Cjupyterhub

A "THING EXPLAINER"

OVERVIEW

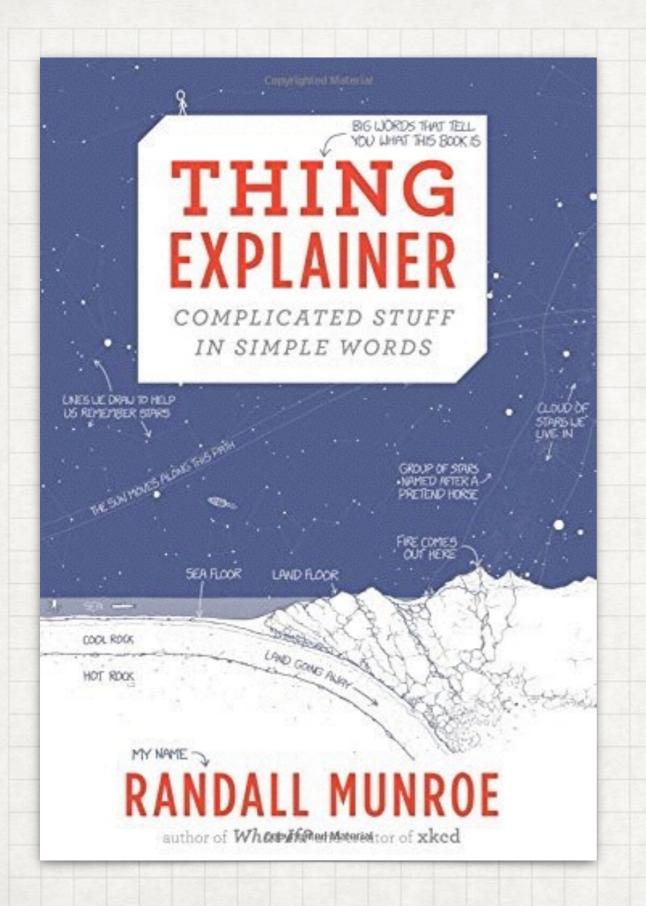
PyData Carolinas September 16, 2016

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http://bit.ly/jupyterhub-pdc



HAND COMPUTER

These machines began as radios for talking. As these machines turned into computers, out loud to people who were far away. Over they started taking the place of a lot of the years, they slowly became more and things we used to carry around-like picture more like computers.

takers, music players, and even books.

POWER KEY

SOCIOE

Later Block

の音型は同じ

B-0-111

40年4年

This turns the screen off if your head is near it, so you don't gress keys with your

FACE CHECKER

000000

POWER BOX

THE PARTY OF THE P

MAKER

EAR BIG PIECE HOLE

HOT SPOT TALKER

EXTRA MEMORY HOLDER

If your phone is storing too many memories for you (like pictures, sounds, and games), you can put a card here to give it more space. As computers and radios get feater, companies are holding more and more of your memories on their computers, and only

LOUD CONTROLS

TINY POWER GATE

Like other computers, almost Like other computers, almost every part of a hand computer is full of many different londs of power gates. This picture is used in maps of parts to meen "power gate"



These gates take in power from one line, and listen to another line to decide whether to let the power through or not. Computer brains are built by sticking these

games organize. There are a many power gates in a computer as there are people on Earth. Some of them are big and easy to see, but most of them are try and control very little power. The gates, I mean, not the people.

RADIO FEELER

HADRO PERLER
This part listens to the thin pieces of metal along the outside of the hand computer. When a radio message comes in, it makes power move in the metal. This thing listens and turns it into words.

POCKET MOVER

This piece of metal turns very fact to make the phone move. That way, if on get your attention without making teo much noise, (University sitting on a hard table; then it can make a lor of noise.)

Different parts of the hand computer, the the screen and the radio feelers, join up with the rest of the phone here when it gets put together.

CARD HOLDER

CARD HOLDER
This holds the card that lets
the phone sals to the world.
The phone works by using a
nado to talk to a company
that you say to carry your
metayes it uses this card
to tell them which hand
computer they're taking to.

SOUND UNDERSTANDER

RADIO TALKER

This tells the hand computer how to understand the words the company's radios send

DIRECTION EFFLER

FAST MEMORY

This part of the phone holds stuff the hend computer is stuff the hand computer is thinking about right now, like pages you're looking at or games plou're playing. The marriery goes away when the phone turns off.

