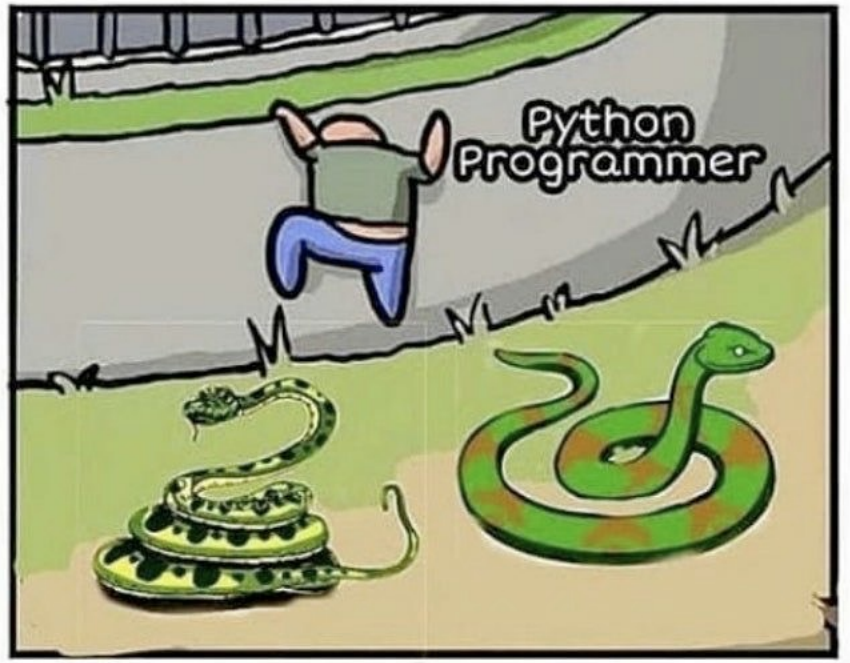


Use of Local Machine:
LOGIN ON **LINUX (DEBIAN)**

User: Etudiant
Password: Stu2003

Teachers

Valentin
CHRISTIAENS

Maxime
FAYS

Guy
MUNHOVEN

Dominique
SLUSE

Antoine
THUILLIER

(Teaching Assistant)

Main objectives of this course

Part 1: *Python in a nutshell*

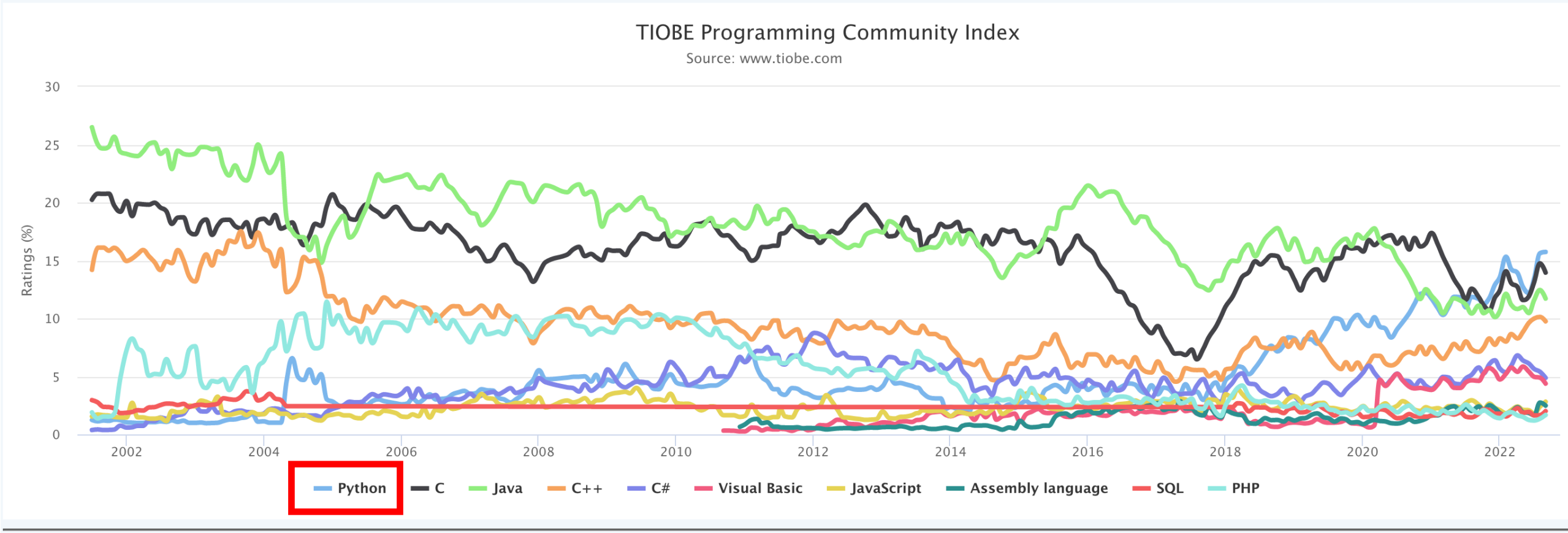
- Learn the basics of python programming language
- Understand that an "external code" is **not** a black box: understand its structure, its logic, be able to debug, … (use a code as a black box is a bad scientific practice)

