

Week 3: Working with Git

Aim:

Practice GIT by creating a repository and demonstrating key commands.

GIT is a version control system that manages project versions and tracks changes.

Initialize a local repo with `git init` and set up a remote repo on GitHub/GitLab. Use `git add <filename>` to stage files. Commit with `git commit -m "Your message"`. Upload to the remote repo using `git push origin main`. On your repo platform, create a pull request to merge branches.

A GIT repository with changes pushed and a pull request created.

Screenshot:

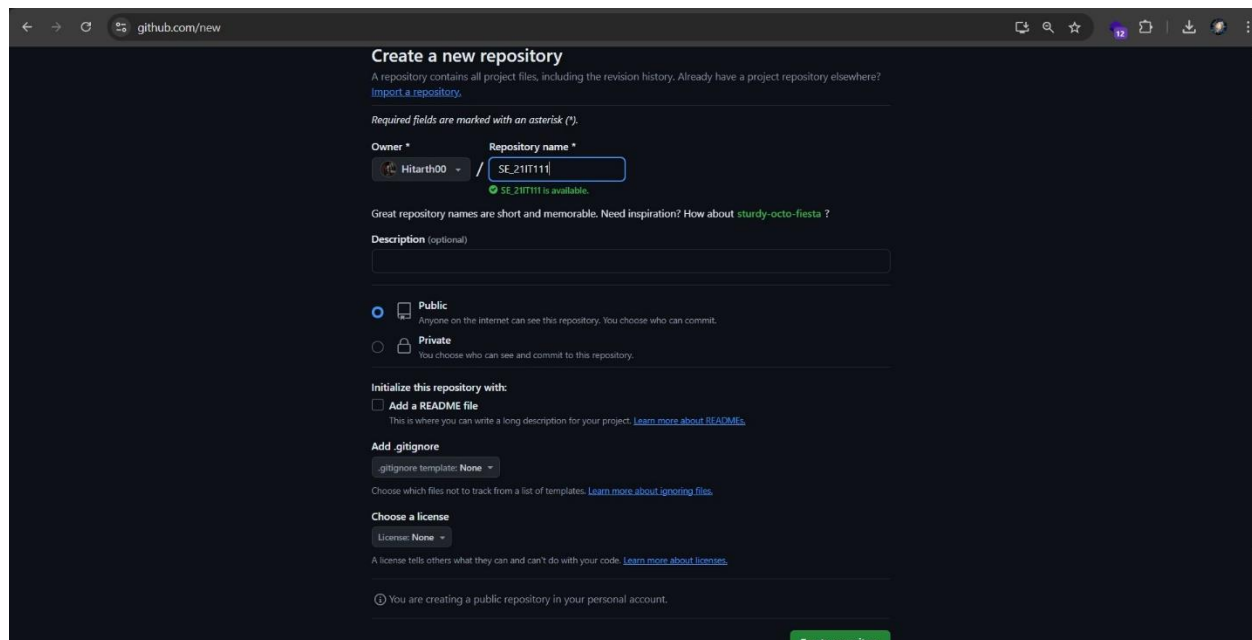


Fig 3.1: Create a new repository in Github

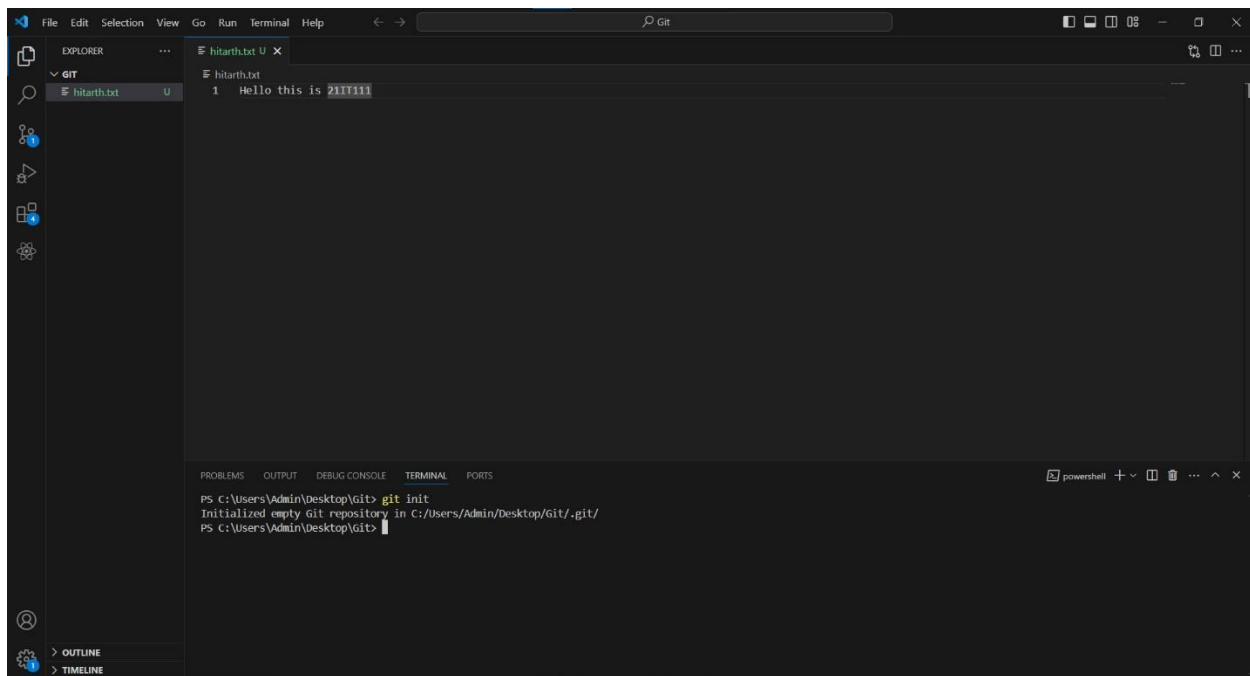


Fig 3.2: *git init*: Clone the repository which is available in the remote git repository to the local machine

