

# Git Basics Summary

## What is Git?

Git is a distributed version control system (VCS) that tracks changes in source code, allowing multiple developers to collaborate efficiently. It stores every version of the project, enabling users to revert, compare, or restore changes as needed.

## Key Concepts

- Version Control System (VCS): Tracks and manages changes in code.
- Distributed System: Every developer has a full copy of the project history.
- Repository (Repo): The folder containing project files and version history.
- Commit: A snapshot of project changes at a specific point in time.
- Branch: A separate line of development for features or fixes.
- Merge: Combines changes from different branches.
- Remote Repository: Online version of the repo hosted on GitHub, GitLab, etc.

## Common Git Commands

```
git init → Initialize a new repository
git clone <url> → Copy an existing repository
git status → Show file status
git add <file> → Stage files for commit
git commit -m "message" → Save changes
git branch → List or create branches
git checkout <branch> → Switch branches
git merge <branch> → Merge changes
git push → Upload to remote repository
git pull → Download updates from remote
```

## Git vs GitHub

Git is the underlying version control tool, while GitHub is a cloud-based platform that hosts Git repositories for sharing and collaboration.

**Git:** A command-line tool installed locally for tracking code versions.

**GitHub:** A web platform to host Git repositories, review pull requests, and collaborate online.

## Basic Git Workflow

```
1. Initialize Git: git init
2. Stage Files: git add .
3. Commit Changes: git commit -m "Initial commit"
4. Link Remote Repo: git remote add origin <GitHub URL>
5. Push Changes: git push -u origin main
```

## Summary

- Git → Tool for version control.
- GitHub → Platform for hosting Git repositories.
- Commit → Saves a snapshot of changes.
- Branch → Enables isolated development.
- Merge → Combines work from multiple branches.

- Push/Pull → Synchronize local and remote changes.