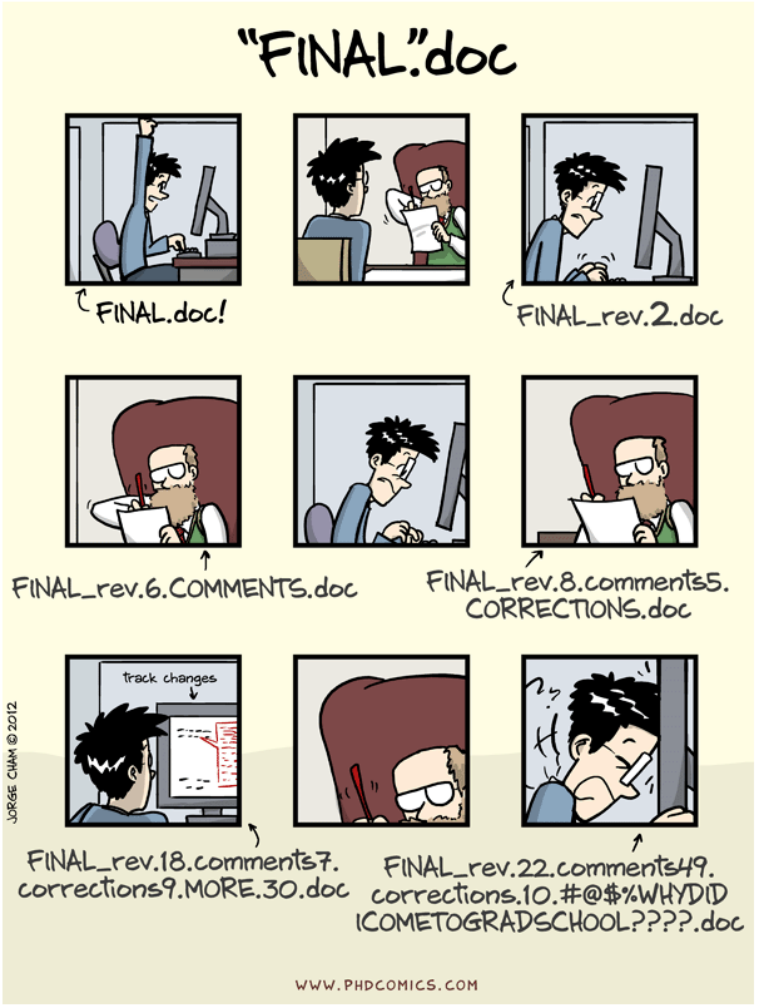
Introduction to Scientific Computing
Meeting 11
Version Control with git



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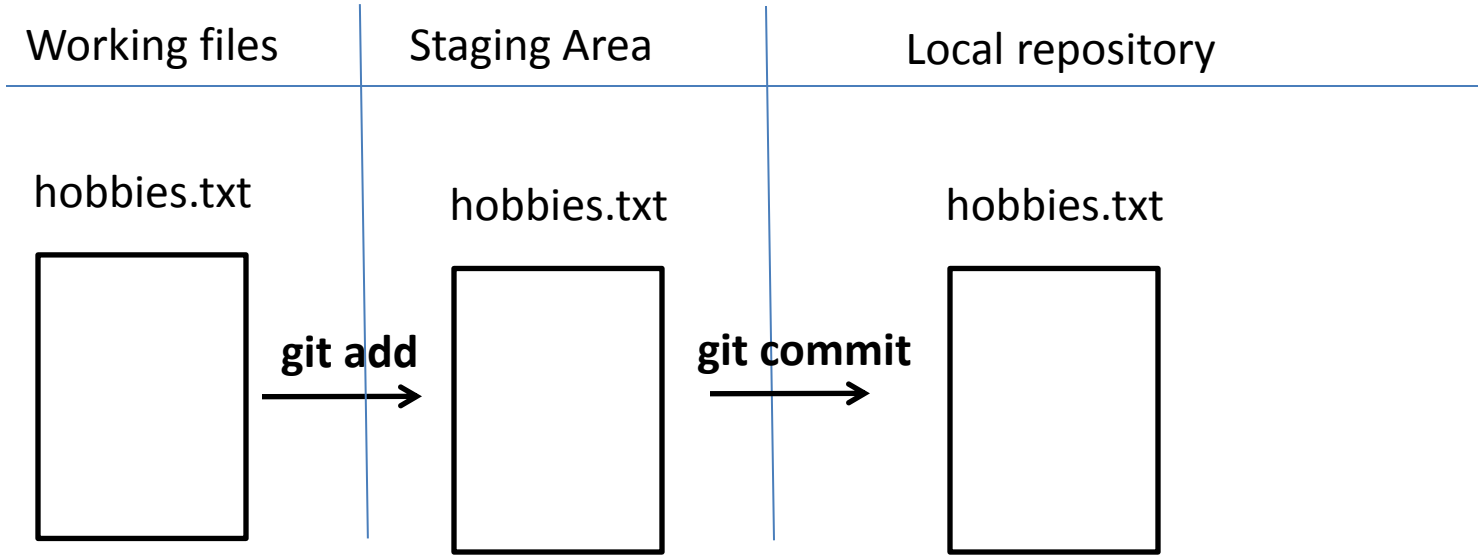
Last Meeting Objectives

