→ free ops distributed version control system - to handle everything from small to very large project with speed & efficiency

Git / Github

Git → at what particular time which person made what particular changes. (version control system)

Github → Online platform which allows us to host our git repository.

* Maintaining the history of project (commits basically)
* Sharing code with people around the world.

Red → line deleted
green → line added

Download Git → commandline

Terminal → Allows us to manipulate the file structure using commands.

ls → list of projects (list)
mkdir → makes a folder (make directory)

Hp

//hp>mkdir project

cd → change directory

hp> cd project

All of these histories are stored in a file called .git folder.
↳ (hidden files)

git init (initialise empty git repository)

git:(master) ls -a → show me all the hidden files

git:(master) ls .git → files inside git

To create a new file we can also use touch.

project git:(master) touch names.txt

Q How do we know about the changes being made?

git:(master) x git status
↳ tells us the changes which are not in the history & also no one tells us about it.

Untracked files → names.txt
(whose history has not been saved yet)

If we share my project'd shared with someone knows no one knows names.txt it.

To have these changes in our history files added.

project git:(master) x git add names.txt

git add .
↳ put all the files which are unsaved

commit the unsaved changes → message

project git:(master) * git commit -m "name.txt file added"

Lets say we are wedding. People/guests take photo with couple.

Guest goes to stage whose photo is not taken. (untracked file) → Took photo → come out of stage → photo save in album. (git history)

write it

project git:(master) vi names.txt

i → insert
esc → esc in mode
:x → exit

it basically displays whatever is there in names.txt file

project git:(master) cat names.txt

Now our file is modified

It shows the names.

git init
git status
git add
git commit

To restore the modified names.txt to its orignal one we use

git restore --staged names.txt

git status

Where can we see the entire history of the project

git log.

Now delete the file

rm -rf name.txt

Now what if my file got deleted by mistake?

Each commit has a hash id they are hashed one above each other.

If you want to remove commit 3 copy commit 1.

commit 3
commit 2
commit 1
dfghooc...

git reset (hash id of commit 1)

Now the previous commits are in the untracked zone.

Put your project somewhere else without making any commits or history

git add.
git status
git touch surnames.txt
git add.
git status

If you don't want to commit the changes but want to save it for future use.

git stash

To send them to backstage

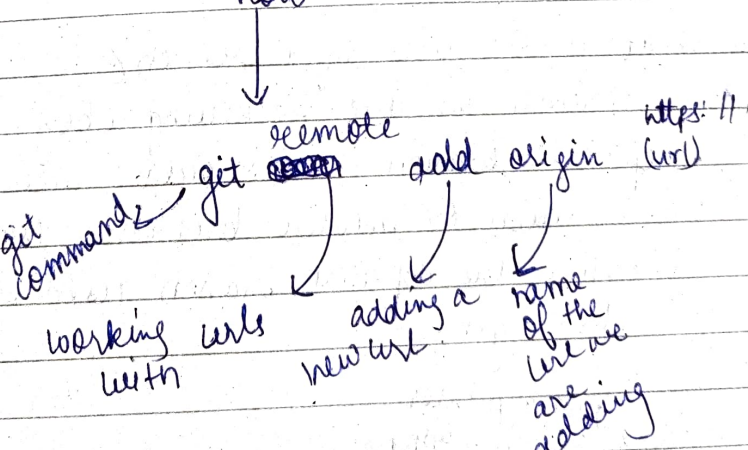
Now all the people from backstage, come to the staging area

git stash pop

git stash clear → To permanently loose or let the commits gone.

Github

New repository → After creating, get the url now



git remote -v → show all the url attached to folder.

Now url is connected to the folder.

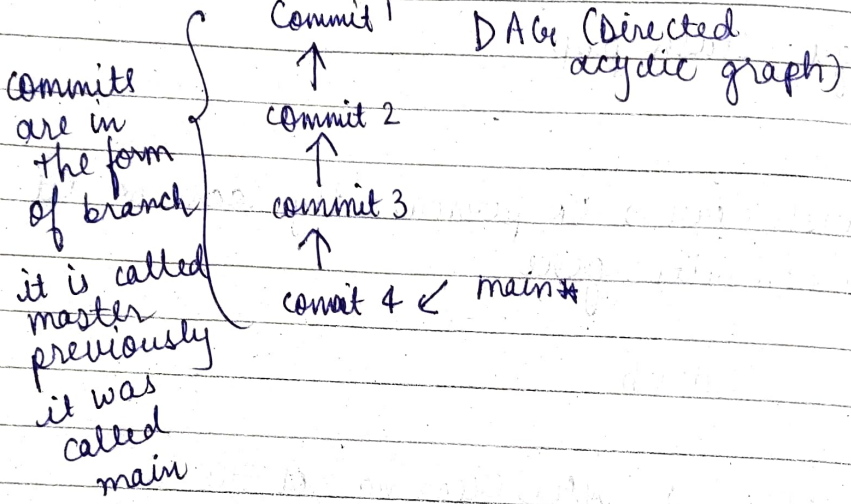
but changes is not shared so after refreshing we can't see the changes so we use

