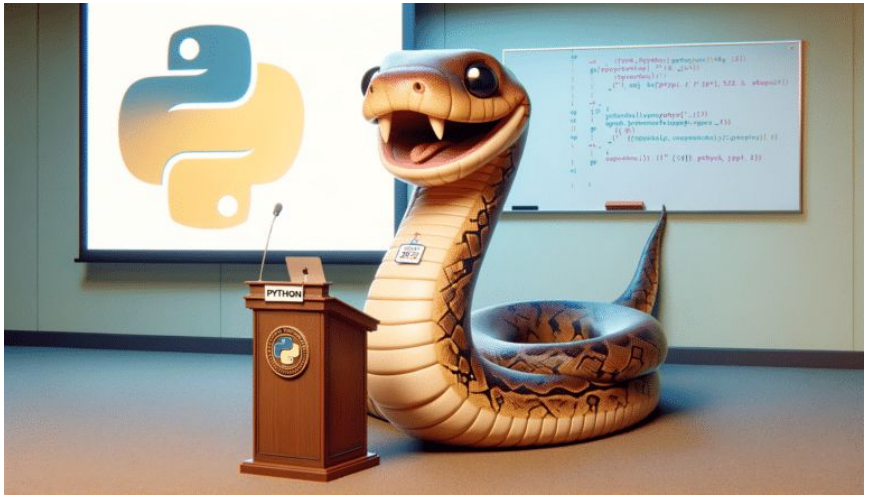
Introduction to Python

Summer Math Review 2024
Zoe Aarons, Fadime Stemmer

Agenda

1. Introduction
2. Anaconda, Bash, Shell
3. Interactive Programming
    a. Basics to Python
    b. Example 1
    c. Example 2



Datascientest: https://datascientest.com/en/python-the-most-popular-language. Accessed 07/17/2024.

About Us

Zoe Aarons

- Rising 5th year in Bio
- Use Python for research (also used Matlab in past)
- Research:
  - Phytoplankton ecology modeling
  - Plankton stoichiometry, Mixotrophy
- zsaarons@mit.edu

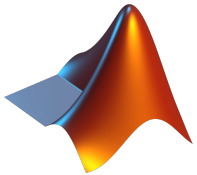
Fadime Stemmer

- Rising 2nd year in MC&G
- Python User for ~2 years
- Research:
  - Metalloproteomics/ Metaproteomics
  - (Metallo-)proteases, POM digestion
- fadime.stemmer@whoi.edu

Why Python?

Python:

+ Data science & machine learning, modeling, open source, libraries, software integration, simple
- Relies on libraries for basic functions



Matlab:

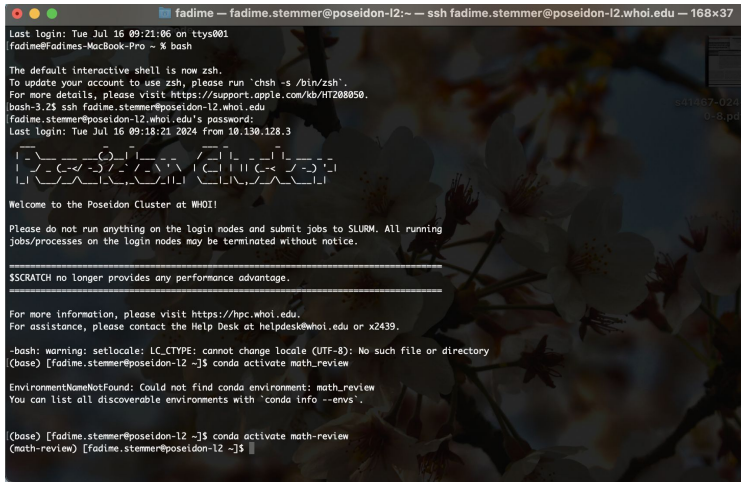
+ Matrix & arrays, modeling, widely used in academia
- Not open source (licenses), limited scope

R:

+ Statistical tools & packages, open source, RStudio
- Unusual syntax, steeper learning curve

Terminal, Bash, Shell

- A command-based way to communicate with the computer's operating system/files
- Learn how to use command line: https://swcarpentry.github.io/shell-novice/01-intro.html



Anaconda

- Free and collective package and libraries manager for python, R and other scientific programs and languages.
- Download includes most recent version of Python + most important libraries (numpy, pandas, etc.)
- Conda environments = virtual environment. Create space that is just for running a specific task.

Download Anaconda: https://docs.anaconda.com/anaconda/install/
Useful cheat sheet for anaconda bash commands:
https://docs.conda.io/projects/conda/en/latest/_downloads/843d9e0198f2a193a3484886fa28163c/conda-cheatsheet.pdf

Additional Resources & Best Practices

→ See GitHub Repository with links and suggestions!