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1 Fast-Ref

1.1 Commit

```
git add . stages all the newly changed/editted files
git commit -m 'msg' commits the staged files using the message: 'msg'
git commit -am 'msg' equivalent the above two-commands
```

1.2 Unstage

```
git restore --staged <file1, file2> Un-stages files 1,2; short form is git restore -S .

git restore --staged . Un-stages all the staged files

git rm --cached <file> Un-stages <file>

git rm -rf --cached . Un-stages all staged files +

git resset <file> Un-stages <file>

git resset . Un-stages all the staged files
```

1.3 Amend

```
git commit --amend -m 'newmsg' Replaces last commit to include the updates & changes the commit msg
git add .

git commit --amend --no-edit commits the staged files BUT using '--no-edit' retains the previous commit
message
git log --oneline shows commit history in a shorter form as:
e.g.: f425059 (HEAD -> master, origin/master) msg
8f184d5 first commit
git revert 8f184d5
This creates a new commit with the changes from the previous commit.
```

1.4 Codespace

To edit the files directly in GitHub (online), go to the intended repo. in GitHub, press ".". This opens the file in vscode. You can make changes to the code and push them to the remote repo.

1.5 Stash

To save your work without adding them to the staging area and creating a new commit. This allows you to save your progress and restore it whenever you need to.

```
saves your current progress by providing a name and stashing it.

e.g.: Saved working directory and index state On master: new-idea

git stash list view your stash list and note the corresponding index to retrieve it.

e.g.: stash{0}: On master: new-idea

stash of "new ideas" is saved at index 0.

git stash apply 0 retrieves the stash of "new-idea" that was already saved at index 0

git branch -M main renames your default branch name.

In this case, it renames "master" to "main".
```

1.6 Log

git reflog	Views the history of checkouts
git loggraphdecorateoneline	git log shows a detailes history of all the commits.
	displays the changes made in multiple branches and how they merge.
	To make it more readable.

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```
1.7 Unstage
```

```
01 git restore --staged <file1, file2> Un-stages files 1,2
```

1.8 Merge branches

```
01 git merge <master> <branch> merge <branch> to master
02 git merge <branch1> <branch2> merges: <branch2> to <branch1>
```

1.9 Merge to master

```
01 git branch Lists branches
02 git checkout master switch to master
03 git merge <branch> merge <branch> to master
04 git log
```

1.10 Del a branch

```
01 git branch Lists branches
02 git checkout master switch to master
03 git branch -d <branch> Deletes branch
04 git push origin
```

1.11 Rename a branch

```
01 git branch -m <name> rename the current branch to <name>
```

```
p (going back to HEAD)
git reset --hard HEAD∧ (going back to the commit before HEAD)
git reset --hard HEAD~ 1 (equivalent to "∧")
```

2 First-Time Git Setup

First-time set-up & configuration for a new Git installation.

```
git config --global user.name <FirstName LastName> Drop "--global" option from these commands git config --global user.email <email@example.com> to recognize you only locally.

git config --global core.editor <emacs> To use a different text editor (from system default) for git.

git config --list --show-origin Shows settings and where they are coming from Checking the Settings that are in effect.
```

2.1 remote repo

```
git config user.name Shows who it is configured to git config user.email Shows the email associated to git
```

$3 \quad GUI$

```
gitk | Opens a visual commit browser (some GUI)
```

4 help

```
git --version
git help | git --help
git help <command>
Gives help about <command> git <command> --help
Checks installed Git's version
Shows git help
```

5 Status

```
git status Checks the current state of repo git status <file> Checks state of specific file
```

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$6 \log$

```
git reflog
                                            Views the history of checkouts
                                            Shows a detailed log of commit history
git log
git log --oneline
                                            Shows only <commentsID> commit-comments
git shortlog
                                            For a shorter log of commit history
git shortlog -s
                                            Creates even much shorter log
                                            Shows only the last 'one' commit
git shortlog -1
git log --graph --decorate --oneline
                                            git log shows a detailes history of all the commits.
                                            displays the changes made in multiple branches and how they merge.
                                            To make it more readable.
```

- 1. **-1**:
- 2. -p: shows the line diff for each commit
- 3. -p -word-diff: shows the word diff for each commit
- 4. --stat: shows stats instead of diff details
- 5. -- name-status: shows a simpler version of stat

7 Create repo.

Two ways to create a repository:

7.1 git init

