Getting Started with Git

By

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Getting Started with Git

- **Welcome!**
- This is where things really start to take-off since we're going to learn a lot of commands that you will use **all** the time with Git and GitHub.

Getting Started with Git

- **Review:**
    - So far we've learned about version control, setting up Git and GitHub, and how to create Code Repositories.
    - Now it's time to learn how to add code to these repositories, make changes or updates, and push or pull changes from repos to and from local machines.

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- **Review:**
    - We're also going to be more precise with terminology than we have been.
    - We've been using the term code **repository** as a catch-all term for where we are developing our code, but really we want to break this down into our **working directory**, **staging area**, and **repository**.

Getting Started with Git

- **Overview:**
  - Learn the logic behind Git Usage and general Workflow.
  - Explore commands that allow us to use this workflow.

Basic Git Usage

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.

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Create Repo on GitHub

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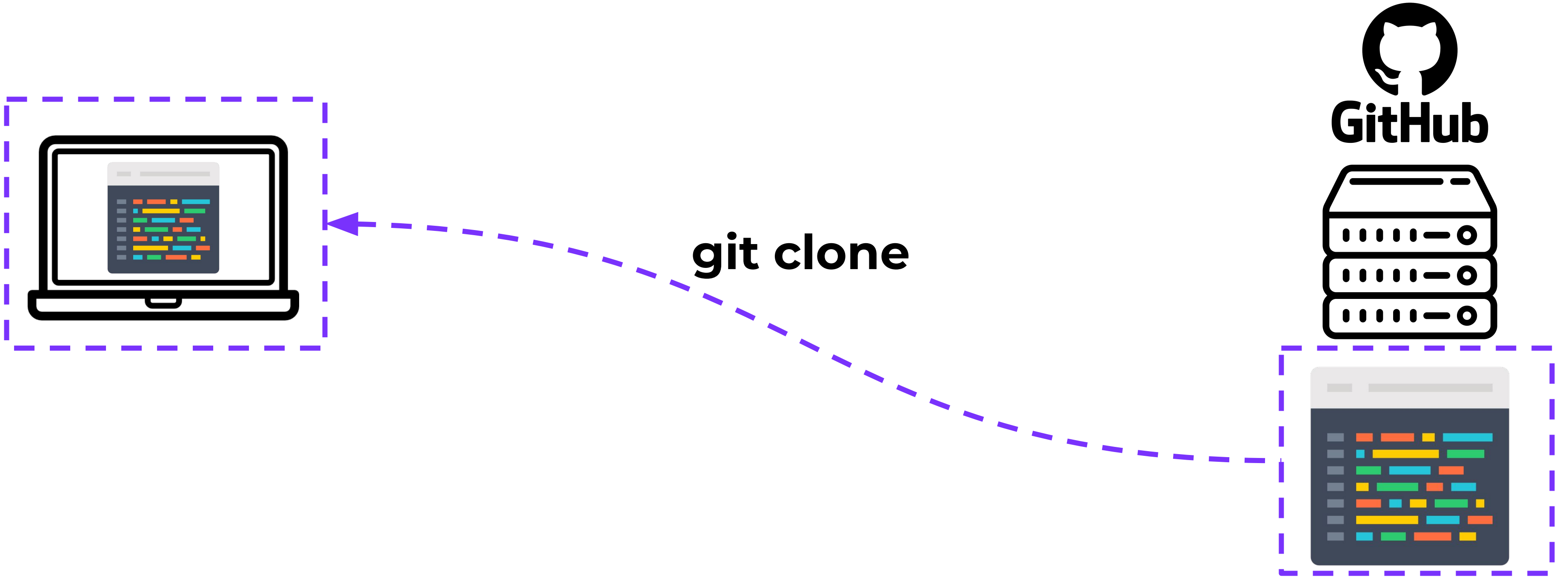

Create Repo on GitHub

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git init
GitHub

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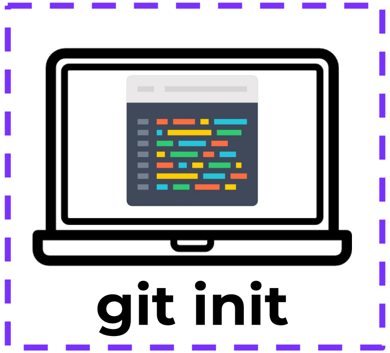

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What we need to learn today:

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

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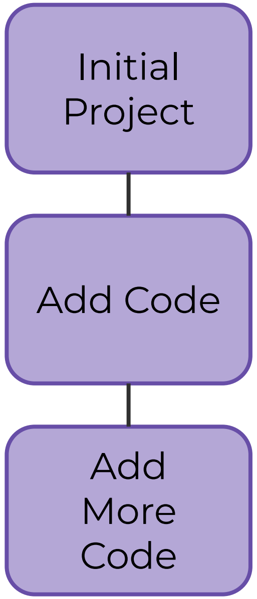

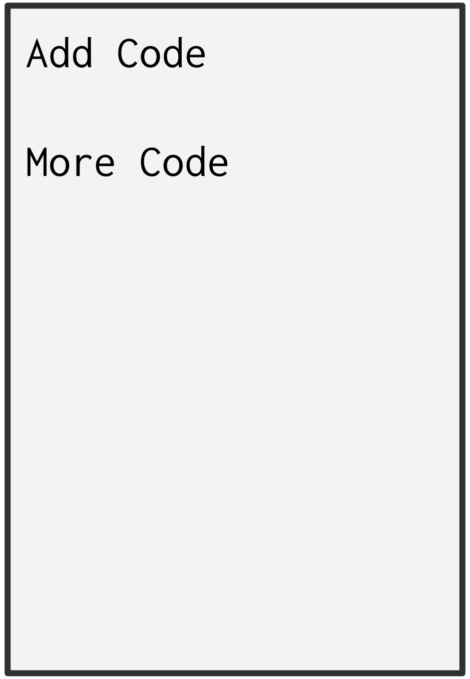

```
Add Code

More Code
```

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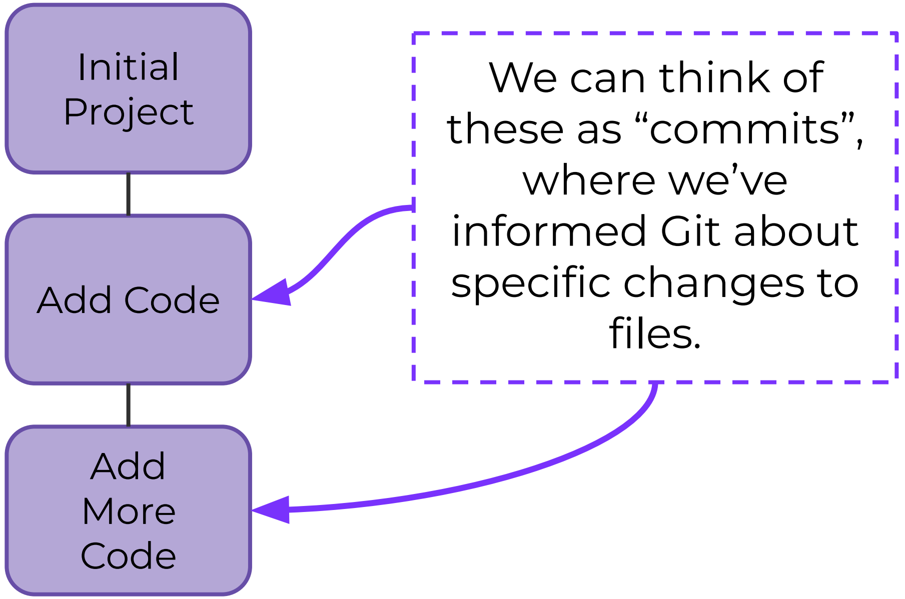

We can think of these as “commits”, where we’ve informed Git about specific changes to files.

```
Add Code

More Code
```

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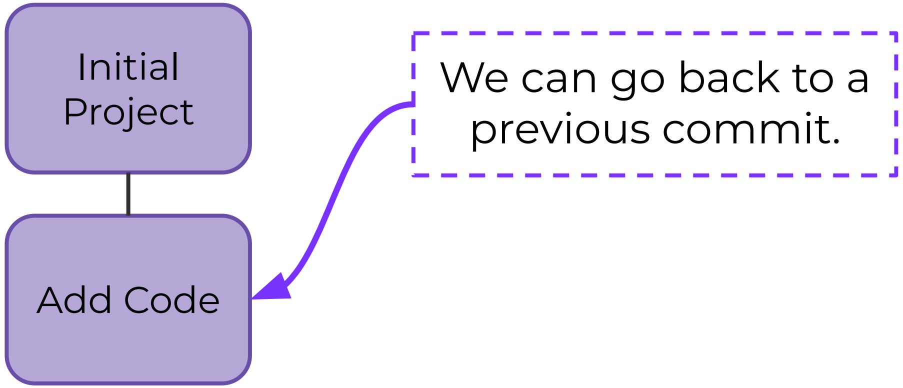

```
Add Code
```

