Git and GitHub

ASSIGNMENT : 2(a)

- **Create version control account on GitHub and using Git Commands to create repository ans push your code to GitHub.**

❖ What is Git?

- **Git** is a distributed version control system designed to handle projects of any size with speed and efficiency.
- It tracks changes in source code, allowing multiple developers to collaborate.
- **Purpose** : **Git** focuses on **local version control** and managing changes in code.
- Key Features:
  - Version control
  - Branching and merging
  - Offline work capability

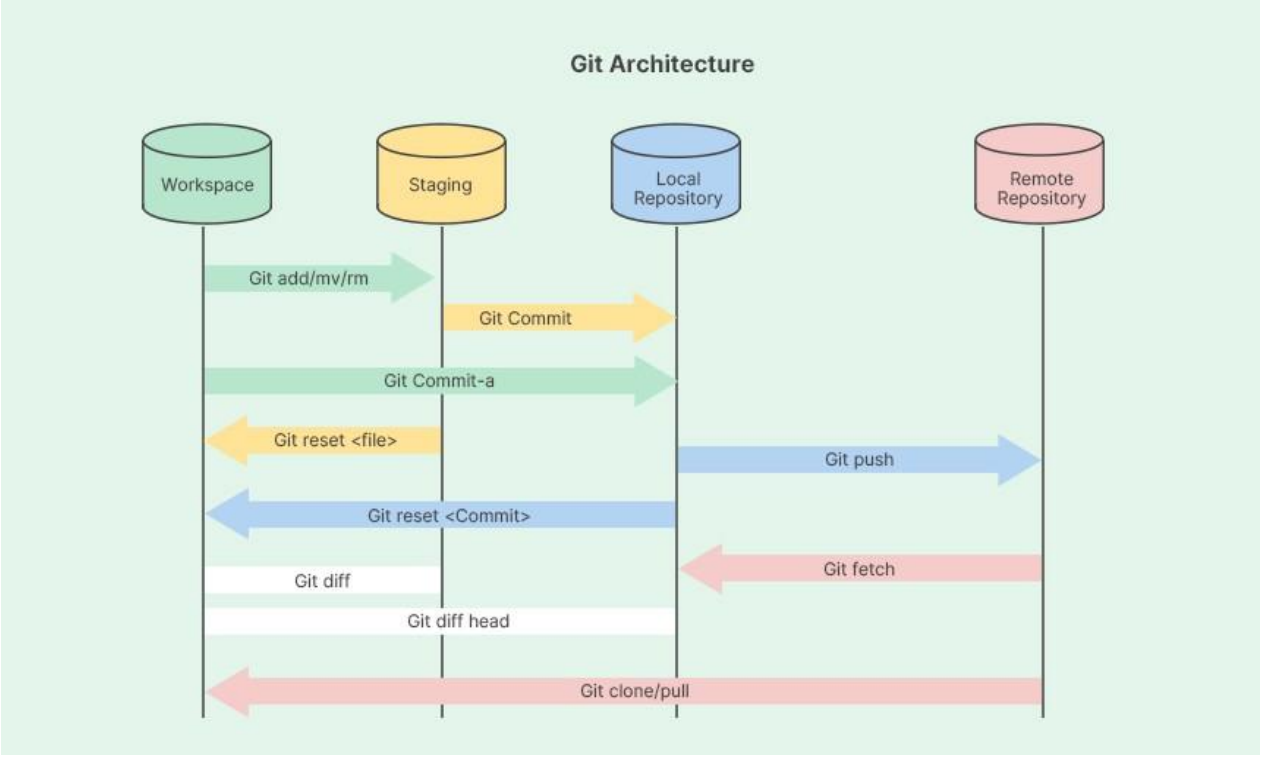
❖ What is GitHub?

