Shell / Command Line

* echo: used like “print” in other languages
* ls: list files in directory
* ls -l: list files in directory with more information (l for long)
* ls -a: shows all files (including hidden ones)
* cd: move to a different directory
* cd ..: move one directory up
* cd -: return to previous directory
* cd ~: return to main working directory
* pwd: print working directory
* mkdir: creates a directory
* touch: create a file
  + touch test.txt: creates a file called test.txt
* mv: move files from a directory to another
* curl: used in command lines or scripts to transfer data (downloading)
* rm: delete files
* rmdir: delete directories
* grep: “global regular expression print” (a form of regex), processes text line by line and prints any lines which match a specified pattern
  + grep shell dictionary.txt | less

Version Control

* Commit: Saves a project’s files at a specific point in time
* Repository / Repo: directory which contains your project’s work, as well as a few hidden files (made up of commits)
* Working Directory: files seen in the computer’s file system
* Checkout: when content in the repository has been copied to the Working Directory
* Staging Area / Staging Index / Index: file in the Git directory that stores information about what will go into your next commit. Files on the Staging Index are poised to be added to the repository
* SHA: an ID number for each commit. 40 characters string composed of charters (0-9 and a-f)
* Branch: a new line of development is created that diverges from the main lien of development

Git

* git config –list –show-origin: displays git conifigurations
* git init: create a git repository inside the current working directory
* git clone: clones an existing repository, specified by a path (usually a URL)
  + git clone https://...
* git status: shows vital information, should be ran often
* git log: shows history and basic information of commits (type q to quit out)
* git log –oneline: shows history, but with shortened SHA and just commit message
* git log –stat: builds on git log with the additional information of changed files and number of added/removed files
* git log -p: will display files that have been modified, location of the lines that have been added/removed, and displays the actual changes that have been made (p for patch)
* git show: typically followed by a SHA (or shortened SHA), and will show just that one commit. Default show is “git show -p”, but can be combined with other flags such as:
  + –stat: to show how many files were changed and the number of lines that were added / removed
  + -p: this is the default, but can be combined with –stat to show stat + patch information (git show SHA –stat -p)
  + -w: ignore changes to whitespace
* git add: moves files from the Working Directory to the Staging Index
  + git add file
    - for multiple:
    - git add file1 file2
    - git add folder1/file1 folder2/file2
    - SPECIAL CHARACTER: period: git add .
* git commit: commits the files located in the Staging Index
  + git commit –‘m “type (short) commit message here”: use for shorter messages to bypass opening of code editor
* git diff: see what changes have been made but not yet committed
* .gitignore: note the dot in front, THIS IS NOT A COMMAND, but placed in the same directory the hidden .git folder is in if you would like certain files in the directory to not be committed
  + Add files not to be committed to the .ignore file
  + globbing: using regex concepts in conjunction with .gitignore if you need to ignore numerous of the same type of file
    - blank lines can be used for spacing
    - #: marks line as a comment
    - \*: matches 0 or more characters (any number of characters, including none)
      * Law\* = Law, Laws, Lawyer
      * \*Law\* = Law, GrokLaw, Lawyer
    - ?: matches 1 character (any single character)
      * ?at = Cat, cat, Bat, bat
    - [abc]: matches a, b, or c (matches one character in bracket)
      * [CB]at = Cat, Bat
    - \*\*: matches nested directories – a/\*\*/z matches
      * a/z
      * a/b/z
      * a/b/c/z
    - Example: 50 JPEG images in the sample folder we don’t want to commit
      * Samples/\*.jpg
* git tag: draw attention to specific commits
  + git tag -a v1.0: creates an annotated flag labeled v1.0 (without -a, the tag becomes a lightweight tag)
  + typing just “git tag” will display all tags within the repository
  + git tag -d v1.0: deletes the specified tag
  + git tag -a v1.0 SHA: will create a tag for the commit with the specified SHA
* git branch: list all branch names in repository, create new branches, delete branches
  + git branch sidebar: creates a branch named sidebar
  + git branch sidebar SHA: creates a branch named sidebar at commit SHA
  + git branch -d sidebar: deletes branch sidebar
  + git branch -D sidebar: force deletion (Git won’t let you delete a branch with new commits)
* git checkout: used to switch between branches
  + git checkout sidebar: switches to the sidebar branch
  + IMPORTANT NOTES:
    - Checkout will remove all files and directories from the Working Directory that Git is tracking
    - Checkout will go into the repository and pull out all of the files and directories of the commit that the branch points to
  + Can actually create branch and switch to it all at once: git checkout -b newbranch. Taking it further, you can have it branch at a specific branch, i.e. git checkout -b newbranch specbranch
* git log –oneline –graph –all: shows log of all commits from all branches
* git reset –hard HEAD^: use this command to undo an erroneous merge
* git merge: combine Git branches. Merging follows this process:
  + look at the branches its going to merge
  + look back along the branch’s history to find a single commit that both branches have in their commit history
  + combine the lines of code that were changed on the separate branches together
  + makes a commit to record the merge
  + git merge <name-of-branch-to-merge-in>
  + Fast Forward Merge: branch being merged in must be ahead of the checked out branch, and the checked out branch’s pointer will just be moved forward
  + Regular Type Merge: two divergent branches are combined, and a merge commit is created
* Merge Conflict Indicators:
  + <<<<<<< HEAD: everything below this line (until next indicator) shows you what’s on the current branch
  + ||||||| merged common ancestors: everything below this line (until next indicator) shows you what the original lines were
  + =======: is the end of the original lines, everything that follows (until the next indicator) is what's on the branch that's being merged in
  + >>>>>>> heading-update: is the ending indicator of what's on the branch that's being merged in
* git commit –amend: alter the most recent commit. With a clean Working Directory, you can alter the commit and then resave as normal. Furthermore, you can add forgotten files to the commit:
  + edit the file(s)
  + save the file(s)
  + stage the file(s)
  + and run git commit –amend
* git revert: takes the changes made in the specified commit (git revert SHA), and does the exact opposite of them. This command makes a new commit itself
* Relative Commit References: notation used when navigating through parent commits in a commit graph:
  + ^: indicates parent commit
  + ~: indicates first parent commit
  + The parent commit:
    - HEAD^
    - HEAD-
    - HEAD^
  + The grandparent commit:
    - HEAD^^
    - HEAD-2
  + The great-grandparent commit:
    - HEAD^^^
    - HEAD-3
  + Merging with parents:
    - ^: first parent (branch checked out during merge)
    - ^2: second parent (branch specified to be merged in)
* git reset: this will reset the progress to a specified parent notation. What happens to the cut portion relies on the flag that is added:
  + git reset –mixed HEAD^: resets to the parent commit, places most recent commit in the Working Directory
  + git reset –soft HEAD^: resets to the parent commit, places most recent commit in the Staging Index
  + git reset –hard HEAD^: resets to the parent commit, places most recent commit in the Trash
* git branch backup: before any resetting, it is wise to create a backup branch

