What is git?

Git is the free and open source distributed version control system that's responsible for everything GitHub related that happens locally on your computer.

1) what are the other platform same as a github to version and maintain your code?

platforms like GitHub that are used for version control, code hosting, and collaboration

GitLab: Best for: All-in-one DevOps lifecycle.

Bitbucket: SourceForge

AWS CodeCommit

Azure Repos:

2)git init

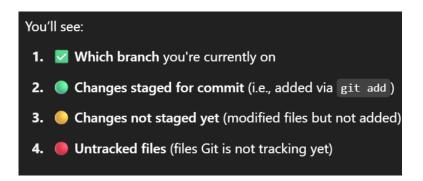
- It creates a hidden folder named .git in your directory.
- This .git folder contains all the metadata (version history, configs, logs, etc.) required to track changes in your code.

3) what is inside the .git folder?

Name	Description
HEAD	A reference to the current branch (like a pointer to where you are).
config	Configuration for this repo (user info, remote URLs, etc.).
description	Used in GitWeb to describe the repo. Ignored in most local setups.
index	Staging area (tracks what's ready to be committed).
hooks/	Scripts that Git runs on certain actions (e.g., before commit or push).
info/	Contains a global exclude file (like egitignore).
objects/	Where Git stores all content (files, commits, trees) as hashed objects.
refs/	Pointers to commits (like branches and tags).
logs/	History of updates to refs like branches (used for debugging).
packed-refs	Optimized version of refs (used when there are many tags/branches).

4) What is the use of the git status command

The git status command is used to check the current state of your working directory and staging area.



Useful for if any changes are made after the git commit(modified file tracks)

5) use of git add.

"Stage all changes (new files, modified files, and deletions) in the current directory and subdirectories for the next commit."



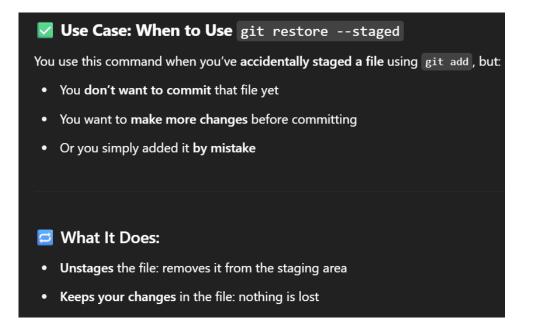
For a particular file if you want to add then command is git add <filename>

6) git commit -m "new commit"

The git commit -m command is used to save (commit) your staged changes in Git with a message.

7) If you want to remove the stage of current file then you write git restore git restore --staged <filename>



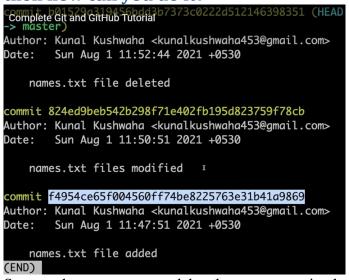


8) git log

The git log command is used to view the history of commits in a Git repository.

Information Provided b	y git log:
Info	Description
Commit Hash	Unique ID for each commit (used to refer to it)
Author	Who made the commit
Date & Time	When the commit was made
Message	Description of what was changed

9) if you want to remove the last commit because the file has been deleted by mistake then how can you do it?



Suppose here you want to delete last two commits then Then copy the hash before that last two commits

```
→ project git:(master) git reset f4954ce65f004560ff74
be8225763e31b41a9869
Unstaged changes after reset:
D names.txt
```

Then again you check git log now you will be only see the one commit

```
Complete Git and GitHub Tutorial -> master)
Author: Kunal Kushwaha <kunalkushwaha453@gmail.com>
Date: Sun Aug 1 11:47:51 2021 +0530

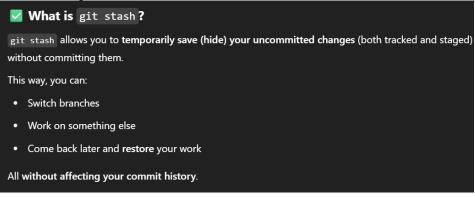
names.txt file added
(END)
```

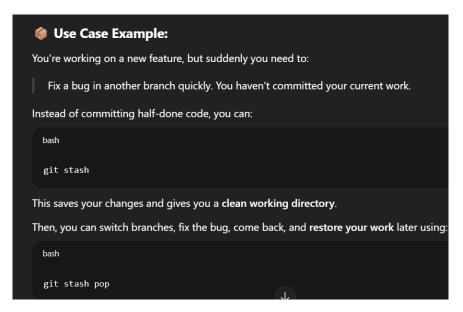
10) where these all changes has gone?

