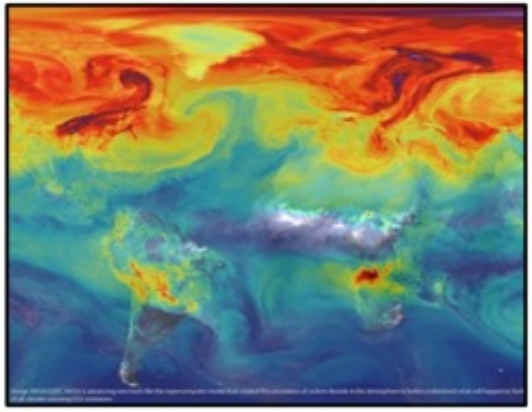





Geo Data Science with Python (GEOS-5984/4984)

Prof. Susanna Werth

Software Setup: GitHub and Jupyter Lab

Please keep sending me your song suggestions through Canvas!

Today

- Survey Results
- GitHub & Setup
- A Taste of Python

Note: At the end of this week, you should feel comfortable to:

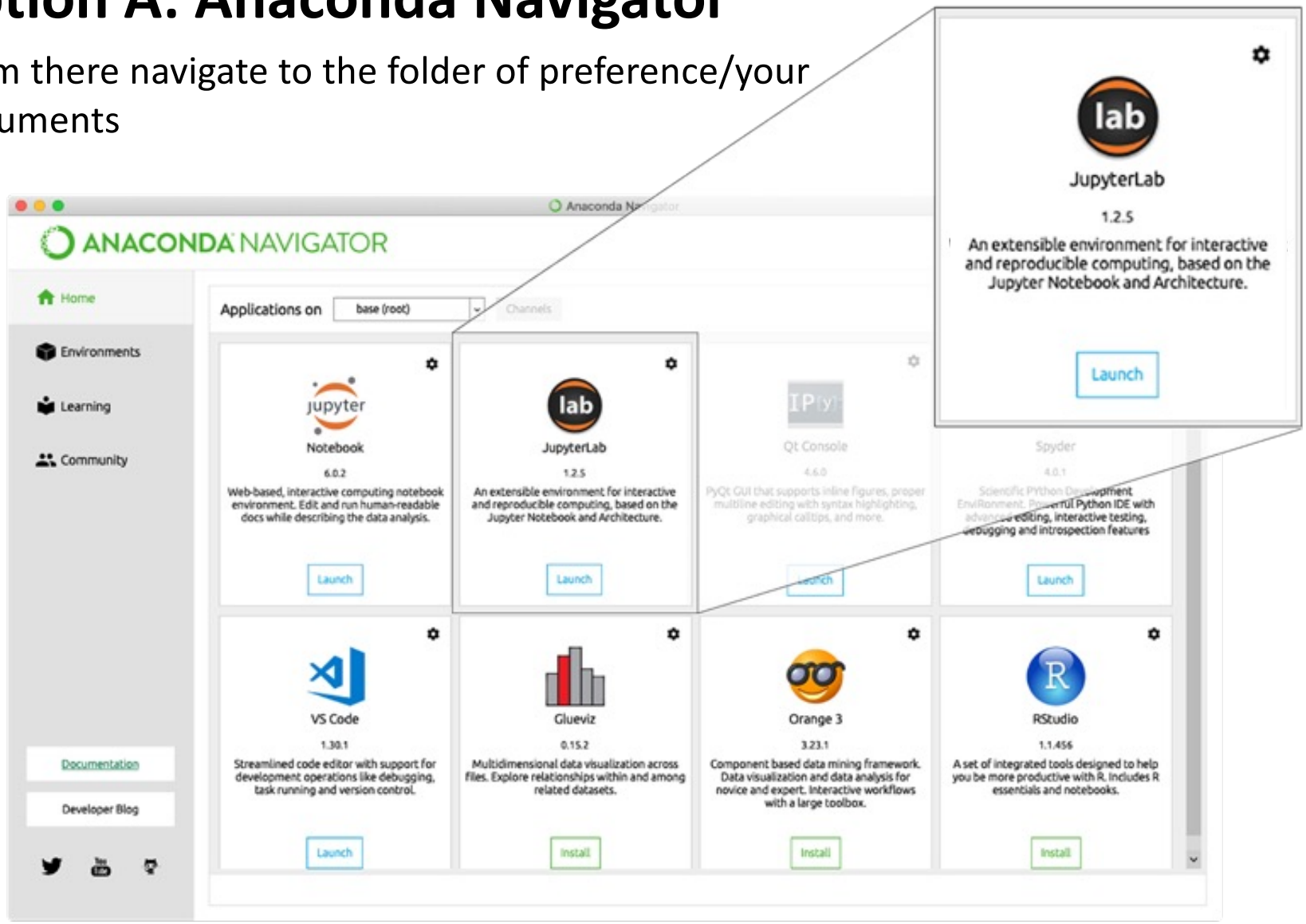
- *Use Jupyter Notebooks*
- *Retrieve Course material from GitHub*
- *Submit Homework via GitHub*

