

Getting started instructions for JupyterLab

These instructions will follow the documentation for [anaconda](#) and [jupyter](#).

JupyterLab is an integrated development environment (IDE) through which most of this course will be run. With it, you can run or edit scripts, such as the prerequisite material Jupyter notebooks you've been given.

Anaconda is a widely-used package management system that makes it easy to install and organize data science packages. The distribution includes Python and Jupyter (and much more), which is the easiest way to get started with them.

Connect to the JupyterHub (all students)

All students should request access to the JupyterHub prior to the first day of class. This is our safeguard to streamline learning in case of troubleshooting issues. To request access to the hub go to <http://bcmb.timplab.org/> and select “Signup!”.

The image shows a screenshot of a web-based sign-in interface. At the top, there is an orange header bar with the text "Sign In". Below this, there are two input fields: one for "Username" and one for "Password". Both fields have placeholder text ("Username:" and "Password:" respectively). To the right of the password field is a small icon showing a lock with a keyhole. Below these fields is an orange "Sign In" button. At the bottom of the form, there is a link in blue text that reads "Don't have an account? [Signup!](#)". A thick red arrow points from the left towards this "Signup!" link.

Please create a username and password and click “Create User”.

Sign Up

Username: 

Password: 


Create User 

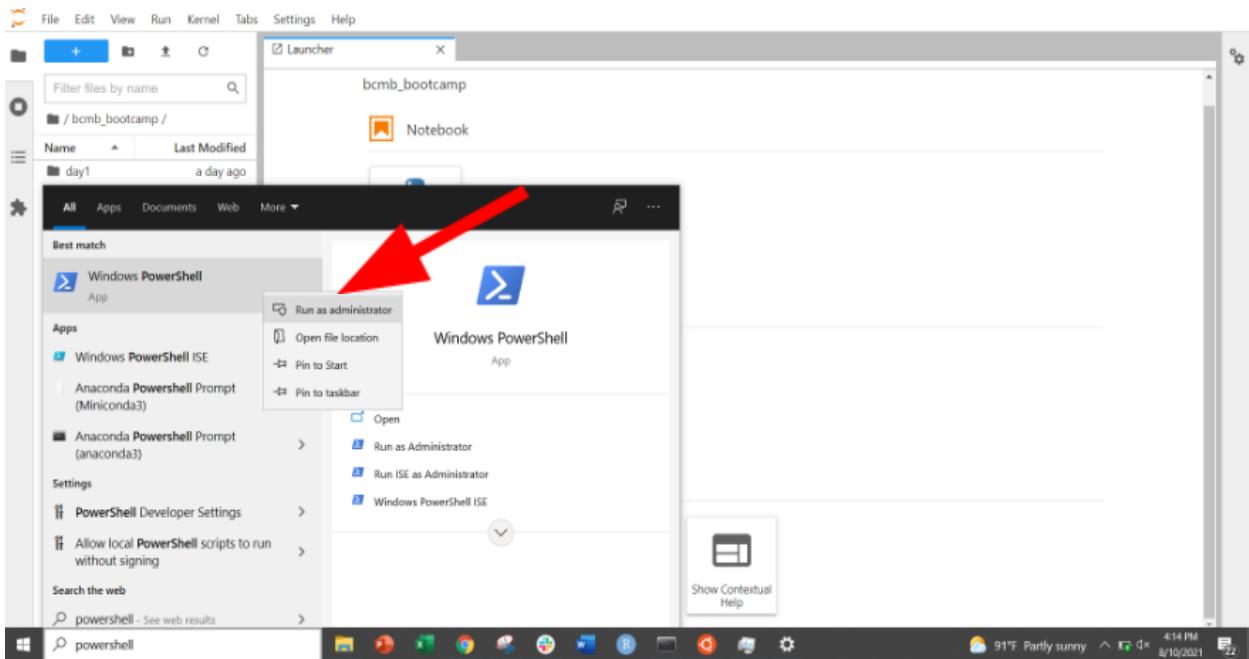
Already have an account? [Login!](#)

Access to the hub will not be instantaneous as we have to authorize each user so please allow 1-2 days before attempting to log in.

