



Week 2 : SOFTWARE DEVELOPMENT TOOLS AND ENVIRONMENTS

Week2 Getting Started with Git

● Week2 Commands:

- Changing code in a Repository
 - **git add**
- Committing these changes
 - **git commit**
- Pushing or Pulling Changes
 - **git push** and **git pull**
- Checking Status, Logs, and Changes
 - ***git status, git log, git diff***
- Getting repository *changes from a remote branch*
 - **git fetch, git pull**

Week 2

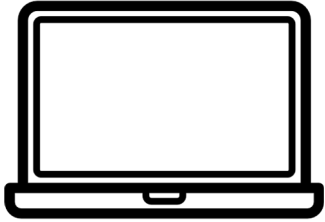
Basic Git Usage

Week 2 Getting Started with Git

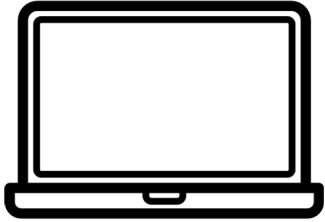
- **Basic Git Usage**

- Let's cover the basic cycle of a workflow of using Git and GitHub.
- This particular basic example will assume just a solo developer and everything working on the same branch.
- We'll cover branches and working with others on Week 3.

Week 2 Getting Started with Git

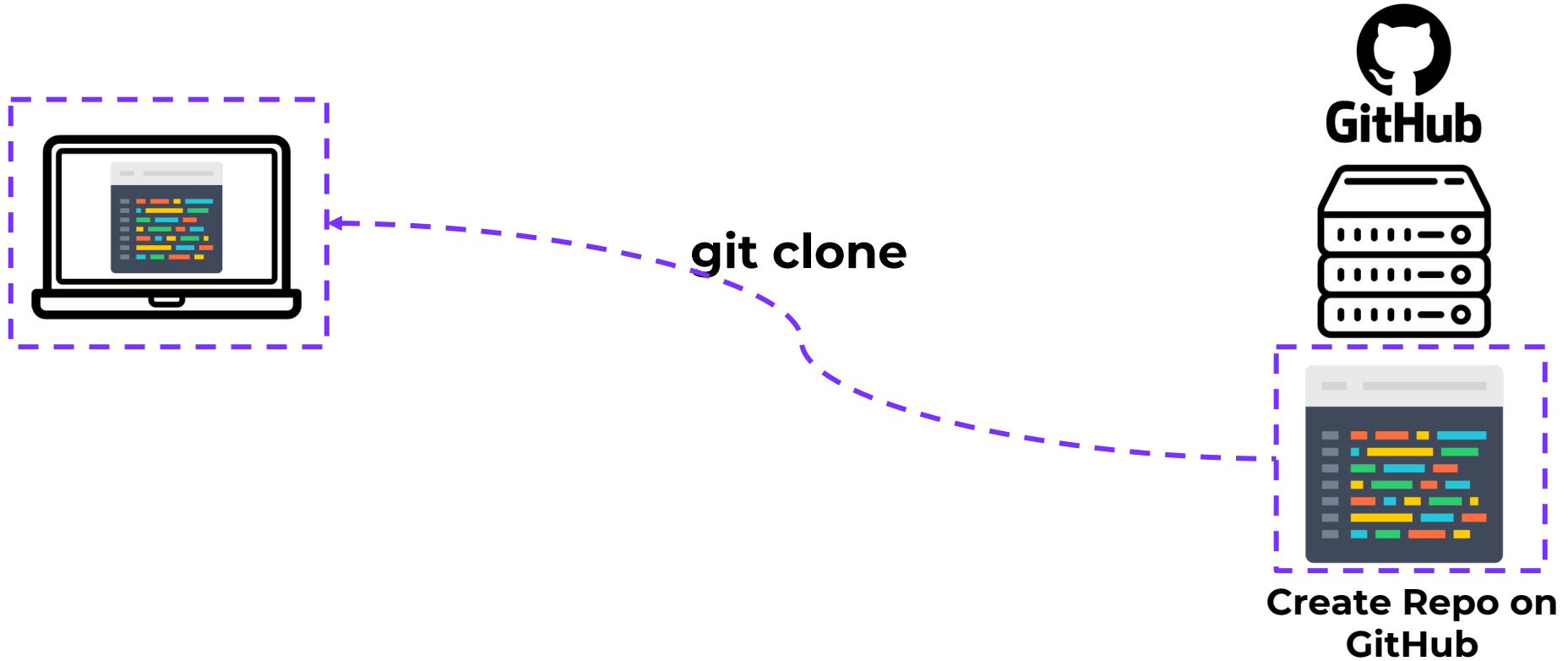


Week 2 Getting Started with Git

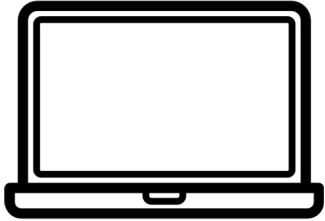


**Create Repo on
GitHub**

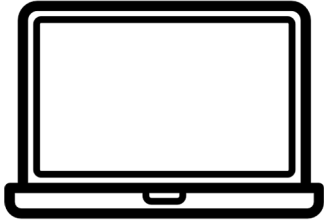
Week 2 Getting Started with Git



Week 2 Getting Started with Git



Week 2 Getting Started with Git



git init



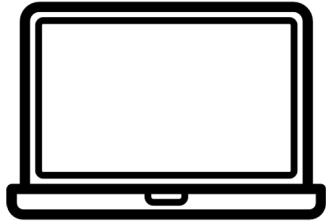
Week 2 Getting Started with Git



git init



Week 2 Getting Started with Git

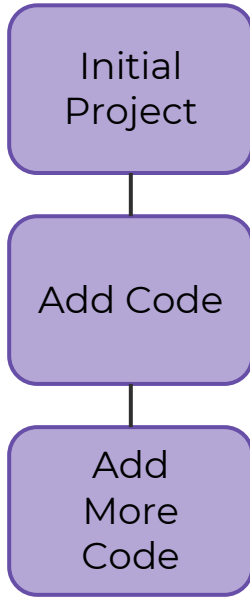


What we need to learn toWeek:

- Git Workflow
- How to tell Git about changes to our code
- How to push changes to GitHub
- How to pull changes from GitHub



