

# Python and the Jupyter Notebook

## Installation of Python

We recommend the Anaconda distribution from Continuum Analytics.

Installation:

<https://www.continuum.io/downloads>

You should install the version for **Python 3.5**.

## The Jupyter Notebook Intro

Although you can write code in a text editor and run it at the command line, it's simpler and more fun to use the Jupyter Notebook, which runs in your web browser. You will also use the Notebook to do your homework.

Use this video for an overview of how to use the notebook – The notebook was formerly called the IPython notebook, but the main functionality is the same as described here around minute 4.30+ (You can skip ahead):

<https://www.youtube.com/watch?v=IsXXIYVBt1M&list=PL5-da3qGB5ICeMbQuqbbCOQWcS6OYBr5A&index=2>

You can also review this:

<https://nbviewer.jupyter.org/github/ipython/ipython/blob/3.x/examples/Notebook/Notebook%20Basics.ipynb>

## Starting a Notebook Server

You can launch the notebook from the Anaconda Navigator. It will open the notebook browser window in your User directory (your "root" top level directory, where all your folders start).

If you have an error doing this, or want to start it FROM ANOTHER FOLDER, you can open a terminal window or CMD window (on Windows), navigate to a new directory/folder, and type this:

```
jupyter notebook
```

It will start the notebook Home in your browser in this folder.

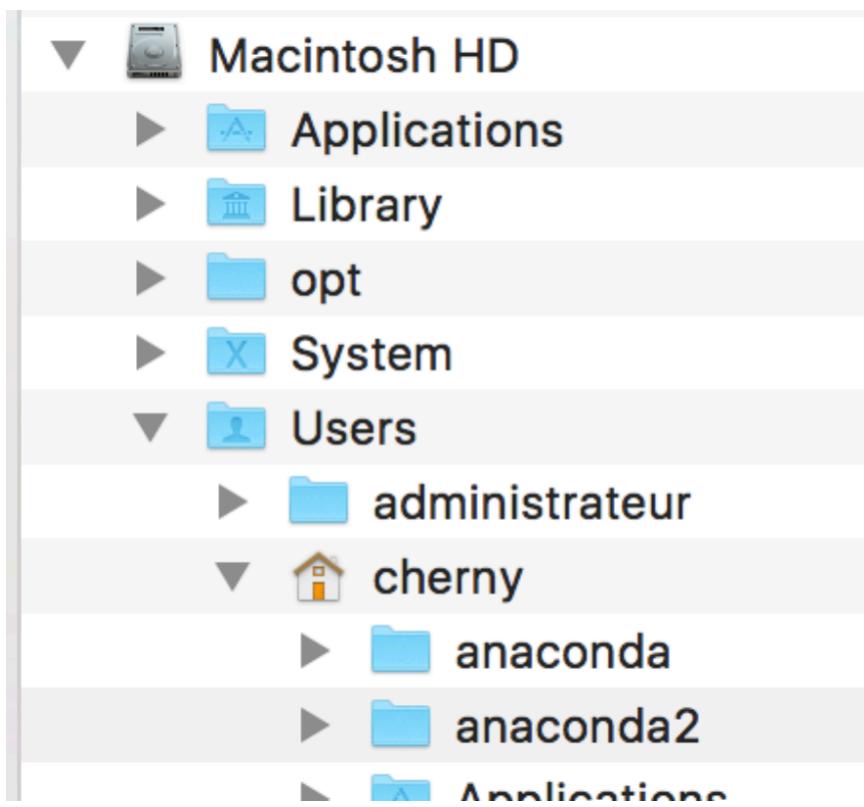
```
(pandasnlp) MAC20085:week1 cherny$ jupyter notebook
[I 10:34:14.960 NotebookApp] [nb_conda_kernels] enabled, 8 kernels found
[I 10:34:15.561 NotebookApp] The port 8888 is already in use, trying another port.
[I 10:34:15.627 NotebookApp] [nb_anacondacloud] enabled
[I 10:34:15.633 NotebookApp] [nb_conda] enabled
[I 10:34:15.705 NotebookApp] ✓ nbpresent HTML export ENABLED
[W 10:34:15.705 NotebookApp] ✗ nbpresent PDF export DISABLED: No module named 'nbrowserpdf'
[I 10:34:15.709 NotebookApp] Serving notebooks from local directory: /Users/cherny/Documents/France-PandasNLP/week1
[I 10:34:15.709 NotebookApp] 0 active kernels
[I 10:34:15.709 NotebookApp] The Jupyter Notebook is running at: http://localhost:8889/
[I 10:34:15.709 NotebookApp] Use Control-C to stop this server and shut down all kernels (twice to skip confirmation).
```

Leave this window alone until you are ready to shut down the notebooks, after saving them.... Then use Control-C (twice) to close the notebook server.