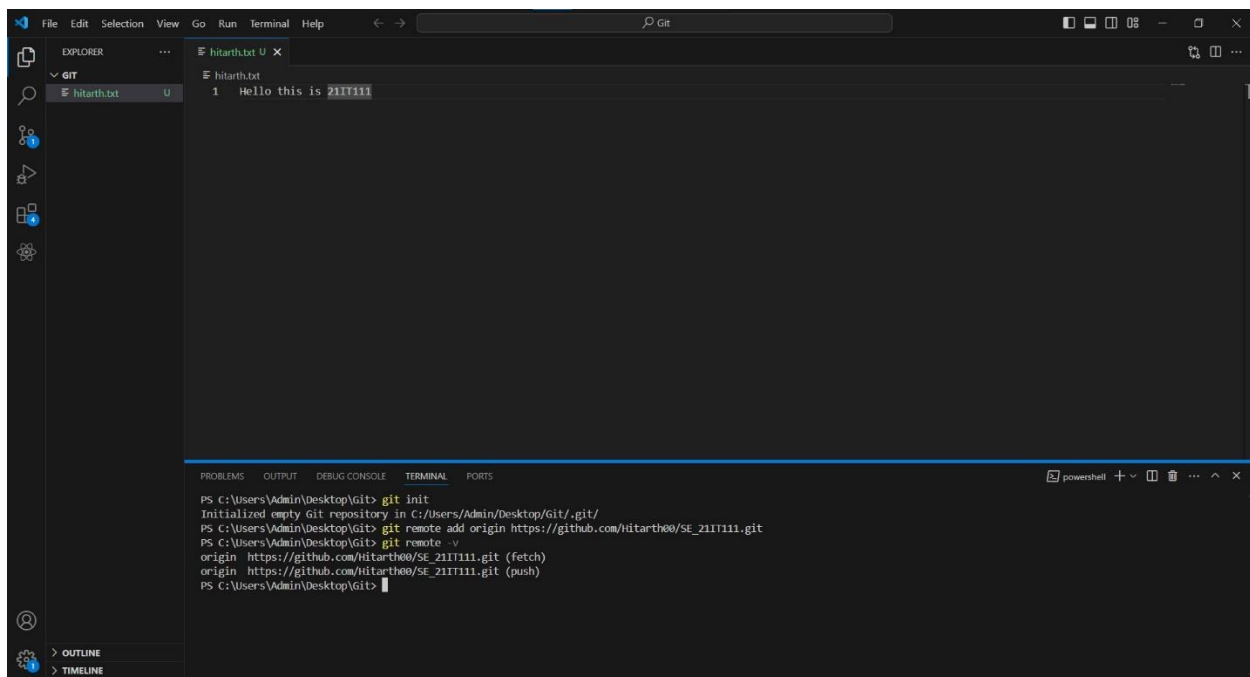
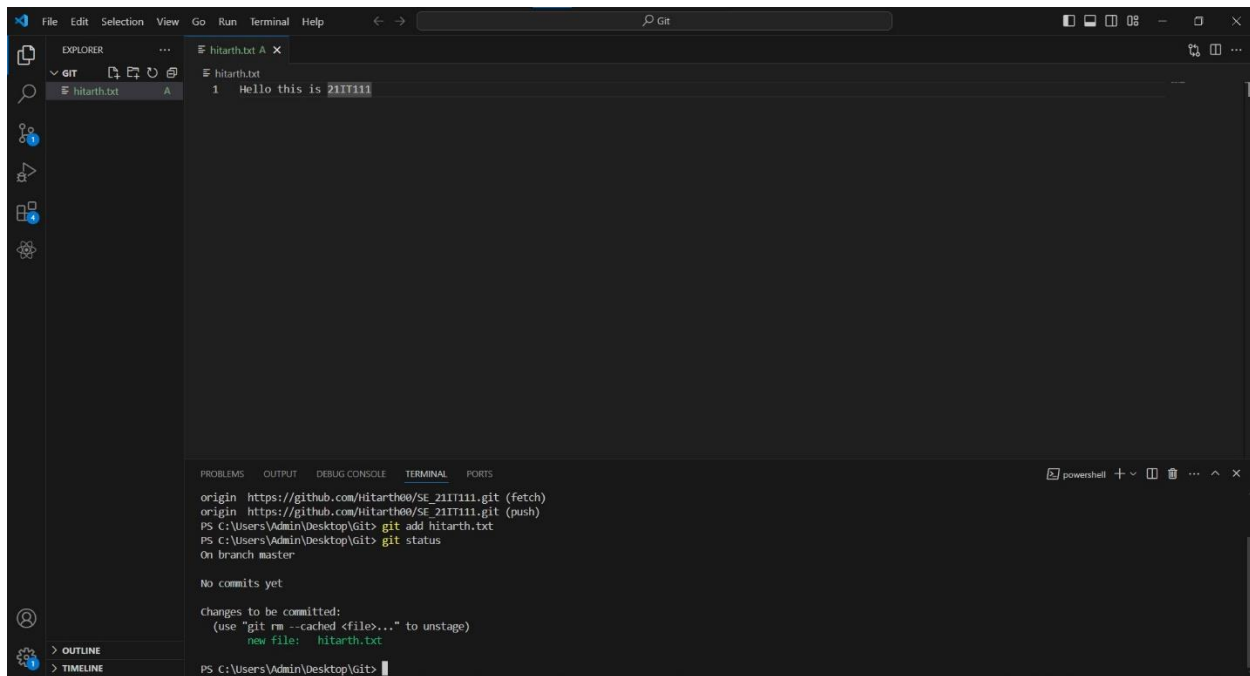


