COLLECTING, ANALYZING, AND VISUALIZING DATA WITH PYTHON PART I

DR. MICHAEL FIRE

Collecting Data

There several ways to collect data:

- Using existing datasets
- Create/Simulate your own dataset
- Using Web scraping
- Using API

Web Scraping

We can collect data using web scraping using one of the following methods:

- Using simple tools like wget
- Using Selenium for dynamic loaded pages
- Using web scraping frameworks like Scrapy
- Writing your own code

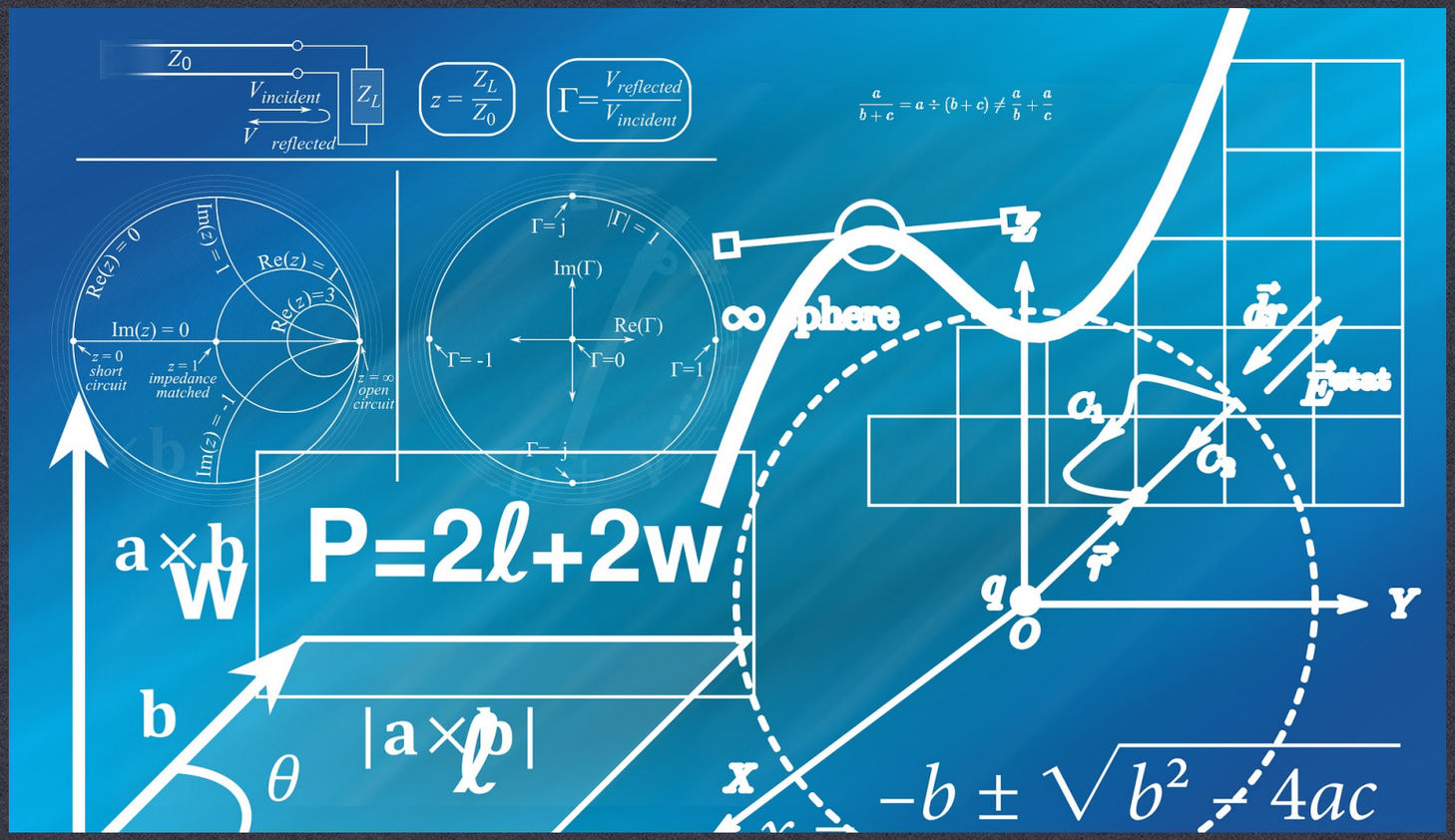
Using Application Programming Interfaces

We can use various websites' Application Programming Interfaces (APIs) to collect data from various platforms, such as:

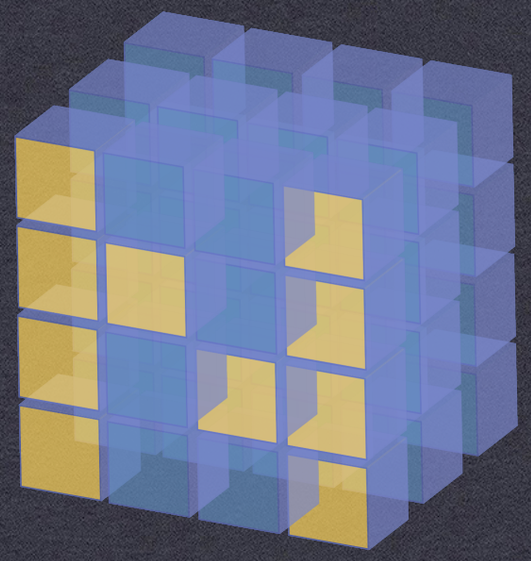
- Twitter
- Reddit
- Google Maps
- Kaggle
- Github

Recommended Read

- **Python Data Science Handbook, Chapter 1 IPython: Beyond Normal Python by Jake VanderPlas**
- **The Unix Shell by Software Carpentry Foundation**
- **Practical Introduction to Web Scraping in Python by Colin OKeefe**

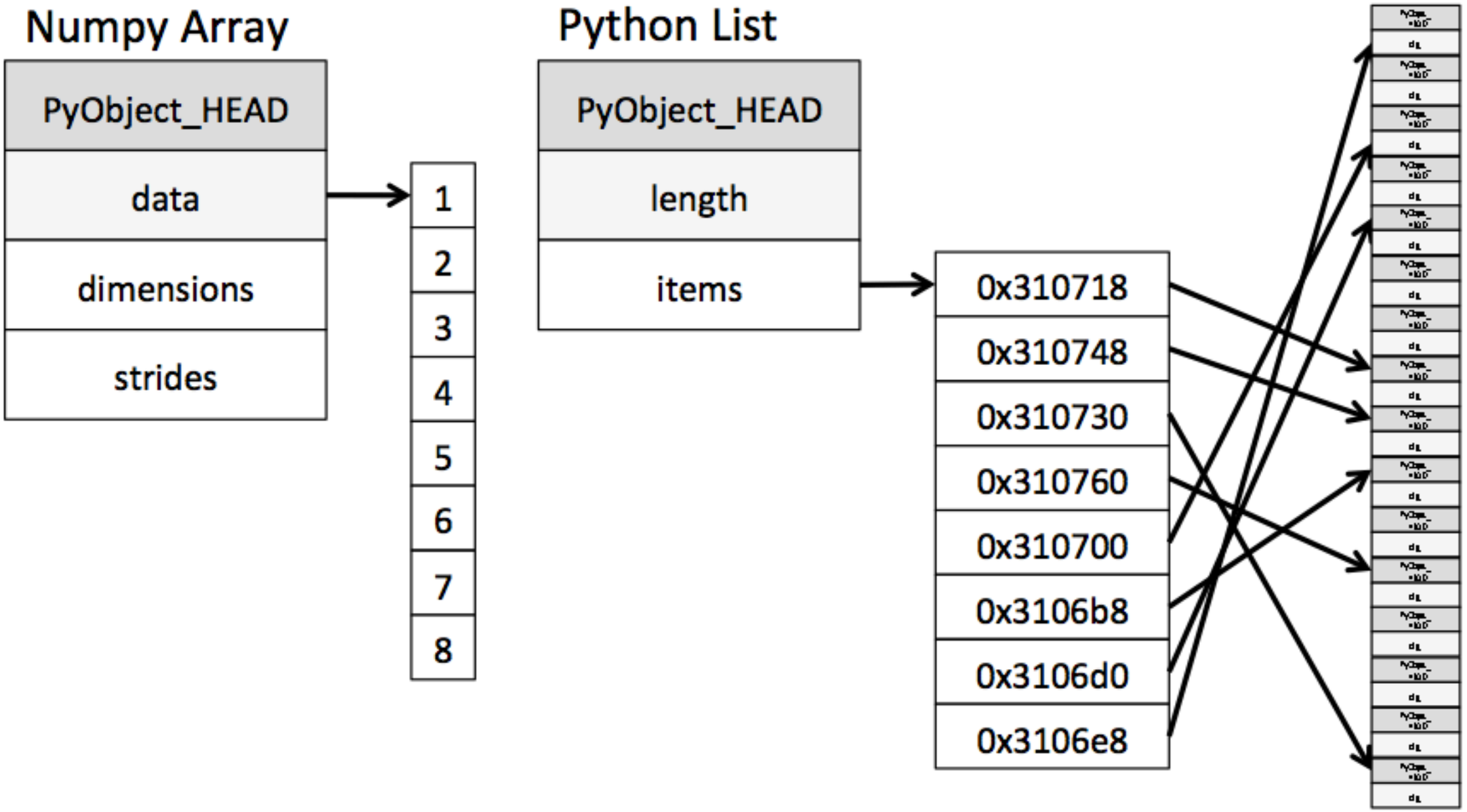


MANIPULATING DATA



NumPy

NUMERICAL PYTHON (NUMPY)



Source: Python Data Science Handbook, Chapter 1 IPython: Beyond Normal Python by Jake VanderPlas

