



**Academic Year: 2025-26**

**Semester: V**

**Class / Branch: TEIT**

**Subject: DevOps Lab**

**Name of Instructor: Ms. Sujata Oak**

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### **Experiment No. 3**

**Aim: To understand and perform version control system / source code management using Git Branch.**

#### **Theory:**

**Branching** means creating a separate line of work in your project so you can make changes without affecting the main version.

It's like making a copy of your project to try new things (like adding a feature or fixing a bug), and then later you can combine your changes back into the main project.

When a repository is created, the files are automatically put in a branch called **main**. Whenever possible it is recommended to use branches rather than directly updating the main branch. Branching is used so that you can make changes in another area without affecting the main branch. This is done to help prevent accidental updates that might overwrite existing code.

In this lab, students will implement:

- **create a new branch,**
- **checkout the branch,**
- **make changes in the branch,**
- **stage**
- **commit** the branch
- **merge** the branch changes to the main branch, and
- **delete** the branch.

#### **Implementation:**

**STEP1:** Goto your working directory

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```
devasc@labvm:~$ cd Desktop/  
devasc@labvm:~/Desktop$ cd git-sujata/  
devasc@labvm:~/Desktop/git-sujata$ ls  
gitdemo11072025  
devasc@labvm:~/Desktop/git-sujata$ sudo su  
root@labvm:/home/devasc/Desktop/git-sujata# pwd  
/home/devasc/Desktop/git-sujata  
root@labvm:/home/devasc/Desktop/git-sujata#
```

List the files in your working directory:

```
root@labvm:/home/devasc/Desktop/git-sujata# ls -ltr  
total 16  
drwxr-xr-x 7 root root 4096 Jul 10 17:00 .git  
drwxrwxr-x 4 devasc devasc 4096 Jul 10 17:05 .  
drwxr-xr-x 7 devasc devasc 4096 Jul 10 17:58 ..  
drwxr-xr-x 3 root root 4096 Jul 13 10:21 gitdemo11072025  
root@labvm:/home/devasc/Desktop/git-sujata#
```

Change the directory to your git remote repository:

```
root@labvm:/home/devasc/Desktop/git-sujata# cd gitdemo11072025/  
root@labvm:/home/devasc/Desktop/git-sujata/gitdemo11072025# ls  
factorial.py mynewfile name.html
```

**Step2:** Verify Current branch : Use **git branch** command without a branch-name to display all the branches for this repository. Git branch command tells you how many branches you have and you are working on which branch(\*)

The "\*" next to the main branch indicates that this is the current branch

```
root@labvm:/home/devasc/Desktop/git-sujata/gitdemo11072025# git branch  
* main
```

**Step3:** Create a new branch feature: **Feature Branch:** Allows you to develop features, fix bugs, or safely experiment with new ideas in a contained area of your repository

Create a new branch called **featureA** using the **git branch** <branch-name>

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```
root@labvm:/home/devasc/Desktop/git-sujata/gitdemo11072025# git branch featureA
root@labvm:/home/devasc/Desktop/git-sujata/gitdemo11072025# git branch
featureA
* main
```

#### Step 4: Checkout the new branch

Use the **git checkout <branch-name>** command to switch to the *feature* branch.

```
root@labvm:/home/devasc/Desktop/git-sujata/gitdemo11072025# git checkout featureA
Switched to branch 'featureA'
```

#### Step 5: Verify the current branch:

- Verify you have switched to the *feature* branch using the **git branch** command. Note the "\*" next to the *feature* branch. This is now the *working branch*.

```
root@labvm:/home/devasc/Desktop/git-sujata/gitdemo11072025# git branch
* featureA
main
```

Create a file add.py

```
root@labvm:/home/devasc/Desktop/git-sujata/gitdemo11072025# touch add.py
root@labvm:/home/devasc/Desktop/git-sujata/gitdemo11072025# gedit add.py
```

```
root@labvm:/home/devasc/Desktop/git-sujata/gitdemo11072025# cat add.py
# WAP to add two numbers in python??
# Adding two numbers
a = 5
b = 3
sum = a + b

print("The sum is:", sum)
```

#### Step 6: Stage the modified file in the feature branch

A] Stage the updated file to the current *feature* branch.

