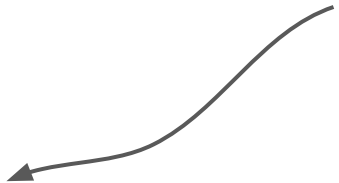
Python

...and Anaconda and Jupiter

Python

- Python, a quick introduction
- Anaconda
- Jupyter Notebooks
- The Basics of Python
  - Numbers, strings, functions, etc.
- Exercises



Refer to document on Blackboard

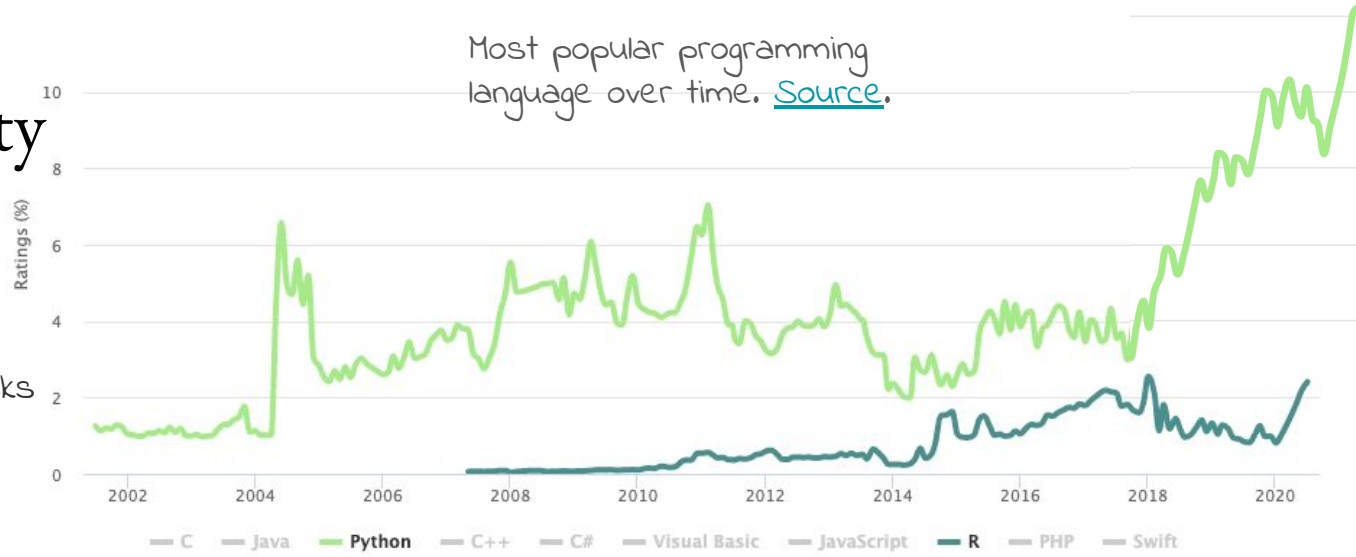
Python, a quick introduction

- Released in 1991
- General purpose language, i.e. not developed for a specific purpose
  - Ordinary software development
  - Web frameworks
  - Web scraping
  - Scientific computing
  - Text and image processing
- Consistently ranked in the top ten most popular programming languages
  - July, 2021: 3rd most popular language (behind Java and C)
  - In trend continues, Python may as well be the most popular programming language next year 📈
  - Sidenote: R went from 8th position to 12th position since July, 2020 📉

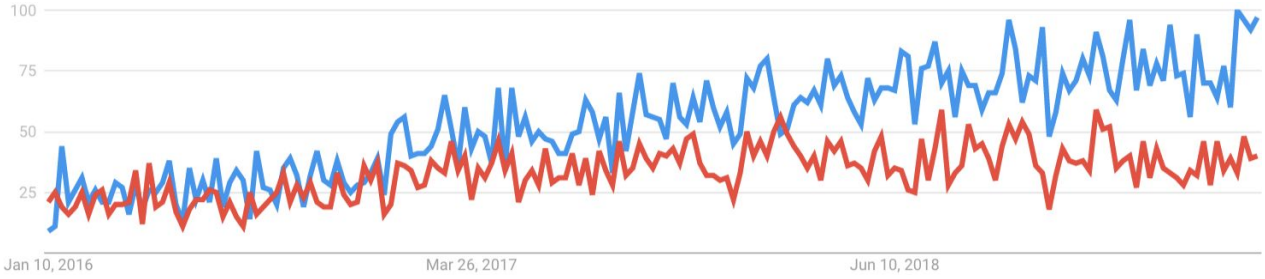
Python Popularity

"Python seems to have the best chances to become number 1, thanks to its market leadership in the booming field of data mining and artificial intelligence."