1. **Explore the history of a version controlled file**
2. **Learn how to recover old version of a file.**
3. **Learn what a remote repository is**
4. **Sign up with a hosting site:**
    1. **GitHub (https://github.com/) or**
    2. **Bitbucket (https://bitbucket.org/)**
5. **Set up a remote repository on hosting site of your choice and push a local repository up to the remote repository.**

Last Meeting Review

- **Make a local git repository** called “my-hobbies”. Make a file called “hobbies.txt” to track under version control.
- **Explore the history** of hobbies.txt
  - **git diff HEAD~1 hobbies.txt**
  - **git diff *unique-identifier* hobbies.txt**
- **Recover old versions** of hobbies.txt
  - **git checkout HEAD hobbies.txt**
  - **git checkout *unique-identifier* hobbies.txt**


Working files
Staging Area
Local repository
hobbies.txt
hobbies.txt
hobbies.txt
git add
git commit

Last Meeting Review – GitHub vs. Bitbucket

- **Public repositories -** Anyone can view the repository, but you choose who can commit.
- **Private repositories -** You choose who can view and commit to the repository.

- **GitHub - https://github.com/**
  - Pricing plan based on **number of private repositories.**

- **Bitbucket - https://bitbucket.org/**
  - Pricing plan based on **number of users.**

- **Recommendations**
  - Use Bitbucket for personal work to eliminate any confusion with the USGS GitHub account for USGS work.
  - Using multiple hosting sites is good for expanding what you know.

Today's Objective

1. **Set up a remote repository on hosting site of your choice and push a local repository up to the remote repository.**
2. **Learn how to push changes to and pull changes from a remote repository.**

Create a remote repository and push local repository to remote

- **Create** a remote repository called “my-hobbies”
  - Make sure that directory names match between local and remote repo.