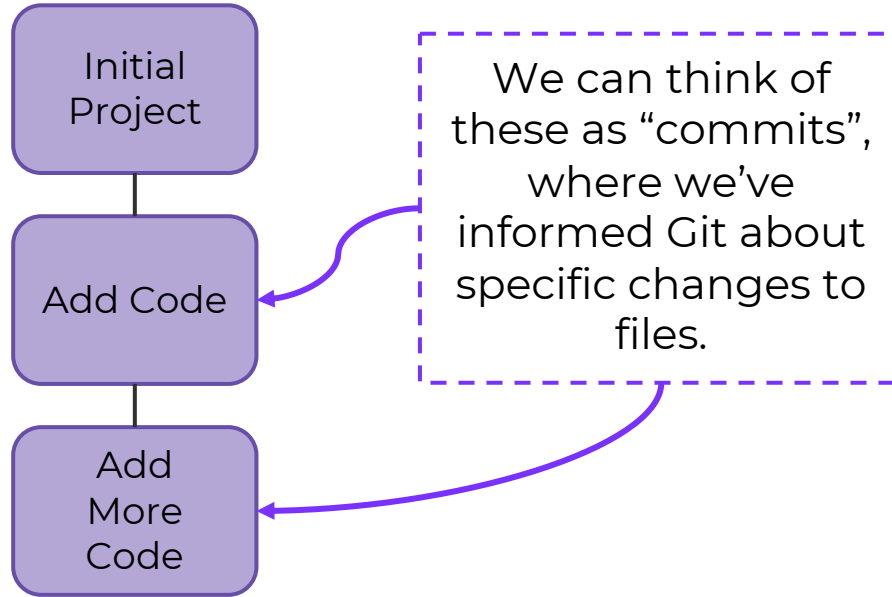
Week 2 Getting Started with Git



Add Code

More Code

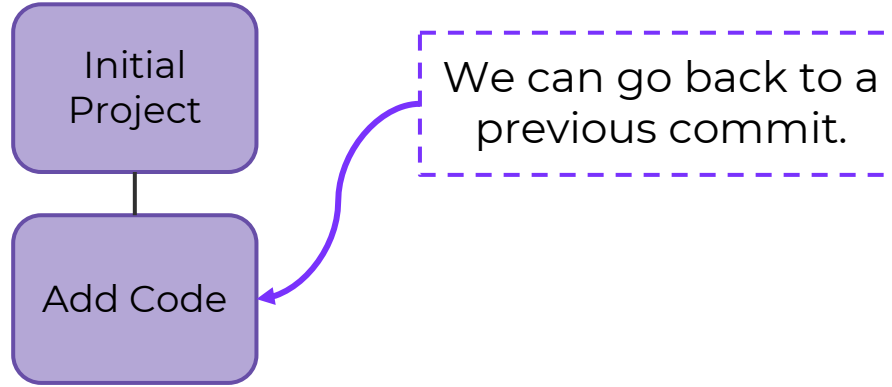
Week 2 Getting Started with Git



Add Code

More Code

Week 2 Getting Started with Git



Add Code

Week 2 Getting Started with Git

Initial
Project

Add Code

A Git commit doesn't just pertain to saving changes in a single file. It can constitute specific changes across an entire **working directory**.

program.py

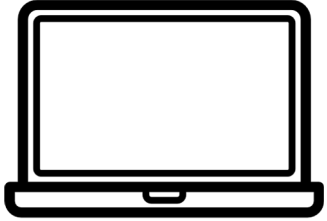
index.html

style.css

Week 2

Add and Commit

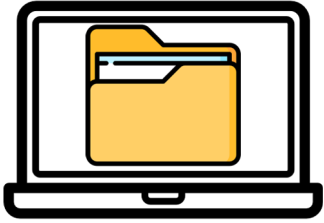
Week 2 Getting Started with Git



git init

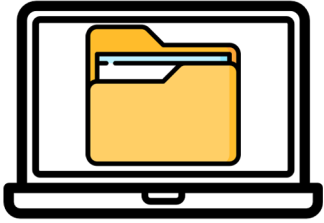
Week 2 Getting Started with Git

Working Directory



Week 2 Getting Started with Git

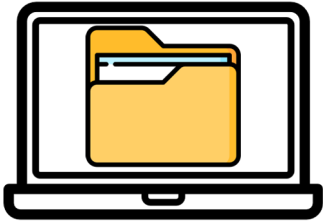
Working Directory



`program.py`

Week 2 Getting Started with Git

Working Directory



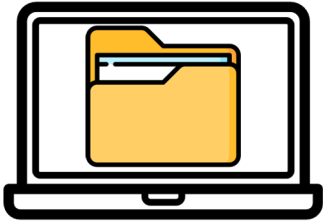
`program.py`

`index.html`

`style.css`

Week 2 Getting Started with Git

Working Directory

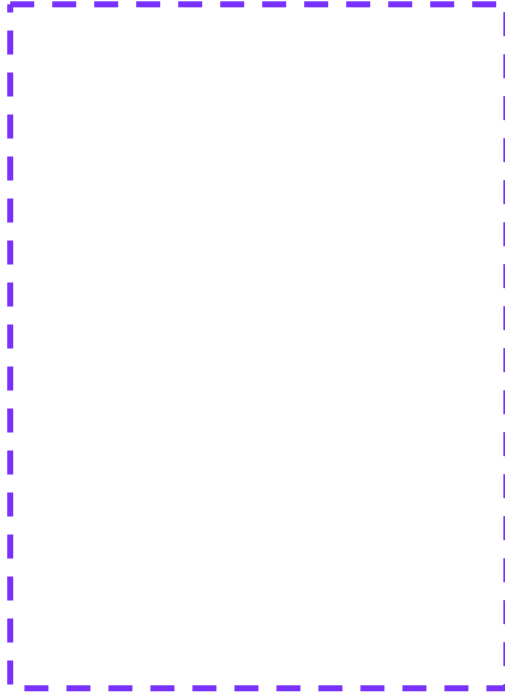


program.py

index.html

style.css

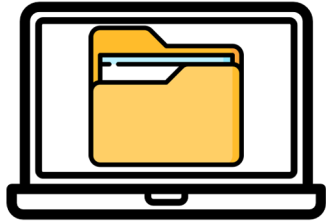
Staging Area



Week 2 Getting Started with Git

Working Directory

Staging Area



program.py

index.html

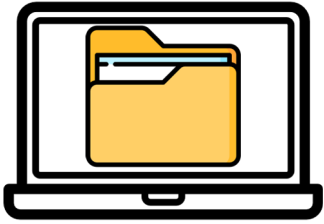
style.css

git add program.py

program.py

Week 2 Getting Started with Git

Working Directory



program.py

index.html

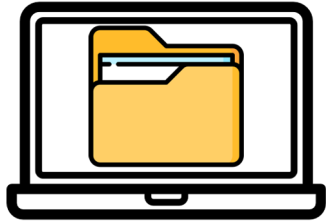
style.css

Staging Area

program.py

Week 2 Getting Started with Git

Working Directory



program.py

index.html

style.css

Staging Area

program.py

Repository

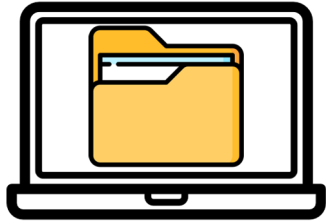
git commit

program.py



Week 2 Getting Started with Git

Working Directory



program.py

index.html

style.css

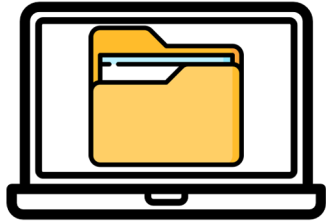
Staging Area

Repository

program.py

Week 2 Getting Started with Git

Working Directory



program.py

index.html

style.css

Staging Area

program.py

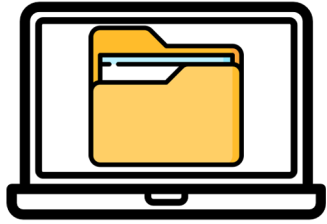
`git commit -m "python code"`

Repository

program.py

Week 2 Getting Started with Git

Working Directory



program.py

index.html

style.css

Staging Area

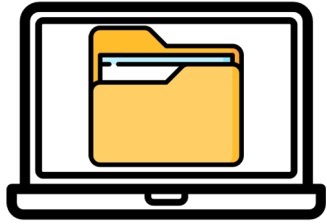
Repository

program.py

“python
code”

Week 2 Getting Started with Git

Working Directory



program.py

index.html

style.css

Staging Area

git add .

index.html

style.css

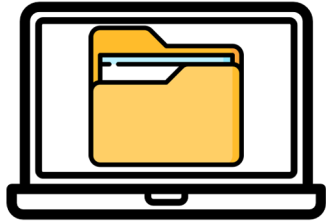
Repository

program.py

“python
code”