```
git init <dir> | Create new (empty) / reinitialize existing repo in <dir> git init | Executing this in project-directory <dir> makes it a repo
```

7.2 clone

- » git clone <repo-url> It is the URL to a remote git repository <repo>
- 1. Creates a local <repo> folder & Initializes it as a git repository
- 3. Copies (pull-downs) all data from repo-url to the local folder
- 4. Automatically configures <repo> to point to the <repo-url>
- 5. Checkout to the local working directory

Once making change-&-committing files, one can git push the changes to the remote repository at <repo-url>

- » git clone <repo-url> <folder-name> Same as above but local repo can be <folder-Name> (different from the remote one)
- » git clone <repo1> <repo2> Copies a local repo-folder to a new local folder

Delete: To remove git control delete ".git" from working director.

8 Staging

Staged-files are ready to be committed

8.1 add

```
git add <file1 file2 file3> Adds files 1--3 to staging area
git add *.txt stages all text files
git add -A | git add --a[11] Adds evergitything in and beneath
git add --u Adds modified files (but not the new ones)
```

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8.2 .gitignore

A hidden file (.gitignore.txt) in the root of repository specifies the files we do not need to keep track of their changes (e.g. *.exe files). Note that the files already tracked by Git are not affected. To remove all files from the repository and adding them back according to the rules in .gitignore:

```
Use: git rm -rf --cached . \longrightarrow git add . (see Appendix B)
```

9 Delete

9.1 rm

```
git rm <files> Deletes from both the working directory and staged area.

Note: you may lose all the changes (even the good ones):
```

10 Commit

```
git commit  
Gommits staged files & asks for "comment message" to the commit  
Commits & (switch '-m') simultaneously adds a commit message  
Gommits all the file in the staged area and asks for the comment  
Adds modified files to stage, commits them, and adds commit message
```

Un-commit

```
git commit - -amend -m "new-msg" Replaces the last commit of the current branch with the current staged files and replace its commit-msg with the "new-msg"; as last commit never happened.

git commit - -amend

If no changes since last commit (e.g. immediately after a commit), This only changes the commit-msg. It opens the last commit-message in the editor for editing, any change overwrites last commit-msg.
```

Reset Author

```
git commit --amend --reset --author
git commit --amend --reset --author
git commit --amend --author="Author Name <email>"
Amends commit author & author date to the committer
Amends commit author with given author name & email,
author date remains unchanged
Amends the commit date (use ISO 8601 format for convenience)
```

11 branch

To create, rename, delete, etc. of a branch

```
git branch <name>
git branch <name>
git branch -m <new-name>
git branch -d <name>
git branch -D <bra>
git branch --a
git branch --a
git branch --a
Shows (list) both local branches
Greate a new (local) branch from the current Head (i.e. last commit)
Rename the current branch to "new-name"
Delete this branch, This do not delete if branch has unmerged changes
Force delete this branch, even if it has unmerged changes
Shows (list) both remote & local tracking branches
Shows remote tracking branches
```

12 Branch - checkout

Takes to branch

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```
git checkout -b <name>
git checkout master
git checkout master
git checkout <br/>
git checkout <br/>
git checkout <br/>
git checkout <remote-branch>
git checkout -- <files>
git checkout --detach

Creates a new-branch < name> from current Head & then, checkout to it

Switches to branch "master" (github)

Switches to <br/>
branch-name> +

Discards all the changes in <files> and restore it from the staged-version

Detaches Head from current branch
```

13 diff: compare

Compares and shows differences between two instances.

