

Tutorial for Important Git Commands

1. What is Git

Git is a distributed version control system that helps developers track and manage changes in code. It allows multiple developers to work on the same project simultaneously without overwriting each other's work. You can revert to previous versions of your project and work offline as Git is local-first.

2. What is GitHub

GitHub is a cloud-based platform for hosting Git repositories. It provides a web interface for Git, and adds features like issue tracking, pull requests, project boards, and GitHub Actions for automation.

3. Installing Git

1. **Window:** Download Git for Windows [here](#) for install.

2. **Mac:** Install using Homebrew with ``brew install git``.

3. **Linux:** Install git using your package manager. For example, you can install it with: ``sudo apt install git`` for Ubuntu.

After installation open a terminal or command prompt and run:

```
git config --global user.name "Your Name"
git config --global user.email "you@example.com" git config --global init.defaultBranch main
```

This sets your identity for commits and the default branch name.

4. Creating a Local Repository

To start a new Git project locally:

```
mkdir my-project cd my-project
git init
```

This initializes a `.git` directory in your project, enabling version control.

5. Tracking and Committing Changes

Use the following commands to manage file changes:

```
git status          - Shows tracked and untracked files
git add .           - Adds all modified files
git commit -m "Message" - Commits changes with a message
```

Git stages files before committing, allowing fine control over what is saved.

Connecting to GitHub

Create a new repository on GitHub.

Connect your local repo to GitHub:

```
git remote add origin https://github.com/yourusername/your-repo.git git push -u origin main
```

This uploads your code and links your local repo to the remote GitHub repo.

Cloning a GitHub Repository

Cloning means copying an existing repository to your local machine:

`git clone https://github.com/username/repository.git`

This is used when you want to contribute to an existing project or work offline.

6. To send or receive code between your local and remote repository

`git push origin main` -Pushes local changes to GitHub
`git pull origin main` -Pulls changes from GitHub to local repo

These commands keep your local and remote versions in sync.

Branching and Merging

Branches allow you to develop features independently:

`git branch feature-x` -Create a new branch `git checkout feature-x` -Switch to that branch `git checkout main`
`git merge feature-x` -Merge the feature into main `git branch -d feature-x` -Delete the feature branch

Branching is essential for safe parallel development.

7. Useful Git Commands Summary

`git status` - View changes
`git log` - Show commit history `git diff` - Show file differences
`git stash` - Temporarily save changes `git reset --hard` - Discard all local changes `git remote -v` - Show connected remotes
`git fetch` - Download changes without merging `git merge` - Merge one branch into another

8. Other Commands

To view the differences between your working directory and the staging area, use the ``git diff`` command.
`git diff`

To view the differences between the staging area and the previous commit:
`git diff --staged`

You can switch to an older commit to view it or make a new branch out of it.
`git checkout <commit-hash>`

To make a new branch from an older commit.
`git checkout -b <new-branch-name> <commit-hash>`

To amend the latest commit, run the ``git commit --amend`` command.
`git commit --amend`

To rename a local branch.
`git branch -m <old-branch-name> <new-branch-name>`

To rename or relocate a file inside the repository:
`git mv <old-file> <new-file>`

To display a detailed view for a given commit:
`git show <commit-hash>`

To delete untracked files and directories from your working directory:
`git clean -fd`

‘-f` will force deleting.
‘-d` will delete directories also.

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