Week 2 Getting Started with Git

Working Directory



program.py

index.html

style.css

Staging Area

`git commit -m "site files"`

index.html

style.css

Repository

program.py

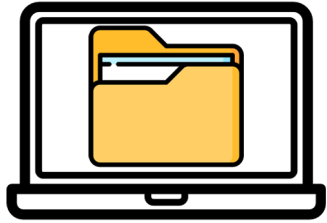
"python
code"

index.html

style.css

Week 2 Getting Started with Git

Working Directory



program.py

index.html

style.css

Staging Area

Repository

program.py

“python
code”

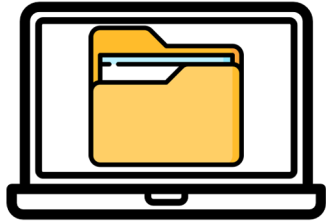
index.html

style.css

“site files”

Week 2 Getting Started with Git

Working Directory



program.py

index.html

style.css

Repository

program.py

“python
code”

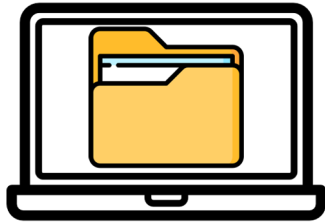
index.html

style.css

“site files”

Week 2 Getting Started with Git

Working Directory



program.py

index.html

style.css

Repository

program.py

“python
code”

index.html

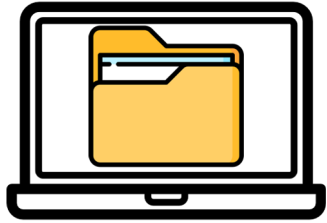
style.css

“site files”



Week 2 Getting Started with Git

Working Directory



program.py

index.html

style.css

Repository

program.py

“python
code”

index.html

style.css

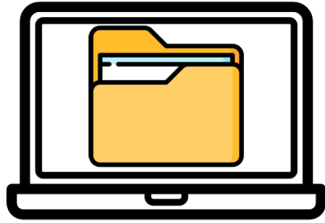
“site files”



git push

Week 2 Getting Started with Git

Working Directory



program.py

Repository

program.py

“python
code”

index.html

style.css

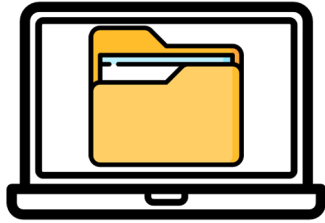
“site files”



Week 2 Getting Started with Git

Working Directory

Repository



program.py

git pull

program.py

“python
code”

index.html

style.css

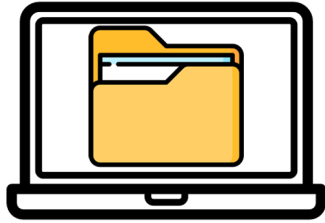
“site files”



Week 2 Getting Started with Git

Working Directory

Repository



program.py

index.html

style.css

git pull

program.py

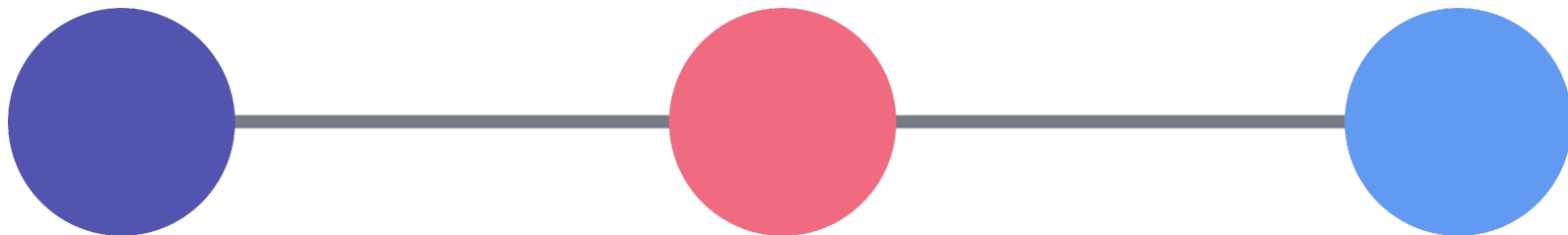
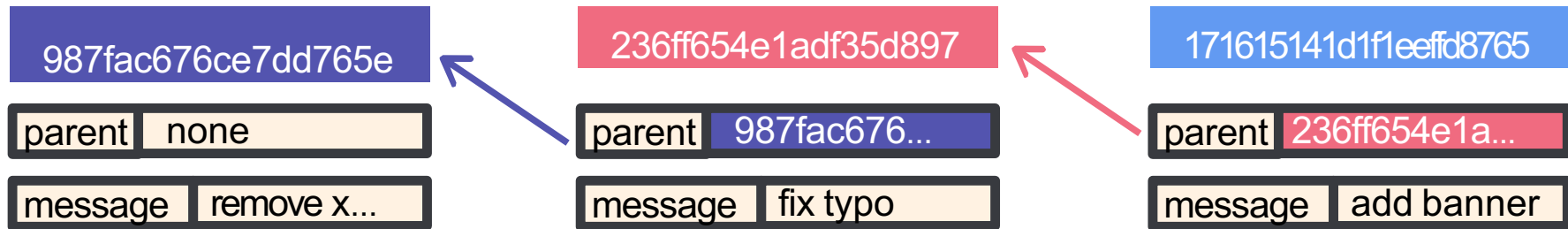
“python
code”

index.html

style.css

“site files”





Week 2

Push and Remote Branches

Week 2 Getting Started with Git

- We can check for remote branches with the command:
 - **git remote -v**
- If you run this command on a cloned repo, you will **view** the URL of the remote branch, like the GitHub URL.
- If there is no connection to a remote branch, then you won't see a URL.

Week 2 Getting Started with Git

- We tell git we want to add a remote branch using the git remote command syntax:
 - **git remote add name https://url.git**
- By convention, we call this remote branch the **origin** branch.
 - **git remote add origin https://url.git**
- You then replace the .git URL with the .git URL from the repository you created.

Week 2 Getting Started with Git

- **Important Note:**

- We won't use these commands in the video, but just in case you need them in the future:

- **git remote rename <old> <new>**
- **git remote remove <name>**

Week 2 Getting Started with Git

- Once we've connected to our remote branch on GitHub, we can **push** our code to the remote branch.
- We tell git to push to the remote main/master branch called origin with the command:
 - **git push -u origin main/master**

Week 2 Getting Started with Git

- **Important Note:**

- GitHub has officially changed the naming convention of its **master** branch to **main** branch.
- You'll see this reflected in the instructions that GitHub provides:
 - **git branch -M main**



Master? Main?

In 2020, Github renamed the default branch from **master** to **main**. The default Git branch name is still **master**, though the Git team is exploring a potential change.

We will circle back to this shortly.

Couple Years Back..