Fig 3.3: *git remote add origin URL*: Add a new remote repository to your local project
git remote -v: Print list of bookmarked repository names and additionally, the corresponding repository URL



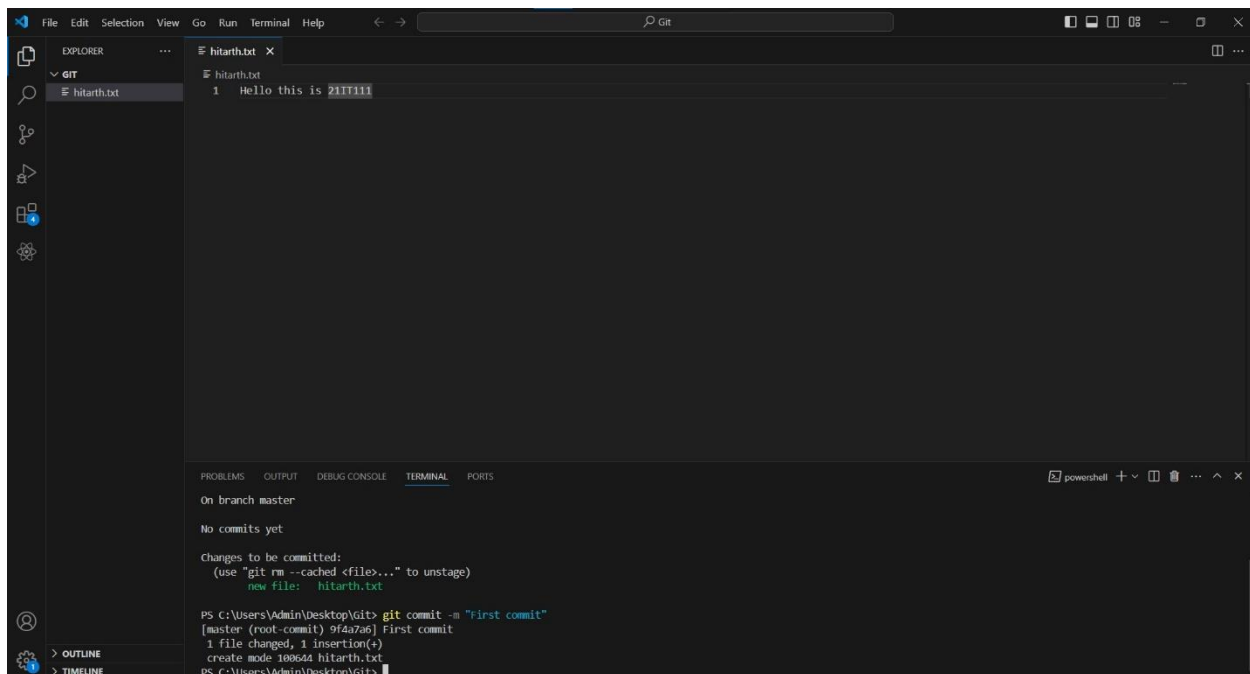
The screenshot shows the Visual Studio Code interface with a file explorer on the left showing 'hitarth.txt'. The main editor displays the content of 'hitarth.txt' as '1 Hello this is 21IT111'. The terminal at the bottom shows the following commands and output:

```
origin https://github.com/Hitarth00/SE_21IT111.git (fetch)
origin https://github.com/Hitarth00/SE_21IT111.git (push)
PS C:\Users\Admin\Desktop\git> git add hitarth.txt
PS C:\Users\Admin\Desktop\git> git status
On branch master

No commits yet

Changes to be committed:
  (use "git rm --cached <file>..." to unstage)
        new file:   hitarth.txt
PS C:\Users\Admin\Desktop\git>
```

Fig 3.4: `git add <filename>`: Add changes in your working directory to the staging area
`git status`: information about the state of the various files in your working directory, also known as the working tree



The screenshot shows the Visual Studio Code interface with the same file explorer and editor as Figure 3.4. The terminal at the bottom shows the following commands and output:

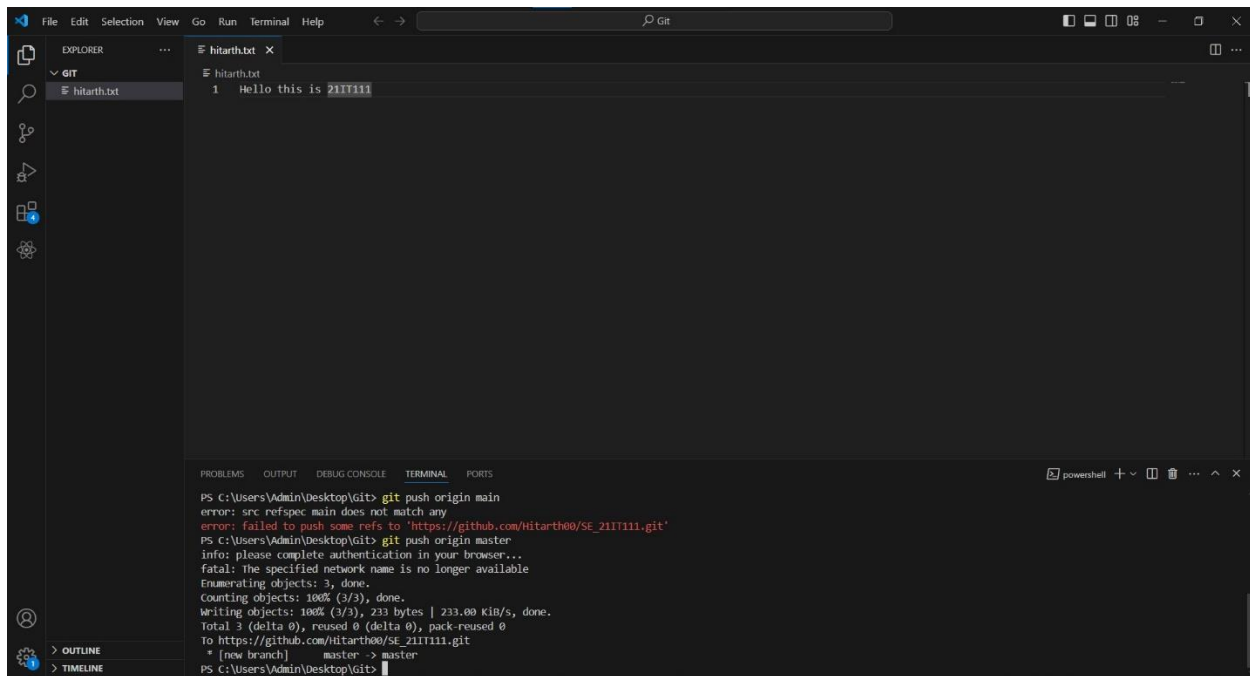
```
On branch master

No commits yet

Changes to be committed:
  (use "git rm --cached <file>..." to unstage)
        new file:   hitarth.txt

PS C:\Users\Admin\Desktop\git> git commit -m "First commit"
[master (root-commit) 9f4a7a6] First commit
 1 file changed, 1 insertion(+)
 create mode 100644 hitarth.txt
PS C:\Users\Admin\Desktop\git>
```

Fig 3.5: `git commit -m "<message>"`: Commits the staged changes to the local repository with a descriptive commit message specified by "`<message>`"



The screenshot shows the Visual Studio Code interface. The Explorer pane on the left shows a file named `hitarth.txt` under a `git` folder. The main editor area shows the content of `hitarth.txt`:
1 Hello this is 21IT111
The bottom panel shows the Terminal with the following output:
PS C:\Users\Admin\Desktop\git> git push origin main
error: src refspec main does not match any
error: failed to push some refs to 'https://github.com/Hitarth00/SE_21IT111.git'
PS C:\Users\Admin\Desktop\git> git push origin master
info: please complete authentication in your browser...
fatal: the specified network name is no longer available
Enumerating objects: 3, done.
Counting objects: 100% (3/3), done.
Writing objects: 100% (3/3), 233 bytes | 233.00 KiB/s, done.
Total 3 (delta 0), reused 0 (delta 0), pack-reused 0
To https://github.com/Hitarth00/SE_21IT111.git
* [new branch] master -> master
PS C:\Users\Admin\Desktop\git>

Fig 3.6: *git push origin master*: Push the committed changes from the local master branch to the remote repository's master branch on the origin remote