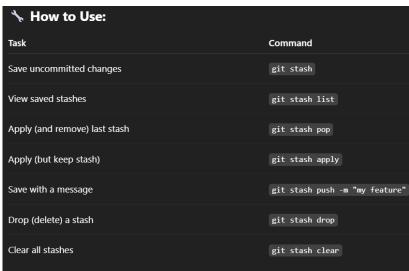
In the unstaged area

11) If you want that your progress or a feature of the project that code you have written, is there is anyway so that put your work somewhere else without making a commit and history and whenever you want that things back you get it

Command: git stash







If you do not want to lose your current status of the git and also do not want that changes in your repo You just saying like just go a back to the stage and when I need I will call for you

12) for calling stash in project folder

Command: git stash pop

13)if you want to clear or remove the stash which you have stored then

Command: git stash clear

14) to add project on github repo

Command: git remote add origin <link of repo>.git

15) If you want to see the link which is associated with this folder then command is

Command: git remote -v

16) for push code in the repository

Command: git push origin
 branch name_master>

17) how to create a branch

Command: git branch

branch name>

18) how to change the branch

Command: git checkout

branchname>

Means head is changing towards the branch name that you have provided

Note: Whenever you are creating a new branch at that time the new branch is created from your head is currently pointing

Create a new branch with the given name and switch to it immediately.

git checkout -b feature1

19) How to clone the repository which is already exist

Command: git clone <link>

20) Why we required to clone the repository

Because whenever you are trying to add some code in some organization you did not able to push the code into the directly main repository. It is so risky for that organization, so for that first of all you have to fork that repository into your github account after that you can change the code by your own on your repo

21) From where you have forked the repository that is known as upstream url

And how to add upstream url

- → commclassroomOP git:(main) git remote add upstream https://github.com/commclassroom/commclassroomOP.git
- → commclassroomOP git:(main)

22) If you have created a type of branch separately and add one feature on that and you want to merge that feature on the main branch then how can you do it

For that you need to create pr request

Note: If one branch is if one branch is <main> and another branch is <new feature> then if <new feature> branch has made a request to push the code onto the main branch only one time pull request has been created And after that again if you commit some other things onto the <new feature> branch at that time new pull request is not being generated it is automatically added into the main branch

Your Scenario Recap:

- You have two branches:
 - main → the production or primary branch
 - new-feature → where you're developing a new feature
- You create a pull request (PR) from new-feature to main
- Later, you add more commits to the new-feature branch
- Those new commits automatically appear in the same PR

Why does that happen?

Because a pull request is a live view of the difference between branches.

- A pull request tracks the entire branch (new-feature) against main
- So any new commits you make to new-feature (until the PR is merged) are automatically included
- You don't need to create a new PR every time you add more commits to the same branch

☑ So yes — you're correct:

"That is why we never push directly to main" — This is a best practice in most teams and open-source projects.

It avoids:

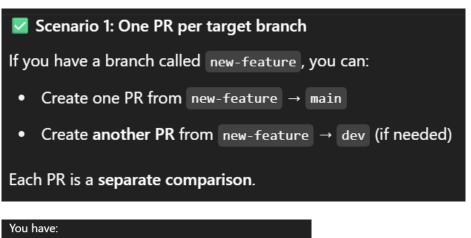
- Accidental breaking of production code
- · Skipping code reviews
- Skipping automated tests in CI/CD

