C & N WORKSHOP: INTRO TO GIT/GITHUB

Michelle Chiu

michelle.chiu@temple.edu

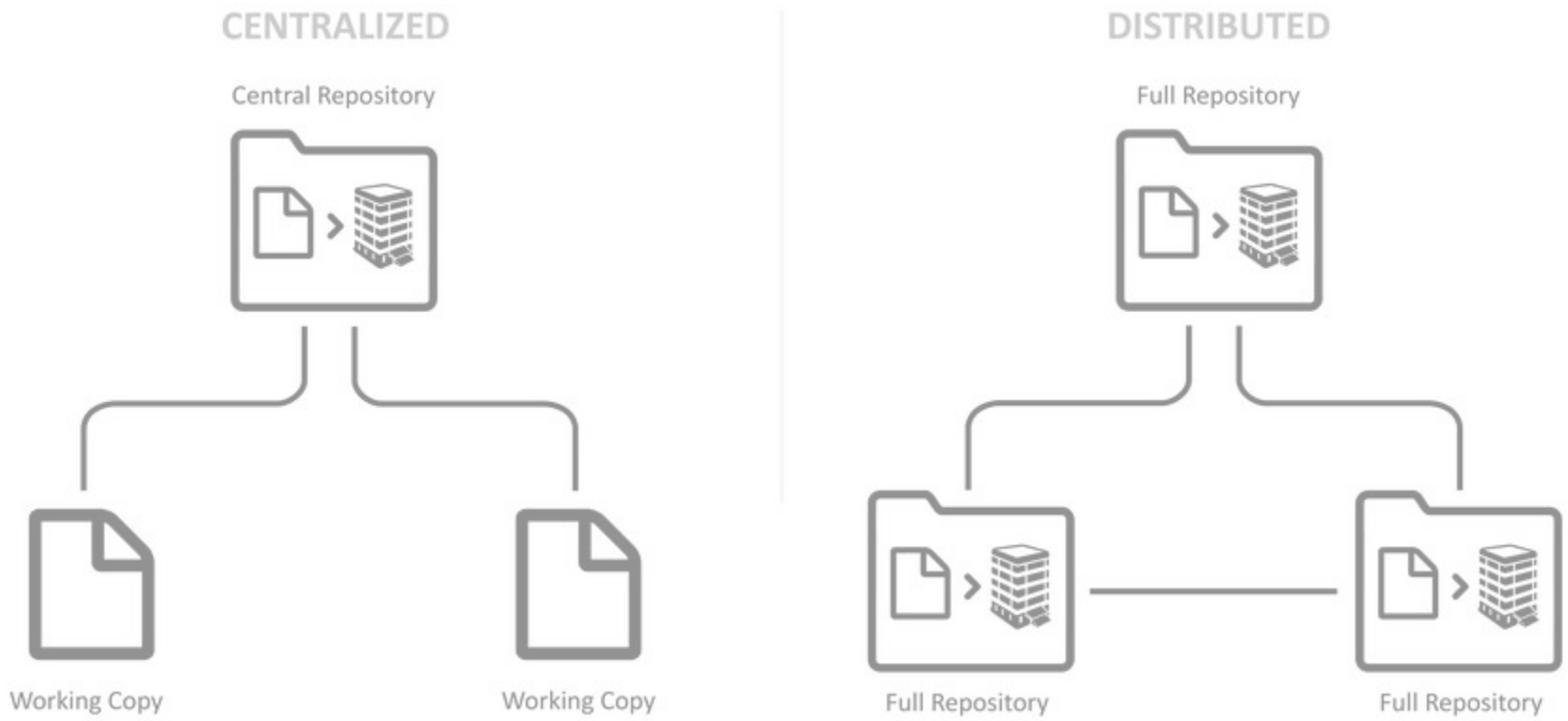
https://www.improgrammer.net/wp-content/uploads/2018/01/The-real-version-control.png

What is Git?

Repository (repo): storage of files + their change history

What is Git?

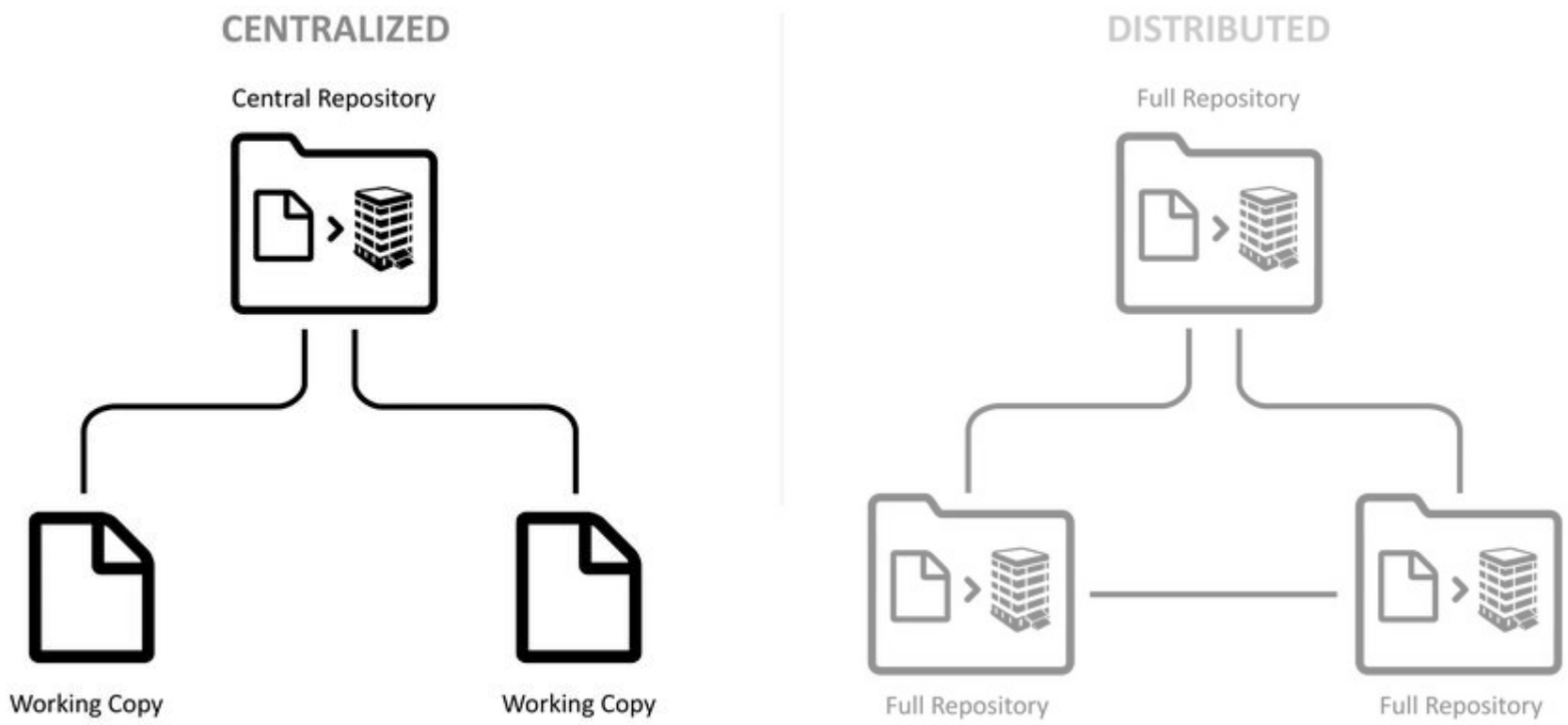
1) **D**istributed **V**ersion **C**ontrol **S**ystem (DVCS)



What is Git?

1) **D**istributed **V**ersion **C**ontrol **S**ystem (DVCS)

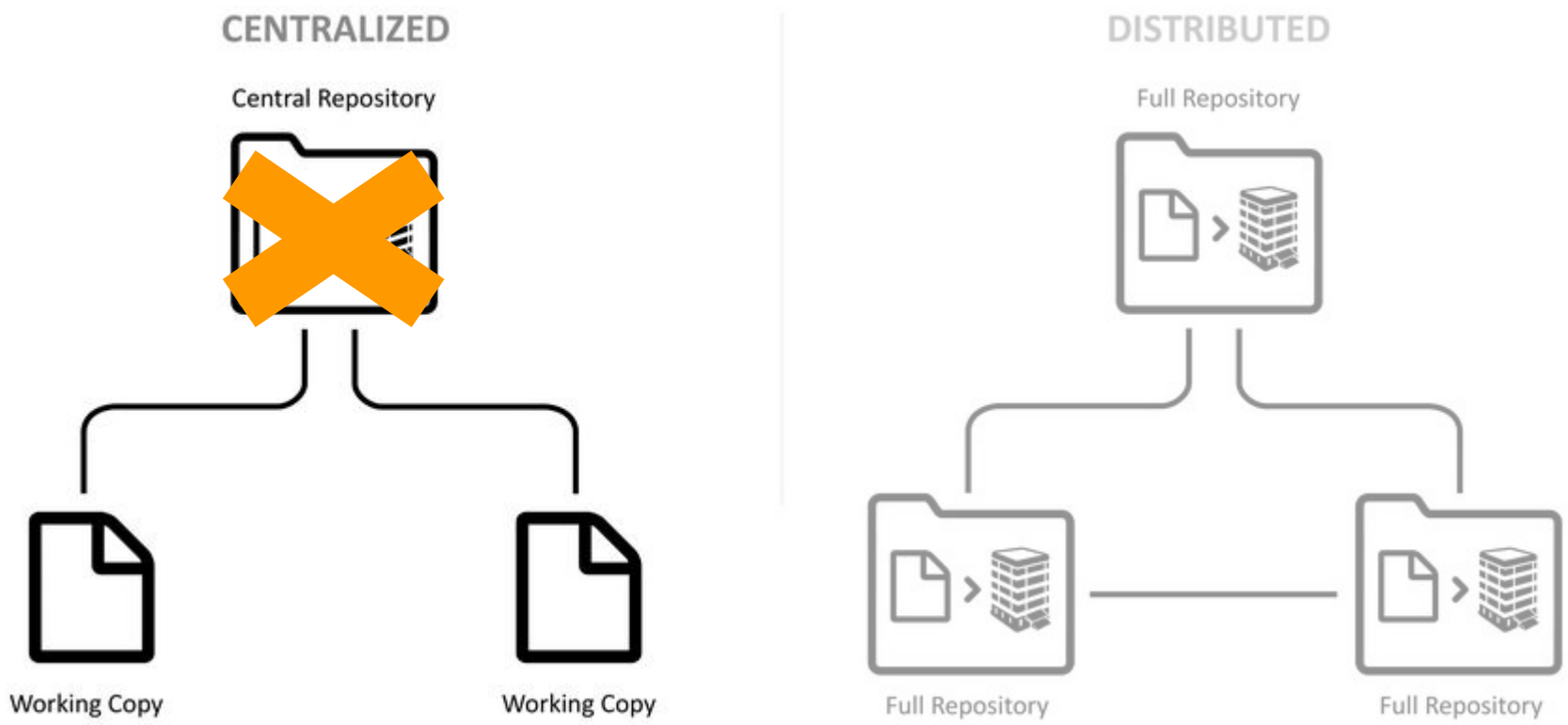
client-server



What is Git?

