

**Source Code Lab**

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**Section: CSE**

**Course: Source Code Lab**

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Amity School of   
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| **SI** | **Topic** | **Date** | **Pg No** |
| **1** | **Git & GitHub Fundamentals-** Install Git & GitHub- Basic Linux Commands, File Operations, Git Installation | **31-01-2025** |  |
| **2** | **Committing & Viewing History-** Understanding Commits- Viewing Git Logs, Comparing changes | **14-02-2025** |  |
| **3** | **Remote Repositories-** Pushing Local Repos to GitHub | **07-03-2025** |  |
| **4** | **Branching & Version Comparison-** Creating & Managing Branches- Using git diff | **16-05-2025** |  |
| **5** | **Collaboration & Conflict Resolution-Forking, Clone** Inducing & Resolving Conflicts- Opening & Closing Pull Requests | **21-05-2025** |  |

1. **Git & GitHub Fundamentals**

**Git Installation**

 Downloaded **Git** from the official website: <https://git-scm.com>

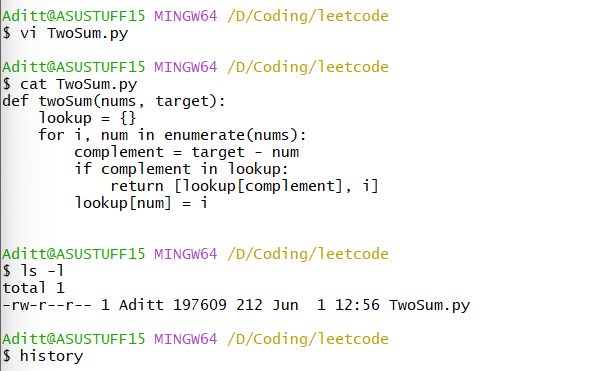
 Ran **the installer** and selected the **default options** during setup

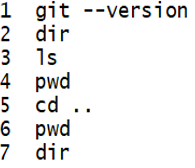
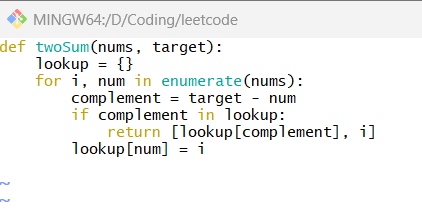
 Completed **installation** and clicked **Finish**

 Verified **installation** by running: git --version

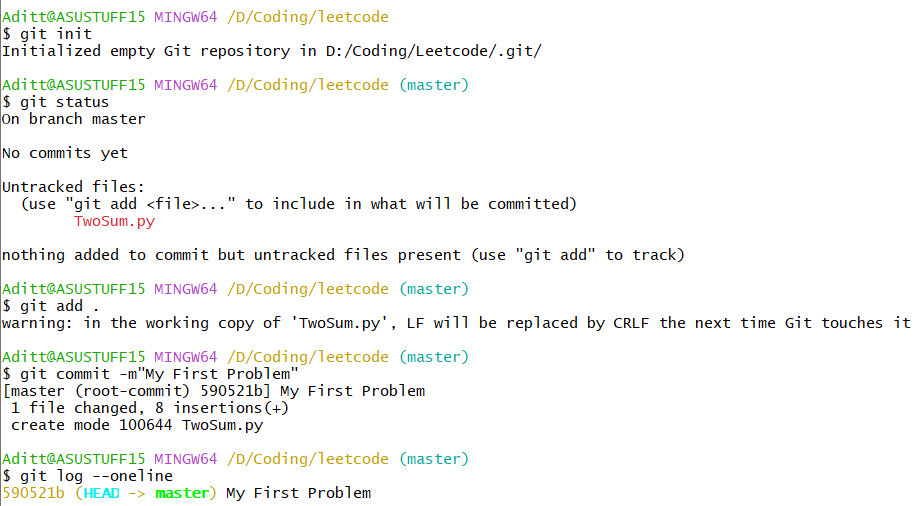
* **Basic Linux Commands**
* ls – List directory contents
* ls -ah – List all files including hidden ones
* pwd – Print working directory
* cd .. – Move to the parent directory
* mkdir – Create a new directory
* cd <folder> – Change into a directory

