Git Commands - In-Depth Notes with Visuals

This guide dives deeper into Git, covering not only commands but also workflows, error handling, and visual explanations.

## 1. git init

Initializes a new Git repository in the current directory. This creates a hidden .git folder where Git tracks changes.  
  
Use case: Start tracking changes in a local project.  
Example:  
 git init  
  
Once initialized, you can start adding files to version control.

## 2. git remote add origin <URL>

Links your local repository to a remote one hosted on GitHub or another service.  
  
Example:  
 git remote add origin https://github.com/username/repo.git  
  
Now you can push/pull code to/from this remote repository.

## 3. git add and git status

Use 'git add' to stage changes and 'git status' to check the current state of your working directory.  
  
Examples:  
 git add . # stages all changes  
 git status # shows tracked/untracked changes

## 4. git commit

Commits staged changes to the repository. Always use a clear commit message.  
  
Example:  
 git commit -m "Added login feature"  
  
A commit is like a save point in your project history.

## 5. git push and git pull

'git push' uploads your commits to the remote repo.  
'git pull' brings remote changes to your local copy.  
  
Example:  
 git push -u origin main  
 git pull origin main

## 6. git pull --rebase vs git pull

'git pull --rebase' keeps history cleaner by avoiding unnecessary merge commits.  
  
Use this if you're working solo or want linear history.  
Avoid it if you're unsure about rebasing.

## 7. Common Git Workflow

1. git status  
2. git add .  
3. git commit -m "message"  
4. git push  
  
This is your standard Git cycle for local changes.  
Use 'git pull --rebase' before starting work to stay up to date.

## 8. git log and git diff

'git log' shows commit history.  
'git diff' shows code differences between commits or branches.

## 9. git branch and git checkout

'git branch' shows available branches.  
Use 'git checkout -b' to create and switch to a new branch.

## 10. git clone

Copies a repository from GitHub to your local machine.  
  
Example:  
 git clone <https://github.com/user/repo.git>

**Common Combo Commands**

To stage, commit and push:  
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 git commit -m "message"  
 git push  
To get updates:  
 git pull --rebase origin main

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