1) **D**istributed **V**ersion **C**ontrol **S**ystem (DVCS)

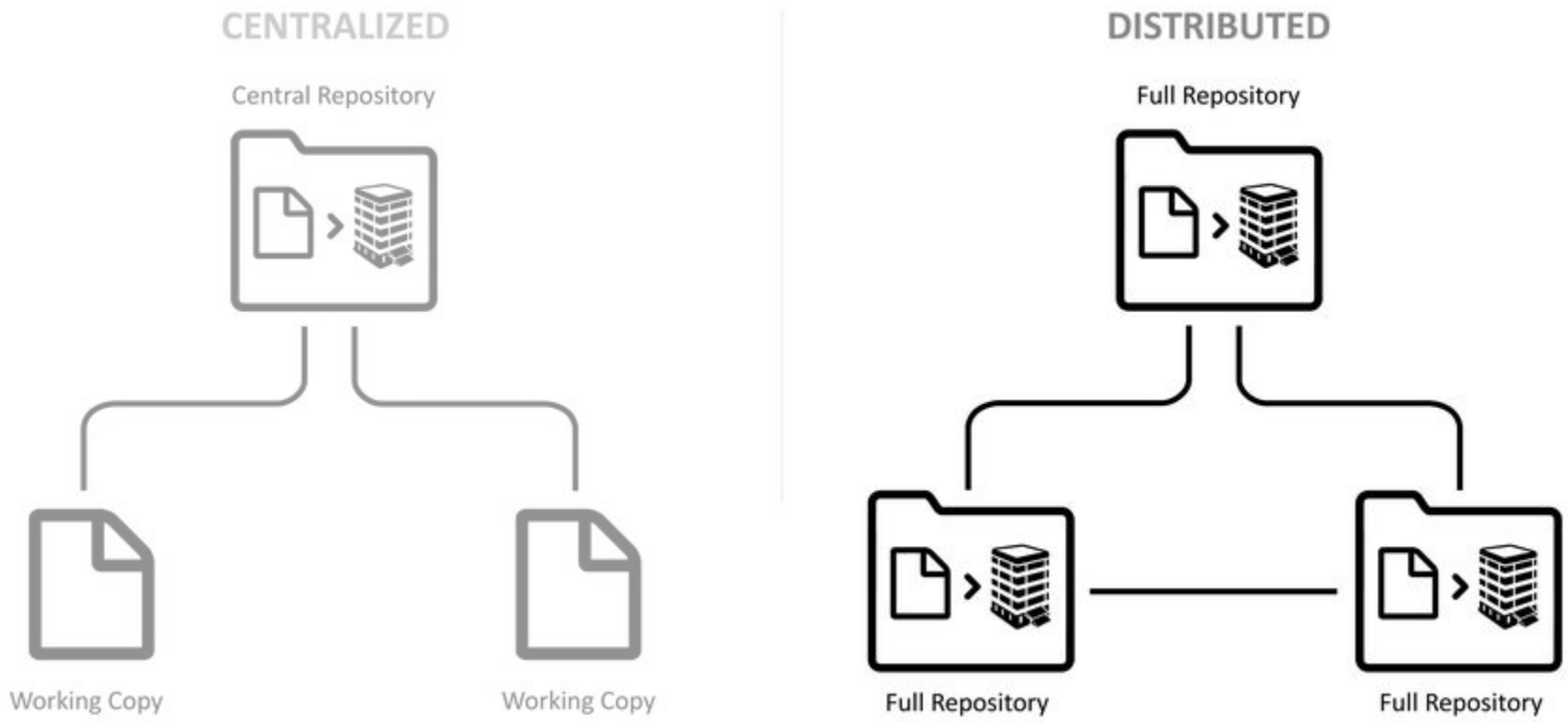
client-server



What is Git?

1) **D**istributed **V**ersion **C**ontrol **S**ystem (DVCS)

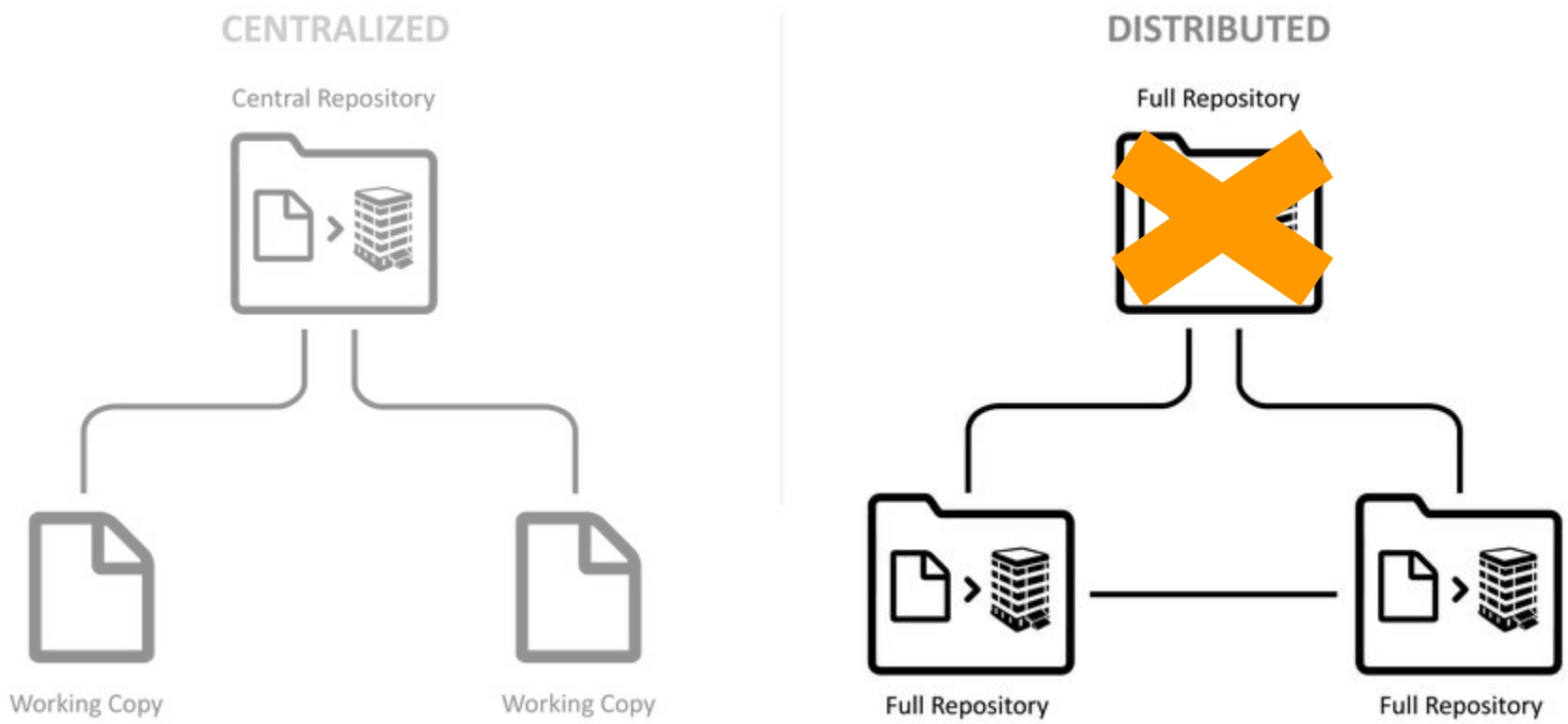
peer-peer



What is Git?

1) **D**istributed **V**ersion **C**ontrol **S**ystem (DVCS)

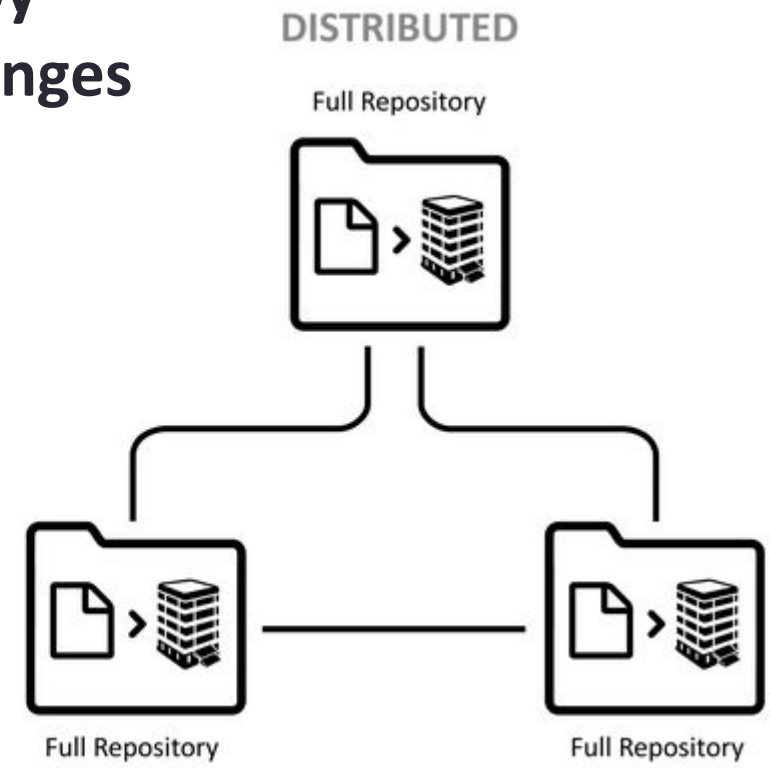
peer-peer



What is Git?