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* **File Operations**
* vi <filename> – Open file in vi editor
  + Press i to insert
  + Press Esc to exit insert mode
  + Use : wq to save and quit
* cat <filename> – Display contents of a file
* ls -l – Show file permissions and details
* history – Show command history
* clear – Clear the terminal screen

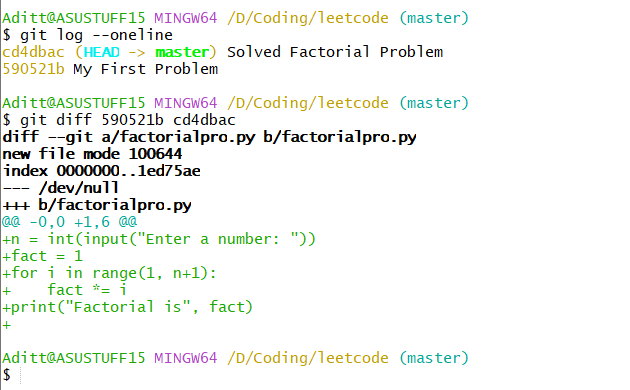


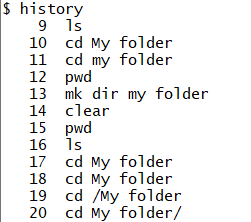
* **Git Initialization**
* git init – Initialize a Git repository
* git status – Show the working tree status
* git add <filename> – Stage a file for commit
* git commit -m "message" – Commit changes with a message

 Configure Git with your email and username

1. **Committing & Viewing History**

**Comparing Changes:**

git diff: Show changes between commits, commit and working tree, etc.

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**3.Push Local Repository to GitHub (Remote)**

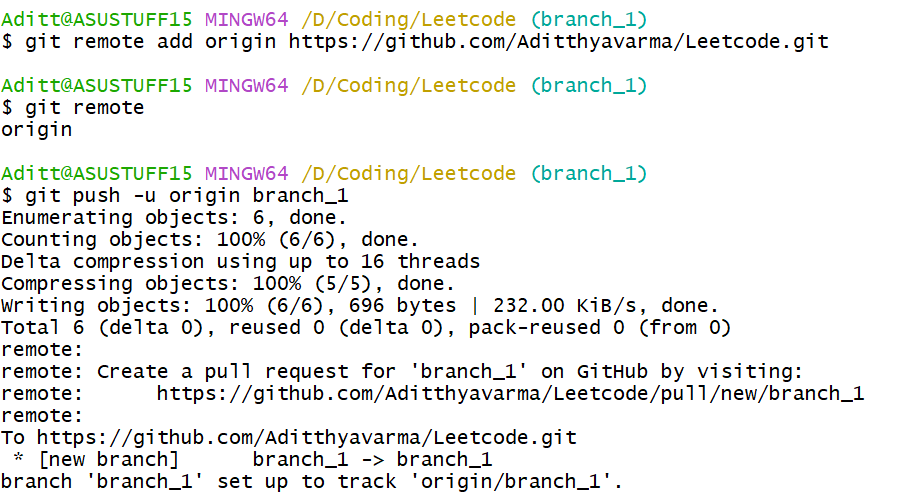
**Linking Local to Remote Repository:**

\* git remote: Helps connect your local repository to a remote repository

\* git remote add origin "[address of repo GitHub]": Add a new remote repository. (e.g.,https://github.com/Aditthyavarma/Leetcode/pull/new/branch\_1). origin is a common variable name but can be anything.

\* git push -u origin master: Push local master branch to the origin remote. The -u flag sets the upstream. This is used when there's only one branch.

\* git push -u origin [branch name]: Push a specific local branch to the remote.

