

Intro to Python Part 1

Benjamin Rudski
April 16, 2025



McGill

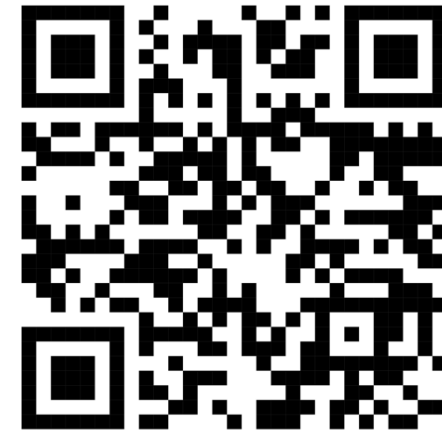
Quantitative Life
Sciences

Sciences quantitatives
du vivant

QLS-MiCM mission statement: deliver quality workshops designed to help biomedical researchers develop the skills they need to succeed.



Location: 550 Sherbrooke
Street, Montreal, Quebec



Scan the QR code to sign up
for our **mailing list**

Contact: workshop-micm@mcgill.ca



McGill

Quantitative Life
Sciences

Sciences quantitatives
du vivant

Workshop Series

Workshop	Date	Location	Registration
How to think in Code	Jan. 28 1PM-3PM	EDUC 133	Closed
Intro to Git & GitHub	Jan. 30 1PM-5PM	EDUC 133	Closed
Intro to Unix	Feb. 6 1PM-5PM	EDUC 133	Closed
Intro to Python (Part 1)	Feb. 11 1PM-5PM	EDUC 133	Closed
Intro to R (Part 1)	Feb. 13 1PM-5PM	EDUC 133	Closed
Exploring MATLAB	Feb. 18 1PM-5PM	EDUC 133	Closed
Statistics in R (Part 2)	Feb. 20 1PM-5PM	EDUC 133	Closed
Data Processing in Python	Feb. 25 1PM-5PM	EDUC 133	Closed
Intro to Machine Learning	Mar. 13 1PM-5PM	EDUC 133	<u>Open</u>
Intro to R (Part 1)	Apr. 15 1PM-5PM	EDUC 133	TBA
Intro to Python (Part 1)	Apr. 16 1PM-5PM	EDUC 133	TBA
Intermediate Python (Part 2)	Apr. 17 1PM-5PM	EDUC 133	TBA

<https://www.mcgill.ca/micm/training/workshops-series>



McGill

Quantitative Life
Sciences

Sciences quantitatives
du vivant

Learning Outcomes

Summary

In this 4-hour workshop, participants will be introduced to the basics of programming in Python. Students will journey from the beginnings of creating variables and performing simple mathematical operations to writing code that can perform fundamental tasks and wrapping this code into functions. Participants will learn how to write the important building blocks that make up complex programs.

Learning Objectives

1. Store data in variables and collections.
2. Perform basic operations on these data.
3. Use control flow and loops to write powerful code.
4. Define functions to create repeatable units of behaviour.



McGill

Quantitative Life
Sciences

Sciences quantitatives
du vivant

Outline

1. Module 1 – Python Basics (1 hour 15 minutes)

- a. Foundations of Python - A Brief Overview of Types and Variables
- b. Numbers and Comparisons
- c. Intro to Control Flow and Loops (if, while and for)
- d. **Exercise**

2. Module 2 – Strings and Collections: An Object Primer (1 hour)

- a. Introducing Objects
- b. Introducing the String!
- c. Introduction to Tuples, Lists and Dictionaries
- d. **Exercise**

3. Module 3 – Introduction to Functions (45 minutes)

- a. Function Overview
- b. Writing Custom Functions
- c. Documenting Functions
- d. **Exercise**

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



McGill

Quantitative Life
Sciences

Sciences quantitatives
du vivant

Interactive Workshop!

- That's pretty much all that will be in the slides... For the rest, we'll go to a Jupyter Notebook:



To the repository!



McGill

Quantitative Life
Sciences

Sciences quantitatives
du vivant

Module 2

Strings and Collections

An Object Primer



What is an Object?

Object

Attributes

- Variables
- Describe the object

Methods

- Functions
- Compute values
- Alter the object



Objects

Car

colour

year

model

turn_on()

turn_off()

change_gear()

toggle_headlights()

Mouse

height

weight

age

sex

genotype



To summarize

- ✓ Data can be stored in **variables** of several types, including **strings**, **integers**, **floating point numbers** and **Booleans**.
- ✓ **Collection types**, such as **tuples**, **lists** and **dictionaries** can be used to store **multiple** data points.
- ✓ **Control flow** and **loops** help decide which lines to run and allow lines to be repeated.
- ✓ **Functions** help package up behaviour into units that you can easily reuse.

Now you are ready to:

- Store data in variables and collections.
- Perform basic operations on these data.
- Use control flow and loops to write powerful code.
- Write functions to repeat complicated tasks.



Acknowledgements

- Thank you to QLS-MiCM for giving me this opportunity and for helping me along the way.
- Thank you to the professors from the McGill School of Computer Science for helping me along my programming journey and for inspiring me to share my programming experience with others.
- Thank you to Professor Mathieu Blanchette, whose COMP 204 course helped introduce me to Python (back in Fall 2018).
- Thank you to the Python community!



McGill

Quantitative Life
Sciences

Sciences quantitatives
du vivant