Installation on Windows 10

NOTE: If you cannot install Windows Subsystem for Linux, either because you are on an older version of Windows or because the install was not successful, you will have access to the cloud instance during the course to complete the exercises. However, we think it will benefit you in the future to have the coding environments set up on your own machines.

1. To be fully able to complete the exercises that utilize **Bash**, you'll need to install [Windows Subsystem for Linux](#). Follow the manual installation steps at <https://docs.microsoft.com/en-us/windows/wsl/install-win10#manual-installation-steps>.
For our purposes, WSL version 1 is just fine, so complete steps 1 and 6.
 - o WSL requires Windows 10, so if you are stuck on an older version, skip this installation. For step 6, choose Ubuntu 20.04 (the most recent supported release).
 - o For step 1, to run Windows PowerShell as administrator, search for PowerShell in the Start menu. Then right-click and select “Run as administrator”.



- For step 6, once you create a username and password, you are ready to move onto the next step. As you type in your password, it may not show up on the screen, but it is still typing!

NOTE: WSL has a reputation for being difficult to install, so if **after troubleshooting** you are unable to complete the installation, skip to “Installation on Windows < 10”.

2. Now that you have Ubuntu, you’ll need to install Anaconda on it. Follow the installation instructions at <https://www.emilykauffman.com/teaching/install-anaconda-on-wsl>
 - For step 1, you’ve already completed this.
 - For step 3, the file will end in `Linux-x86_64.sh`. Be sure to choose the most recent version **for Linux**, then right-click and “copy link address”.
 - For step 4, type `wget` into the **Ubuntu** terminal and then paste (with a right-click). “Wget” is a common way to download files from the web via the terminal.
 - For step 7, if prompted, you do not need to install VS Code.
3. Anaconda will automatically build with JupyterLab. Open **Ubuntu** terminal and start JupyterLab with the following command, and copy the URL into your browser.

```
(base) jared@myComputer:~$ jupyter lab
```

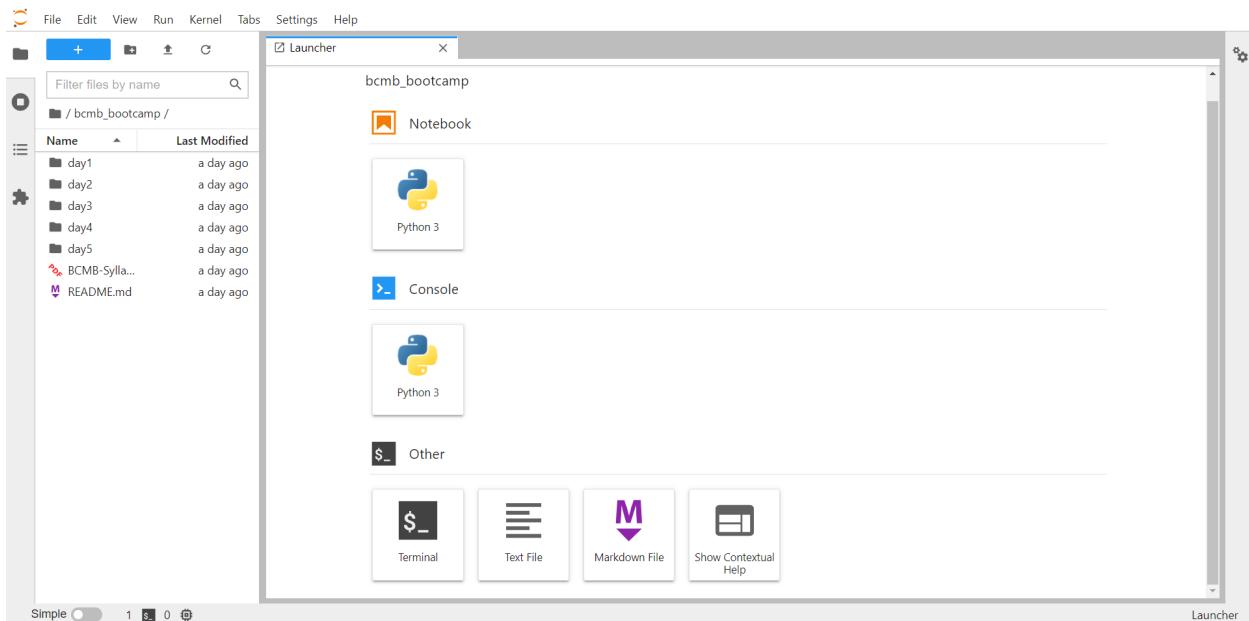
NOTE: By default, the “Home” directory in the file navigator will be your Ubuntu home directory. To open Jupyter with access to your Windows files (such as the prerequisite notebooks) specify the `--notebook-dir` argument. The Windows file system is mounted (located) under