Most popular programming language over time. Source.



Google search-term trends:
"Python data science"
"R data science"



Check out this article for a comparison of Python & R.

Anaconda: Installation

- Anaconda is a python distribution
  - Aims to provide everything you need (python wise) for data science “out of the box”.
  - Conda uses environments to handle different versions of Python and Python packages.
- Installation
  - Follow instructions.
- Getting started
  - Follow this slide deck.
  - Follow and/or understand the walk-through follow Getting Started With Conda.
- Having trouble?
  - Try out YouTube tutorials on installation.
  - Ask fellow students.

Anaconda: Environments

You should use environments to avoid configuring your root (default, also called `base`) environment.

To create an environment, open your terminal and type:

```
conda create --name iidsp python=3.7
```

Feel free to replace "`iidsp`" with any other environment name.

When conda asks you to proceed, type `y`: `proceed ([y]/n)?`

This creates the environment. This environment uses the specified version of Python (3.7). Most recent is ~3.9, but we will stick with 3.7 for now.

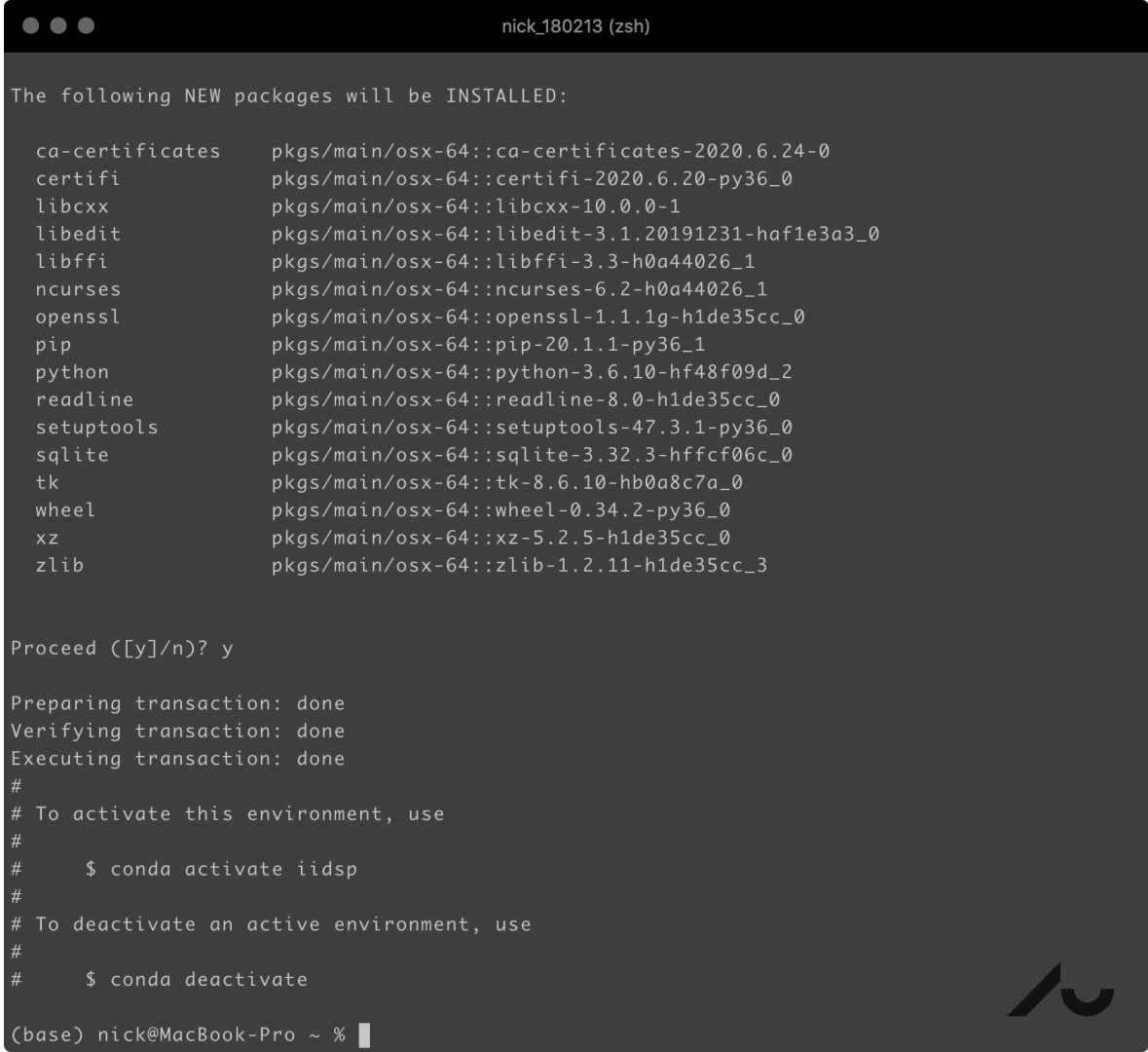
Anaconda: Environments

Verify that the new environment was installed correctly by [listing all environments]:

```
conda info --envs
```

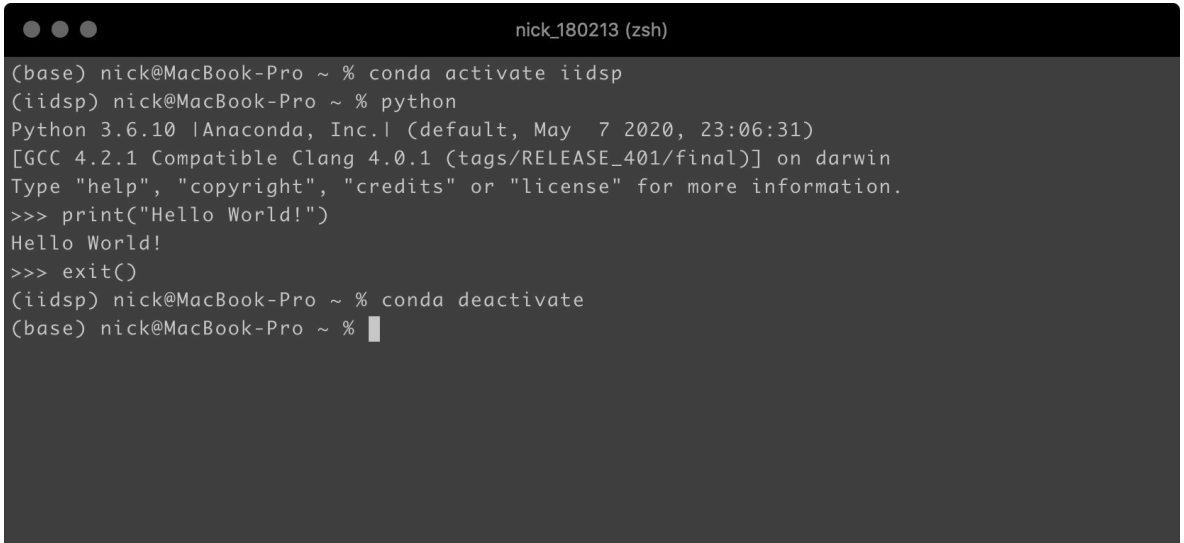
Activate an environment:

```
conda activate iidsp
```



Anaconda: Environments

From inside an environment, we can execute (run) Python scripts. In this following example, we activate an environment, write a Python print statement (a function that prints a string), and finally the environment is exited by deactivating.



Anaconda: Jupyter Notebook

Jupyter Notebooks is a great tool for learning and executing Python.

