Git

ENCE361

Outline

1. Version Control
    - Philosophies
2. Getting Started with Git
3. Git in CCS
4. Getting the Most Out of Git

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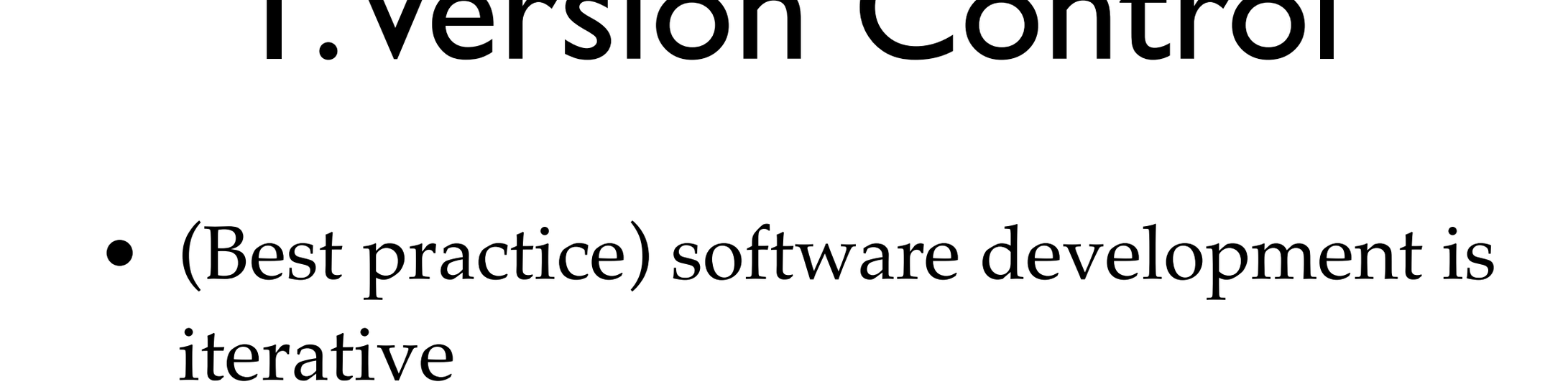
1. Version Control

- (Best practice) software development is iterative
- Features are added to successive "versions" of the codebase



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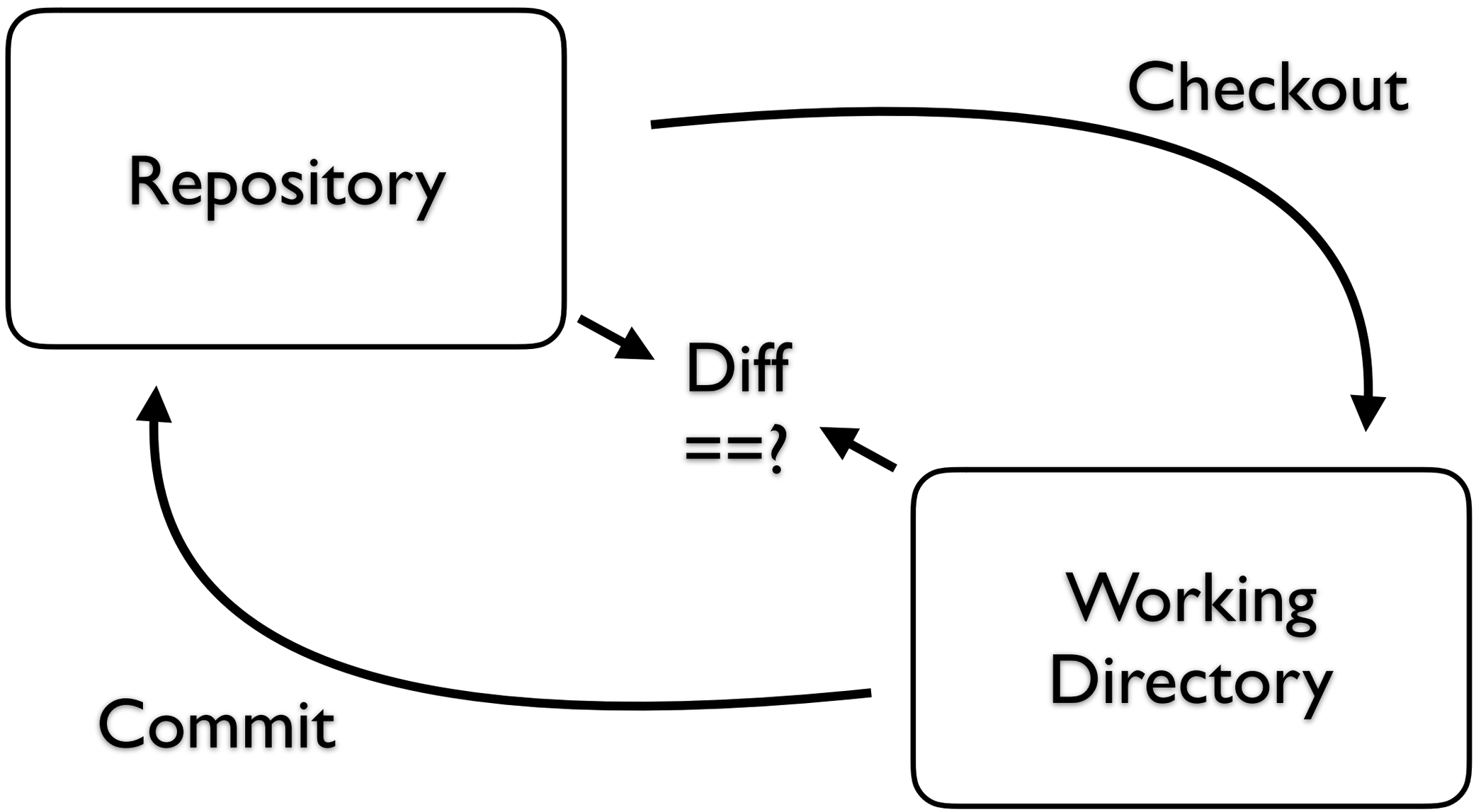
1. Version Control