Part 2: *Data analysis (in astronomy) with python*

- Use python to calculate *uncertainties*, perform *model regression* (Frequentist and Bayesian inference), manipulate data sets, …
- Use python to calculate *Fourier transforms*, build and interpret *periodograms*, identified caveats with *sampled* data, …
- Toolbox: know where and how to use the main tools but there are more that you'll have to learn by yourself. Technical understanding will not be a bottleneck!

https://www.tiobe.com/tiobe-index/

Why Python?



Python keeps taking over other languages and is now the first programming language (closely followed by C, C++ and Java)

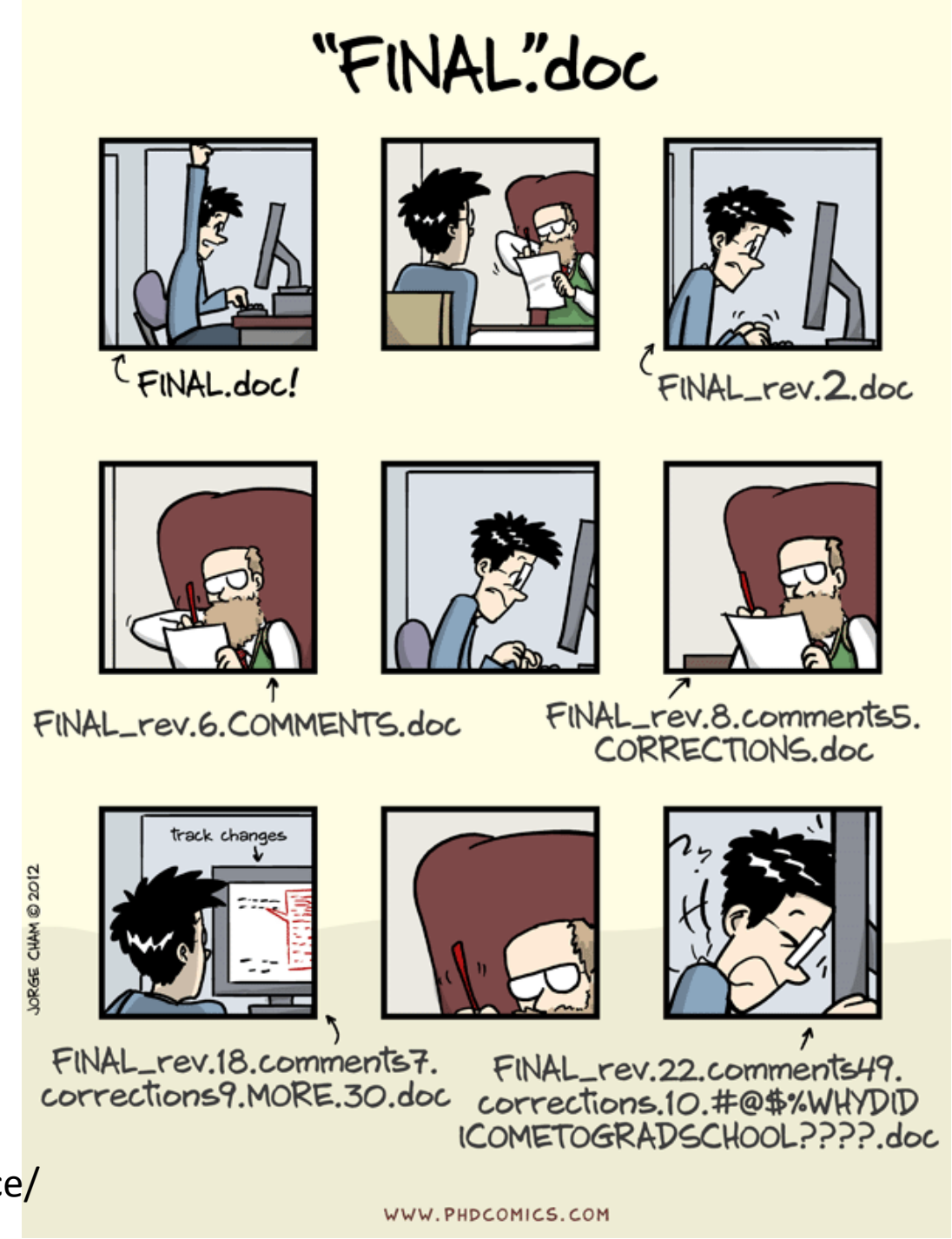
Use of Local Machine: **LOGIN ON LINUX (DEBIAN)** **User:** Etudiant **Password:** Stu2003