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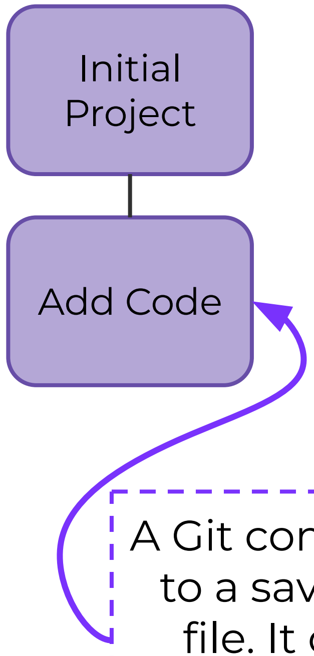
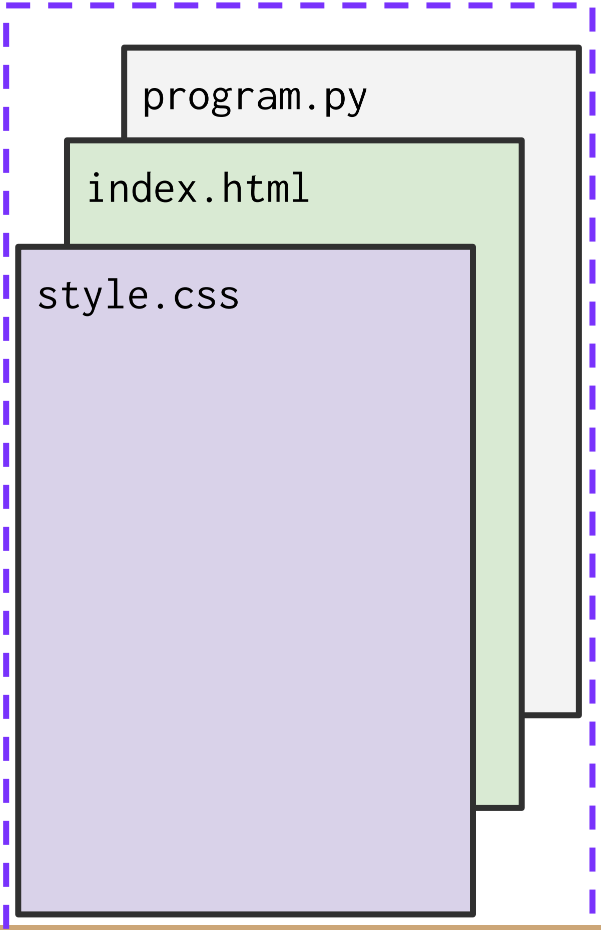


A Git commit doesn't just pertain to a saving changes in a single file. It can constitute specific changes across an entire **working directory**.



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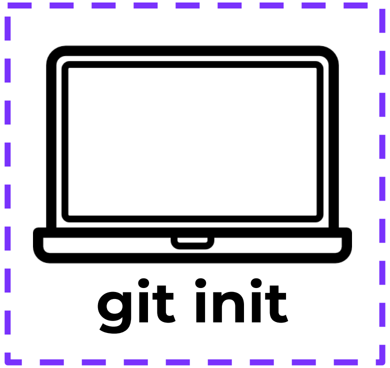

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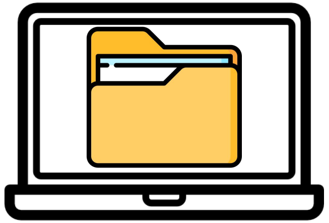
Working Directory



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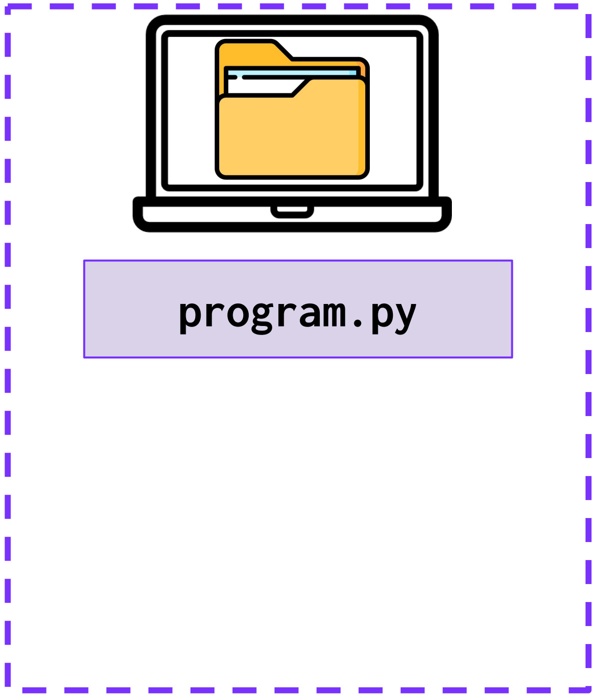
Working Directory



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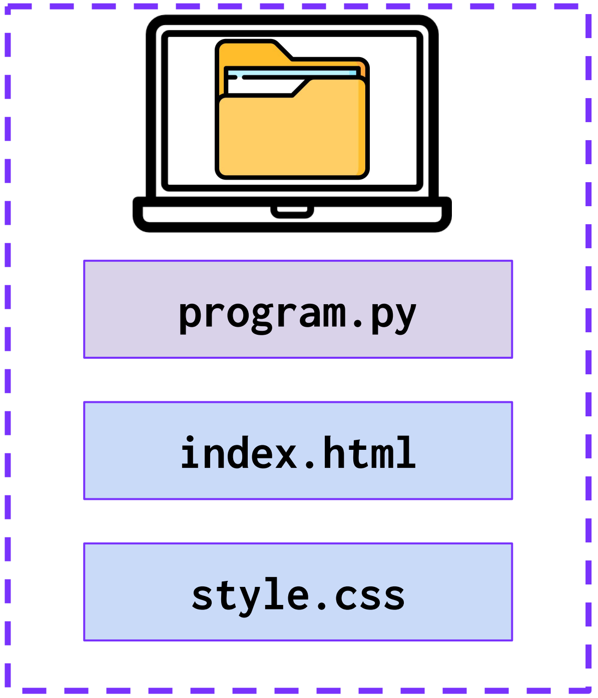
Working Directory



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Working Directory

`program.py`

`index.html`

`style.css`

Staging Area

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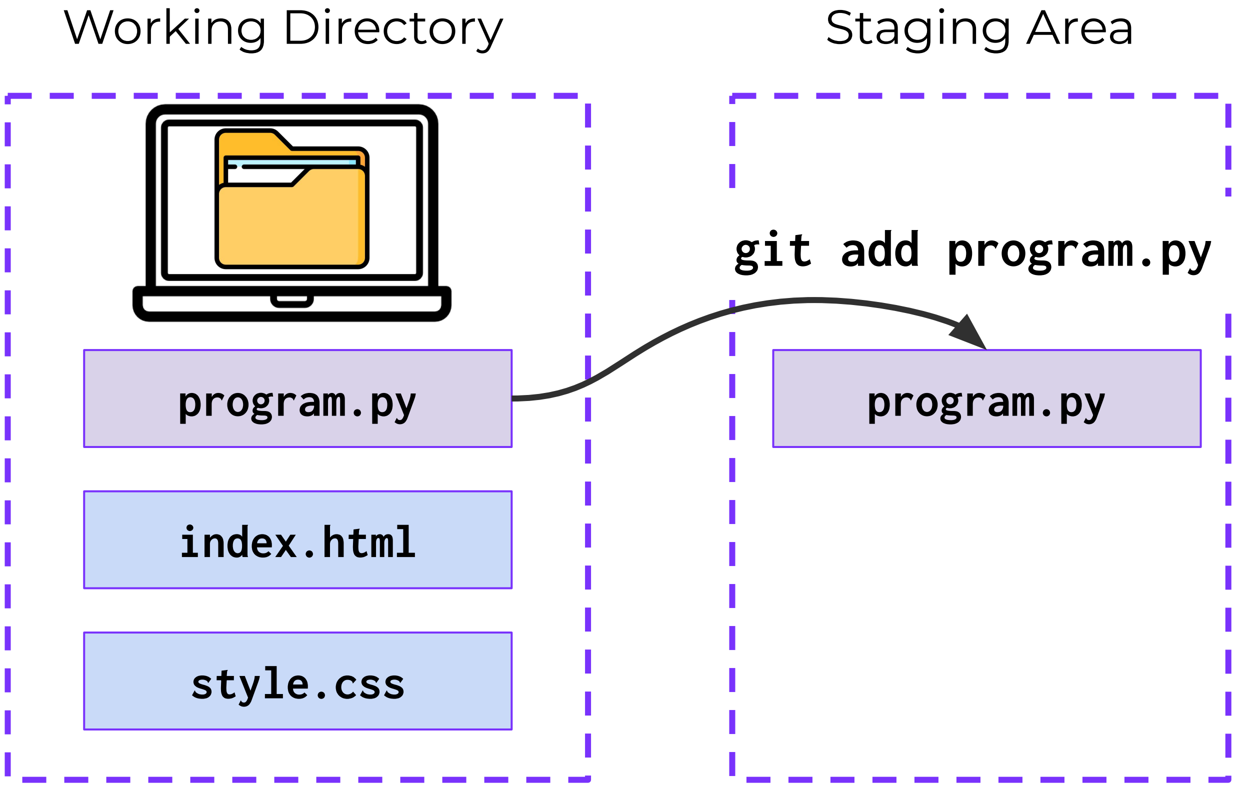