/mnt/c/Users/{yourUsername}. It is up to you if you want work out of your Windows file system or the Linux file system. For example, to work out of Windows, the Jupyter command would look like this:

```
(base) jared@myComputer:~$ jupyter lab --notebook-dir /mnt/c/Users/{yourUsername}/{Path_to_notebook}
```

```
[base] augustin_lab@Goffs-iMac:~$ jupyter lab
[I 2021-08-10 17:51:12.928 ServerApp] jupyterlab | extension was successfully linked.
[W 2021-08-10 17:51:12.943 ServerApp] Cannot bind to localhost, using 127.0.0.1 as default ip
  [Errno 49] Can't assign requested address
[I 2021-08-10 17:51:12.944 ServerApp] Writing notebook server cookie secret to /Users/augustin_lab/Library/Jupyter/runtime/jupyter_cookie_secret
[I 2021-08-10 17:51:13.168 ServerApp] nbclassic | extension was successfully linked.
[I 2021-08-10 17:51:13.197 LabApp] JupyterLab extension loaded from /Users/augustin_lab/anaconda3/lib/python3.8/site-packages/jupyterlab
[I 2021-08-10 17:51:13.197 LabApp] JupyterLab application directory is /Users/augustin_lab/anaconda3/share/jupyter/lab
[I 2021-08-10 17:51:13.200 ServerApp] jupyterlab | extension was successfully loaded.
[I 2021-08-10 17:51:13.202 ServerApp] nbclassic | extension was successfully loaded.
[I 2021-08-10 17:51:13.203 ServerApp] Serving notebooks from local directory: /Users/augustin_lab
[I 2021-08-10 17:51:13.203 ServerApp] Jupyter Server 1.4.1 is running at:
[I 2021-08-10 17:51:13.203 ServerApp] http://127.0.0.1:8888/lab?token=618160ff0785b06a23b77356b38a0f743273e0f80325d31e
[I 2021-08-10 17:51:13.203 ServerApp] or http://127.0.0.1:8888/lab?token=618160ff0785b06a23b77356b38a0f743273e0f80325d31e
[I 2021-08-10 17:51:13.203 ServerApp] Use Control-C to stop this server and shut down all kernels (twice to skip confirmation).
[C 2021-08-10 17:51:13.217 ServerApp]

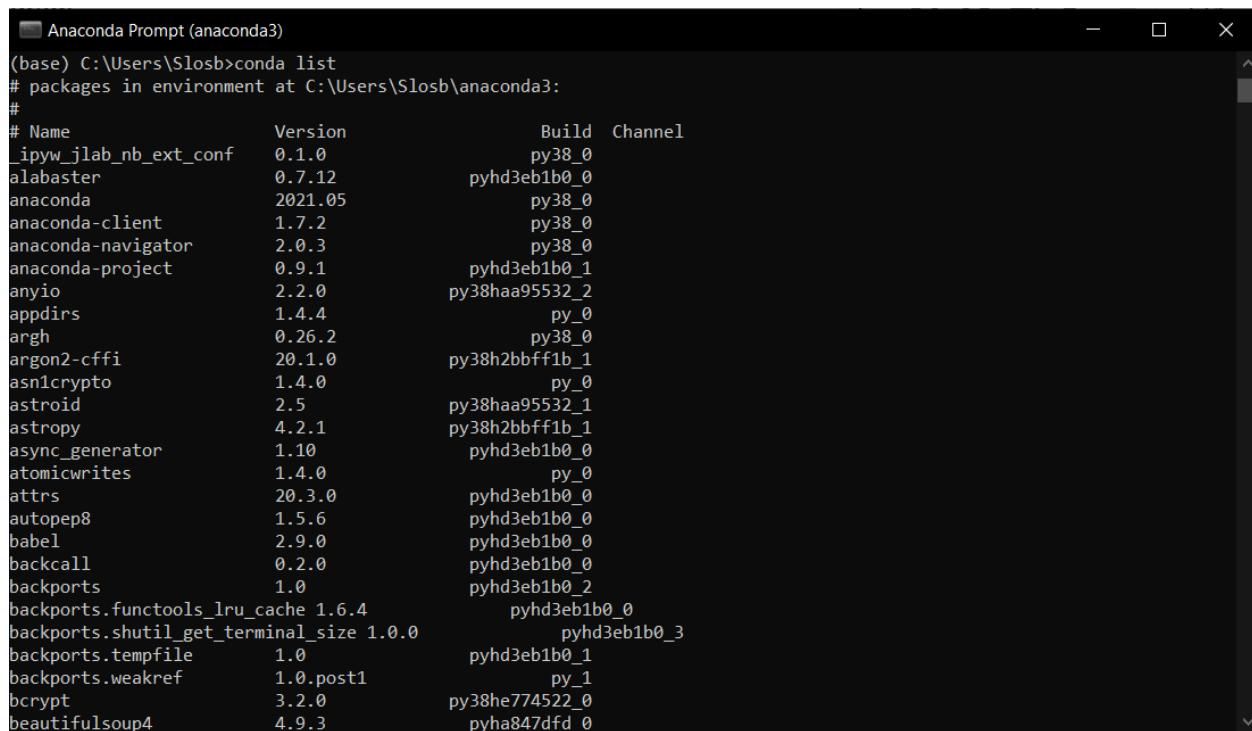
To access the server, open this file in a browser:
  file:///Users/augustin_lab/Library/Jupyter/runtime/jpserver-58769-open.html
Or copy and paste one of these URLs:
  http://127.0.0.1:8888/lab?token=618160ff0785b06a23b77356b38a0f743273e0f80325d31e
  or http://127.0.0.1:8888/lab?token=618160ff0785b06a23b77356b38a0f743273e0f80325d31e
```