- **Add** a link to the remote repository in your local repository

$ cd meetings/meeting-9/my-hobbies

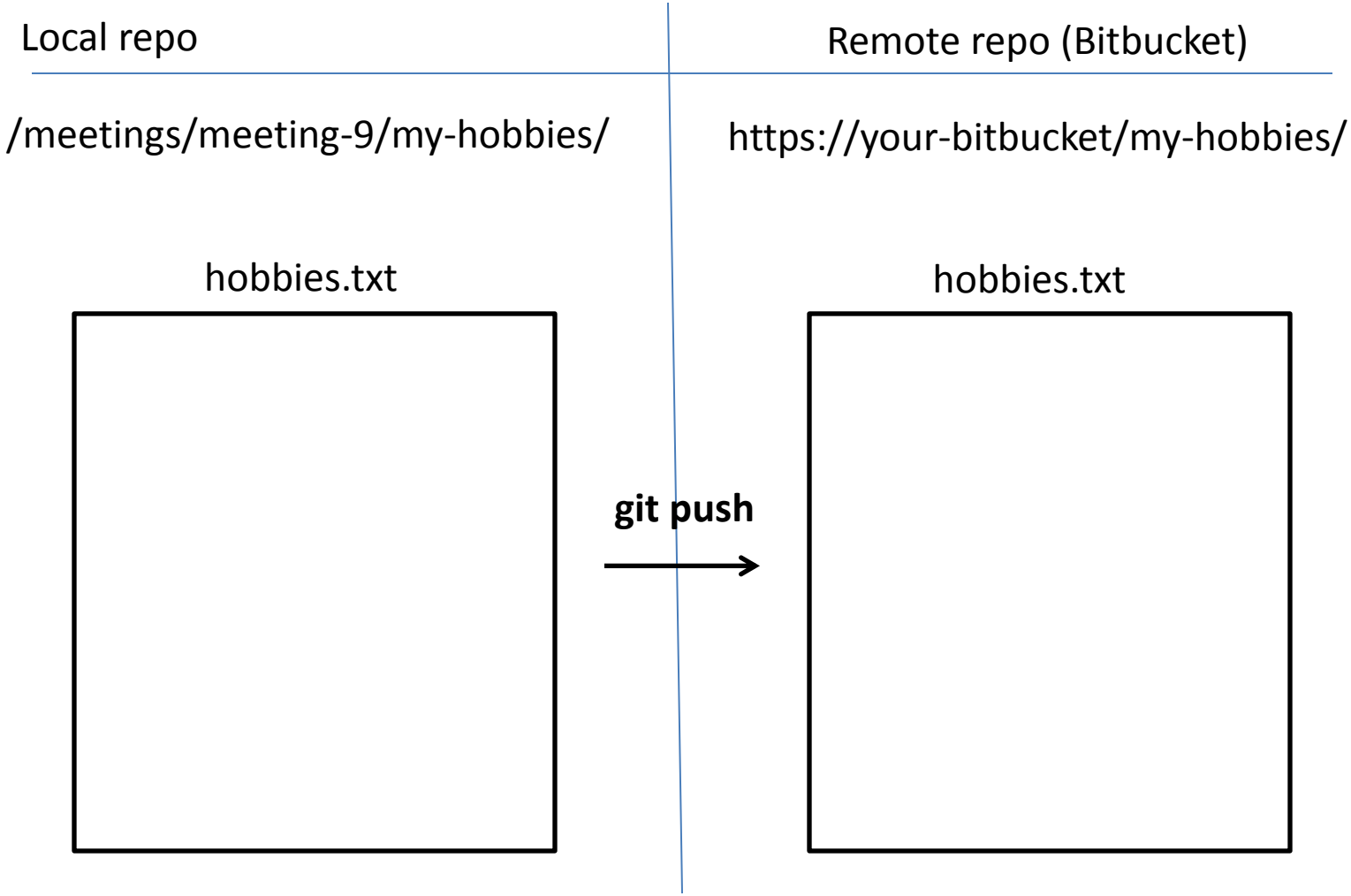
$ git remote add origin https://jlant@bitbucket.org/jlant/my-hobbies.git

