

Python study checklist

STA 217

This checklist provides a study guide of what you are expected to know the basics of python programming. Follow this as a part of your self-study and you should be well prepared for the rest of the semester. There is a lot of material but investing the time to learn these subjects up front will help throughout the rest of the course.

Code and code structures

- ☐ Python syntax and semantics, including whitespace
 - ☐ “for” loops
 - ☐ Tabs vs. spaces for indenting (use hard tabs = 4 spaces)
 - ☐ Keywords or and not, = vs. ==
- ☐ Understand objects, functions, methods
- ☐ Understand import statements, dealing with *namespace*, `math.log` vs. `log` for example
 - ☐ Importing from Python’s standard library vs. importing third-party modules
- ☐ Understand mutability of data structures
- ☐ Understand `L.sort()` vs. `sorted(L)` , sorting in place
 - ☐ In general, pass-by-reference vs. pass-by-value
- ☐ List/set/dict comprehensions
- ☐ Zipping Python iterables together, `enumerate()`
- ☐ Method chaining
- ☐ Multi-assignment, functions with multiple return values return tuples

Data and data structures

- ☐ Python “scalar” variables (floats, ints, Booleans, None, etc.)
- ☐ Python data structures (lists, dicts, sets) and their methods (`list.append` vs. `list.extend` , etc.), understand indexing and slicing
- ☐ NumPy ndarrays, differences between lists and ndarrays
- ☐ Python strings, string slicing, and string methods (`join` , `split` , etc.), special characters such as newlines (`\n`) and tab (`\t`).
- ☐ Understand lists-vs.-tuples
- ☐ Understand dictionaries, mapping keys to values
- ☐ Understand sets

Working with file and file paths

- ☐ Read and write files, close files, work with directories and file paths
- ☐ Working directories

Writing and running Python scripts and code

- ☐ Preparing self-contained Python scripts in .py files
- ☐ Using IPython to interactively explore docstrings and methods

Popular useful built-in functions

- ☐ abs, round, min, max, sum, count, sorted, range, slice
- ☐ str, list, set, float, int, tuple
- ☐ eval, dir, exec, len, type
- ☐ enumerate, zip, map, filter, reversed,
- ☐ string methods: upper, lower, strip, replace, split, join, format
- ☐ list methods: append, extend, count, clear
- ☐ dictionary methods: keys, values, items

Uses of popular third-party modules

- ☐ NumPy
- ☐ SciPy
- ☐ Matplotlib
- ☐ Pandas