Installation on Windows <10

NOTE: If you only need to install JupyterLab (e.g. if you already use miniconda), follow the install instructions at <https://jupyter.org/install>. Otherwise start at Step 1

1. Follow Anaconda Individual Edition download and installation instructions at <https://docs.anaconda.com/anaconda/install/windows/>
 - o For step 8, you do **not** need to add Anaconda to PATH.
 - o For step 12, you do **not** need to install PyCharm.
2. Follow verification instructions at
<https://docs.anaconda.com/anaconda/install/verify-install/>



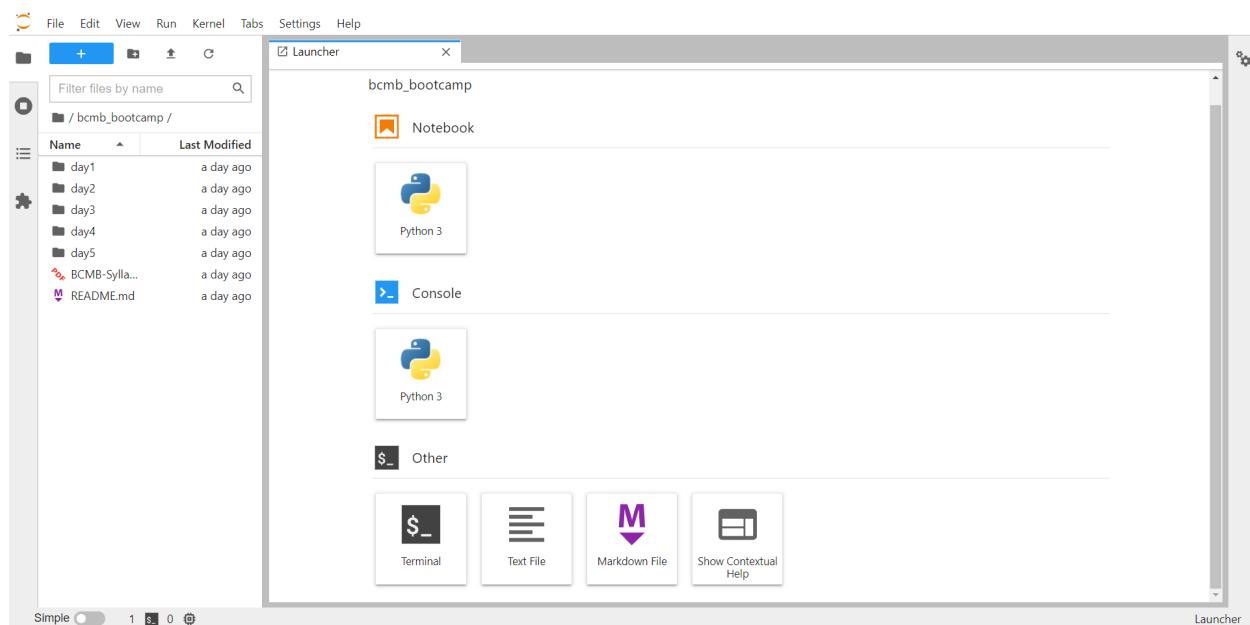
```
(base) C:\Users\Slosb>conda list
# packages in environment at C:\Users\Slosb\anaconda3:
#
# Name           Version        Build  Channel
_ipyw_jlab_nb_ext_conf  0.1.0            py38_0
alabaster         0.7.12           pyhd3eb1b0_0
anaconda          2021.05          py38_0
anaconda-client    1.7.2            py38_0
anaconda-navigator 2.0.3            py38_0
anaconda-project   0.9.1           pyhd3eb1b0_1
anyio              2.2.0           py38haa95532_2
appdirs             1.4.4            py_0
argh                0.26.2           py38_0
argon2-cffi       20.1.0          py38h2bbff1b_1
asn1crypto          1.4.0            py_0
astroid              2.5           py38haa95532_1
astropy             4.2.1           py38h2bbff1b_1
async_generator     1.10           pyhd3eb1b0_0
atomicwrites        1.4.0            py_0
attrs                20.3.0          pyhd3eb1b0_0
autopep8            1.5.6           pyhd3eb1b0_0
babel                2.9.0           pyhd3eb1b0_0
backcall             0.2.0           pyhd3eb1b0_0
backports            1.0            pyhd3eb1b0_2
backports.functools_lru_cache 1.6.4      pyhd3eb1b0_0
backports.shutil_get_terminal_size 1.0.0      pyhd3eb1b0_3
backports.tempfile    1.0           pyhd3eb1b0_1
backports.weakref     1.0.post1        py_1
bcrypt               3.2.0           py38he774522_0
beautifulsoup4       4.9.3           pyha847dfd_0
```

