JANUARY 19, 2024

PICT ACM STUDENT CHAPTER

PRESENTS

Git & Github SIG

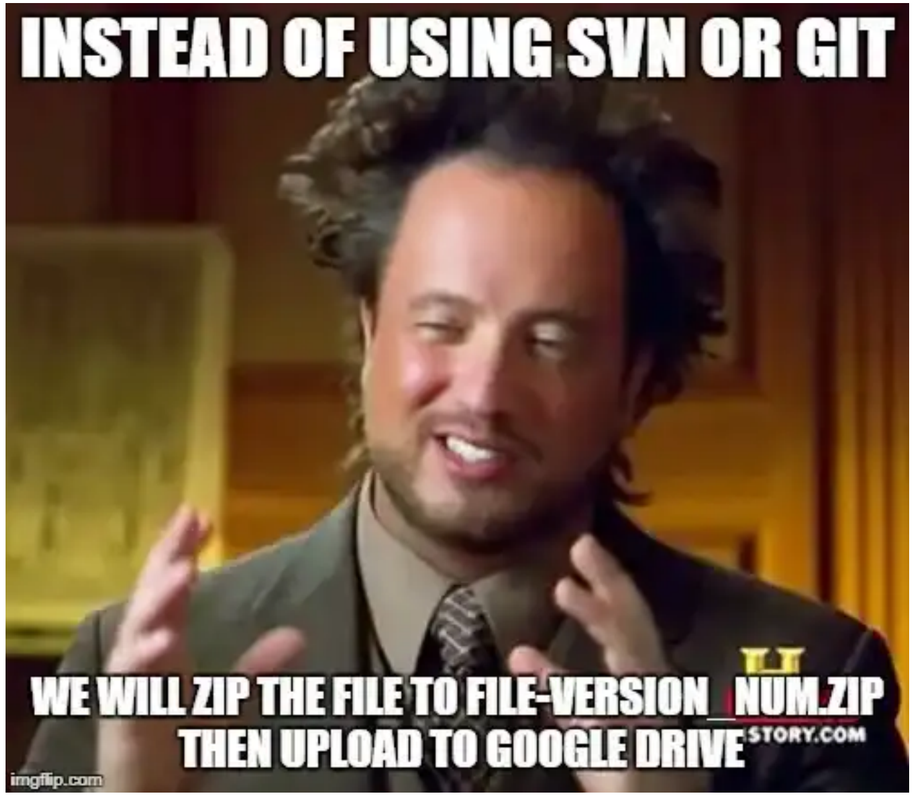
Let's get visual with our processes!

Git & Github

Topics

1. Introduction to Version Control
2. Git Basics
3. Branching and Merging
4. Remote Repositories
5. Collaboration
6. Best Practices and Doubts Resolution

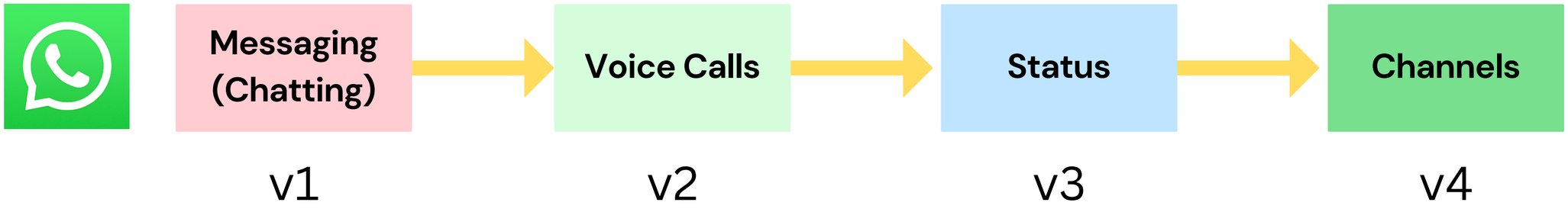
Why Git and Github 🌚



Even if you have to revert to 6 months back in your project, git makes it easier for you.

01. Introduction to Version Control

Version control, also known as source control or revision control, is a system that manages changes to a project's source code, documents, or any set of files over time.



Installing Git

https://git-scm.com

git --distributed-is-the-new-centralized

Search entire site...

Git is a free and open source distributed version control system designed to handle everything from small to very large projects with speed and efficiency.

Git is easy to learn and has a tiny footprint with lightning fast performance. It outclasses SCM tools like Subversion, CVS, Perforce, and ClearCase with features like cheap local branching, convenient staging areas, and multiple workflows.

About
The advantages of Git compared to other source control systems.

Documentation
Command reference pages, Pro Git book content, videos and other material.

Downloads
GUI clients and binary releases for all major platforms.

Community
Get involved! Bug reporting, mailing list, chat, development and more.

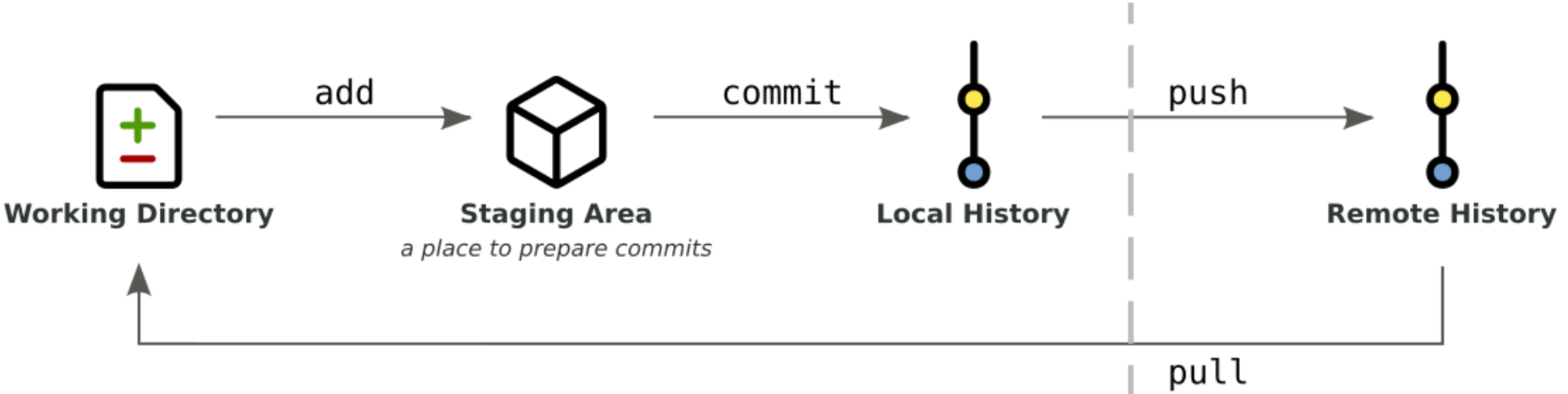
01. Set git user name

```
git config --global user.name "Your Good Name"

$ git config --global user.name
> Your Good Name
```

02. Setting your email

```
git config --global user.email "your_email@example.com"

$ git config --global user.email
> your_email@example.com
```

02. Git Basics



Local

where you run git commands

Examples

Your Computer

Farm

Remote

a computer online

Examples

GitHub

GitLab

Manging a Project using Git

Let's Learn Git✨

Initialize a Repository:
git init: Initializes a new Git repository in the current directory.

