Introduction to Pandas

An Overview of Python's Data Analysis Library

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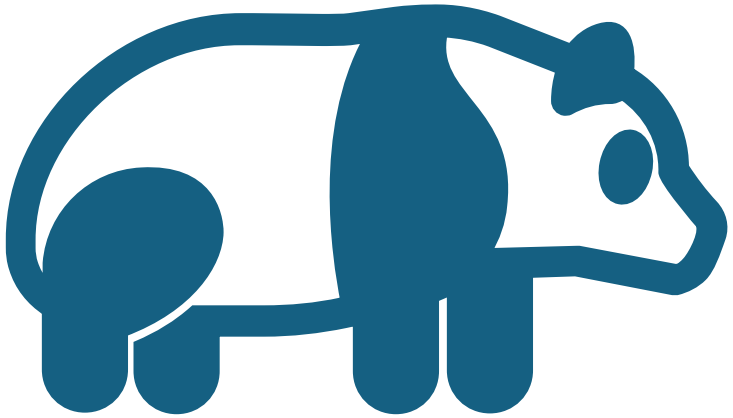
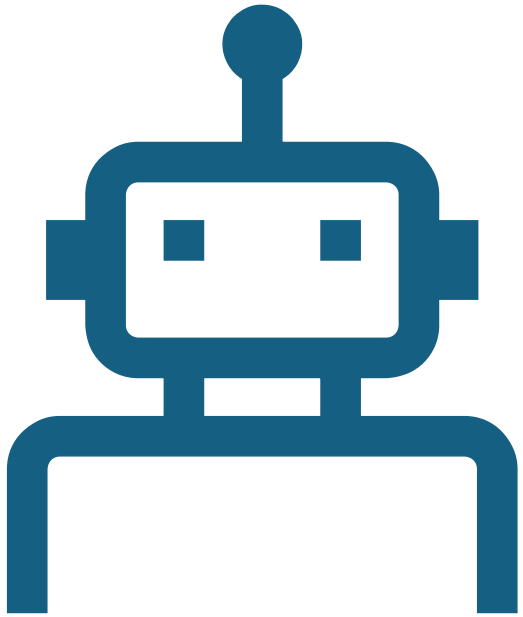
What will I learn?

- The what?
- The how?
- The why?



What

- What is Pandas and where does it fall in relation to Python as a language.
- Capabilities and functionalities.
- Useful tools which help make the most out of Pandas.



How

- How to work with Pandas through a hands-on approach.
- Familiarizing and experimenting with its capabilities.
- How to dream

Why

- The why now
- The why after

Workshop outline

- Introduction to some of other tools which surround Pandas.
- Loading the repository containing the scripts we need.
- Building the proper environment to work in.
- Birds-eye-view of Pandas and the workbook
- Getting our hands dirty and writing some code.

Other tools

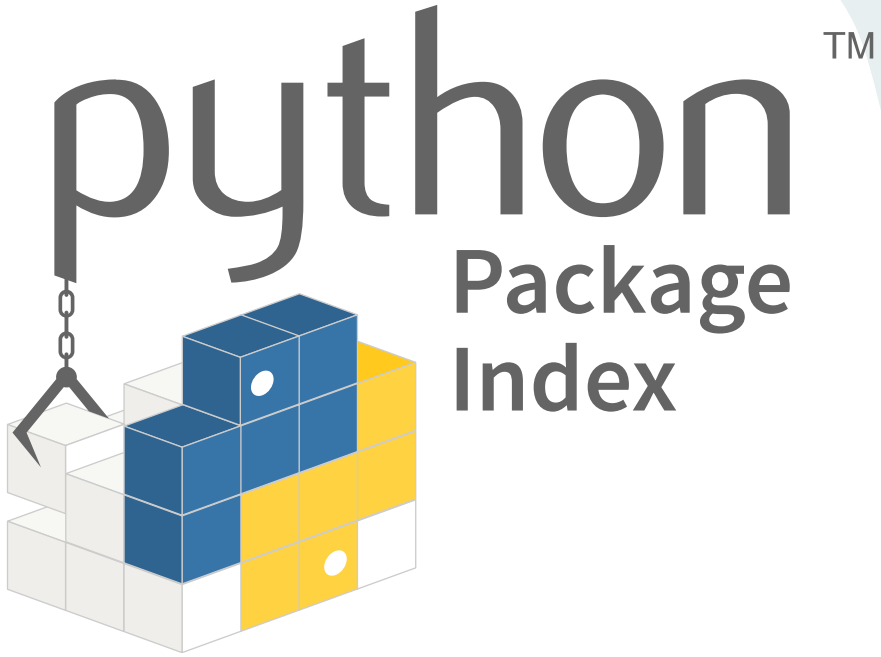
- A few other tools to help us along the way

Github

- Github is the graphical user-interface (GUI) to git. A language developed by Linus Torvalds to help him build the Linux Kernel!
- Version control tool which also hosts billions of lines of code across millions of repositories.
- This workshop lives on git.