Open a terminal (Linux/Mac) / Anaconda Prompt (WINDOWS) and type the following commands (see below):

```
> cd Desktop
> mkdir SPAT0002-1
> cd SPAT0002-1
> git clone https://github.com/SPAT0002-1/Ongoing.git
> cd Ongoing
> jupyter-notebook Index.ipynb   [You can ignore the filename Index.ipynb]
```

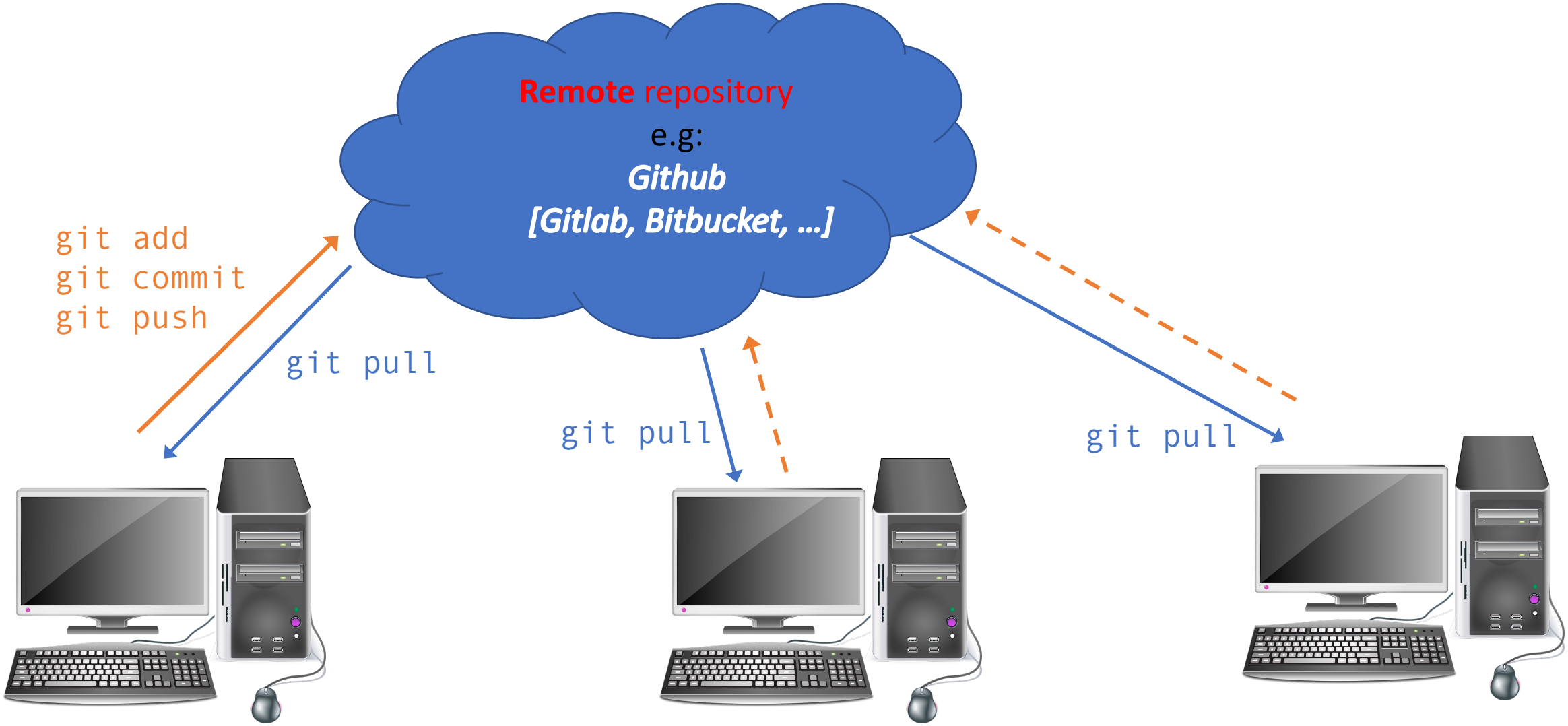
On local computers, login with your **Uliege ID** on **Firefox** before running the git command

```
MBPdeDominique:~ dsluse$ cd Desktop/
MBPdeDominique:Desktop dsluse$ mkdir SPAT0002-1
MBPdeDominique:SPAT0002-1 dsluse$ git clone https://github.com/SPAT0002-1/Ongoing.git
Cloning into 'Ongoing'...
remote: Enumerating objects: 102, done.
remote: Counting objects: 100% (102/102), done.
remote: Compressing objects: 100% (71/71), done.
remote: Total 102 (delta 38), reused 89 (delta 26), pack-reused 0
Receiving objects: 100% (102/102), 29.47 MiB | 6.81 MiB/s, done.
Resolving deltas: 100% (38/38), done.
MBPdeDominique:SPAT0002-1 dsluse$ ls
Ongoing
MBPdeDominique:SPAT0002-1 dsluse$ cd Ongoing/
MBPdeDominique:Ongoing dsluse$ ls
01-Intro_to_python              07-Astropy                      Figures                         README.md
02-Main_useful_python_modules   Exercises                       Index.ipynb                     organization_schedule.md
MBPdeDominique:Ongoing dsluse$ jupyter-notebook Index.ipynb
[I 09:00:01.167 NotebookApp] [nb_conda_kernels] enabled, 4 kernels found
[I 09:00:01.478 NotebookApp] The port 8888 is already in use, trying another port.
```