Classroom Computer Software

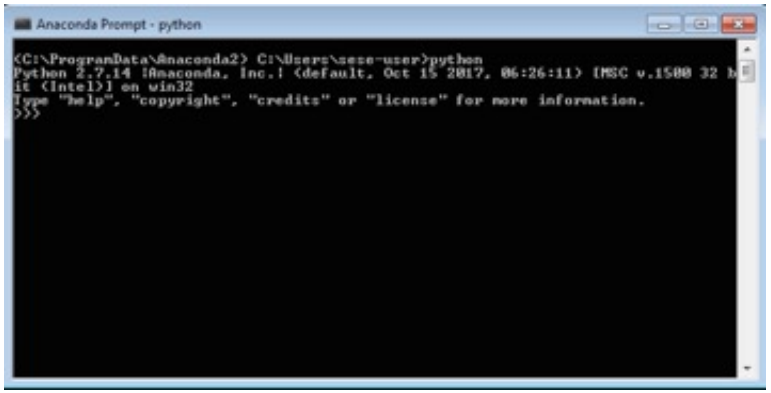
Launch Jupyter Lab

Option A: Anaconda Navigator

From there navigate to the folder of preference/your documents



Launch Jupyter Lab



Option B: Command line (Terminal)

1. Navigate to the data directory of your choice

   Unix Terminal/Console:

   ```
   cd ~/Documents
   ```

   Windows Command Prompt:

   ```
   cd /D %userprofile%\Documents
   ```

2. Start Jupyter server by typing:

   ```
   jupyter lab
   ```

Command prompts

Useful file system-related commands

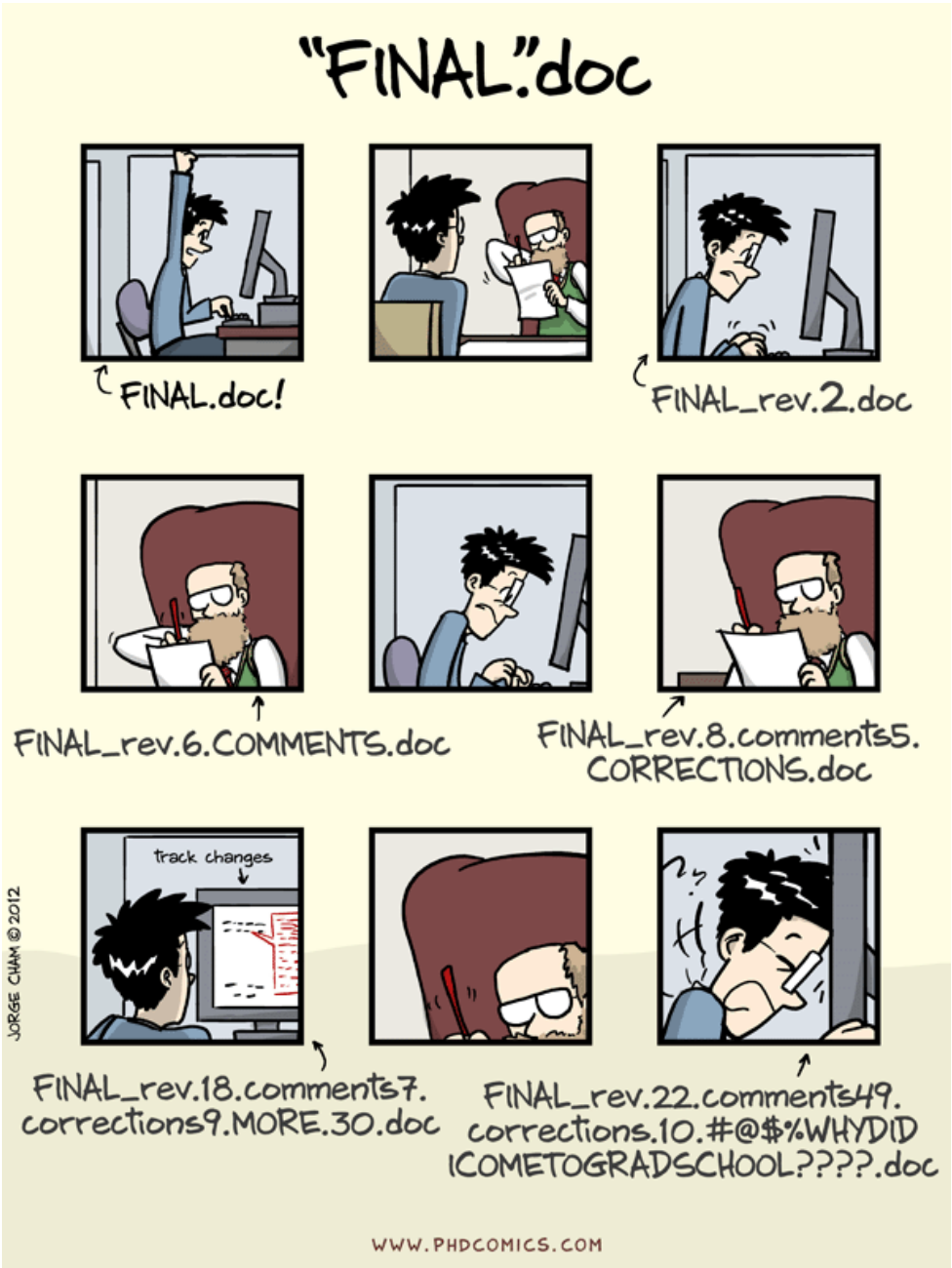
Function	shell command (Linux, Mac)	respective command (Windows)
display current directory	**pwd**	cd
display content of current directory	**ls**	dir
go to ‘directory’	**cd** ‘directory’	cd ‘directory’
create directory	**mkdir** ‘directory’	md ‘directory’
copy file	**cp** ‘file’	copy ‘file’
delete file	**rm** ‘file’	del ‘file’
display file	**cat** ‘file’	type ‘file’