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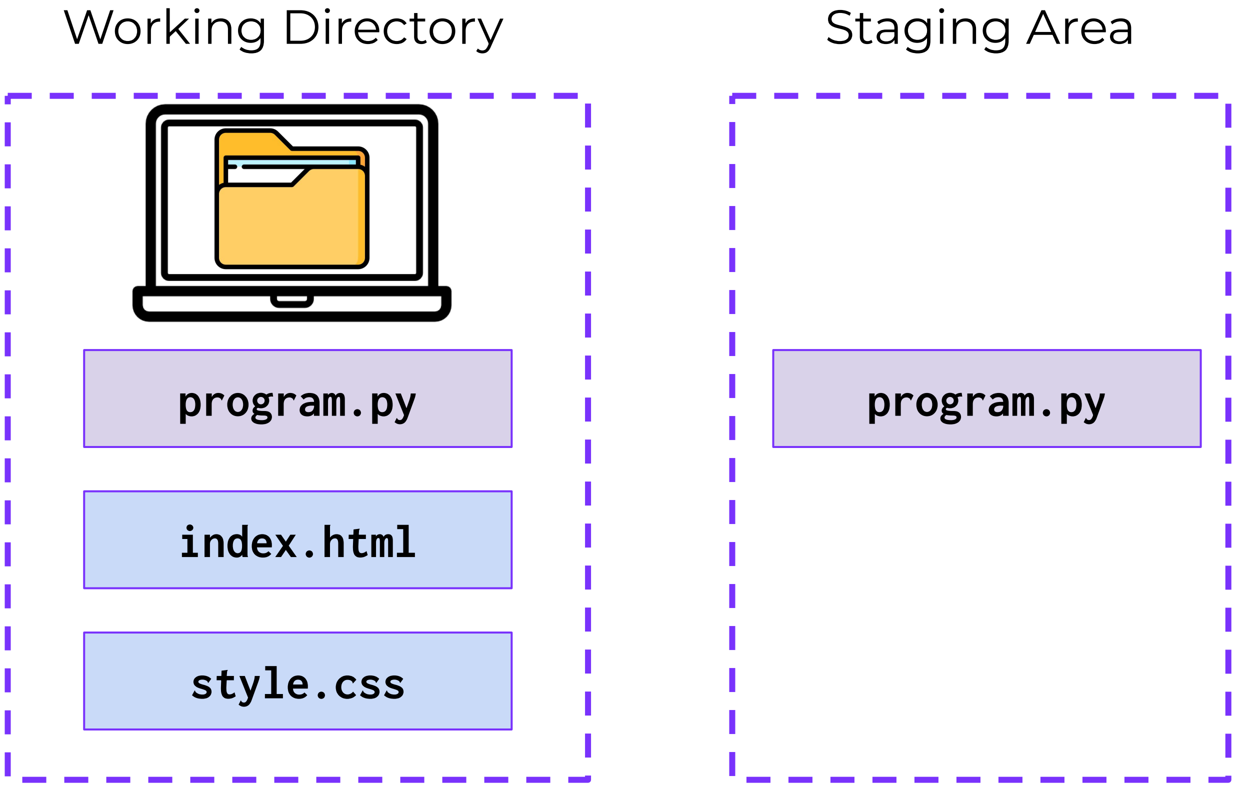

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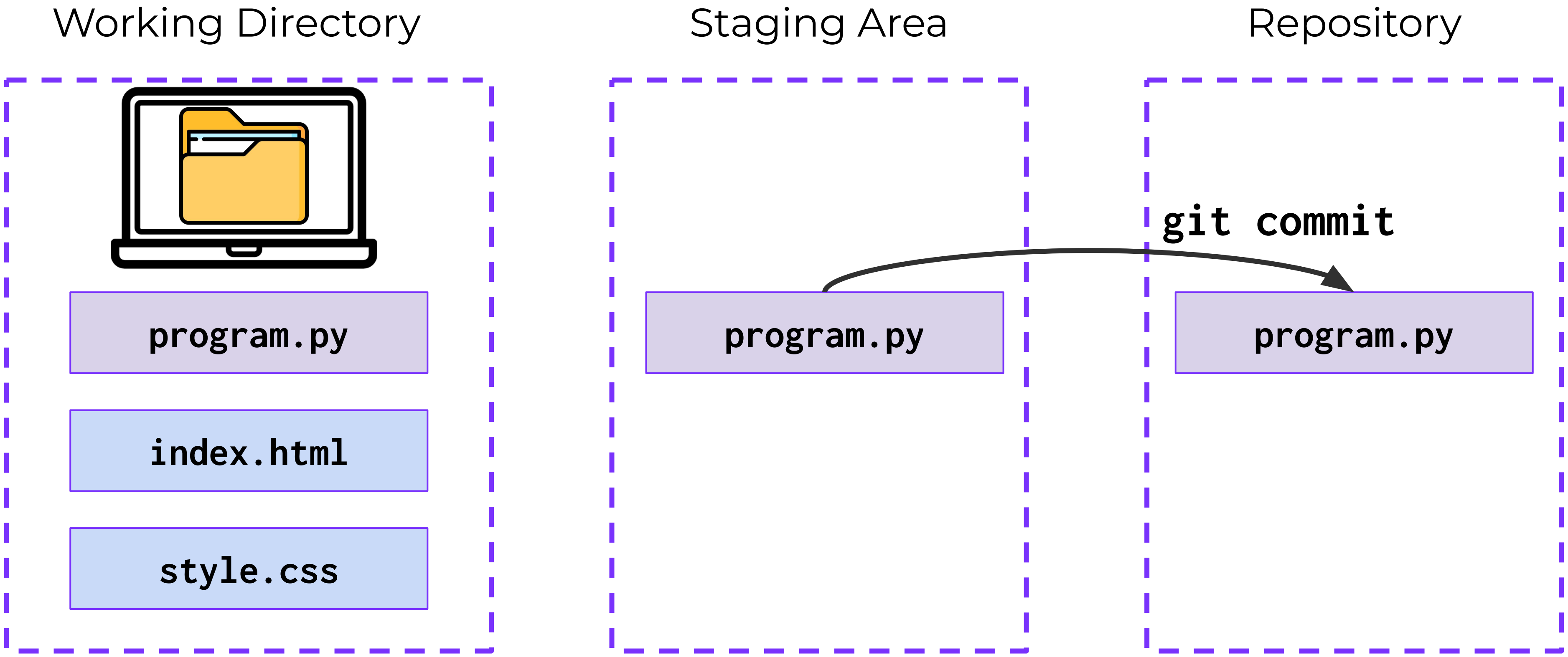

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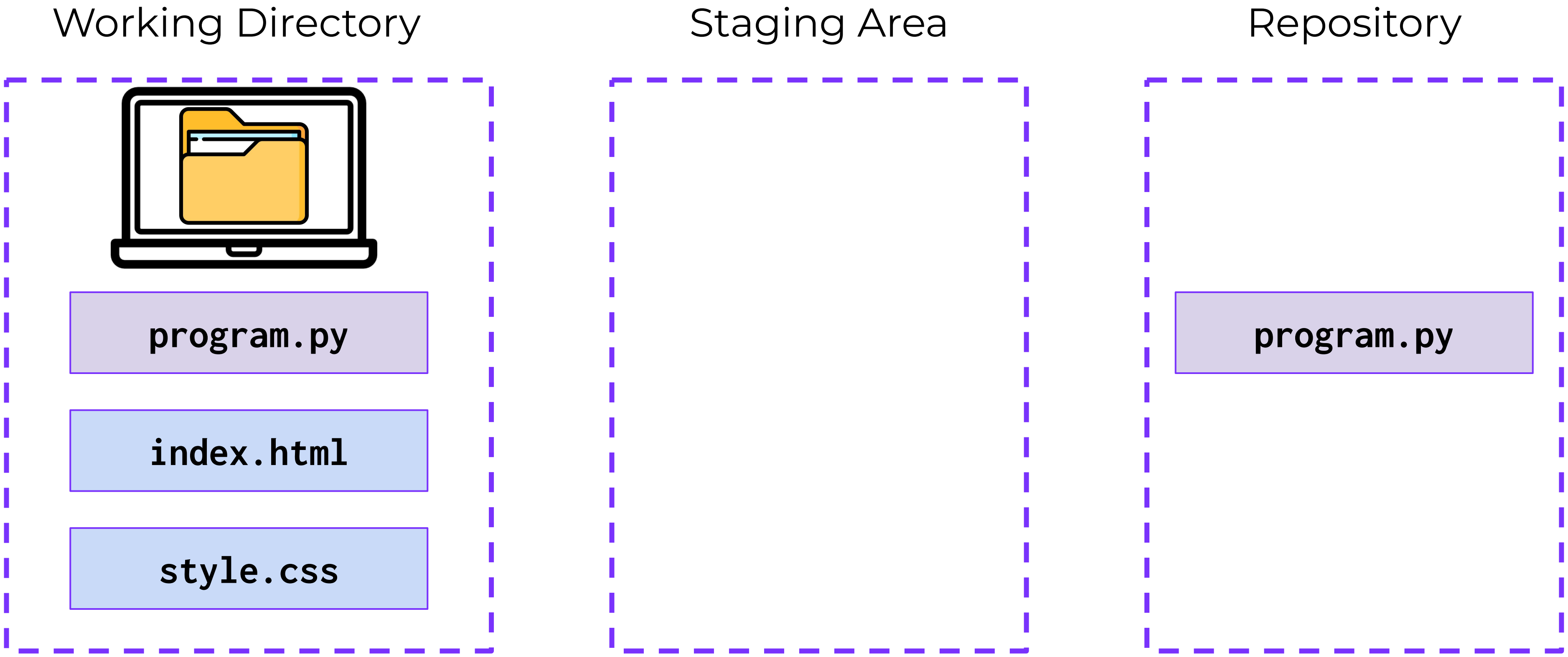