1) **D**istributed **V**ersion **C**ontrol **S**ystem (DVCS)

- Every user has a **working copy** with **complete history of changes**
- Work locally **offline**

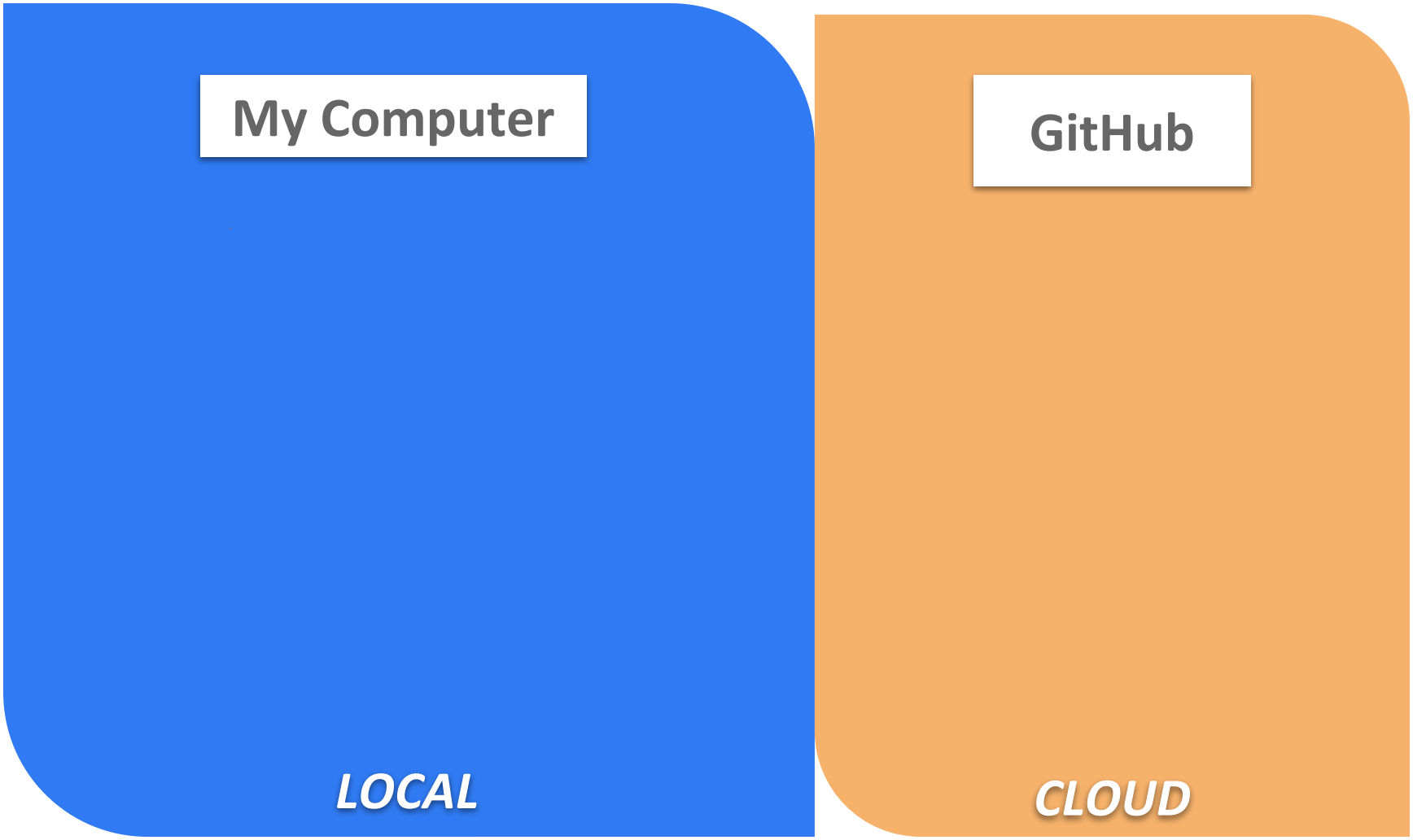


Why Git?

2) **Granular control** over which **changes** are included in each **saved version**

3) Git rarely deletes anything

Git and GitHub

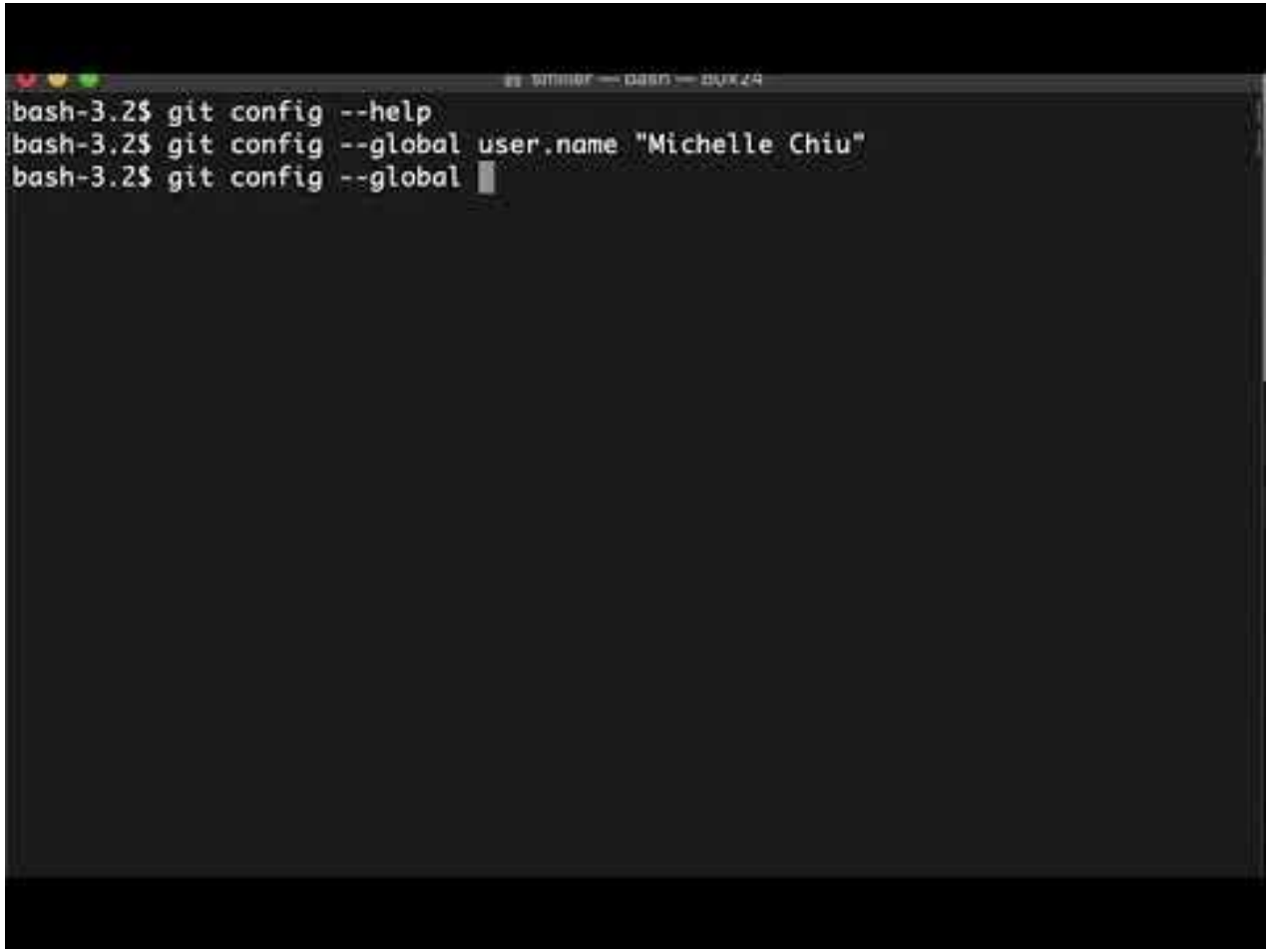


Exercise 1: Tell Git who you are

Git records **WHO** and **WHAT** of changes

Exercise 1: Tell Git who you are

https://youtu.be/Sf_D7jAe-QI



Exercise 1: Tell Git who you are

My Computer

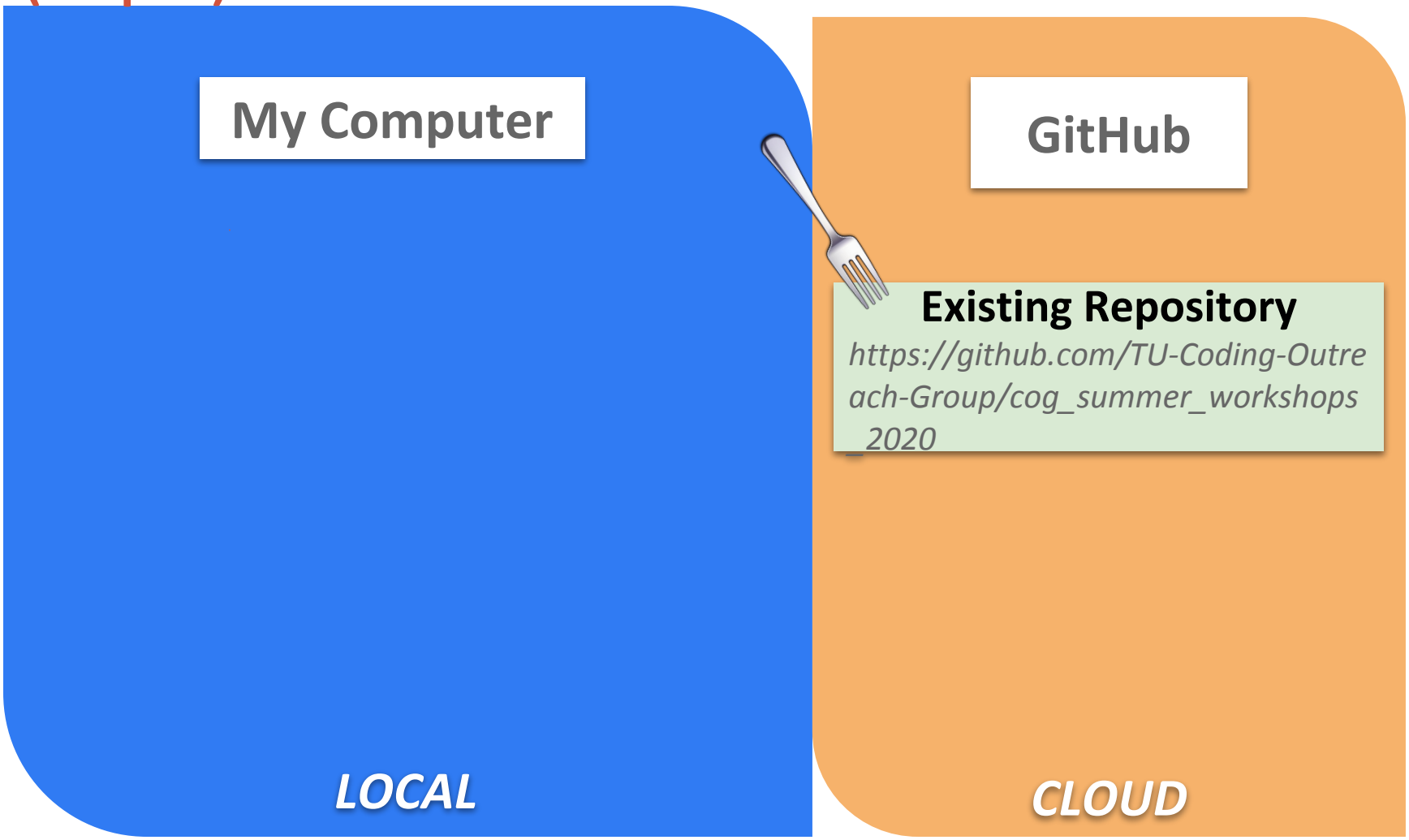
```
$ git config --global user.name "Your Name"
$ git config --global user.email yourname@yourplace.org
```

```
$ cat ~/.gitconfig
    [user] name = Your Name email = yourname@yourplace.org
    [core] editor = nano
```

