Intro to Python

JP Summer Math Review 2023

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July 12, 2023

Agenda

1. Introductions
2. Anaconda & Bash/The Shell
3. Interactive Programming
    a. Python Fundamentals (syntax, indexing, documentation, libraries)
    b. *Applied Example*: Data Science - Sea Level Trends

A Little About Me!

- Rising 4th Year in G&G, ***Coastal Geomorphology***
- *Research Interests:* Sandy coastlines, island-reef systems, numerical modeling, data science, remote sensing
- Python user for ~3+ years
  - Also know MATLAB & a bit of R, so can help translating between languages!

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Feel free to e-mail with questions, or message me on Slack!

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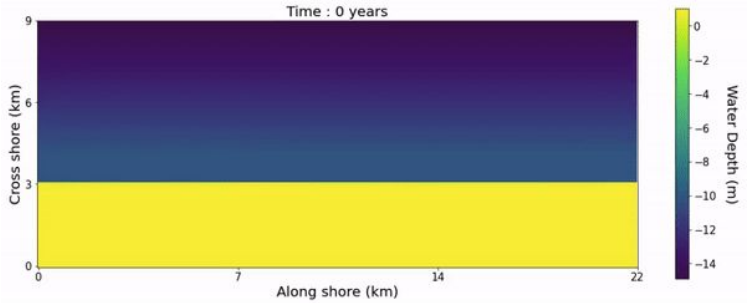
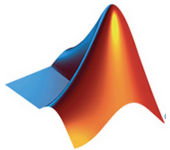


Comparing Different Languages



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

Python:

+ Data science & machine learning, modeling, open source, libraries, software integration, easiest language to learn
− Reliant on libraries for some basic functions

Anaconda: One Stop Library Shop

Useful cheat sheet of typical Anaconda bash commands!

- Package and libraries manager for many languages (Python, R, Java, C/C++, etc.)
- Download includes most recent version of Python & relevant libraries (numpy, pandas, etc.)
- Navigator application
- Connections with associated software (Jupyter, Spyder, RStudio, etc.)

Bash/The Shell

- A command-based way to communicate with the computer's operating system/files
- Compatible with Python & Anaconda

Resources:

CSDMS ESPIn Bash/The Shell Lesson*

Software Carpentry Lesson

*Mark Piper, Benjamin Campforts, Irina Overeem, Nicole Gasparini, and Leilani Arthurs, 2020. Earth Surface Processes Institute (ESPIn) Course Material (Version v1.0). Zenodo. http://doi.org/10.5281/zenodo.4000979.

Helpful Tips for Today's Lesson

- Follow along with live coding demo in empty notebooks
- Use resources from slides & in Jupyter notebooks (and contact me for more!)
- More applied examples + coding practices with Perrin on Friday!
- Overwhelmed? Do not fret! Patience is key!