RIG SOUND MAKER

This thing makes noise that you can hear even when your ear is far away from the

LISTENING BOX

This is a special thinking box that just listens for words. that just listers for words. Since it only does one thing, it use do it without as much power as the main thinking box would need. If a phone has this, you can make it listen for your worse all the time, not just when you press a key.

POWER CONTROLLER

UNDERSTANDING JUPYTERHUB

IN 1,000 (AND MAYBE A FEW MORE) COMMON WORDS



SIMPLE WRITER

WRITE LIKE UP GOER FIVE AND THING EXPLAINER

PUT WORDS HERE

https://xkcd.com/simplewriter/

THE NOBLEST PLEASURE IS THE JOY OF UNDERSTANDING.

— Leonardo da Vinci

99

UNDERSTANDING JUPYTERHUB LEONARDO MEETS THING EXPLAINER

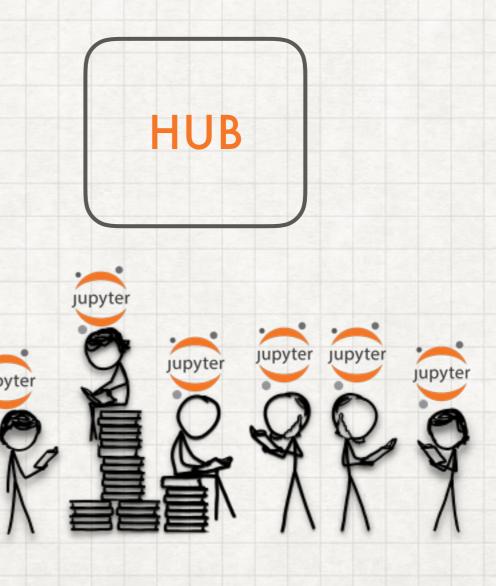
- WHAT THIS TALK IS A user friendly JupyterHub introduction
- WHAT IT IS NOT A deep dive architecture talk or a "hands on" workshop..though I will give you resources to these things along the way
- WHO Scientists, researchers, engineers, managers, teachers, you
- WHY Understanding the major parts that make up JupyterHub to help with planning, trial, and deployment



BASICS

Cjupyterhub

A WAY TO GIVE A
JUPYTER NOTEBOOK
SERVER TO EACH
PERSON IN A GROUP
OF PEOPLE.



WHAT IS A NOTEBOOK?

- Document
- Environment
- Web app

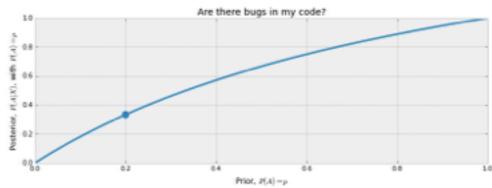
We have already computed P(X|A) above. On the other hand, $P(X|\sim A)$ is subjective: our code can pass tests but still have a bug in it, though the probability there is a bug present is reduced. Note this is dependent on the number of tests performed, the degree of complication in the tests, etc. Let's be conservative and assign $P(X|\sim A)=0.5$. Then

$$P(A|X) = \frac{1 \cdot p}{1 \cdot p + 0.5(1 - p)}$$
$$= \frac{2p}{1 + p}$$

This is the posterior probability. What does it look like as a function of our prior, $p \in [0, 1]$?