You cannot use this window for anything else while it is running the notebook. If you shut this window, it will stop the notebook server and you may lose some work unless you have saved it recently (using the save icon on top of the notebook toolbar).

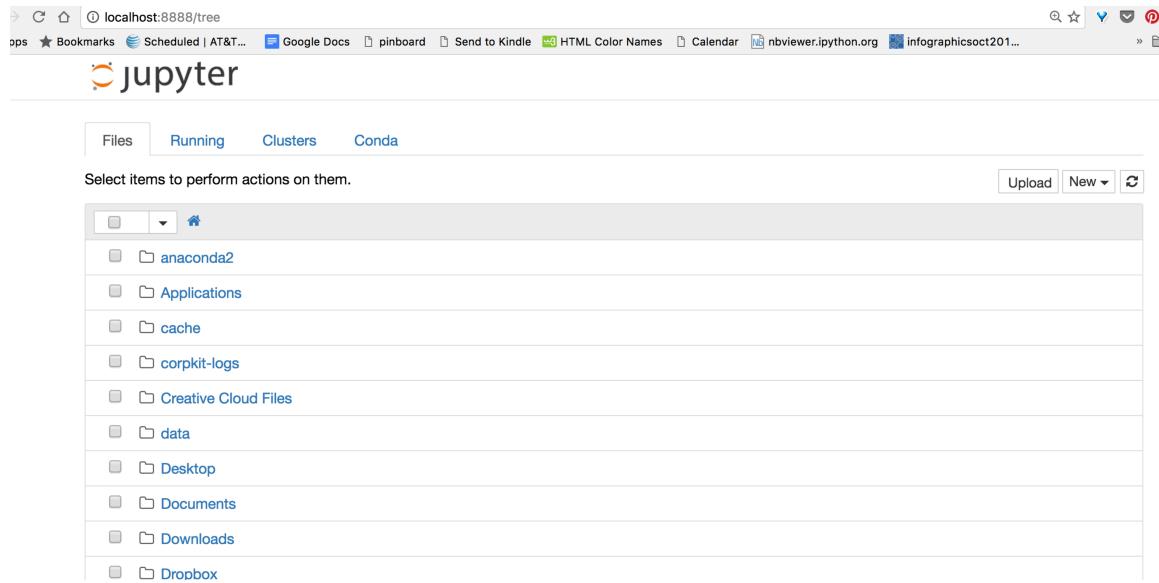
## Finding a Notebook and Opening It

If you start the notebook from the Anaconda Navigator, it will show you the list of folders ("directories") at the top of your User Directory, to start with. If you need to find the User directory on your machine, try clicking on your hard drive, and finding USER or Users, and your name under it. On my Mac, it's here where you see "cherny" and the house icon:



I dragged the house to my favorites to make it easier to find it.

When you start up the notebook, you will see a tab in your browser showing the contents of the current folder (usually your top level directory under "Users"). It might look like this:



Each of those folder icons can be clicked on to navigate to a new location.

Wherever you are when you click the NEW button to create a new notebook is the location that notebook will be saved in.

The notebook will show your folders and files based on where you start it from. You can click on a folder name (or create one using the NEW button) to navigate to where you want to save your notebook.

This is also how you will find your notebooks for the homework assignments.