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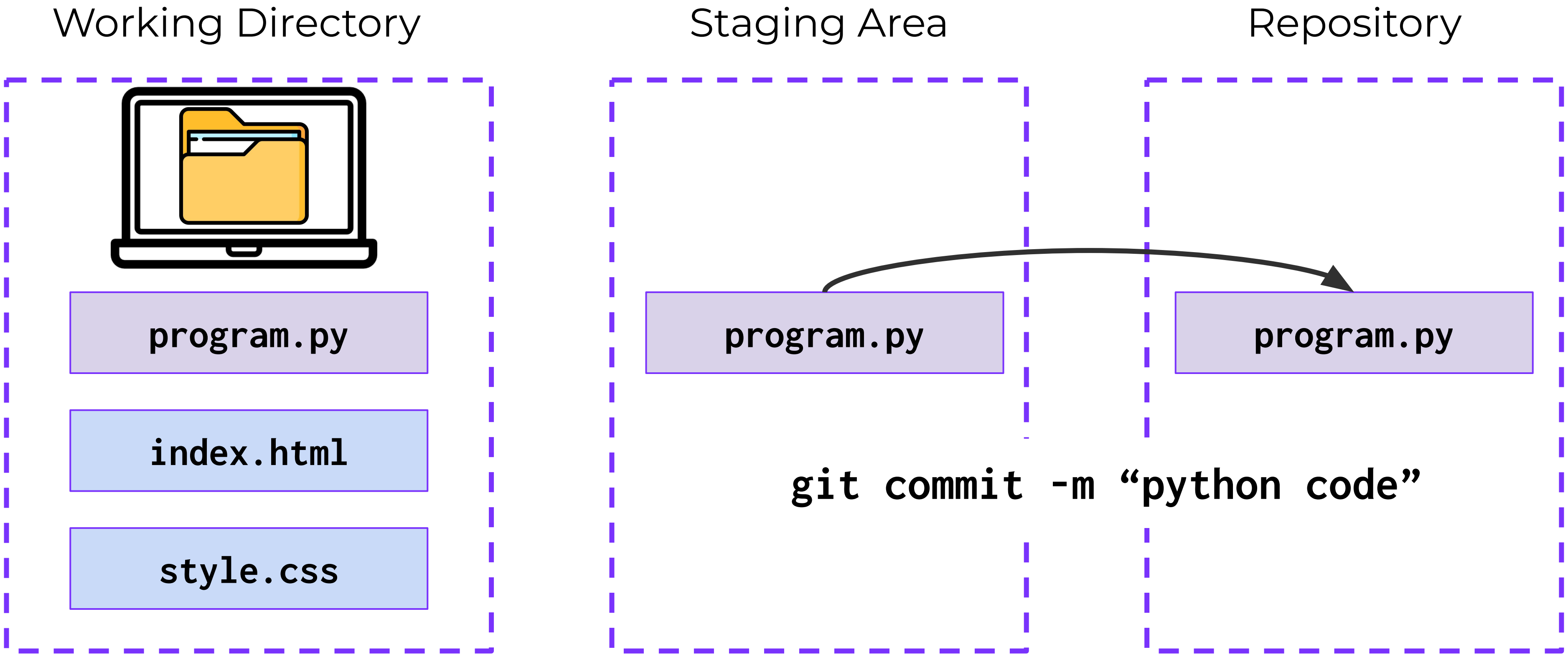

```
git commit -m "python code"
```

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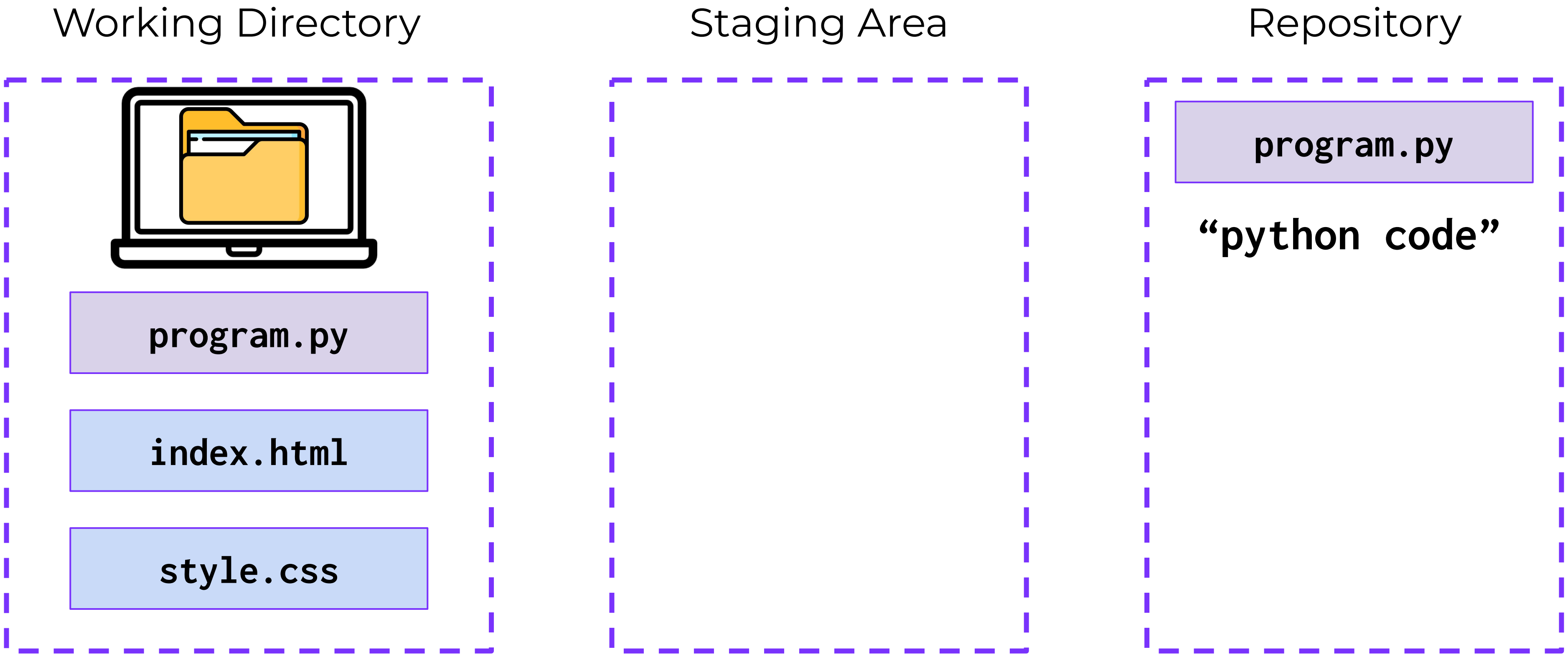

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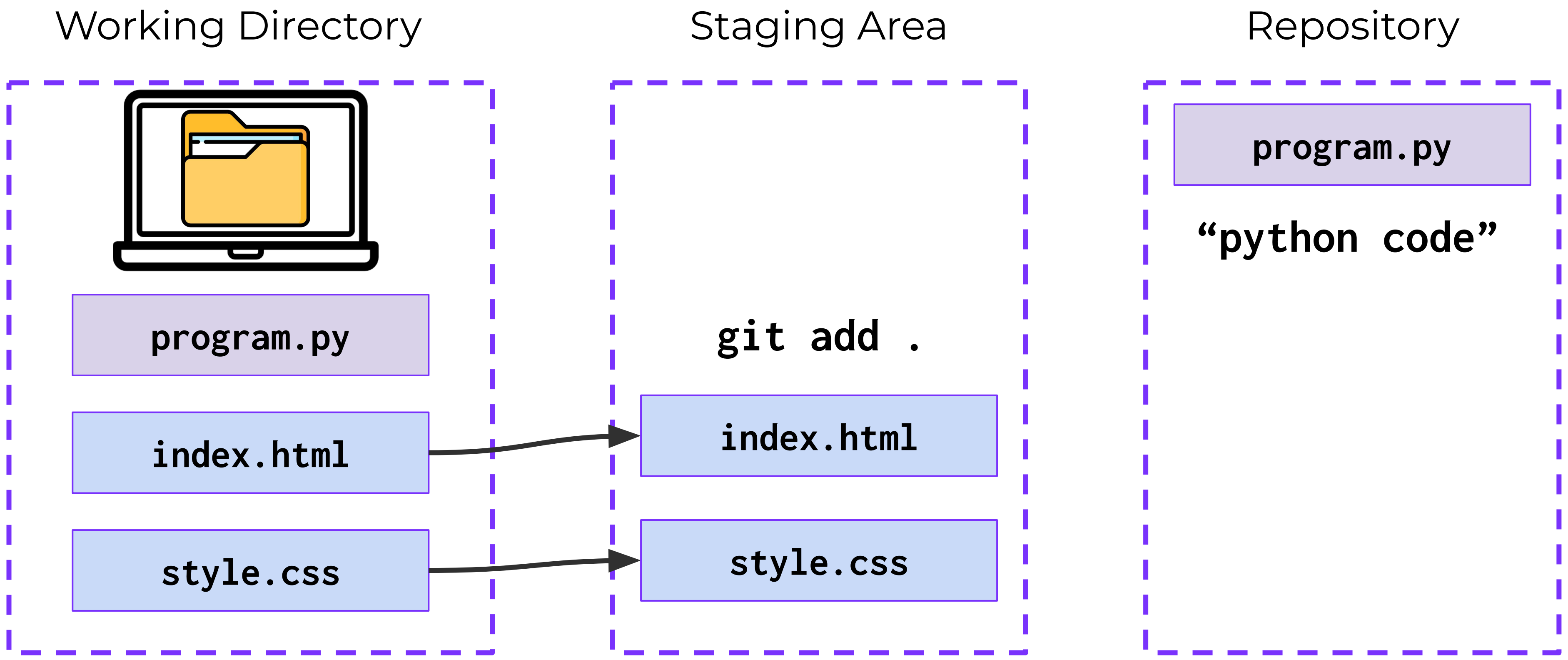