http://swcarpentry.github.io/git-novice/

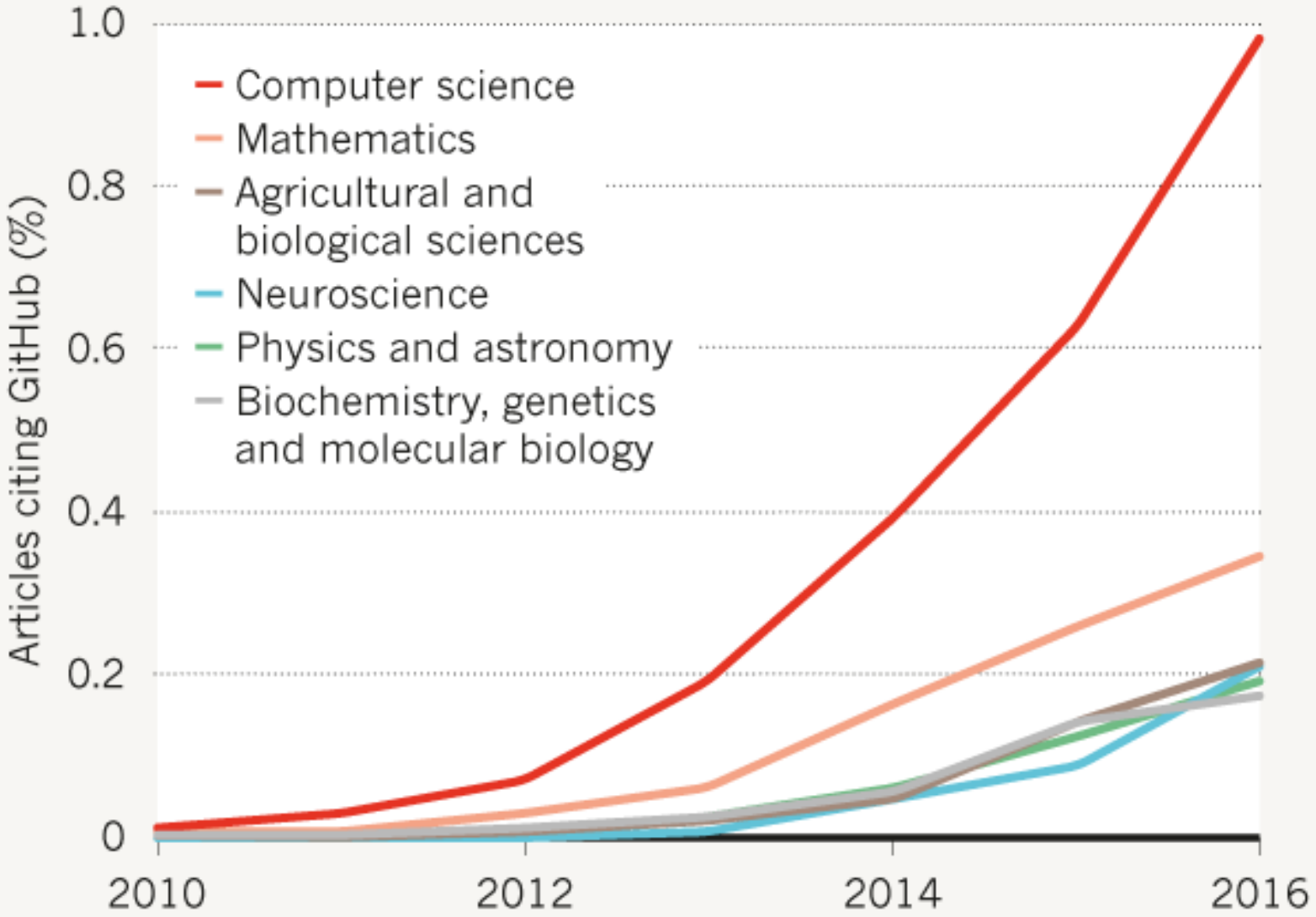
"Piled Higher and Deeper" by Jorge Cham, http://www.phdcomics.com


Remote repository
e.g:
Github
[Gitlab, Bitbucket, ...]
git add
git commit
git push
git pull
git pull
git pull
Teacher
Local repository
Version control w. git
YOU (Stu. #1)
Local repository
Version control w. git
YOU TOO (Stu. #x)
Local repository
Version control w. git