#git status





```
root@labvm:/home/devasc/Desktop/git-sujata/gitdemo11072025# git status
On branch featureA
Untracked files:
  (use "git add <file>..." to include in what will be committed)
    add.py

nothing added to commit but untracked files present (use "git add" to track)
```

git add add.py

```
root@labvm:/home/devasc/Desktop/git-sujata/gitdemo11072025# git add add.py
```

B] Use the **git status** command and notice the modified file **add.py** is staged in the *feature* branch  
#git status

```
root@labvm:/home/devasc/Desktop/git-sujata/gitdemo11072025# git status
On branch featureA
Changes to be committed:
  (use "git restore --staged <file>..." to unstage)
    new file:   add.py
```

### Step 7: Commit the staged file in the feature branch

A] Commit the staged file using the **git commit** command. Notice the new commit ID and your message.

```
root@labvm:/home/devasc/Desktop/git-sujata/gitdemo11072025# git commit -m "Added add.py
file for commit on 18072025"
[featureA 62e5df1] Added add.py file for commit on 18072025
1 file changed, 7 insertions(+)
create mode 100644 add.py
```

**Step 8:** Use the **git log** command to show all commits including the commit you just did to the *feature* branch.  
The prior commit was done within the *main* branch.



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```
root@labvm:/home/devasc/Desktop/git-sujata/gitdemo11072025# git log
commit 62e5df132fc714e7b55be031f76536f5b1f5163a (HEAD -> featureA)
Author: "sujataoak799" <sujataoak2021@gmail.com>
Date:   Fri Jul 18 09:00:36 2025 +0000

    Added add.py file for commit on 18072025

commit a4f720130f948281bdfc5950541294bec3238838 (main)
Author: "sujataoak799" <sujataoak2021@gmail.com>
Date:   Sun Jul 13 10:23:10 2025 +0000

    Added Info on Branching

commit 650568337cdc24cb0792f83479739de39113efa0
Merge: c62d707 c07059b
Author: "sujataoak799" <sujataoak2021@gmail.com>
Date:   Sun Jul 13 09:59:59 2025 +0000

    Merge branch 'main' of https://github.com/sujataoak799/gitdemo11072025 into main

commit c07059b6d27720f3f9af46e03a8b63df5bb16218 (origin/main, origin/HEAD)
Author: sujataoak799 <79905110+sujataoak799@users.noreply.github.com>
Date:   Sun Jul 13 09:56:31 2025 +0000

    Create mynewfile

    I am committing my mynewfile in remote repository
```

Press a key **q** to exit from git log screen

**Step9:** How to push a **featureA** branch from local repository to remote repository?

#git push --set-upstream origin featureA