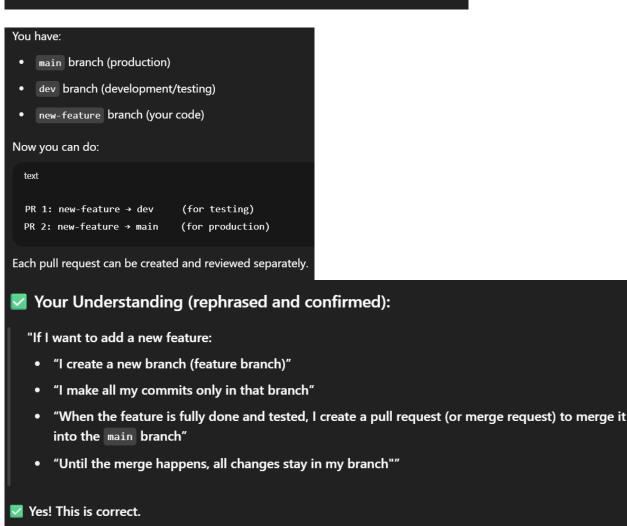
23) At a time only one pr is open

A pull request is not tied to a branch forever — it's a comparison between two branches.

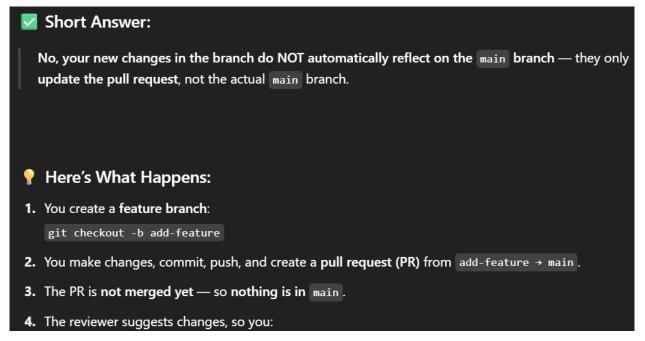
So:

- A branch can have only one open PR to another specific branch at a time.
- But it can have multiple PRs to different branches, if needed.



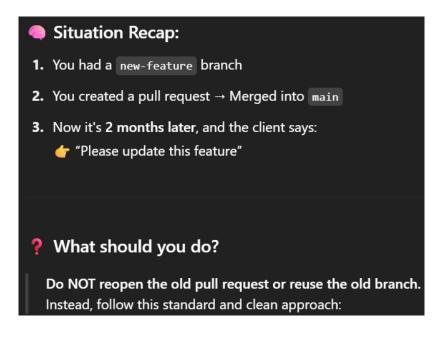


24) But I have confused in that if I feel like I have completed my feature and after the code reviewer says that you have to add these things and I have to add those things into the my branch but I have already created one pr for pushing my code already with the main branch so if I commit the new changes in my branch that is also reflected on the main branch?



```
4. The reviewer suggests changes, so you:
bash
Copy
Edit
# Still in your branch
git add .
git commit -m "Apply reviewer suggestions"
git push origin add-feature
Now, the pull request is automatically updated with your new commits.
6. ✓ Once everything looks good, the reviewer approves and merges the PR — only then your code is actually merged into main .
```

25) merging main branch with my feature branch and after two months the client says that I want these changes in this feature so I have already created pr previously I have just explained then I need to change the code or change the new feature then in that case what should be done



✓ Step-by-Step: How to Add New Changes to an Old Feature ✓ Option A: Create a new branch from the latest main bash # Step 1: Make sure your main branch is up to date git checkout main git pull origin main # Step 2: Create a new feature update branch git checkout -b update-old-feature # Step 3: Make changes, commit and push git add . git commit -m "Update feature X as per new client request" git push origin update-old-feature # Step 4: Create a NEW pull request to merge this into main

Why this is better:

- Keeps history clean
- Keeps the previous pull request closed and complete
- Clearly shows that this is a new phase/update to an existing feature
- · Helps reviewers and clients understand what changed this time

Option B: (If you're fixing something in a feature branch that isn't merged yet)

If the original new-feature branch was never merged, you can still use the same branch.

But in your case, it was already merged, so it's better to start fresh.