Note on Classroom Computers

- To start Jupyter lab (or spyder), you do not need open anaconda, but can type ‘jupyter lab’ or ‘spyder’ into the command line.
- Remember to browse in private mode, if you login to accounts!
- Remember, this is only local. You can download files from the internet and work with them. **Don’t forget to take a copy of your work with you**, or upload it to your Google drive or a private GitHub repository

Git & GitHub Setup

What is Git?



Solution:
Version Control

Version Control with Git

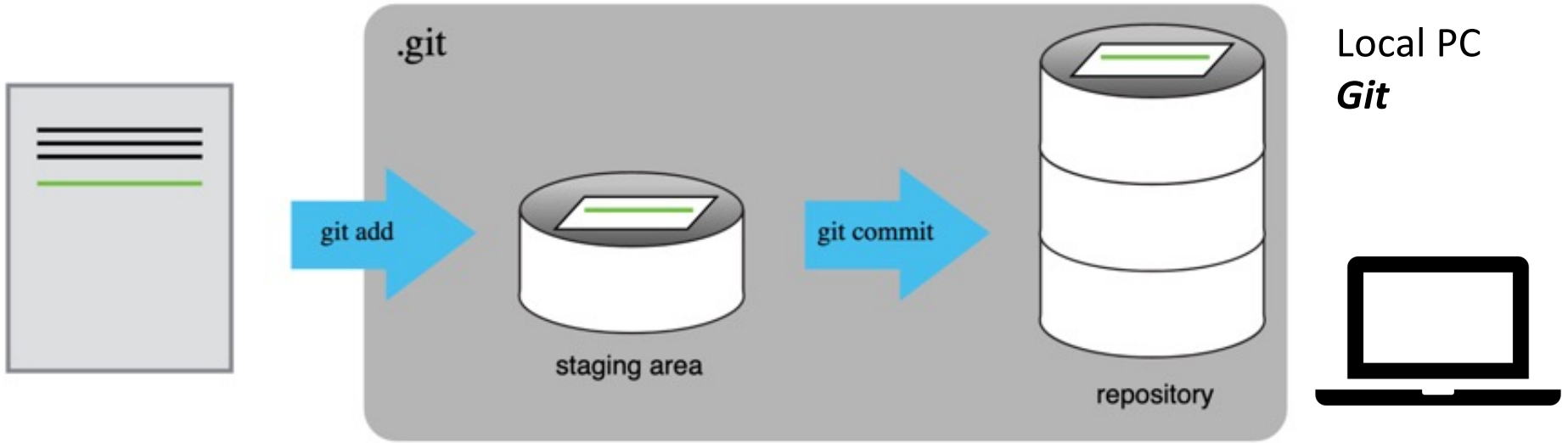
Base version of the document
Then record changes you make each step of the way.
You can rewind to different states of the document.