GROWING INFLUENCE OF GITHUB

©nature

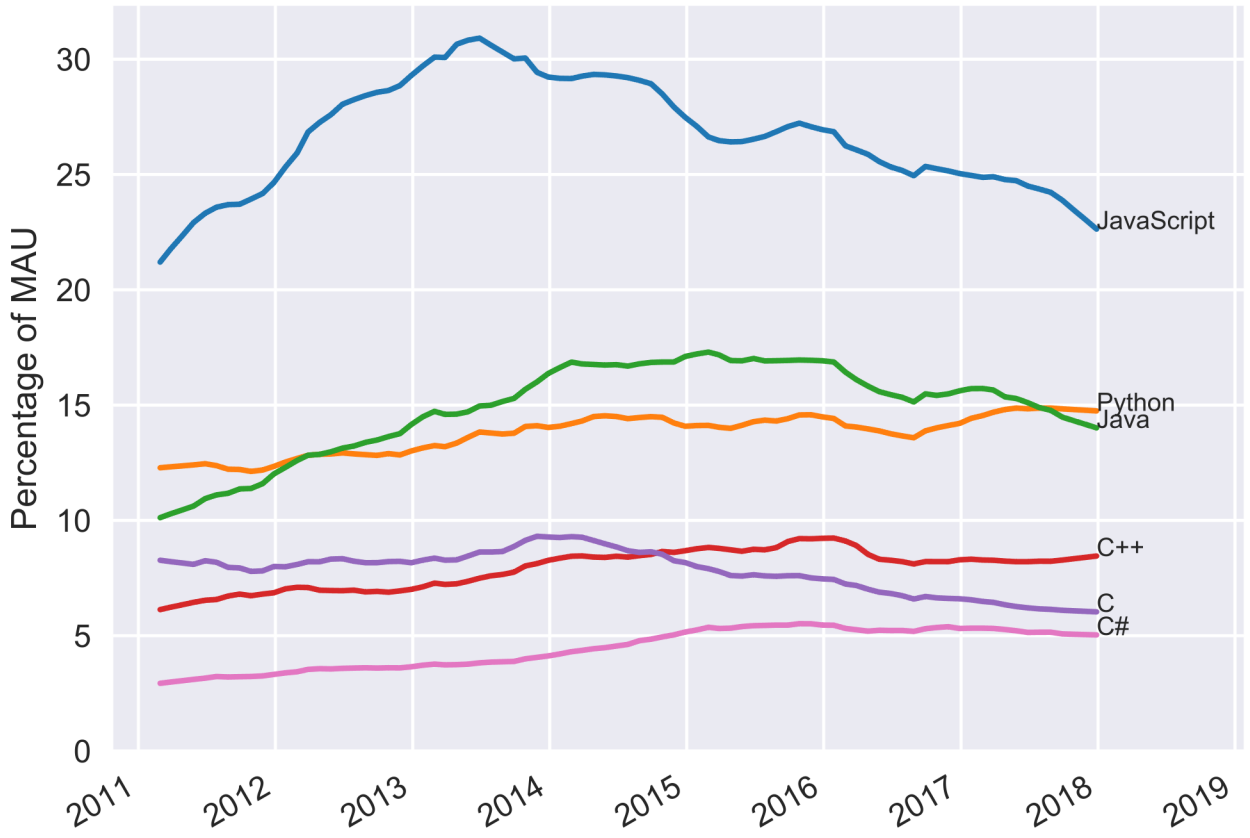
An increasing proportion of research articles cite GitHub in their references.