```
root@labvm:/home/devasc/Desktop/git-sujata/gitdemo11072025# git push --set-upstream ori
gin featureA
Enumerating objects: 13, done.
Counting objects: 100% (13/13), done.
Delta compression using up to 2 threads
Compressing objects: 100% (9/9), done.
Writing objects: 100% (10/10), 1.35 KiB | 1.35 MiB/s, done.
Total 10 (delta 1), reused 0 (delta 0)
remote: Resolving deltas: 100% (1/1), done.
remote:
remote: Create a pull request for 'featureA' on GitHub by visiting:
remote:   https://github.com/sujataoak799/gitdemo11072025/pull/new/featureA
remote:
To https://github.com/sujataoak799/gitdemo11072025
 * [new branch]      featureA -> featureA
Branch 'featureA' set up to track remote branch 'featureA' from 'origin'.
```

Goto github.com account → Refresh the page



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The screenshot shows the GitHub interface for the repository 'gitdemo11072025' by user 'sujataoak799'. A yellow banner at the top of the repository content area states 'featureA had recent pushes 3 minutes ago'. Below this, the repository files are listed: 'README.md' (Initial commit, last week), 'factorial.py' (first file added, last week), and 'mynewfile' (Create mynewfile, 5 days ago). The right sidebar displays repository statistics: 'About' (setting a git demoto c local to remote and vi), 'Readme', 'Activity', '0 stars', '0 watching', and '0 forks'. The 'Releases' section shows 'No releases published' and a link to 'Create a new release'.

Select featureA branch. You see the same contents in featureA branch as was in main branch.



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← → ↺ 🔍 github.com/sujataoak799/gitdemo11072025/tree/feat...

🔗 featureA had recent pushes 3 minutes ago [Compare & pull request](#)

🔗 featureA 🔗 🔍 Go to file t + <> Code ▾

This branch is 4 commits ahead of main. 🔗 Contribute ▾

🟢 sujataoak799	Added add.py file for commit on 18072025	62e5df1 · 5 hours ago	🕒 7 Commits
📄	add.py	Added add.py file for commit on 180...	5 hours ago
📄	factorial.py	first file added	last week
📄	mynewfile	Added Info on Branching	5 days ago
📄	name.html	Added Info on Branching	5 days ago

📖 README

📖

**Add a README**

Click on view all branch:





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Branch	Updated	Check status	Behind	Ahead	Pull request
main	5 days ago			Default	
featureA	5 minutes ago		0	4	

Click on add.py file to see the contents of add.py

```
1 # WAP to add two numbers in python???
2 # Adding two numbers
3 a = 5
4 b = 3
5 sum = a + b
6
7 print("The sum is:", sum)
```

Now in local repository in featureA branch create 3 files:





```
root@labvm:/home/devasc/Desktop/git-sujata/gitdemo11072025# git branch
* featureA
  main
root@labvm:/home/devasc/Desktop/git-sujata/gitdemo11072025# touch featureA-1
root@labvm:/home/devasc/Desktop/git-sujata/gitdemo11072025# touch featureA-2
root@labvm:/home/devasc/Desktop/git-sujata/gitdemo11072025# touch featureA-3
root@labvm:/home/devasc/Desktop/git-sujata/gitdemo11072025# ls
add.py  factorial.py  featureA-1  featureA-2  featureA-3  mynewfile  name.html
```

Suppose the developers, they are done with their coding.  
Now they want to **merge** back the content which you have put it in the **featureA** branch to the **main** branch, and then they can delete that branch.

For that they have to **raise the pull request. That is PR.**

#git status

```
root@labvm:/home/devasc/Desktop/git-sujata/gitdemo11072025# git status
On branch featureA
Your branch is up to date with 'origin/featureA'.

Untracked files:
  (use "git add <file>..." to include in what will be committed)
    featureA-1
    featureA-2
    featureA-3

nothing added to commit but untracked files present (use "git add" to track)
```

#git add .

#git status

```
root@labvm:/home/devasc/Desktop/git-sujata/gitdemo11072025# git add .
root@labvm:/home/devasc/Desktop/git-sujata/gitdemo11072025# git status
On branch featureA
Your branch is up to date with 'origin/featureA'.

Changes to be committed:
  (use "git restore --staged <file>..." to unstage)
    new file:   featureA-1
    new file:   featureA-2
    new file:   featureA-3
```

# git commit -m " Added 3 files in featureA branch"



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```
root@labvm:/home/devasc/Desktop/git-sujata/gitdemo11072025# git commit -m " Added 3 files in featureA branch"
[featureA 1534631] Added 3 files in featureA branch
3 files changed, 0 insertions(+), 0 deletions(-)
create mode 100644 featureA-1
create mode 100644 featureA-2
create mode 100644 featureA-3
```

# git push -u origin featureA

```
root@labvm:/home/devasc/Desktop/git-sujata/gitdemo11072025# git push -u origin featureA
Enumerating objects: 4, done.
Counting objects: 100% (4/4), done.
Delta compression using up to 2 threads
Compressing objects: 100% (2/2), done.
Writing objects: 100% (3/3), 385 bytes | 385.00 KiB/s, done.
Total 3 (delta 0), reused 0 (delta 0)
To https://github.com/sujataoak799/gitdemo11072025
62e5df1..1534631 featureA -> featureA
Branch 'featureA' set up to track remote branch 'featureA' from 'origin'.
```