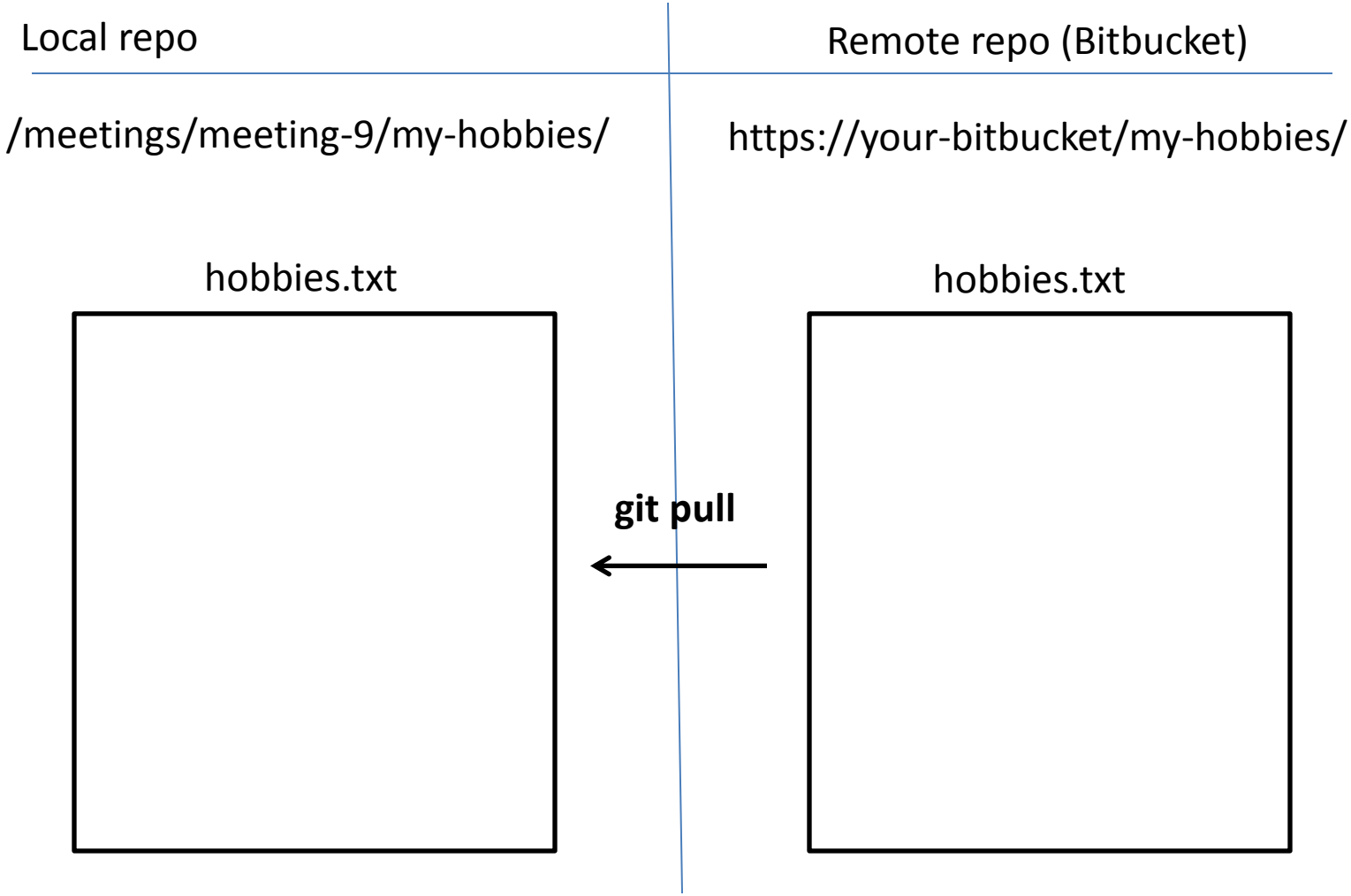
$ git remote -v

- **Push** local files (in master branch) to your remote repository.

$ git push origin master

  - The name “origin” is a local nickname for your remote repository
  - Go to your remote repository and check that it worked.


Local repo
Remote repo (Bitbucket)
/meetings/meeting-9/my-hobbies/
https://your-bitbucket/my-hobbies/
hobbies.txt
hobbies.txt
git push


Local repo
Remote repo (Bitbucket)
/meetings/meeting-9/my-hobbies/
https://your-bitbucket/my-hobbies/
hobbies.txt
hobbies.txt
git pull