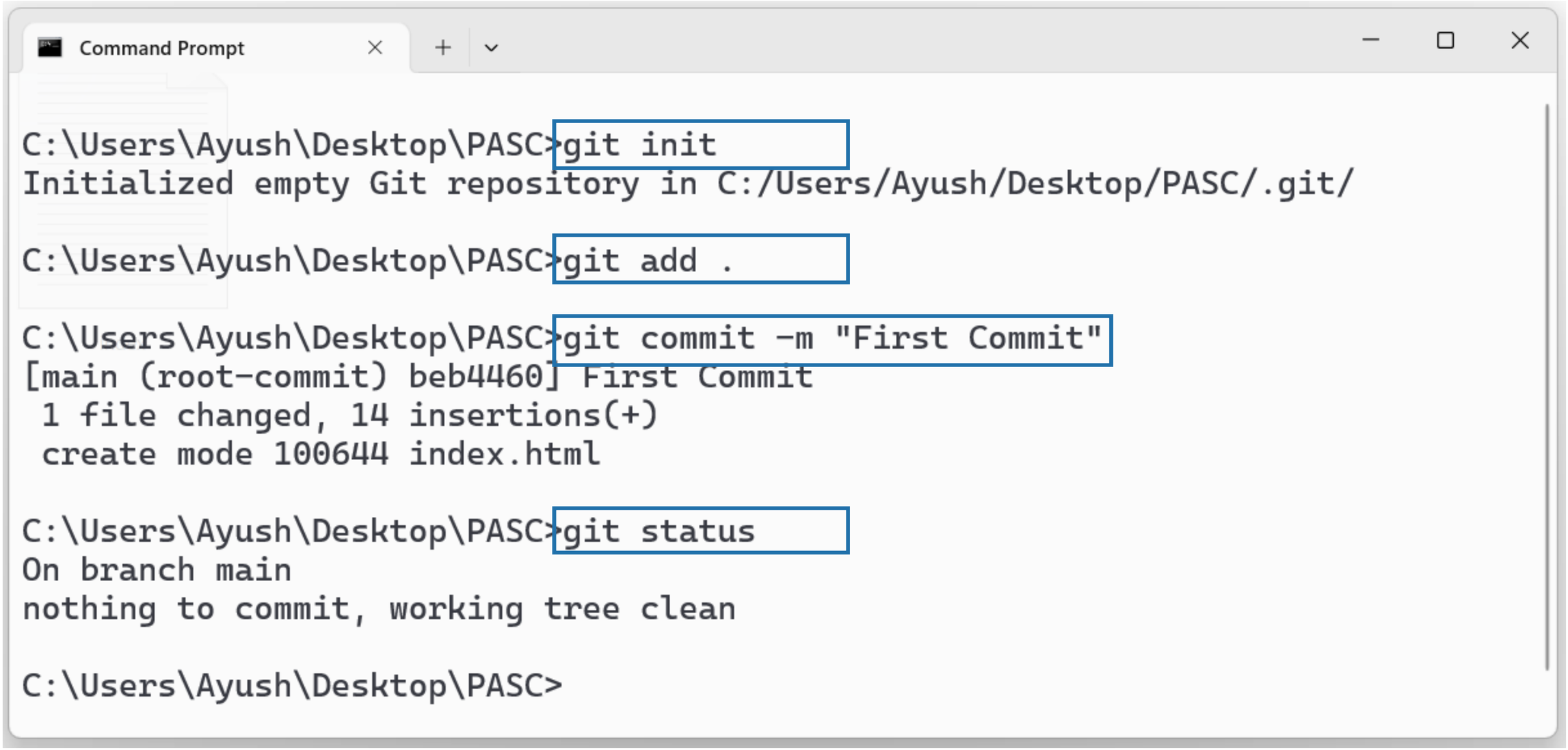
Clone a Repository:
git clone <repository_url>: Creates a copy of a remote repository on your local machine.

Check Repository Status:
git status: Shows the status of changes as untracked, modified, or staged.

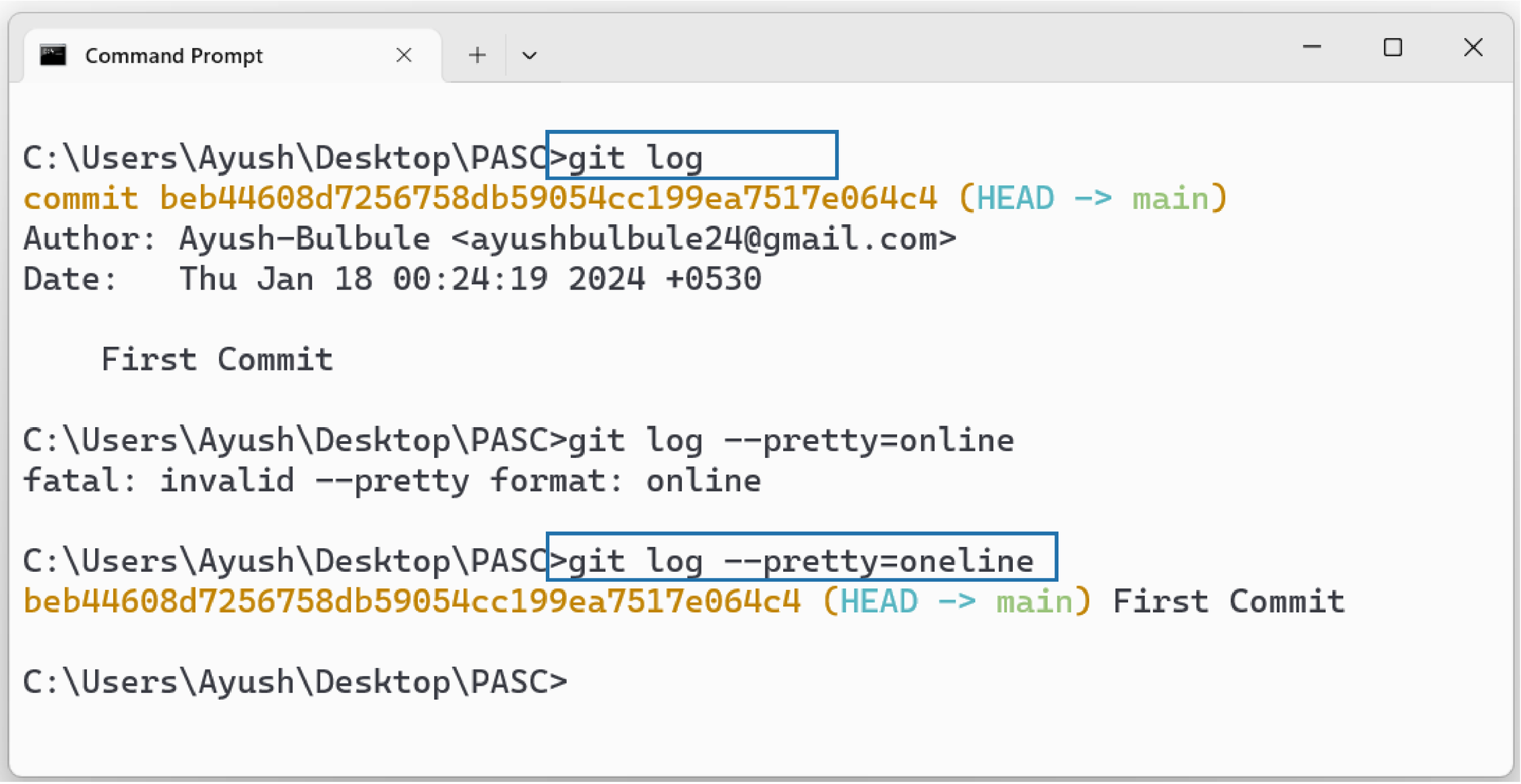
Add Changes to Staging Area:
git add <filename>: Adds specific file(s) to the staging area.
git add . or git add -A: Adds all changes to the staging area.

