

# PROGRAMMING WITH PYTHON



**BUILD YOUR SKILLS**  
WORKSHOP SERIES

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

# Today's Instructors & Helpers

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**Materials:** [go.gwu.edu/pyw](https://go.gwu.edu/pyw)

# Today's Plan

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

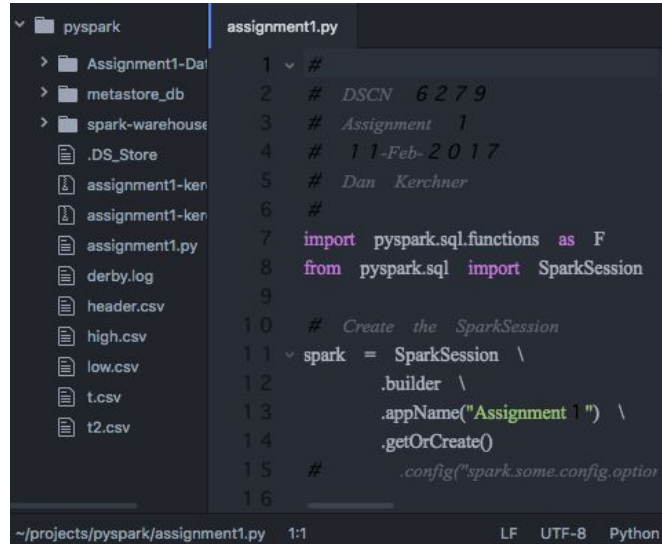
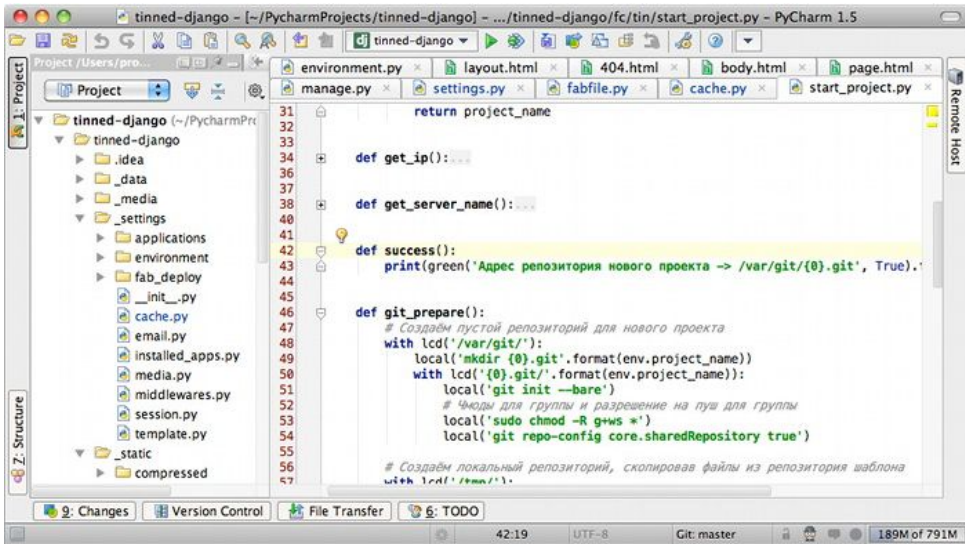


- Command line/REPL

```
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
  - others?

# Even more ways to use Python

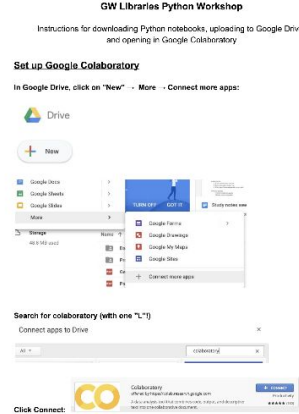
Anaconda = Python (and R) plus:

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



# Setup


- Google Colaboratory



<https://colab.research.google.com>

- 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](https://learnpython.org)
- [docs.python.org/3/tutorial](https://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](https://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](https://go.gwu.edu/coding)

**Stats Appointments (with Stats grad students):**

[calendly.com/statistical-consulting-gw](https://calendly.com/statistical-consulting-gw)

**Workshop Materials:** [go.gwu.edu/pyw](https://go.gwu.edu/pyw)