Version Control with Git

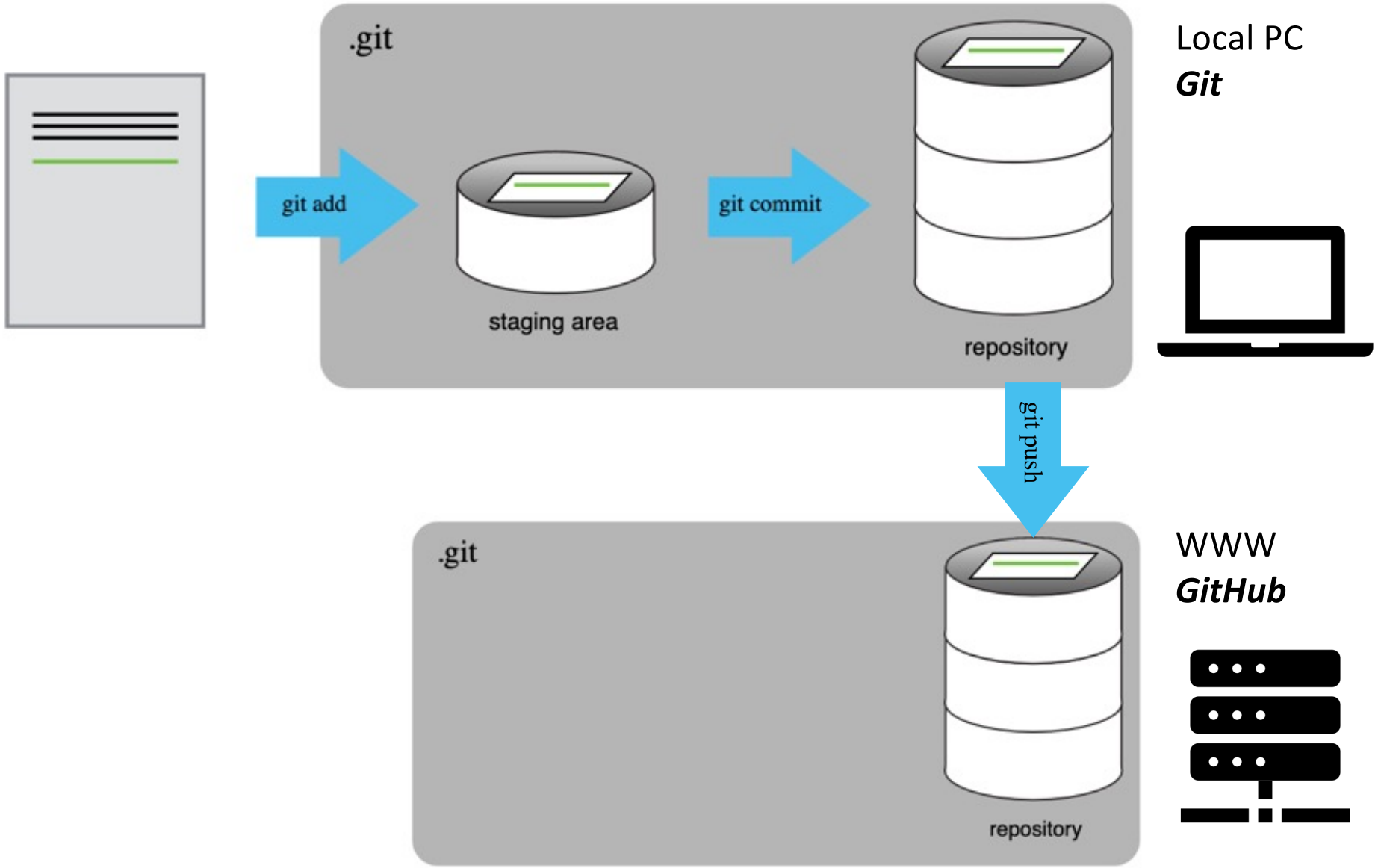
Key Points

- Version control is like an unlimited ‘undo’.
- Version control also allows many people to work in parallel.

