Intro to Python
JP Summer Math Review 2022

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Agenda

1. Introductions

2. Anaconda & Bash/The Shell

3. Interactive Programming

    a. Python Fundamentals (syntax, indexing, documentation, libraries)

    b. *Example #1*: Modeling Processes - Diffusion of Particles

    c. *Example #2*: Data Science - Sea Level Trends

A Little About Me!

- Rising 3rd Year in G&G, **Coastal Geomorphology**

- *Research Interests:* Sandy coastlines, island-reef systems, numerical modeling, data science, remote sensing
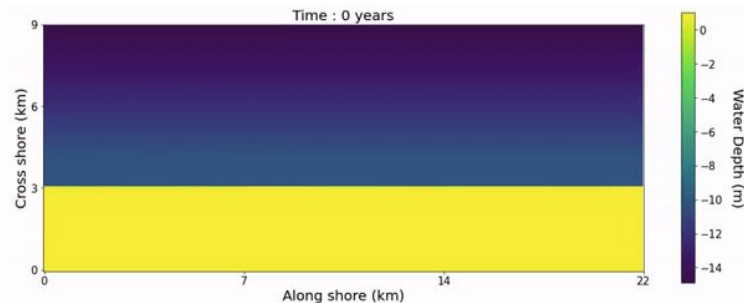
- Python user for ~3+ years

  - Also know MATLAB & a bit of R, so can help translating between languages!

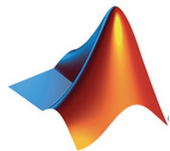E-mail: mgillen@mit.edu or mgillen@whoi.edu

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!)

- Overwhelmed? Do not fret! Patience is key!