3. Anaconda will automatically build with JupyterLab. Open the **anaconda prompt (not the command prompt or PowerShell)** and start JupyterLab with the following command, and copy the URL into your browser. It should also automatically open, but it might be in Microsoft Edge.

```
(base) C:\Users\Jared> jupyter lab
```

```
(base) C:\Users\Slosb>jupyter lab
[I 2021-08-09 12:25:34.722 ServerApp] jupyterlab | extension was successfully linked.
[W 2021-08-09 12:25:34.751 ServerApp] The 'min_open_files_limit' trait of a ServerApp instance expected an int, not the NoneType None.
[I 2021-08-09 12:25:34.824 LabApp] JupyterLab extension loaded from C:\Users\Slosb\anaconda3\lib\site-packages\jupyterlab
[I 2021-08-09 12:25:34.825 LabApp] JupyterLab application directory is C:\Users\Slosb\anaconda3\share\jupyter\lab
[I 2021-08-09 12:25:34.833 ServerApp] jupyterlab | extension was successfully loaded.
[I 2021-08-09 12:25:35.447 ServerApp] nbclassic | extension was successfully loaded.
[I 2021-08-09 12:25:35.448 ServerApp] Serving notebooks from local directory: C:\Users\Slosb
[I 2021-08-09 12:25:35.448 ServerApp] Jupyter Server 1.4.1 is running at:
[I 2021-08-09 12:25:35.451 ServerApp] http://localhost:8888/lab?token=922fa5ccc6570c81f19e85208685dc88b5de33899dedece7
[I 2021-08-09 12:25:35.452 ServerApp] or http://127.0.0.1:8888/lab?token=922fa5ccc6570c81f19e85208685dc88b5de33899dedece7
[I 2021-08-09 12:25:35.452 ServerApp] Use Control-C to stop this server and shut down all kernels (twice to skip confirmation).
[C 2021-08-09 12:25:35.575 ServerApp]

To access the server, open this file in a browser:
  file:///C:/Users/Slosb/AppData/Roaming/jupyter/runtime/jpserver-17840-open.html
Or copy and paste one of these URLs:
  http://localhost:8888/lab?token=922fa5ccc6570c81f19e85208685dc88b5de33899dedece7 ←
  or http://127.0.0.1:8888/lab?token=922fa5ccc6570c81f19e85208685dc88b5de33899dedece7
```



Installation on MacOS/Linux

NOTE: If you only need to install JupyterLab (e.g. if you already use miniconda) , follow the install instructions at <https://jupyter.org/install>.

1. Follow Anaconda Individual Edition installation instructions for your OS at <https://docs.anaconda.com/anaconda/install/>, after downloading from <https://www.anaconda.com/products/individual>
 - On MacOS, we recommend downloading the Command Line Installer, which you can find at the bottom of the second link.
 - For step 3, replace the version with the version of Anaconda you downloaded. For example, as of August 13th, 2021, the most recent version is 2021.05, so:

```
(base) jared@myComputer:~$ bash ~/Downloads/Anaconda3-2021.05-MacOSX-x86_64.sh
```

- Install to the default directory
