

GIT

GIT : Git is a free and open source version control system for tracking changes in computer files. It helps in coordinating work among several people in a project and tracks progress over time. Unlike the centralized version control system, Git branches can be easily merged. A new branch is created every time a developer wants to start working on something. This ensures that the master branch always has a production-quality code. We actively use two repositories.

- **Local repository:** The local repository is present on our computer and consists of all the files and folders. This Repository is used to make changes locally, review history, and commit when offline.
- **Remote repository:** The remote repository refers to the server repository that may be present anywhere. This repository is used by all the team members to exchange the changes made.

Both repositories have their own set of commands. There are separate Git Commands that work on different types of repositories.

Git Commands:

git init: The git init command is used to create a new Git repository. When you run this command, Git sets up the necessary structures and files in the current directory, allowing you to start tracking changes. Here's a step-by-step look at what happens when you initialize a repository with git init:

Command: git init

1. **Creation of the .git Directory:** The command creates a hidden directory named .git in your project's root directory. This directory contains all the metadata and object files that Git uses to manage the repository.
2. **Initial Setup Files:** Inside the .git directory, Git generates several important files and subdirectories, including:
 - **HEAD:** A reference to the current branch.
 - **config:** Configuration settings for the repository.
 - **description:** A brief description of the repository.
 - **objects:** Directory to store all the objects.
 - **refs:** Directory to store pointers to commit objects for branches and tags.

git clone url:

- The git clone command is used to create a local working copy of an existing remote repository.
- The command downloads the remote repository to the computer. It is equivalent to the Git init command when working with a remote repository.

Command: git clone <remote_URL>

git add: command is used to add changes in your working directory to the staging area. The staging area, also known as the index, is where you prepare a snapshot of your project's current state before committing it to the repository.

Uses:

- **Selective Staging:** You might not want to commit all changes at once. git add allows you to select specific files or changes to include in your next commit.
- **Organized Commits:** By staging specific changes, you can create more meaningful and organized commits. This is particularly useful when you're working on multiple features or bug fixes simultaneously.
- **Error Reduction:** Staging your changes allows you to review what will be committed, reducing the chance of accidental or unnecessary changes being included.

Command : git add <filename>

git status: The git status command is used to display the state of the working directory and the staging area. It shows which changes have been staged, which have not, and which files are not being tracked by Git. This command is important for understanding the current status of your project and for making informed decisions about your next steps.

Command : git status

git branch:

- The git branch command is used to determine what branch the local repository is on.
- The command enables adding and deleting a branch.

Command : git branch <branch_name>

git commit:

- The commit command makes sure that the changes are saved to the local repository.
- The command "git commit -m <message>" allows you to describe everyone and help them understand what has happened.

Command : `git commit -m`

git push: Using the `git push` command, you can upload your files available on your local machine to the remote repository. After `git` pushes the changes to the remote repository other developers can access the changes and they can contribute their changes by `git` pulling. Before pushing it to the remote repository you need to do a `git commit` to your local machine.

Command: `git push`

git pull: `Git pull` is basically combination of `git merge` and `git fetch` which is used to update the local branch with the changes available in the remote repository branch. By which each and every developer will have the updated code with in there local machines they can work with the newly updated code.

Command : `git pull`