**Goto github.com account**



github.com/sujataoak799/gitdemo11072025/tree/feat...

sujataoak799 / gitdemo11072025

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gitdemo11072025 Public

featureA had recent pushes 1 minute ago

featureA 2 Branches 0 Tags

This branch is 5 commits ahead of main.

sujataoak799 Added 3 files in featureA branch 1534631 · 3 minutes ago 8 Commits

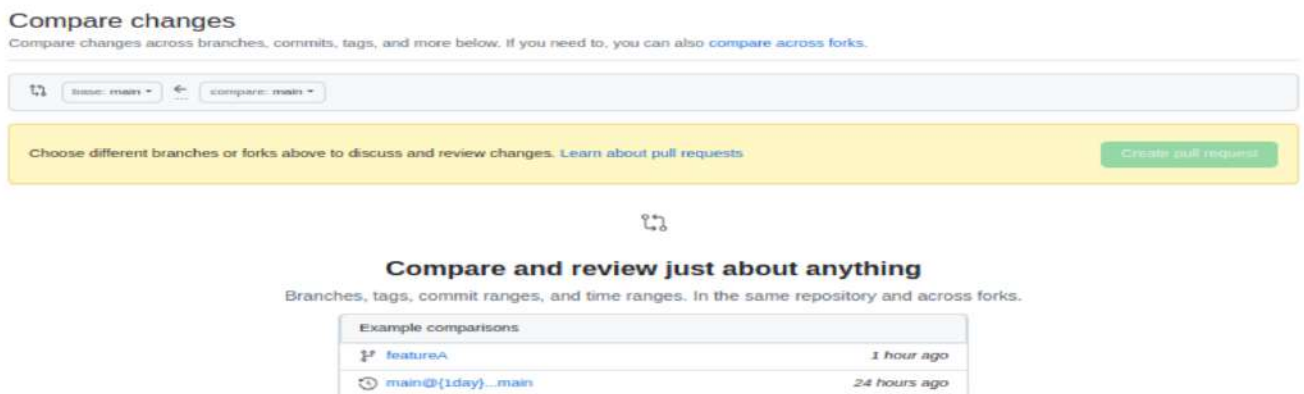
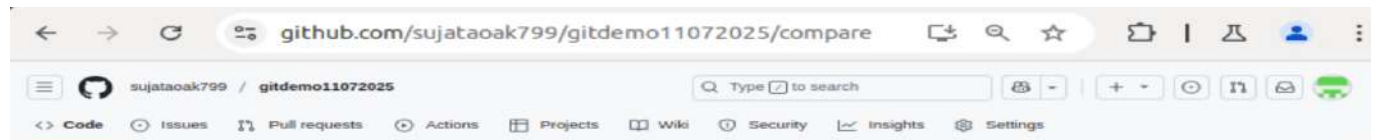
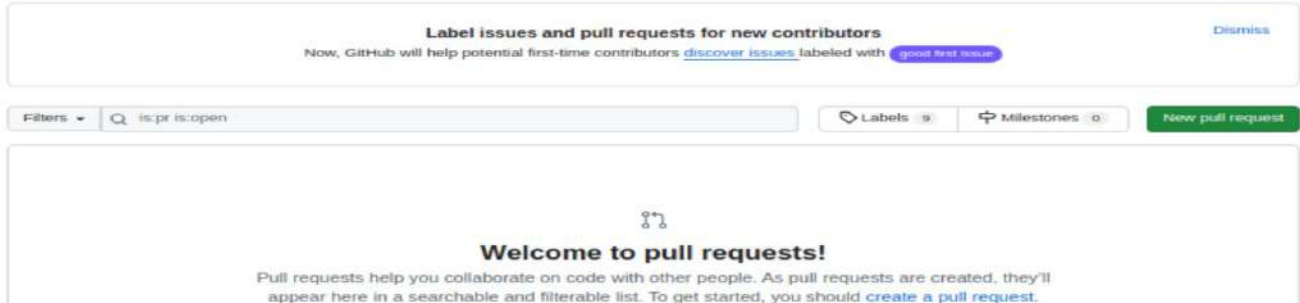
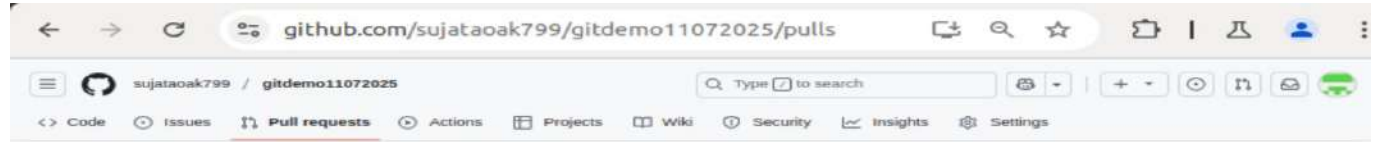
add.py	Added add.py file for commit on 18072025	6 hours ago
factorial.py	first file added	last week
featureA-1	Added 3 files in featureA branch	3 minutes ago
featureA-2	Added 3 files in featureA branch	3 minutes ago
featureA-3	Added 3 files in featureA branch	3 minutes ago
mynewfile	Added Info on Branching	5 days ago