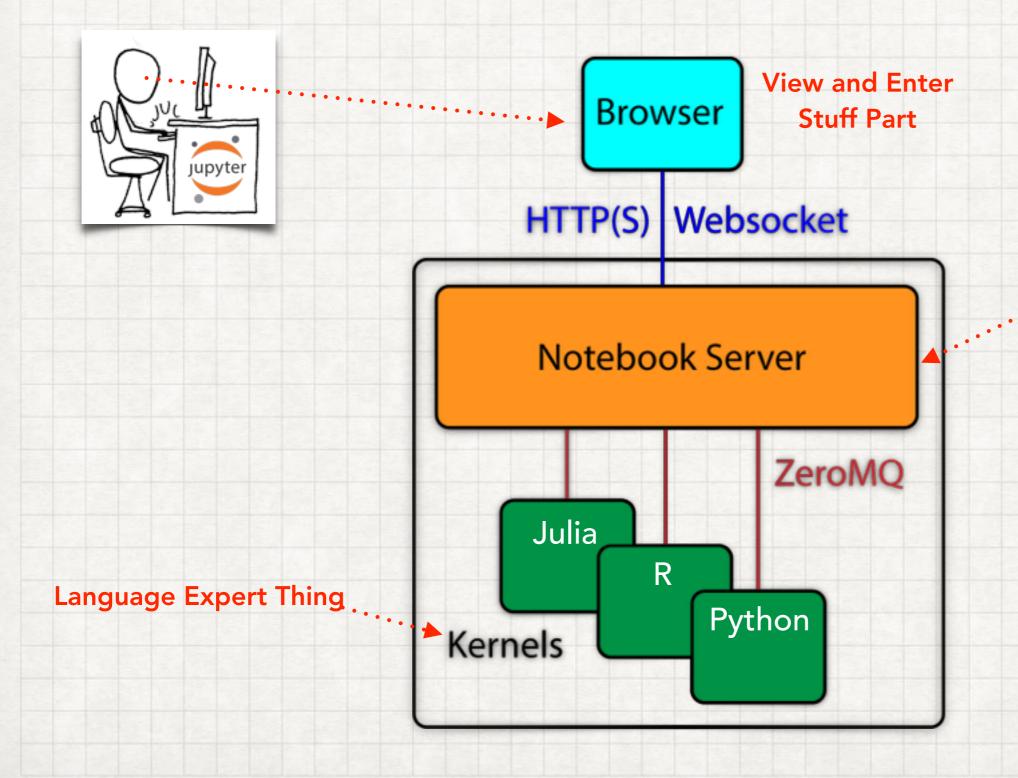
```
figsize(12.5, 4)
p = np.linspace(0, 1, 50)
plt.plot(p, 2 * p / (1 + p), color="#348ABD", lw=3)
# plt.fill_between(p, 2*p/(1+p), alpha=.5, facecolor=["#A60628"])
plt.scatte(0.2, 2 * (0.2) / 1.2, s=140, c="#348ABD")
plt.xlim(0, 1)
plt.xlim(0, 1)
plt.ylim(0, 1)
plt.xlabel("Prior, $P(A) = p$")
plt.ylabel("Posterior, $P(A|X)$, with $P(A) = p$")
plt.title("Are there bugs in my code?")
```

<matplotlib.text.Text at 0x1051de650>



https://github.com/CamDavidsonPilon/Probabilistic-Programming-and-Bayesian-Methods-for-Hackers