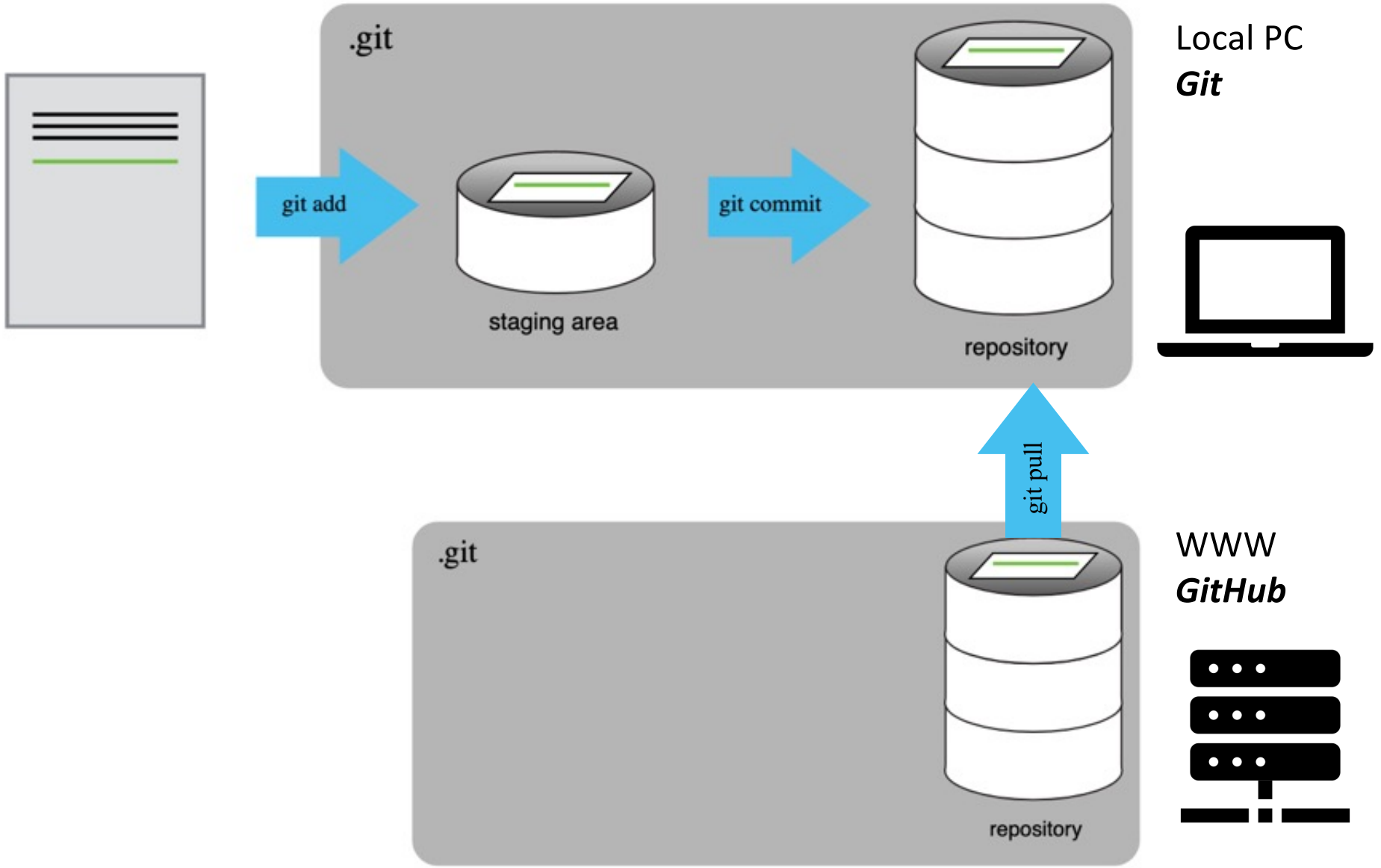
How GitHub works



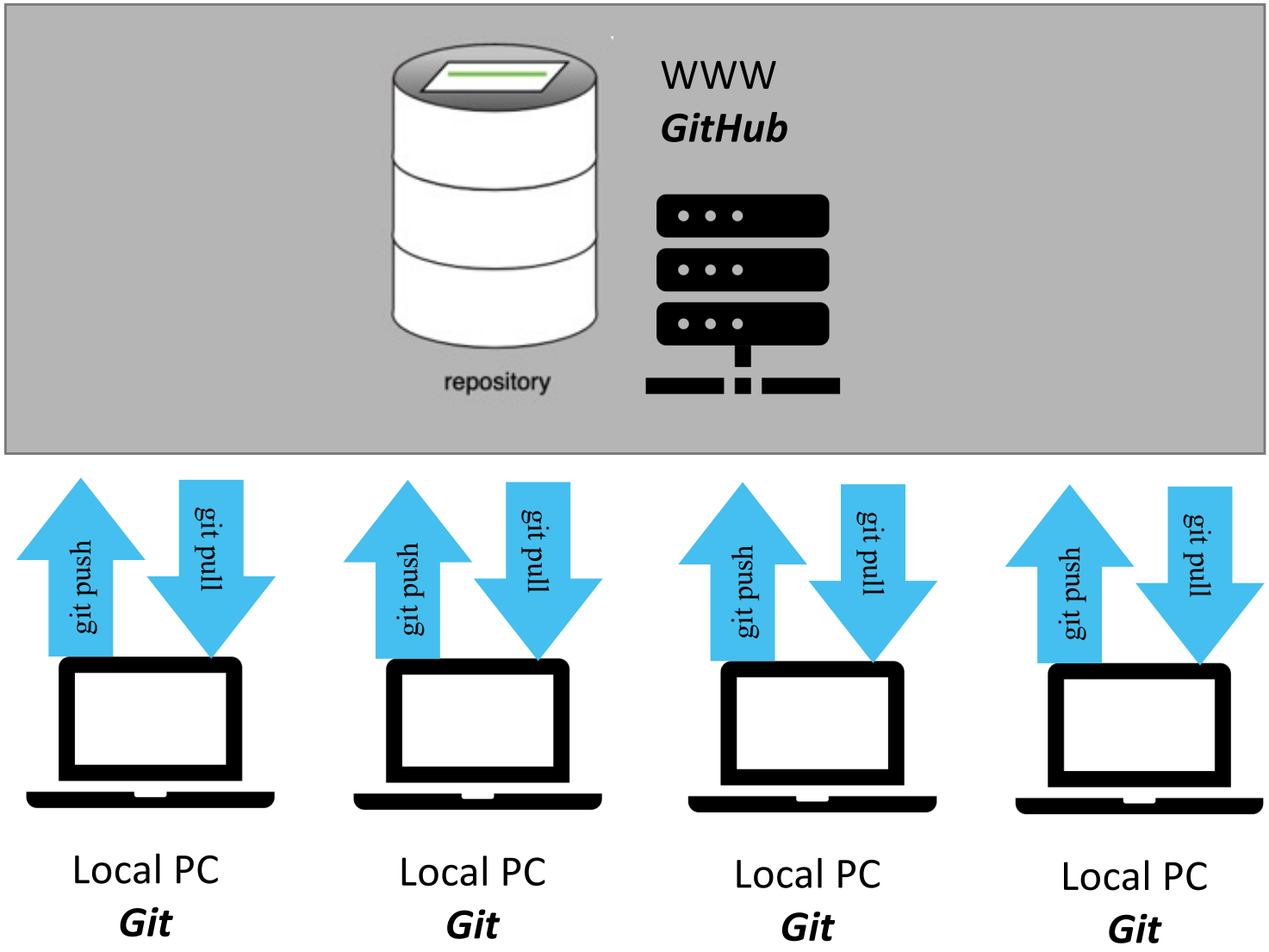
How GitHub works



How GitHub works



How GitHub works



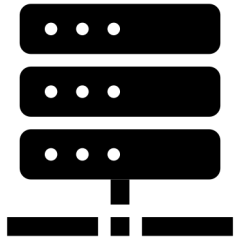
Why do we use GitHub?