26)

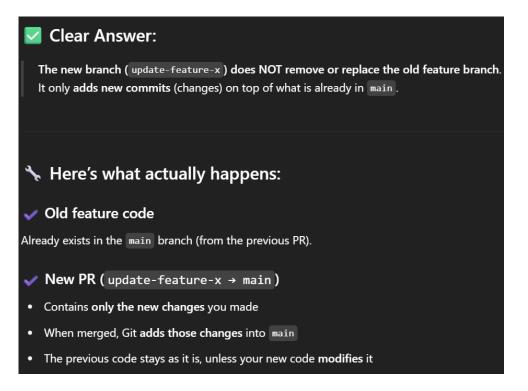
Your Situation:

- \bullet You had a feature branch (${\tt feature-x}$) that was merged into ${\tt main}$.
- Now you created a new branch (update-feature-x) to make changes related to that same feature.
- You created a new pull request from update-feature-x → main.

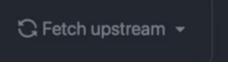
Now your question is:

"When I merge the new updated feature branch (update-feature-x), what happens to the old feature that's already in the project?"

- "Does it get removed?"
- "Does it get overwritten?"
- "Does the new branch somehow replace the old one?"



27)if update like open source project of kubernetes has accept some request of one of the user then definitely it will not reflect onto your local branch or the repo that you have forked in your machine or github account because you have forked before the merging that code so for that what do you use?



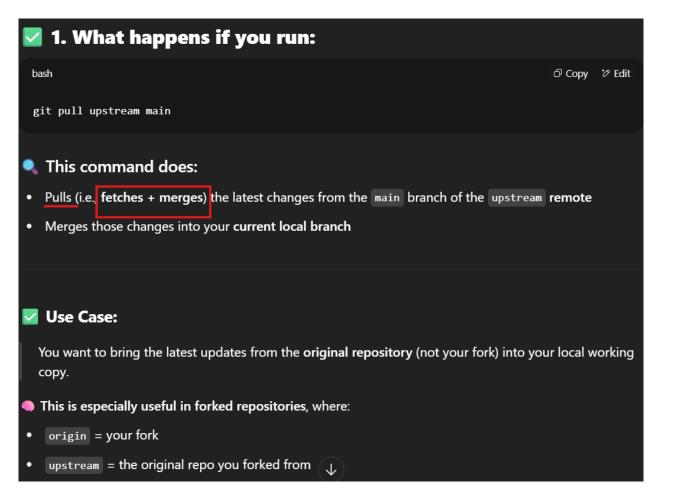
You can go to your github account and do with ui or you can also with do with manual step

```
→ commclassroomOP git:(main) git fetch --all --prune
Fetching origin
```

Now reset the main branch of your origin to the main branch of the upstream

```
→ commclassroomOP git:(main) git reset --hard upstrea
m/main
HEAD is now at 8c87fa8 Merge pull request #1 from kuna
l-kushwaha/kunal
```

You can also runs git pull upstream main but there is a difference between these two commands



28) Difference between git fetch and git pull



29) rebase command

If I have created one file "1" and then commit ,again created file "2" and commit , again created file "3" and commit ,again created file "4" and commit

But now I want to merge that all four commits into the one commit then using rebase -i you can use it

```
Author: Kunal Kushwaha <kunalkushwaha453@gmail.co
Complete Git and GitHub Tutorial temp) touch I commit commclassroomOP git:(temp) x git add .; git commit
                                                                           Sun Aug 1 12:56:32 2021 +0530
[temp d9dd724] 1
1 file changed, 0 insertions(+), 0 deletions(-)
                                                                   commit 759d6448fd0d87e41623bdccaf54a462f28192fc
create mode 100644 1
                                                                   Author: Kunal Kushwaha <kunalkushwaha453@amail.com>
                                                                           Sun Aug 1 12:56:29 2021 +0530
  commclassroomOP git:(temp) touch 2
commclassroomOP git:(temp) x git add _; git commit
[temp c6969ee] 2
                                                                   commit c6969ee3759b0dc460a7f6b94a355d31f02e1e62
1 file changed, 0 insertions(+), 0 deletions(-)
                                                                   Author: Kunal Kushwaha <kunalkushwaha453@gmail.com>
create mode 100644 2
                                                                   Date:
                                                                          Sun Aug 1 12:56:25 2021 +0530
  commclassroomOP git:(temp) touch 3
  commclassroomOP git:(temp) x git add _; git commit
                                                                   commit d9dd72480457667d7d9194d6b25fcc139c2f62b5
[temp 759d644] 3
                                                                   Author: Kunal Kushwaha <kunalkushwaha453@gmail.com>
1 file changed, 0 insertions(+), 0 deletions(-)
                                                                          Sun Aug 1 12:56:19 2021 +0530
create mode 100644 3
  commclassroomOP git:(temp) touch 4
commclassroomOP git:(temp) x git add _; git commit
                                                                   commit 4f3b54bf569c9c7ed40c8c90e1c72d5e8ac46152 (upstr
```