If you go to **main** branch , files of **feature-A** branch will not be seen. For that we need to do **merging**

For that goto **feature-A** branch → **pull requests** tab → click on **New Pull Requests**



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**Compare changes from main branch and featureA branch**





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### Comparing changes

Choose two branches to see what's changed or to start a new pull request. If you need to, you can also [compare across forks](#) or [learn more about diff comparisons](#).

base: main

compare: featureA

Discuss and review the changes in this comparison with others. [Learn about pull requests](#)

Create pull request

5 commits 7 files changed 1 contributor

Commits on Jul 10, 2025

Revert "Initial commit" [c62d7b7](#)

Commits on Jul 13, 2025

Merge branch 'main' of <https://github.com/sujataoak799/gitdemo11072025> [6585683](#)

Added Info on Branching [a4f7201](#)

Click on create pull requests

### Open a pull request

Create a new pull request by comparing changes across two branches. If you need to, you can also [compare across forks](#). [Learn](#)

base: main

compare: featureA

Add a title

Added 3 files in FeatureA branch

Add a description

Write Preview

Merging a branch FeatureA to main branch

Markdown is supported Paste, drop, or click to add files

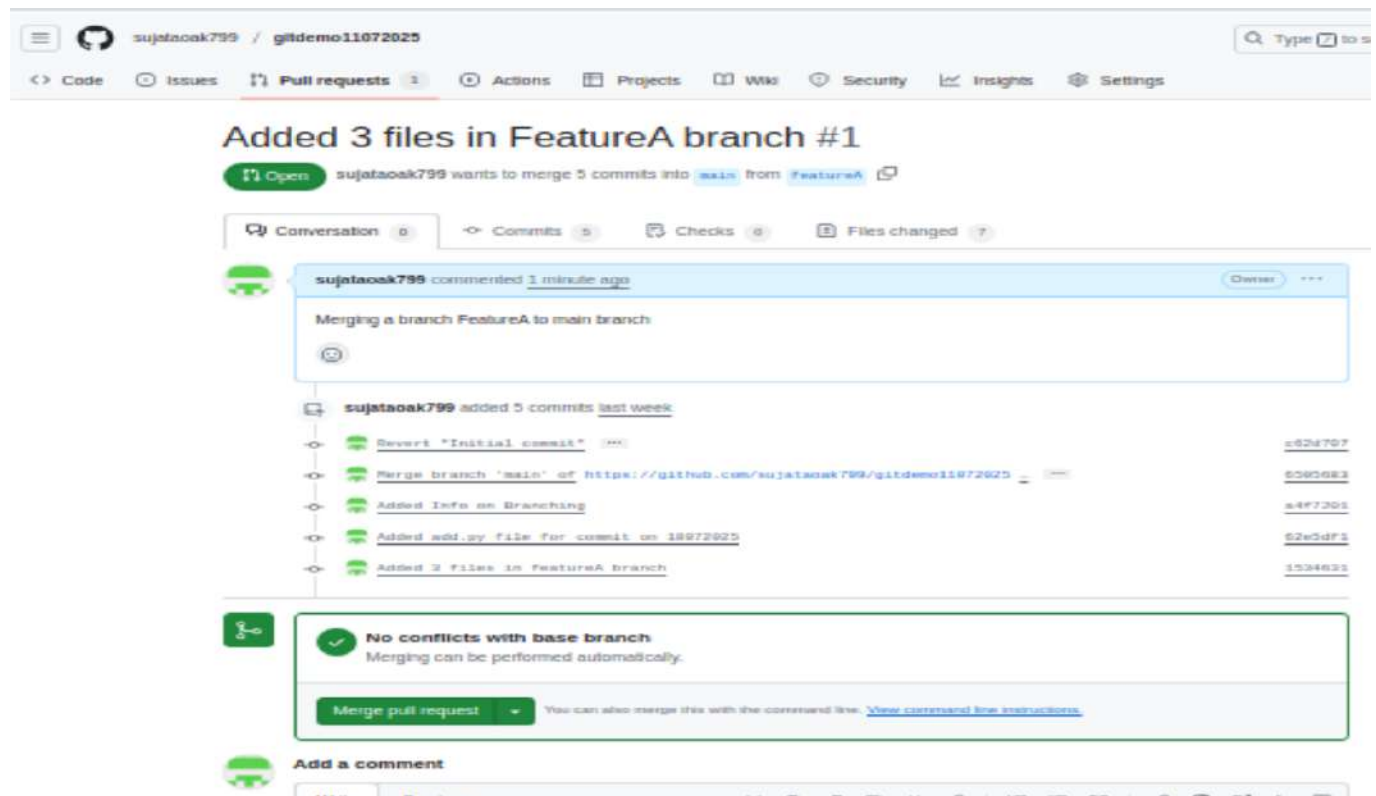
Create pull request



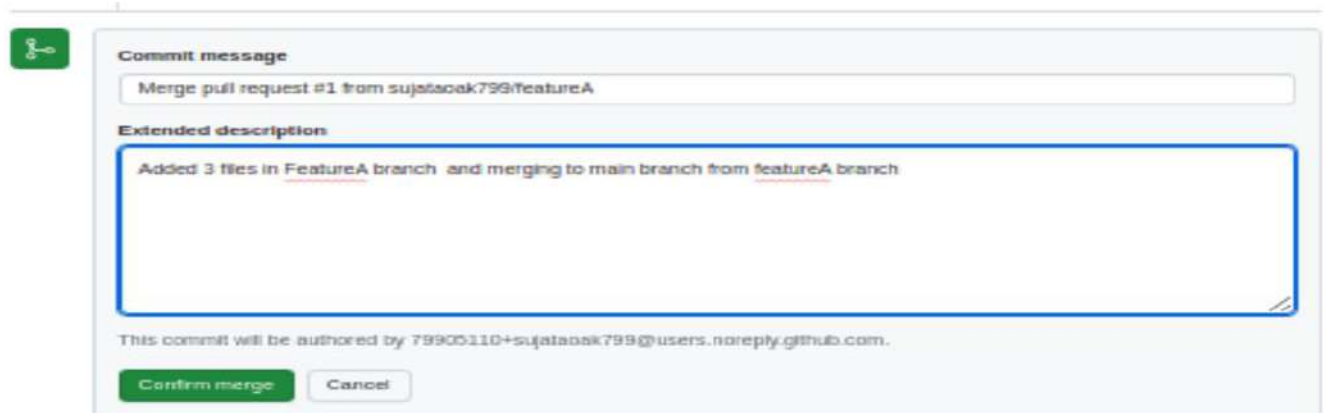
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**Click on Create pull request**