Here I have navigated into the course file and here is the Week1 notebook:



Files

Running

Clusters

Conda

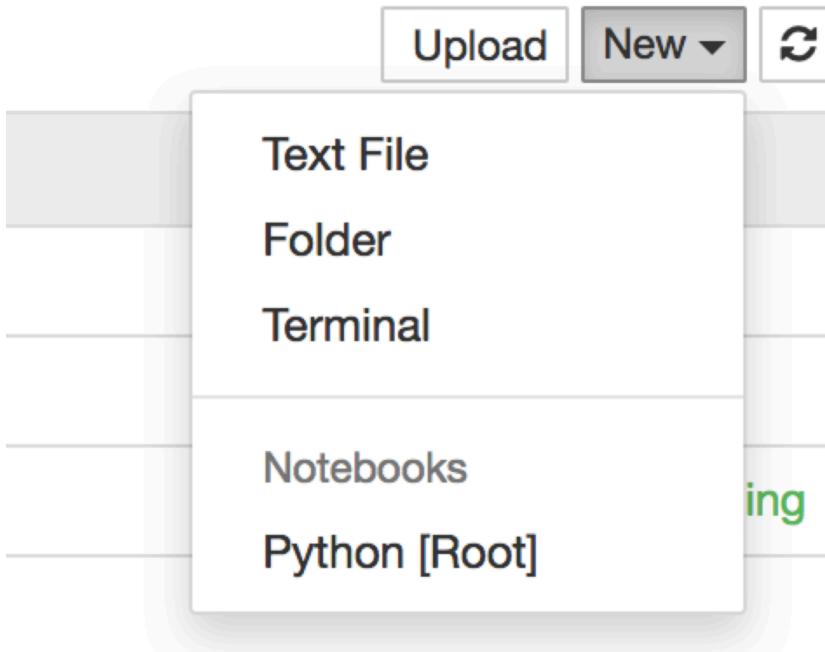
Select items to perform actions on them.

A screenshot of the Jupyter Notebook interface. At the top, there's a navigation bar with tabs for 'Files', 'Running', 'Clusters', and 'Conda'. Below the navigation bar, a message says 'Select items to perform actions on them.' A sidebar on the left shows a file tree: a root folder with a 'Course Intro and Review.ipynb' file, a 'Week1 Lesson.ipynb' file, and a 'Notebook Tips! PLEASE READ.pdf' file. The path 'Documents / France-PandasNLP / week1' is displayed above the files.

- ..
- Course Intro and Review.ipynb
- Week1 Lesson.ipynb
- Notebook Tips! PLEASE READ.pdf

### Create a New Notebook

Create a new notebook using the NEW button on the right side – pick Python [root]:



## Using the Notebook for Code

- Add a new “cell” to the notebook with the + icon



- “Run” or evaluate a cell by clicking in the cell and pressing SHIFT-ENTER (at the same time) (it will display any results and create a new empty cell).
- To see values of variables or print, you can either put a variable alone in a cell and execute it, or use a “print(var)” statement (replacing “var” with the name of your variable). In this example, we defined var as the string of characters “hi” and then we checked it by using 2 methods, evaluating it in a cell (2, which has the output below in “Out[2]”) and by printing it (3).

```
In [1]: var = "hi"
```

```
In [2]: var
```

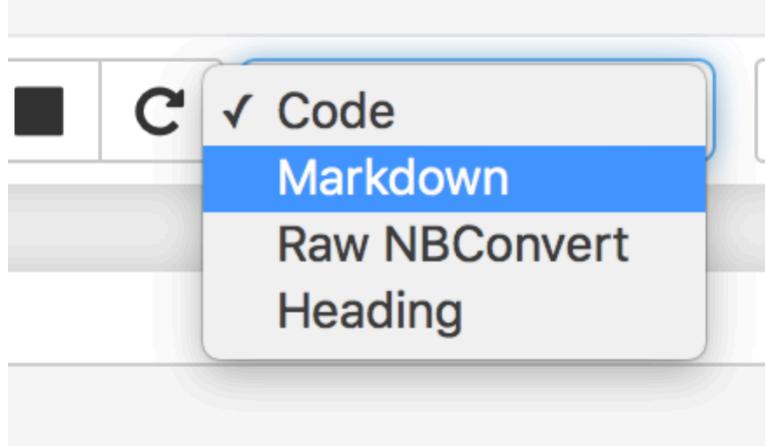
```
Out[2]: 'hi'
```

```
In [3]: print(var)
```

```
hi
```