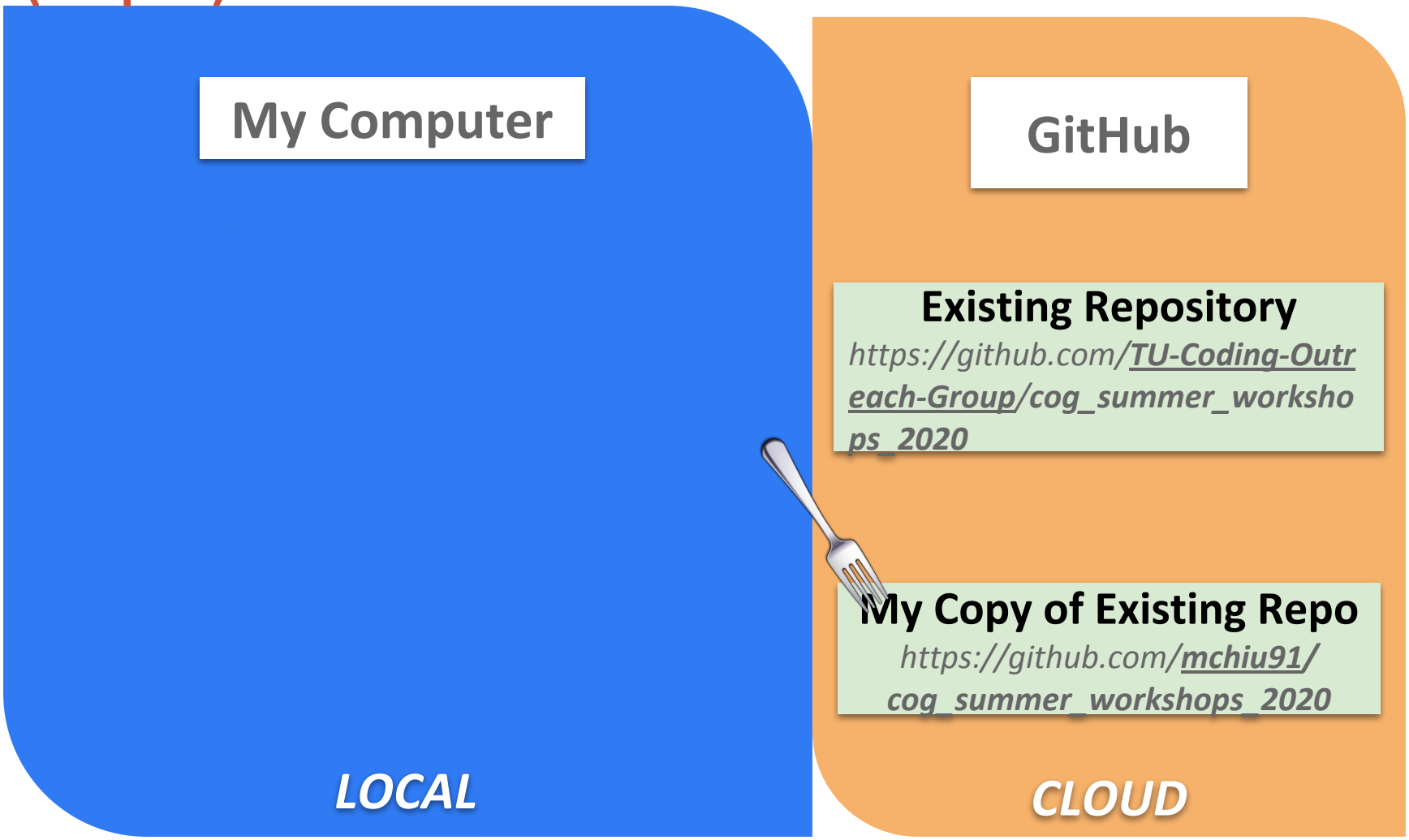
LOCAL

Git records **WHO** and **WHAT** of changes

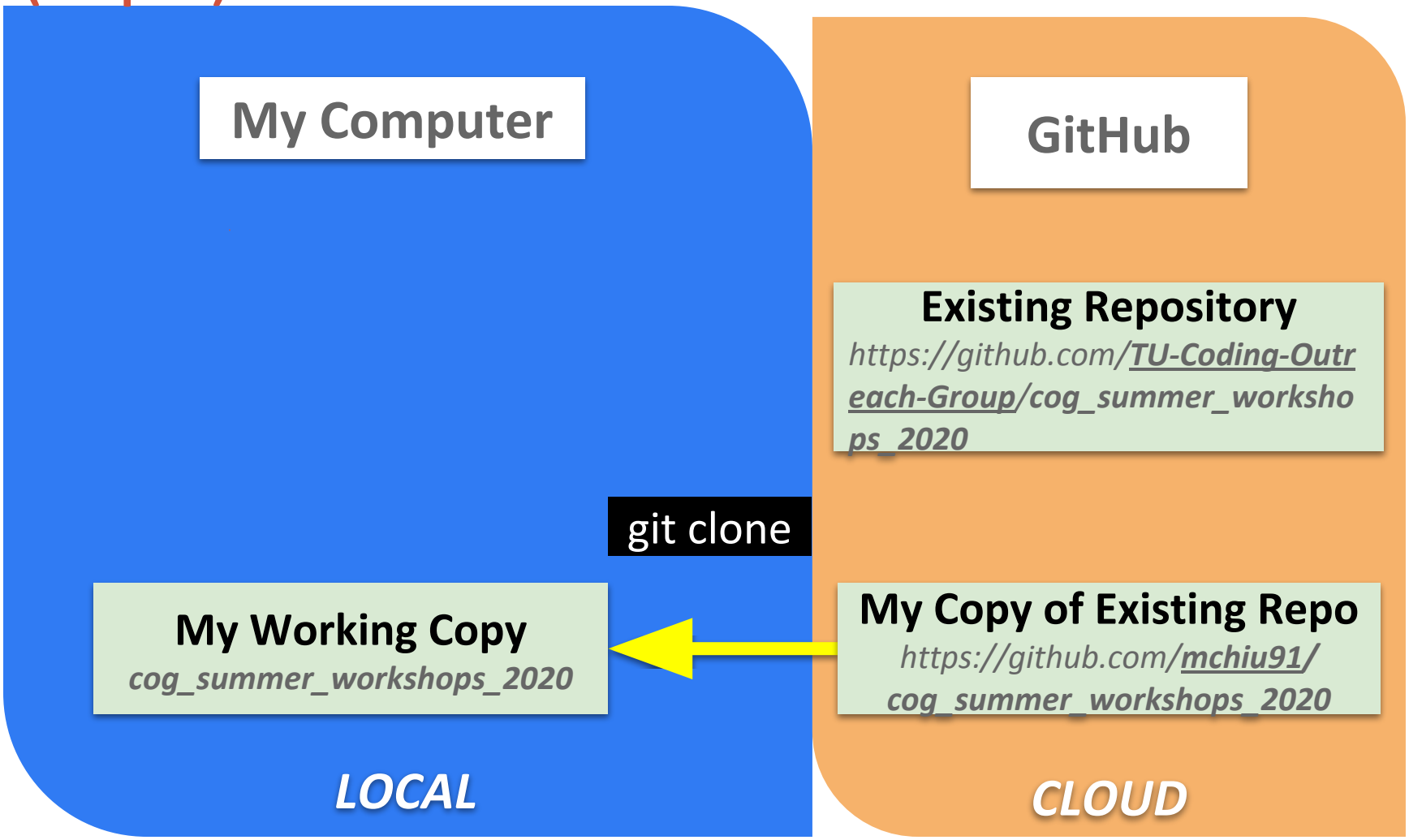
Working From An Existing Repository (repo)



Working From An Existing Repository (repo)