Commit Changes:
git commit -m "Commit message": Commits the changes in the staging area with a descriptive message.

Example: Setting git in a project

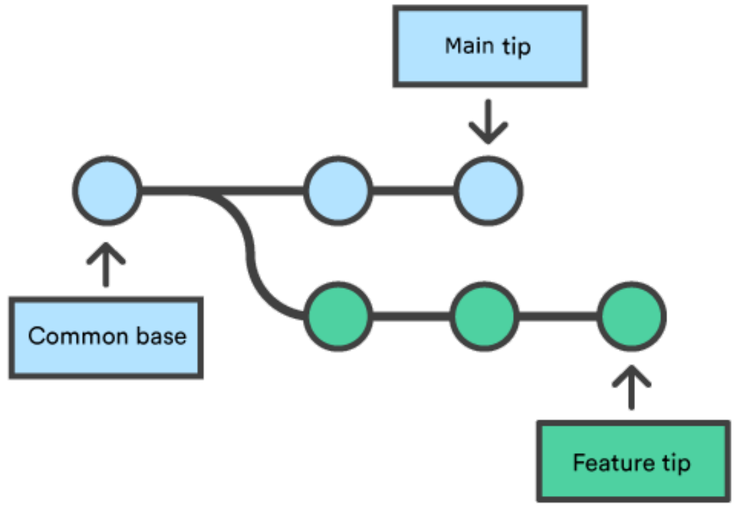


Example: Checking History



03. Branching and Merging

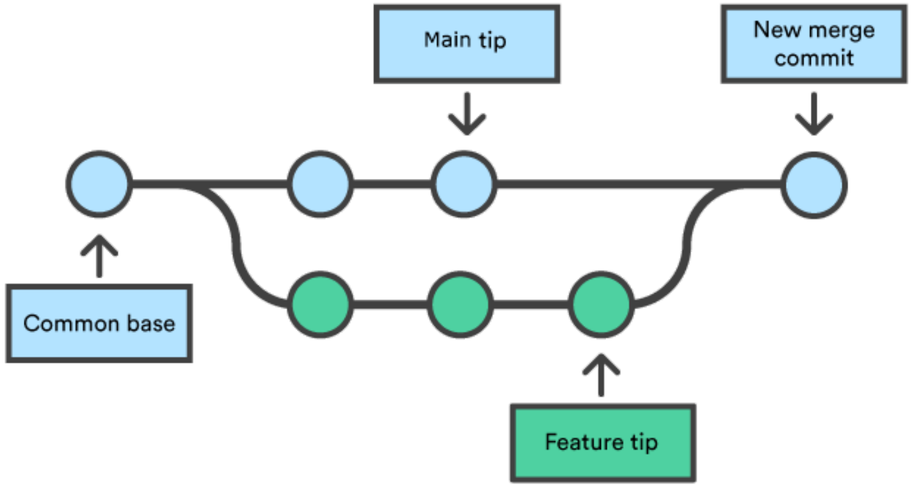
Branch in Git: In Git, a branch is like a separate lane on a highway, letting you explore & experiment without affecting the main road (master branch). ✨




```
git branch <new_branch_name>
```

Merge in Git:

In Git, merging is like bringing two separate roads (branches) together into one main highway (master branch). It combines the changes made on different branches to create a unified history of your project ✨




```
git merge <branch_name>
```

Git Branching Commands

Create a New Branch:

`git branch <branch_name>`: Creates a new branch.

Create and Switch to a New Branch:

`git checkout -b <branch_name>`: Creates and switches to a new branch in one command.

`git switch -c <branch_name>` (Git 2.23 and later): Creates and switches to a new branch.

Switch to a Different Branch: (Already Existing Branch)

`git checkout <branch_name>` : Switches to an existing branch.

List All Branches:

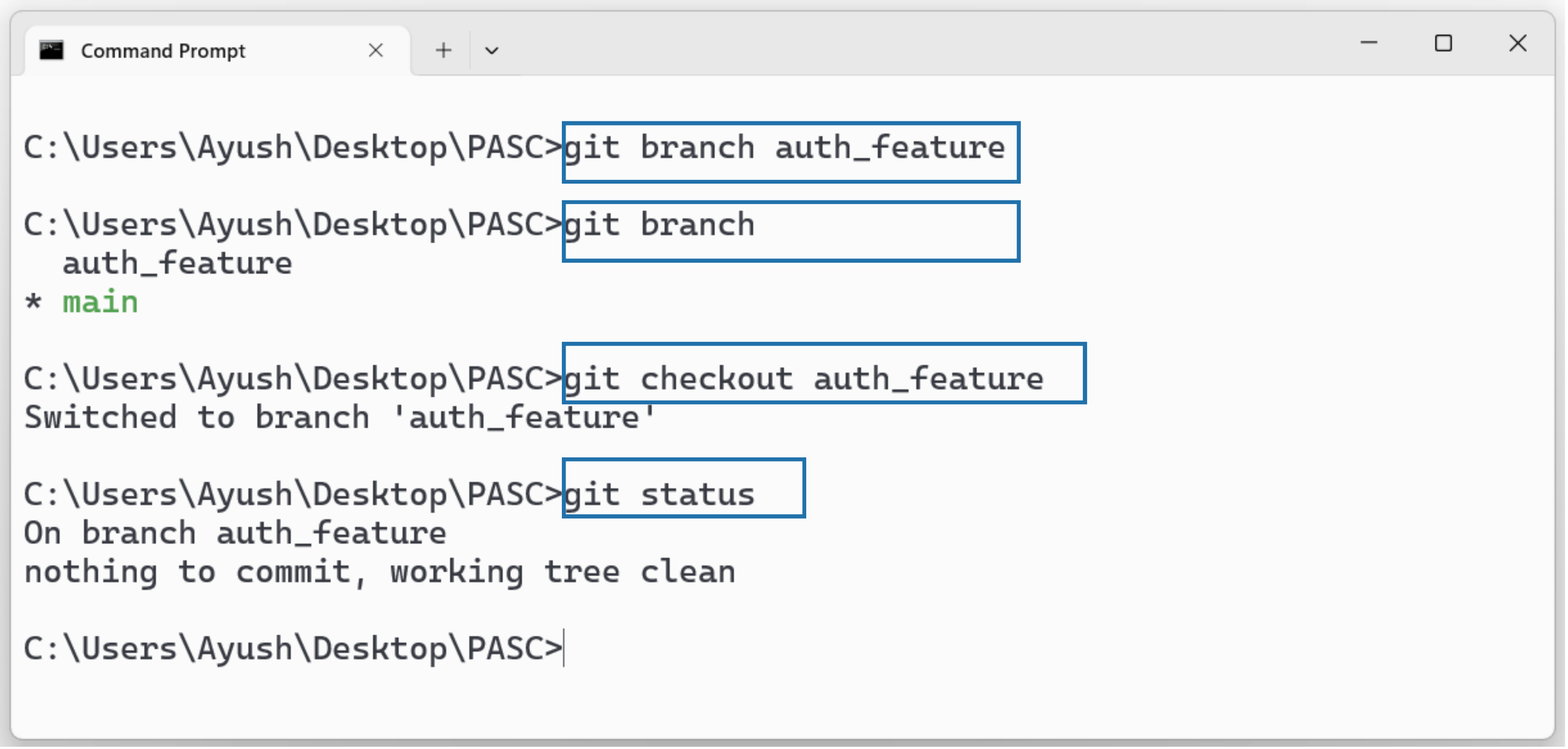
`git branch`: Lists all branches in the repository.

