Python study checklist

STAT/CS 287
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This checklist provides a study guide of what you are expected to know after week 2. 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. A *quiz* during week 2 will assess your preparation.

Document Key:

- **WT**: Whirlwind Tour of Python for STAT/CS 287
- **L1**: Lecture 01 slides
- **L1S**: Lecture 01 Supplement notebook
- **PS**: Python Setup slides
- **PSA**: Preparing and submitting Assignments slides

Code and code structures

- ☐ Python syntax and semantics, including whitespace (WT, L1S, PS)
  - ☐ for loops are more like "for-each" loops (WT)
  - ☐ tabs vs. spaces for indenting (use hard tabs = 4 spaces)
  - ☐ Keywords or and not, = vs. == (WT, L1)
- ☐ Understand classes vs. objects and functions vs. methods, the `self` argument (WT)
- ☐ Understand `import` statements, dealing with *namespace*, `math.log` vs. `log` for example (WT, L1S)
  - ☐ importing from Python's standard library vs. importing third-party modules (WT)
- ☐ Understand mutability of data structures (WT, L1S)
- ☐ Understand `L.sort()` vs. `sorted(L)`, sorting in place (WT, L1S)
  - ☐ In general, pass-by-reference vs. pass-by-value
- ☐ iterables and iterators, list/set/dict comprehensions (WT, L1S)
- ☐ zipping Python iterables together (WT, L1S), `enumerate()` (WT)
- ☐ Method chaining (L1S)
- ☐ Multi-assignment, functions with multiple return values return tuples (L1S)

Data and data structures

- ☐ Python "scalar" variables (floats, ints, Booleans, None, etc.) (WT)
- ☐ Python data structures (lists, dicts, sets) and their methods (`list.append` vs. `list.extend`, etc.), understand indexing and slicing (WT)
- ☐ NumPy ndarrays, differences between lists and ndarrays (WT, L1S)
- ☐ Python strings, string slicing, and string methods (`join`, `split`, etc.), special characters such as newlines (`\n`) (WT)
- ☐ Understand lists-vs.-tuples (WT, L1S)
- ☐ Understand dictionaries, mapping eys to values (WT, L1)
- ☐ Understand sets (WT)

Working with file and file paths

- ☐ Read and write files, close files, work with directories and file paths (WT)
- ☐ Working directories (WT)
- ☐ Assignment *enclosing folders* (PSA)

Writing and running Python scripts and code

- ☐ Preparing self-contained Python scripts in .py files (PS)

- ☐ Using IPython to figure out what the code is doing (WT, PS, PSA)
- ☐ Using IPython to interactively explore docstrings and methods (PS)
- ☐ Understand an assignment's provided *plotter script(s)* (PSA)

Uses of popular third-party modules

- ☐ NumPy (WT)
- ☐ SciPy (WT)
- ☐ Matplotlib (WT)