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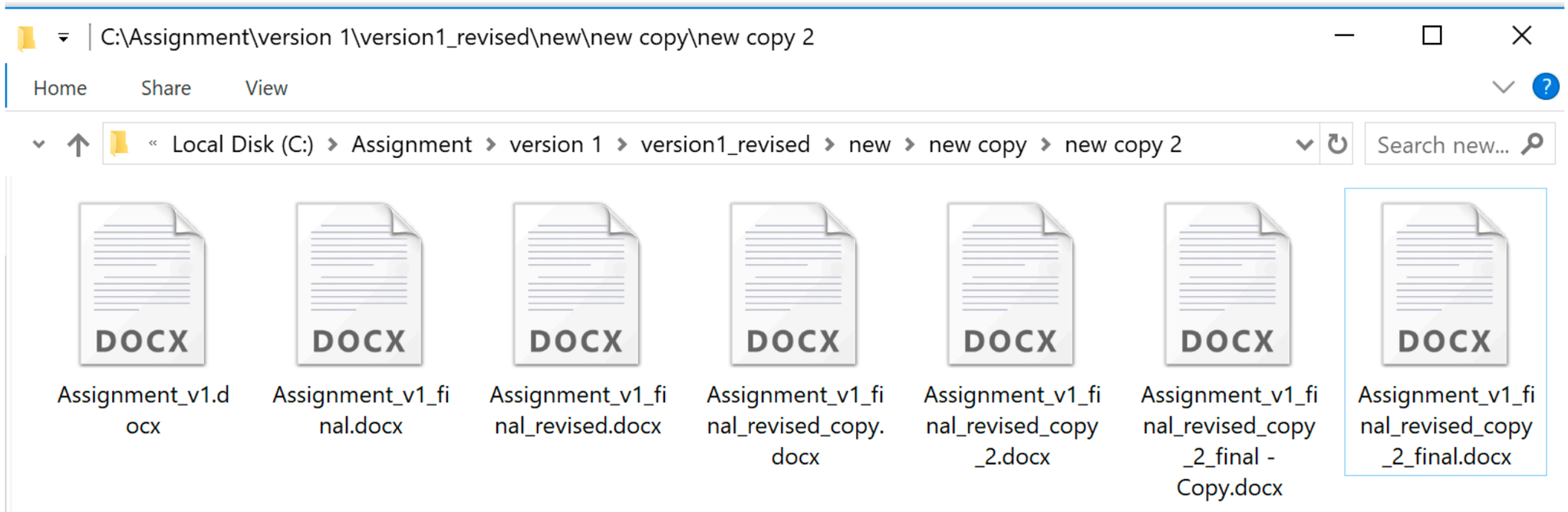
Approaches to Version Control

- Manual Control
  - Filenames and filesystem structure reflect version information:



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Approaches to Version Control

- Client-Server Version Control e.g. Subversion (SVN)
  - Single, remote copy of the complete codebase
  - Individual versions can be checked out
  - Checkouts are fast, but merges are slow

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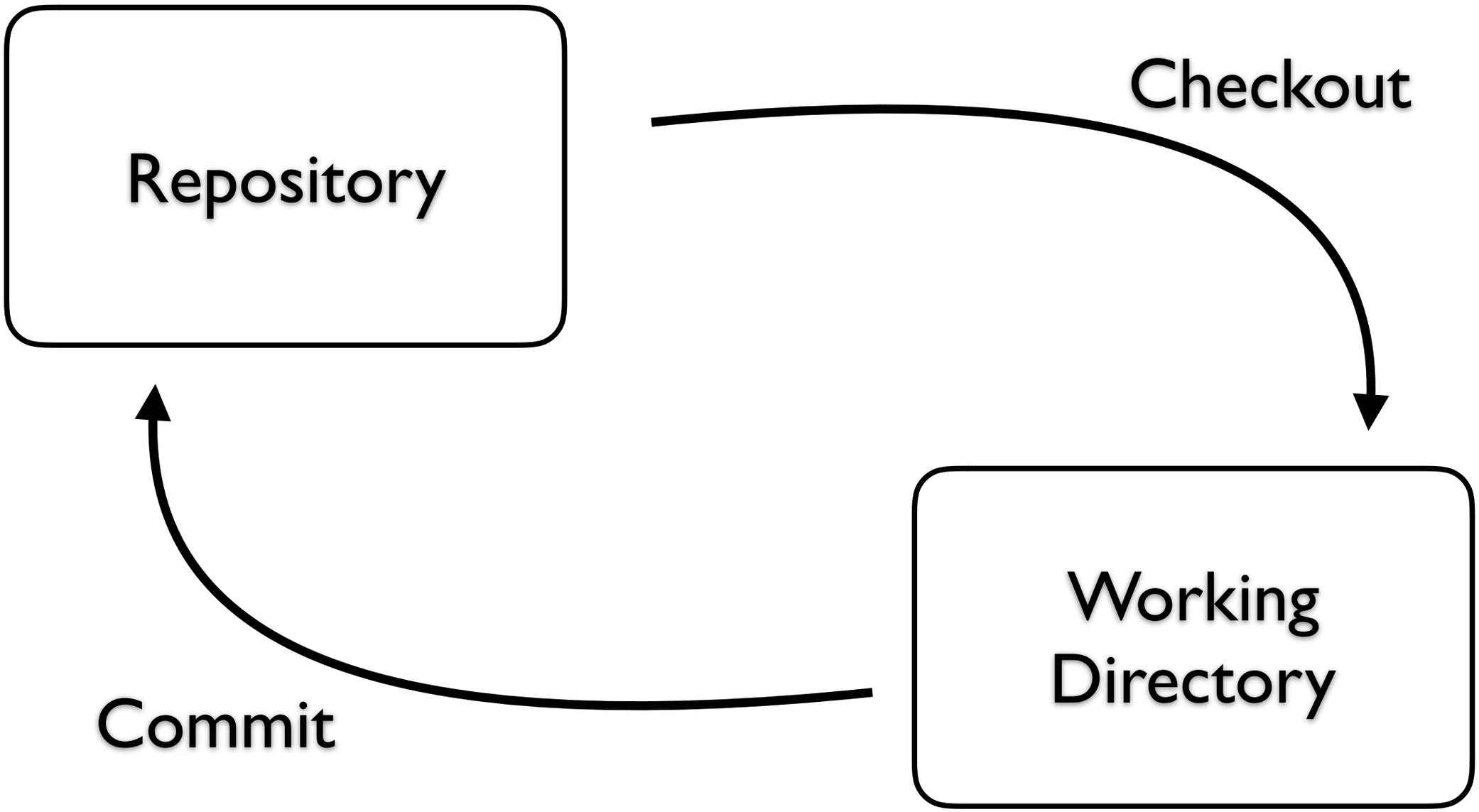
SVN