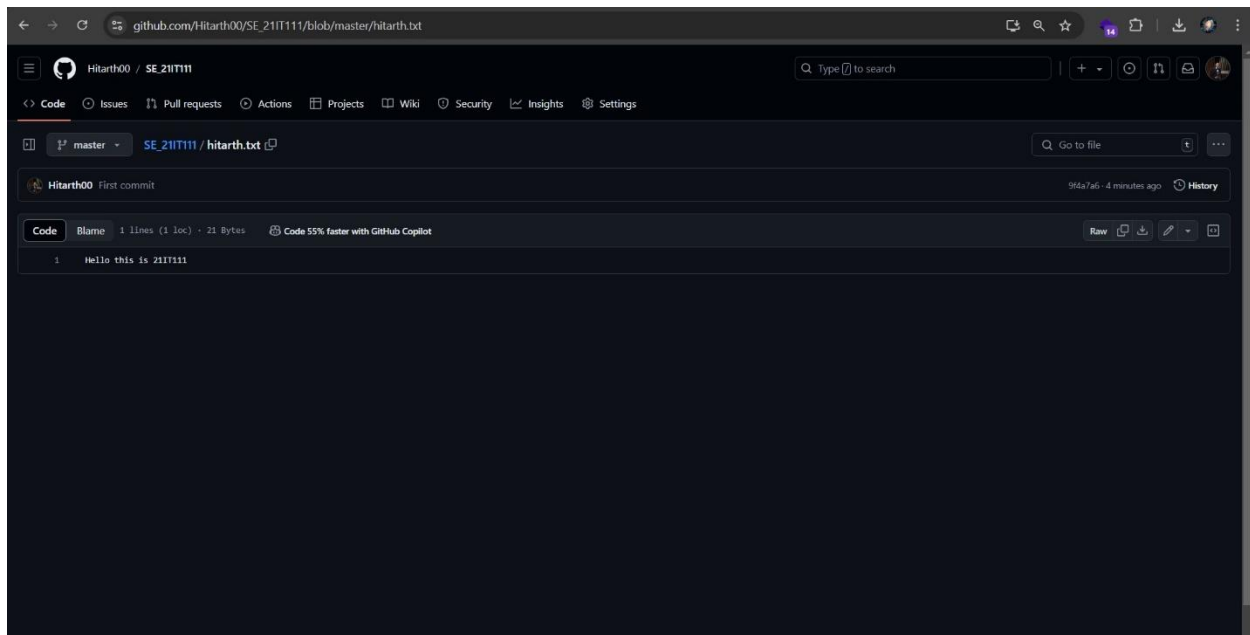
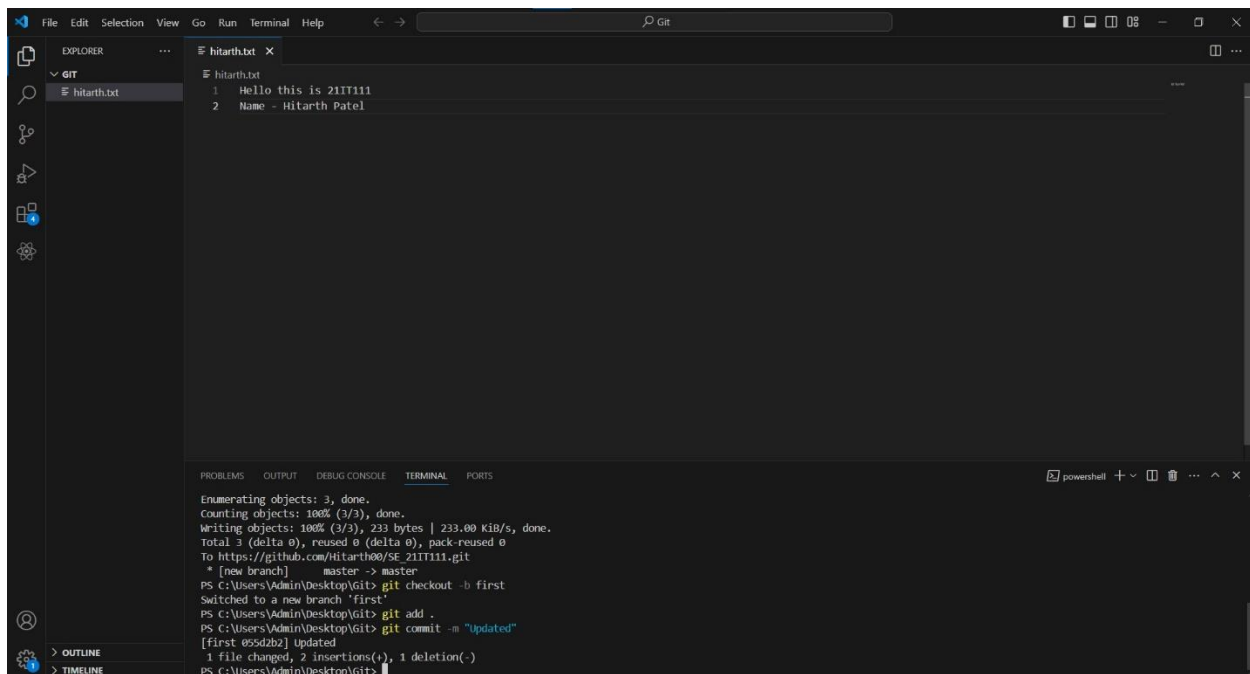


Fig 3.7: The file is pushed to the remote repository



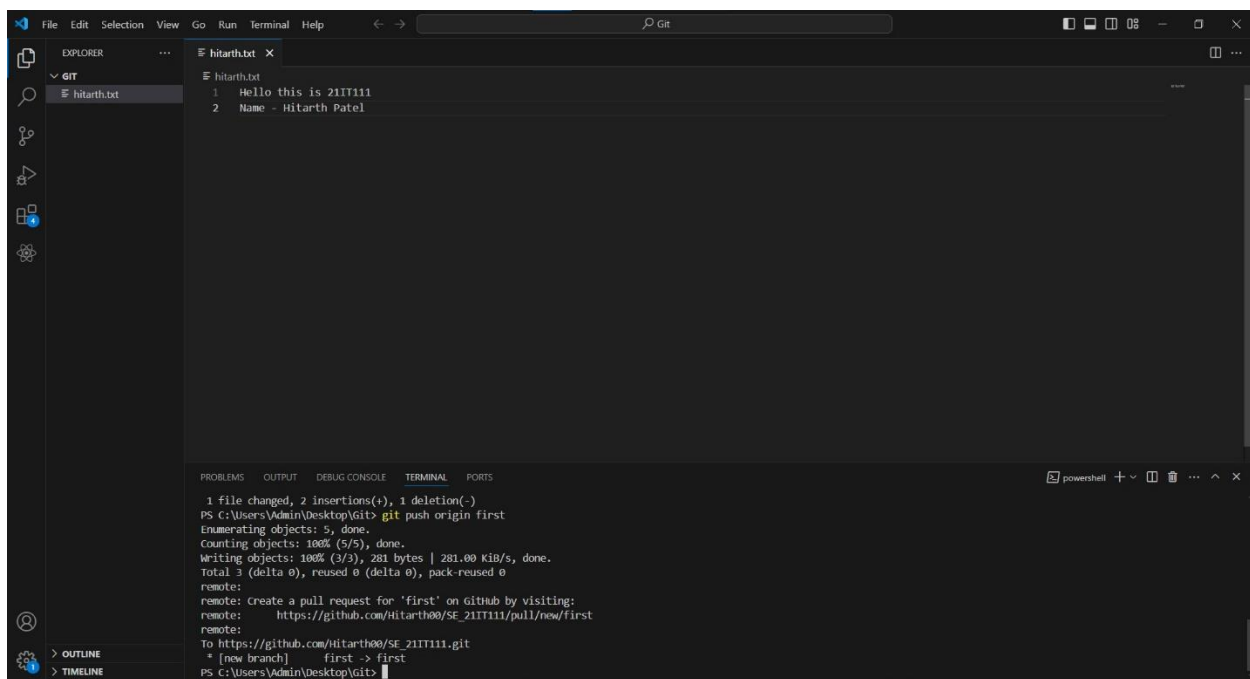
The screenshot shows the Visual Studio Code interface with a file explorer on the left showing a project named 'git' containing a file 'hitarth.txt'. The file content is:

```
1 Hello this is 21IT111
2 Name - Hitarth Patel
```