14 Cleaning Working-Directory

```
git clean --n | See what would be done by git clean command (Dry-Run of clean Operation) git clean --1 | Interactively(?) removes un-tracked files from repository (Remove un-traced files) git restore -\:-staged .

Or simply you can git restore -S .
```

15 git reset

15.1 Roll-back to a previous commit

```
git reset --hard HEAD | Reverts working copy to the HEAD (most recent commit) +
                          Shows current commit history or use git log --oneline
git reflog
git reset <commitId>
                          Resets master to the commit < commitID > (absolute address).
                          e.g., commit \frac{0766c05}{3}c0ea2035e90f504928f8df3c9363b8bd
                          Resets master to 2 commit before the current commit (relative address)
git reset current2
git reset
                              1. Removes everything from staging area
                              2. Resets every modified files in working-space to the latest commit
                              3. Brings them back to the working-area
                                  Note: you may lose all the changes (even the good ones):
                            Un-stages "<files>" from the indexing \rightarrow Reset to the latest commit \rightarrow Leaves
git reset <files>
                            them in the working-area
git reset path/to/file
                            Un-stages files in "path/to/file" folder from the indexing, ... as above
```

[&]quot;checkout" is the act of switching between different versions of a target entity.

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15.2 git reset HEAD

```
git reset HEAD -- <files> Un-stages "<files>" from the index
Un-stages files in "path/to/file" folder from the index
Un-stages from the indexing all the files recursively and so forth to the subfolders
```

16 Remote Repository

16.1 Git-Hub

Given you have a GitHub account:

```
    log-in to: https://github.com
    Create a remote repository in https://github.com/yourgit/proj.git
    git remote add origin https://github.../proj.git
```

17 Stash

A practical guide to using the git stash command

17.1 Removing Remote URL

```
git remote -v
git remote rm
git remote rm master

| Removes a remote URL from your repository
| Removes a remote URL from your repository
| Removes a remote URL from your repository
| Pushing
| git push - -u origin master | Sends local changes to remote repository (origin)
```

17.3 Pulling

git pull origin master | Pull-down any new changes (by collaborators etc.) from the remote repo.

17.4 Example: working with git and GitHub

```
    mkdir D:/proj
    echo "# main.tex" » D:/proj/README.txt
    cd D:/proj
    GIT init
    git add README.txt
    git commit -m "first commit"
    remote add origin https://github.com/BehN/Git-Help-LaTeX.git
    git push -u origin master
```

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A Appendix: Reviewing some concepts with a descriptive style

Differences:

Uh oh, looks like there have been some additions and changes to the cat family. Let's take a look at what is different from our last commit by using the git diff command. In this case we want the diff of our most recent commit, which we can refer to using the HEAD pointer.

```
git diff HEAD
```

Staged Differences:

Another great use for diff is looking at changes within files that have already been staged. Remember, staged files are files we have told git that are ready to be committed. Let's use git add to stage octofamilyoctodog.txt, which I just added to the family for you.

```
git add octofamily/octodog.txt
```

Good, now go ahead and run git diff with the –staged option to see the changes you just staged. You should see that octodog.txt was created.

```
git diff -staged
```

Resetting the Stage:

So now that octodog is part of the family, cat is all depressed. Since we love cat more than octodog, we'll turn his frown around by removing octodog.txt.

You can unstage files by using the git reset command. Go ahead and remove octofamily/octodog.txt.

```
git reset octofamily/octodog.txt
```

Undo:

git reset did a great job of unstaging octodog.txt, but you'll notice that he's still there. He's just not staged anymore. It would be great if we could go back to how things were before octodog came around and ruined the party.

Files can be changed back to how they were at the last commit by using the command: git checkout – <target>. Go ahead and get rid of all the changes since the last commit for cat.txt

```
git checkout - cat.txt
```

Removing:

Ok, so you're in the clean_up branch. You can finally remove all those pesky cats by using the git rm command which will not only remove the actual files from disk, but will also stage the removal of the files for us.

You're going to want to use a wildcard again to get all the cats in one sweep, go ahead and run:

```
git rm '*.txt'
```

Removing one file is great and all, but what if you want to remove an entire folder? You can use the recursive option on git rm:

```
git rm -r folder_of_cats
```

This will recursively remove all folders and files from the given directory.

Committing Branch Changes:

Now that you've removed all the cats you'll need to commit your changes. Feel free to run git status to check the changes you're about to commit.

```
git commit -m "Remove all the cats"
```

Switching Back to master: Great, you're almost finished with the cat... er the bug fix, you just need to switch back to the master branch so you can copy (or merge) your changes from the clean_up branch back into the master branch.

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Go ahead and checkout the master branch:

git checkout master

Preparing to Merge:

Alright, the moment has come when you have to merge your changes from the clean-up branch into the master branch. Take a deep breath, it's not that scary.