## Text Cells in the Notebook

You can create text in the notebook too. For example, do this by typing “Question 1” in a new cell, and then changing the type at the top using the dropdown menu that shows “Code” by default:



After you evaluate this cell using markdown (or Heading), you will see it change into plain text:

## Question 1



### Changing the name of the Notebook file

You will use the notebook for the homework assignments. Change the UNTITLED name of the notebook to name it following this template:

FAMILYNAMEfirstname\_Week1 – like this:

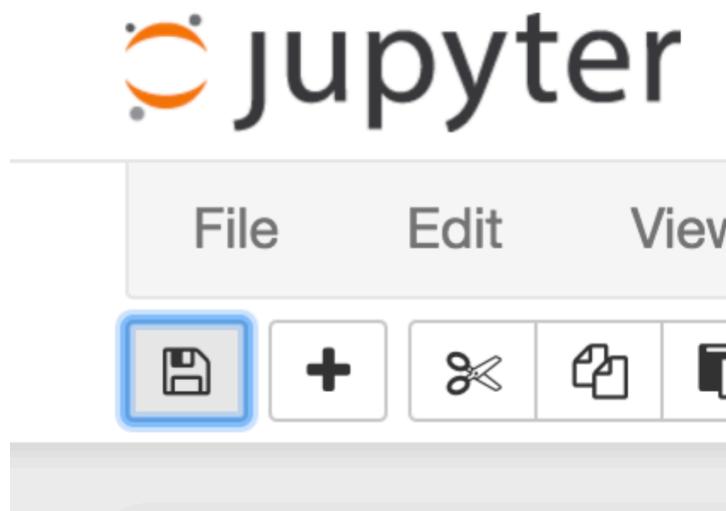
## Rename Notebook

Enter a new notebook name:

CHERNYLynn\_Week1

### The Notebook Files You Turn In

Save your work using the save button on the notebook toolbar:



DO NOT SAVE THE NOTEBOOK FILE FROM THE WEB BROWSER FILE MENU.

The notebook, when you save it, will be a file ending in “**.ipynb**”. You will submit this as your homework each week.

If you started the notebook from the Anaconda dialog, your notebook files will be in the root directory for your operating system. If you navigated into a folder before you opened the file or created it, it will be in the directory you navigated to.

The root directory, if you did not navigate somewhere, is your folder under “Users” and “User”.

On Windows, this is wherever your User directory is. Click on your C drive and navigate to it. Look for the files that end with “.ipynb” at the end.

On Mac, this is probably the top of your Users directory too. Use the finder to navigate.

Upload the .ipynb file to the Dropbox.

## **Installing Python Packages**

If you get an error during import, it means a package isn’t installed yet.

Open a terminal window. It must be a **new terminal window** (“nouvelle fenetre”) not the one that is showing the code for the notebook that is running....

For instance, try “conda install seaborn”:

```
MAC20085:~ cherny$ conda install seaborn
Fetching package metadata .....
Solving package specifications: .....
Package plan for installation in environment /Users/cherny/miniconda3:
The following packages will be downloaded:

  package          | build
  -----|-----
  libpng-1.6.22      0        225 KB
  freetype-2.5.5     1        734 KB
  pyparsing-2.1.4    py35_0    72 KB
  cycler-0.10.0      py35_0    11 KB
  matplotlib-1.5.3   np111py35_1  6.1 MB
  pandas-0.19.2      np111py35_0  8.4 MB
  seaborn-0.7.1      py35_0    282 KB
  -----
                                         Total: 15.7 MB
```

The following NEW packages will be INSTALLED:

```
cycler: 0.10.0-py35_0
freetype: 2.5.5-1
libpng: 1.6.22-0
matplotlib: 1.5.3-np111py35_1
mkl: 11.3.3-0
numpy: 1.11.2-py35_0
pandas: 0.19.2-np111py35_0
pyparsing: 2.1.4-py35_0
scipy: 0.18.1-np111py35_0
seaborn: 0.7.1-py35_0
```

Proceed ([y]/n)? y

Type “y” and it will install for you.

Now you will be able to “import seaborn” when we need it.

If a “conda install <packagename>” fails... you can try “pip install <packagename>” instead. The packages may not all be listed in the conda online repository, but most of them are in “pip.” We prefer conda because they work best with Anaconda.