Anaconda

- Anaconda streamlines the setup of Python environments.
- Anaconda is the backbone for setting up the Python environment needed to run our Pandas workshop.
- Supports many languages.



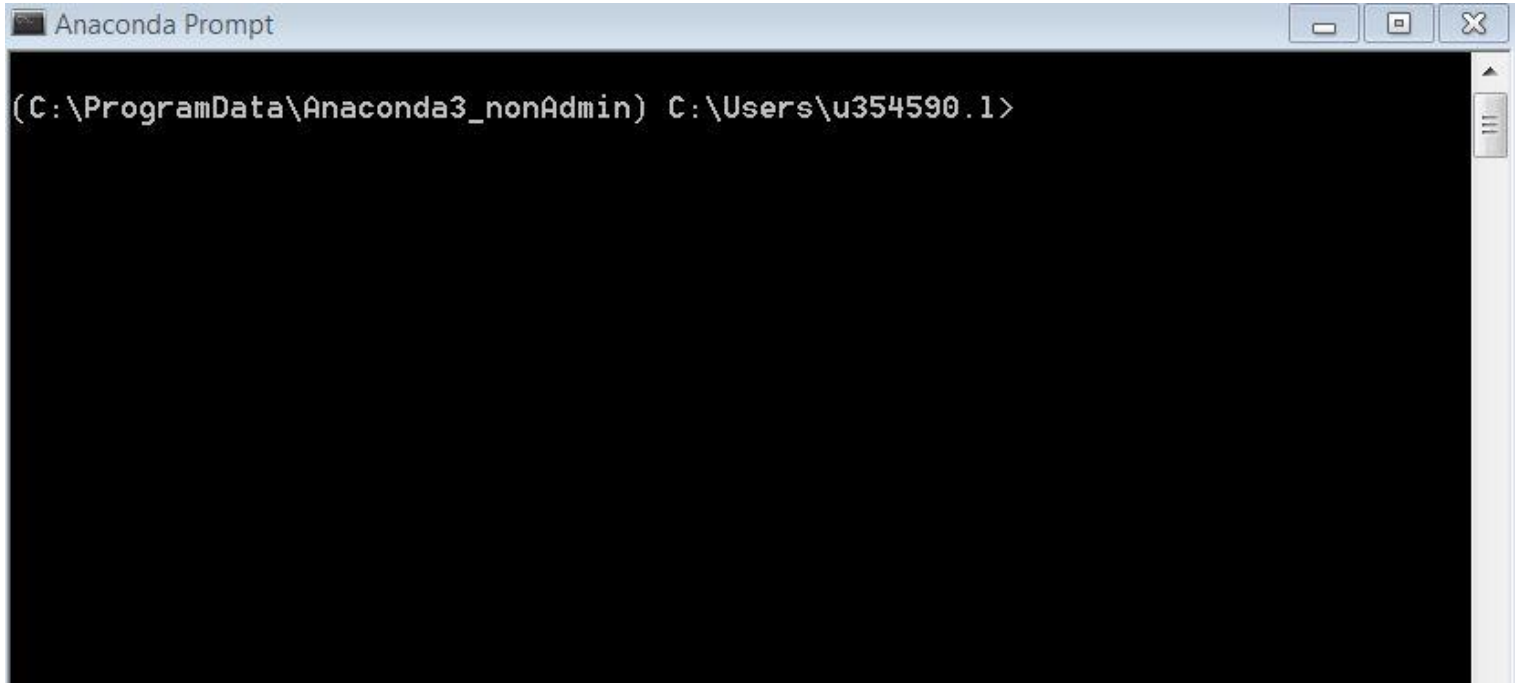
PyPI and pip

- Just as GitHub hosts code repositories, pip interfaces with the Python Package Index (PyPI).
- PyPI is mainly community driven but is also overseen by the Python Software Foundation which sets the guidelines and infrastructure for the Index and its security.
- When you use pip to install a package, it connects to PyPI, locates the package, and downloads it along with any required dependencies.

Jupyter

- Jupyter provides an interactive computing environment where you can write, run, and visualize code.
- Widely adopted in academia and industry.
- This is where we will be doing all our hands-on work.