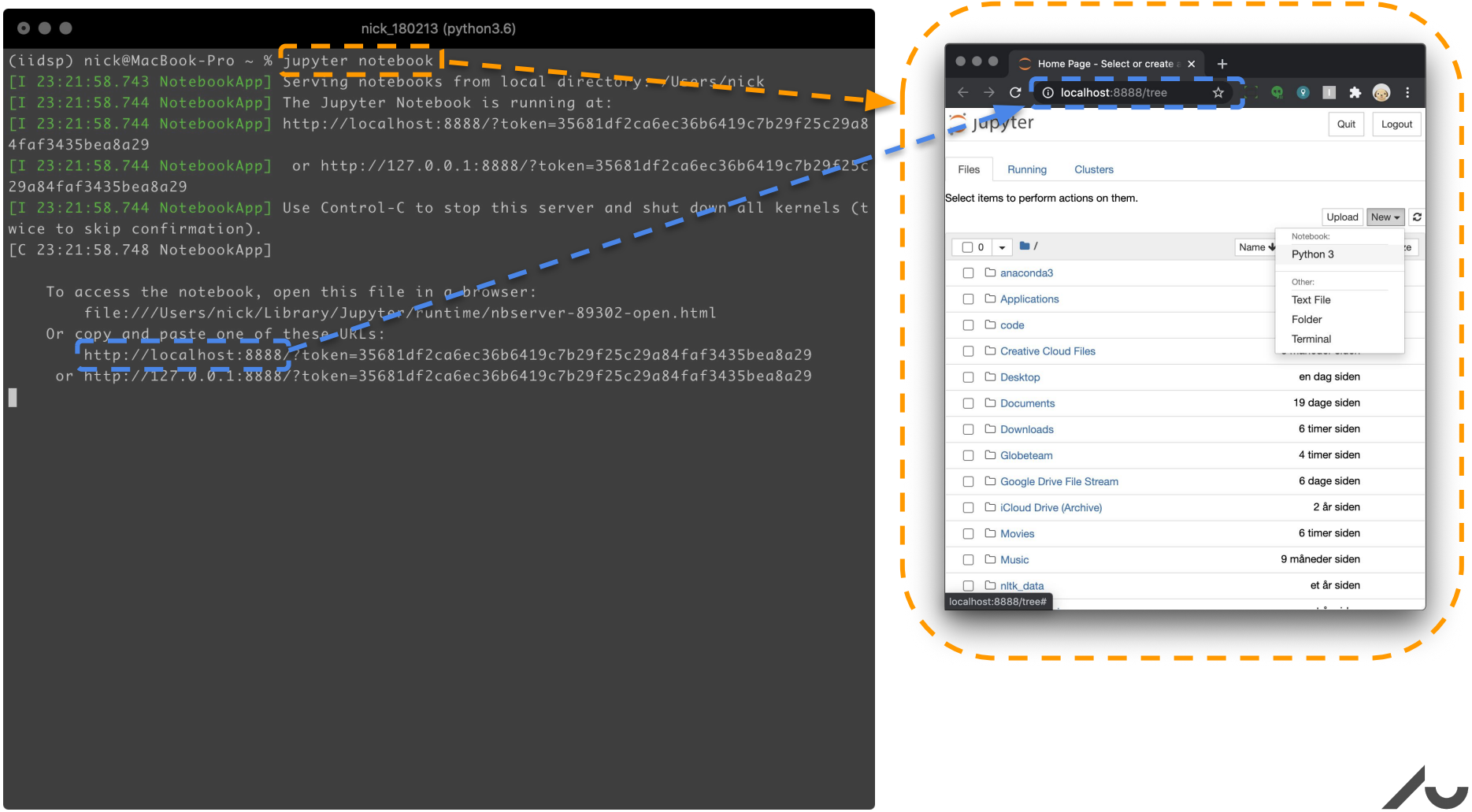
Install Jupyter using the following command **from within the new environment** using:

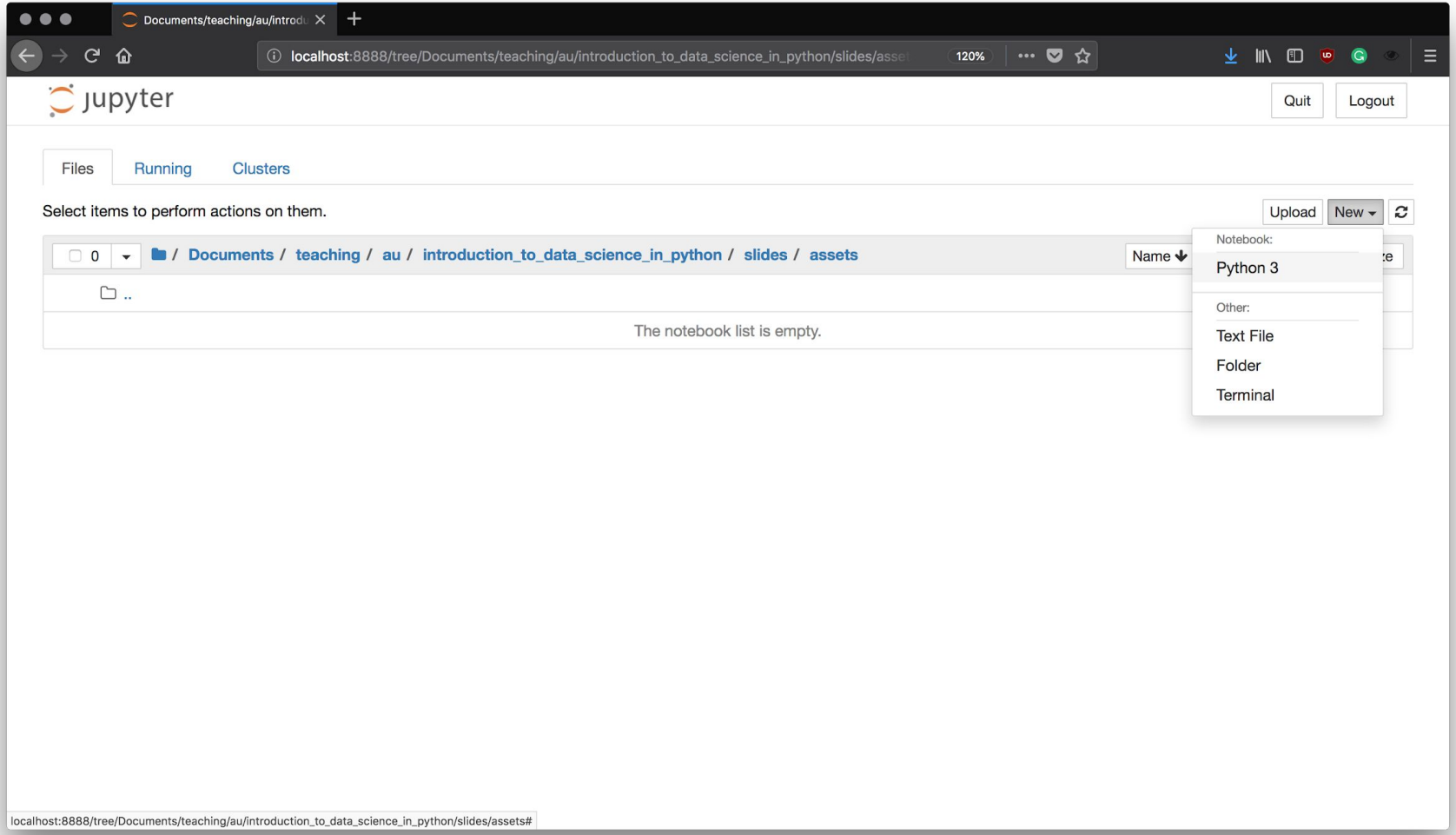
```
conda install jupyter
```

Run the Jupyter Notebook App from within the new environment using:

```
jupyter notebook
```

To close the notebook application, simply type [ctrl]+[c] in the Terminal/Cmd.