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* 1. **Branching & Version Comparison**

**1. Branching:**

\* git branch [branch name]: Create a new branch

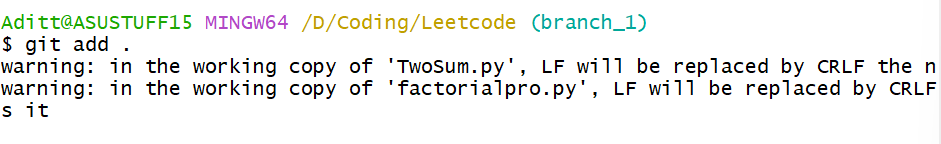
\* git checkout [branch name]: Switch to a different branch

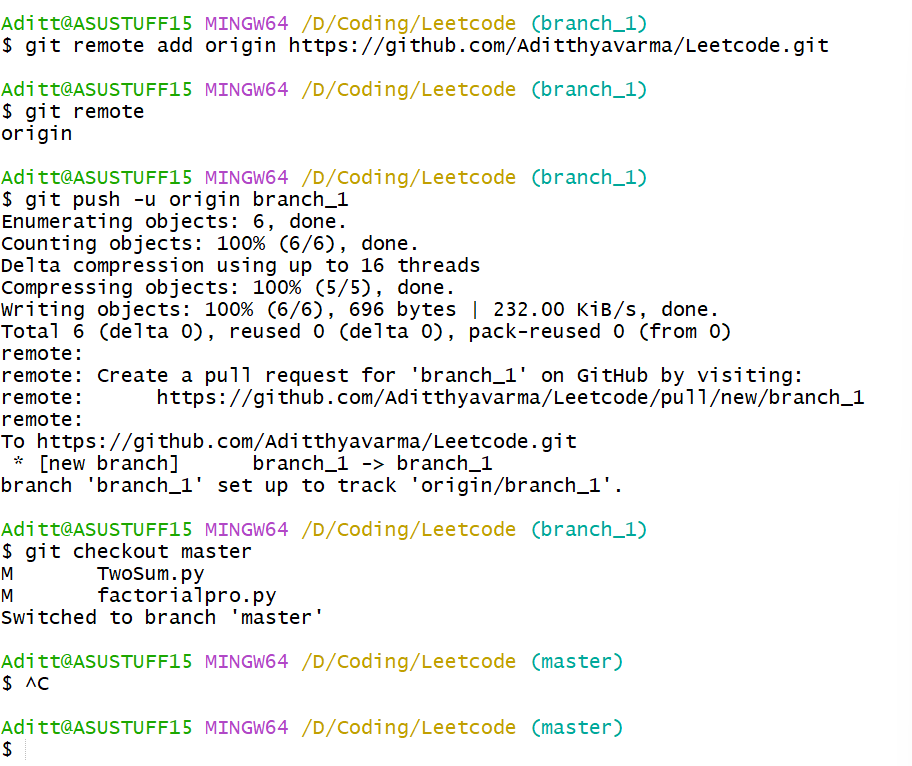
\* git checkout master: Switch back to the master branch

\* **Concept:** Any branch and the master branch can have completely different codebases after many commits in their respective branches.

\* **HEAD:** A special pointer that points to the last commit in the current branch.

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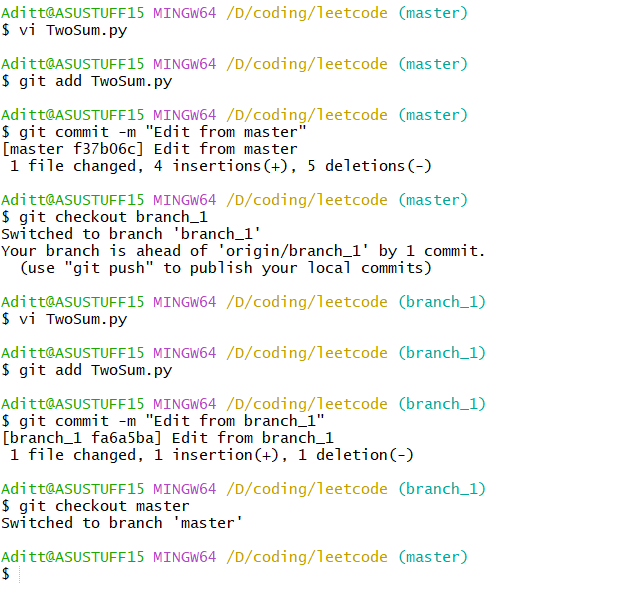
1. **Induce Conflicts, Open and Close Pull Requests** 
   1. **Git Merging & Conflicts:**