`git branch -a`: Lists all local and remote branches.

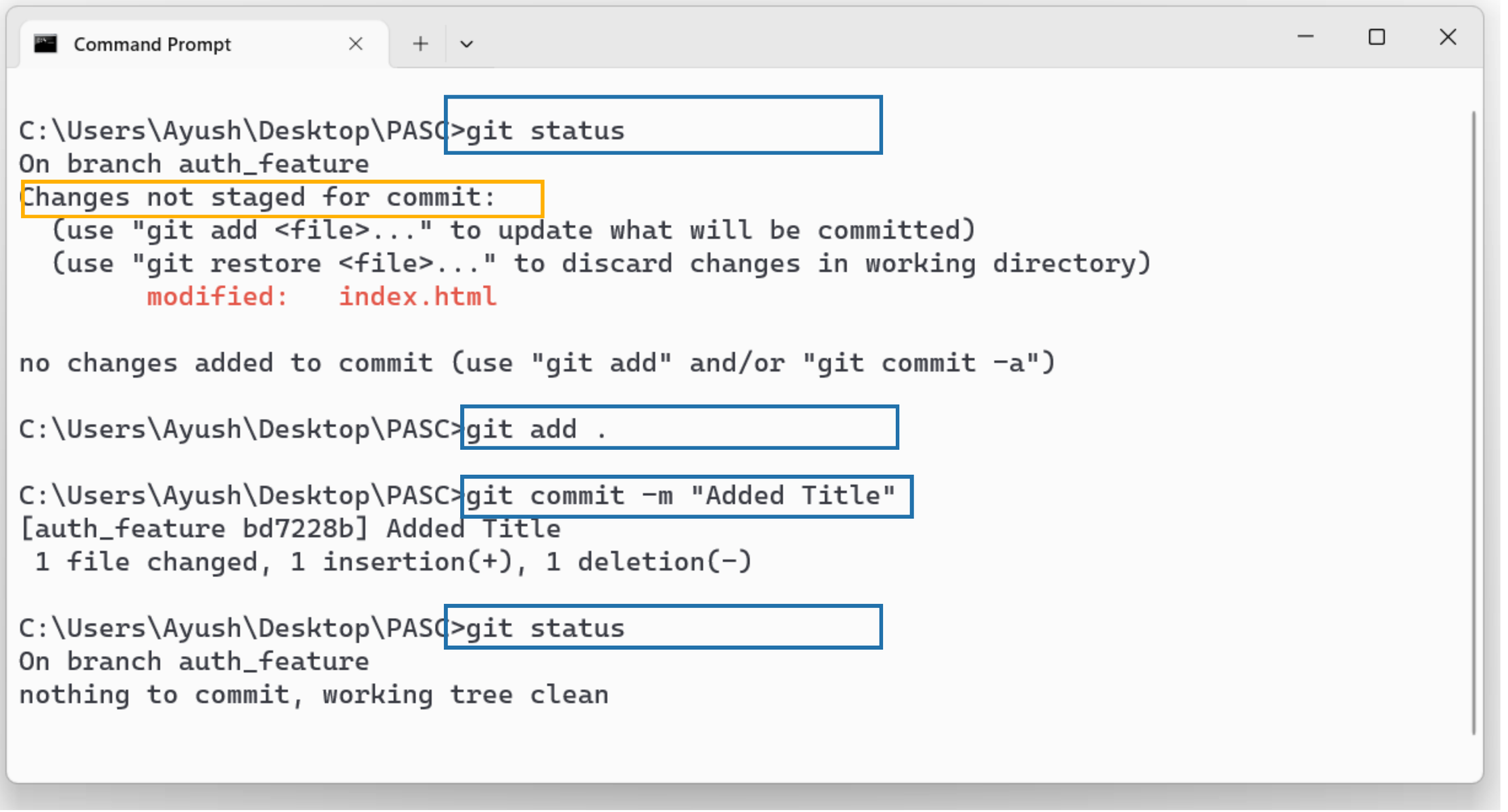
Delete a Branch:

`git branch -d <branch_name>`: Deletes a local branch (safe delete)