Branch: master



LOCAL
DESKTOP



Branch: master



Improper Reference



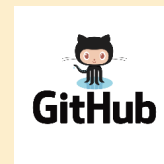
Branch: master



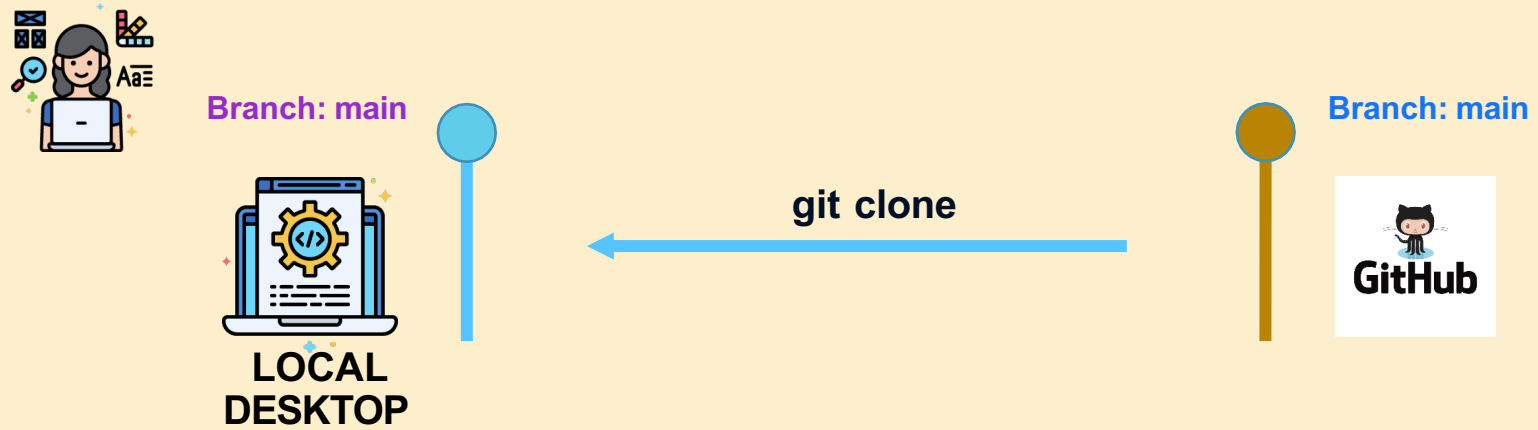
LOCAL
DESKTOP



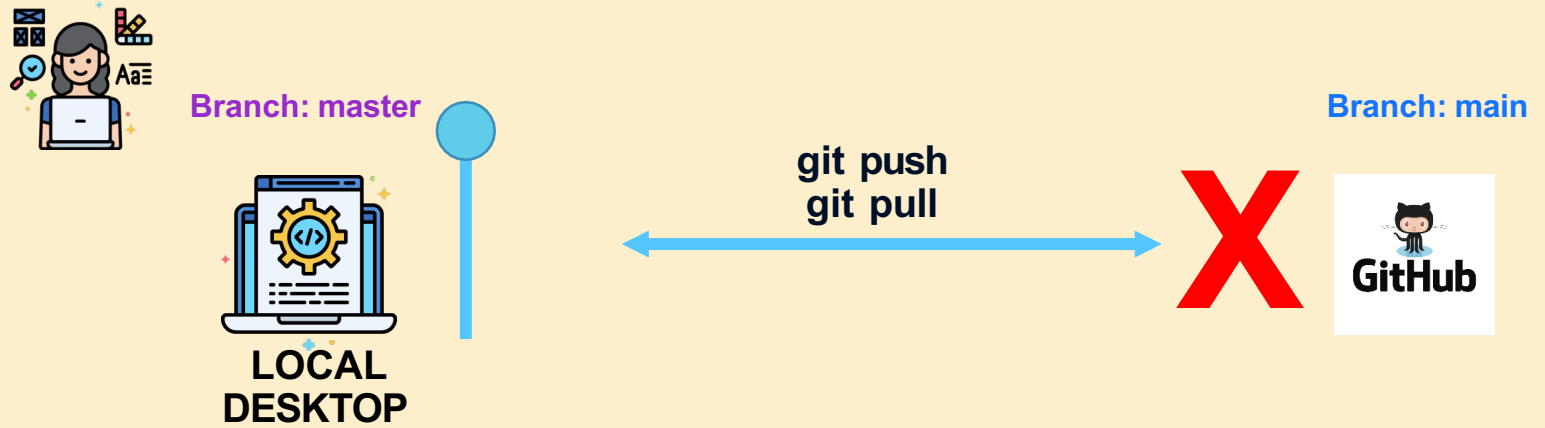
Branch: main



Clone



Local Folder to GitHub without Clone



Local Folder to GitHub without Clone

Quick setup — if you've done this kind of thing before

 Set up in Desktop or **HTTPS** **SSH** `https://github.com/saha-rajdeep/test77.git` 

Get started by [creating a new file](#) or [uploading an existing file](#). We recommend every repository include a [README](#), [LICENSE](#), and [.gitignore](#).

...or create a new repository on the command line

```
echo "# test77" >> README.md
git init
git add README.md
git commit -m "first commit"
git branch -M main
git remote add origin https://github.com/saha-rajdeep/test77.git
git push -u origin main
```

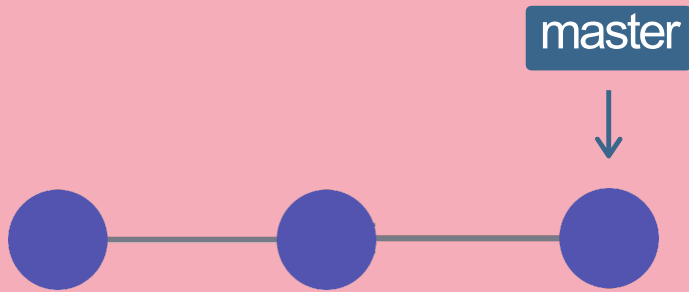


A Closer Look At Cloning



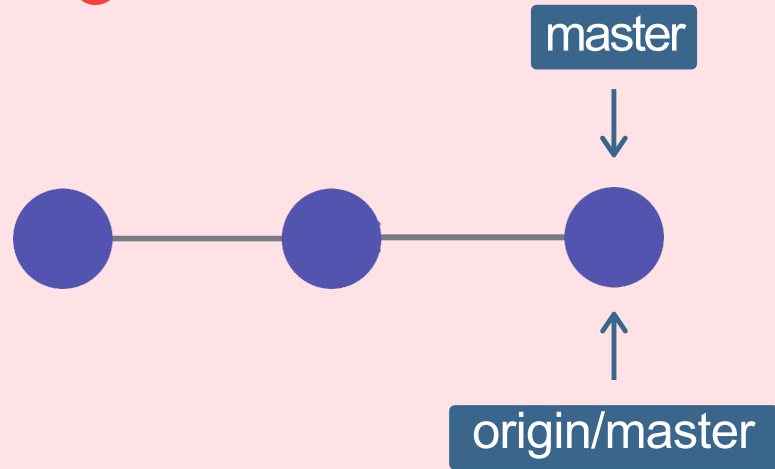
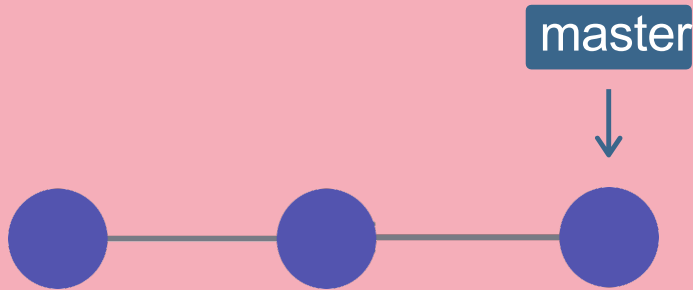
Github Repo