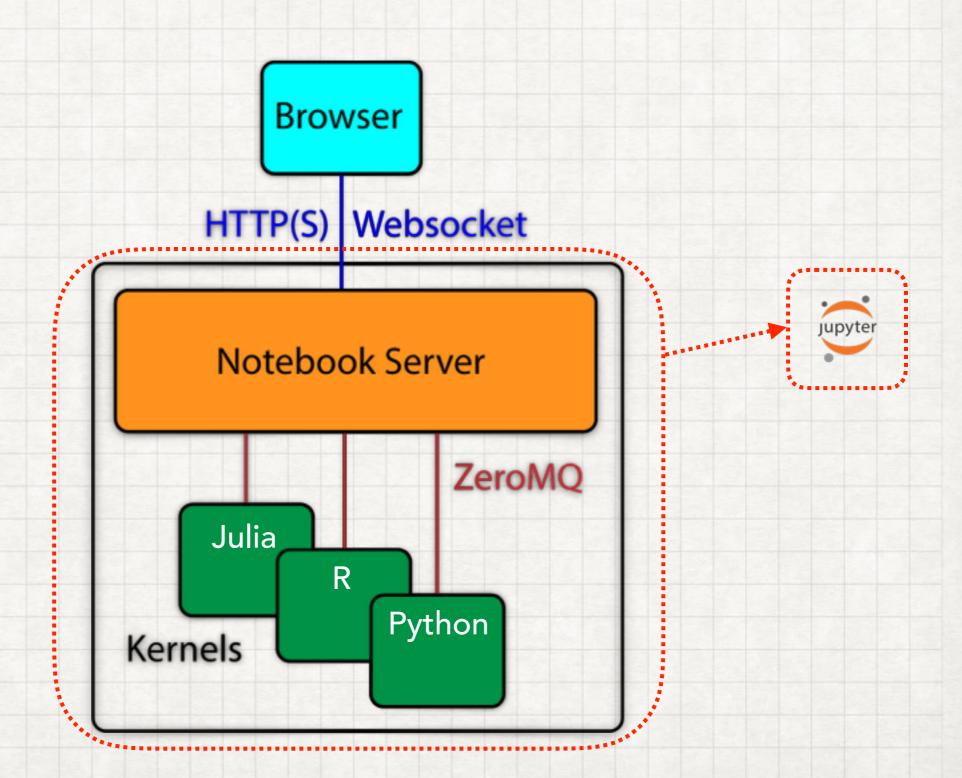
JUPYTER NOTEBOOK



Important Stuff
Organizer and
Doing Thing

A SINGLE USER JUPYTER NOTEBOOK SERVER

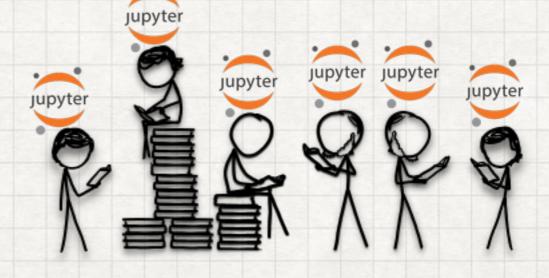




Cjupyterhub

A THING TO GIVE A
JUPYTER NOTEBOOK
SERVER
TO EACH PERSON IN
A GROUP OF PEOPLE.



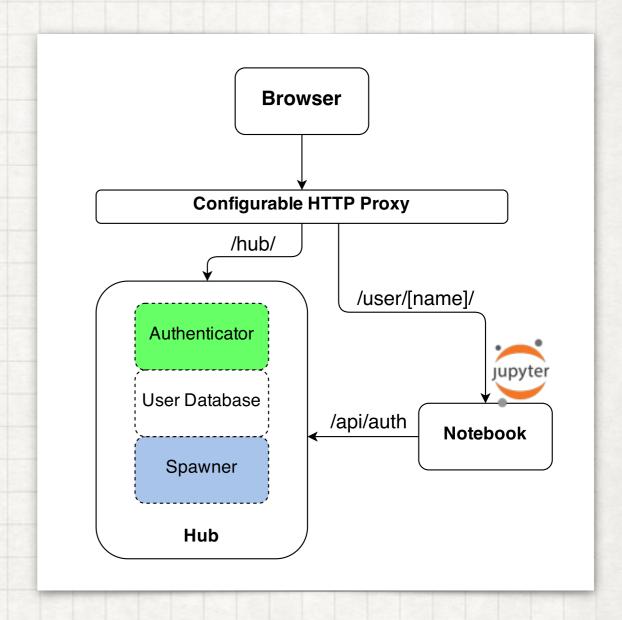




HOWIT WORKS

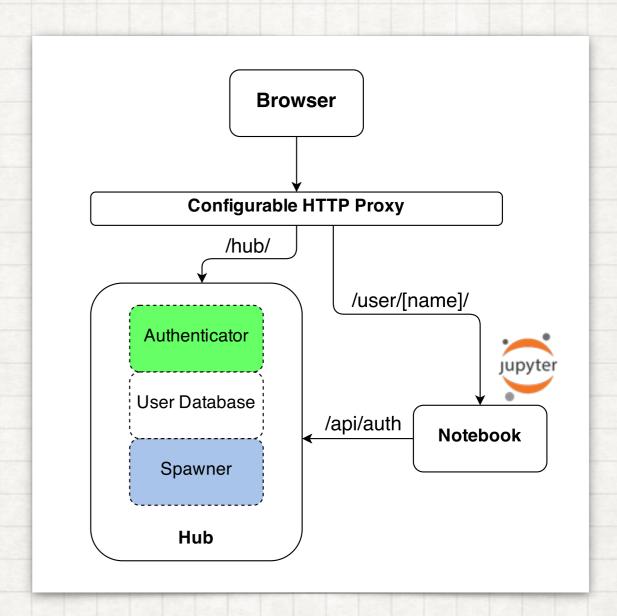
WHAT DOES THE HUB DO?