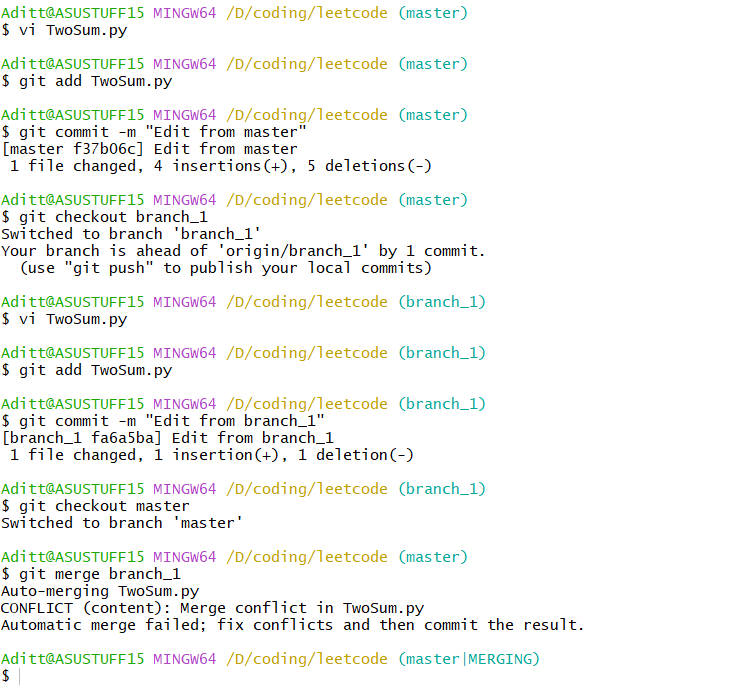
\* git merge: Integrate changes from one branch into another.

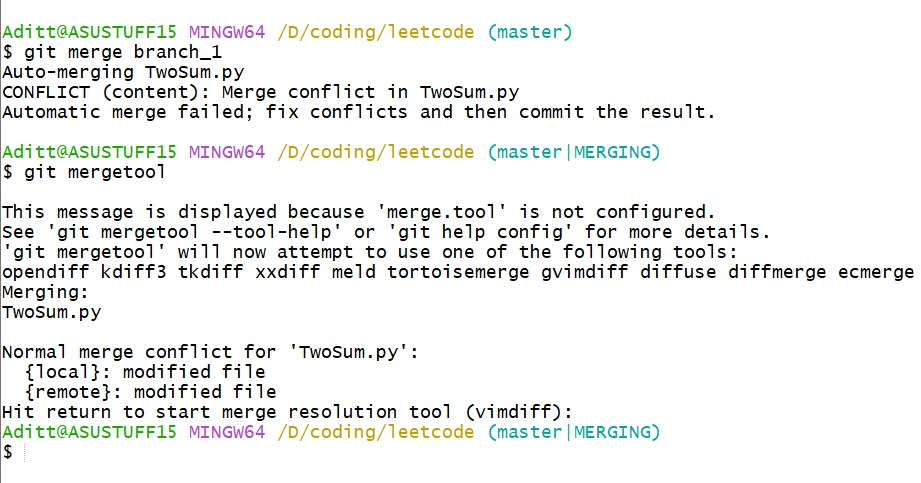
\* Conflicts arise during merging when Git cannot automatically reconcile diverging changes.

