

PROGRAMMING WITH PYTHON



HYBRID
EDITION!



BUILD YOUR SKILLS
WORKSHOP SERIES

[GO.GWU.EDU/LIBWORKSHOPS](https://go.gwu.edu/libworkshops)

Today's Instructor

- Dan Kerchner kerchner@gwu.edu

Materials: go.gwu.edu/pyw

Today's Plan

~2 hours:	1 hour	~2 hours
Basic Python Language Concepts	Brain Break	Data Analysis 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

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

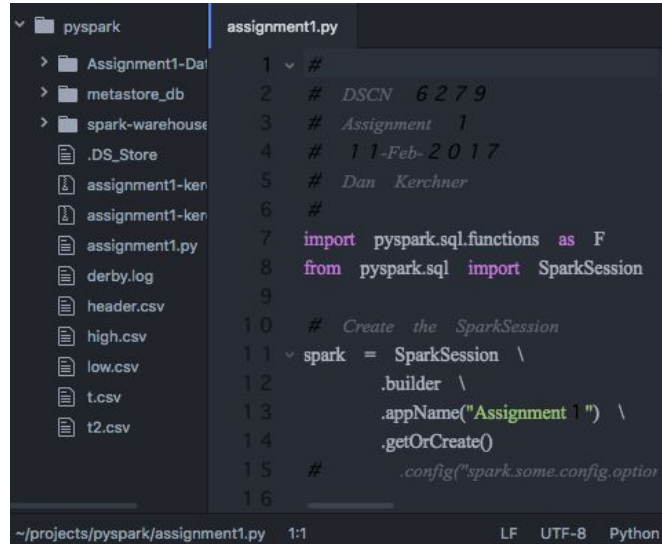
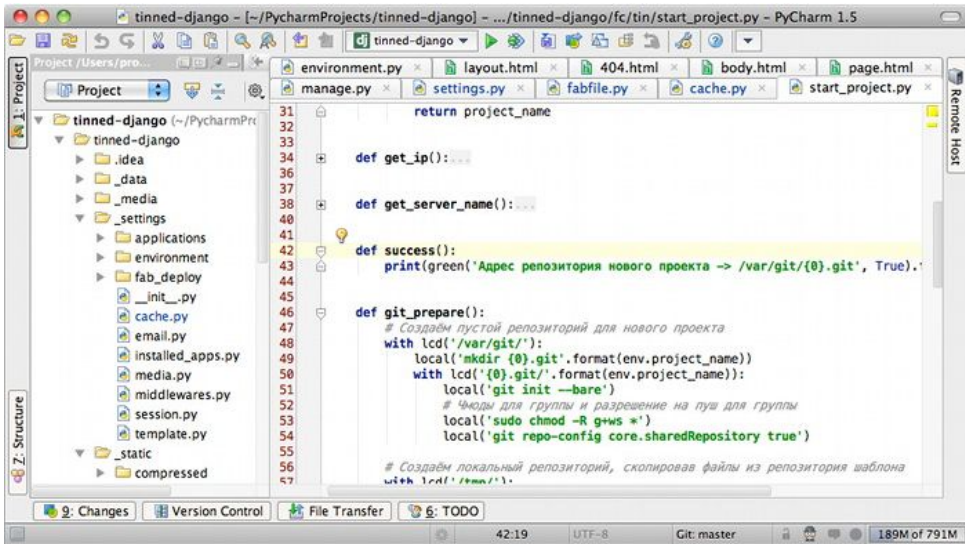