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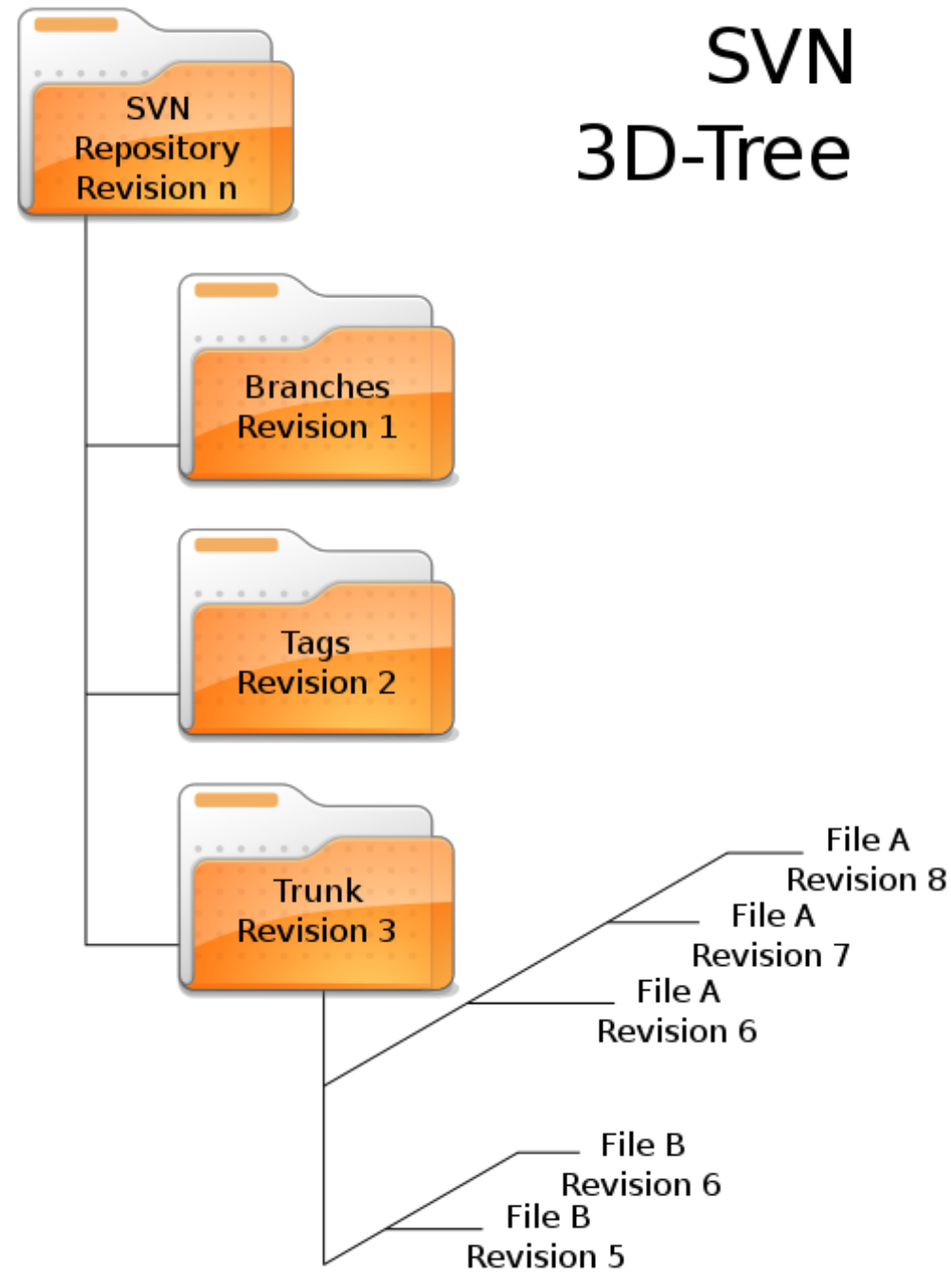
SVN

- A source *tree* has a *trunk* and multiple *branches*
- Every file has a version number
- Renaming things is hard



SVN
3D-Tree

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Approaches to Version Control

- Distributed Version Control e.g. Git
    - Every developer gets a copy of the complete codebase
    - Merges are very fast, at the expense of bigger checkouts