NumPy - The Basics

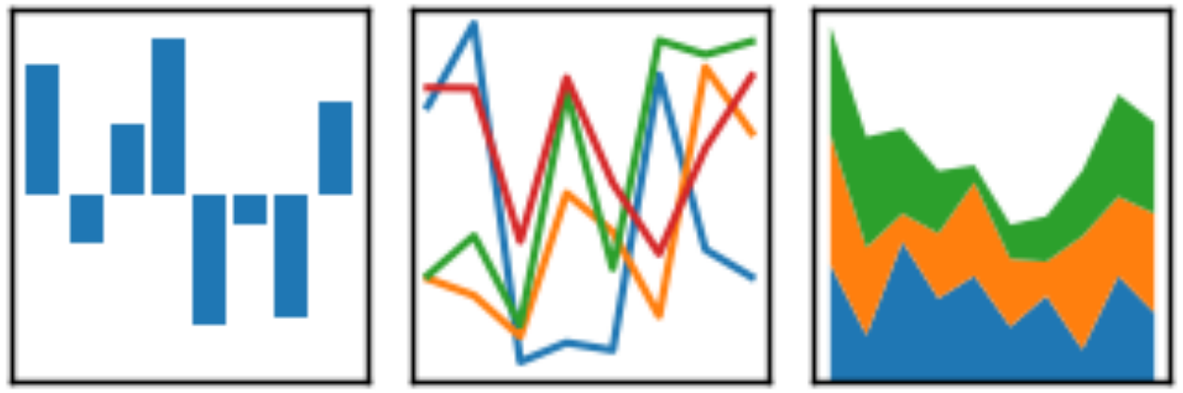
- Supports large multi-dimensional arrays and matrices
- Contains large collection of high-level mathematical functions to operate on these arrays
- Tools for reading / writing array data to disk

Useful Reading:

- Chapter 4. NumPy Basics: Arrays and Vectorized Computation, *Python for Data Analysis*
  by Wes McKinney
- Chapter 2. Introduction to Numpy, Python Data Science Handbook, by Jake VanderPlas

pandas

$$y_{it} = \beta' x_{it} + \mu_i + \epsilon_{it}$$



WORKING WITH PANDAS & DATAFRAMES

Big Data Borat
@BigDataBorat

Follow

In Data Science, 80% of time spent prepare data, 20% of time spent complain about need for prepare data.

6:47 PM - 26 Feb 2013

Pandas

Pros:

- Provides flexible and expressive data structures
- Easy to handle missing data
- Columns can easily be added and deleted

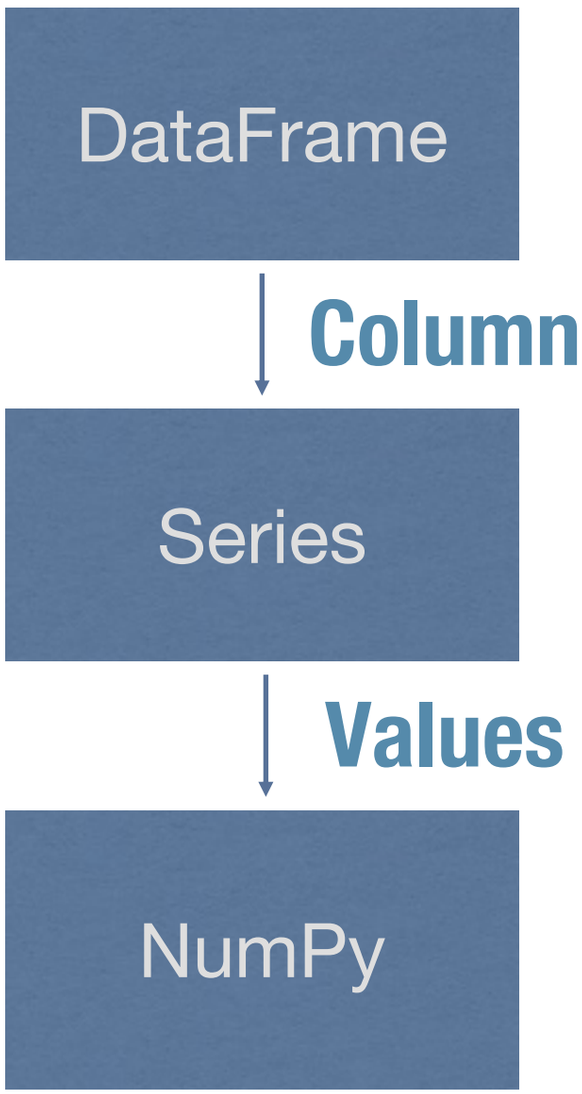
Cons:

- Good for several gigabytes of data
- Mostly single threaded
- Complex Group By operations

“My rule of thumb for pandas is that you should have 5 to 10 times as much RAM as the size of your dataset”

Wes McKinney, 2017

Pandas Objects



Let’s move to the Notebook