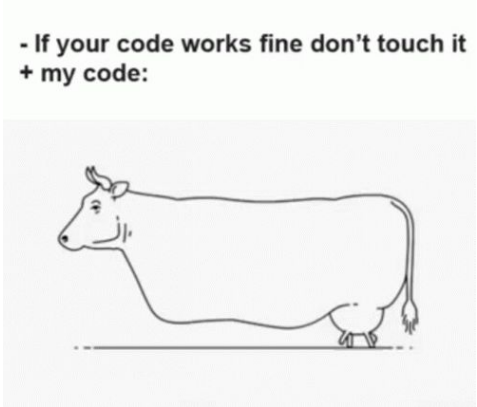
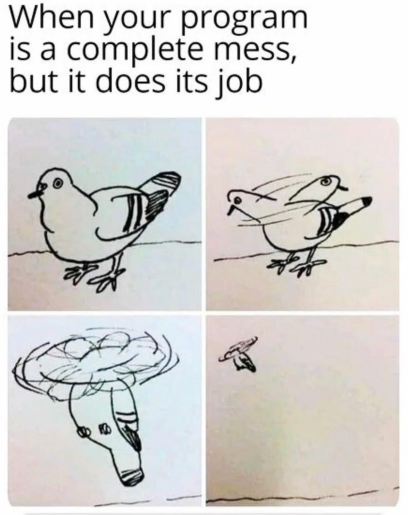


COGS 108 Week 2

FA23, A04/A07



Discussion slides and materials adapted from Sam Lau (TA: WI20)

Plan for Today

- Basic introductions
- Tools we will be using in COGS 108 (anaconda, jupyter, git/github)
- Github Demo

Your TA

Jason Chen

- First-year graduate student in Data Science
- B.S. in Cognitive Science and Neurobiology @ UCSD
- OH: Tue/Thu 4-5 pm (over Zoom)
- Email: xic007@ucsd.edu

A Little Bit About Yourself…

slido

How are you doing?

ⓘ Click **Present with Slido** or install our Chrome extension to activate this poll while presenting.

slido

What is your major?

ⓘ Click **Present with Slido** or install our Chrome extension to activate this poll while presenting.

slido

What is your level of Python proficiency?

ⓘ Click **Present with Slido** or install our Chrome extension to activate this poll while presenting.

Section Philosophy

- Attendance is not mandatory (but encouraged)
- Reasons to attend the discussion sessions:
  - Demos to help you set up and start working
  - Hands-on experience and personalized guidance
  - Time to practice technical aspects of the course
  - Discussion is not supposed to be a monologue – Please ask questions

Programming Basics

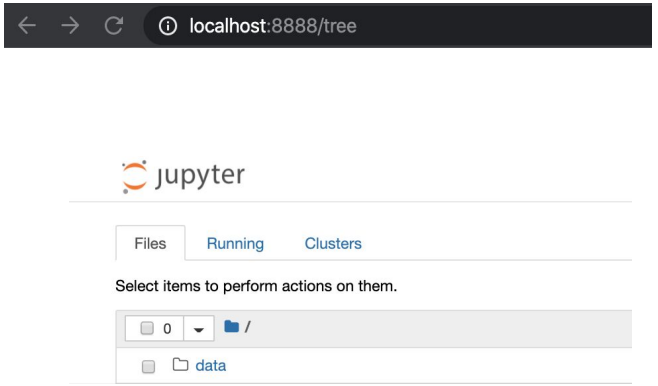
- This course assumes basic programming knowledge... but not much
- Resources:
  - codeacademy
  - Start Here: https://github.com/COGS108/Tutorials/blob/master/01-Python.ipynb
  - Python in detail: https://jakevdp.github.io/PythonDataScienceHandbook/
  - Pandas: https://www.dataschool.io/python-pandas-tips-and-tricks/
  - Git: https://guides.github.com/activities/hello-world/
  - Stack Overflow
- AI helper
  - ChatGPT (warning: DO NOT rely on it too much as it can slow you down from being a good programmer!!! Please refer to the syllabus for information about the use of LLM)

Anaconda

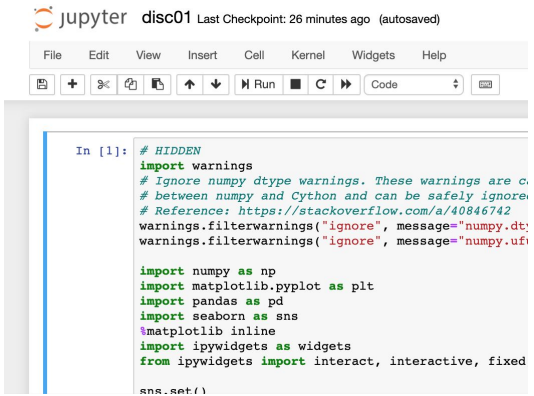
The Data Science Toolkit – contains Python and data science libraries (including jupyter notebooks)

