Syllabus – Intermediate Python3 workshop

Author:

Noam Cohen

Audience:

Students who completed first course using Python

Revision history

|  |  |
| --- | --- |
| 2019-05-07 | initial material selection |
| 2019-05-16 | Started writing jupyter notebooks |
| 2019-05-26 | Add topics |
| 2019-06-19 | Add topics |
| 2019-06-23 | Review with Oren |
| 2019-07-07 | Add list comprehension |
| 2019-07-07 | Reorganize the table, add initial time estimation |

2019-07-07 inputs from meeting with Reut , Afek, Itai:

* The Challenge should emphasis writing code, so Data driven is less appropriate:

\*\* Students will have (at end of second year) a Data driven bootcamp

\*\* When writing DS code, most of the work (at least after first year) is just using the packages – no real value for python learners.

* The Challenge should be presented as a teaser few days before the workshop
  + In the workshop, present it at beginning of day 1, so can refer to it while talking about the language.
* Lecture spacing:
  + 1 hour lecture, hands on, 1 hour lecture, hands on, TBD
  + In the third (last) day, give 1 hour lecture, and leave rest of day for hands- on

The time scope is 3 days ,4 academic hours each, rest of day dedicated for the challenge

This workshop is for people who already used python before and have basic knowledge. We will *not* teach the basics of python and how to install it on your computer.

# Teasing: What Does It Take to Be An Expert At Python? https://youtu.be/7lmCu8wz8ro

*We will use jupyter notebook in addition to PowerPoint*

|  |  |  |  |
| --- | --- | --- | --- |
| Day | topics | Estimated time [minutes] | comments |
| Basic knowledge | Introduction to the course | 20 |  |
|  | Project description | 20 |  |
|  | Logging | 15 |  |
|  | The memory model | 5 |  |
|  | Argument passing | 10 |  |
|  | Garbage collection | 10 |  |
|  | Virtual environments and Packages | 30 |  |
|  | Exception Handling | 20 |  |
|  | Profiling (and optimization) | 20 |  |
|  | Introducing popular packages   * Scrapy, SciPy ,NumPy ,scikit-learn, SqlAlchemy | 50 | <https://www.quora.com/What-is-the-relationship-among-NumPy-SciPy-Pandas-and-Scikit-learn-and-when-should-I-use-each-one-of-them> |
|  | Multi-threading and the GIL   * Multiprocessing * Async. Await * Subprocess module | 50 |  |
| Advanced topics | Generators and Iterator Protocol | 40 |  |
|  | Decorators (class and method based) | 20 |  |
|  | Comprehensions | 10 |  |
|  | The built-ins | 15 | <https://docs.python.org/3/library/functions.html> |
|  | Regular Expressions | 50 |  |
|  | Magic method (\_\_init\_\_ . .. ) called data model objects | 30 |  |
|  | Remote development, remote debugging | 40 | <https://www.jetbrains.com/help/pycharm/remote-debugging-with-product.html> |
|  | Class method vs. static method | 10 |  |
|  | The Collections module | 15 |  |
|  | Type checking: mypy | 10 |  |
|  | Profiling (hands on) | 40 | cProfile (builtin) |
| TOTAL |  | **530** | minutes |

**Some keyworks that might be of interest:**

Json, xml, socket, async, future, promise,

--------------------- Scratch pad area ------------

Argument passing \*args, \*\*kwargs

Private by convention \_privateData \_\_privateSystemData

Class variables, class methods

Class inheritance. How to call super class methods (isinstance(), issubclass() )

Collecting from lists in <https://www.quora.com/What-are-the-advanced-topics-in-python>

List of topics to pick from

<http://www.cs.fsu.edu/~carnahan/cis4930sp17/index.html>

* *Python Errors and Exceptions*
* *Python Exception Handling*
* ~~Python 3 Extensions~~
* Python Tools
* ~~XML Processing in Python3~~
* ~~Networking in python 3~~
* ~~Sending mail with Python 3~~
* ~~GUI Programming in Python 3~~
* ~~CGI Programming in Python~~
* *Python Multi-threading*
* *Multiprocessing with Python*
* *Python Subprocess module*
* *Python Regular Expressions*

My jupyter server setup at <http://jupiter-iem-technion.westeurope.cloudapp.azure.com/notebooks/>

And also built jupyterHub which is required for multiuser

[*https://hub.docker.com/r/jupyter/datascience-notebook*](https://hub.docker.com/r/jupyter/datascience-notebook)

Installed Docker on new Azure machine. Run jupyter container in it.

jupiter-iem-technion.westeurope.cloudapp.azure.com

VM in Azure

Docker Engine

Jupyter container

Your browser

kernel