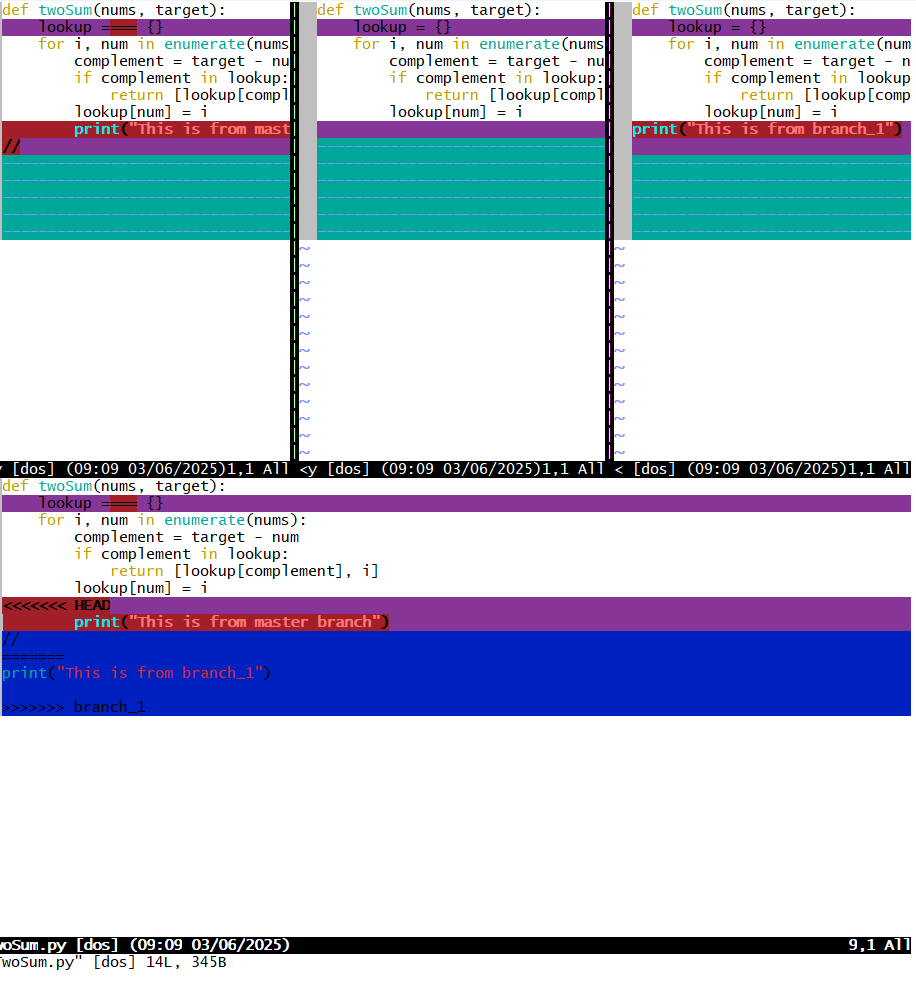
\* Use a merge tool to resolve conflicts.

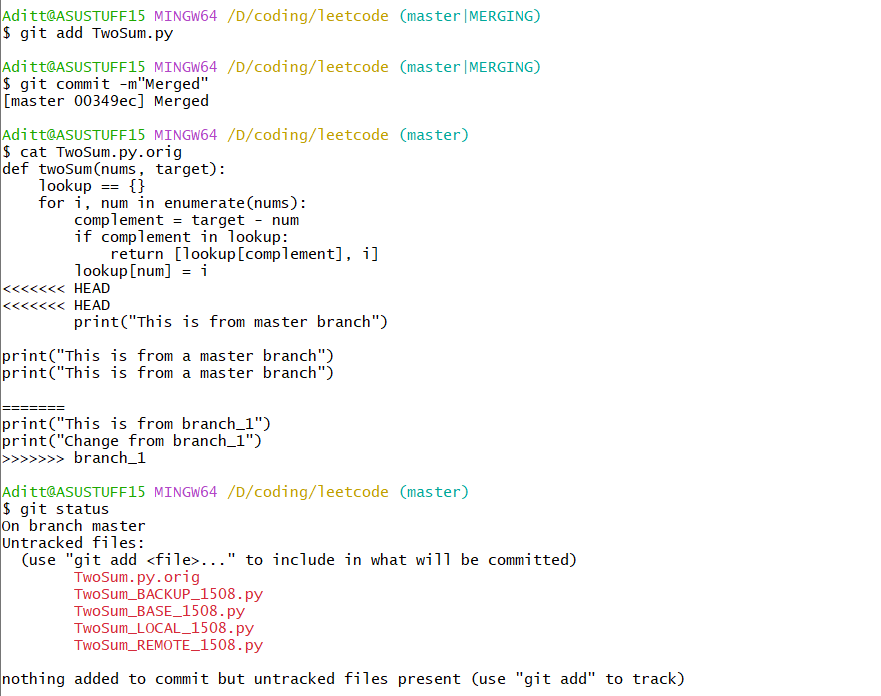
\* git merge tool: Command to launch the configured merge tool.