My Computer

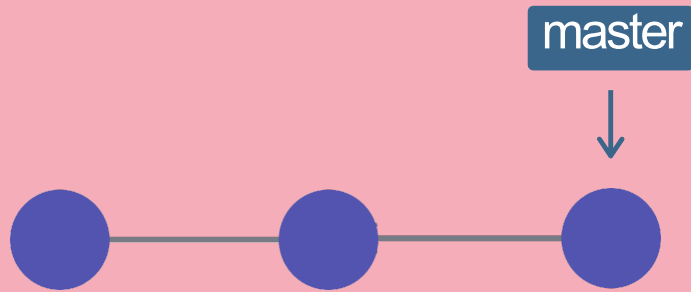


Github Repo

My Computer

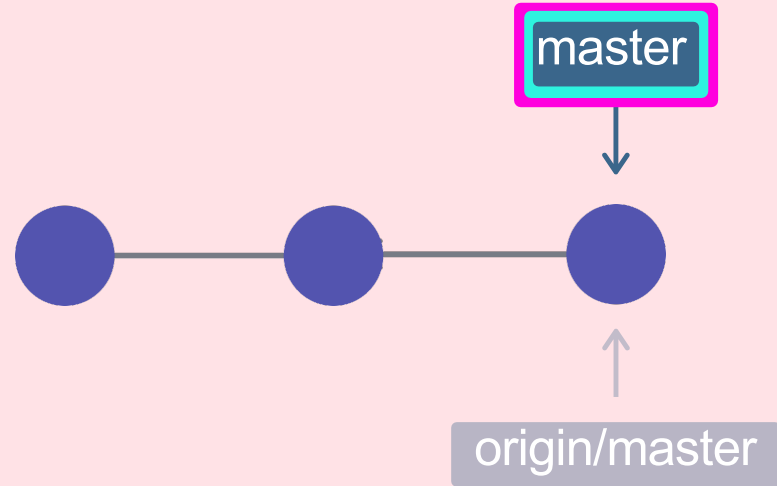


Github Repo



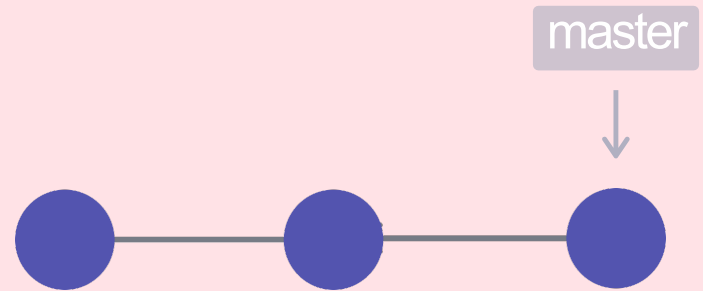
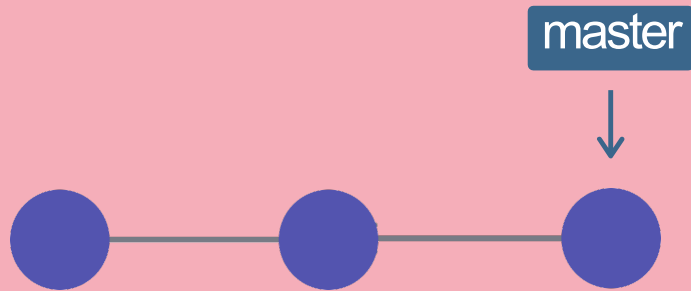
My Computer

A regular branch reference.
I can move this around myself.



Github Repo

My Computer



This is a "Remote Tracking Branch". It's a reference to the state of the master branch on the remote. I can't move this myself. It's like a bookmark pointing to the last known commit on the master branch on origin

origin/master



Remote Tracking Branches

"At the time you last communicated with this remote repository, here is where x branch was pointing"

They follow this pattern `<remote>/<branch>`.

- `origin/master` references the state of the master branch on the remote repo named origin.
- `upstream/logoRedesign` references the state of the logoRedesign branch on the remote named upstream (a common remote name)





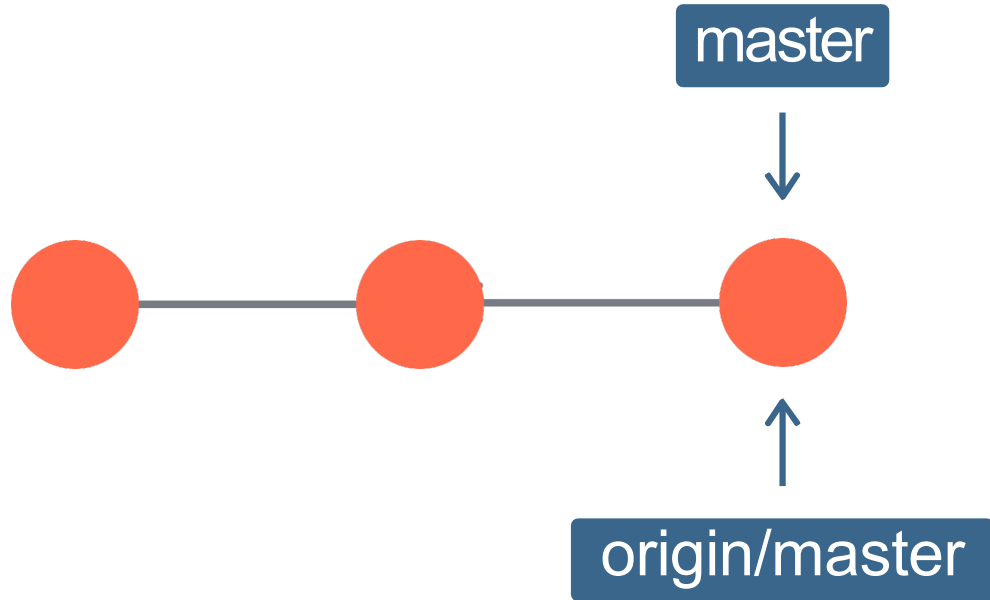
Remote Branches

Run `git branch -r` to view the remote branches our local repository knows about.

```
git  
branch -r  
origin/master
```