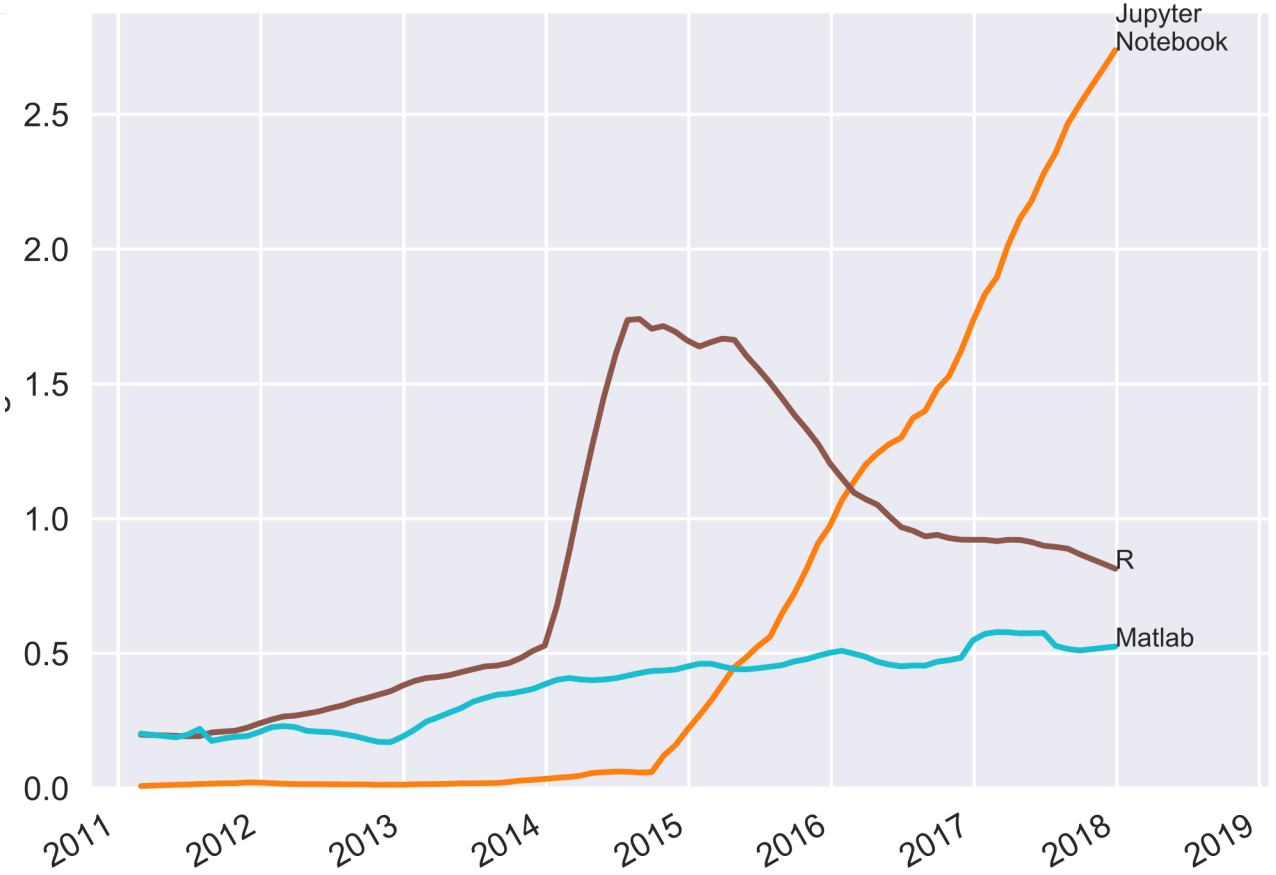
Languages used in Python repositories

MAU = Monthly active users

All languages



Scientific “languages”



https://www.benfrederickson.com/ranking-programming-languages-by-github-users/

A simple strategy to manage this course

- Use `git` to keep track of new notebooks, updates, …
- If you wish to keep track of your own copy of the notebook:
  - Create your own `Index.ipynb`. E.g. `Index_MYNAME.ipynb`
  - Create your own copy of the notebooks you modify (Save as `noteb_MYNAME.ipynb`)
  - Update `Index_MYNAME.ipynb`, linking to your personal copy of the notebook

Main objective of today's lecture

- Get familiar with to structure of the lecture
- Understand the difference between git and github
- Open a Jupyter notebook and execute a code cell within it
- Print text and define a variable in python
- Get an overview of the main data types and operators