- Command line/REPL

```
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

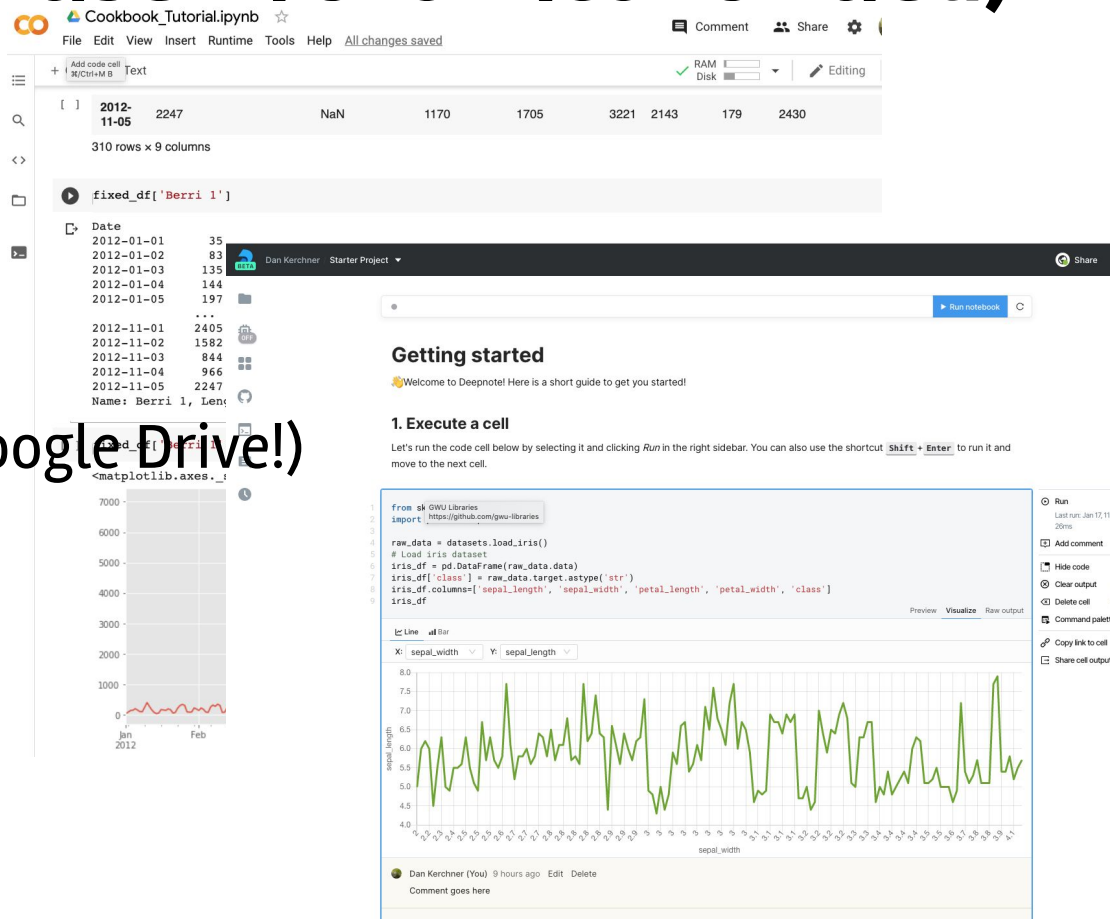
- Google Colab

(available in your Google Drive!)

- Kaggle notebooks

- Deepnote

- Binder



Even more ways to use Python

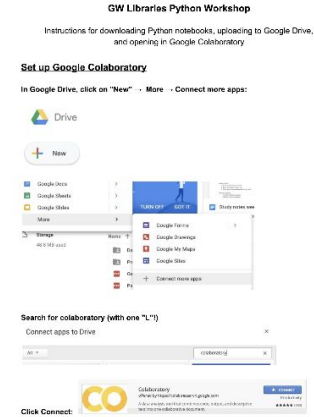
Anaconda = Python (and R) plus:

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



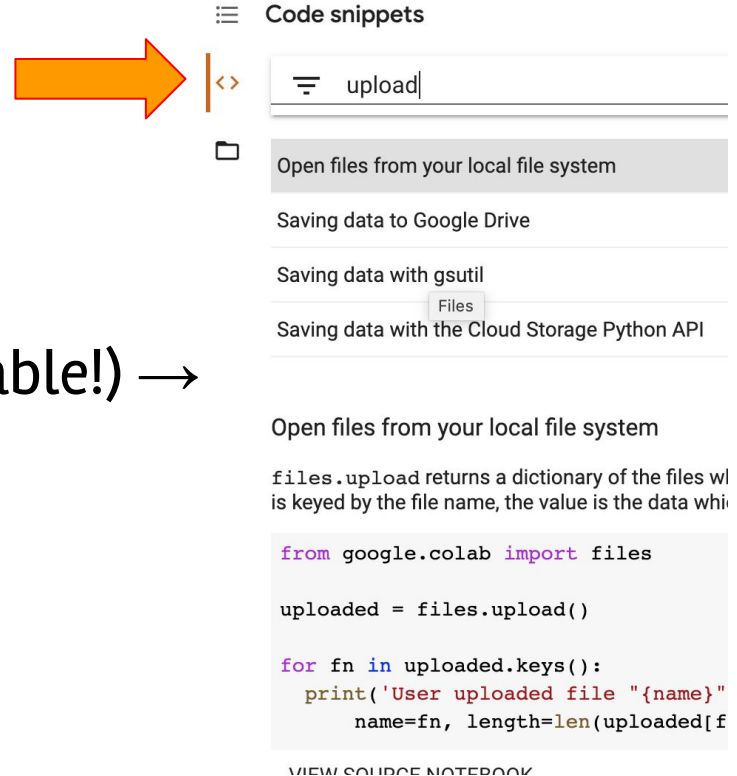
Setup

- Google Colaboratory
<https://colab.research.google.com>
- Backup plan: <https://jupyter.lai.gwu.edu>




Uploading Data (and doing other things) in Google Colab

Use "Code Snippets" (searchable!) →



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, tensorflow
Data Visualization (check out www.python-graph-gallery.com)	matplotlib bokeh ggplot (like ggplot2 in R) plotly (<- interactive) seaborn

To Learn More

- Kaggle: [kaggle.com/learn](https://www.kaggle.com/learn)
- learnpython.org
- [Software Carpentry](https://datacarpentry.org), [Data Carpentry](https://datacarpentry.org) (not just Python)
- docs.python.org/3/tutorial (and docs.python.org/)
- [GW Online: Get data off the ground with Python](https://www.gwu.edu/~geog441/courses/online/)
- [Upcoming Python workshops @ GW Libraries](https://www.gwu.edu/~geog441/courses/workshops/)
- LinkedIn learning [it.gwu.edu/linkedin-learning](https://www.linkedin.com/learning/it-gwu) courses
 - 84 Python, 4 Pandas
- More on Pandas: Pandas cookbook:
<https://github.com/jvns/pandas-cookbook>
 - <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/>

Contact us:

Coding Consultations (with Dan & colleagues):

go.gwu.edu/coding

Stats Appointments (with Stats grad students):

calendly.com/statistical-consulting-gw

Workshop Materials: go.gwu.edu/pyw

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