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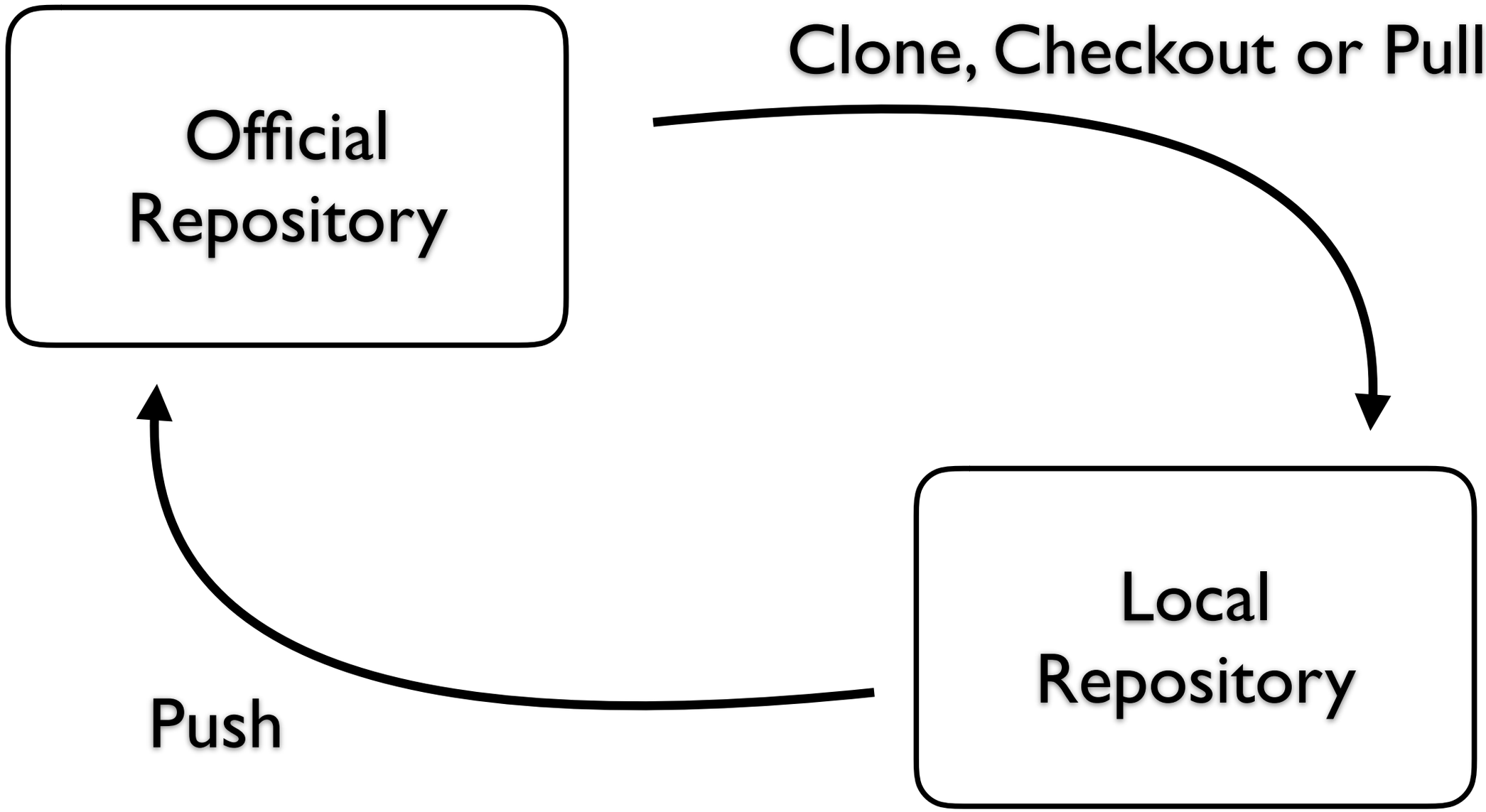
Git



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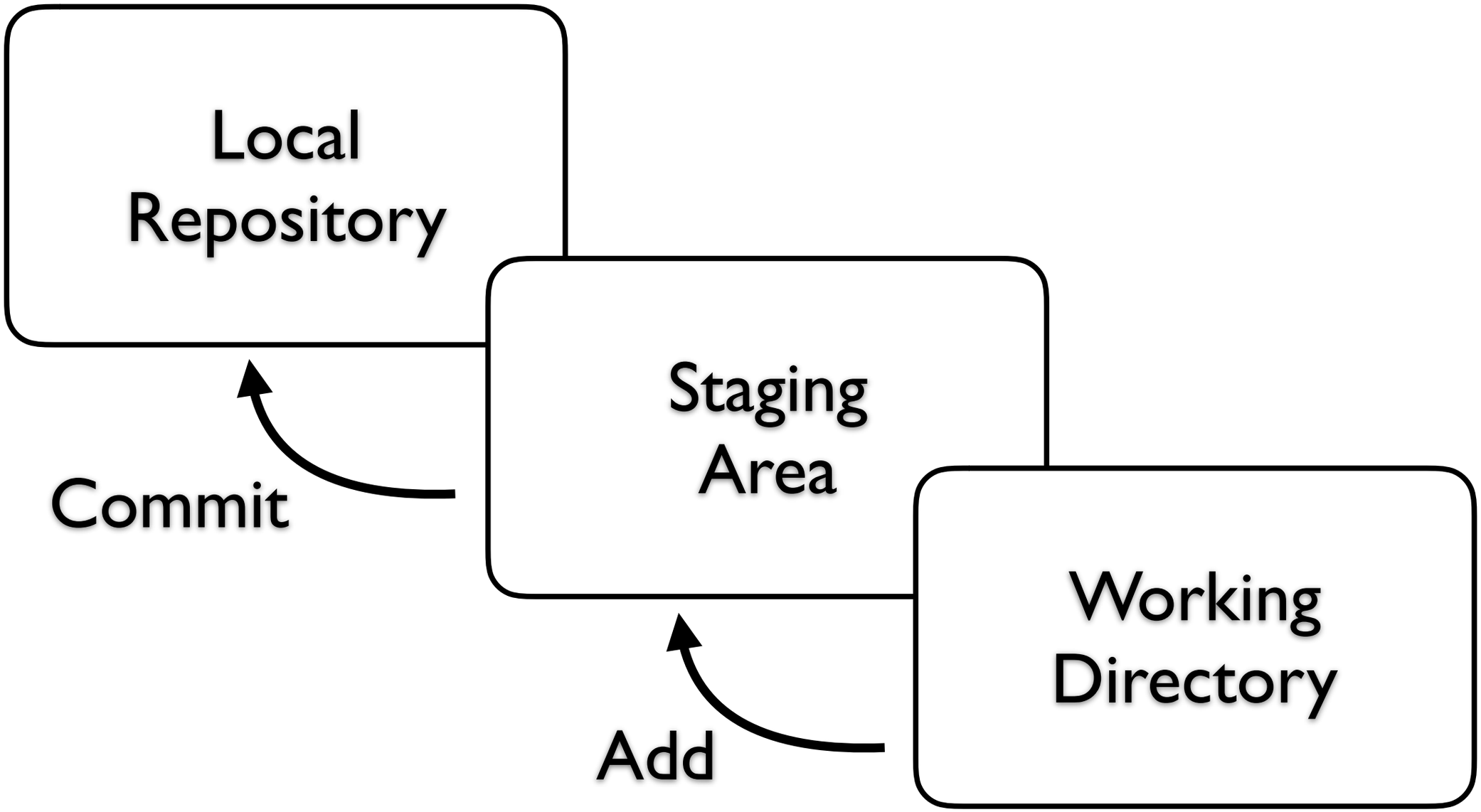
Git



