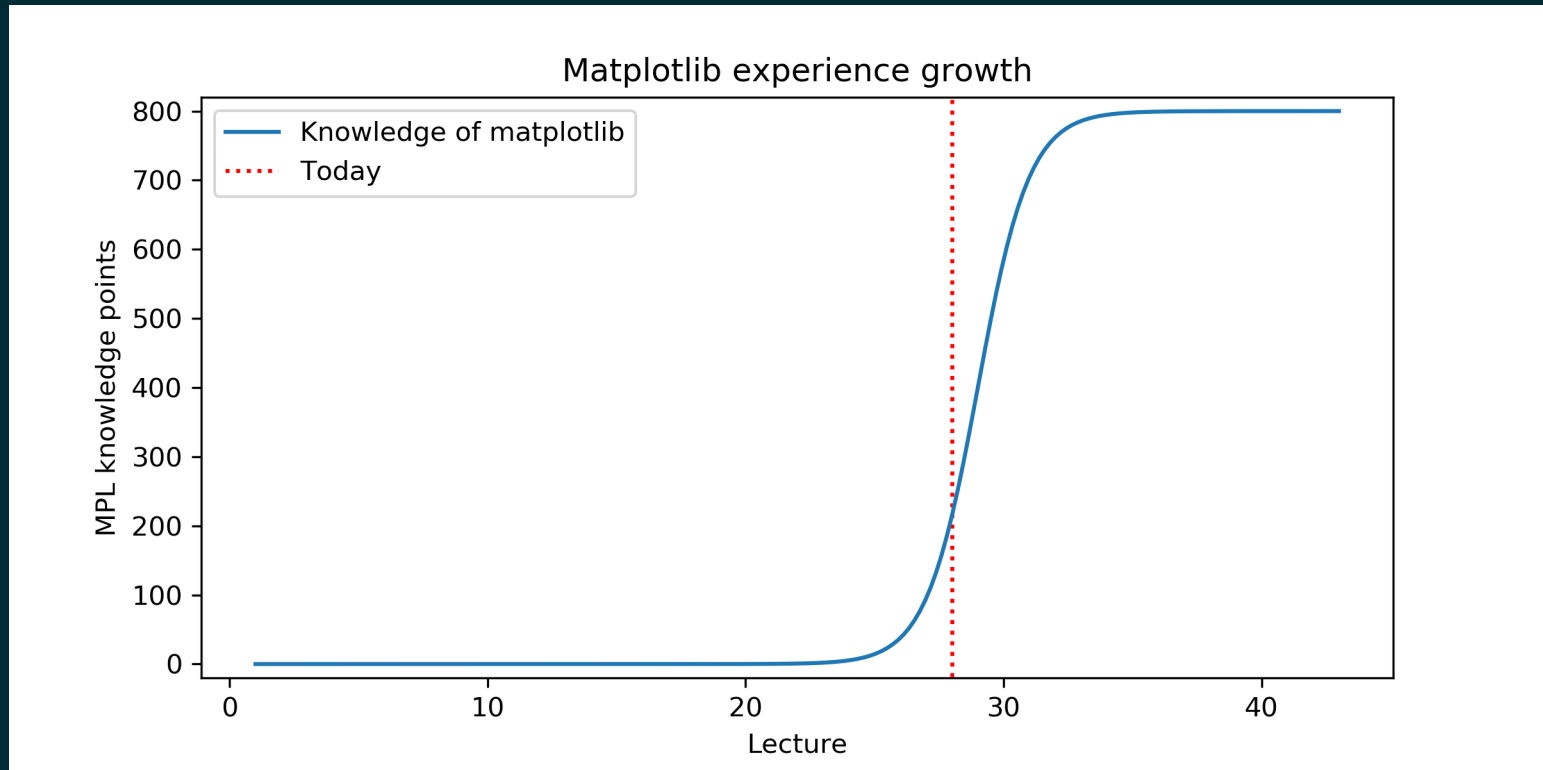
```
python3 -m pip install matplotlib
```

Often paired with:

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

See [official matplotlib install help](#).

PLOTS



BACKGROUND

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

DEMONSTRATION

NOTEBOOK

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

→ [Matplotlib demo notebook](#) ←

While I'll post the 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 Last year's lecture on this topic finalized
- 2022-03-15 Updated for 2023