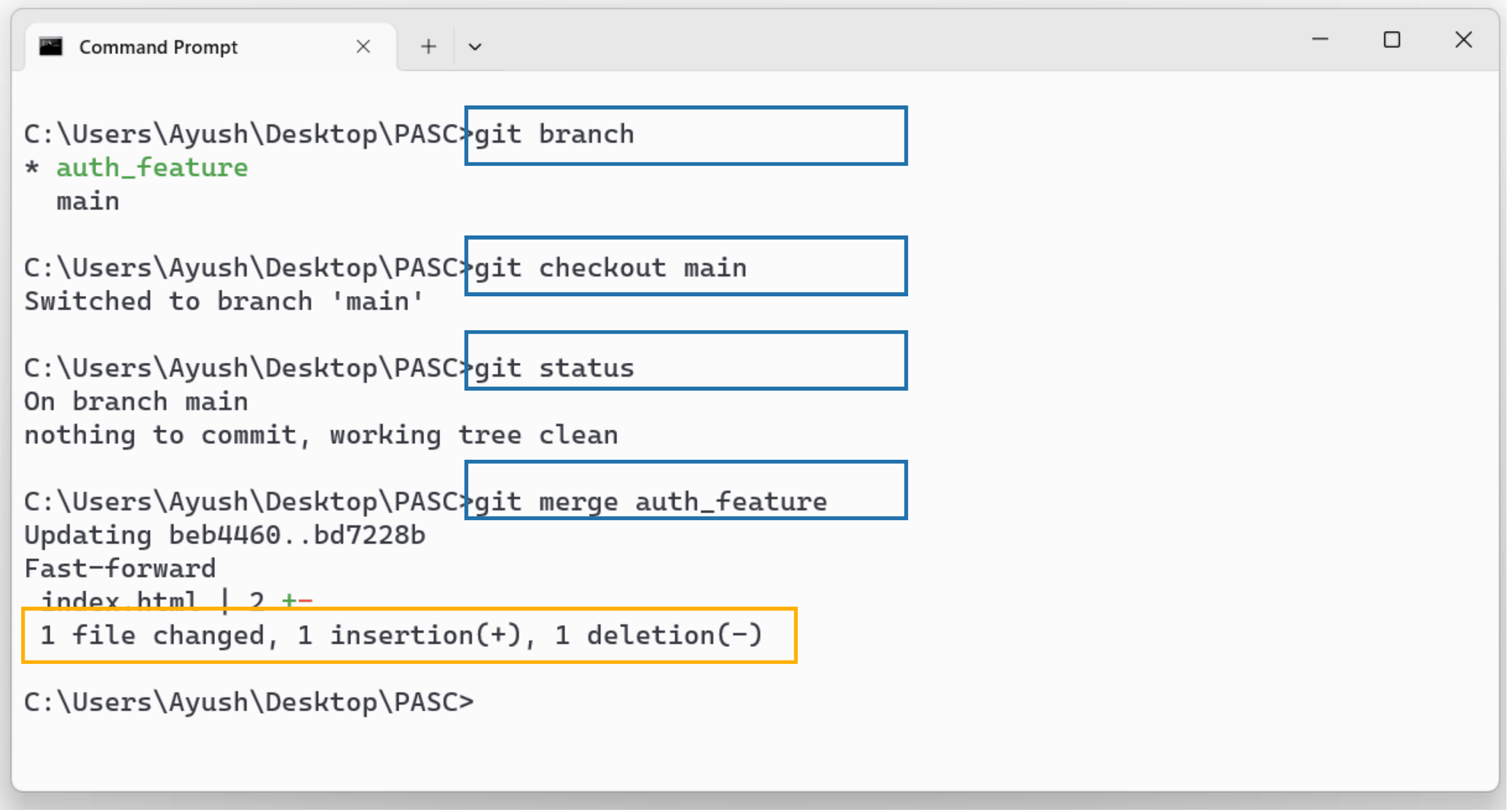
Example: Creating new branch and switching



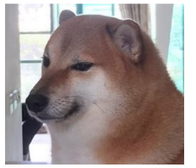
Example: Staging changes on newly created branch



Example: Merging two branches



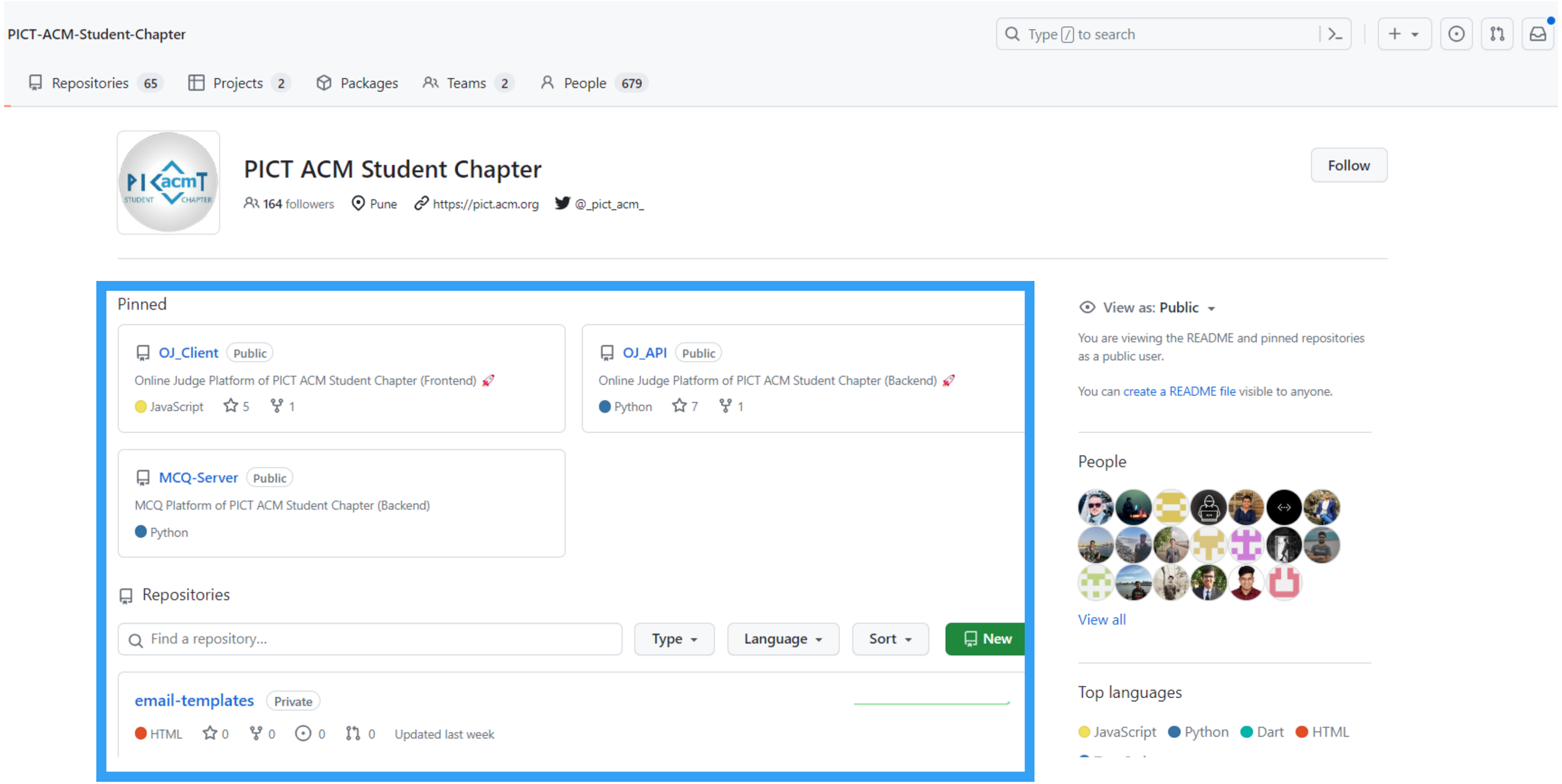
Example: Git reset - Covering your mistakes