- **GitHub** is a cloud-based platform for hosting Git repositories.
- It provides tools for collaboration, code review, and project management.
- **Purpose** : **GitHub** focuses on **remote hosting** and providing collaboration and project management tools.
- Features:
  - Remote repository hosting
  - Pull requests for collaboration
  - Issues for tracking bugs or tasks
  - Actions for automation and CI/CD

❖ Difference Between Git and GitHub

Aspect	Git	GitHub
Definition	A version control system.	A platform to host and manage Git repositories.
Usage	Works locally on your machine.	Requires an internet connection for hosting.
Functionality	Tracks code changes and allows collaboration.	Provides a GUI, collaboration tools, and hosting.
Dependency	Does not need GitHub to work.	Requires Git for version control.

❖ Git Architecture



Components of Git architecture

1. Working Directory

- The working directory is the place where you work on your project files.
- It contains the actual files and directories of the project.
- Any changes made here need to be staged and committed to be tracked by Git.

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2. Staging Area (Index)

- The staging area is an intermediate space where changes are prepared before committing.
- Files are added to the staging area using the `git add` command.
- It acts as a preview of what will be included in the next commit.

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3. Local Repository

- The local repository is the `.git` folder located inside your project directory.
- It contains the entire history of the project, including commits, branches, and configurations.
- Changes are saved to the local repository using the `git commit` command.

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4. Remote Repository

- The remote repository is a version of your repository hosted on a remote server (e.g., GitHub, GitLab, Bitbucket).
- It allows multiple developers to collaborate by sharing and synchronizing code.