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Repository Hosting Services

- Github – free hosting for publicly accessible projects
- GitLab – hosting for UC projects (including ENCE361!)
  `https://eng-git.canterbury.ac.nz`

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2. Getting Started with Git

- // Installing Git
  - For Windows:
    https://git-scm.com
  - For Linux:
    ```
    $ sudo apt-get install git
    ```


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2. Getting Started with Git

- // create an empty (local) repository
  ```
  $ git init
  ```
- // create a local copy of a remote repository
  ```
  $ git clone https://eng-git.canterbury.ac.nz/ence361-2019/Ddd_tt_Group-#
  ```


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Asking Git Questions

- // See changes in `filename` since the last commit:
  `$ git diff HEAD filename`
- // See which files have changed or been added/deleted/staged:
  `$ git status`
- // List previous commit tree:
  $ git log [-n #]
- // As above, but prettily:
  $ git log --graph [-n #]

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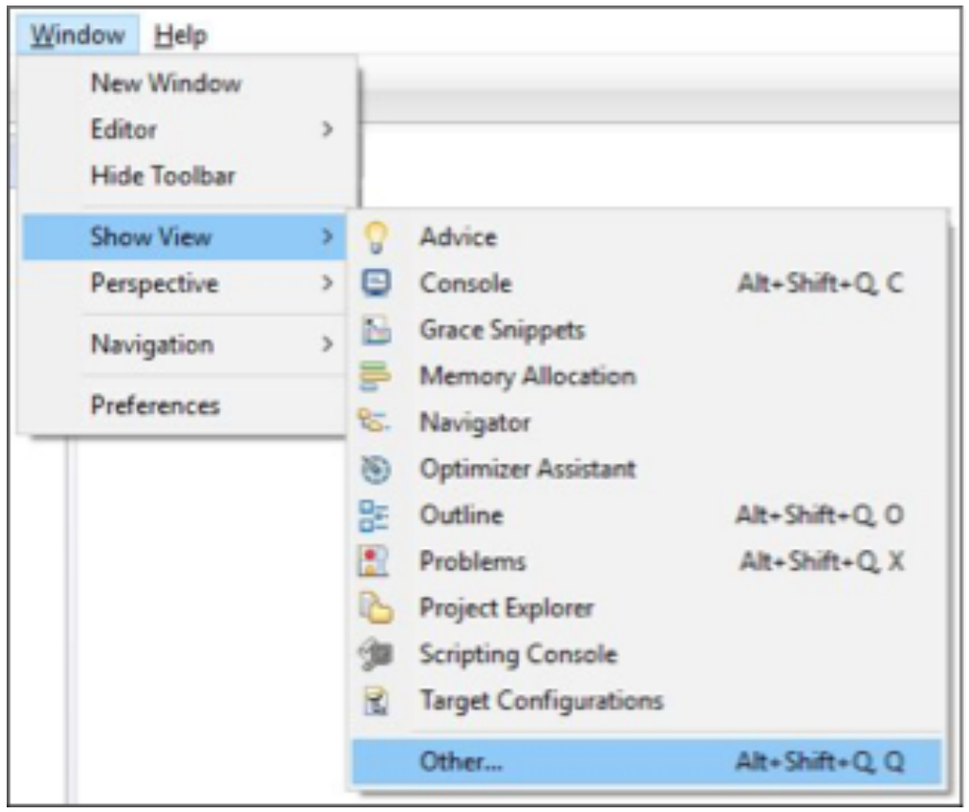
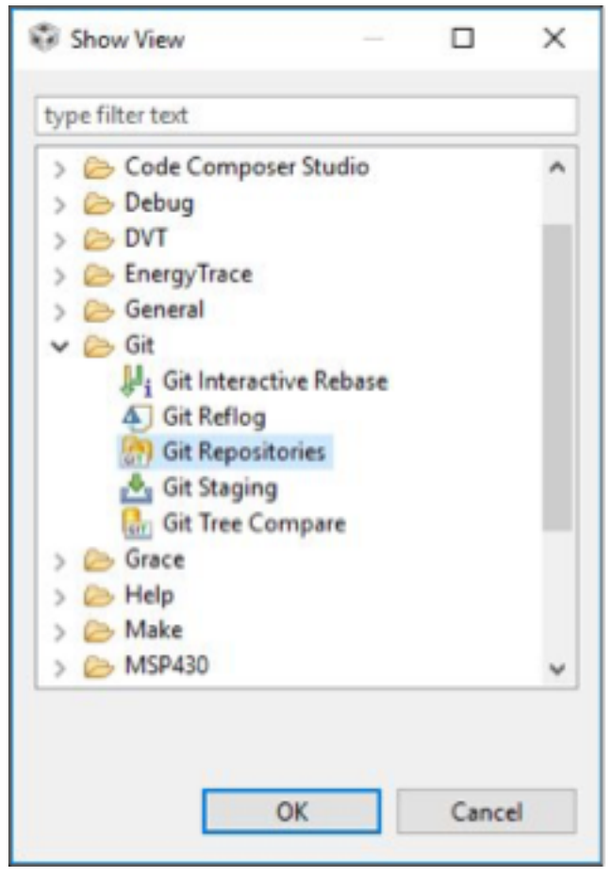
3. Git and CCS