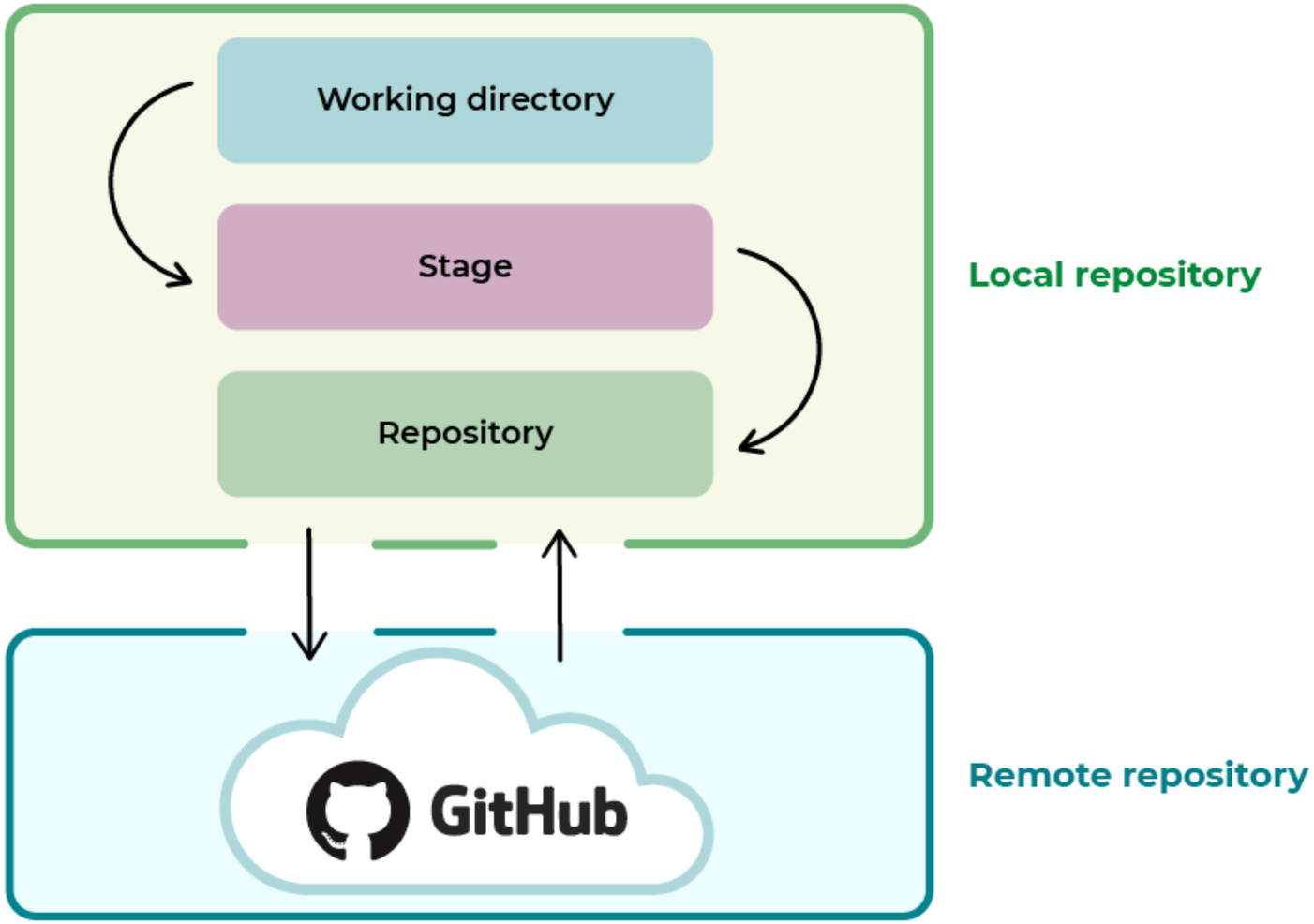


Command Prompt

```
commit beb44608d7256758db59054cc199ea7517e064c4
Author: Ayush-Bulbule <ayushbulbule24@gmail.com>
Date:   Thu Jan 18 00:24:19 2024 +0530

    First Commit

C:\Users\Ayush\Desktop\PASC>git reset beb44608d7256758db59054cc199ea7517e064c4
Unstaged changes after reset:
M       index.html

C:\Users\Ayush\Desktop\PASC>git status
On branch main
Your branch is behind 'origin/main' by 1 commit, and can be fast-forwarded.
  (use "git pull" to update your local branch)

Changes not staged for commit:
  (use "git add <file>..." to update what will be committed)
  (use "git restore <file>..." to discard changes in working directory)
        modified:   index.html

no changes added to commit (use "git add" and/or "git commit -a")
```

04. Remote Repositories




Working directory
Stage
Repository
GitHub
Local repository
Remote repository

Git Remote Commands

Clone a Remote Repository

git clone <repository_url> : This command creates a copy of a remote repository on your local machine.

Add a Remote Repository

git remote add <remote_name> <repository_url> : This command adds a reference to a remote repository, allowing you to easily interact with it.

Push Changes to a Remote Repository:

git push <remote_name> <branch_name>: This command pushes your local changes to a remote repository.