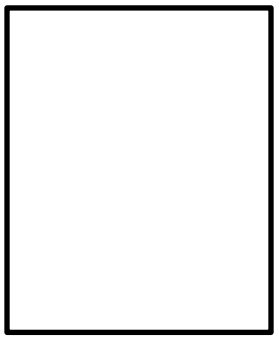
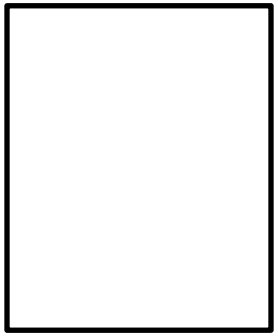
Create a local and remote Git repository for a bash script

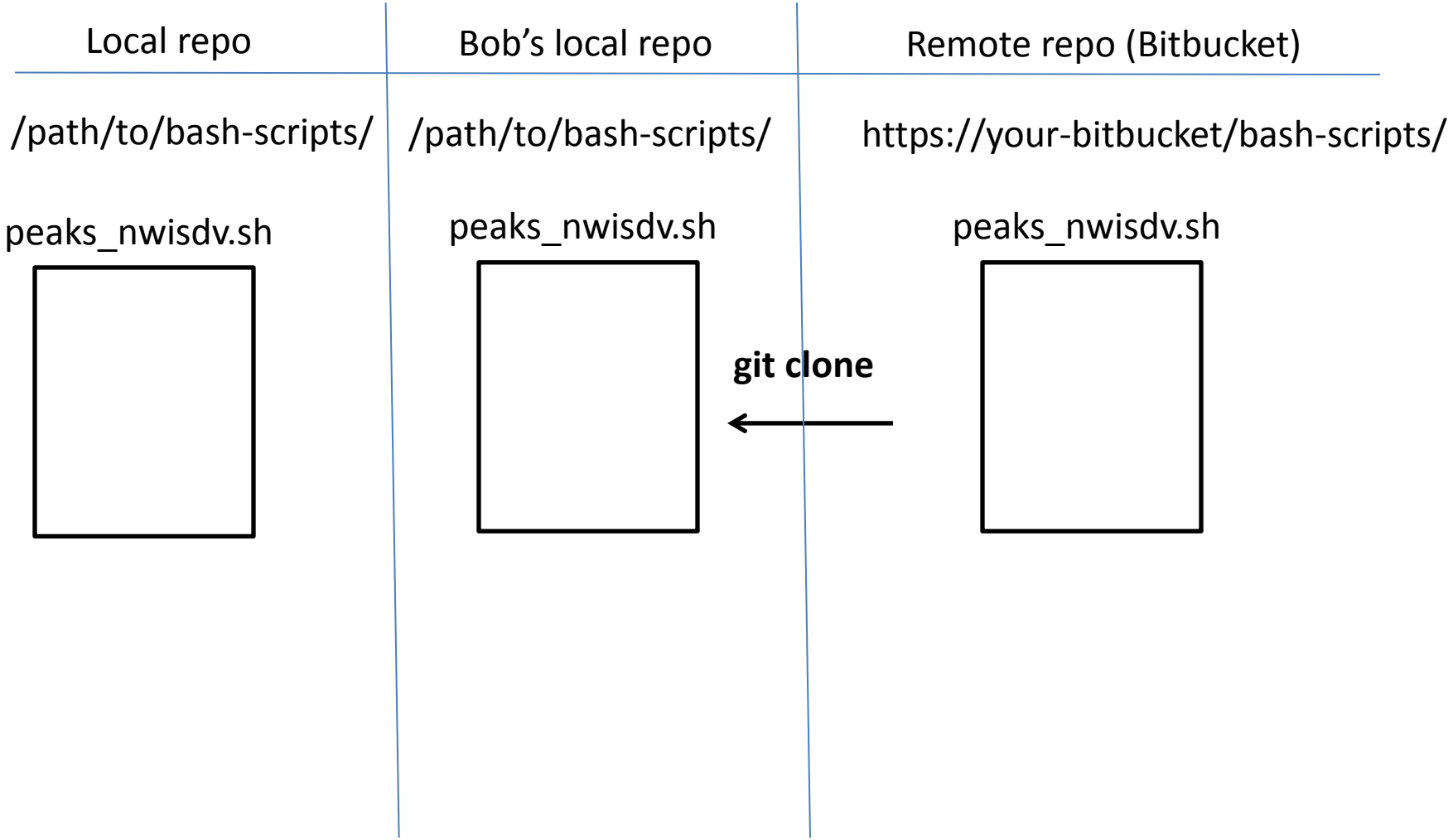
- Create git repositories (local and remote) for a bash script from scratch.
- **git remote add origin** https://your-bitbucket-address/your-repo-name.git
- **git push** copies changes from a local repository and “pushes” them to a remote repository.