git push origin master

↓

push the changes

Branches in Github



Q. What is the use of a branch?

Ans. Whenever we are resolving a bug we create a separate branch. We should never commit in the main or master branch. Main branch is the default branch used by people.

ls. git

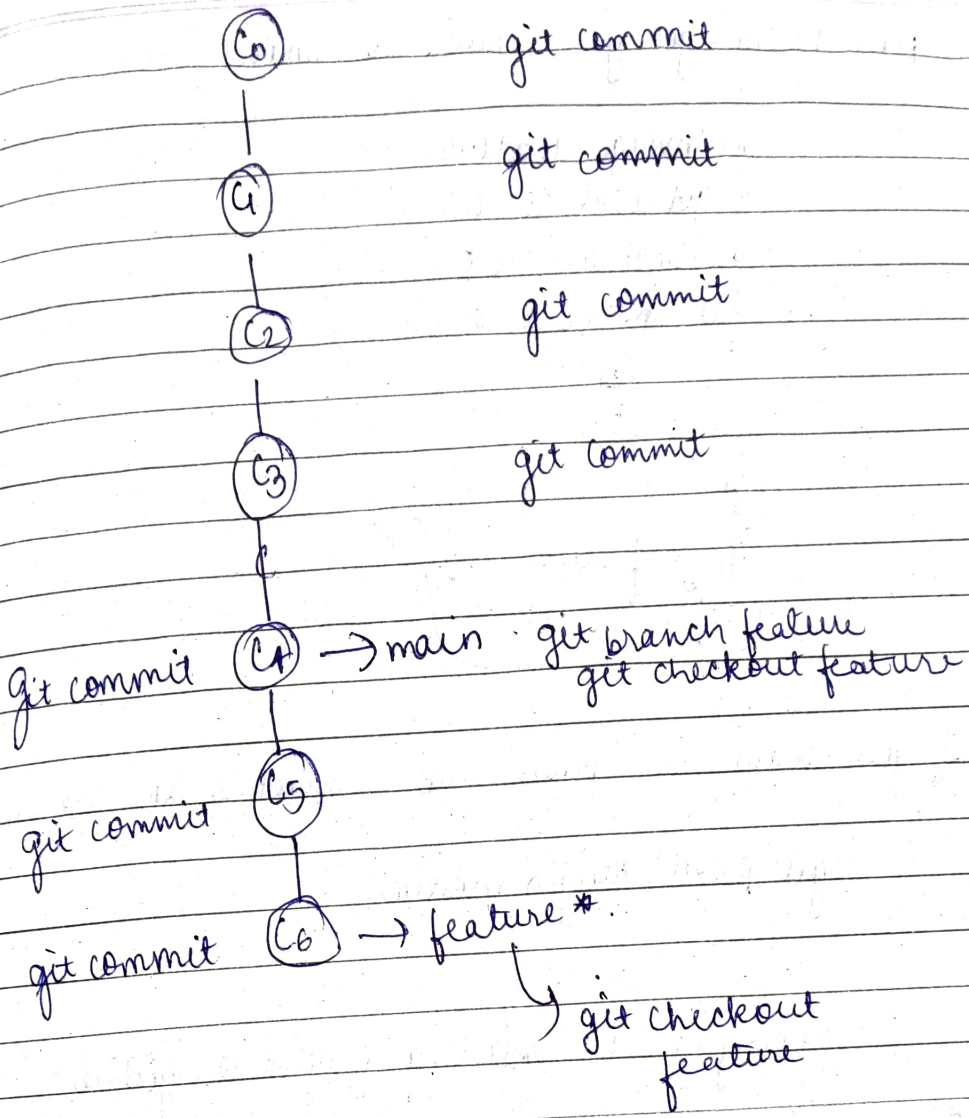
head → just a pointer which says all the new commits being made added to head

