Python for Programmers

Outline: A specialist course

Audience: This is a course for software developers and engineers with programming experience

Outcome: By the end of the course, you will have a good understanding of the core Python language, Python's excellent built-in data types, and the fundamentals of object-oriented programming in Python. You will have experience using expressive Python idioms, understand how modules and packages work, Python's coding style guidelines, and how to write unit tests for Python code. You will also know about how to read, write, visualise, and perform powerful descriptive analytics on tabular datasets (including CSV, Excel, and SQL) and how to use Python to consume web APIs and to create your own web APIs. You will also understand the elegance and power of the language and you will be well-placed to continue learning more as you use it day-to-day.

Duration: 3-4 days

Dates: Monday 30th July - Thursday 2nd August 2018

Venue: 50 Queen Street, Melbourne CBD

Format: Each topic is a mixture of hands-on exercises and expert instruction.

Instructors: Robert Layton and/or Henry Walshaw

Prerequisites: Experience with other programming languages is assumed.

Course Outline

Day 1: Python Basics

Day 1 covers how to use Python for basic scripting and automation tasks, including tips and tricks for making this easy. The syllabus is as follows:

- Why use Python? What's possible?
- Setting up your Python development environment (IDE, *Jupyter*)
- The *Jupyter* notebook and shell for rapid prototyping and automated reporting
- Modules and packages
- Python concepts: an introduction through examples
- Essential data types, tips and tricks
- Raising and handling exceptions
- Worked example: consuming web APIs

Day 2: Handling, Analysing, and Presenting Data in Python

The Pandas package is an amazingly productive tool for working with different kinds of data in Python. Day 2 gives a comprehensive introduction to reading and writing the most important data formats and how to analyse and visualise data easily.

- Reading and writing essential data formats: CSV, Excel, SQL databases, JSON, time-series
- Indexing and selecting data in Pandas
- Data fusion: joining & merging datasets
- Summarisation with "group by" operations; pivot tables
- Time-series analysis: parsing dates, resampling
- Visualisation and statistical graphics with *Seaborn*

Day 3: Real-world programming in Python

Day 3 shows you intermediate-level language features, tools, techniques, and best practices for writing maintainable Python code in teams.

Morning

- Elegant features of Python: keyword arguments, comprehensions, sequence unpacking
- Defining classes: custom data types; inheritance
- Iterators and generators
- Functional programming with *toolz*

Afternoon

- Integrated development environments; debugging tools
- Python style and docstring conventions; linting tools
- Elegant code beyond PEP8: class special methods, context managers, decorators
- Creating modules and installable packages; structuring Python projects
- Automated unit-testing with *py.test* and property-based testing with *hypothesis*
- Managing isolated environments for team projects with *conda*; specifying package requirements

Day 4: Web APIs

Day 4 will show you how to consume and create web APIs in depth:

- Consuming web APIs: the *requests* package in more depth; oauth; sessions; rate limits
- Background: creating dynamic websites with *Flask*
- Templating; sessions; deployment; security
- Creating web APIs with *Flask* and *Flask-RESTful*
- Documenting web APIs with *OpenAPI* (*Swagger*)

Supplemental materials

We will supply you with printed course notes and a USB stick containing electronic versions of the course notes as *Jupyter* notebooks, solutions to the programming exercises, several written tutorials, and reference documentation on Python and the third-party packages covered in the course.

Instructor bios

Your trainers for the course will be selected from one or more of:

Henry Walshaw   Henry has 15 years of experience in GIS, spatial analysis and application development, particularly in the natural resource management field. Henry's core technical expertise relates to the development and analysis of large scale spatial datasets (primarily using Python), and communicating this understanding to people including subject matter experts and the general public.

Henry has worked in government at federal and state levels, at Geoscience Australia (GA), the Victorian Government Department of Sustainability and Environment (DSE), and the Environmental Protection Agency (EPA). He has also worked in the private sector as Senior Spatial Consultant with Sinclair Knight Merz (SKM) and we-do-IT. He holds a Bachelors in Computational Science.

Robert Layton   Robert is the author of the book "Data Mining in Python", published by O'Reilly. He provides analysis, consultancy, research and development work to businesses primarily using Python. Robert has worked with government, financial and security sectors, in both a consultancy and academic role. He is also a Research Fellow at the Internet Commerce Security Laboratory, Federation University Australia.

Robert is a regular contributor to the Python-based *scikit-learn* open source project for machine learning and writes regularly on data mining for a number of outlets. He has presented regularly at a number of international conferences in Python, data analysis, and its applications. He is also the author of the website learningtensorflow.com.

Edward Schofield   Ed is the founder of Python Charmers in Australia and Singapore. He is well-known in the Python and scientific Python communities as the author of the *future* package and a former release manager of *SciPy*. He has consulted to or trained dozens of organisations in scientific and data analytics applications of Python, including ANZ, Barclays, Cisco, CSIRO, DST Group, Dolby, Optus, Telstra, and Toyota Technical Centre. Ed is co-chair of the Python in Science & Data miniconf for PyCon AU and co-organises the Python user group in Melbourne.

Ed holds a PhD in computer science from Imperial College London, where his thesis was in machine learning. He also holds BA and MA degrees in maths and computer science from Cambridge University. He has 20+ years of experience in programming, teaching, and public speaking.

Other information

Computer: A computer will be provided for you during the course.

Exercises: There will be practical programming exercises throughout the course. These will be challenging and fun, and the solutions will be discussed after each exercise and provided as source code on the USB sticks. During the exercises, the trainer will offer individual help and suggestions.

Timing: The course will run from 9:00 to roughly 17:00 each day, with breaks of 1 hour for lunch and 15 minutes each for morning and afternoon tea.

Personal help: Your trainer(s) will be available after the course each day for you to ask any one-on-one questions you like — whether about the course material and exercises or about specific problems you face in your work and how to use Python to solve them. We encourage you to have your own data sets ready to use if this is relevant.

Certificate of completion: We will provide you a certificate if you complete the course and successfully answer the majority of the exercise questions.

Food and drink: We will provide lunch, morning and afternoon tea, and drinks.

Price

$825 per day per person, including GST.

Booking

To book places on the course, please contact us, or visit:

https://pythoncharmers.com/training/python-for-programmers

Testimonials

Testimonials from participants of similar courses are available at pythoncharmers.com/testimonials.

About Python Charmers

Python Charmers is the leading provider of Python training in the Asia-Pacific region, based in Australia and Singapore. Python Charmers specialises in teaching programming to data scientists, engineers, scientists, quants, and computer scientists in the Python language. Python Charmers' delighted training clients include the ABC, Barclays, the Bureau of Meteorology, CSIRO, Dolby, EPA Victoria, Geoscience Australia, Optiver, Primary Health Care, Shell, Telstra, and Toyota.

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