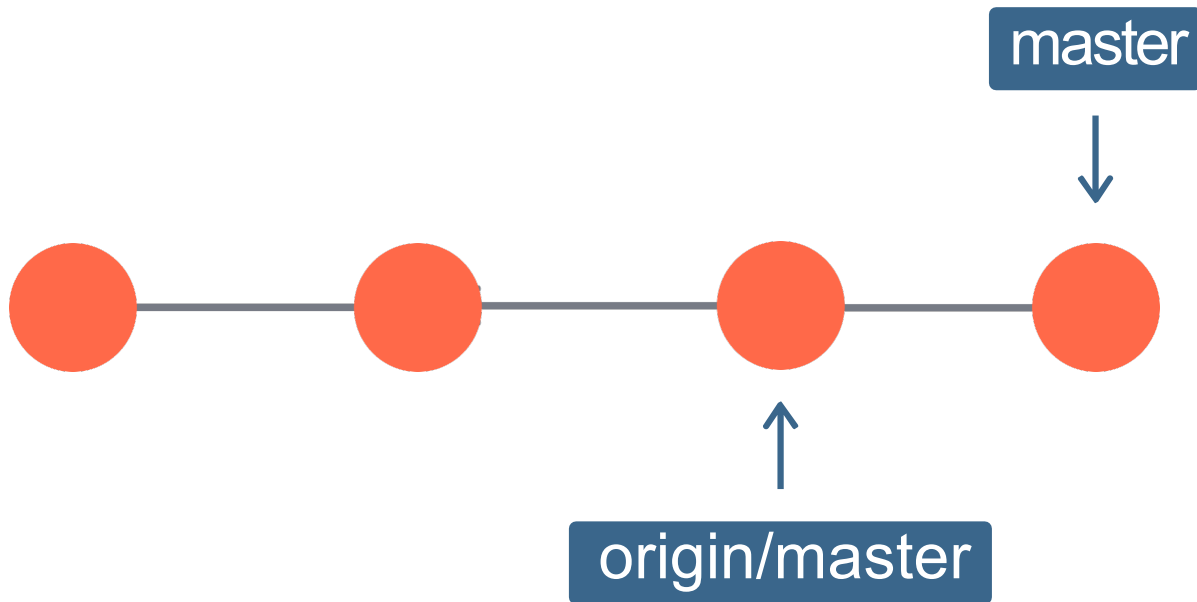


My Computer



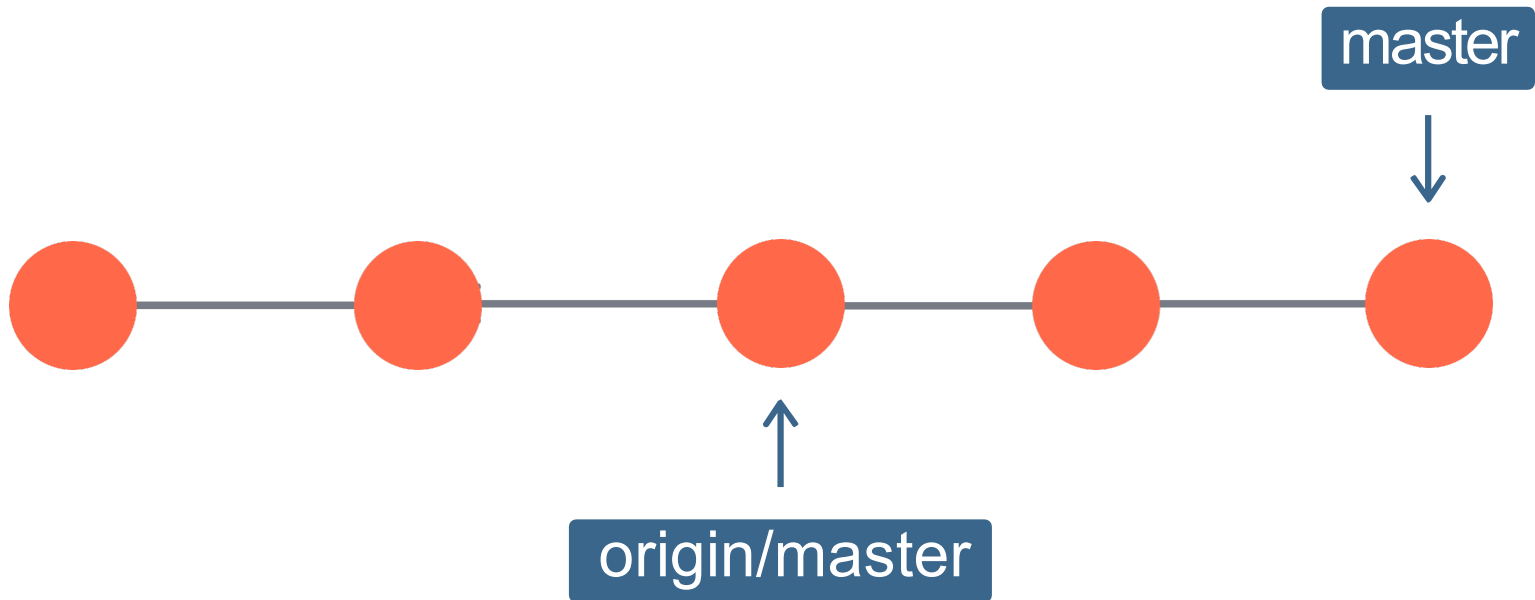
My Computer

I make a new commit locally. My master branch reference updates, like always.



The remote reference stays the same

My Computer



Remote reference doesn't move!



When I run git status



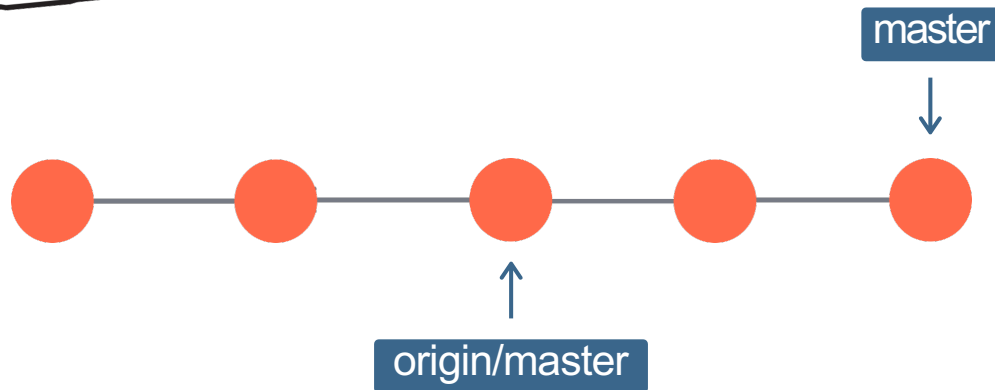
```
> git status
```



```
On branch master  
Your branch is ahead of 'origin/master' by 2  
commits.  
(use "git push" to publish your local commits)
```




hmm...what did this
project look like when I
first cloned this repo?





You can checkout these remote branch pointers



```
>git checkout origin/master
```

```
Note: switching to 'origin/master'.  
You are in 'detached HEAD' state. You can look  
around, make experimental changes and commit  
them, and you can discard any commits you make  
in this blah blah blah blah
```

Detached HEAD! Don't panic. It's fine.

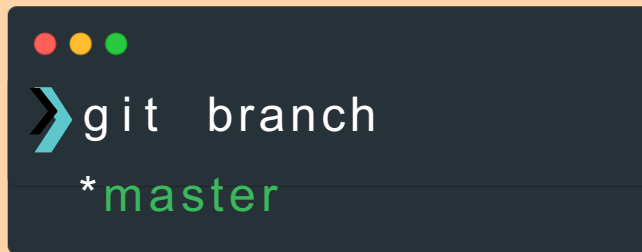




Remote Branches

Once you've cloned a repository, we have all the data and Git history for the project at that moment in time. However, that does not mean it's all in my workspace!

The github repo has a branch called puppies, but when I run `git branch` I don't see it on my machine! All I see is the master branch. What's going on?

A terminal window with a dark background and three colored window control buttons (red, yellow, green) in the top left corner. The command `git branch` has been executed, and the output is `* master`, where the asterisk and the word 'master' are in green, indicating the current branch.

```
> git branch  
* master
```



Week 2

Git Log

Week 2 Getting Started with Git

- Before we jump into using git fetch and git pull, let's quickly show you how to use **git log**.
- The **git log** command will show a list of all the commits made to a repository, including the hash, message, and metadata.
- Think of it as the history of a repo.


