A 6-session IAP Python programming bootcamp introduces the basics of Python. All levels of experience are welcome, but the material is targeted at those with little or no programming experience.

The syllabus/schedule below provides some details of what the bootcamp will cover. Ideally folks will bring a laptop to each session so they can follow along with the examples presented.

Rough class structure:

- 90-minute sessions.
- Each session we'll send you off with some additional readings/scripts to further familiarize yourself with the material.

Prerequisites (detailed instructions for linux/mac/windows to follow):

- Install anaconda (Python 3.8) on your computer/laptop from the link below: https://docs.anaconda.com/anaconda/install/.

Day 1 | Introduction, variables | 1/4/2022 3:00-4:30 (Tuesday)

- Value of programming in biology
- Why python?
- Getting started with notebooks and scripts
- Overview of useful libraries
- Variables and variable types
- Where to look for more help
- Extended reading: PT – Chapters 1, 3 [docs.python.org/3/tutorial]

Day 2 | Functions, and control structure | 1/5/2022 3:00-4:30 (Wednesday)

- Defining functions, calling functions, function signatures
- Pass by reference vs pass by value
- Conditions - if/then/else
- For loops, while loops
- Extended reading PT – Chapter 4 [docs.python.org/3/tutorial]

Day 3 | Data structures | 1/11/2022 3:00-4:30 (Tuesday)

- Lists/arrays, iterators, dictionaries
- List & dictionary comprehension
- Numpy arrays
- Pros/cons of various data structure
- Extended reading: PT – Chapter 5 [docs.python.org/3/tutorial]; https://numpy.org/doc/stable/user/absolute_beginners.html

Day 4 | Basic input/output, data wrangling I | 1/12/2022 3:00-4:30 (Wednesday)

- Opening, reading, and writing files
- Working with Pandas dataframes intro (selecting, merging, filtering, etc.)
- Exceptions, assertions, error handling
- Accepting user input (time permitting)
- Handling command line arguments (time permitting)
- Extended reading: PT – Chapters 7, 8 [docs.python.org/3/tutorial]; https://pandas.pydata.org/docs/user_guide/10min.html

Day 5 | Data wrangling II | 1/18/2022 3:00-4:30 (Tuesday)

- Numpy array manipulation
- Pandas indexing
- Pandas filtering
- Extended reading: https://pandas.pydata.org/docs/user_guide/dsintro.html; https://pandas.pydata.org/docs/user_guide/basics.html; https://pandas.pydata.org/docs/user_guide/io.html; https://pandas.pydata.org/docs/user_guide/indexing.html

Day 6 | Plotting & good practice | 1/19/2022 3:00-4:30 (Wednesday)

- Matplotlib
- Conventions, comments, readability, modular testing, debugging
- Extended reading: https://pandas.pydata.org/docs/user_guide/visualization.html; https://matplotlib.org/tutorials/introductory/usage.html#sphx-glr-tutorials-introductory-usage-py; https://matplotlib.org/tutorials/introductory/pyplot.html#sphx-glr-tutorials-introductory-pyplot-py; https://matplotlib.org/tutorials/introductory/sample_plots.html#sphx-glr-tutorials-introductory-sample-plots-py.
- Also consider exploring seaborn independently – you can learn more here: https://seaborn.pydata.org/tutorial.html#