- Download: https://www.anaconda.com/products/individual
- Installation: https://docs.anaconda.com/anaconda/install/
- Verify installation: https://docs.anaconda.com/anaconda/install/verify-install/
- Make sure anaconda is added to the system path: For mac: export PATH="/usr/local/anaconda3/bin:$PATH"

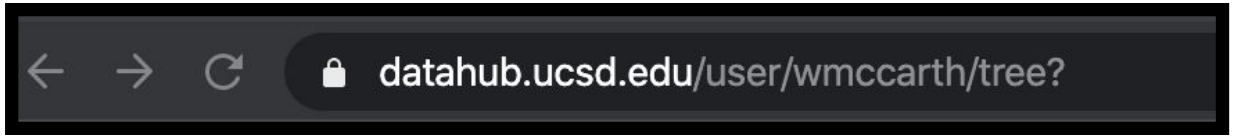
Jupyter



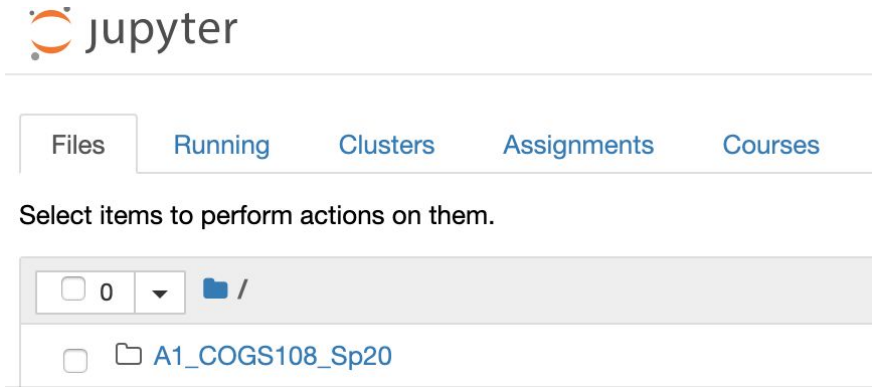
- Python code is run on a python interpreter
- Jupyter is a program that creates an interface for typing python code in a browser, that also runs that code in a python interpreter
- What does this mean?!
  - You can run python programs from a browser!



Datahub



- Datahub lets you interact with Jupyter remotely.
- What does this mean?!
  - You don't need to worry about installing Jupyter
  - You can use datahub to create and run python programs (online)
  - You can use this interface to fetch and submit assignments



Check Your Work (in general on datahub)

- The tests built into the notebook are (very) minimal.
  - To write your own tests, add a cell with assert statements below your code.
- Make sure to click Validate before turning in your notebook!
  - This replicates what our autograder will do.
  - Hidden tests on the autograder aren't validated.
- Don't click submit after deadline! (Your assignment will be marked as a late submission)

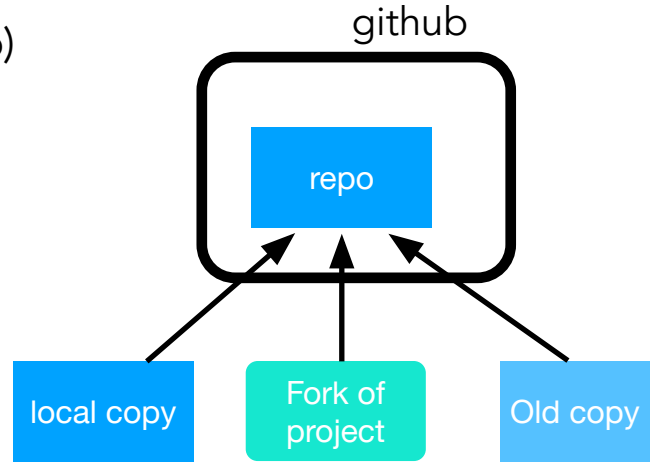
Git

Version control system!

- Go to https://git-scm.com/downloads
- Choose your Operating System (Windows/OS X/Linux)
- Follow the steps specific to your OS
- Verify installation: In terminal type “git –-version”

What is git + GitHub?

- Somewhere online to store a copy of a project (Github)
- Plus a tool to interact with this copy (Git)
  - Command line and desktop versions
- A way of keeping track of changes you make to this project
- Does everyone have a GitHub account?



Why use git + GitHub?