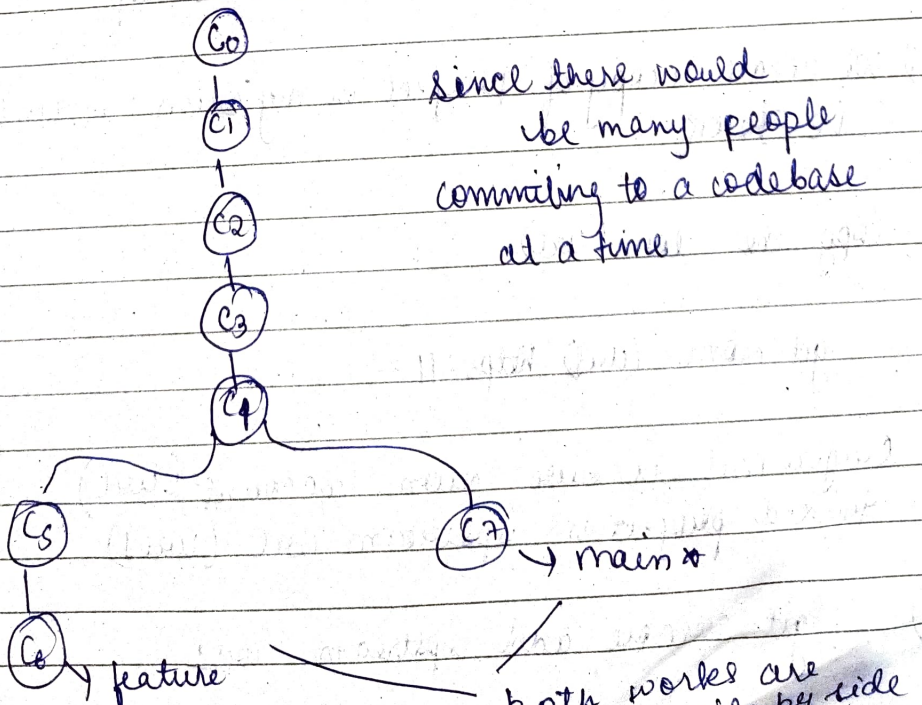
Orig head → hooks

config → index info

logs objects refs.

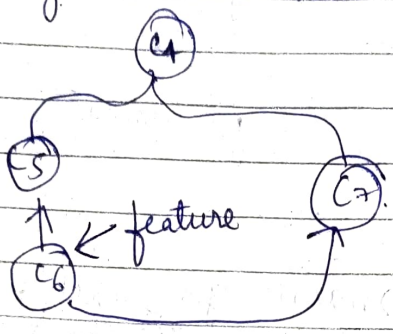
git branch feature


C0
C1
C2
C3
C4
C5
C6
git commit
git commit
git commit
git commit
git commit
→ main
git branch feature
git checkout feature
git commit
git commit
→ feature *
git checkout feature


C0
C1
C2
C3
C4
C5
C6
C7
→ feature
→ main *
Since there would be many people commiting to a codebase at a time
both works are going side by side

How to merge your code to main code

git merge feature
git checkout C5
git checkout C8.
git checkout main



If you want to push new commit to the branch

git push origin master

Working with existing project on github

To make some contributions to others repo

1) We create a copy of project in my own account i.e fork.

2) Copy the clone (url)

git clone (url) https://.....

Origin url is our own account (url)
forked project is upstream url (url1)

3) git remote add upstream url1

checkout → head will come to the new branch.

4) Pull requests → when you create a copy & want it to be reflected it in main project.

* lets create a new branch.
  git branch Riti

* Move the head to the new branch
  git checkout Riti

  git add.
  git commit -m "head changes".
  git log.

whatever code i have in riti branch push it to the main branch.

git push origin riti

Create a pull request.

If a branch has a pr all other pr would go into commits i.e why we don't commit in master branch.

→ Git - distributed version control system (software)

→ Installation - Git windows install (git scm download)

→ Git simply save the changes. (Revert the change, know the date as well as version)

→ Git Bash (terminal) - It works as same as Unix or linux

→ Whenever we use git for the first time we need to provide our email, password etc.