Week 2

Fetch and Pull

Week 2 Getting Started with Git

- There are two options of getting repository changes from a remote branch (like the remote branch on GitHub).
 - **git pull**
 - **git fetch**

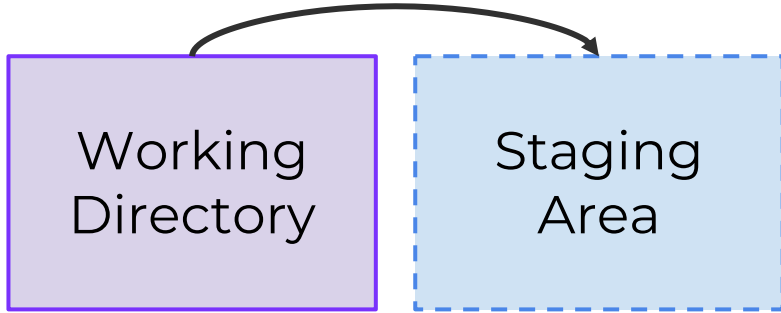
Week 2 Getting Started with Git



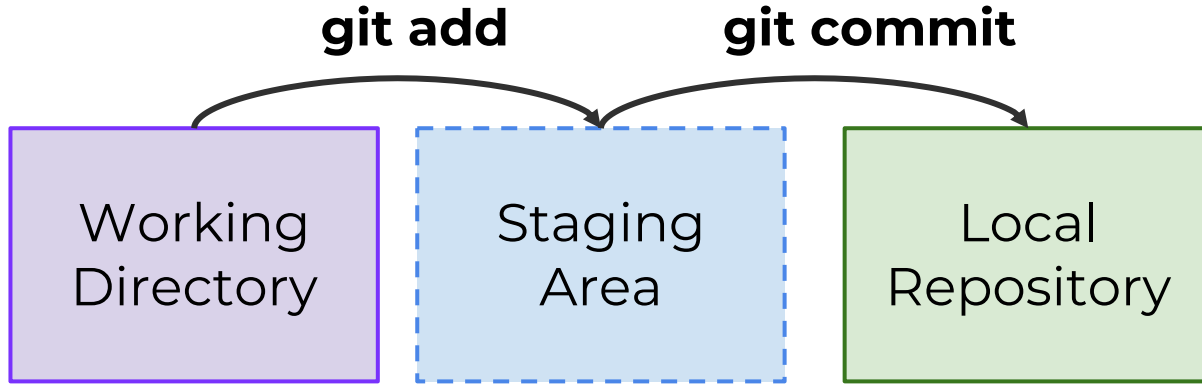
Working
Directory

Week 2 Getting Started with Git

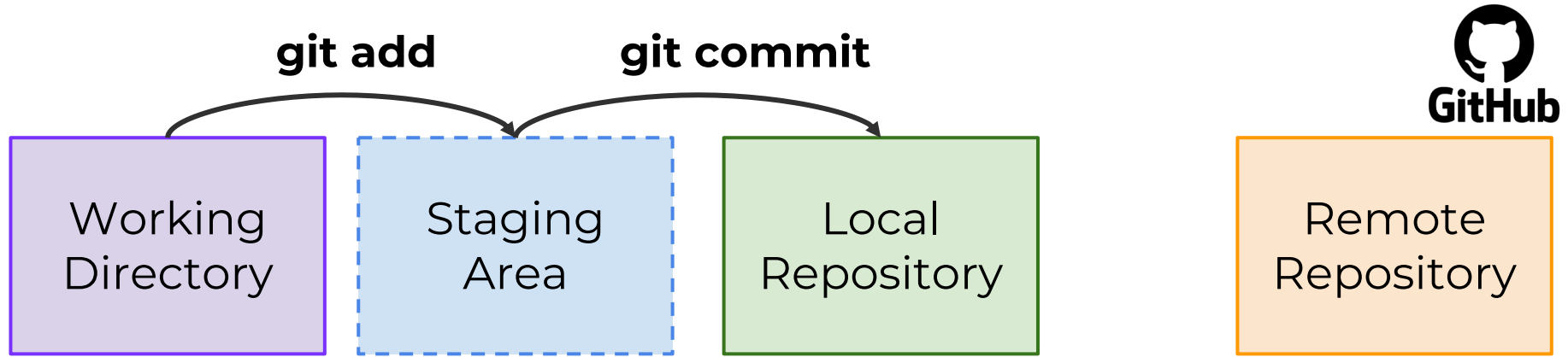
git add



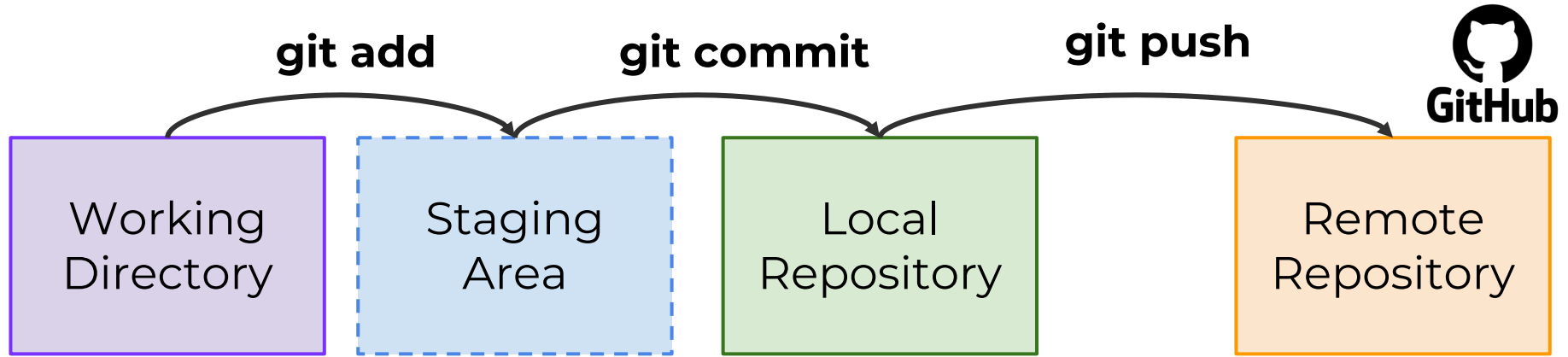
Week 2 Getting Started with Git



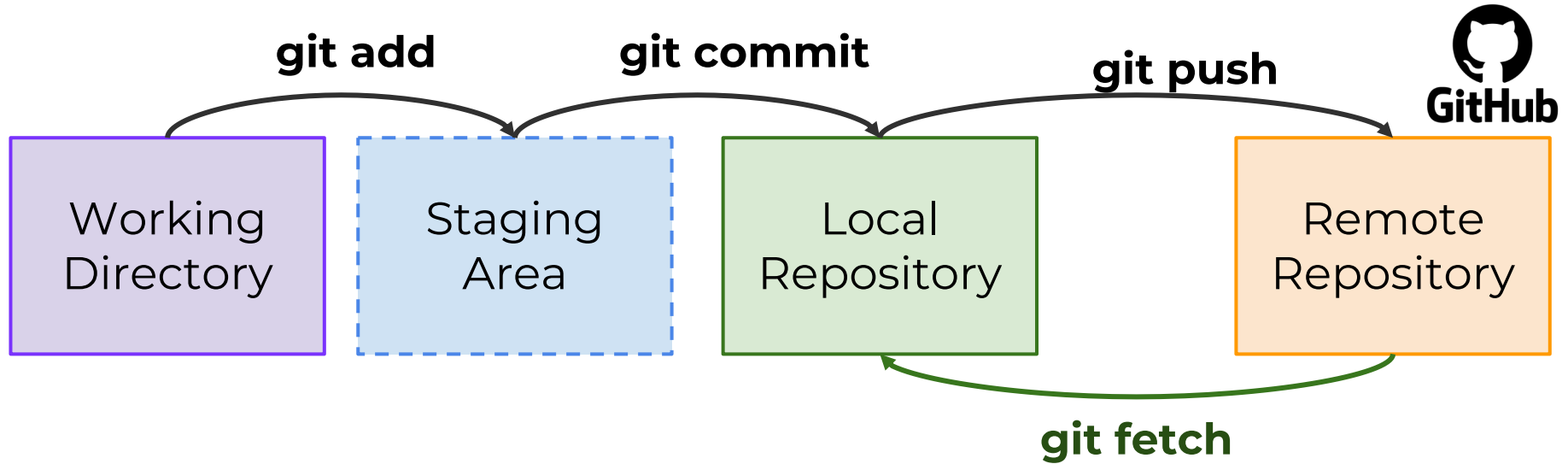
Week 2 Getting Started with Git



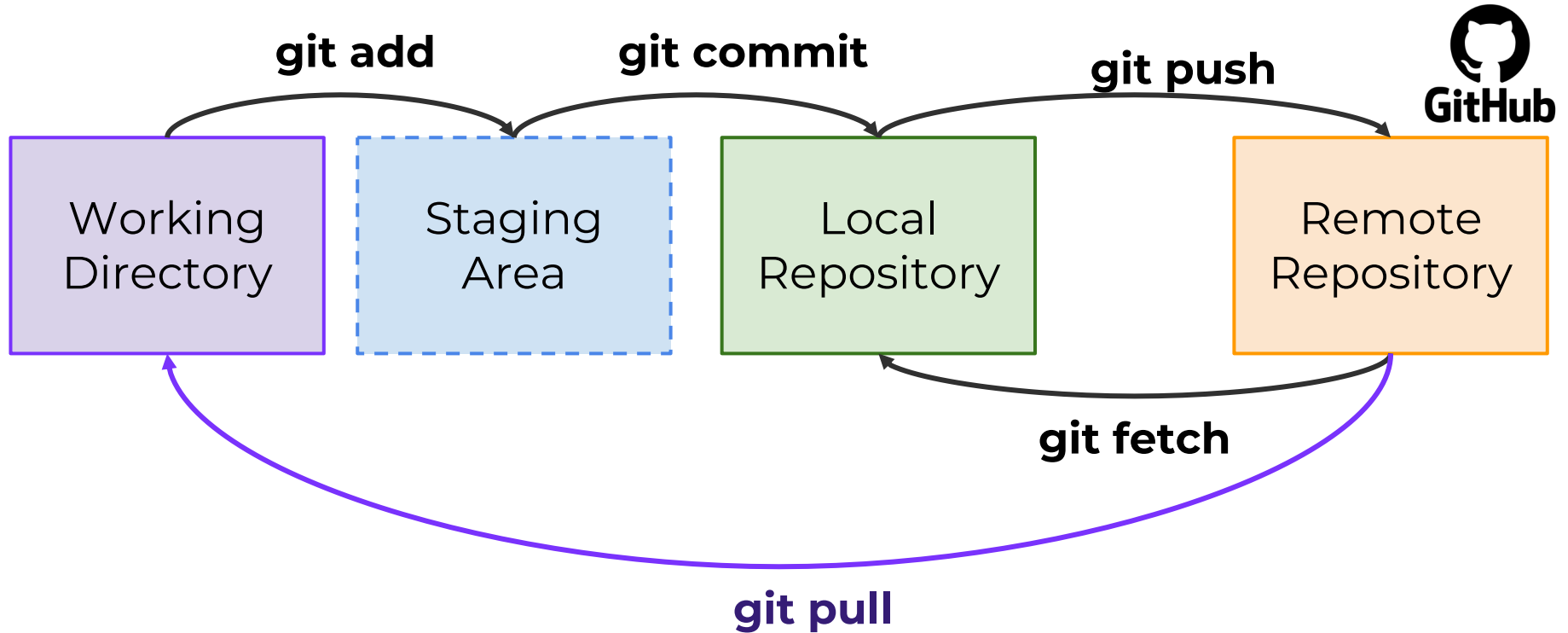
Week 2 Getting Started with Git



Week 2 Getting Started with Git



