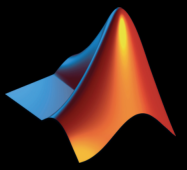


Python for Matlab Users

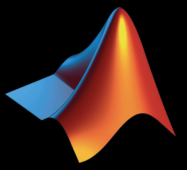
https://github.com/dlilien/pybb

What is Python?

- Free and open source programming language
  - Explicit syntax (for, with, in, etc. are very clear)
  - Interpreted (i.e. not scary like fortran or c)
  - Interactive (can run one line at a time like matlab window)
  - General purpose (not designed exclusively with linear algebra in mind)

Outline

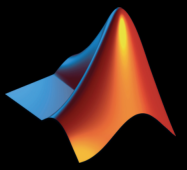
- Why Python?
- Interacting with Python
- Basic python
- The scientific python stack
- Examples



Why Python?

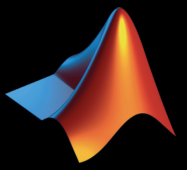
- Free and open source
  - Still free after you graduate
  - Your code can run on any machine
  - Doesn’t break with OSX updates

- More versatile than Matlab
  - General purpose programming language
  - Allows object oriented programming
  - Follows paradigms of other languages



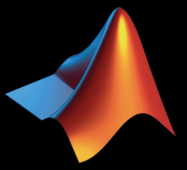
Cons

- You don’t already use it
- Linear algebra takes a few extra characters
- Simulink has no good equivalent



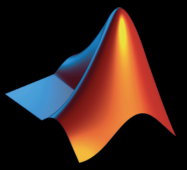
When to switch

- You don’t do much linear algebra
- You might graduate some time and leave academia
- You read the documentation constantly when using matlab anyway
- You are sick of 8000 small files to handle all the functions you want to be able to use



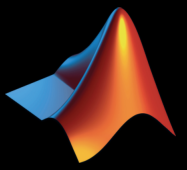
Which python?

- `which python`
  - You probably have some weird version of 2.7
- Just start with python 3 (3.6)
- Easiest to install with anaconda
  - Get python, ipython, jupyter, as well as scientific stack
  - Website here



Matlab approximate equivalents

- numpy ~ matlab arrays/operations
- scipy ~ toolboxes
- matplotlib ~ plotting

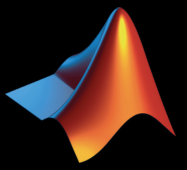


Ways to interact with python

```
#! /usr/bin/env python3
# myscript.py

print('hello world')
```

- Command line (I use this almost exclusively)
  - `python3 myscript.py`
  - `chmod +x myscript.py; ./myscript.py`
- `ipython3` (interactive, great for tests)
- `jupyter notebook` (interactive, allows markdown, great for demos)
- `Spyder` (A nice IDE, probably most comfortable option for Matlab users)



Where do I get help

- https://docs.python.org/3/
- scipy.org
- matplotlib.org
- Stack exchange!!!
- On-campus resources (e.g. eScience institute)