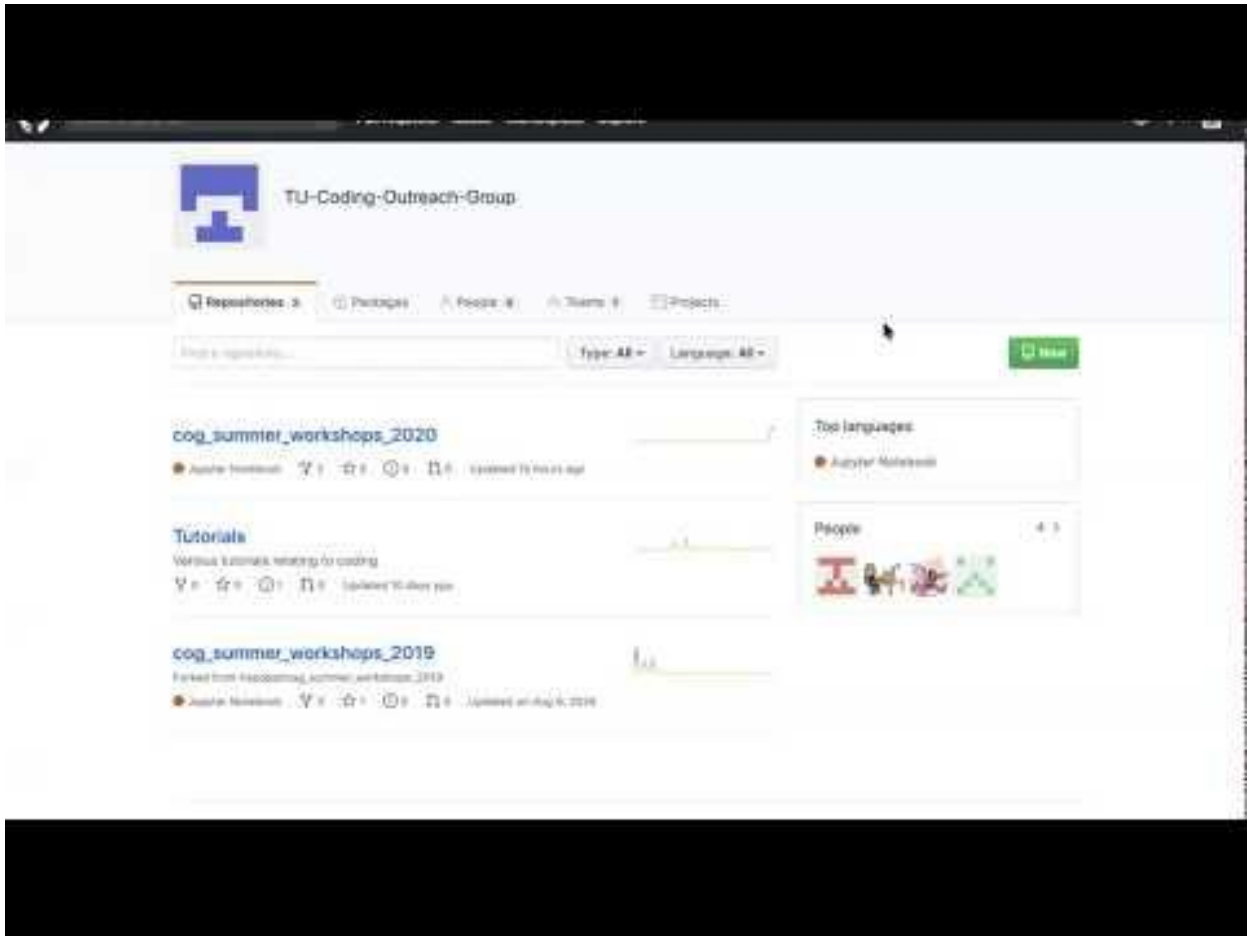


Working From An Existing Repository (repo)

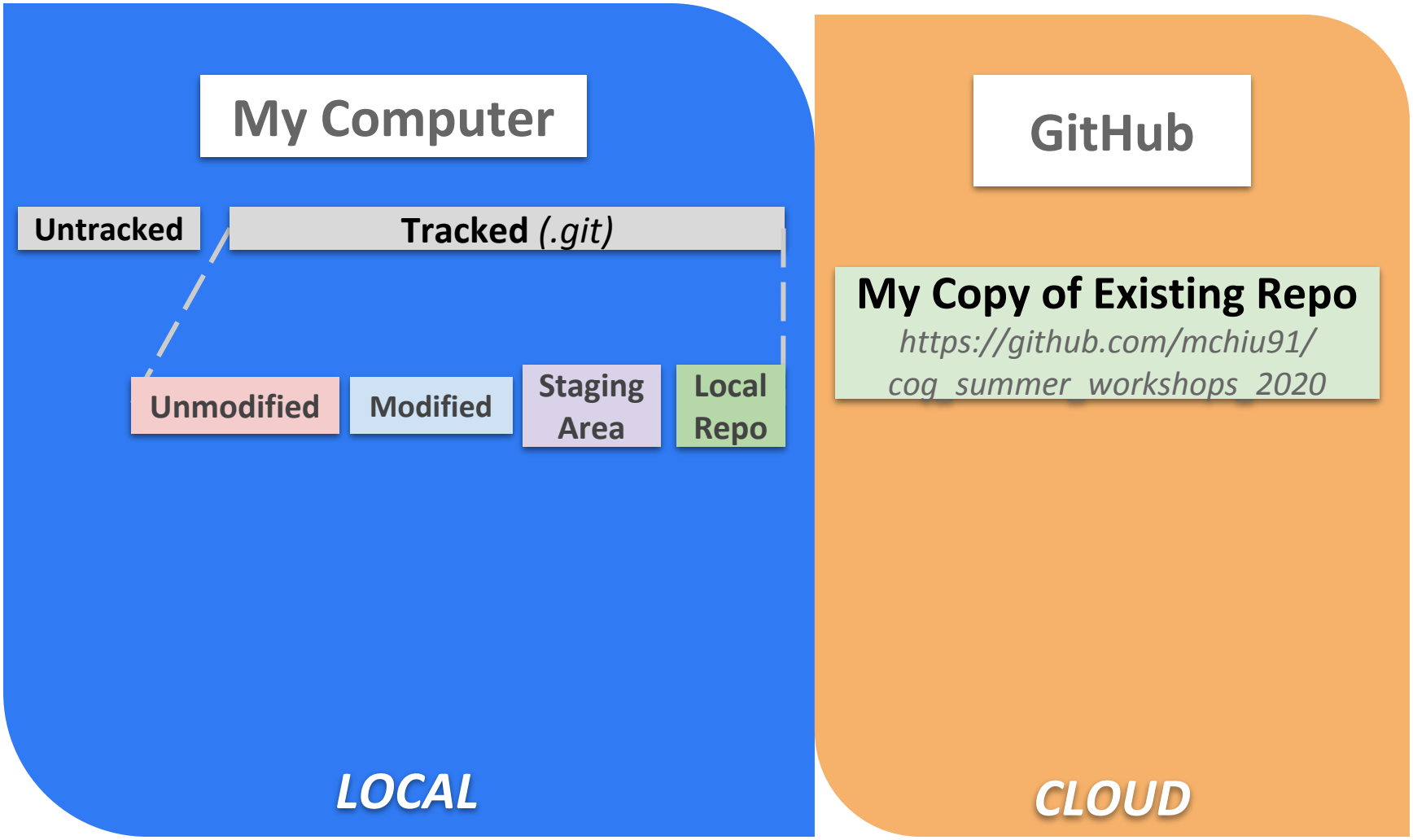


Exercise 2: Fork and Clone an Existing Repository (repo)