I want to merge all these 4 commit into a single commit

```
→ commcLassroomUP git:(temp) git rebase -1 4+3b54b+56
9c9c7ed40c8c90e1c72d5e8ac46152
```

```
Complete Git and GitHub Tutorial
pick 759d644 3
pick 673d440 4
 Rebase 4f3b54b..673d440 onto 4f3b54b (4 commands)
# p, pick <commit> = use commit
                                                      Complete Git and GitH
 r, reword <commit> = use commit, but edit the commit
message
# e, edit <commit> = use commit, but stop for amending
s, squash <commit> = use commit, but meld into previ
                                                         759d644
# f, fixup <commit> = like "squash", but discard this
commit's log message
\# x, exec <command> = run command (the rest of the lin
                                                         673d440
e) using shell
# b, break = stop here (continue rebase later with 'gi
rebase --continue')
 d, drop <commit> = remove commit
 1, label <label> = label current HEAD with a name
 t, reset <label> = reset HEAD to a label
                                                         Rebase 4f3b54b
# m, merge [-C <commit> | -c <commit>] <label> [# <one
        create a merge commit using the original mer
```

Then change the pick here to squash and update the code like in the ss Squash means about a squash commit merge into that pick commit Means here it is three squash has been merged in first pick

30) merging conflicts

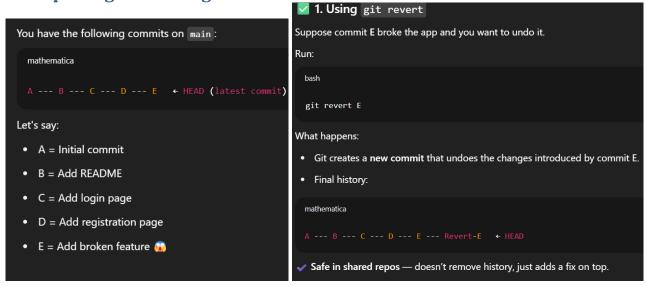
These conflict often happen when if one user has changed the code in line number 3 and another people have also changed the code in line number three at that time git will ask you to help which changes should be done

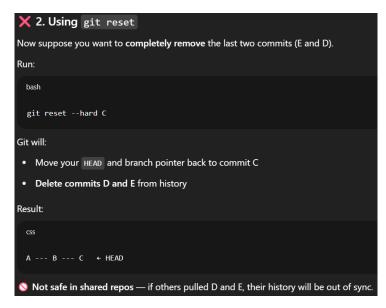
Another screenshots of the interview questions

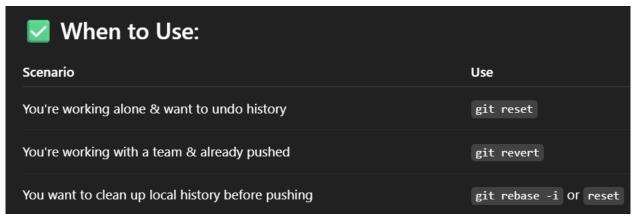
•	1. What is the difference between a fork and a clone?
•	Fork creates a copy of a repository under your GitHub account (remote).
•	Clone creates a local copy of any repository on your machine.
•	2. What is the difference between origin and upstream?
•	origin → usually points to your fork
•	upstream → usually points to the original repository
•	5. What are the types of merge conflicts?
•	Same line edited in two branches
•	One side deletes a file, the other edits it
•	Conflicting rename or move operations
•	6. What is the difference between HEAD, HEAD~1, and HEAD^?
•	HEAD : current commit
•	HEAD~1: one commit before HEAD
•	HEAD^: parent of HEAD (same as HEAD~1 for simple cases)
	3. What is .gitignore used for?
I	to tell Git which files/folders not to track, such as:
	• node_modules/
	• *.log
	•pycache/