The terminal at the bottom shows the following commands and output:

```
Enumerating objects: 3, done.
Counting objects: 100% (3/3), done.
Writing objects: 100% (3/3), 233 bytes | 233.00 KiB/s, done.
Total 3 (delta 0), reused 0 (delta 0), pack-reused 0
To https://github.com/Hitarth00/SE_21IT111.git
* [new branch] master -> master
PS C:\Users\Admin\Desktop\git> git checkout -b first
Switched to a new branch 'first'
PS C:\Users\Admin\Desktop\git> git add .
PS C:\Users\Admin\Desktop\git> git commit -m "Updated"
[first 055d2b2] Updated
1 file changed, 2 insertions(+), 1 deletion(-)
```

Fig 3.8: *git checkout -b new*: Create and switch to a new branch named new
git add .: Stage all the changes in the current directory for the next commit
git commit -m "<message>": Commit the staged changes with a descriptive commit message provided in "<message>"



The screenshot shows the Visual Studio Code interface with the same file explorer and file content as Figure 3.8. The terminal at the bottom shows the following commands and output:

```
1 file changed, 2 insertions(+), 1 deletion(-)
PS C:\Users\Admin\Desktop\git> git push origin first
Enumerating objects: 5, done.
Counting objects: 100% (5/5), done.
Writing objects: 100% (3/3), 281 bytes | 281.00 KiB/s, done.
Total 3 (delta 0), reused 0 (delta 0), pack-reused 0
remote:
remote: Create a pull request for 'first' on GitHub by visiting:
remote:   https://github.com/Hitarth00/SE_21IT111/pull/new/first
remote:
To https://github.com/Hitarth00/SE_21IT111.git
* [new branch] first -> first
PS C:\Users\Admin\Desktop\git>
```

Fig 3.9: *git push origin new*: Push the commits from your local branch named new to the remote repository's branch new, where origin is the alias for the remote repository.