- Manages authentication
- Spawns single-user notebook servers on-demand
- Gives each user a complete notebook server



THE PARTS OF JUPYTERHUB

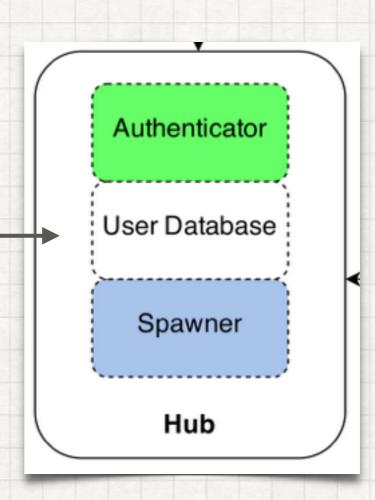
- Hub (User Database, Authenticator, Spawner)
- Users and their individual notebook servers
- Configurable HTTP Proxy



WHAT THE HUB CONTAINS

USER DATABASE

A PLACE TO KEEP
INFORMATION ABOUT PEOPLE
USING JUPYTERHUB



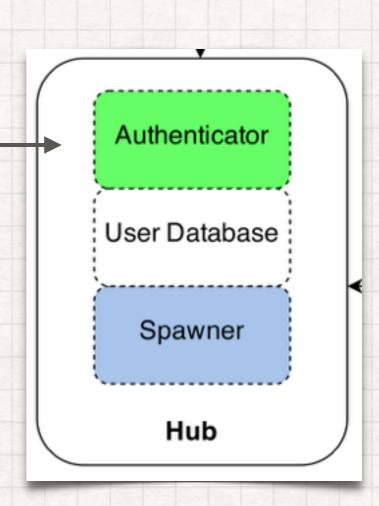
WHAT THE HUB CONTAINS

AUTHENTICATOR

A THING THAT CHECKS:

- IF A PERSON IS WHO THEY CLAIM TO BE
- IF THEY CAN USE THEIR

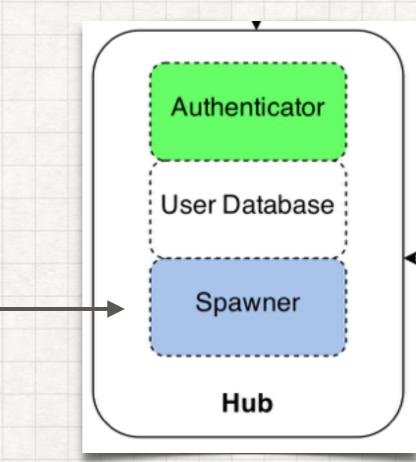
 JUPYTERHUB NOTEBOOK SERVER



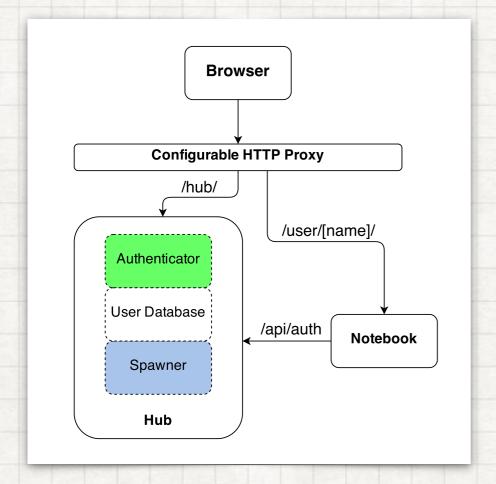
WHAT THE HUB CONTAINS

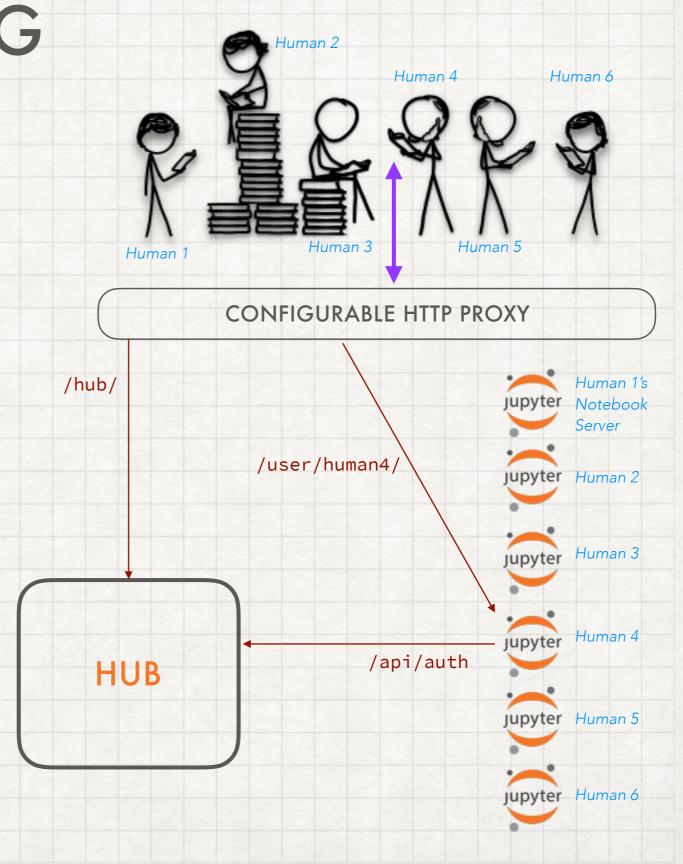
SPAWNER

A WORKER BEE THAT
MAKES JUPYTER NOTEBOOK
SERVERS FOR PEOPLE



UNDERSTANDING







WHEN SHOULD I USE IT?

When to use JupyterHub

- A class where students can do homework (nbgrader)
- A short-lived workshop, especially if installation is hard
- A research group with a shared workstation or small cluster
- On-site computing resources for researchers and analysts at an institution

When not to use JupyterHub

Remember: JupyterHub is Authenticated and Persistent.

- tmpnb: anonymous, ephemeral notebooks
- binder: tmpnb + GitHub repos
- SageMathCloud is hosted and provides realtime-collaboration



RESOURCES AND HELP

Reference Deployments

https://github.com/jupyterhub/jupyterhub-deploy-docker docker-compose, DockerSpawner, Hub in Docker

https://github.com/jupyterhub/jupyterhub-deploy-teaching ansible, no docker, nbgrader

Tutorial and Workshop

JupyterHub tutorial based on PyData London talk by Min Ragan-Kelley https://github.com/jupyterhub/jupyterhub-tutorial

JupyterHub mini-workshop

July 2016

https://github.com/jupyterhub/jupyterhub-2016-workshop

Help

JupyterHub Documentation http://jupyterhub.readthedocs.io/en/latest/index.html

All repos in jupyterhub organization on GitHub https://github.com/jupyterhub

Cjupyterhub

THANKS!

http://bit.ly/jupyterhub-pdc

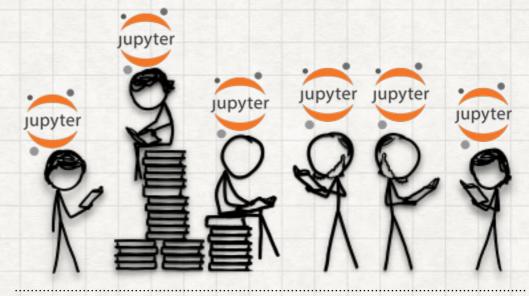
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A THING TO GIVE EACH PERSON THEIR OWN SHINY JUPYTER NOTEBOOK SERVER

Attribution

- xkcd https://xkcd.com/license.html
- Leonardo da Vinci. BrainyQuote.com, Xplore Inc, 2016. http://www.brainyquote.com/quotes/quotes/l/leonardoda154285.html, accessed August 12, 2016.
- https://xkcd.com/simplewriter/
- https://xkcd.com/386/
- PyData London Talk by Min Ragan-Kelley, Thomas Kluyver, and Kyle Kelly

JUPYTERLAB PREVIEW

- Repo: https://github.com/jupyter/jupyterlab
- Preview GIF https://raw.githubusercontent.com/jupyter/jupyterlab/master/jupyter-plugins-demo.gif
- Prerequisite: Jupyter notebook 4.2+
- Install (conda):
 conda install -c conda-forge jupyterlab
- Install (pip):
 pip install jupyterlab
 jupyter serverextension enable --py jupyterlab --sys-prefix
- Run: jupyter lab