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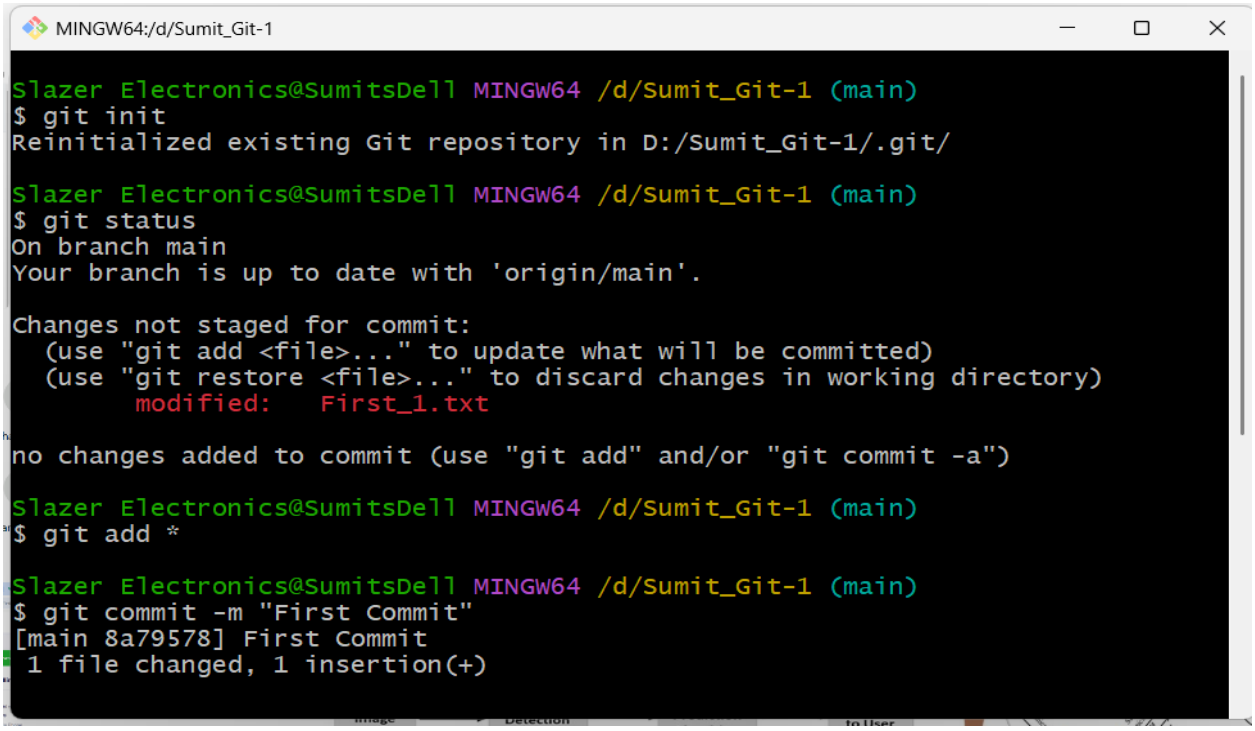
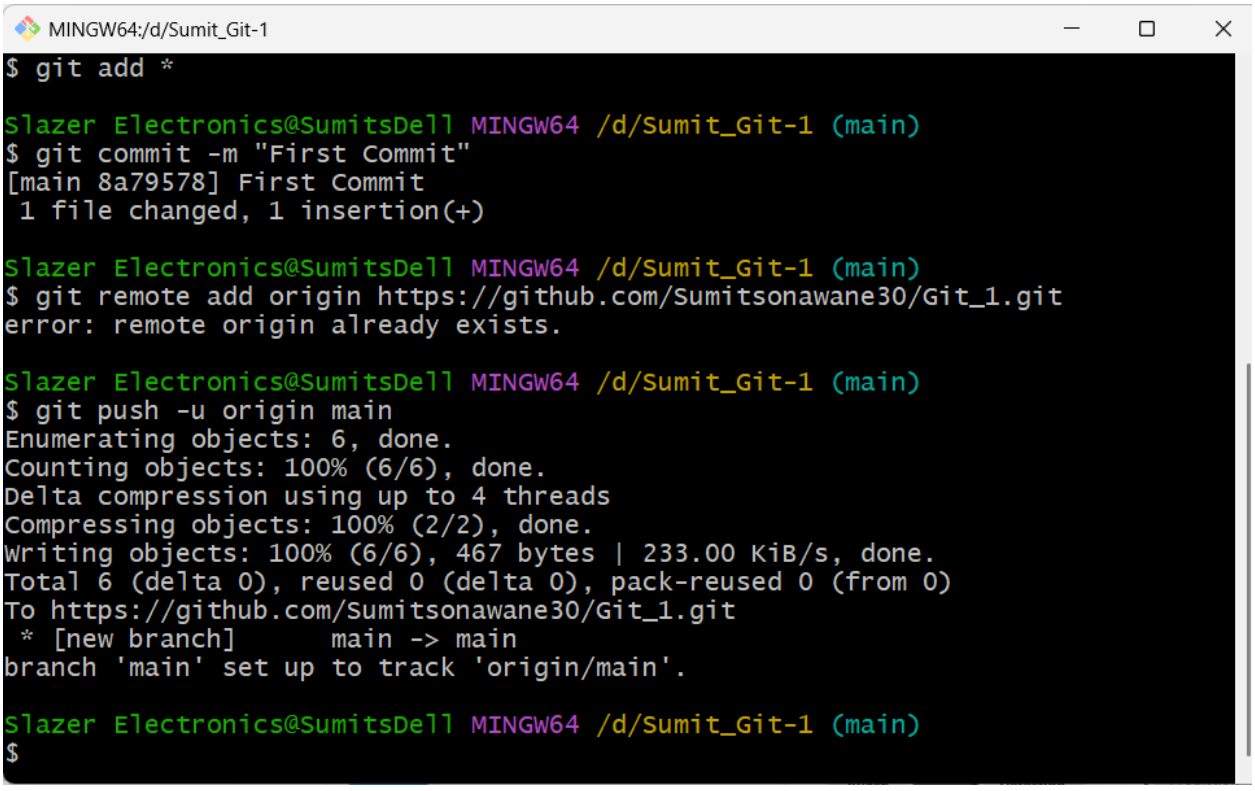
5. Branches