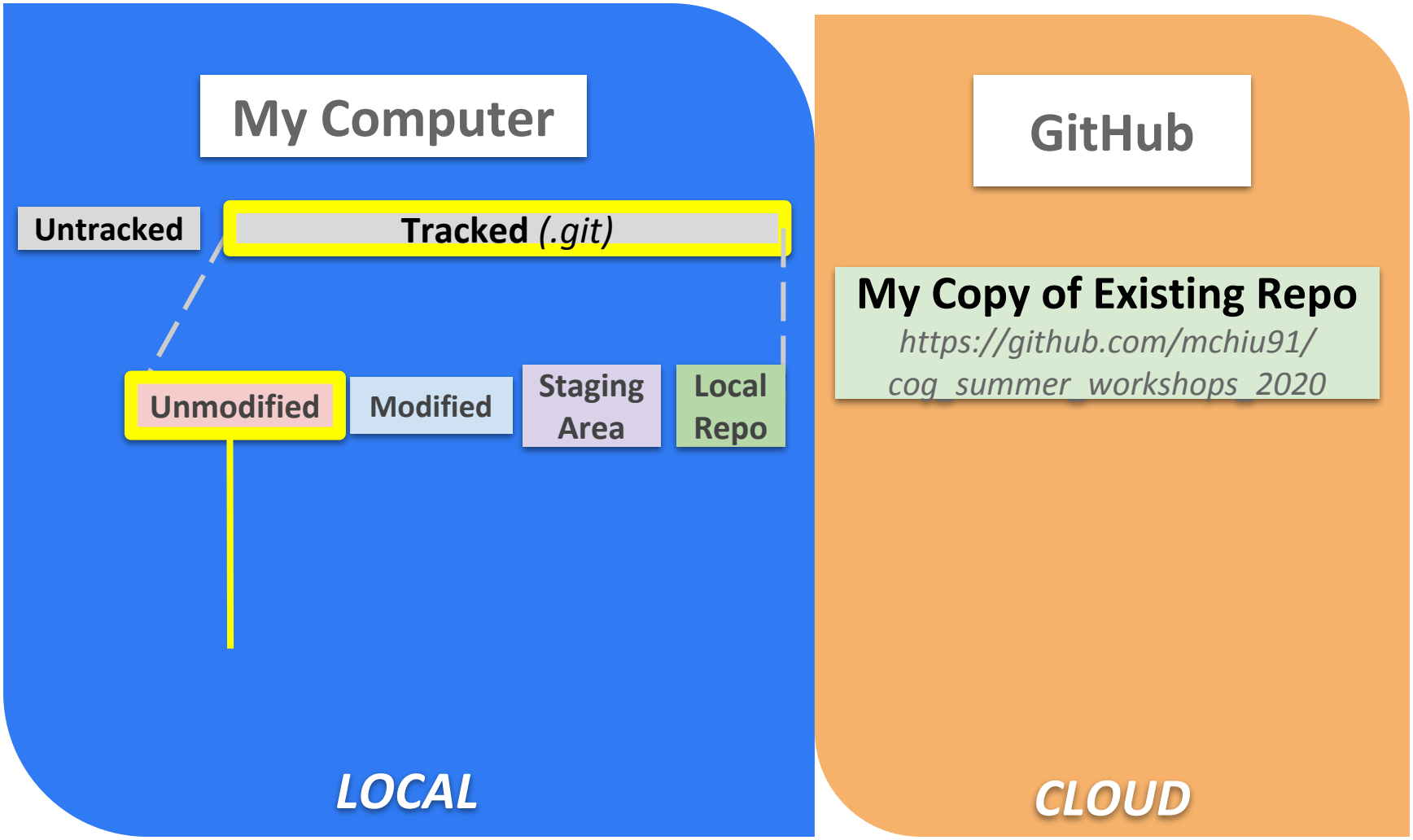
https://youtu.be/zxdR95acSWs



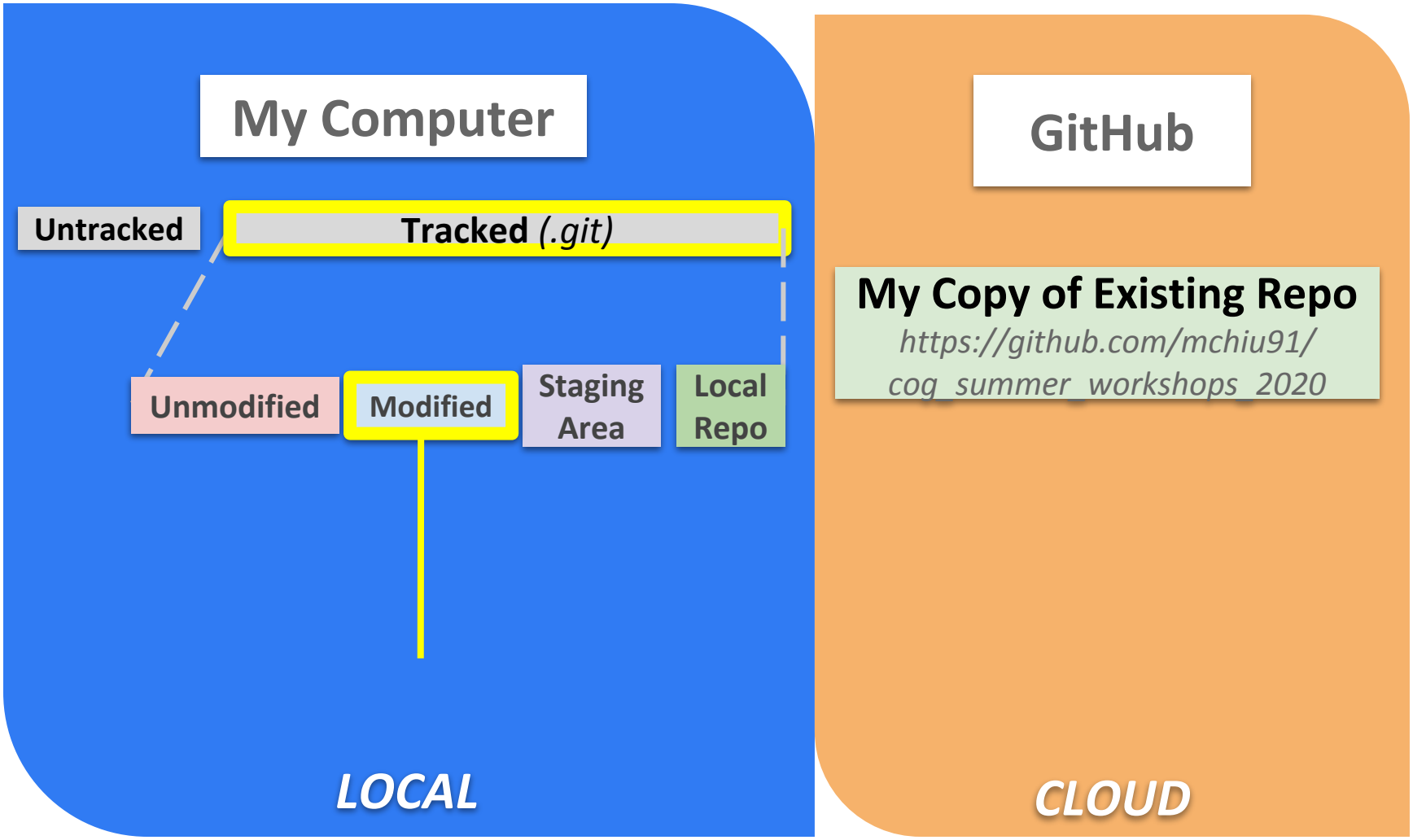
Understanding Git File States



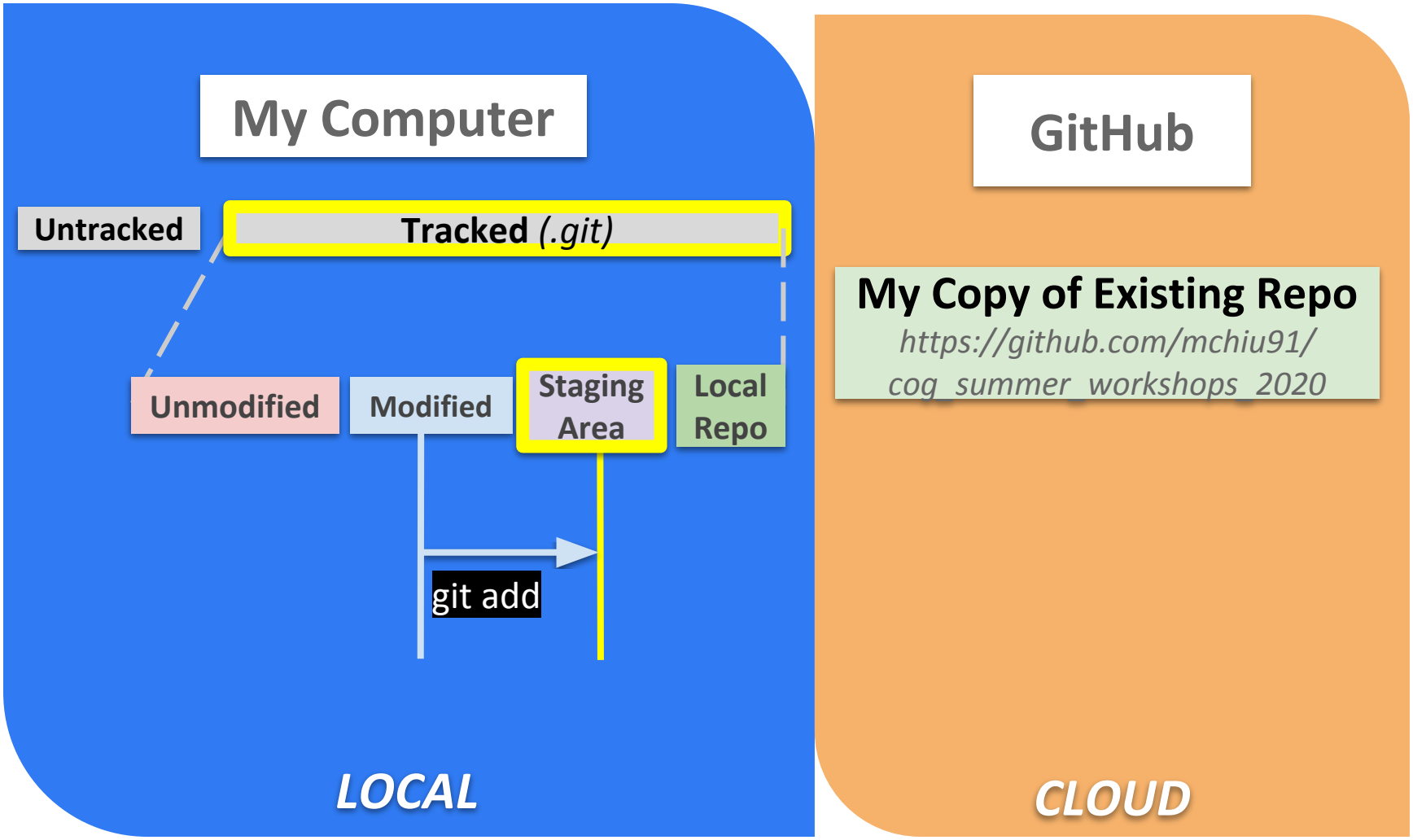
Understanding Git File States



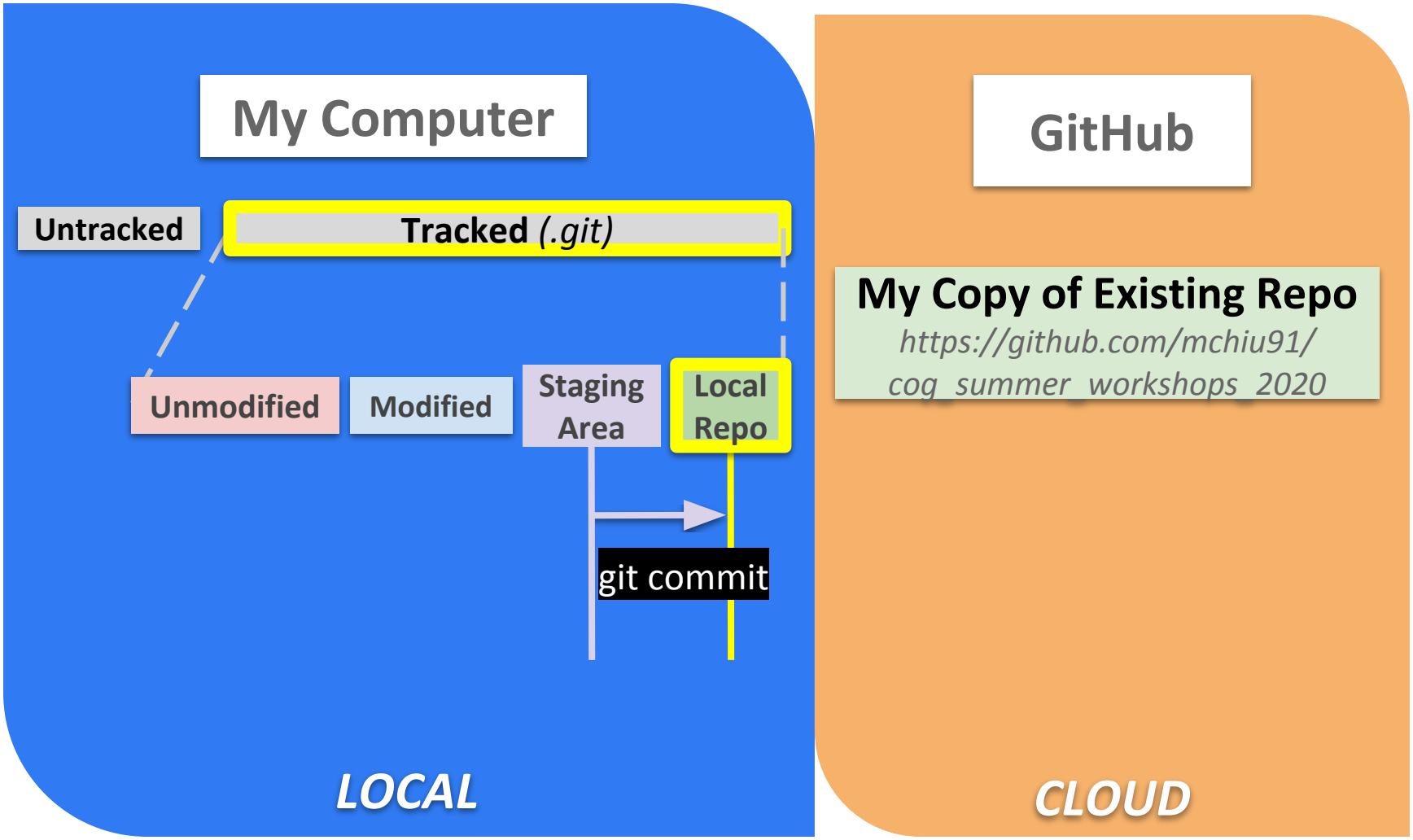
Understanding Git File States



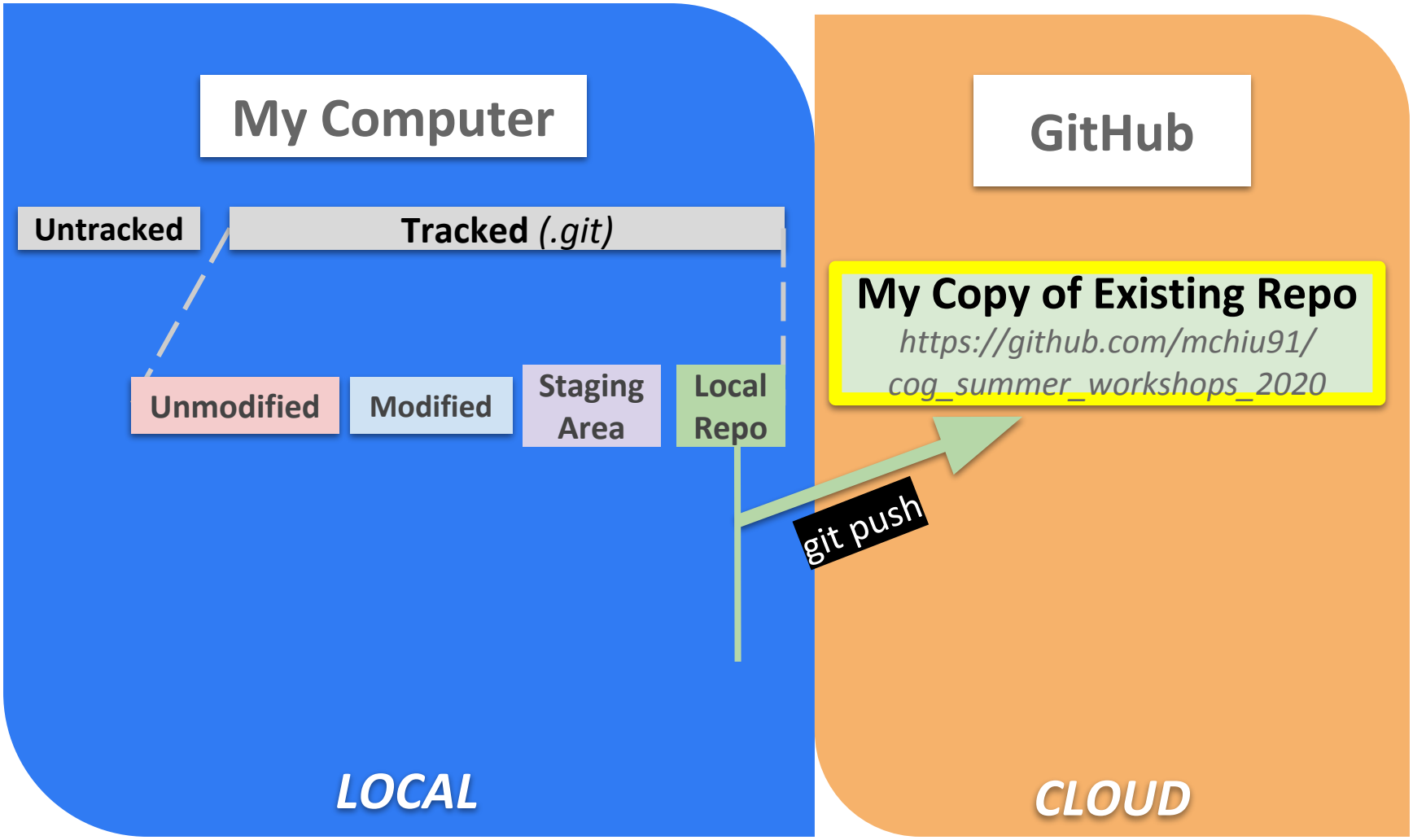
Understanding Git File States



Understanding Git File States



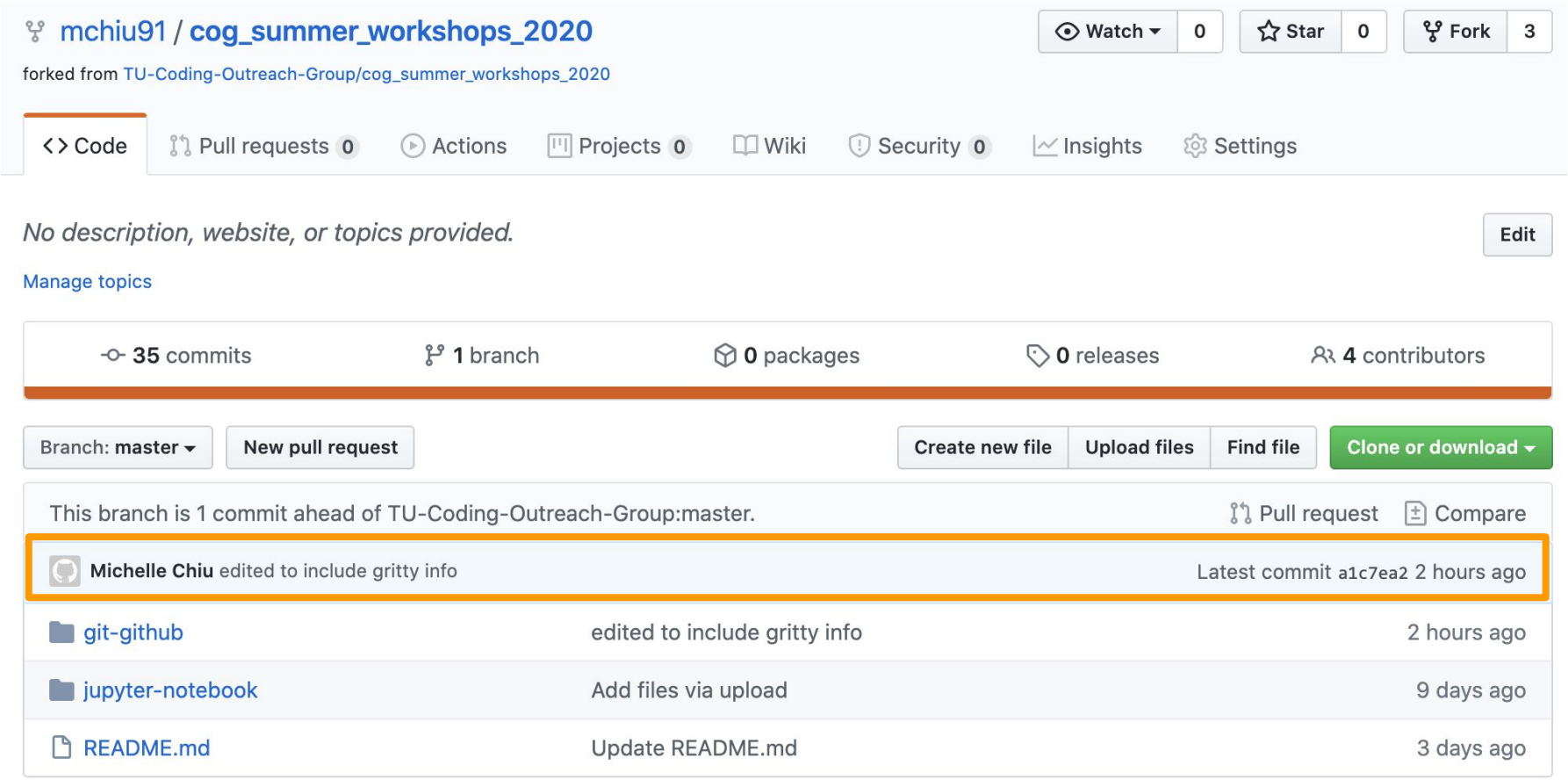
Understanding Git File States



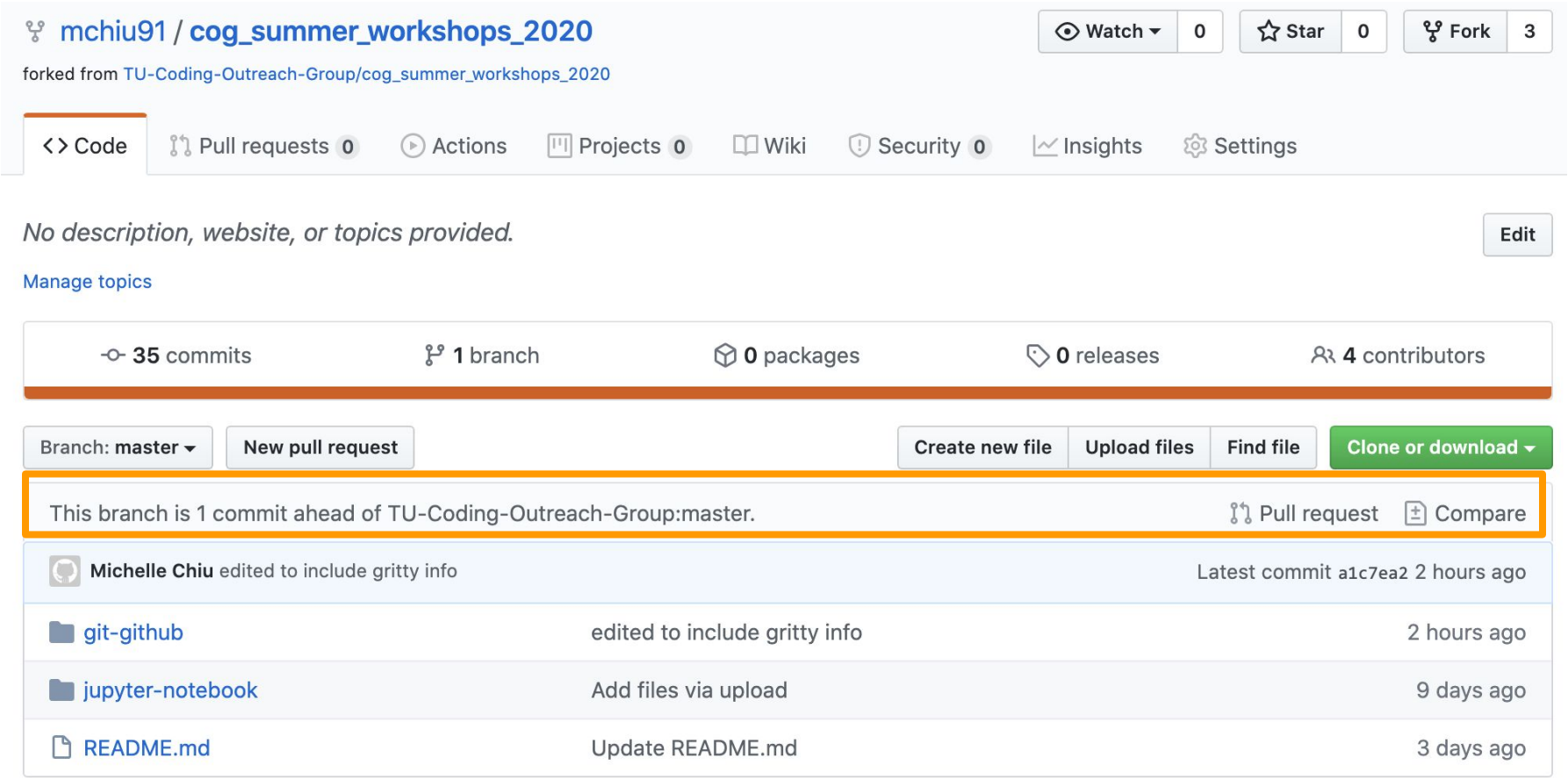
Exercise 3: Add, Commit, Push

https://youtu.be/s2WZ4TA_Obc

Exercise 3: Add, Commit, Push



Exercise 3: Add, Commit, Push



Useful Git commands

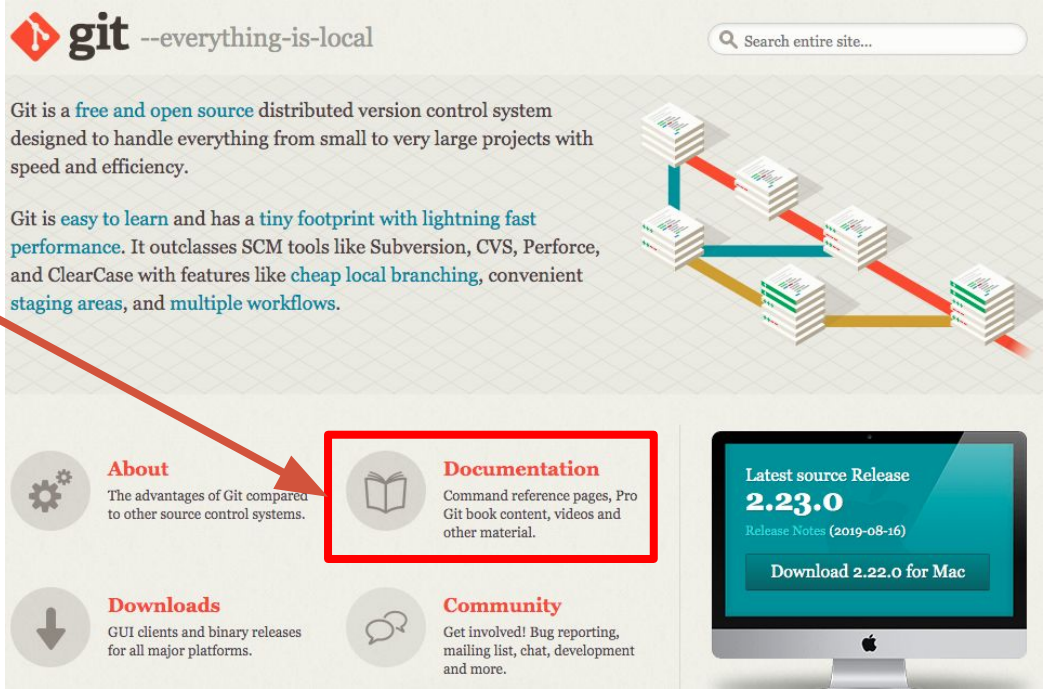
- **git status** shows the **status of a repository**
- **git add** puts files in the **staging area**
- **git commit** saves the staged content as a new commit in the local repository (always write a log message when committing changes)
- **git push** sends from local to GitHub
- **git log** shows the commit history
- **git diff** displays differences between commits