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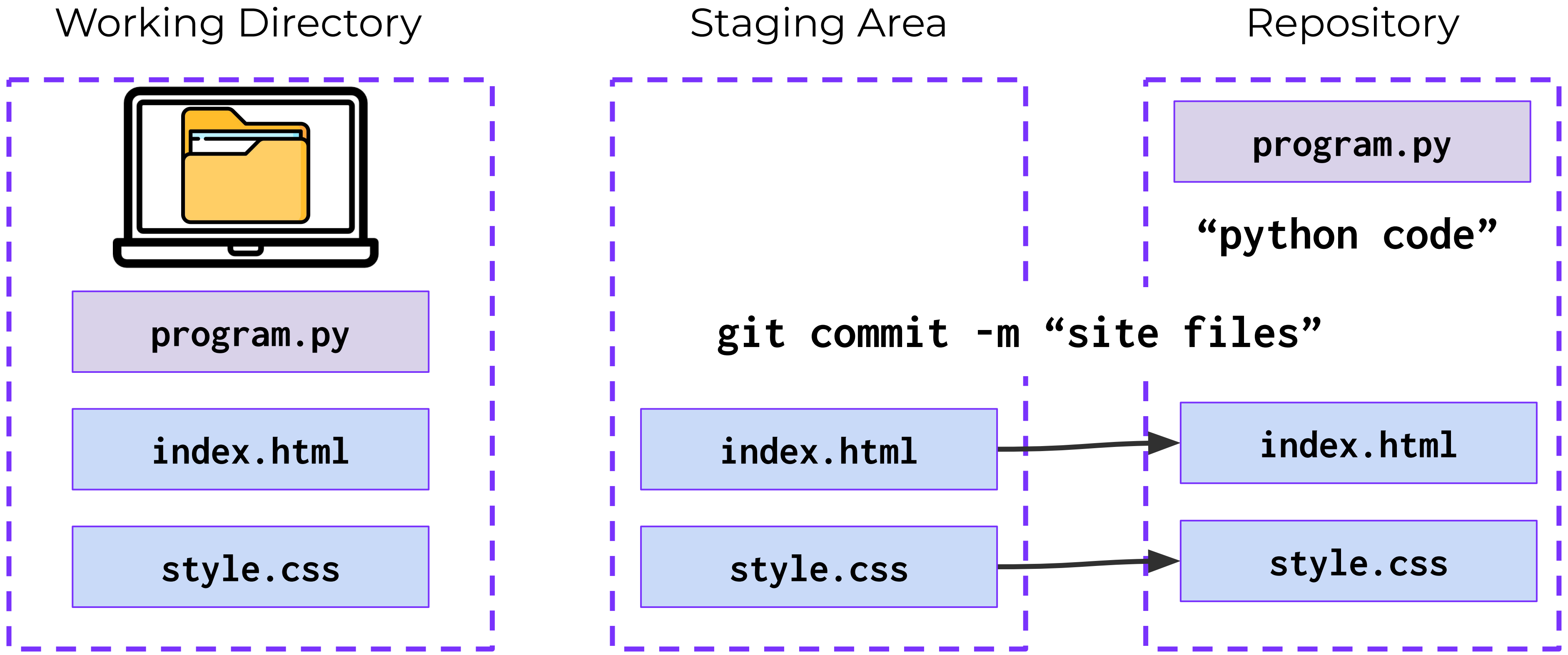

```
git commit -m “site files”
```

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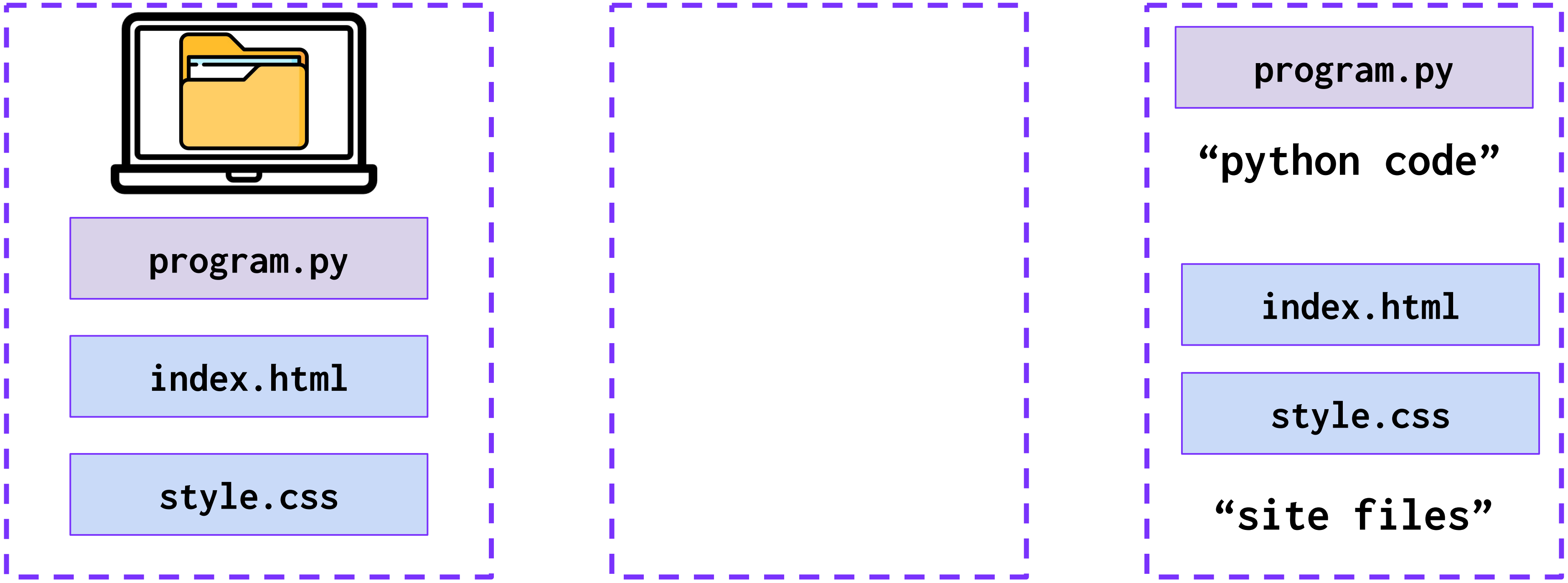

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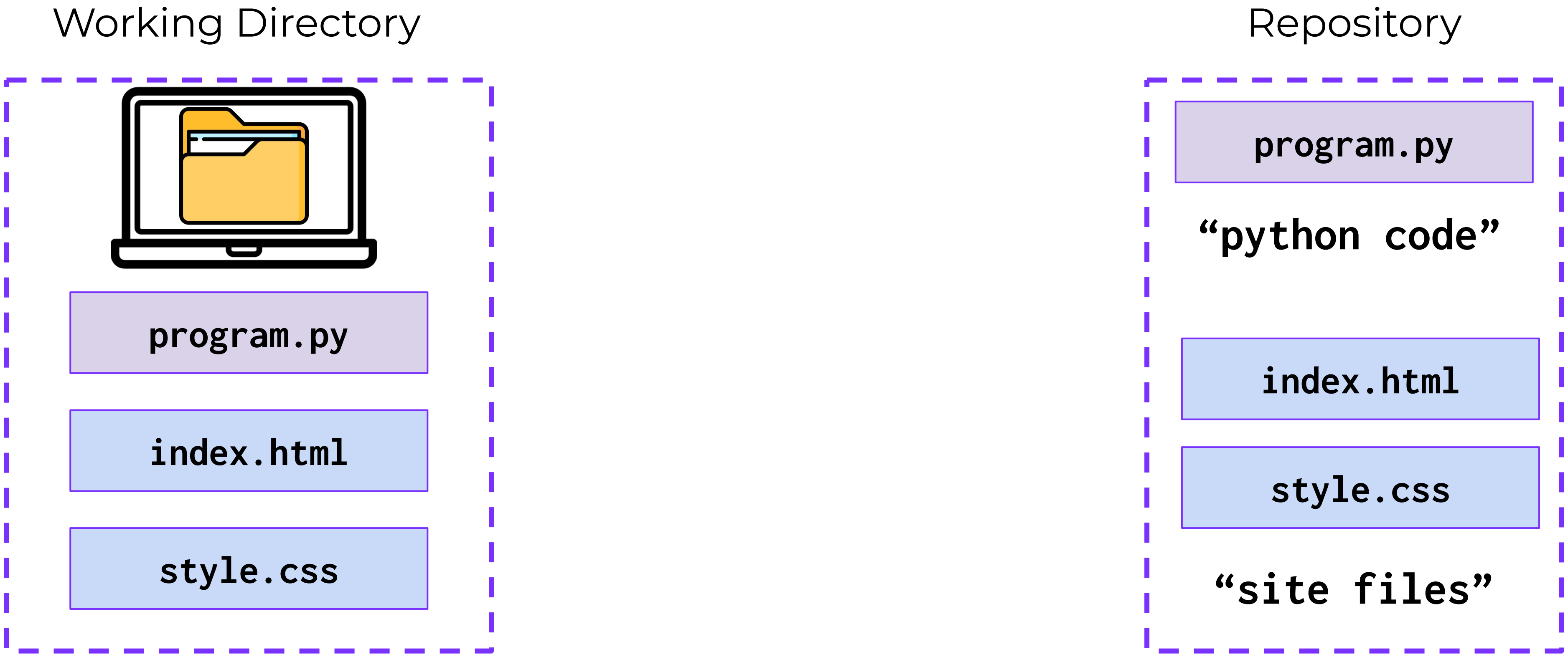

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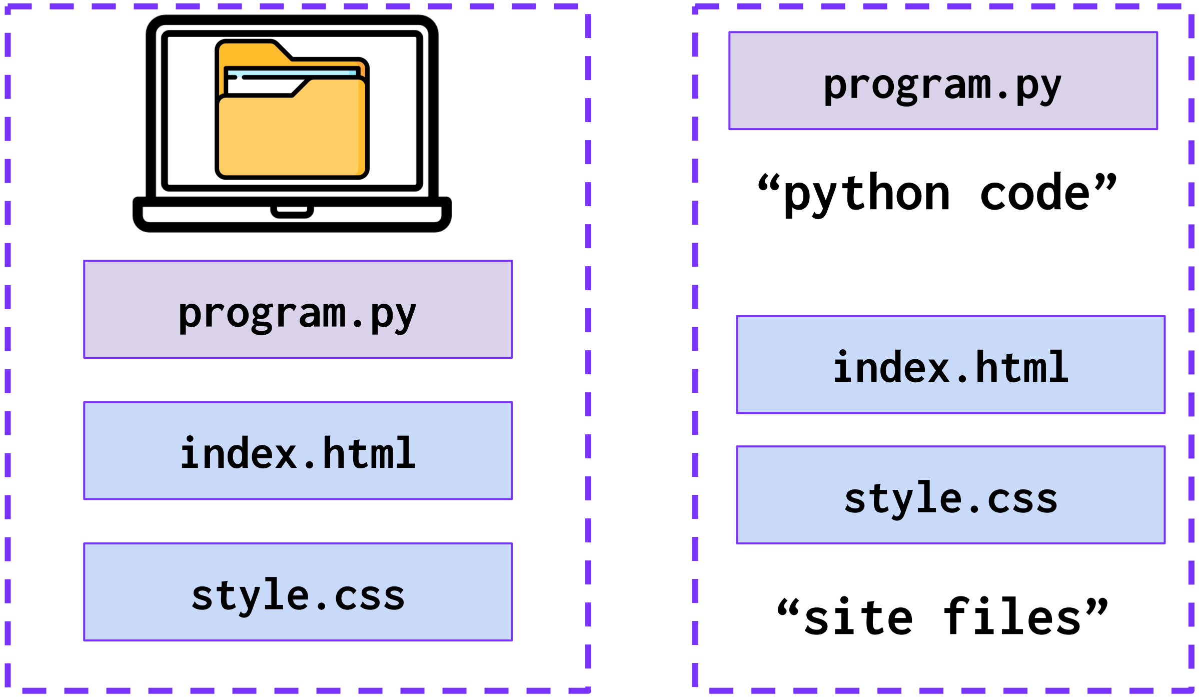