- CCS has built-in support for Git
- To start, show the Git Repositories View





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3. Git and CCS

Add
existing repo

Create
new repo

```
$ git init
```

Clone
remote repo

```
$ git checkout url
```


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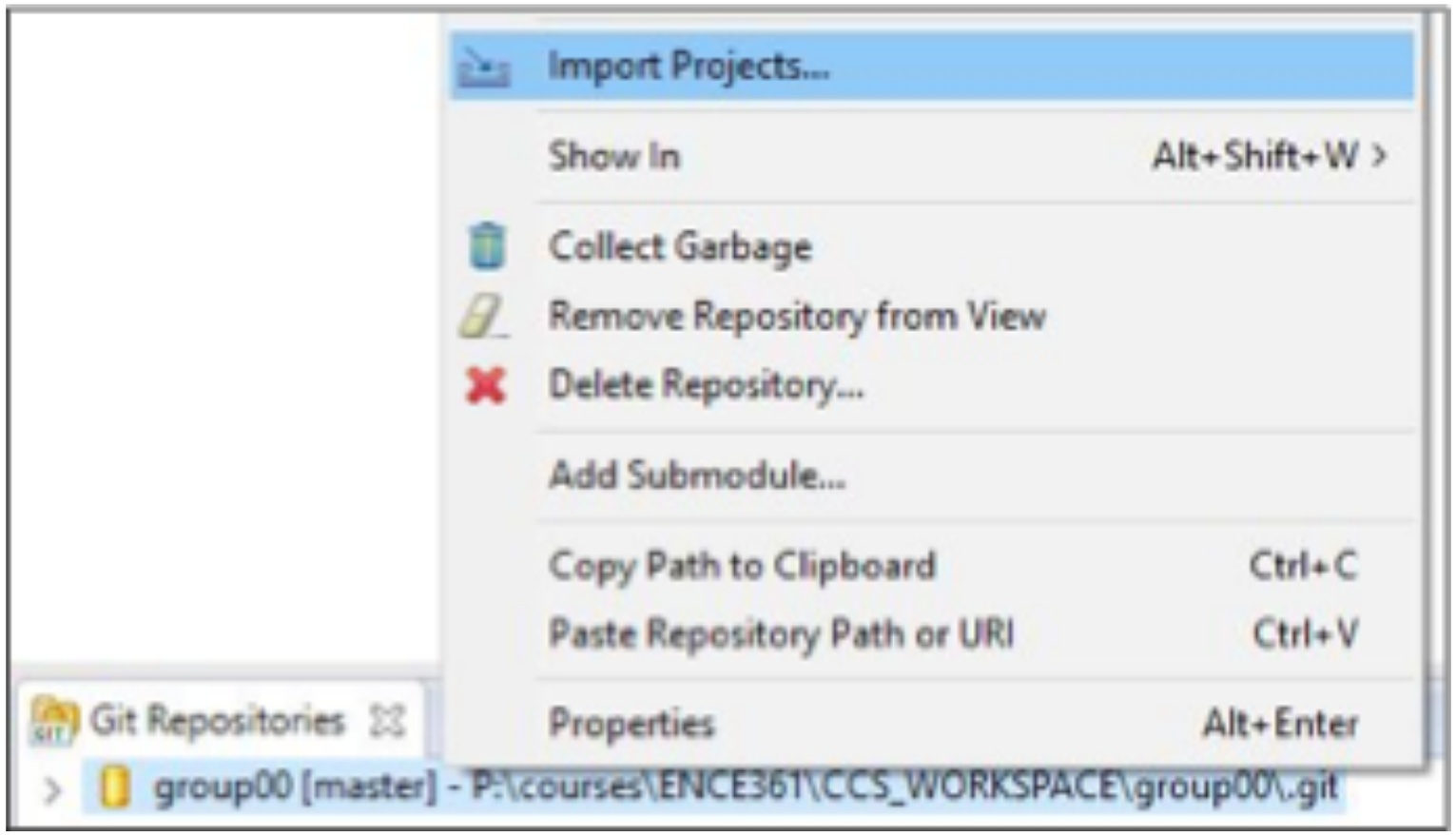
3. Git and CCS

- If you add an existing repo, you may need to **Import Projects**:



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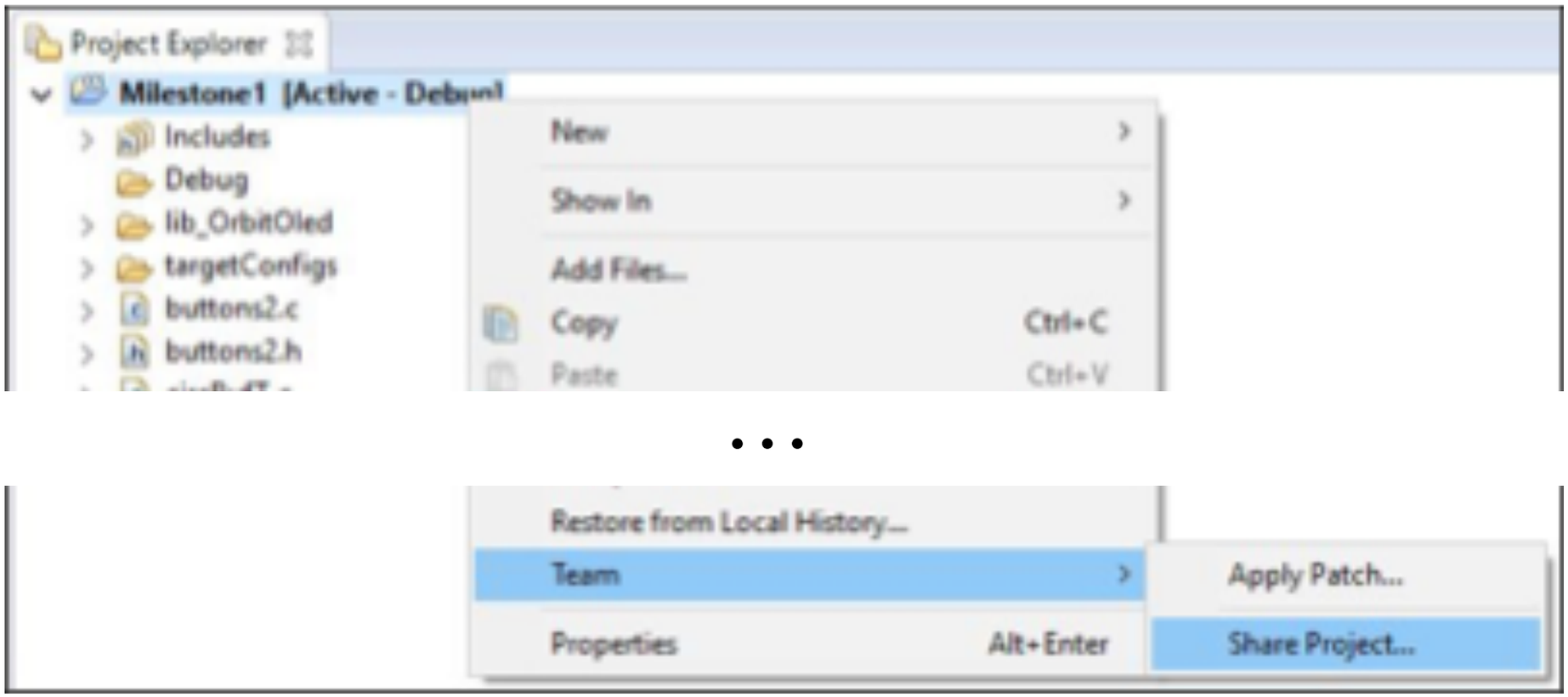
3. Git and CCS

- To add a project to a repo, right click on project, then Team > Share Project…



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3. Git and CCS

- Most git functions you will need can be found in the Team… menu:
- In the **Project Explorer**, right click on a file and select Team >