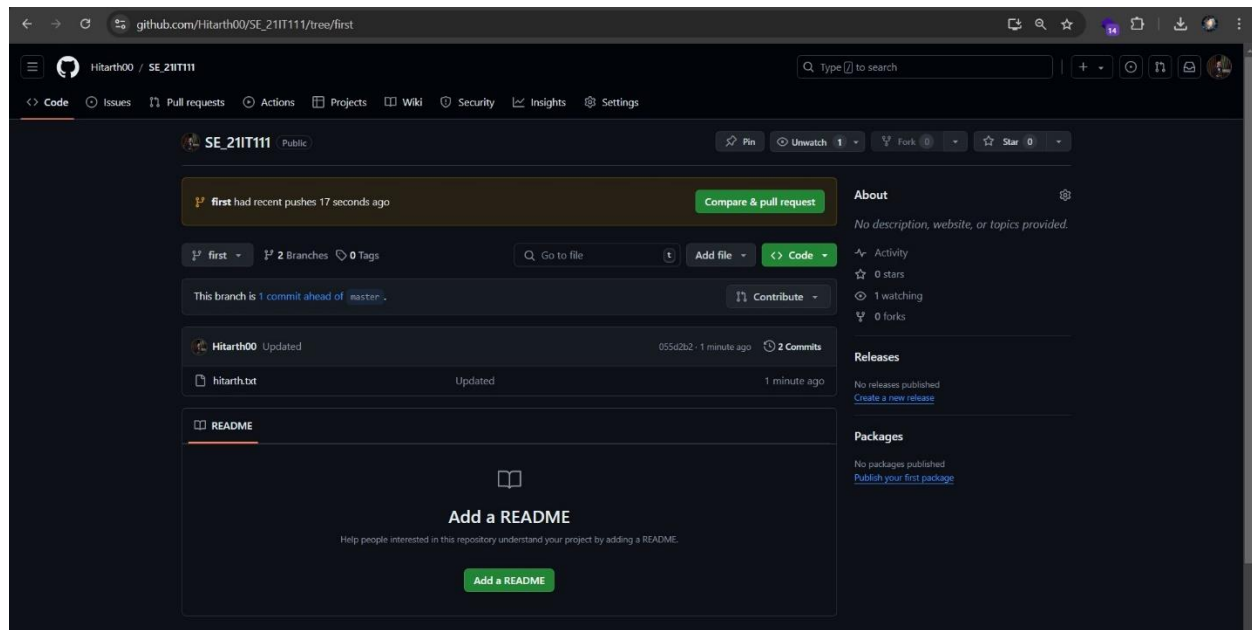


Fig 3.10: A branch named “first” is created

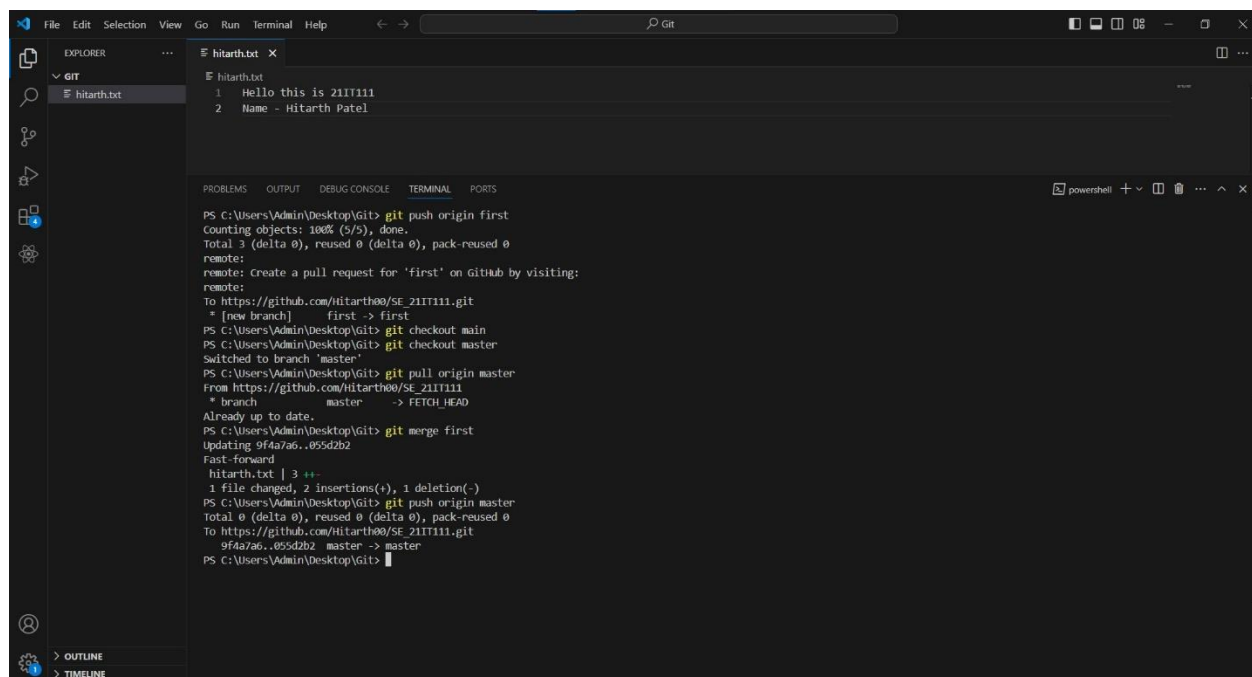


Fig 3.11: *git checkout master*: Switch to the master branch in your local repository.
git pull origin master: Fetch and merge changes from the master branch on the remote repository (origin) into your local master branch.
git merge new: Merge changes from the new branch into the current branch
git push origin master: Push your local master branch changes to the remote master branch on the remote repository (origin).

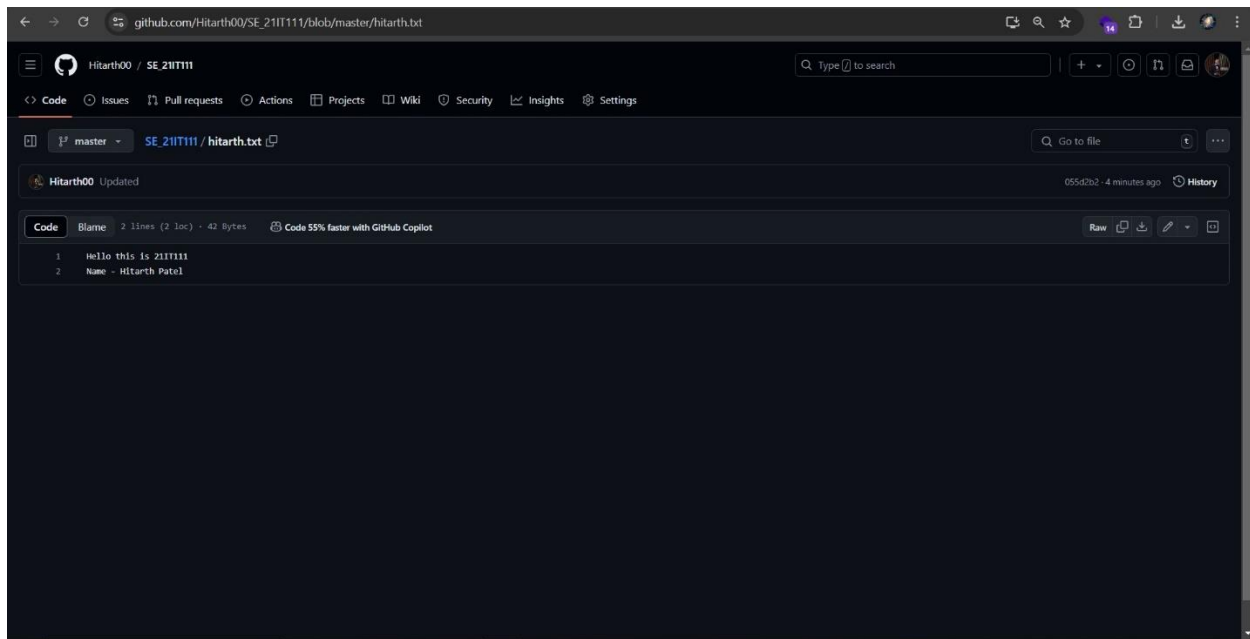


Fig 3.12: Open the text file present in the master branch, you can observe that added content is also present

