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**HW 2**

**Explain what a version control system does and how it can help you?**

Brief explanation of what it is:

A version control system manages files as well as tracks the changes that occur to those files. This stores a complete history and allows the user to readily change back to a previous version at any stage in the history.

Why it is useful:

This is useful in research as well as for personal use. Let me explain both. In research, you can have many people making individual changes to a single project. Git logs who made what change, and allows for a comment to allow for better communication. This means that the Principle investigator can do a more efficient job at making sure that a project stays on task and does not diverge from the initial goal. If version control was not a thing, then the alternative would be to continuously change and overwrite a master document. This means that meaningful information that should not be changed, could be permanently deleted, and nobody could ever get it back. The alternative to that would be ton continuously save with different names, and that could get very messy. Git allows users to make these changes to one document, while logging changes, and still has the option to revert back to a past state. VERY USEFUL.

**Explain the difference between git init and git clone?**

Git init, turns a directory into a repository. This is where Git stores all its information. It is also empty

Git Clone: Clones a repository into a directory. This must be a preexisting one.

MAIN DIFFERENCE: Git Init creates a new repository from an empty directory. Git Clone downloads (clones) a repository into directory. But for this to occur, the repository must already exist.

**Explain the difference between git add and git commit?**

Git add simply adds file context to the index. For this to occur, there must be changes to the git repository in the form of new/altered documents in the repository.

Git commit records the changes that have been made to any files in the repository

Main difference: Git add adds the modified files to the queue to be commit-ed later. When you commit, you are committing to those changes and making changes to the local repository.

**Explain the difference between git commit and git push?**

Git push pushes the changes that were committed to the remote repository, along with a timestamp and a comment on the changes.

Main difference: Git commit records the changes to the repository, while git push updates, via pushing, the remote repository