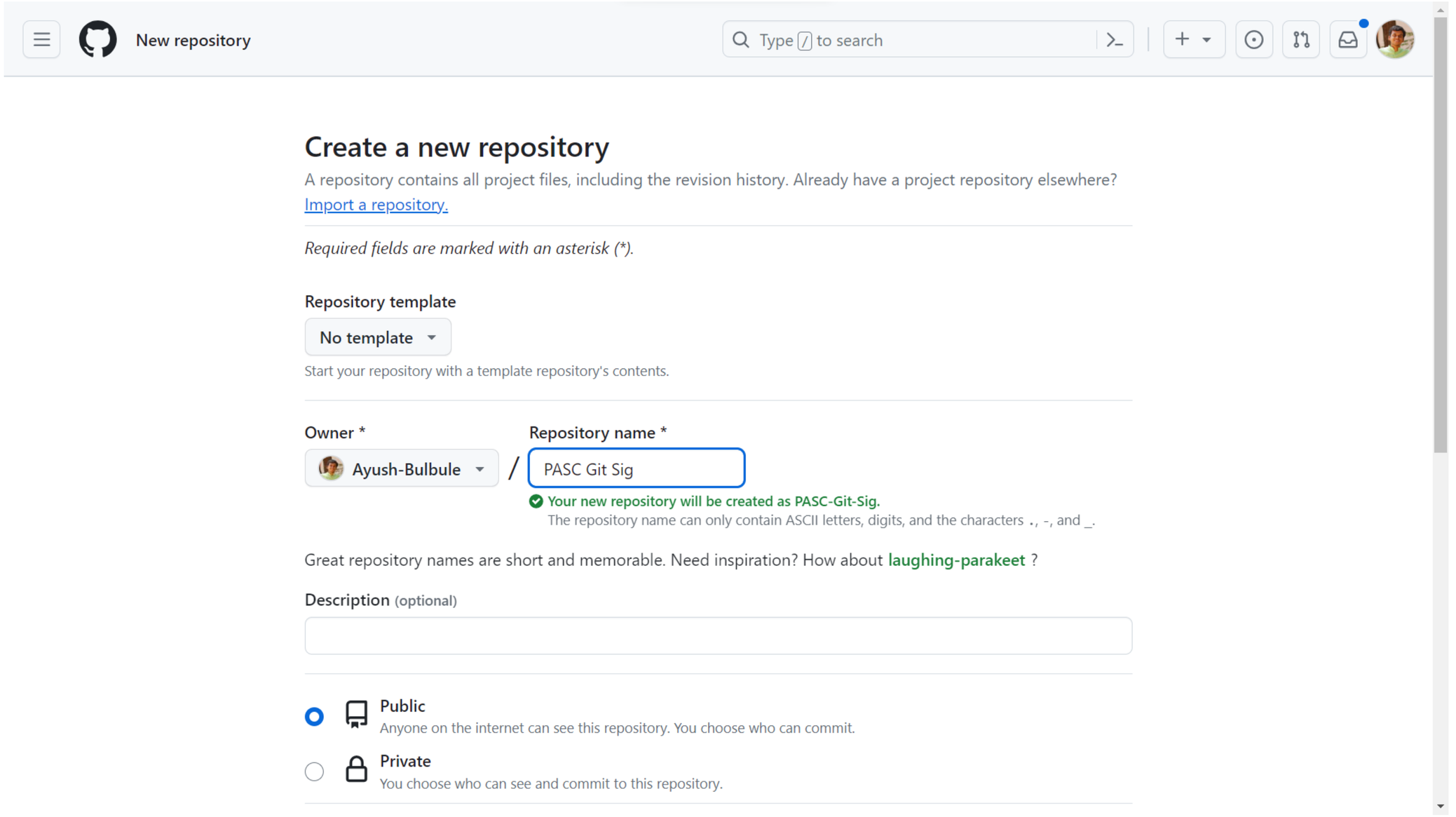
Fetch Changes from a Remote Repository

git fetch <remote_name> : This command fetches changes from a remote repository but does not merge them.

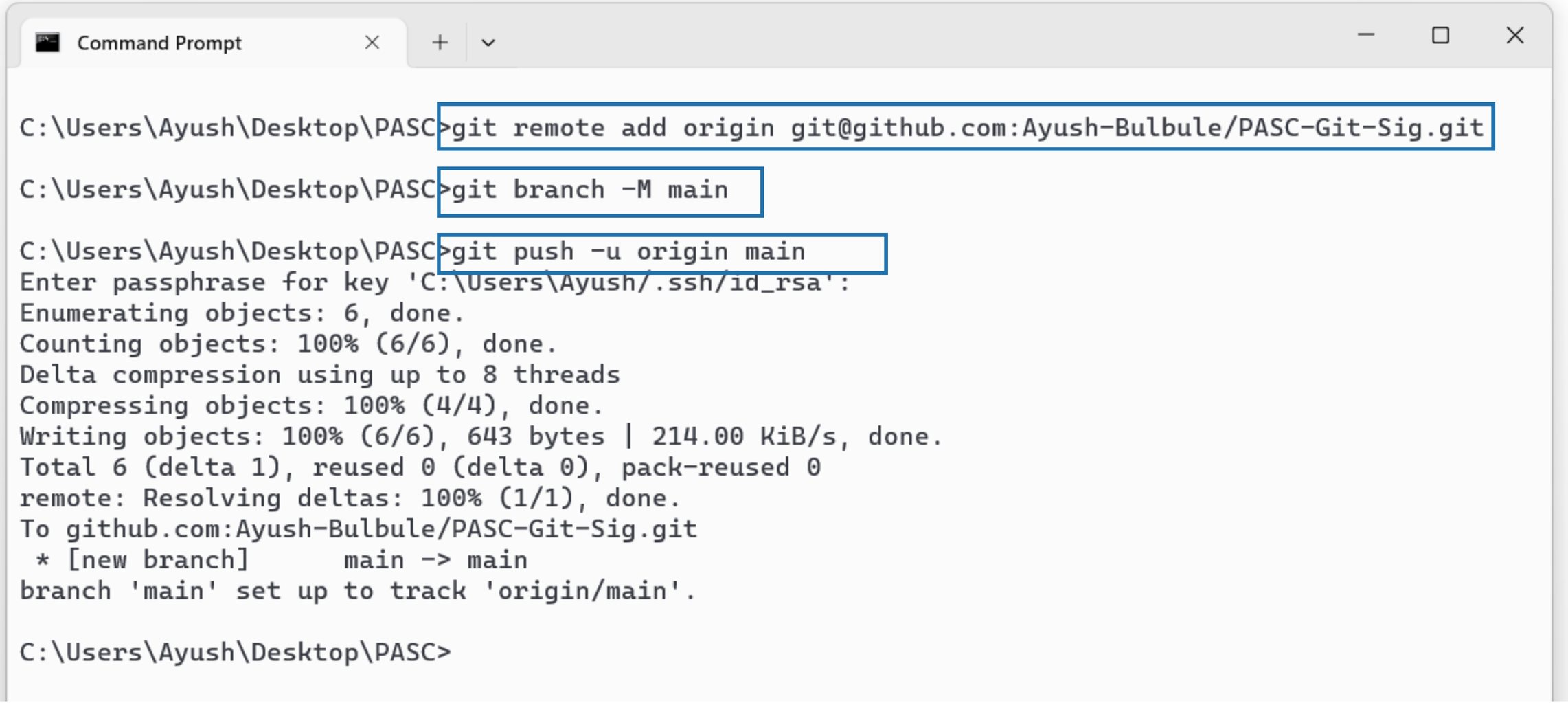
Pull Changes from a Remote Repository

git pull <remote_name> <branch_name>: This command fetches and merges changes.

