PROGRAMMING WITH PYTHON

GO.GWU.EDU/LIBWORKSHOPS

Today's Instructors & Helpers

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Materials: go.gwu.edu/pyw

Today's Plan

~2 hours: Basic Concepts	~½ hr Brain Break	~2 hours Data with Pandas

About today...

- Ask questions!
- If you're stuck:
  - Ask us
  - Help each other out!
- If something is confusing in the workshop, it probably needs improvement; let us know.
- Stay as long as you like

Adapted from slides by Terian Koscik @spine_cone

Objectives

- Gain familiarity with one environment for using Python (Google Colab), and awareness of others
- Learn Python language basics
- Load in a data set as a Pandas DataFrame
- Explore and transform ("wrangle") the DataFrame
- Create data visualizations
- Learn how to look things up, how to interpret errors
- Gain confidence to try things we didn't learn today!

Why Python?

- Free
- General purpose
- Easy to learn
- Readable*
- Community-developed / Open Source
- Widely used and documented
- Good built-in and contributed libraries

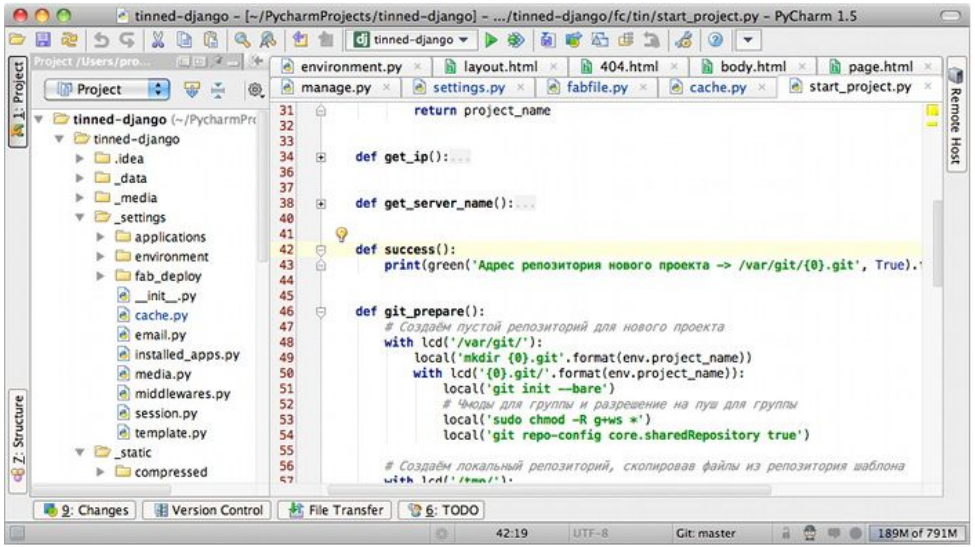
Different ways to use Python

- Command line/REPL

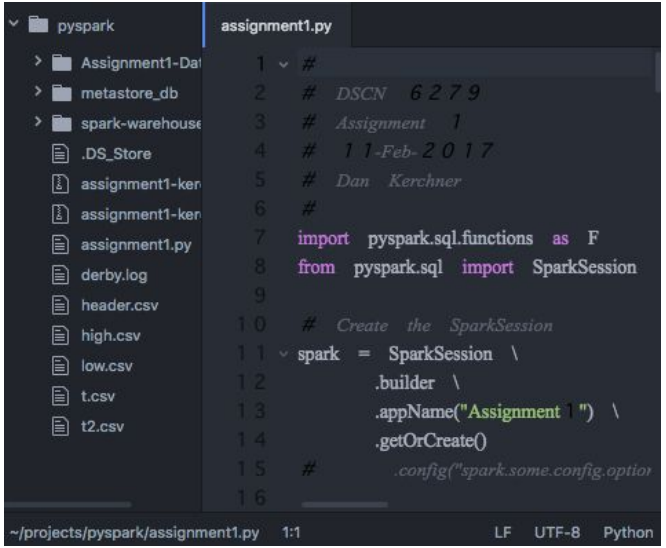
```
Last login: Mon Mar 20 22:09:33 on ttys001
GLSS-M17LFFT:~ kerchner$ python
Python 2.7.10 (default, Oct 23 2015, 19:19:21)
[GCC 4.2.1 Compatible Apple LLVM 7.0.0 (clang-700.0.59.5)] on darwin
Type "help", "copyright", "credits" or "license" for more information.
>>>
>>> opinion = "This workshop is awful!"
>>> opinion == True
False
>>>
```

Different ways to use Python

- Integrated Development Environment (IDE) – Spyder, pyCharm, pyDev, Sublime, …



- File editor (e.g. Atom, vim) + command line tools (pip, virtualenv, …)



Different ways to use Python (continued)

- "Notebooks":
  - Jupyter notebooks
  - Google Colab (available in your Google Drive!)
  - Kaggle notebooks
  - others?

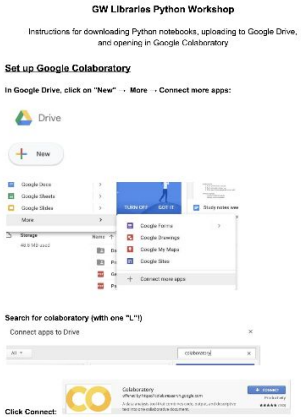
Even more ways to use Python

Anaconda = Python (and R) plus:

- **Jupyter notebooks**
- lots of libraries
  - data processing
  - analytics
  - scientific computing
  - including: **Pandas**

Setup

- Google Colaboratory



GW Libraries Python Workshop

Instructions for downloading Python notebooks, uploading to Google Drive, and opening in Google Colaboratory

Set up Google Colaboratory

In Google Drive, click on "New" - More - Connect more apps:

Drive

New

Google Docs
Google Sheets
Google Slides
More
Storage

Google Forms
Google Drawings
Google My Maps
Google Sites
Connect more apps

Search for colaboratory (with one "L"!)

Connect apps to Drive

colaboratory

Click Connect:

Colaboratory

- Backup plan: https://jupyter.lai.gwu.edu

Some recommendations

- Write assuming your code will be read (incl. by Future You)
- Version your code  GitHub
- Learn to be "Pythonic" in your style
- Isolate your projects from each other (try: virtualenv)
- Stuck? Try an Internet search
- Find good code examples and make them work
- Keep learning!

Some Python libraries/frameworks

Building web applications	Django Flask
Scientific/numerical	Numpy Scipy Pandas
Machine Learning	scikit-learn
Data Visualization	matplotlib bokeh ggplot (like ggplot2 in R) plotly (<- interactive) seaborn

To Learn More (free stuff)

- learnpython.org
- docs.python.org/3/tutorial
- Software Carpentry, Data Carpentry (not just Python)
- GW Online: Get data off the ground with Python
- LinkedIn learning it.gwu.edu/linkedin-learning courses
  - 84 Python, 4 Pandas
- More on Pandas:
  - http://pandas.pydata.org/pandas-docs/stable/10min.html
  - http://pandas.pydata.org/pandas-docs/stable/tutorials.html
  - http://pandas.pydata.org/pandas-docs/stable/cookbook.html
  - http://www.datacarpentry.org/python-ecology-lesson/
- More on Pandas and on Data Viz: https://www.kaggle.com/learn/

Contact us:

Coding Appointments (with Laura, Dan, Dolsy):
go.gwu.edu/coding

Stats Appointments (with Stats grad students):
calendly.com/statistical-consulting-gw

Workshop Materials: go.gwu.edu/pyw