PCs

Classroom

Teacher / Student

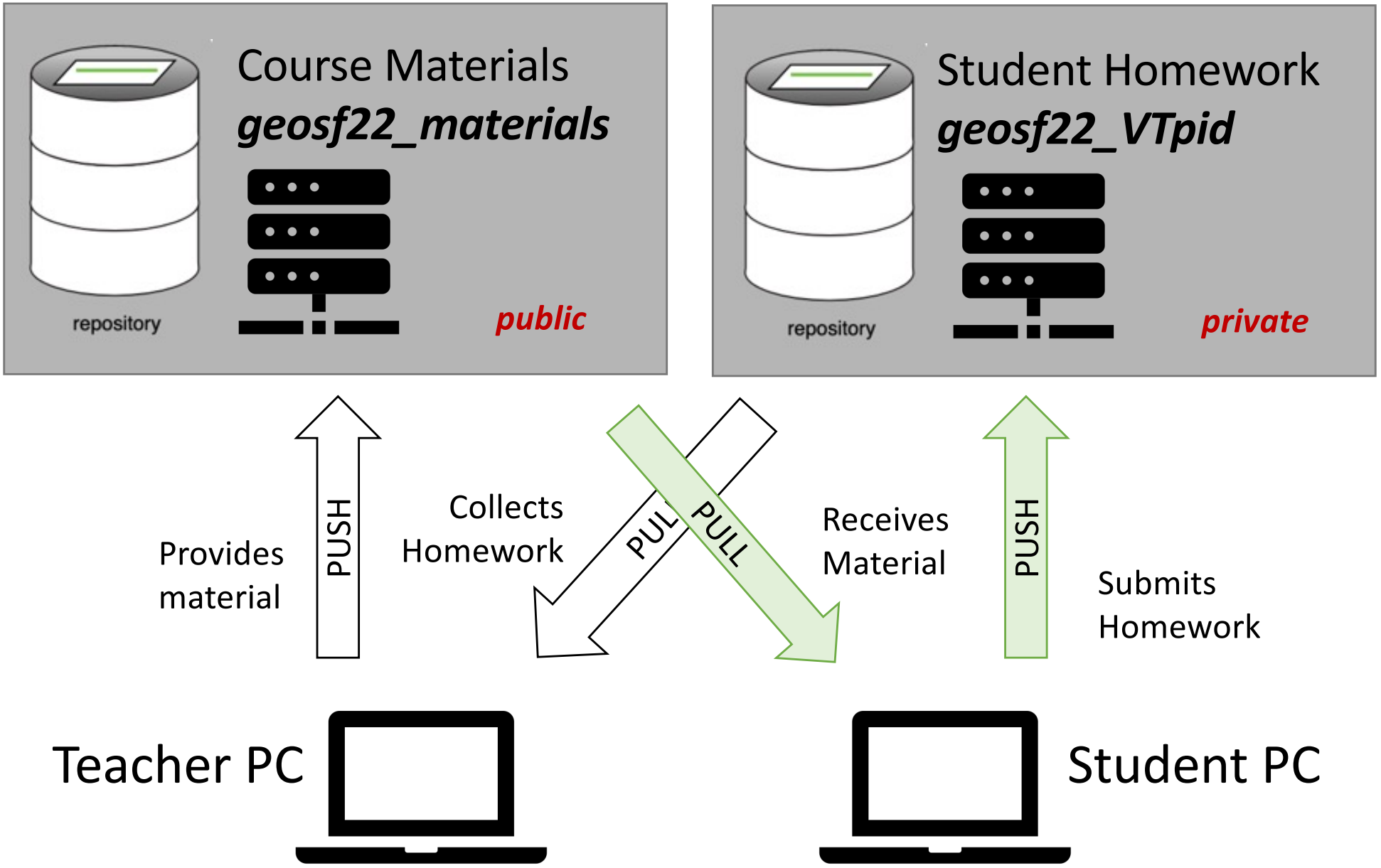
GitHub Cloud



Control & Execute
Jupyter Notebooks
and Python Scripts

Store and Access
Jupyter Notebooks
and Python Scripts

GitHub Repositories



Course repository

- Geosf22_material: https://github.com/GeoPythonVT/geosf22_material

- Public repository
- You cannot add (push) material
- But you can get (pull) material

- Go to the repository and check the content

Course Repository Files

One folder per Lecture: “Lxx”

You should different files in the Lecture folders.

- Slides: Lxx_slides_...pdf
- Reading material: Lxx_reading_...*
- Tutorials/codebooks: Lxx_tutorial_...ipynb
  (sometimes there will be a filled and an empty version of these)

- Jupyter Notebook: *.ipynb
- Python scripts: *.py
- Textfile: *.txt
- Images: *.png, *.jpg
- Datasets any other file type, e.g., *.csv, *.nc4
  (large datasets might be stored in the separate data folder)

Course Repository Structure

Exercises and homework will not be in the lecture folders, but rather be located in the main folder:

Exx_exerciseName.ipynb

What is the Student PC?

- Classroom computer

- Your computer

What is the Student PC?

- Classroom computer: all software installed
  - Follow upcoming instructions…

- Your computer: You need to:
  - Install software
  - Same Setup as today

Next Steps: GitHub Setup

1. On your computers, open internet browser in private mode!

1. Follow my instructions on the other screen for
   - Set Up GitHub
   - Connect Classroom Computers to GitHub
   - Practice Using GitHub
     - Get course material
     - Submit material to your homework repository

Create your own GitHub Repository

Follow instructions in README.md:
Setup A:2-3

- Creates your own Repository
- **Do this only once!**

Set up Git on your Computer

Follow instructions in README.md:
Setup B:3-4

- Sets up Git to connect to your own Repository
- **Do this only once on a certain PC!**

Copy your repository to your Computer

Follow instructions in README.md:
Setup B:5

- Clones your own repository to your Computer
- **Do this anytime you want to start over**

Submit to your repository

Follow instructions in README.md:
Setup B:6

- Push your first work to your repository
- **Do this only once!**

Get Course Material

Follow instructions in README.md:
Cloning course material to your computer – “Initial Download”

- Get the course material
- **Do this only on a certain PC!**
- **(You can start from scratch, if you have issues and re-clone the material)**

Update Course Material

Follow instructions in README.md:
Cloning course material to your computer – “Update”

- Wait for me to add a new file to the course material “update.txt”
- Updates your course material
- **Do this whenever you want to get updates**