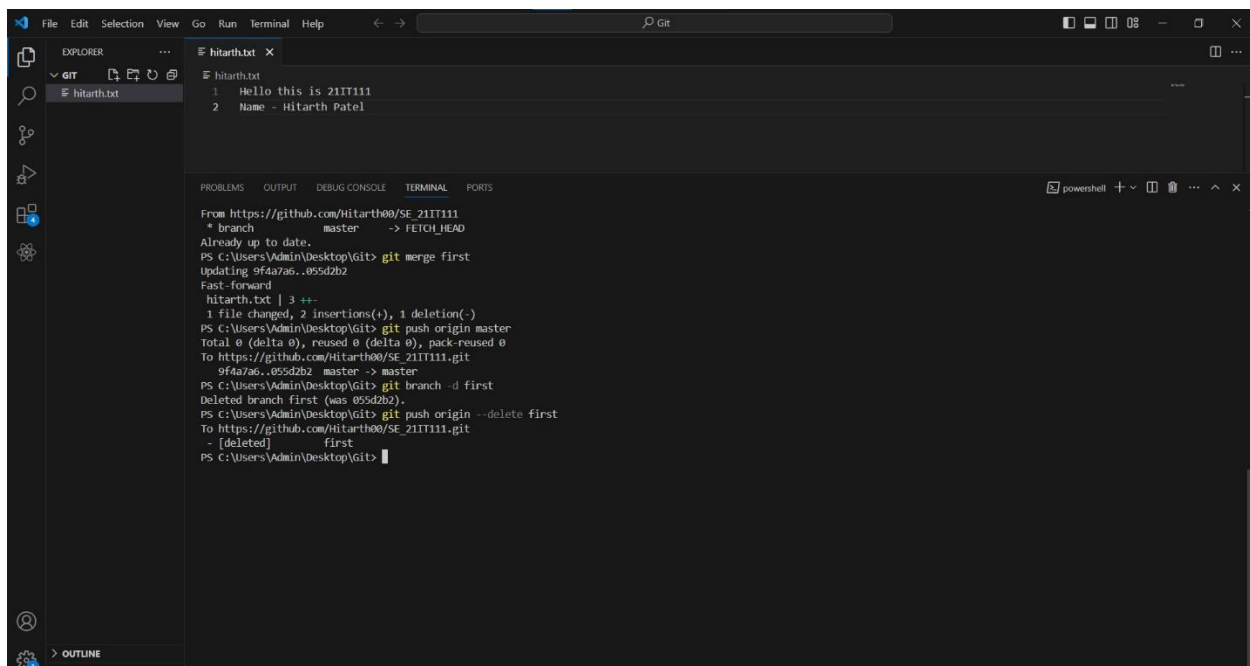


Fig 3.13: *git branch -d:* Delete the specified local branch if it has been fully merged
git push origin --delete new: Delete the specified remote branch from the origin repository

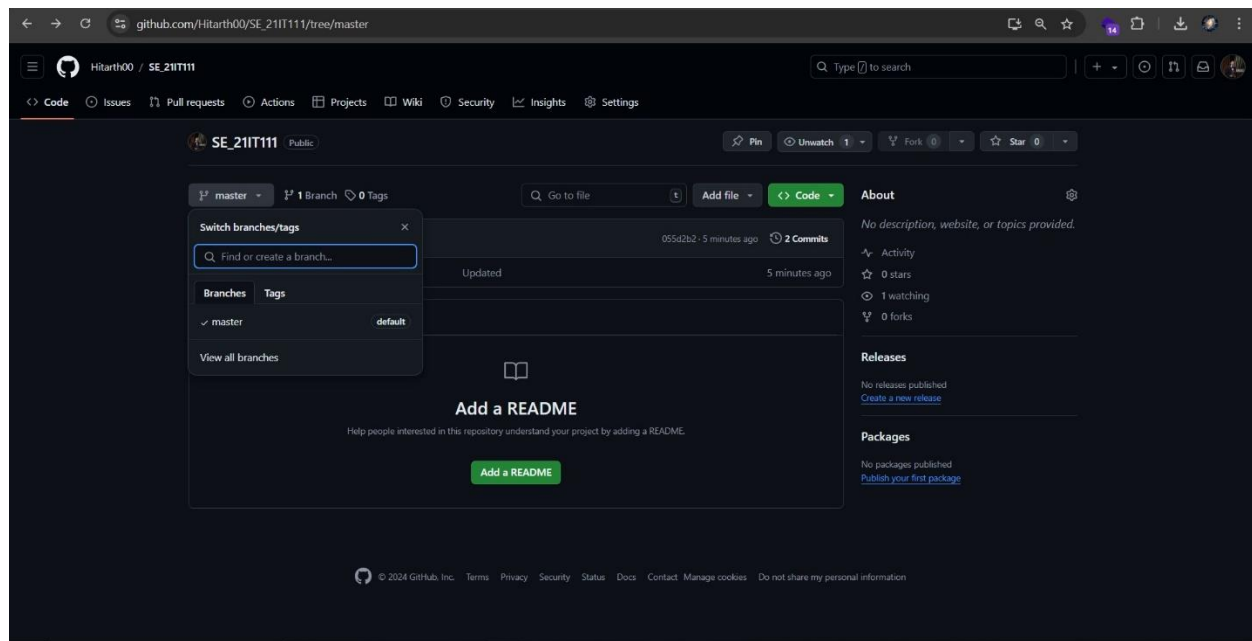


Fig 3.14: New branch deleted

Learning Outcome:

In this practical exercise, I gained practical experience with Git, an effective version control system for managing project versions and tracking changes. I learned to initialize a local repository using `git init` and link it to a remote repository on platforms like GitHub or GitLab. By using `git add <filename>`, I staged changes and then committed them to the repository with descriptive messages using `git commit -m "Your message"`. I also practiced pushing changes to the remote repository with `git push origin main` and learned how to create pull requests for code reviews and branch merging. This practical improved my understanding of Git workflows and collaboration in software development projects.