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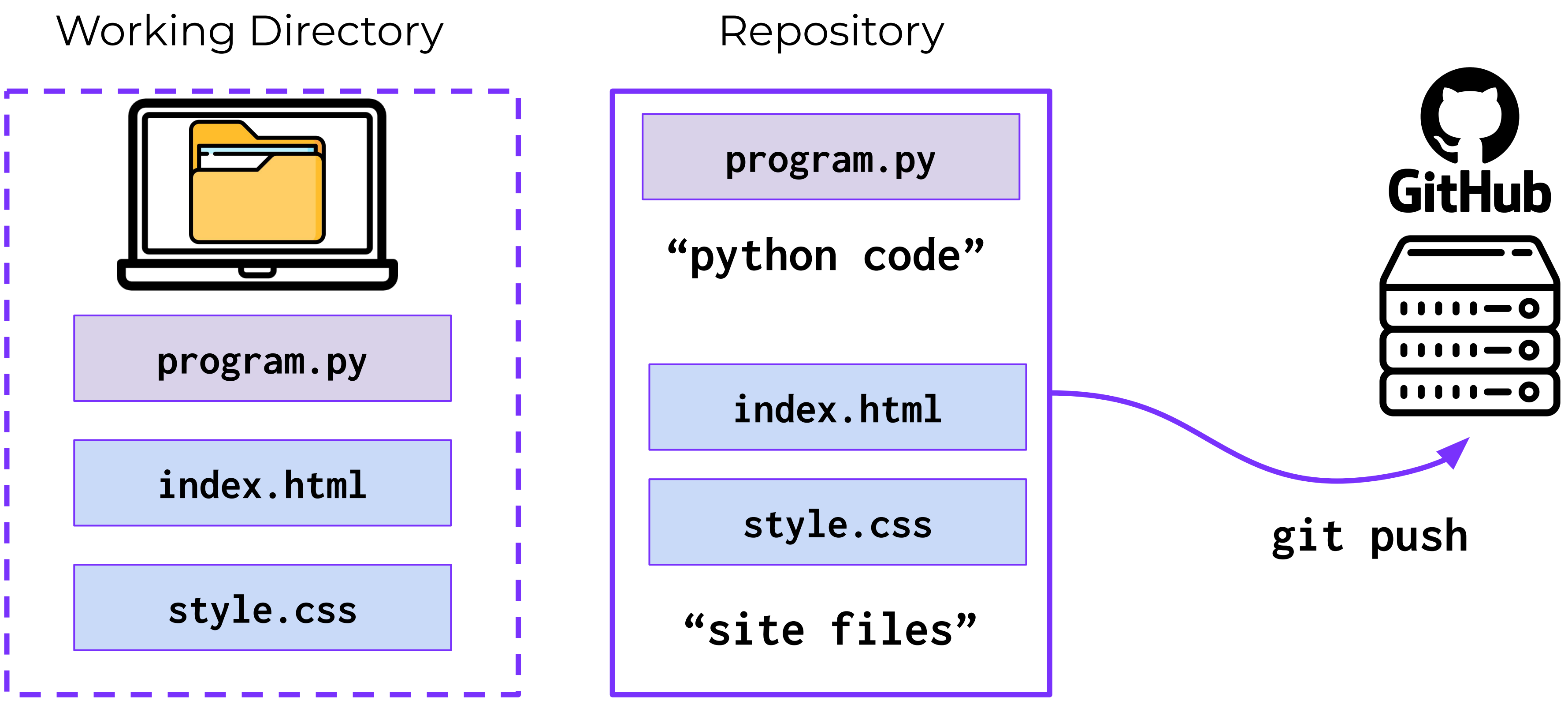

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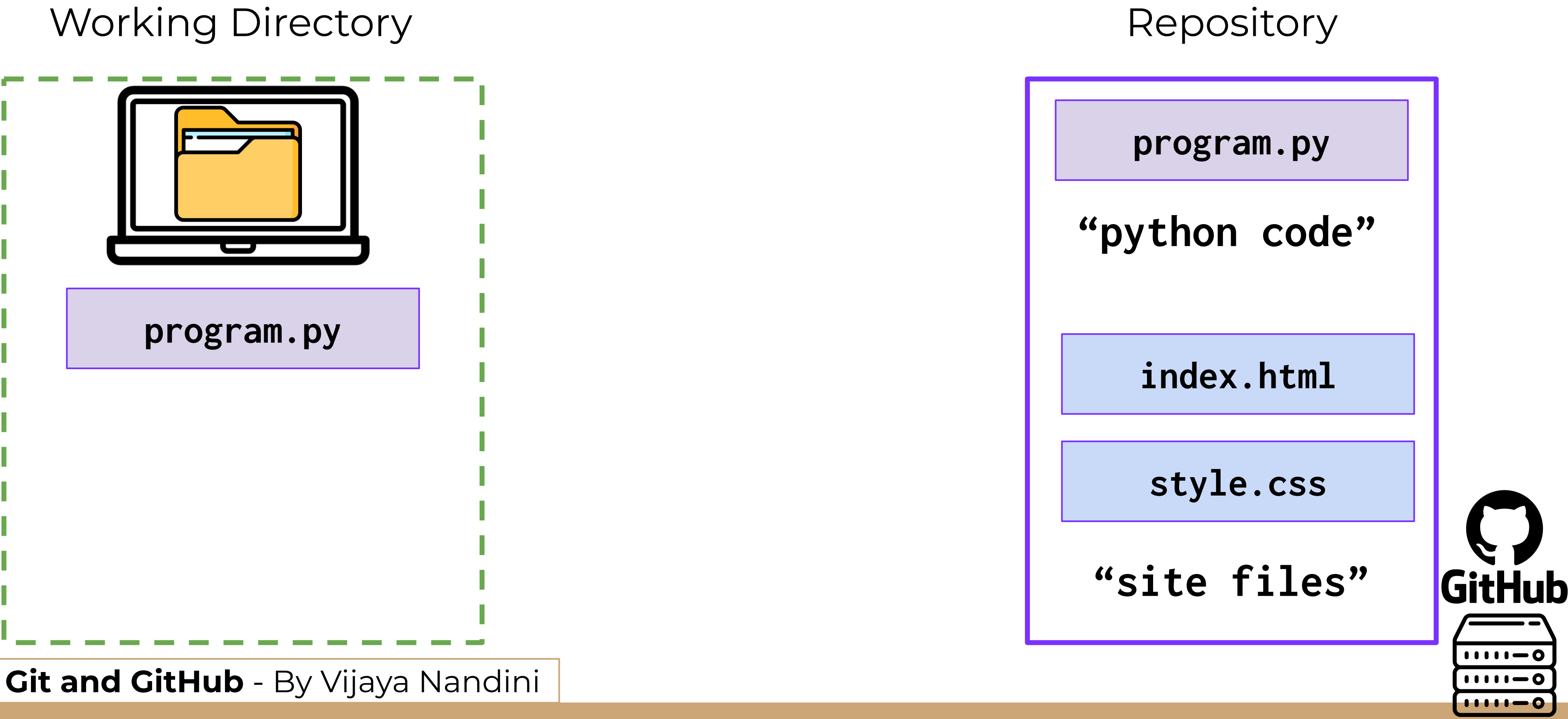