- **git checkout** recovers old versions of files

Git Workflow

https://medium.com/@lulu.ilmaknun.q/kompilasi-meme-git-e2fe49c6e33e

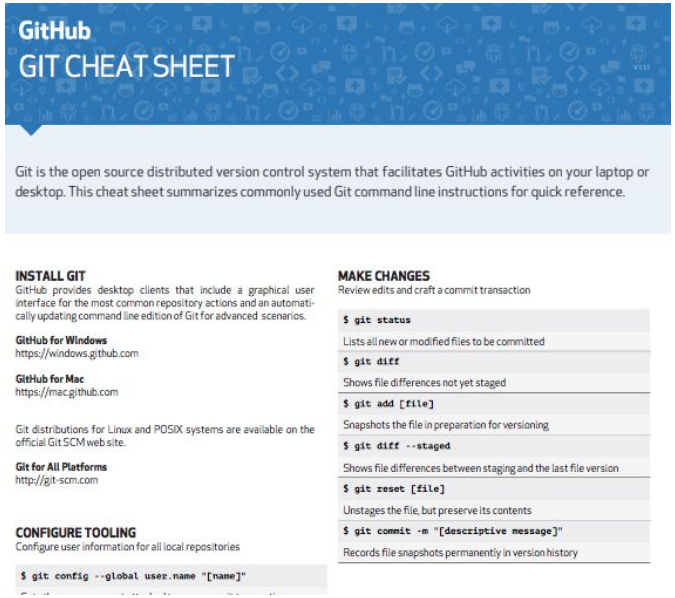
Resources (among many!)

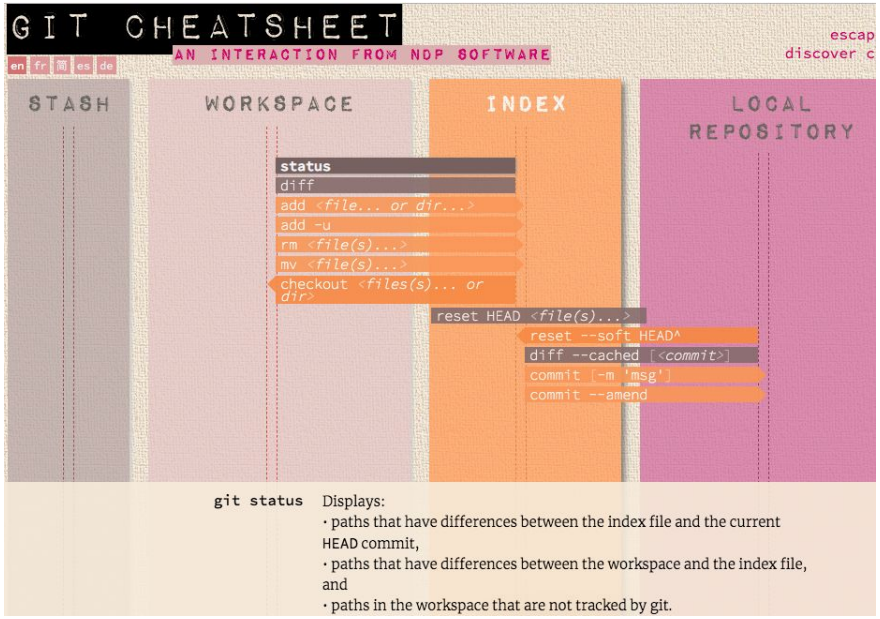
- https://git-scm.com



Resources (among many!)

- https://git-scm.com/docs
  (links to videos, static and interactive cheat sheets)





Resources (among many!)

- https://git-scm.com/docs
- https://try.github.io/

Resources to learn Git

Learn by reading

Git Handbook

Git, GitHub, DVCS, oh my! Learn all the lingo and the basics of Git.

Cheat Sheets

Keep these handy! Reference sheets covering Git commands, features, SVN migrations, and bash. Available in a multiple languages.

Learn by doing

Learn Git branching

Try Git commands right from your web browser. Featuring some of your soon-to-be favorites: branch, add, commit, merge, revert, cherry-pick, rebase!

Visualizing Git

Look under the hood! Explore how Git commands affect the structure of a repository within your web browser with a free explore mode, and some constructed scenarios.

Git-It

You've downloaded Git, now what? Download Git-It to your machine and you'll get a hands-on tutorial that teaches you to use Git right from your local environment, using commands on real repositories.

Resources (among many!)

- https://git-scm.com/docs
- https://try.github.io/
- http://dangitgit.com/

Dangit, I did something terribly wrong, please tell me git has a magic time machine!?!

```
git reflog
# you will see a list of every thing you've
# done in git, across all branches!
# each one has an index HEAD@{index}
# find the one before you broke everything
git reset HEAD@{index}
# magic time machine
```

Sources

- https://doi.org/10.5281/zenodo.3369466 - slides by Stephanie DeCross (Harvard)
- https://elizabeth-dupre.com/git-course/ - Git course by Elizabeth DuPre (Montreal Neurological Institute)
- https://agripongit.vincenttunru.com/ ← Git tutorial with simple and clear visuals
- https://codingbee.net/git/git-file-states ←useful visuals for understanding file states