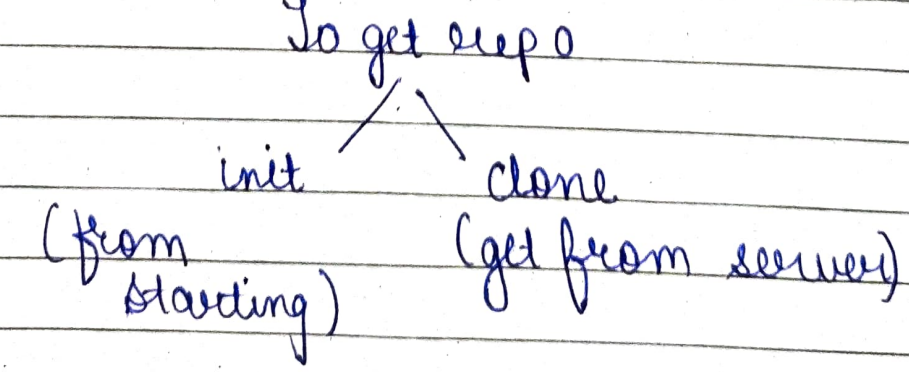
→ So we need to write the command

$ git config --global user.name Riti

$ git config --global user.email rritikumarupadhyay24@gmail.com

→ To open visual studio write

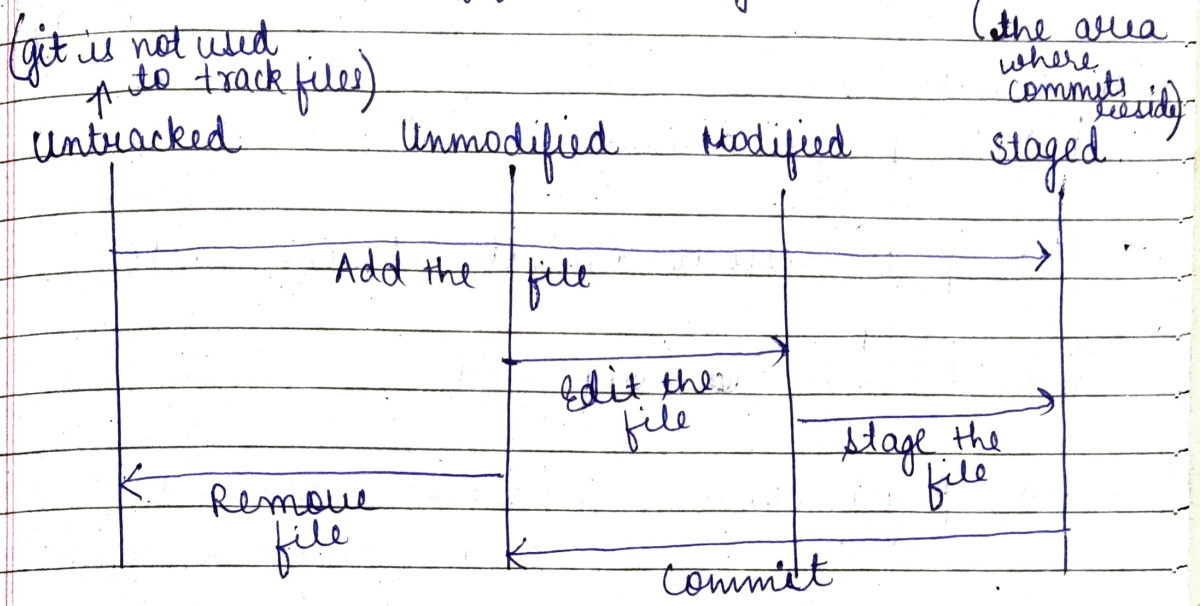
$ code (in the git-bash)

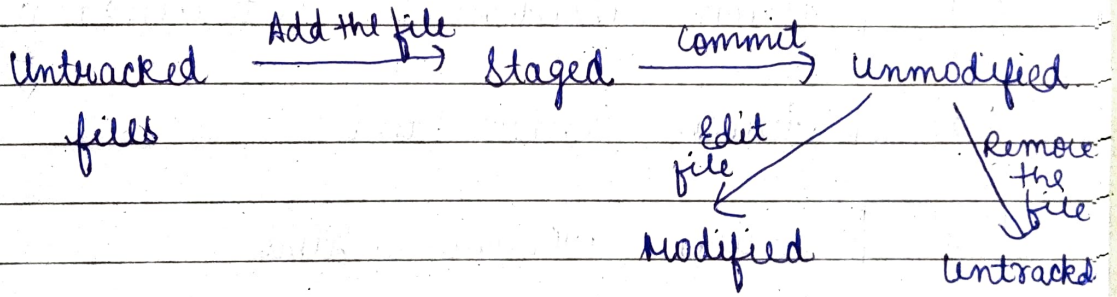


→ To initialise a repo : $ git init

→ To see hidden files : $ ls -lart

→ To see the status of files : $ git -status





- Untracked: The files are not tracked by git.
- Staged: We directly commit the file.
- Modified: To apply changes to file.
- Unmodified: We are ready to commit.