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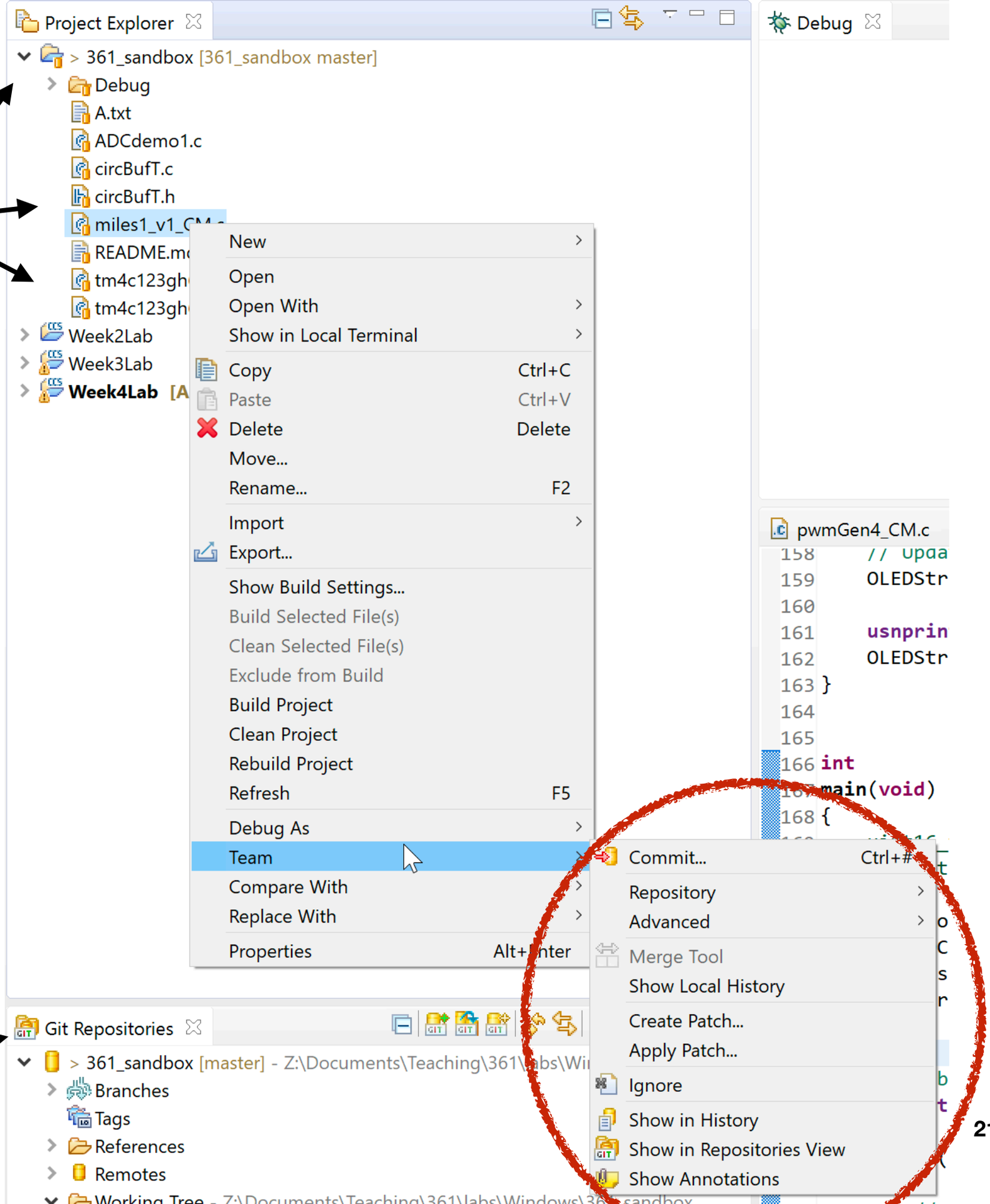
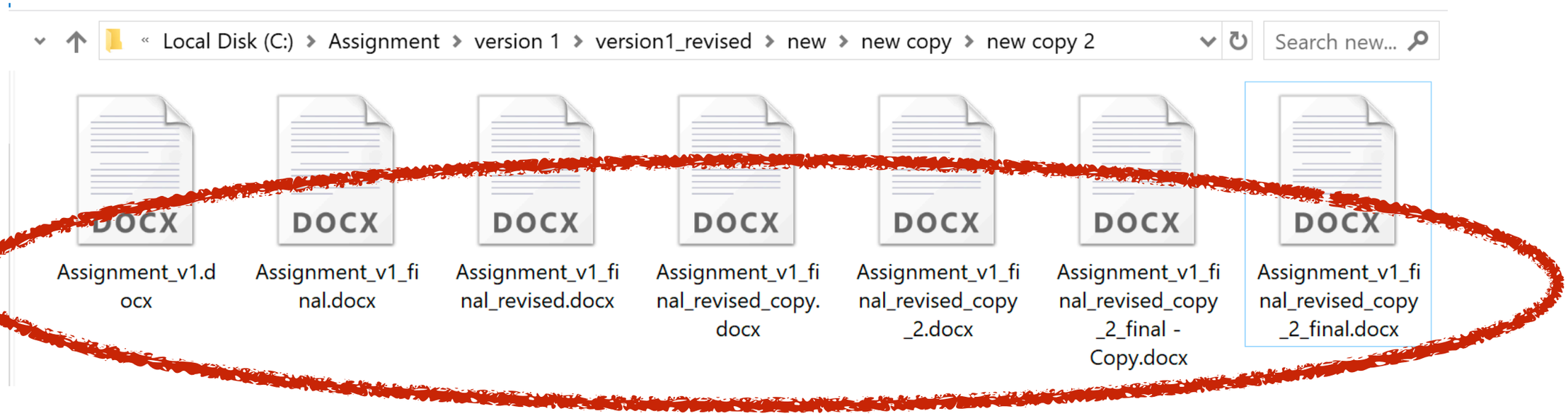
Right click here:

Not here:



4. Getting the Most out of Git

- Git wants to replace your naming scheme



- That's OK – file versions correspond to different commits

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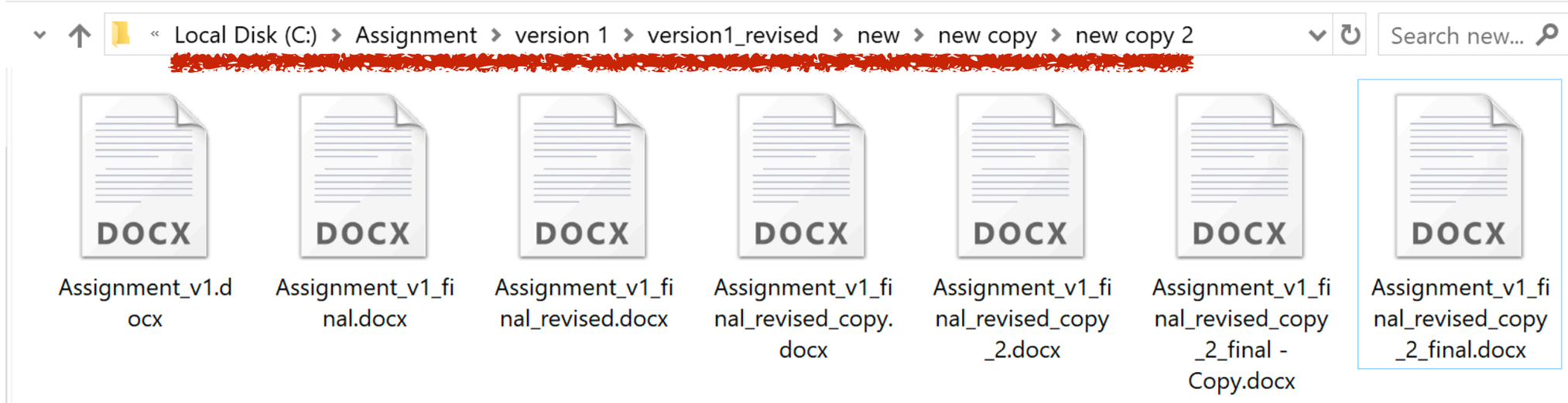
4. Getting the Most out of Git

- Git *also* wants to replace your file manager (Explorer, Finder, Dolphin *et al*.)



- That's OK, too*

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4. Getting the Most out of Git

- // Copy contents of local repository into a new "subdirectory" or branch:
  `git checkout -b newbranch`
- // Go back to "main" branch:
  `git checkout master`
- // Merge master and newbranch:
  `git merge newbranch`

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