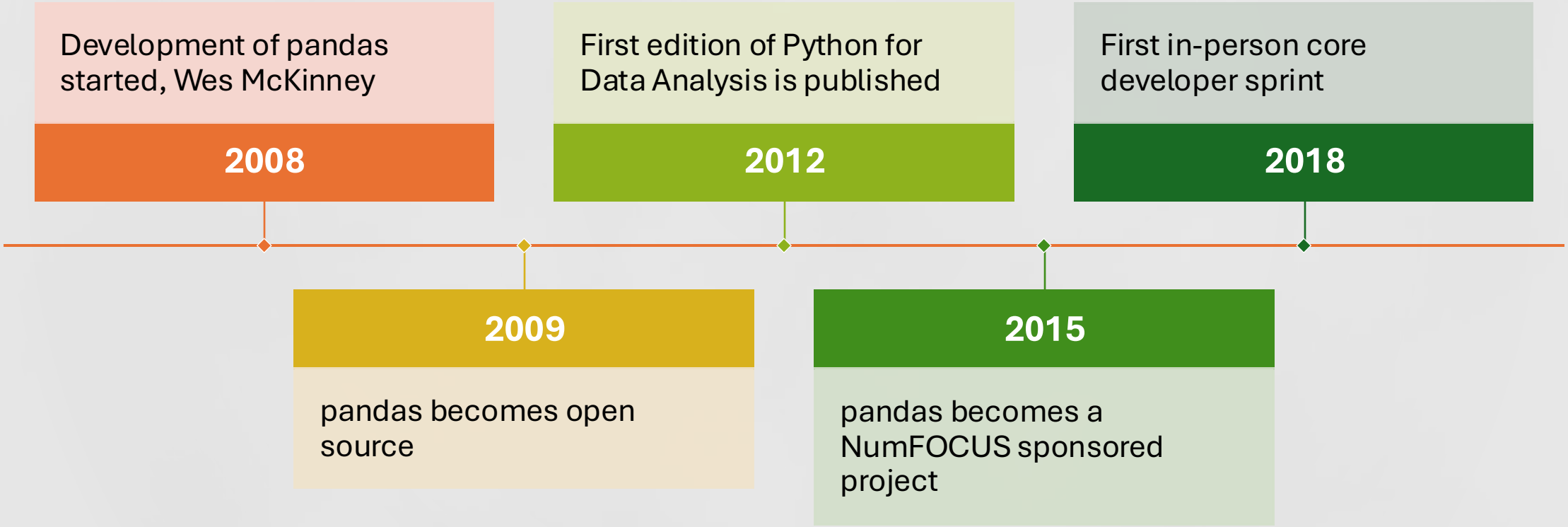
Let's do a little prep together!



conda env create -f environment.yml

What is Pandas?

Short History



Pandas namesake?

Panel Data + Python Data Analysis = Pandas

Series

One-dimensional labeled array capable of holding any data type.

```
class pandas.Series(data=None, index=None, dtype=None,

name=None, copy=None, fastpath=_NoDefault.no_default) #
```

DataFrame

A DataFrame in Pandas is a two-dimensional labeled data structure capable of holding data of various types in a tabular format

DataFrames can be thought of as a collection of Pandas Series where each Series represents a column.

With many built-in methods!!

Functions vs methods

Both run blocks of code but differ in scope.

Function are standalone blocks that are not bound to a particular object.

```
def my_function(args):
return result
```

```
result = my_function(arguments)
```

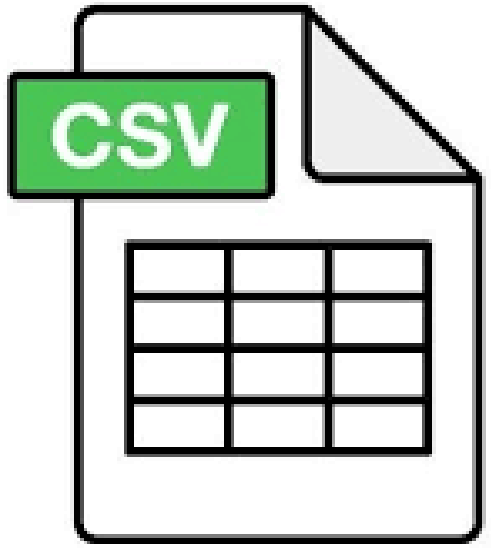
Methods are functions defined within a class and are bound to instances of that class.

```
my_object = MyClass()
```

```
Result = my_object.my_method()
```

Dictionaries vs DataFrames

Loading in data.