- **Collaboration:** Git allows you to work on code projects with other people. It's the preferred tool for many projects, like...
  - Python: https://github.com/python/cpython
  - Jupyter: https://github.com/jupyter/
  - COGS 108: https://github.com/COGS108/
- Backup
- Version control (*undo* on a large scale)
- Code reuse

Jupyter is NOT Good in Version Control

In [10]:

```
import numpy as np
import matplotlib.pyplot as plt

# Data for plotting
t = np.arange(0.0, 2.0, 0.01)
s = 1 + np.sin((5 * 2)* np.pi * t)

# Note that using plt.subplots below is equivalent to using
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ax.set(xlabel='time (s)', ylabel='voltage (mV)', title='Sine Wave')
ax.grid()
```
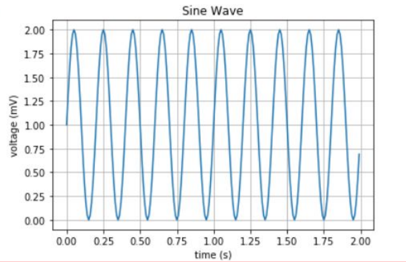

Out[10]:



This is what the plot looks like in GitHub:

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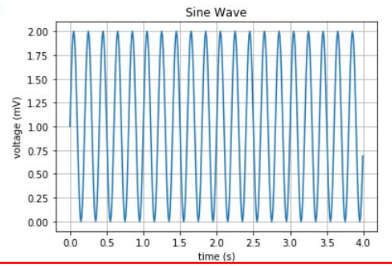

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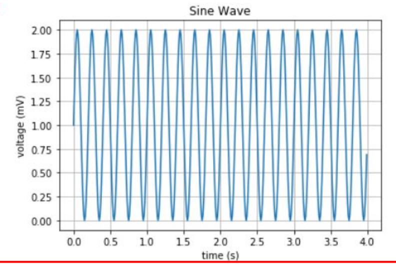

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FFFFFFFF

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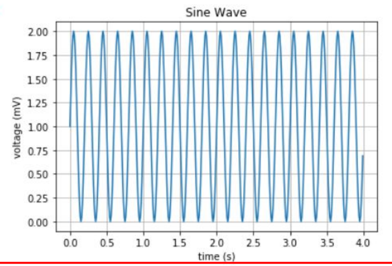

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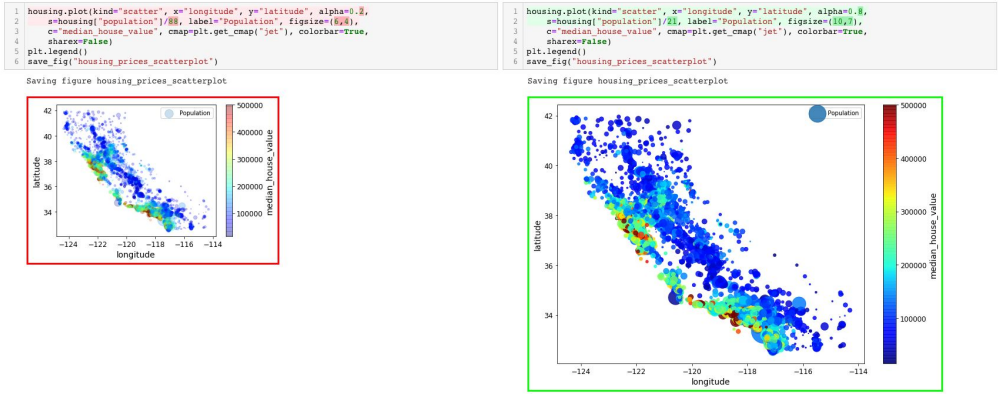
////////////////////////9/////3////////////////////+///9//"

When you have a lot of plots, your changes in git will be thousands-pages long… And it is impossible to tell what the differences are…

Source: https://nextjournal.com/schmudde/how-to-version-control-jupyter

How to Avoid This Issue?

- Clear your outputs before pushing back your notebook to GitHub. (You will only be able to see changes in your CODE)
- Use other GitHub Apps, like ReviewNB.
- This app will VISUALIZE the plots, instead of showing those nonsense words (Yay!)



Source: https://nextjournal.com/schmudde/how-to-version-control-jupyter

Demo of GitHub Repo and Commands

- Cloning a repo on your local machine
- Working on your local repo (making changes to files)
- Stage, commit and push these changes to your Github repo
- Commands you should know:
  - Git clone -This will download the latest version of the repo to your local PC
  - Git status (not really needed – but really helpful)
  - Git add - This adds the changes in the staging area
  - Git commit -m “” - This will save a “Snapshot” of your most recent changes
  - Git push - This will upload your local changes to your GitHub Repo
  - Git pull - This will update your local repo to the latest version which is on GitHub

A Few Reminders

- Lecture Quiz Q1 Due **TODAY 11:59 PM**
- Practice Assignment Due **Wednesday 11:59 PM**
- Pre-course Survey Due **Wednesday 11:59 PM**
- Discussion Lab D1 Due **Friday 11:59 PM**