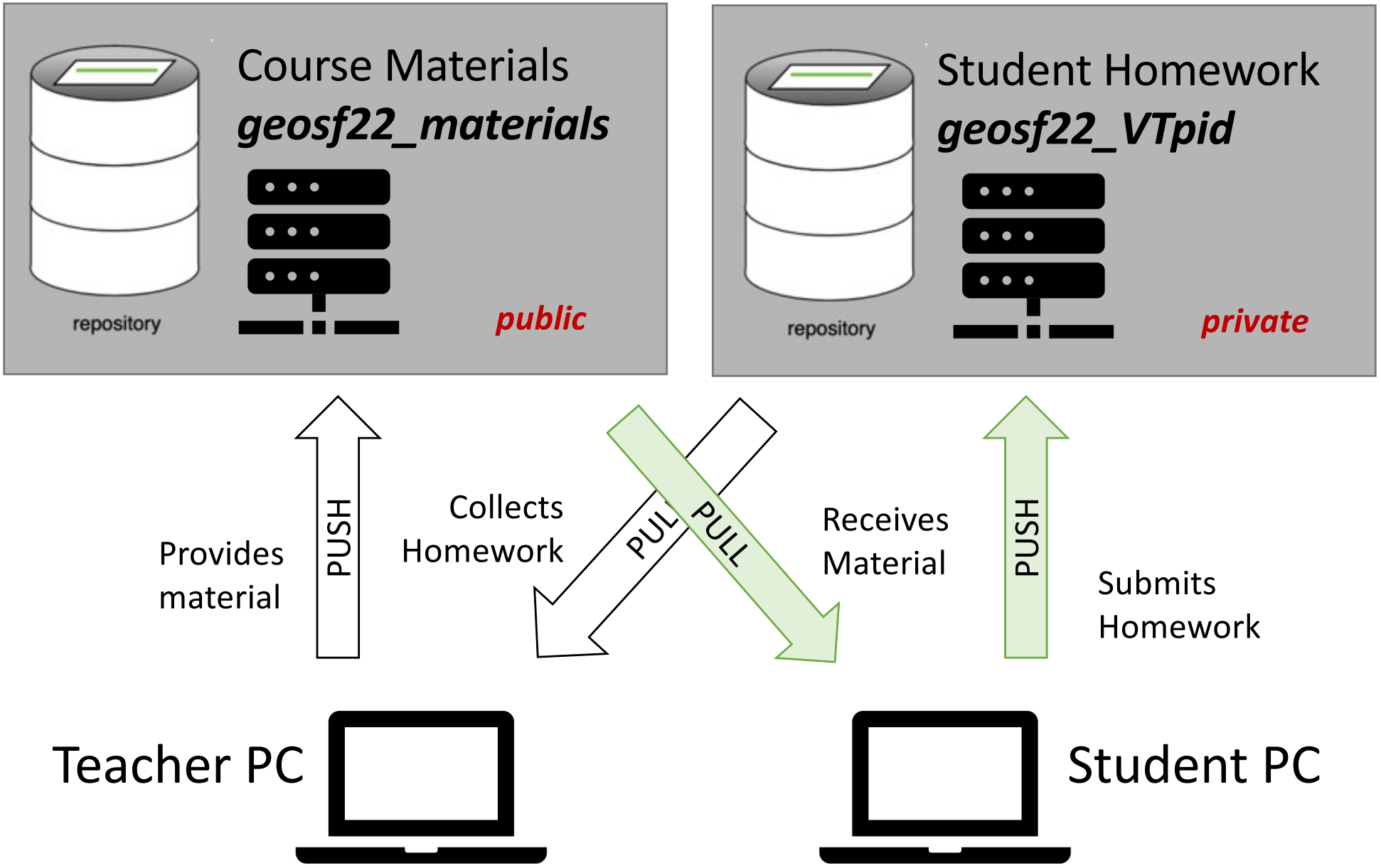
Conclusion:

- You will have at least one PC to work with
  - Class room computer
  - Optional: Set up your personal computer

- We will use GitHub
  - to submit homework
  - to make sure to have course content available everywhere

- I will only have access to material in your GitHub homework repository (you will have to add me as collaborator, see below)

GitHub Repositories



Your own Computer?

- You need to:
  - Install software
  - Same Setup as today
  - **Follow entire instructions “Setting up your Computer” in README.md on repository *geosf22_material***

Practice all together

- Copy the lesson book to your homework repository and open it: L01_tutorial_PythonFundamentals.ipynb
- Rename it to: **E01**_tutorial_PythonFundamentals
- **Submit this to GitHub**

First Coding Homework

- Copy the exercise book to your homework repository and open it: E02_ATasteOfPython.ipynb

- Go through instructions in README.md: **Submitting homework**

- **Please don't rename the exercise books!**
- Work on this at home and submit as homework

Homework

- Add me as collaborator to your repository
- Submit completed E02_ATasteOfPython.ipynb to your repository *geosf22_<yourPID>* and go through instructions in README.md: **Submitting homework**
- Revise L01 notebook on Markdown and Magic

Due date: Monday (Aug 29, 11:59pm)