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2.**Forking**

Forking a repository means creating a personal copy of someone else's project on your own GitHub account. This allows you to freely make changes without affecting the original repository.

How to Fork:

1. Go to the repository you want to fork on GitHub.
2. Click the "Fork" button (top-right).

3. **Git Clone**

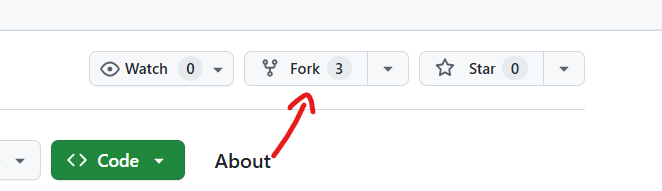
Cloning a repository means downloading the code from a GitHub repo to your local machine.

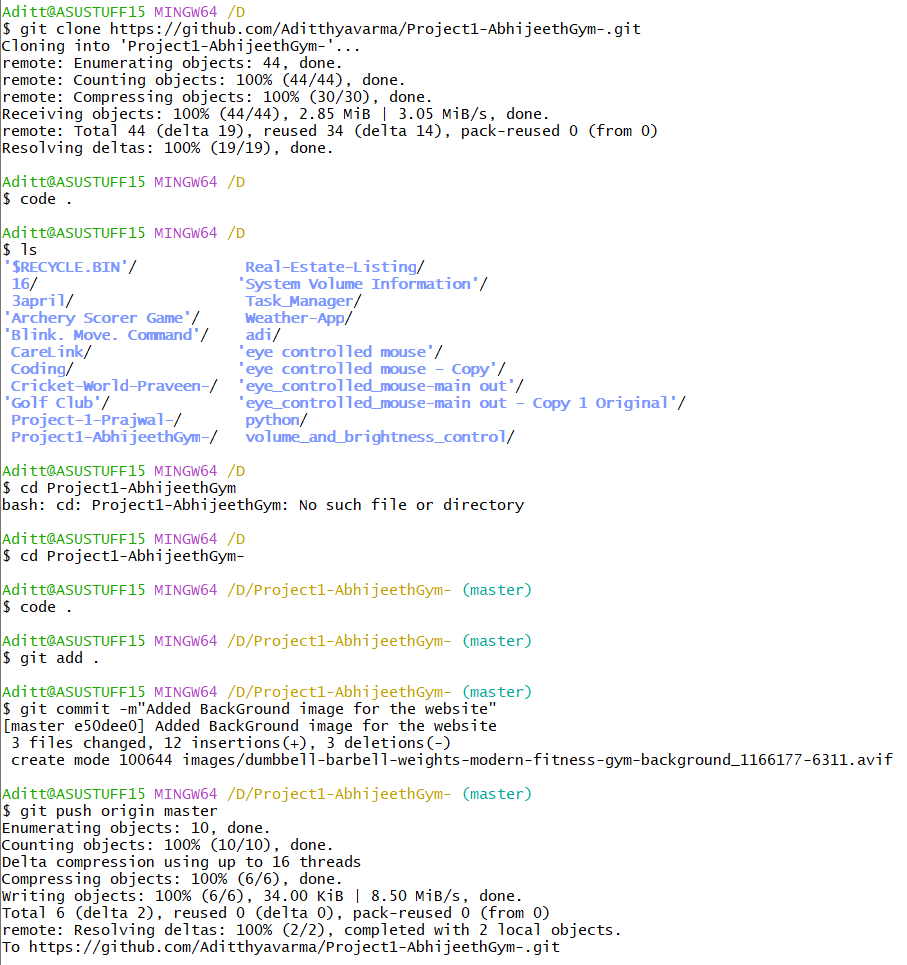
**git clone https://github.com/YOUR-USERNAME/FORKED-REPO.git**