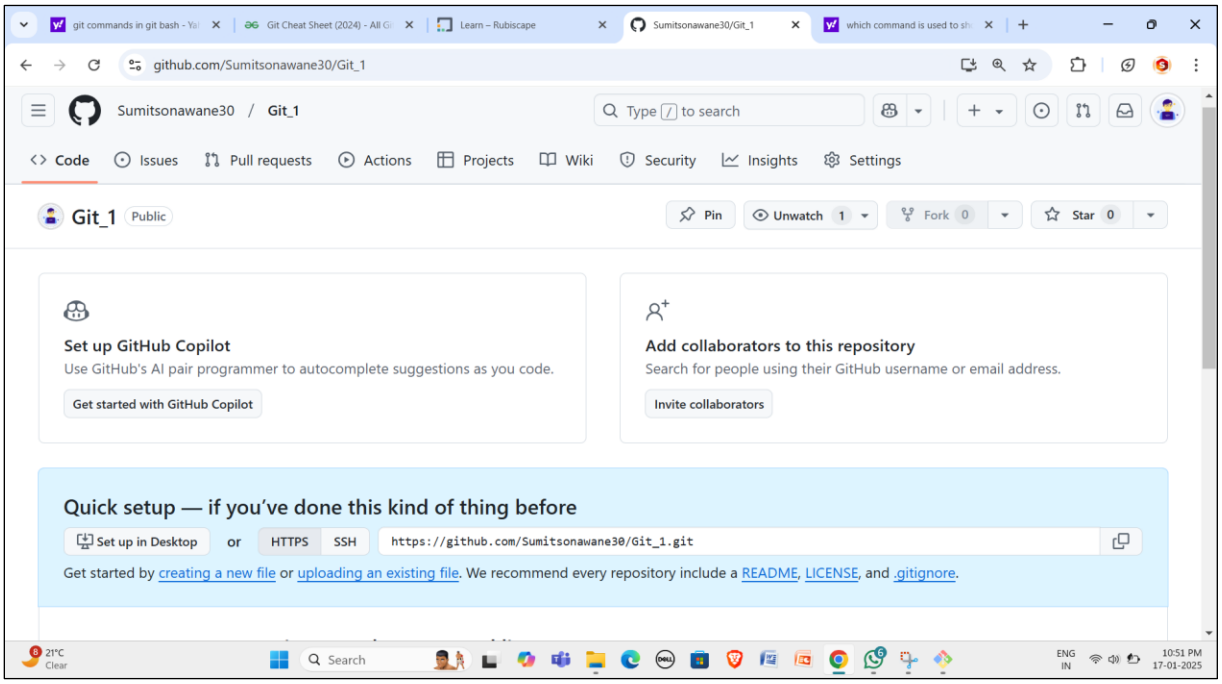
- A branch is an independent line of development within a repository.
- The default branch is usually called `main` or `master`.
- Feature branches allow developers to work on separate features without affecting the main branch.

❖ Git Commands Executed on Git Bash :

