

## Week 6: Python for Data Analysis, Ch. 3 and 4

### *Ch. 3*

1. IPython is a Python development environment that provides an interactive shell, a web-ready notebook, and a fast parallel computing engine. It promotes an execute-explore model of development suited for Python projects.
2. Important IPython features include introspection with `?`, and magic commands (`%timeit`, `%run`, `%logstart`, `%debug`).
3. Two principles of “Zen of Python”: flat is better than nested. Keep code as modular and decoupled as possible to make testing and debugging easier. Overcome a fear of longer files.

### *Ch. 4*

Numpy’s central data structure is the `ndarray`, which provides vectorized arithmetic operations. The element-wise array functions are called Universal Functions (ufuncs) and include unary ufuncs (`sqrt()`, `exp()`), and binary ufuncs (`maximum()`). These vectorized operations are much faster than pure Python equivalents.

Ndarrays are created with `np.array(list)` or `np.matrix(list)`. The type (accessible through the attribute `dtype`) is inferred from the data, but if you’d like to coerce a type, you can use this syntax: `np.array(list, dtype=np.float64)`.

An extremely important point about slices: slices create a list of references to the original data, not a new list. So if you update any element in your slice, those same elements will be modified in your original array.