- 10. What is the difference between pull request and merge?
- PR (Pull Request): Request to merge code with discussion and review
- Merge: The actual action of combining branches

Example of git reset vs git revert







Chat link of chatgpt of git and github manually: https://chatgpt.com/share/6854f029-3ebc-8002-bbe6-2e0292d127ba

git cheatsheet ss

SETUP

Configuring user information used across all local repositories

git config --global user.name "[firstname lastname]"

set a name that is identifiable for credit when review version history

git config --global user.email "[valid-email]"

set an email address that will be associated with each history marker

git config --global color.ui auto

set automatic command line coloring for Git for easy reviewing

SETUP & INIT

Configuring user information, initializing and cloning repositories

git init

initialize an existing directory as a Git repository

git clone [url]

retrieve an entire repository from a hosted location via URL

BRANCH & MERGE

Isolating work in branches, changing context, and integrating changes

git branch

list your branches. a * will appear next to the currently active branch

git branch [branch-name]

create a new branch at the current commit

git checkout

switch to another branch and check it out into your working directory

git merge [branch]

merge the specified branch's history into the current one

git log

show all commits in the current branch's history

STAGE & SNAPSHOT

Working with snapshots and the Git staging area

git status

show modified files in working directory, staged for your next commit

git add [file]

add a file as it looks now to your next commit (stage)

git reset [file]

unstage a file while retaining the changes in working directory

git diff

diff of what is changed but not staged

git diff --staged

diff of what is staged but not yet committed

git commit -m "[descriptive message]"

commit your staged content as a new commit snapshot

INSPECT & COMPARE

Examining logs, diffs and object information

Retrieving updates from another repository and updating local repos

git log	git remote add [alias] [url]
show the commit history for the currently active branch	add a git URL as an alias
git log branchBbranchA	git fetch [alias]
show the commits on branch A that are not on branch B	fetch down all the branches from that Git remote
git logfollow [file]	git merge [alias]/[branch]
show the commits that changed file, even across renames	merge a remote branch into your current branch to bring it up to date $% \left(1\right) =\left(1\right) \left(1$
git diff branchBbranchA	git push [alias] [branch]
show the diff of what is in branchA that is not in branchB	Transmit local branch commits to the remote repository branch
git show [SHA]	git pull
show any object in Git in human-readable format	fetch and merge any commits from the tracking remote branch

TRACKING PATH CHANGES

Versioning file removes and path changes

git rm [file]
delete the file from project and stage the removal for commit
git mv [existing-path] [new-path]
change an existing file path and stage the move
git logstat -M
show all commit logs with indication of any paths that moved

IGNORING PATTERNS

Preventing unintentional staging or commiting of files

logs/
*.notes
pattern*/

Save a file with desired patterns as .gitignore with either direct string matches or wildcard globs.

git config --global core.excludesfile [file]

system wide ignore pattern for all local repositories

REWRITE HISTORY

Rewriting branches, updating commits and clearing history

git rebase [branch]
apply any commits of current branch ahead of specified one
git resethard [commit]
clear staging area, rewrite working tree from specified commit

TEMPORARY COMMITS

Temporarily store modified, tracked files in order to change branches

git stash
Save modified and staged changes
git stash list
list stack-order of stashed file changes
git stash pop
<pre>git stash pop write working from top of stash stack</pre>

Cherry-pick

• An commit from the origin branch into my working branch

git cherry-pick <commit-hash> <commit-hash>

Git commands link:

https://github.com/Bhavya2520/DevOps-Learning/blob/main/docs/git/commands.md