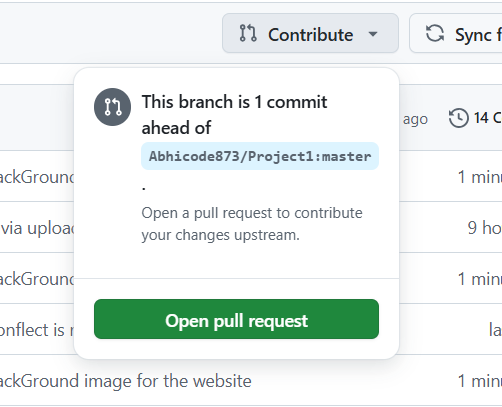
4. **Git ignore**: . gitignore file: Specifies intentionally untracked files that Git should ignore.

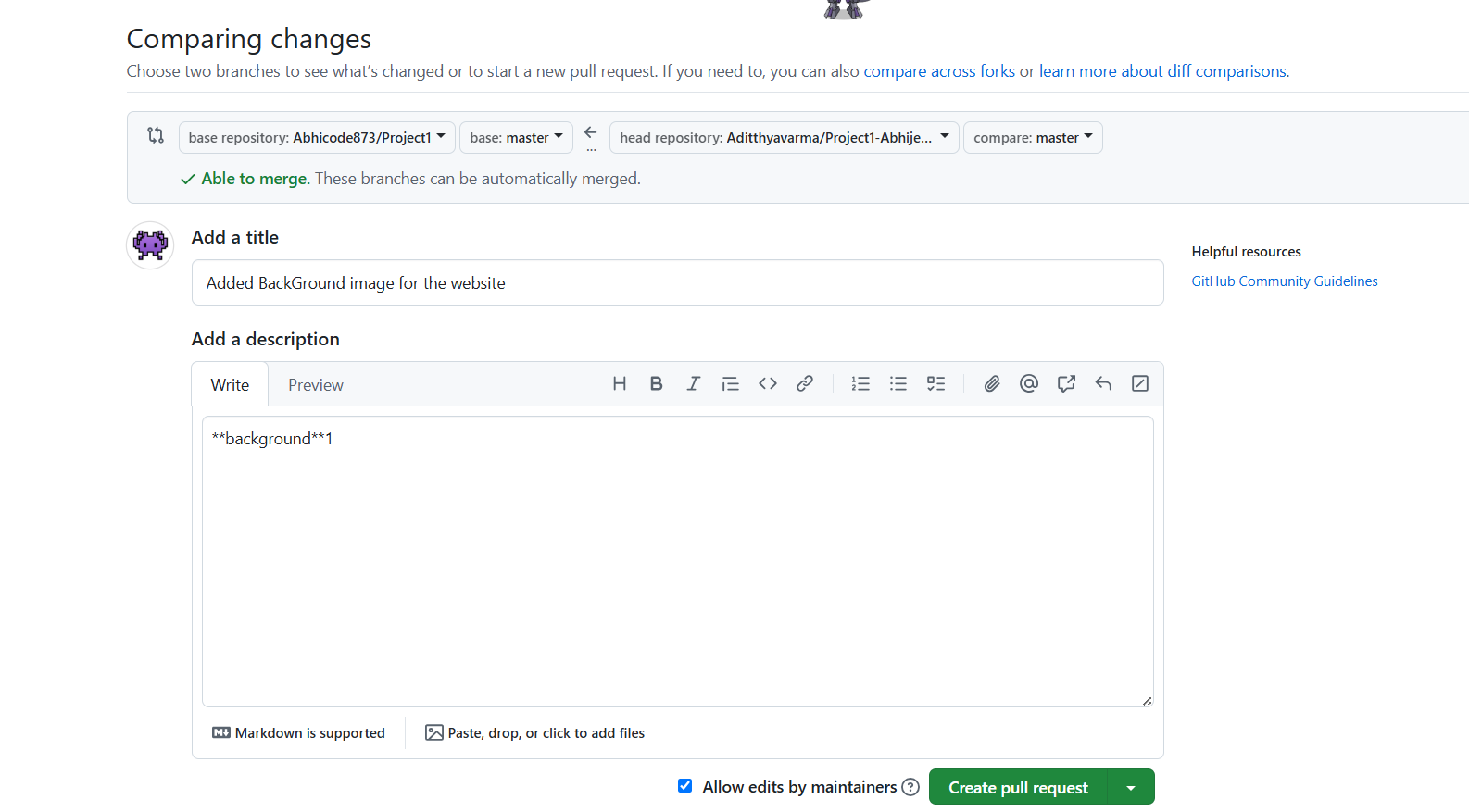
Files listed in .gitignore will not be tracked by Git and will not be mirrored on GitHub.