2. Follow verification instructions at <https://docs.anaconda.com/anaconda/install/verify-install/>

```
(base) augustin_lab@Goffs-iMac:~$ conda list
# packages in environment at /Users/augustin_lab/anaconda3:
#
# Name           Version        Build  Channel
_ipyw_jlab_nb_ext_conf 0.1.0            py38_0
alabaster       0.7.12          pyhd3eb1b0_0
anaconda        2021.05          py38_0
anaconda-client 1.7.2            py38_0
anaconda-navigator 2.0.3          pyhd3eb1b0_1
anaconda-project 0.9.1          py38hecd8cb5_1
anyio           2.2.0            py38hecd8cb5_1
appdirs          1.4.4            py_0
applaunchservices 0.2.1            py_0
appnope         0.1.2            py38hecd8cb5_1001
appscript        1.1.2            py38h9ed2024_0
argh             0.26.2          py38_0
argon2-cffi     20.1.0          py38h9ed2024_1
asn1crypto      1.4.0            py_0
astroid          2.5              py38eccd8cb5_1
astropy         4.2.1            py38h9ed2024_1
async_generator 1.10             pyhd3eb1b0_0
atomicwrites    1.4.0            py_0
attrs            20.3.0          pyhd3eb1b0_0
autopenp8        1.5.6            pyhd3eb1b0_0
babel            2.9.0            pyhd3eb1b0_0
backcall         0.2.0            pyhd3eb1b0_0
backports        1.0              pyhd3eb1b0_2
backports.functools_lru_cache 1.6.4
backports.shutil_get_terminal_size 1.0.0
backports.tempfile 1.0            pyhd3eb1b0_1
backports.wekref 1.0.post1       py_1
beautifulsoup4   4.9.3            pyha847df1_0
bitarray         1.9.2            py38h9ed2024_1
bkcharts          0.2              py38_0
black            19.10b0          py_0
blas             1.0              mkl
bleach           3.3.0            pyhd3eb1b0_0
blosc            1.21.0          h2842e9f_0
bokeh            2.3.2            py38hecd8cb5_0
boto              2.49.0          py38_0
bottleneck      1.3.2            py38hf1f0d96c_1
brotlipy        0.7.0            py38h9ed2024_1003
bz2p2            1.0.8            h1de35cc_0
c-ares           1.17.1          h9ed2024_0
ca-certificates 2021.4.13       hecd8cb5_1
certifi          2020.12.5       py38hecd8cb5_0
cffi              1.14.5          py38h2125817_0
chardet          4.0.0            py38hecd8cb5_1003
click             7.1.2            pyhd3eb1b0_0
cloudpickle     1.6.0            py_0
clyent           1.2.2            py38_1
colorama         0.4.4            pyhd3eb1b0_0
conda            4.10.1          py38hecd8cb5_1
conda-build      3.21.4          py38hecd8cb5_0
conda-content-trust 0.1.1          pyhd3eb1b0_0
conda-env        2.6.0            1
conda-package-handling 1.7.3          py38h9ed2024_1
conda-repo-cli   1.0.4            pyhd3eb1b0_0
conda-token      0.3.0            pyhd3eb1b0_0
```