Collaborating with others using Git

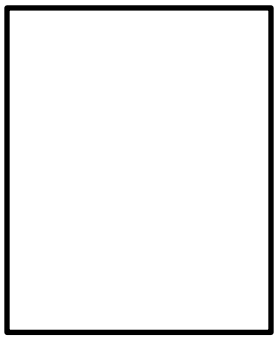
- **git pull** copies changes from a remote repository and "pulls" them to a local repository.
- **git clone** copies a remote repository and creates a local repository with a remote called **origin**.

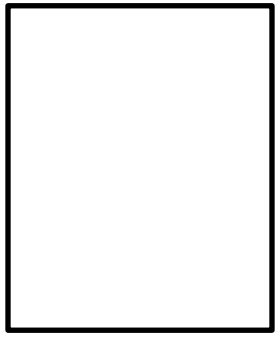
- Simulate working with a collaborator using another copy of a repository on the local machine.

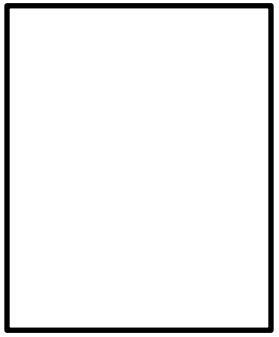
Local repo	Bob's local repo	Remote repo (Bitbucket)
/path/to/bash-scripts/	/path/to/bash-scripts/	https://your-bitbucket/bash-scripts/
peaks_nwisdv.sh 		peaks_nwisdv.sh 

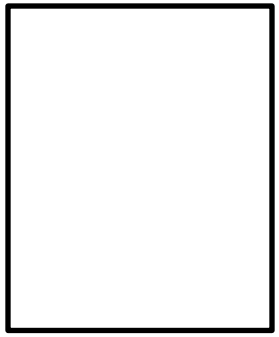

Local repo
Bob's local repo
Remote repo (Bitbucket)
/path/to/bash-scripts/
/path/to/bash-scripts/
https://your-bitbucket/bash-scripts/
peaks_nwisdv.sh
peaks_nwisdv.sh
peaks_nwisdv.sh
git clone

Local repo	Bob's local repo	Remote repo (Bitbucket)
/path/to/bash-scripts/	/path/to/bash-scripts/	https://your-bitbucket/bash-scripts/
peaks_nwisdv.sh	peaks_nwisdv.sh	peaks_nwisdv.sh
	README.txt	README.txt