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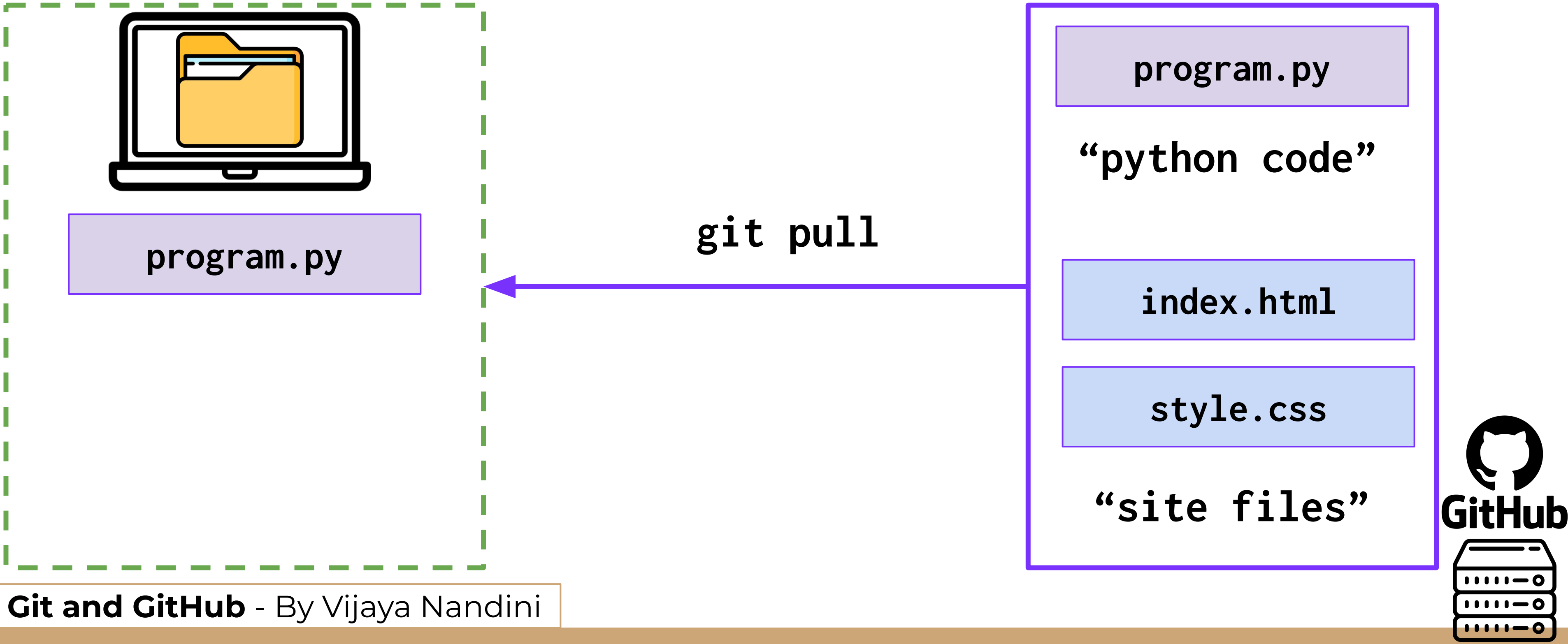

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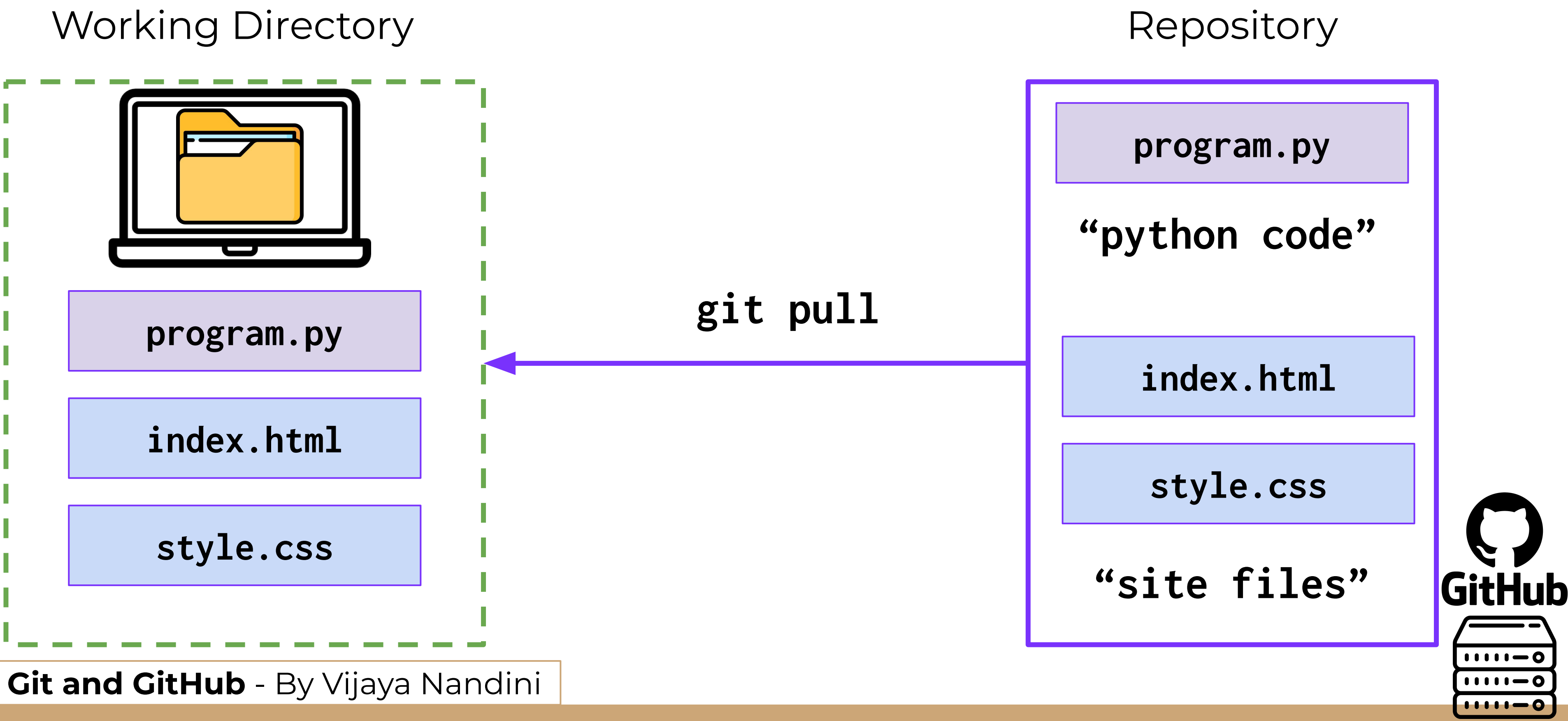

Push and Remote Branches

Getting Started with Git

- We've learned how to create repositories locally and add changes to the staging area and then commit them to the main (master) branch we have locally.
- If you are also using GitHub as a hosting service, we can think of this as a **remote branch**.

Getting Started with Git

- We're still operating under the assumption that the context is just a single solo developer operating on just a single branch, but later on we'll talk about branches in more detail.
- Let's learn how to **push** local code to a **remote branch** on GitHub.

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.

Getting Started with Git

- After we've created a repository locally, we need to create the repository on GitHub.
- Once you've created the repository on GitHub, you will actually see the instructions under: ***"...or push an existing repository from the command line"***

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.

Getting Started with Git

- **Important Note:**
  - We won’t use these commands, but just in case you need them in the future:
    - **git remote rename <old> <new>**
    - **git remote remove <name>**

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**

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**

Getting Started with Git

- **Git Log**
  - Before we jump into using git fetch and git pull, let's understand **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.

Fetch and Pull

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**

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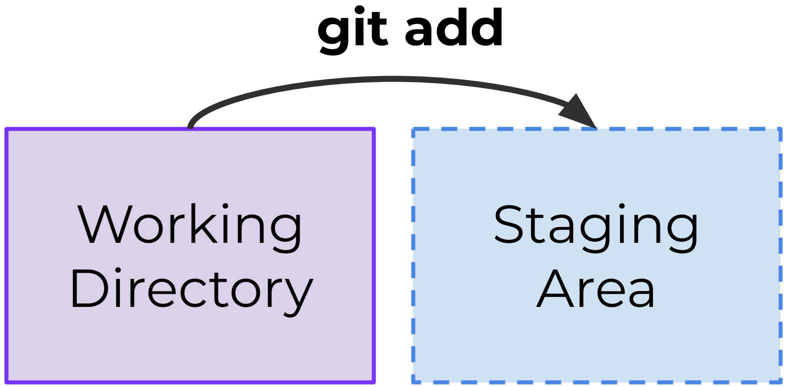
Getting Started with Git



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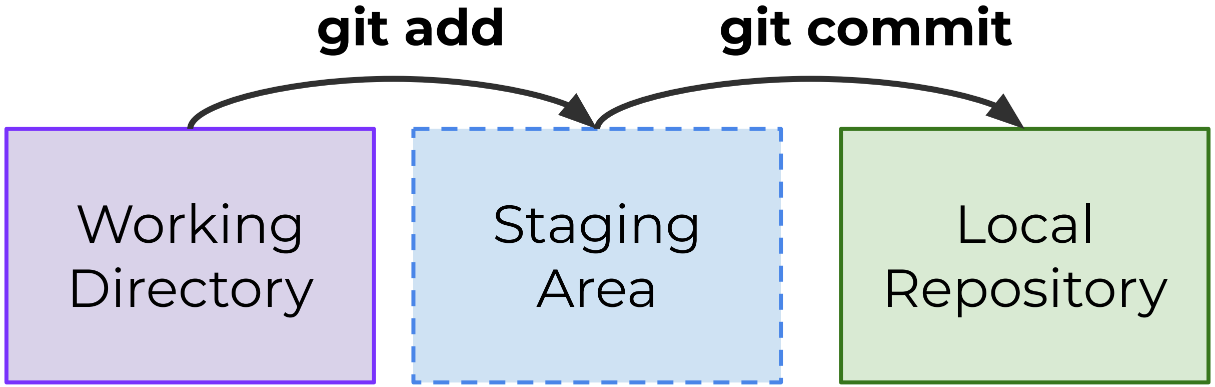

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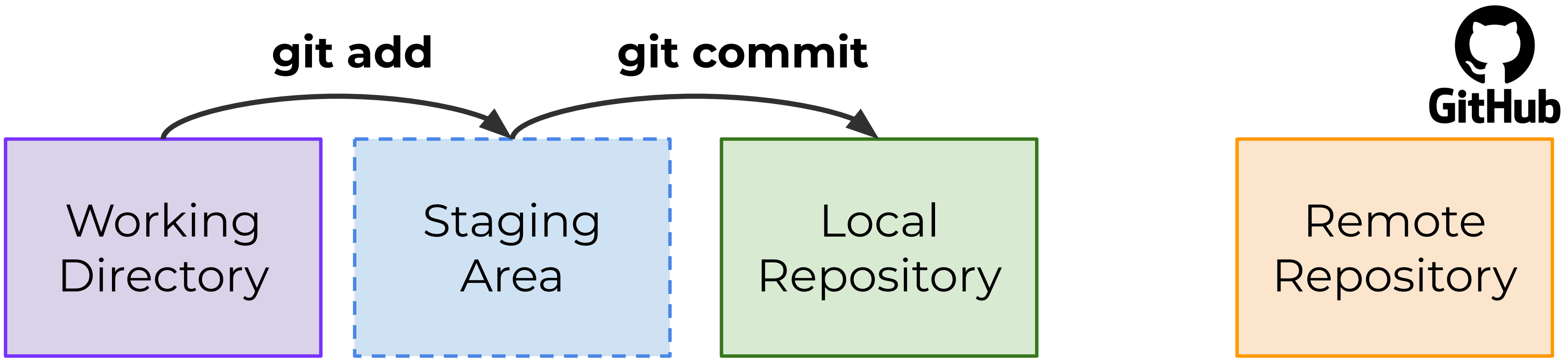

