Git Version control

START HERE

`git status`
What changed?

`git pull`
Get changes

`git add <file>`
Stage a file

`git push`
Share changes

`git commit -m "<msg>"`
Save a snapshot

`git log --oneline --graph`
See history

`git switch -c <branch>`
Start a branch

`git restore --staged <file>`
Unstage a file

Working tree your files → `git add` → **Staging area** next commit → `git commit` → **Local repo** history → `git push` → **Remote** origin

What reset moves

reset	HEAD	Index	Files
`--soft`	moves	kept	kept
`--mixed`	moves	reset	kept
`--hard`	moves	reset	replaced

CONCEPTS

Run git status often: it shows what changed and what to do next.

A branch is just a movable pointer to a commit, so branching is cheap.

Never rewrite history (reset --hard, rebase, force-push) on commits others have pulled.

SETUP

`git init`
Create a repository here

`git clone <url>`
Copy a remote repository

`git config --global user.name "<name>"`
Set your name

`git config --global user.email "<email>"`
Set your email

`git config --global init.defaultBranch main`
Name new branches main

`git config --global pull.rebase true`
Rebase instead of merge on pull

SNAPSHOTS

`git status`
Show changed and staged files
Add -sb for a compact one-line-per-file view.

`git add <file>`
Stage a file

`git add .`
Stage everything here
Stages new, modified and deleted files below the current directory.

`git commit -m "<msg>"`
Commit staged changes
Without -m an editor opens for a longer message.

`git diff`
Show unstaged changes
Does not show untracked files.

`git diff --staged`
Show staged changes

`git add -p`
Stage changes hunk by hunk
y = stage, n = skip, s = split, q = quit.

`git restore <file>`
Discard changes in a file
Uncommitted work cannot be recovered afterwards.

SNAPSHOTS (cont.)

`git restore --staged <file>`
Unstage a file

`git commit --amend`
Rewrite the last commit
Do not amend commits you have already pushed.

`git rm <file>`
Delete a file and stage it

`git mv <old> <new>`
Rename a file

HISTORY

`git log --oneline --graph`
Compact branch history
Add --all to see every branch.

`git show <commit>`
Show one commit

`git blame <file>`
Who changed each line
Add -L 10,20 to limit it to those lines.

`git log -p <file>`
History of a file with diffs

`git log -S"<text>"`
Commits that add or remove text

`git reflog`
Everything HEAD has pointed to
Lost a commit? Find its hash here, then git switch -c rescue <hash>.

`git shortlog -sn`
Commits per author

BRANCHES

`git branch`
List local branches

`git switch <branch>`
Switch branch

`git switch -c <branch>`
Create and switch
Starts at the current commit; add a start point to base it elsewhere.

`git merge <branch>`
Merge branch into current

`git merge --abort`
Cancel a conflicted merge
Only works while the merge is still in progress.

`git branch -d <branch>`
Delete a merged branch

`git rebase <branch>`
Replay commits on top of branch
Fix conflicts, then git rebase --continue.

BRANCHES (cont.)

`git rebase -i HEAD~<n>`
Edit the last n commits
Change pick to squash, reword or drop in the editor.

`git cherry-pick <commit>`
Copy one commit here
Creates a new commit, so the hash differs.

`git branch -vv`
Branches with upstream status

`git branch -D <branch>`
Force-delete a branch

merge, rebase or cherry-pick?

Command	Result
`merge`	keeps both lines, adds a merge commit
`rebase`	replays your commits, linear history
`cherry-pick`	copies single commits

REMOTES

`git pull`
Fetch and integrate changes
Equals git fetch plus merge (or rebase, if configured).

`git push`
Upload commits

`git fetch`
Download without merging
Updates origin/ only; your own branches are untouched.*

`git push -u origin <branch>`
Push and track a new branch
-u lets a plain git push / pull work on this branch later.

`git remote -v`
List remotes

`git remote add origin <url>`
Add a remote

`git push --force-with-lease`
Safer force push
Refuses if someone else pushed in the meantime.

`git push origin --delete <branch>`
Delete a remote branch

UNDO

`git revert <commit>`
New commit that undoes one
Safe on shared branches: adds history instead of rewriting it.

`git reset --soft HEAD~1`
Undo commit, keep changes staged

UNDO (cont.)

`git reset --hard HEAD`
Throw away all local changes
Untracked files stay; use git clean for those.

`git clean -fd`
Delete untracked files
Run with -n first for a dry run.

STASH & TAGS

`git stash`
Shelve local changes

`git stash pop`
Restore the latest stash
Pop removes the stash; apply keeps it.

`git stash list`
List stashes

`git stash -u`
Stash untracked files too

`git tag -a v1.0 -m "<msg>"`
Annotated tag

`git push --tags`
Push all tags

`git bisect start`
Binary-search for a bad commit

`git worktree add <path> <branch>`
Second checkout of the repo

RECIPES

Start a feature

```
git switch -c feature/x
# work and commit
git push -u origin feature/x
```

Tidy before a pull request

```
git fetch origin
git rebase -i origin/main
git push --force-with-lease
```

Undo a pushed commit

```
git revert <commit>
git push
```

Handy ~/.gitconfig

```
# ~/.gitconfig
[init]
  defaultBranch = main
[alias]
  st = status -sb
  lg = log --oneline --graph
```

HELP

`git help <command>`
Manual page for a command

`git <command> -h`
Short usage summary