nick_180213 (python3.6)
(iidsp) nick@MacBook-Pro ~ % jupyter notebook
[I 23:21:58.743 NotebookApp] Serving notebooks from local directory: /Users/nick
[I 23:21:58.744 NotebookApp] The Jupyter Notebook is running at:
[I 23:21:58.744 NotebookApp] http://localhost:8888/?token=35681df2ca6ec36b6419c7b29f25c29a84faf3435bea8a29
[I 23:21:58.744 NotebookApp] or http://127.0.0.1:8888/?token=35681df2ca6ec36b6419c7b29f25c29a84faf3435bea8a29
[I 23:21:58.744 NotebookApp] Use Control-C to stop this server and shut down all kernels (twice to skip confirmation).
[C 23:21:58.748 NotebookApp]
To access the notebook, open this file in a browser:
file:///Users/nick/Library/Jupyter/runtime/nbserver-89302-open.html
Or copy and paste one of these URLs:
http://localhost:8888/?token=35681df2ca6ec36b6419c7b29f25c29a84faf3435bea8a29
or http://127.0.0.1:8888/?token=35681df2ca6ec36b6419c7b29f25c29a84faf3435bea8a29
Home Page - Select or create
localhost:8888/tree
jupyter
Quit
Logout
Files
Running
Clusters
Select items to perform actions on them.
Upload
New
Notebook:
Python 3
Other:
Text File
Folder
Terminal
Name
anaconda3
Applications
code
Creative Cloud Files
Desktop
en dag siden
Documents
19 dage siden
Downloads
6 timer siden
Globeteam
4 timer siden
Google Drive File Stream
6 dage siden
iCloud Drive (Archive)
2 år siden
Movies
6 timer siden
Music
9 måneder siden
nltk_data
et år siden
localhost:8888/tree#

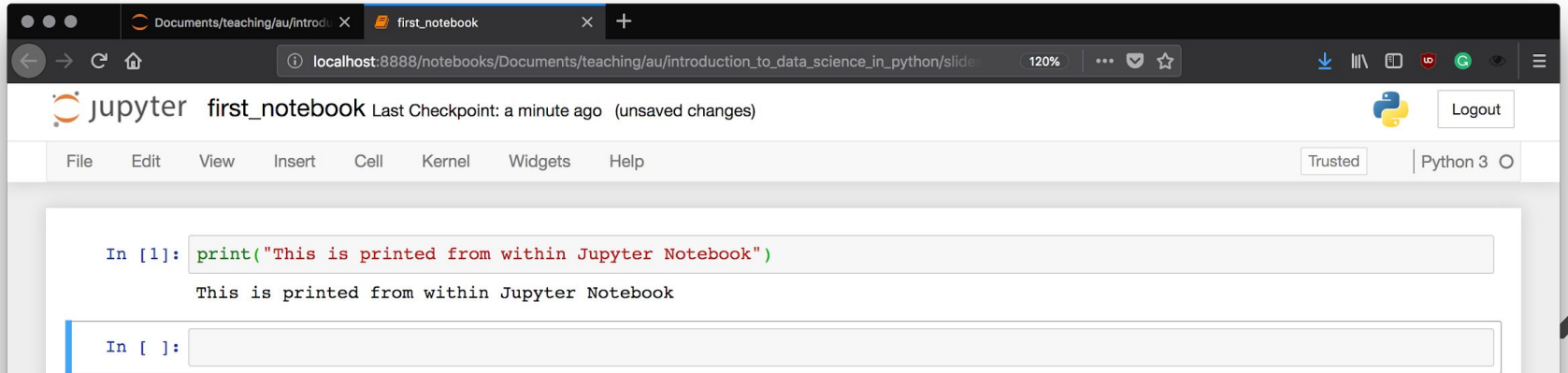

Documents/teaching/au/introdu
localhost:8888/tree/Documents/teaching/au/introduction_to_data_science_in_python/slides/asse
120%
jupyter
Quit
Logout
Files
Running
Clusters
Select items to perform actions on them.
Upload
New
0
/ Documents / teaching / au / introduction_to_data_science_in_python / slides / assets
Name
..
The notebook list is empty.
Notebook:
Python 3
Other:
Text File
Folder
Terminal
localhost:8888/tree/Documents/teaching/au/introduction_to_data_science_in_python/slides/assets#

Jupyter Notebook

Once a notebook has been created, you can write python scripts in cells, execute the cells using [shift]+[enter].