Subsets of the data

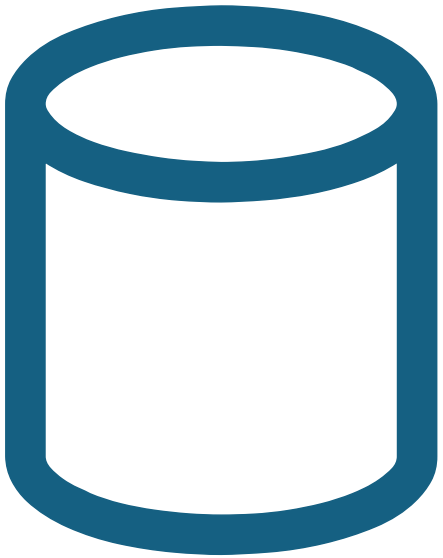
HEAD

COLUMN

INDEX

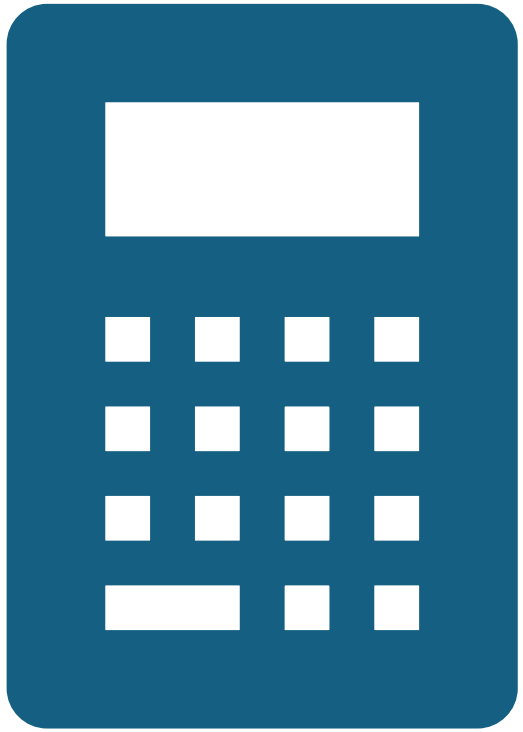
LOC & ILOC

SLICING

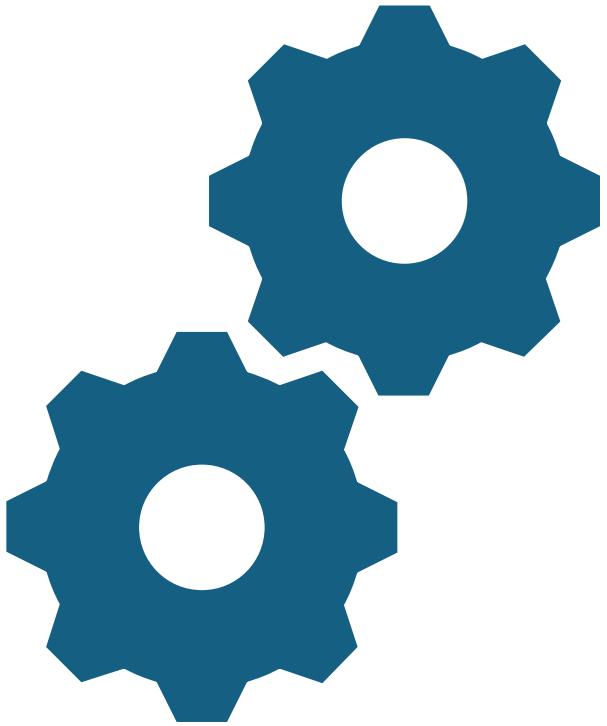


Dtype exercise

- Dtypes
- Subsets
- Copy
- Editing Data



Mathematical Operations



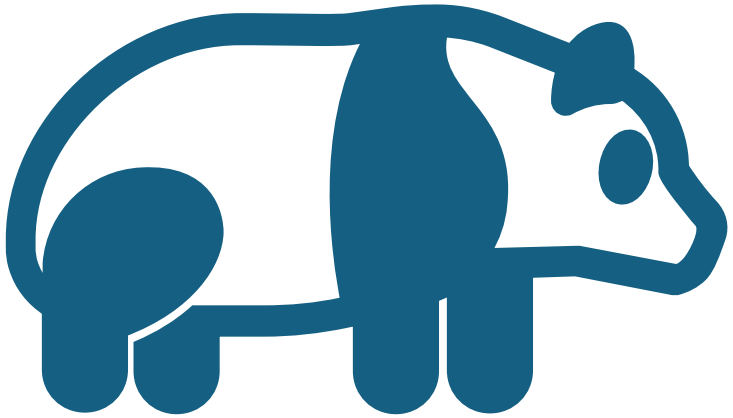
Feature Engineering

Masks

Time

Groupby

Plotting



Let's Go!