4. Anaconda will automatically build with JupyterLab. Open the **Terminal** and start JupyterLab with the following command, and copy the URL into your browser. It should automatically in Safari, which is also okay.

```
(base) jared@myComputer:~$ jupyter lab
```

```
[base] augustin_lab@Goffs-iMac:~$ jupyter lab
[I 2021-08-10 17:51:12.928 ServerApp] jupyterlab | extension was successfully linked.
[W 2021-08-10 17:51:12.943 ServerApp] Cannot bind to localhost, using 127.0.0.1 as default ip
[Errno 49] Can't assign requested address
[I 2021-08-10 17:51:12.944 ServerApp] Writing notebook server cookie secret to /Users/augustin_lab/Library/Jupyter/runtime/jupyter_cookie_secret
[I 2021-08-10 17:51:13.168 ServerApp] nbclassic | extension was successfully linked.
[I 2021-08-10 17:51:13.197 LabApp] JupyterLab extension loaded from /Users/augustin_lab/anaconda3/lib/python3.8/site-packages/jupyterlab
[I 2021-08-10 17:51:13.197 LabApp] JupyterLab application directory is /Users/augustin_lab/anaconda3/share/jupyter/lab
[I 2021-08-10 17:51:13.200 ServerApp] jupyterlab | extension was successfully loaded.
[I 2021-08-10 17:51:13.202 ServerApp] nbclassic | extension was successfully loaded.
[I 2021-08-10 17:51:13.203 ServerApp] Serving notebooks from local directory: /Users/augustin_lab
[I 2021-08-10 17:51:13.203 ServerApp] Jupyter Server 1.4.1 is running at:
[I 2021-08-10 17:51:13.203 ServerApp] http://127.0.0.1:8888/lab?token=618160ff0785b06a23b77356b38a0f743273e0f80325d31e
[I 2021-08-10 17:51:13.203 ServerApp] or http://127.0.0.1:8888/lab?token=618160ff0785b06a23b77356b38a0f743273e0f80325d31e
[I 2021-08-10 17:51:13.203 ServerApp] Use Control-C to stop this server and shut down all kernels (twice to skip confirmation).
[C 2021-08-10 17:51:13.217 ServerApp]

To access the server, open this file in a browser:
  file:///Users/augustin_lab/Library/Jupyter/runtime/jpserver-58769-open.html
Or copy and paste one of these URLs:
  http://127.0.0.1:8888/lab?token=618160ff0785b06a23b77356b38a0f743273e0f80325d31e ←
  or http://127.0.0.1:8888/lab?token=618160ff0785b06a23b77356b38a0f743273e0f80325d31e
```