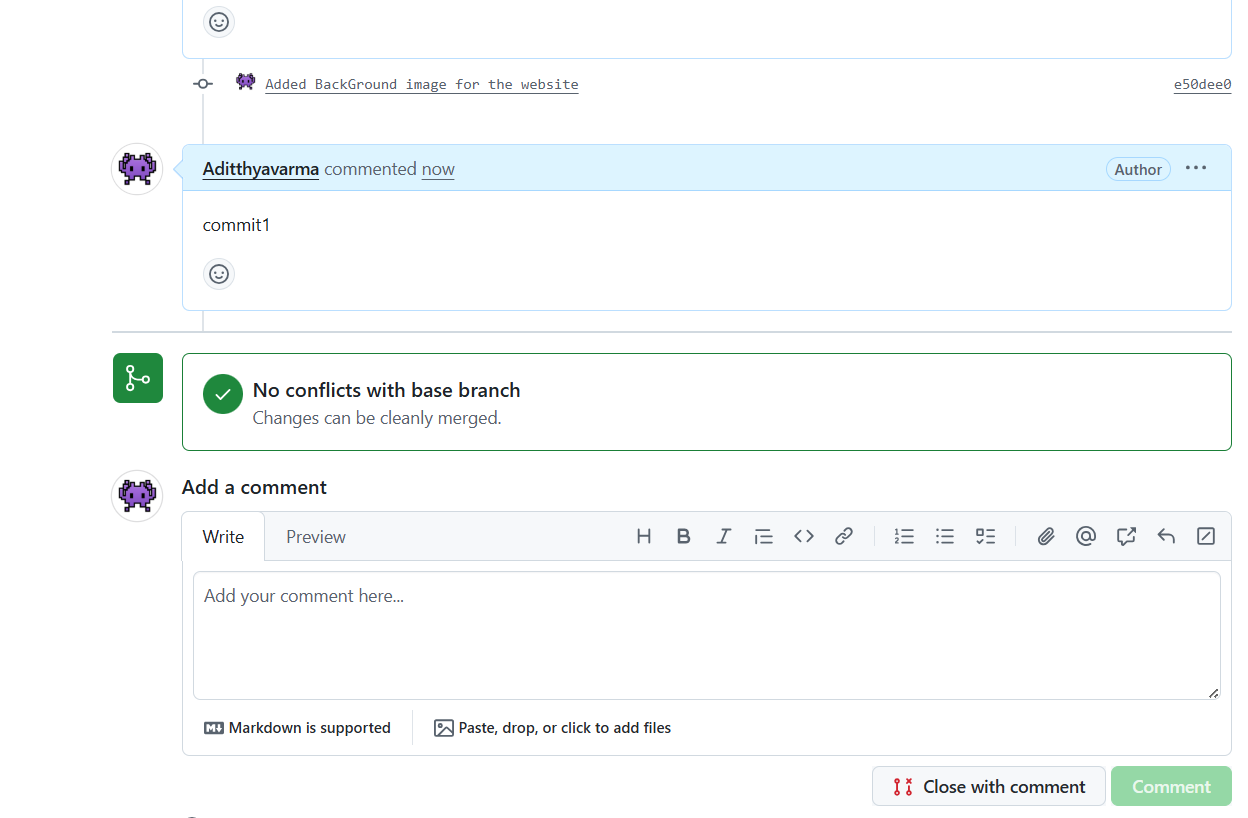
**5. Pull Requests**: \* Opening a pull request

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