We're already on the master branch, so we just need to tell Git to merge the clean_up branch into it:

git merge clean_up

Keeping Things Clean:

You just accomplished your first successful bugfix and merge. All that's left to do is clean up after yourself. Since you're done with the clean up branch you don't need it anymore.

You can use git branch -d
 tranch name> to delete a branch. Go ahead and delete the clean_up branch now:

git branch -d clean_up

git merge:

When you're done working on a branch, you can merge your changes back to the master branch, which is visible to all collaborators. git merge cats would take all the changes you made to the "cats" branch and add them to the master.

git merge

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B More about .gitignore

In each line of this file, it specifies the (type of) files that we do not want to stage (never) and git should ignore when staging the files with --all switch.

Useful "pattern format" to specify a group of files/folders.

```
1. "blank line": matches no files, so it can serve as a separator for readability
```

- 2. "#": makes it a comment line; \# for the patterns literally leading with #
- 3. "!": ignore but excluding the matching pattern; \ for the patterns literally leading with
 - e.g.: important!.txt: ingores all important*.* except the ones with .txt extension
- 4. An asterisk "*" matches anything except "\".
- 5. The character "?" matches any one character except "\".
- 6. "**/<this>": match <this> in all directories. e.g.:
 - "**/foo": matches file or folder "foo" anywhere.
 - "**/foo/bar": matches file/folder "bar" in/under "foo" folder
- 7. "<folder>/**": match everything inside "<this>" and all the paths underneath it
- 8. "/**/": matches zero or more directories. e.g.:
 - "a/**/b" matches "a/b", "a/x/b", "a/x/y/b" and so on.
- 9. "*": Usage
 - "hello.*": matches any file or directory whose name begins with "hello."
 - "/*": matches any file or directory
 - "/foo/*": matches any file or directory inside "/foo" and folders underneath
- 10. The forward-slash "/", all paths are relative from the .gitignore file location
 - "a/**/b" matches "a/b", "a/x/b", "a/x/y/b" and so on.
 - "foo/": matches a directory "foo" and paths underneath it, but does not match a regular file or a symbolic link foo
 - "doc/frotz/": matches folder "./doc/frotz", but not "a/doc/frotz" directory
 - "frotz/": matches both folders as "./frotz/" and "a/frotz"
 - "doc/frotz": and "/doc/frotz" have the same effect. A leading slash is not relevant when a middle slash in the pattern
 - "foo/*": matches "foo/test.json" (a regular file), "foo/bar" (a directory), but it does not match "foo/bar/hello.c" (a regular file), as the asterisk in the pattern does not match "bar/hello.c" which has a slash in it
- 11. "a/**/b": matches "a/b", "a/x/b", "a/x/y/b" and so on

Example:

```
$ cat .gitignore
# exclude everything except directory foo/bar
/*
!/foo
/foo/*
!/foo/bar
```

- This exclude everything except folder "foo/bar"

- "/*": Exclude everything (even files inside "/foo" and "/foo/bar"
- "!/foo/bar": keeps the empty folder "/foo/bar"

(note the /* - without the slash, the wildcard would also exclude everything within foo/bar):

B.1 Sample cmd file to Create .gitignore

This is a simple windows script (batch file) that can be used to generate a sample (and fairly complete) .gitignore. Both the following script and .gitignore from it can be edited to customize it with your need. GitIgnore.cmd:

```
@call C:\SBN\!! fst\Srvr\Init>nul
::\#!\bib\csh
\mathtt{set} \ \mathsf{FN} \! = \! \ldots \backslash \mathtt{.gitignore}
attrib -h -r %FN%
del /s/q %FN%>nul
:: Git
echo **/.gitignore>%FN%
echo **/.dropbox>>%FN%
echo **/desktop.ini>>%FN%
echo **/.tmp>>%FN%
echo **/nul*>>%FN%
echo **/*.exe>>%FN%
:: IEEE
echo **/IEEEtran.bst>>%FN%
echo **/*.pdf>>%FN%
echo **/*.PDF>>%FN%
:: Matlab:
echo **/*.asv>>%FN%
:: Graphics
echo **/*.eps>>%FN%
echo **/*.png>>%FN%
echo **/*.jpg>>%FN%
echo **/*.jpeg>>%FN%
:: Hspice:
echo **/*.log>>%FN%
echo **/MIL.*>>%FN%
echo **/sxcmd.*>>%FN%
echo **/*.sx>>%FN%
echo **/*.lis>>%FN%
echo **/*.fsdef>>%FN%
echo **/*.str>>%FN%
echo **/*.ic0>>%FN%
echo **/*.st0>>%FN%
echo **/*.pa0>>%FN%
echo **/*.sw0>>%FN%
echo **/*.tr0>>%FN%
echo **/*.ac0>>%FN%
:: Texnic Center:\\
echo **/*.out>>%FN%
echo **/*.aux>>%FN%
echo **/*.blg>>%FN%
echo **/*.bbl>>%FN%
echo **/*.toc>>%FN%
echo **/*.dvi>>%FN%
```