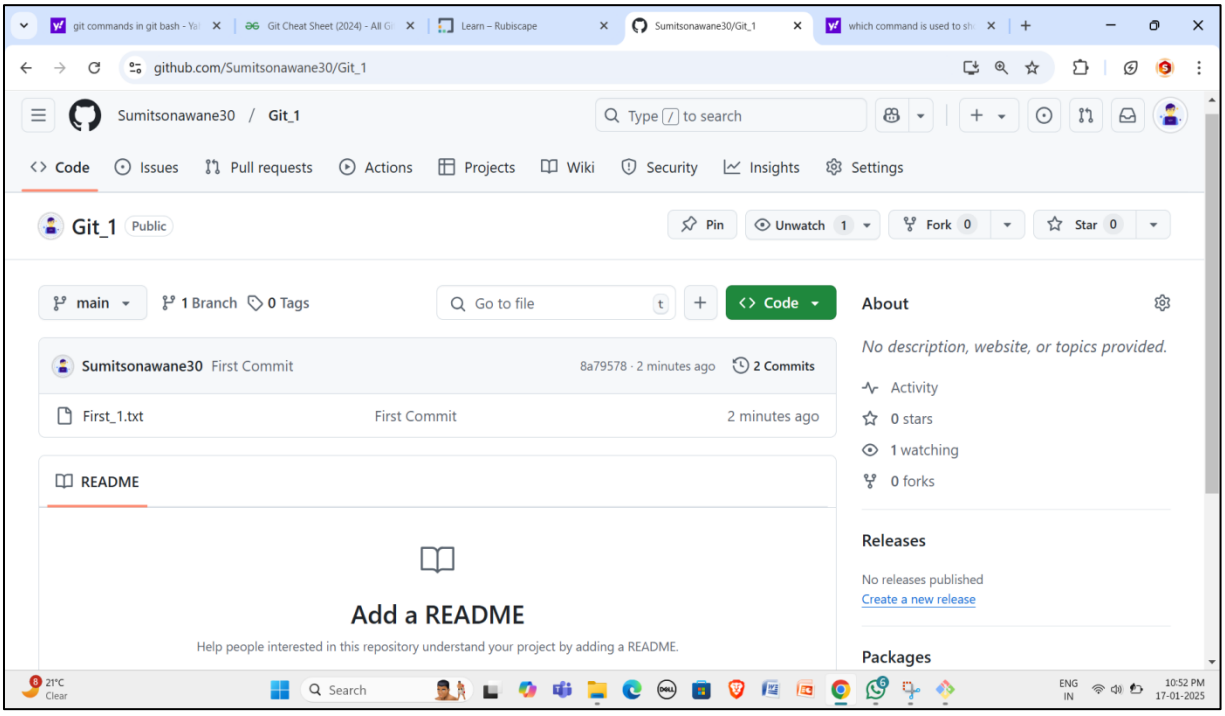




- **Before Push**

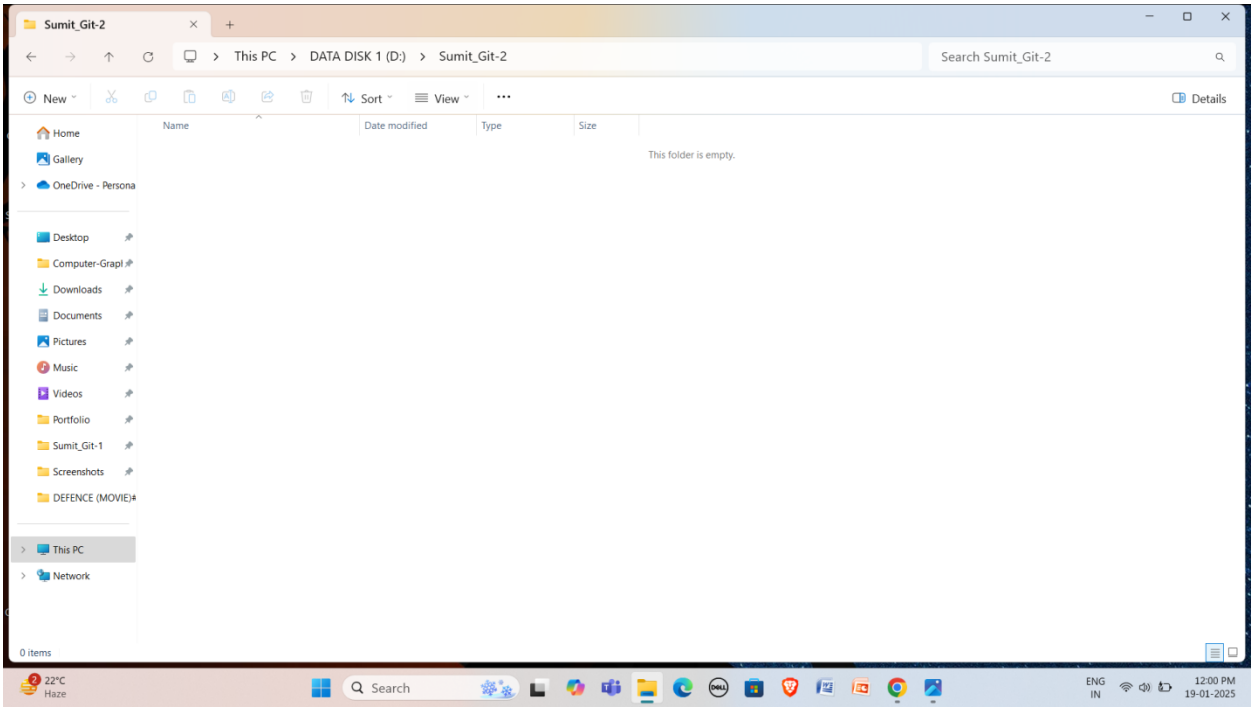


- **After Push**

