

The 1st Data Science Oriented Python Crash Course

Syllabus

1.
 - What is python, and why is it widely used for data science?
 - Introducing python, python interpreter, package managers, IPython and Jupyter
 - Algorithmic thinking
 - Toolbox of a programmer, variables, conditions, loops, and functions, an introduction into the programming world
 - **The art of doc reading, how to learn python like a pro**
 - Python syntax
2.
 - Literals
 - Variables
 - Expressions
 - Boolean expressions
 - If
 - Functions
 - Why functions?
 - **Looping conventions in python**
 - For vs While
 - **The simplicity-integrity cycle**
 - Break, Continue statements
 - An introduction to complexity orders
 - Nested loops
3.
 - Object oriented programming, why do we need it?
 - **Philosophical basis of OOP**
 - Class, Object, Reference
 - Objects are everywhere!
 - Python OOP Syntax
 - Methods
 - Instance methods vs. class methods vs. static methods
 - **Magic methods**
 - Brief overview of association, inheritance, composition and polymorphism
4.
 - Data types
 - Immutable vs. mutable
 - **Iterator, a fundamental interface**
 - Strings
 - Lists and Tuples
5.
 - Dictionaries
 - **How to choose the right data structure in any scenario?**
 - Generators

- Yield and Yield from
- List comprehension
- **Memory and computation efficient programming, how to leverage the full power of python?**

6.

- What are files?
- **Binary vs raw-text files**
- File manipulation in python
- **String encodings**
- Bytes class
- Comma separated values format
- JSON
- Datetime
- Lambda
- Decorators
- Type checking

7.

- Introducing Numpy
- Why numpy? Comparing performance with examples
- Array objects
- Constants
- Routines

8.

- Introducing Pandas
- Series
 - Constructor
 - Attributes
 - Conversion
 - Indexing, iteration
 - Computations / descriptive stats
 - Reindexing / selection / label manipulation
 - Missing data handling
 - Time series
 - Accessors

9.

- DataFrame
 - Constructors
 - Attributes
 - Underlying data
 - Indexing, iteration
 - Computations / descriptive stats
 - Reindexing / selection / label manipulation
 - Reshaping, sorting, transposing
 - Combining / comparing / joining / merging

- Pandas Data Types
- Window and rolling
- GroupBy
- Resampling

10.

- Introducing Matplotlib and Pyplot
- Ax and Figure
- Artists
- Introducing well known charts
- Subplots
- Figure customization
- Axis customization
- Legend
- Pandas plot API
- Seaborn (Overview)

Note: The overall structure of this syllabus is based on Coursera's standards.