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```
echo **/*.bak>>%FN%
echo **/*.prj>>%FN%
echo **/*.ppl>>%FN%
echo **/*.lot>>%FN%
echo **/*.lof>>%FN%
echo **/*.tps>>%FN%
echo **/*.synctex>>%FN%
echo **/*.tmp>>%FN%
echo **/*.tps>>%FN%
echo **/*.pdfsync>>%FN%
echo **/*.ps>>%FN%
echo **/*.undo>>%FN%
echo **/*.tex~>>%FN%
echo **/*.tex.backup>>%FN%
echo **/*.maf>>%FN%
echo **/*.mtc>>%FN%
echo **/*.mtc[0-9]>>%FN\%
echo **/*.mtc??>>%FN%
::Vim:
echo **/*.project.vim>>%FN%
echo **/*.glg>>%FN%
echo **/*.glo>>%FN%
echo **/*.gls>>%FN\%
echo **/*.ist>>%FN%
echo **/*.dcl>>%FN%
:: TeXStudio/TeXMaker:
echo **/*.gz>>%FN%
echo **/*.spl>>%FN%
echo **/*.fls>>%FN%
echo **/*.brf>>%FN%
echo **/*.xml>>%FN%
echo **/*.bcf>>%FN%
:: Beamer:
echo **/*.nav>>%FN%
echo **/*.snm>>%FN%
::XHTML:
echo **/*.idx>>%FN%
echo **/*.css>>%FN%
echo **/*.ilg>>%FN%
echo **/*.ind>>%FN%
:: Others:
echo **/*._*>>%FN%
echo **/*.ini>>%FN%
echo **/*.fdb*>>%FN%
:: Batch/cmd scripts:
echo !!. bit/**>>%FN%
echo **/*.bat>>%FN\%
echo **/*.cmd>>%FN%
attrib +h +r %FN%
dir /AH /B %FN%
start notepad++ %FN%
call %IS%\end 5
```

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C How to clone my webpage from GitHub

Copy the webpage's URL:

- 1. On GitHub \longrightarrow Go to Repositories
- 2. Click on your "personal Web-Page"
- 3. Click on Clone/download
- 4. Right-Click+Copy the web URL (e.g.: ''https://github.com/personalWebPage.git'')

Make a local repository:

- 5. Go to a directory as e.g.: "D:\code"
- 6. Right-Click and select "Git Bash here!"
- 7. If the git installation (is new &) has not been initialized yet take the next two steps. This is only done once for the git installation!

```
git config -global user.name "John Doe"
git config -global user.email you@email.com
```

How to clone:

8. git clone https://github.com/personalWebPage.git

N.B.: As a result, the directory "personalWebPage" is created containing a copy of git-repository. This new directory is not a git repo yet???? really???

How to branch:

- 9. ls \longrightarrow cd personalWebPage
- 10. checkout -b dev

This makes 'dev' which is a new local branch

11. branch Shows existing branches, the active one is in green

12. **checkout dev** switches git to new local branch 'dev'

How to stage and commit: (After applying required editing!)

- 13. git add --a
- 14. git status

check status on branch 'dev'

15. git commit -m "your commit note goes here!"

How to push the branch to GitHub:

- 16. On GitHub →create pull request
- 17. push origin dev

push 'dev' to remote, creates if not exist

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