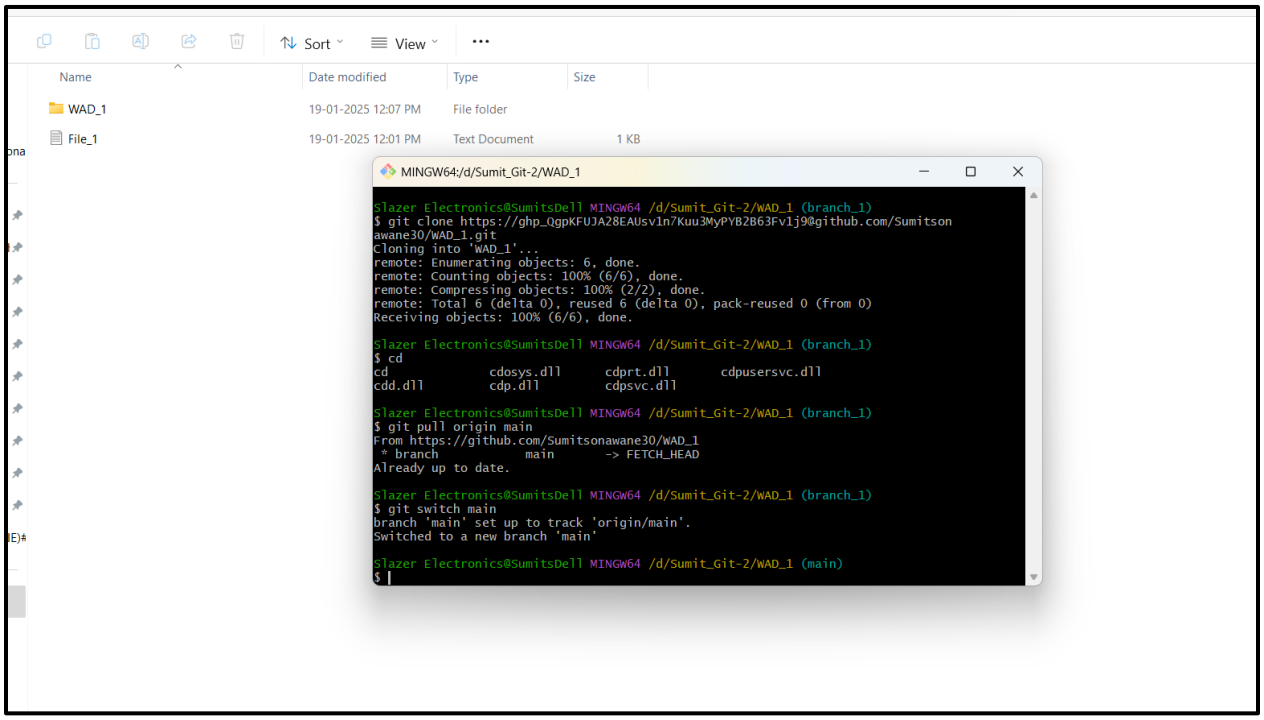


❖ Cloning the repository

- **Before Cloning :**



- **After using Clone Command :**



❖ Pull Command :