

## **Intermediate Python (Part 2)**

**Workshop Lead: Benjamin Rudski**

**Facilitator: N/A**

**Registration link: TBA**

**Approximate duration: 2 hours**

**Prerequisites:**

- Basic knowledge of Python is required.
  - Attendees should be comfortable defining variables of different types, using control flow to define decision branches in code and using loops to run code multiple times.
  - A basic review of key concepts will be provided at the beginning of the workshop.
- To be able to participate in the exercises, participants must either:
  - Have a local installation of Python and Jupyter notebooks. Microsoft Visual Studio Code with the Python extension installed can also be used to run the Notebook.
  - Have a Google Account (to run in-browser as a Colab notebook).
- Participants should also have access to a command line or terminal.

**Summary: (2-3 sentences summarizing the workshop)**

In this 2-hour workshop, participants will learn intermediate programming skills using Python. Attendees will learn how to combine simple pieces of code to perform more complex operations. Students will learn how to use and define functions, import code from built-in modules and install new packages to access even more functionality.

**Learning Objectives: (List 3-5 learning objectives participants will learn upon completion of this workshop)**

1. Define and call new functions.
2. Import and use code from built-in Python modules.
3. Install new packages to access even more tools.

**Content:**

1. **Module 1 – Getting Up to Speed (10 minutes)**

- a. Quick Review
  - i. What is Python?
  - ii. Key Ideas and Syntax

## **2. Module 2 – Introduction to Functions (45 minutes)**

- a. Function Overview
  - i. What is a function?
- b. Writing Custom Functions
  - i. Basic function definitions
  - ii. Passing inputs: Defining parameters
  - iii. Producing outputs: Return values
- c. Documenting Functions
  - i. Defining function docstrings
  - ii. How to get help from your IDE: Type annotations (**optional**)
- d. **Exercise:** Writing functions for biological sequences.

## **3. Module 3 – Modules and Packages (45 minutes)**

- a. Using Modules
  - i. What is a Module?
  - ii. Importing a Module
  - iii. Importing Specific Functions
- b. Package and Environment Management
  - i. What is a Package?
  - ii. Installing Packages using conda
  - iii. Installing Packages using pip
  - iv. Using Packages and Reading Documentation
  - v. A Brief Intro to Environments
- c. Exercise: Using textwrap to nicely print DNA sequences.

## **4. Module 4 – Where to go from here (10 minutes)**

- a. What to learn next? How?
- b. How to get help and how not to get help
  - i. Your code editor
  - ii. Documentation
  - iii. Books
  - iv. Tutorials
  - v. Stack Overflow (and pitfalls)
  - vi. ChatGPT (and pitfalls)
- c. Glimpse of other cool programming topics