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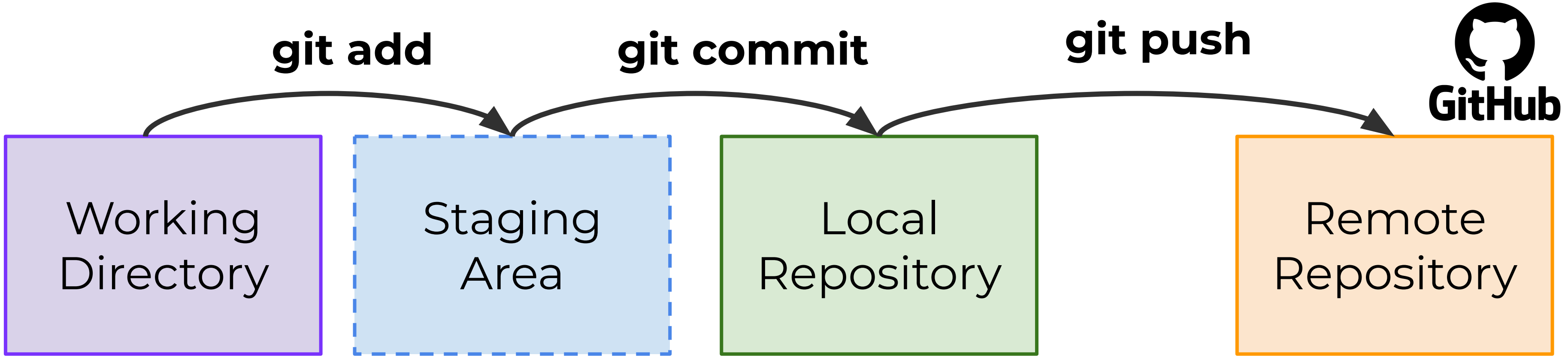

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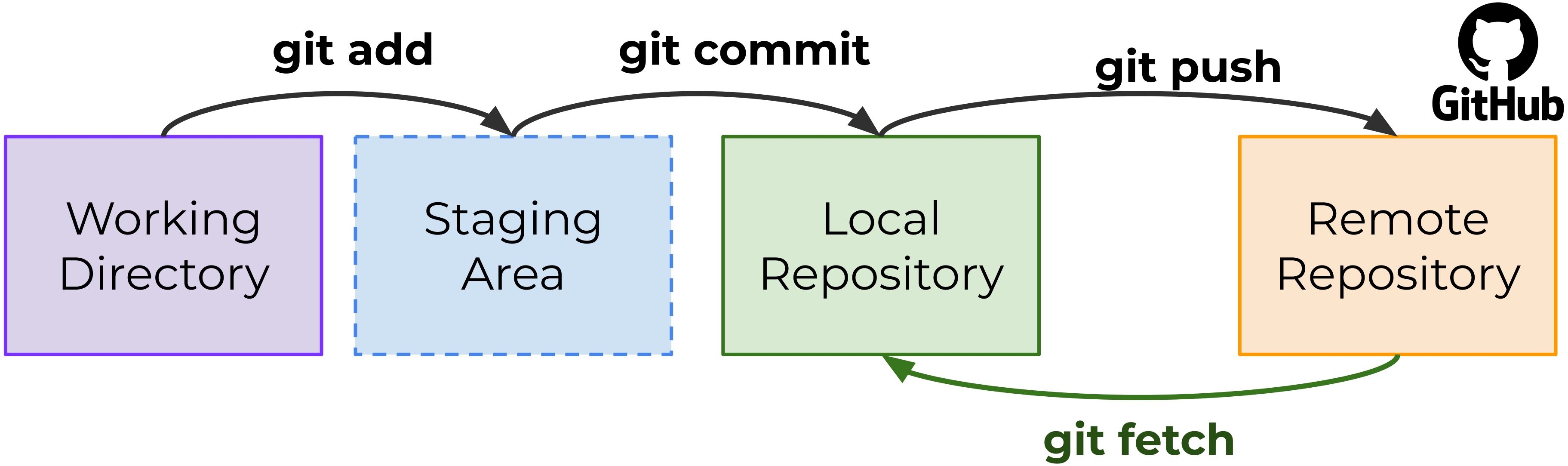

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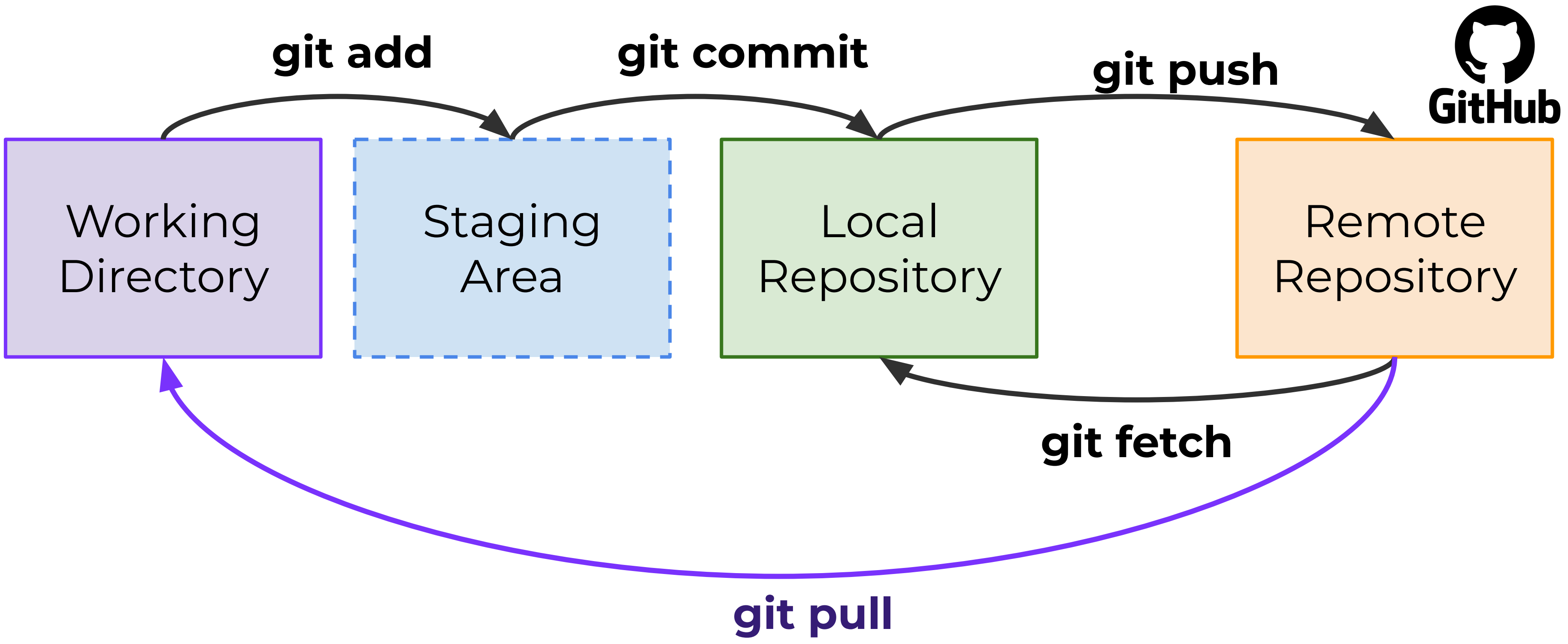

Getting Started with Git

- Using **git fetch** will download changes from the GitHub remote repository, however you will not see those changes be part of the files you have in the working directory.
- Fetch allows you to grab additional work done on the remote master branch, without needing to merge it in your working directory files.

Getting Started with Git

- Using **git fetch** makes sense when you're working with others and want to see what changes they've made but aren't ready to overwrite your own files yet.
- Also if you are simply working by yourself, you may want to just fetch remote changes without overwriting your latest work (later we'll discover branches are a better way of doing this).

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- When using fetch, often you'll just use:
  - **git fetch**
- But you can specify to fetch specific branches using:
  - **git fetch <remote> <branch>**
  - **git fetch origin <branch>**

Getting Started with Git

- Using **git pull** makes sense when you want to directly grab changes from the remote branch and directly merge them into your current branch.
- This means you will literally update the files in your working directory to match up and merge with the remote branch.

Getting Started with Git

- If you're a solo developer working on a single master branch, you often skip using a combination of **git fetch** and **git merge** and go straight for a **git pull**.
- We're not going to condone this as the "best practice", but we also want to be realistic of the workflow of a solo developer on a single branch.

Getting Started with Git

- Later we learn about branches and merging changes more carefully or stashing current changes, we’ll have a more nuanced understanding of using **git fetch** vs. **git pull**.
- In general you should pull before pushing to a remote branch, to make sure you’re in sync.

Exercise and Solution

Getting Started with Git

- Let’s test your understanding of what you’ve learned so far with a quick exercise.

Getting Started with Git

- **Tasks:**
  - Create a new local repo
  - Add a text file locally
  - Create the remote repo on GitHub
  - Push the Local repo changes to GitHub
  - Create a new file on GitHub
  - Pull these changes from GitHub to the local repo