GitHub & Remotes

* Remote Repository: similar to a local repository but it exists elsewhere. Access via:
  + URL (by far the most common)
  + File path
* Git vs. GitHub: Git is a version control tool, whereas GitHub is a service to host Git projects
* git remote: manage and interact with remote repositories
  + will return blank if no remote repository is configured
  + cloned repositories will automatically have a remote
  + origin: shortname and defacto name to refer to the main remote repository (easier than the entire URL / file path)
    - git remote -v: will show the full path
  + git remote add origin URL: after creating a remote repository in GitHub, use this command to link your local repository to GitHub’s remote repository
    - Note: origin is arbitrary, can be named whatever
    - The template command is “git remote add *shortname* *URL*”
  + git remote rename <original> <rename>
* git push: send local commits to a remote repository
  + git push <remote-shortname> <branch>
* git pull: syncs local repository with remote repository (usually a fast forward type)
  + git pull <remote-shortname> <branch>
* git fetch: retrieves commits from the remote repository, but does not automatically merge them (essentially retrieves the commits and places them in a new branch)
* fork: not a command, this a feature in GitHub (and other version control hosts) which allows a copy of an existing remote repository to be made, in which the user is now the owner
  + Note that forking and different from cloning. Cloning creates a copy to a local repository, while forking keeps the repository in a remote repository
* git shortlog: displays alphabetical list of names (of collaborators) and the commit messages that go along with them
* git shortlog -s -n: shows number of commits each collaborator has made
* git log –author=<author>: shows git log for a specific author
* git rebase: (be careful with this command) used for “squashing,” or combining commits together
  + git rebase -i HEAD~x: will combine all commits back to x
  + note that this is a good time to create the backup branch
  + commands used in conjunction with git rebase:
    - p or pick: keep commit as is (default)
    - r or reword: keep commit’s content but alter the commit message
    - e or edit: keep this commit’s content but stop before committing so that you can:
      * add new content or files
      * remove content or files
      * alter the content that was going to committed
    - s or squash: combine this commit’s changes into the previous commit (commit above it on the list)
    - f or fixup: combine this commit’s changes into the previous commit (commit above it in the list)
    - x or exec: run a shell command
    - d or drop: delete ethe commit
* git push -f: used to force push commits (likely will be needed if git rebase is used)