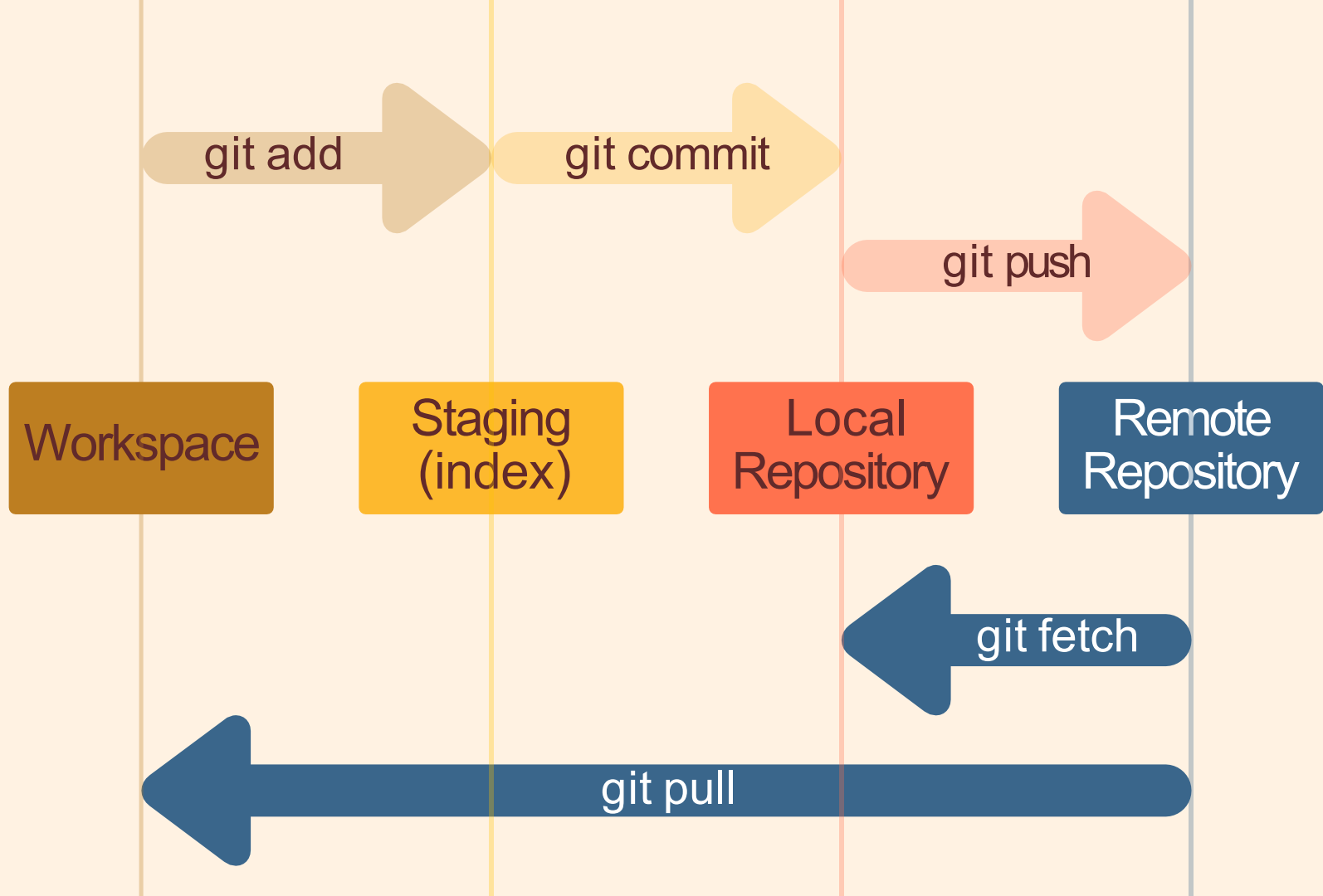
Week 2 Getting Started with Git



git pull = git fetch + git merge

update the remote tracking branch
with the latest changes from the remote
repository

update my current branch with whatever
changes are on the remote tracking
branch





git fetch

- Gets changes from remote branch(es)
- Updates the remote-tracking branches with the new changes
- Does not merge changes onto your current HEAD branch
- Safe to do at anytime

git pull

- Gets changes from remote branch(es)
- Updates the current branch with the new changes, merging them in
- Can result in merge conflicts
- Not recommended if you have uncommitted changes!



Week 2

Exercise