Introduction to Python

Online course learning objectives

Perfect for beginners, this course teaches the fundamentals of Python programming through taught materials and practical example.

This course will help learners to:

- Develop skills with core elements of the Python programming language and gain an appreciation of how these can feed into social scientific work (e.g., researching with digital data).
- See how to make methodologically appropriate decisions when designing and developing research where programming skills are deployed, including harvesting, and organizing data.
- Understand how to approach a social science research question using Python and have the capacity to devise a solution to such problems where programming skills can be deployed to reveal social scientific insight.

To reinforce these learning objectives we include a number of structured activities to follow on from the learning objectives.

Language: English
Time to complete: 24 hours
Instructors: Dr. Rob Mastrodomenico and Dr. Phillip Brooker

Online course full syllabus

MODULE ONE: GETTING STARTED WITH PYTHON AND UNDERSTANDING THE BASICS

Here we cover how to install Python and how to use it from an IDE or in the shell we demonstrate the concepts equality and comparison as well as assigning variables.

- Why use Python? - Introduction to the course and a short explanation of the value of Python for data analysis and social science.
- Installing Python.
- Working in the shell and using an editor.
- Equality and comparison - difference between assignment and equality, using comparison operators.
- Assigning variables - assigning one or more variables, overwriting and modifying variables.

Introduction to Python

MODULE TWO: DATA TYPES AND DATA CONTAINERS

We expand on module 1 by covering different data types and string formatting we then cover three of the basic containers Python offers which are lists, dictionaries and tuples.

- Data types - the three different data types and operations that can be performed on them.
- Lists - creating and manipulating lists, list functions and mapping.
- String formatting - string use and manipulation in Python.
- Tuples - function and use of the tuple data container.
- Dictionaries - Function and use of dictionaries.

MODULE THREE: CONTROL STATEMENTS AND DEALING WITH FILES

In this module, we look at some key syntax which is if else conditions, and or conditions, for and while loops and lastly show how we can deal with files.

- IF, ELSE and ELIF - what IF, ELSE and ELIF statements are and how to use them, e.g using ELSE to handle when a condition is not met.
- Loops - constructing and using loops and IF statements to check conditions and change the behavior of a program.
- And/or - Using and/or conditions.
- Dealing with files - Opening, reading and closing files.

MODULE FOUR: WRITING SCRIPTS, FUNCTIONS, CLASSES AND WORKING IN THE WEB

In the last module we look at how to work in the web and look at objects and classes, we show how we can put together code in functions and scripts and look at how you should think like a programmer.

- Working with the web - pulling data from web content.
- Writing functions - purpose and use of functions.
- Writing scripts in Python - splitting code into multiple scripts.
- Objects and Classes - creating a class and using objects.
- A brief guide to thinking like a programmer - considerations when planning tasks to do using code, task flow etc.

SageCampus