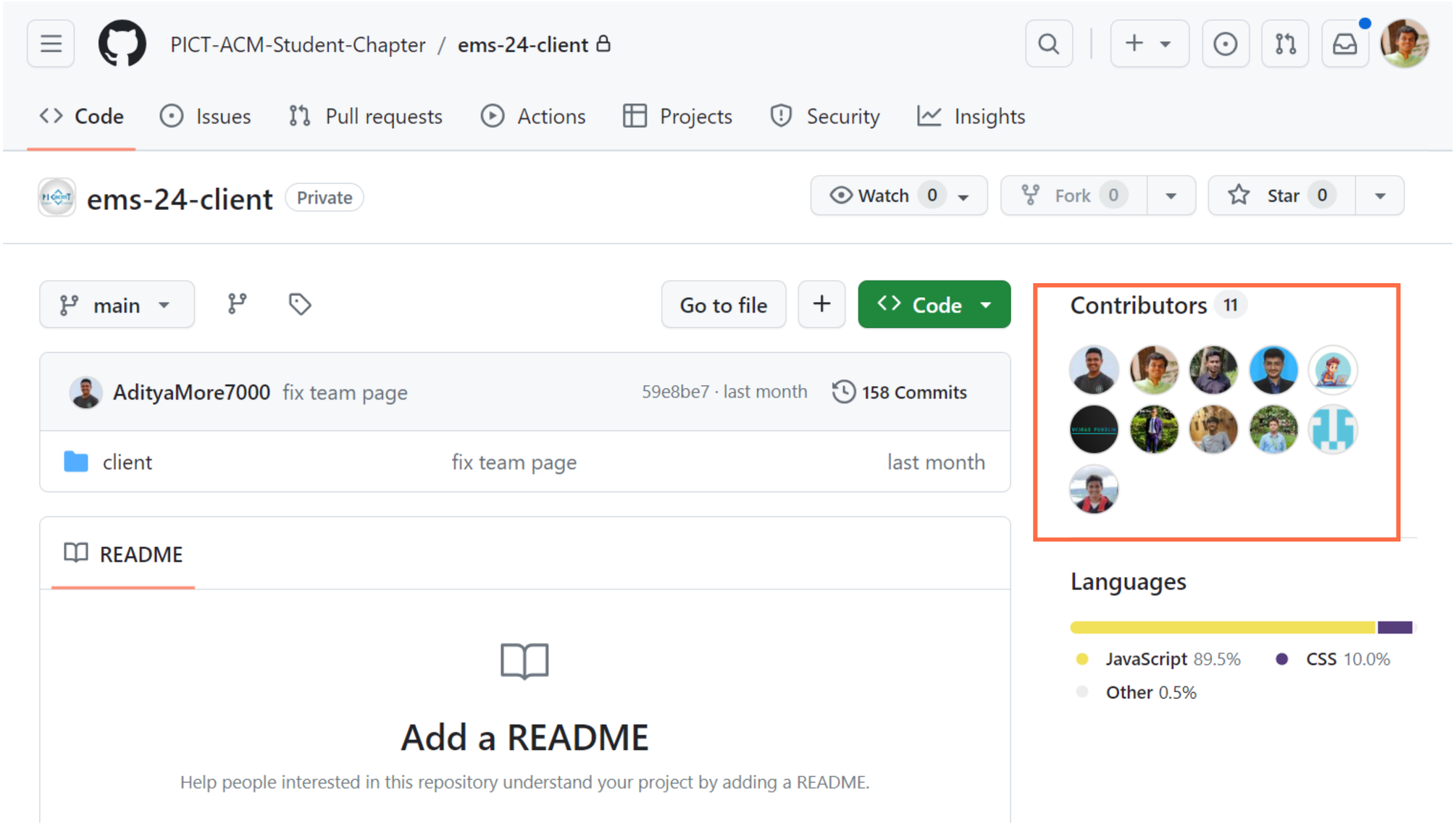
Example: Creating Github Repo

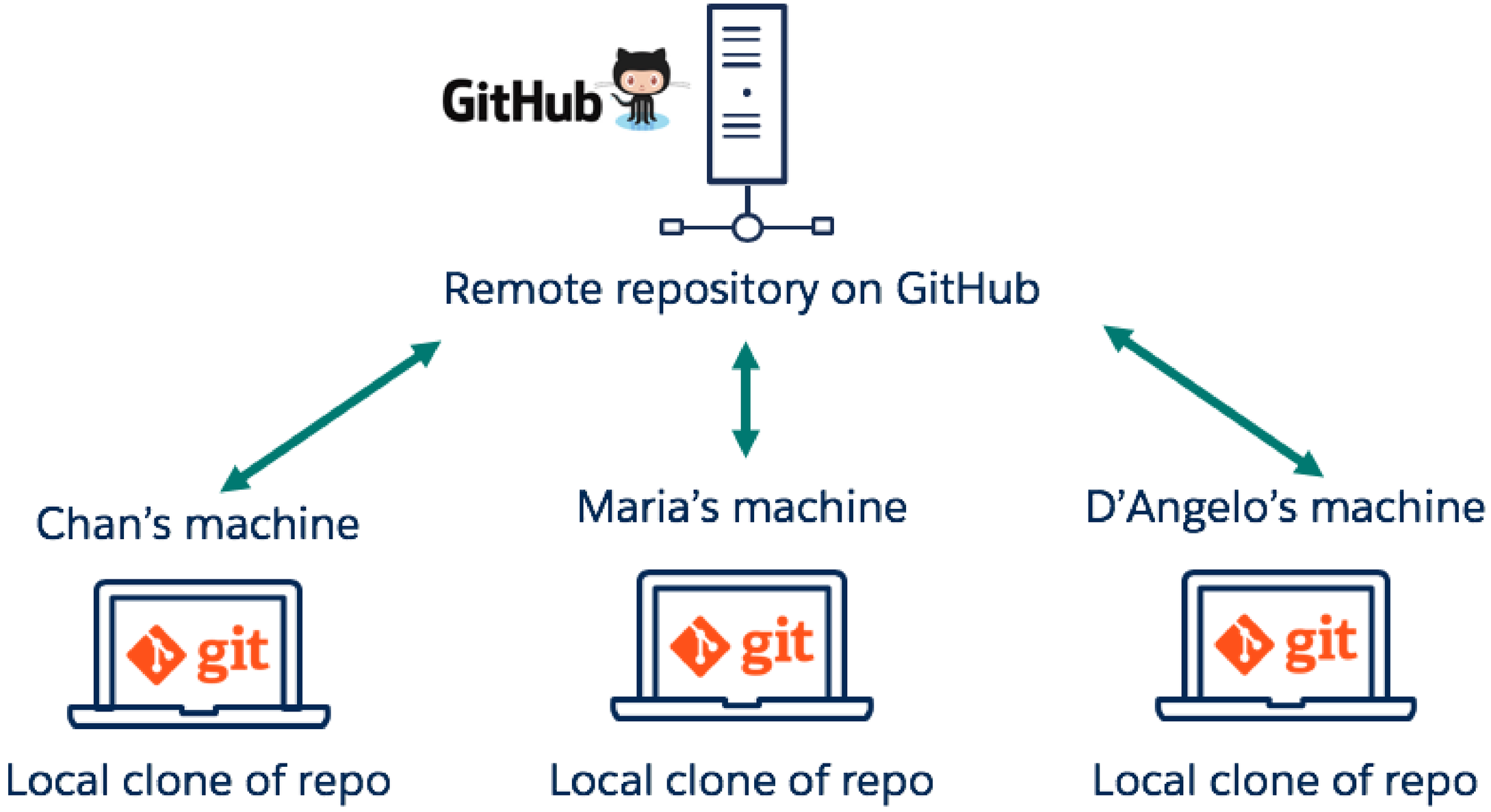


Example: Adding code to Remote Repo



05. Collaboration




GitHub
Remote repository on GitHub
Chan's machine
Maria's machine
D'Angelo's machine
git
git
git
Local clone of repo
Local clone of repo
Local clone of repo

06. Doubts Resolution

Your Turn!

Ask your doubts....