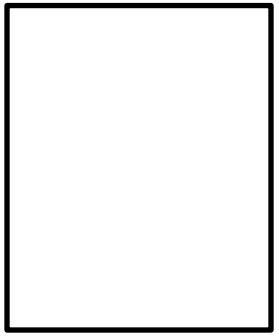


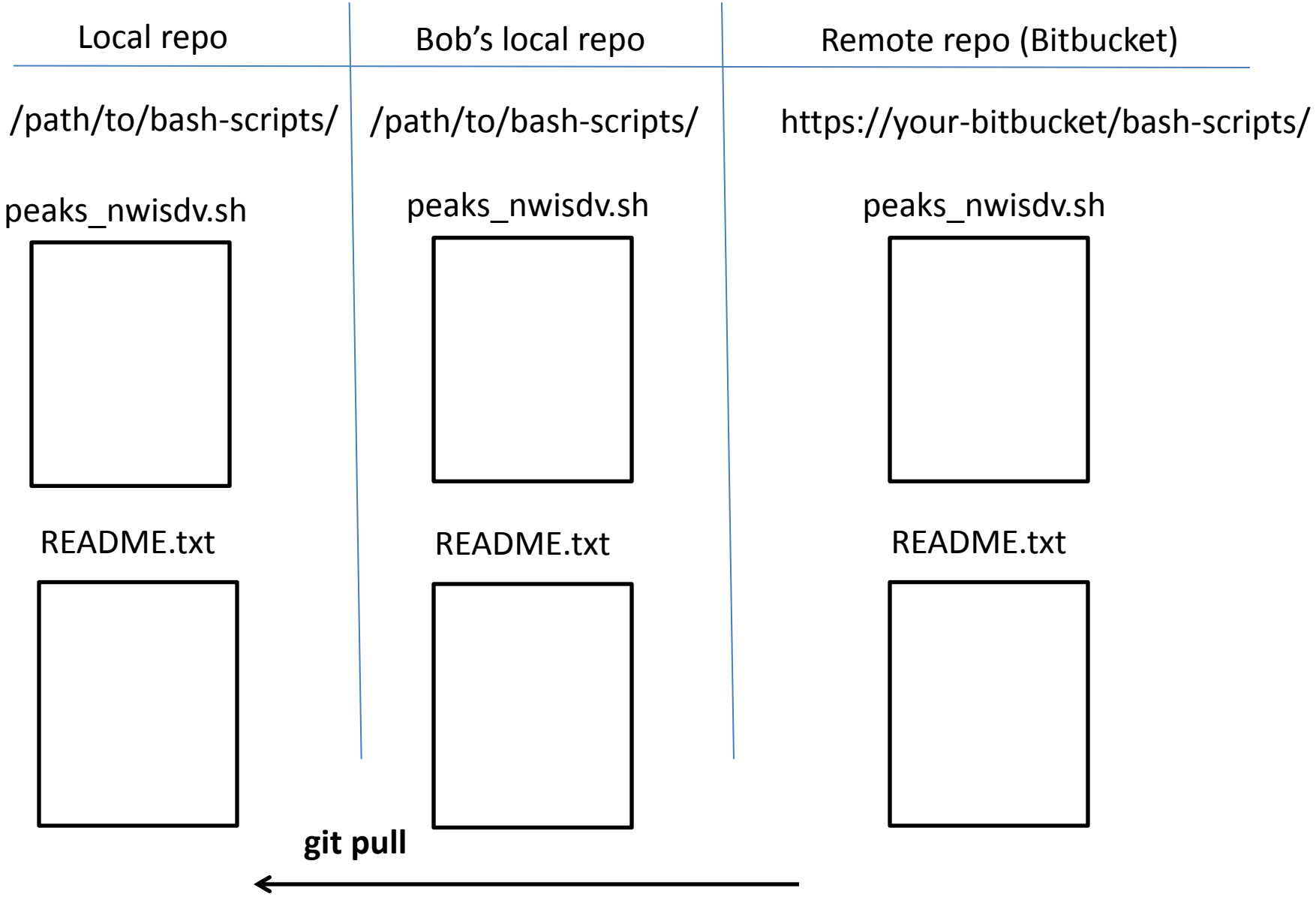






git push




Local repo
Bob's local repo
Remote repo (Bitbucket)
/path/to/bash-scripts/
/path/to/bash-scripts/
https://your-bitbucket/bash-scripts/
peaks_nwisdv.sh
peaks_nwisdv.sh
peaks_nwisdv.sh
README.txt
README.txt
README.txt
git pull

Summary

- Remote repositories are versions of your project that are hosted on the Internet or network somewhere.
- A local Git repository can be connected to one or more remote repositories.
- **git remote add origin** https://your-bitbucket-address/your-repo-name.git
- **git push** copies changes from a local repository and “pushes” them to a remote repository.
- **git pull** copies changes from a remote repository and “pulls” them to a local repository.
- **git clone** copies a remote repository and creates a local repository with a remote called **origin**.

Next meeting

- Introduction to Python