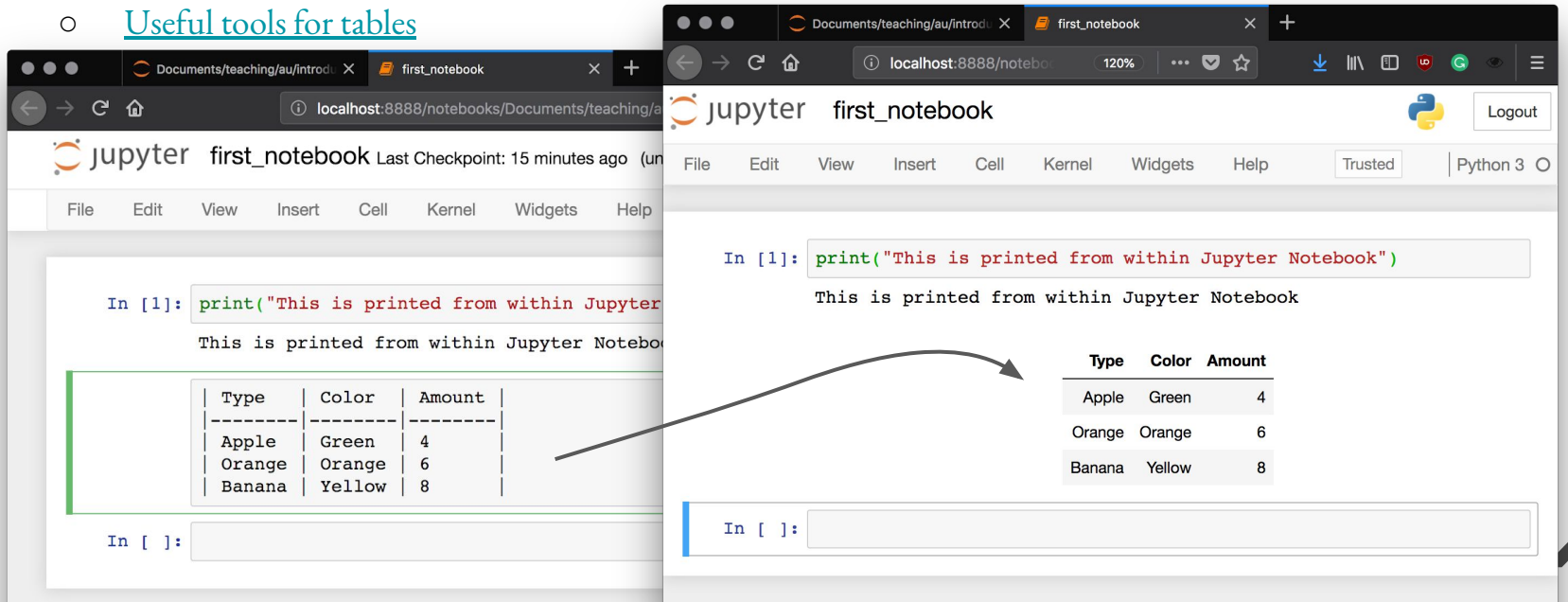
This tutorial gives a quick introduction to Jupyter Notebook.

Make sure you understand the workflow of these notebooks, as we will be using them throughout the course.



Jupyter Notebook

- Official documentation
- Markdown documentation by Github
  - Used for formatting text inside text-cells in notebooks
  - Useful tools for tables



Next up?

A group should be 2-4 (preferably 2-3) students

IN-CLASS	1. Short walk-through of `jupyter_notebook.ipynb`.
INDIVIDUAL	2. Install A-Z (Anaconda, your environment, python, everything...).
IN-CLASS	3. A peak into Python: Hands on basics in Jupyter Notebook.
INDIVIDUAL / GROUP	4. Open `jupyter_notebook.ipynb` and go through the notebook.
INDIVIDUAL / GROUP	5. Go through the basics of python (`the_basics_of_python.ipynb`).
INDIVIDUAL / GROUP	6. Exercises (`exercises_the_basics_of_python.ipynb`).
IN-CLASS	7. Wrap-up & Questions.