Staging area (pose) → Commit (picture clicked)

1→ $ git init

2→ $ git status

3→ $ git add index.html (file gone to staging area)

initial commit

4→ $ git commit

5→ $ i (click) initial commit (vim editor).

6→ $:wq (esc) :wq exit

7→ $ git status (working tree clean all changes are committed)

8→ $ touch about.html (touch → to make blank files)

9→ $ touch contact.html

10→ $ touch monuments.html.

Now 3 files are untracked, so to track all these files we would use

11→ $ git add -A (to push all files to staging area)

When we modify contact.html.

↓

Staging area → modified.

12→ $ git add -A

13→ $ git commit -m "Added more htmls" (If we dont want to work with vim editor)

14→ $ git status (working tree clean)

15→ $ git clear (to clear the terminal)

How to recover last file on the last commit file

16→ $ git checkout contact.html (checkout → match with my last commit)

To restore all the files from last commit

17→ $ git checkout -f

18→ $ git log (what commits are done)

We need to filter out the log like last 5 commits

19→ $ git log -p -5

You can click q for quit

git diff - let us know the difference (working tree is compared with staging area)

20→ $ git diff

21→ $ git diff --staged (compares the last commit with staging area)

22→ $ git checkout -f (now all the differences are restored)

How to skip staging area and fixed
(If we want to work with particular file only & don't want to send them to staging area)

23→ $ git commit -a -m "skipped staging area"

24→ $ ls (to list down all the files)

25→ $ touch waste.html.

26→ $ git add -A

27→ $ git commit -a -m "Added waste"

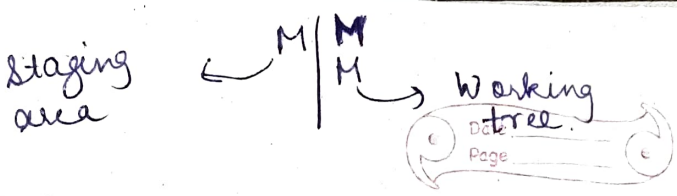
28→ $ git rm waste.html (remove from working directory (harddisk) + staging area)

29→ $ git rm --cached waste.html (to only remove from staging area)

30→ $ git status

31→ $ ls

32→ $ git commit -a -m "Removing waste"



33→ $ git log -p -2

34→ $ git status -s (to get summarised status)

35→ $ touch .gitignore

gitignore - A file which we want to be untracked like pycache which are a waste. Pushes pull process slows down

36→ $ touch mylogs.log

37→ $ git add -A

.gitignore
mylogs.log
↳ (ignoring the files which are present here)

/mylogs.log
only ignore the file where git ignore is present don't get into folder

*.log → any file having extension .log or .cpp
*.cpp

38→ $ git rm --cached logs/mylogs.log

39→ $ git status

40→ $ git add -A

Branches in Git

Branch → We make a new copy and work on it. (so that any changes won't affect or slow down the its)

Master branch → main branch by default (by default main branch is called master branch)

$ git branch feature 1

$ git branch

o/p → feature 1
master

$ git checkout feature 1 (by default it is on master branch so to move to feature 1)

How to merge 2 branches

$ git status

$ git add -A

$ git commit -m "fixed extra bracket"

$ git checkout master (to get back to master branch)

$ git merge feature 1

We can make as many branch as possible.

Make a branch & skip to that branch only

$ git checkout -b branch2

GitHub.

Hosting site for git repositories

Remote repository → We push our local repo in remote repo (It is a url where we would host our project).

$ git init

$ git add Readme.md

$ git commit -m "first commit"

$ git remote add origin https://github.com/aditi2409/one.git

$ git remote op → origin

$ git remote -v o/p → https://.....git (fetch)
https://.....git (push)

$ git push origin master (push master branch at origin)

generate SSH & GPG keys (i.e giving github acc. access to our PC)

To take read write access on our repository.
We deploy SSH keys in our github account

generate a key → Add a key

$ ssh-keygen -t rsa -b 4096 -c "ritikumarupadhyay@gmail.com"

let the passphase be blank.

$ eval $ (ssh-agent -s)

$ ssh -add ~/.ssh/ id_rsa

Adding a new SSH key to github account

$cat~/.ssh/id_rsa.pub

copy the content

Title : Riti personal content
Key : paste

to change url

$ git remote set-url origin git@github.com:riit2709/one

$ git remote -v

$ git push -u origin master