GIT GUIDE

Git guide for beginners

SHEERAZ MEHBOOB

Table of Contents

By: Sheeraz Mehboob

By: Sheeraz Mehboob

GIT

Introduction:

It is command line tool use to keep track of changes that we made to our code, files or repositories. These file are needed to be stored somewhere online, there are various websites online but the most common one is GitHub. It is just like taking a snapshot of previous version and move to a new one and if you want an older one you can revert it back. It also helps us to work with different people on a single project.

Download Git:

Steps:

- Visit "https://git-scm.com/downloads"
- Download git for OS installed on your device.
- Install the setup and you are done
- You can verify installation:
    - Goto cmd and type "git --version"
    - If you have installed git successfully you will get current git version.

Create a New Repository:

Steps:

- Goto page "github.com/new"
- Assign a name to your repo
- Description for your repo(optional)
- Who can access it? (public or private)
- Click on "Create Repository" button

Git clone:

Description:

How to download an available git repo and make it available on your device locally?

Steps:

- Goto cmd and type "git clone <URL>" (URL of repository you are trying to download)
- And now you have a copy of that repo on your device ready to make changes.

By: Sheeraz Mehboob

Git Add:

Description:

Git does not keep track of the changes itself. We have to tell the GIT that this is the state of file I want to add in next commit. By running "git add" with the name of a file, Git adds that file to the staging area. The staging area is like a holding area where you can review changes before committing them. Once you have added all the changes you want to include in your next commit to the staging area, you can run the "git commit" command to create a new commit with those changes.

Steps (For selected Files):

- Move to the directory where your files are available using "cd" command.
- Type "git add <file name>"

Steps (All the files in a directory):

- Move to the directory where your files are available using "cd" command.
- Type "git add ."

Git Commit:

Description:

Use to tell the GIT that I want to save the current state of files that added earlier. When you make changes to files in your working directory and stage those changes using git add, they are not yet committed to the Git repository. The git commit command takes all the changes that you have staged and creates a new commit with those changes. Committing changes frequently is important because it allows you to keep track of changes over time, provides a way to revert to a previous version of the code if necessary, and helps to maintain a clear history of the development process.

Steps:

- Select the directory.
- Type "git commit -m <message>" (Message is a note to self that at this step what changes has been made)
- A new state has been saved.

All the changes till now like staging a file and committing is being done on our local repo now if we want to reflect our changes to server there will be a final command:

- Type "git push" to make your changes available to server.

Alternative of git add and git commit:

- If you want to merge both steps you can use "git commit -am <message>"
- The above command will commit all the files that have been modified.

By: Sheeraz Mehboob

Git Status:

Description:

The purpose of the git status command is to show you the current status of your working directory and staging area in relation to the Git repository. Running "git status" will display a list of files that have been modified since the last commit, files that have been staged for the next commit, and files that are not yet tracked by Git. This allows you to see at a glance what changes have been made and which files are ready to be committed. The "git status" command also provides information about the branch you are currently working on, and any changes that have been made by other people in the remote repository.

Command:

- git status

Git Pull:

Description:

The git pull command is used to update your local Git repository with changes from a remote repository and merge them with your local codebase. It fetches the latest changes from the remote repository and merges them with your local codebase. This ensures that everyone working on the project has access to the latest version of the code and reduces the risk of conflicts or errors caused by using outdated code. However, conflicts may arise if local changes have been made to files that were also modified in the remote repository.

Steps:

- Select the directory
- Type "git pull" and the repo available on server will be pulled and saved to your machine.

CONFLICTS

Merge Conflicts:

Description:

Such problem occurs when changes has been made to the same part of code by two or more collaborators. Merge conflict is a situation where Git is unable to automatically merge conflicting changes made to the same lines of code in different branches of a repository. This requires manual resolution, which involves editing the affected files and choosing which changes to keep and which to discard. Merge conflicts can occur when multiple people are working on the same codebase or when a single person is working on multiple branches of the codebase. Resolving merge conflicts is an important skill for working with Git and collaborating on code with others.

Resolve Conflict:

- push or pull code for github you will get conflict
- Keep the version you want to resolve conflict and push them all again to server as a new version.

By: Sheeraz Mehboob

Git Log:

Description:

Git command that displays a detailed history of all the commits made to a repository, including the commit message, author, date, and unique hash ID for each commit. It can be used to filter the commit history and display specific information such as the commits made by a certain author or within a specific time period. git log is useful for understanding the evolution of a project over time, tracking down errors or bugs, and identifying contributors to the project.

Command:

- git log

Git Reset:

Description:

A Git command that allows you to reset the current state of your repository to a previous commit or a specified branch.

Commit will be referring to hash key of the specific commit.

Some Basic Types of Reset:

1. "git reset HEAD <file>"

The command is useful if you accidentally added a file to your changes and you want to remove it. When you add a file to your changes, it goes into the staging area. git reset HEAD <file> removes the file from the staging area, so that it won't be committed when you make your next commit. However, the changes you made to the file will still be in your working directory, so you can continue working on it.

2. "git reset --soft <commit>"

The command is useful if you want to undo your latest commit, but keep your changes. When you make a commit, it creates a new snapshot of your code, and the HEAD pointer moves to that commit. git reset --soft <commit> moves the HEAD pointer back to the previous commit, so that you're back where you were before you made the latest commit. However, the changes you made in the latest commit will still be in your working directory and staging area, so you can continue working on them.

3. "git reset --hard <commit>"

This command is useful if you want to completely undo your changes and go back to a previous commit. When you make changes to your code, they start in the working directory. When you're ready to commit them, you add them to the staging area, and then make a commit. git reset --hard <commit> moves the HEAD pointer back to the specified commit, and also removes the changes from the staging area and working directory. This means that the changes you made are completely deleted, and you're back to the state of the code at the specified commit.

By: Sheeraz Mehboob

Branching:

Description:

A branch is a new line of development that diverges from the main line of development, allowing multiple developers to work on different parts of the same project simultaneously, without interfering with each other's work. Branching allows developers to work on their own copies, experiment with new features, isolate changes that are not yet ready to be merged into the main branch, review code changes before they're merged into the main branch, and roll back changes if something goes wrong. It is like work on a feature without disrupting master branch. And after a work on a branch is done we merge all the changes to master branch.

Commands:

Git branch

Tells what branch you are currently on by a star on its left side and branches we have on repository.

Create a new branch:

- git checkout –b "name of branch" and it automatically switch your head to newly created branch.

Switch to a branch:

- "git checkout <branch name>"

Merge branches:

- git merge <branch-name> (this will be the branch whose changes you want to merge into the branch you are currently on).

Forking a GitHub Repository

Description:

Forking refers to creating a copy of an existing repository on a remote server, such as GitHub. The purpose of forking is to enable collaboration on an existing project, particularly in the context of open source software development. By forking a repository, you can make changes to the code and propose those changes back to the original project through a pull request.

Steps:

- Goto github repo you want to fork.
- Click on "fork" button on upper right corner and you will have a copy of it.

GitHub Pages

Description:

GitHub Pages is a service that allows users to host static websites directly from their GitHub repository, without the need for a dedicated web server. When enabled for a repository, GitHub will automatically generate a website based on the repository's content. It is widely used for hosting documentation, personal portfolios, and other static websites and is free for public repositories.

By: Sheeraz Mehboob

Steps:

- Goto "github.com/new" to create a new repo
- Repo name should be something like "username.github.io" however it can be change.
- Add new files you want to be hosted
- And github will give you a link where your website is hosted.

By: Sheeraz Mehboob