**Click on Merge pull request**



**Click on Confirm merge**



## Added 3 files in FeatureA branch #1

**Merged** sujataoak799 merged 5 commits into `main` from `featureA` [now](#)

Conversation 0 Commits 5 Checks 0 Files changed 7

**sujataoak799** commented 5 minutes ago Owner

Merging a branch FeatureA to main branch

**sujataoak799** added 5 commits last week

- Revert "Initial commit" `c5d6767`
- Rege branch 'main' of https://github.com/sujataoak799/gitdemo11072025 `6505603`
- Added Info on Branching `a4f7201`
- Added add.py file for commit on 18072025 `62e5dF1`
- Added 3 files in FeatureA branch `1524631`

**sujataoak799** merged commit `50b5e27` into `main` [now](#) Revert

**Pull request successfully merged and closed**  
You're all set — the `featureA` branch can be safely deleted. Delete branch

**Goto code → main branch → All files of feature-A branch merges with main branch.**

sujataoak799 / gitdemo11072025

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**gitdemo11072025** Public Pin Watch

`main` 2 Branches 0 Tags  [Add file](#) [Code](#)

**sujataoak799** Merge pull request #1 from sujataoak799/featureA 50b5e27 - 2 minutes ago 5 Commits

<code>add.py</code>	Added add.py file for commit on 18072025	7 hours ago
<code>factorial.py</code>	first file added	last week
<code>featureA-1</code>	Added 3 files in featureA branch	1 hour ago
<code>featureA-2</code>	Added 3 files in featureA branch	1 hour ago
<code>featureA-3</code>	Added 3 files in featureA branch	1 hour ago
<code>mynewfile</code>	Added info on Branching	5 days ago
<code>name.html</code>	Added info on Branching	5 days ago

[README](#)

**Add a README**  
Help people interested in this repository understand your project by adding a README.



**Step 10:** And finally, once it has been merged, I'm going to delete the featureA branch.

Switch to the main branch using the **git checkout main** command and verify the current working branch using the **git branch** command.

```
root@labvm:/home/devasc/Desktop/git-sujata/gitdemo11072025# git branch
* featureA
  main
root@labvm:/home/devasc/Desktop/git-sujata/gitdemo11072025# git checkout main
Switched to branch 'main'
Your branch is ahead of 'origin/main' by 3 commits.
(use "git push" to publish your local commits)
```

```
root@labvm:/home/devasc/Desktop/git-sujata/gitdemo11072025# git branch
featureA
* main
```

```
root@labvm:/home/devasc/Desktop/git-sujata/gitdemo11072025# ls
factorial.py  mynewfile  name.html
```

**Step 11: Merge file contents from featureA to main branch in local repository.**

Merge the contents (known as the history) from the feature branch into the main branch using the **git merge <branch-name>** command. The branch-name is the branch that histories are pulled from into the current branch. The output displays that one file was changed with one line inserted.

```
root@labvm:/home/devasc/Desktop/git-sujata/gitdemo11072025# git merge featureA
Updating a4f7201..1534631
Fast-forward
 add.py      | 7 +++++++
 featureA-1 | 0
 featureA-2 | 0
 featureA-3 | 0
 4 files changed, 7 insertions(+)
 create mode 100644 add.py
 create mode 100644 featureA-1
 create mode 100644 featureA-2
 create mode 100644 featureA-3
```





```
root@labvm:/home/devasc/Desktop/git-sujata/gitdemo11072025# ls
add.py factorial.py featureA-1 featureA-2 featureA-3 mynewfile name.html
```

### Step 12: Deleting a branch

A] Verify the **feature** branch is still available using the **git branch** command.

```
root@labvm:/home/devasc/Desktop/git-sujata/gitdemo11072025# git branch
featureA
* main
```

B] Delete the **featureA** branch using the **git branch -d <branch-name>** command

```
root@labvm:/home/devasc/Desktop/git-sujata/gitdemo11072025# git branch -d featureA
Deleted branch featureA (was 1534631).
```

C] Verify the feature branch is no longer available using the **git branch** command

```
root@labvm:/home/devasc/Desktop/git-sujata/gitdemo11072025# git branch
* main
```

D] Note the branch featureA is not deleted from remote repository/github

For this we need to :

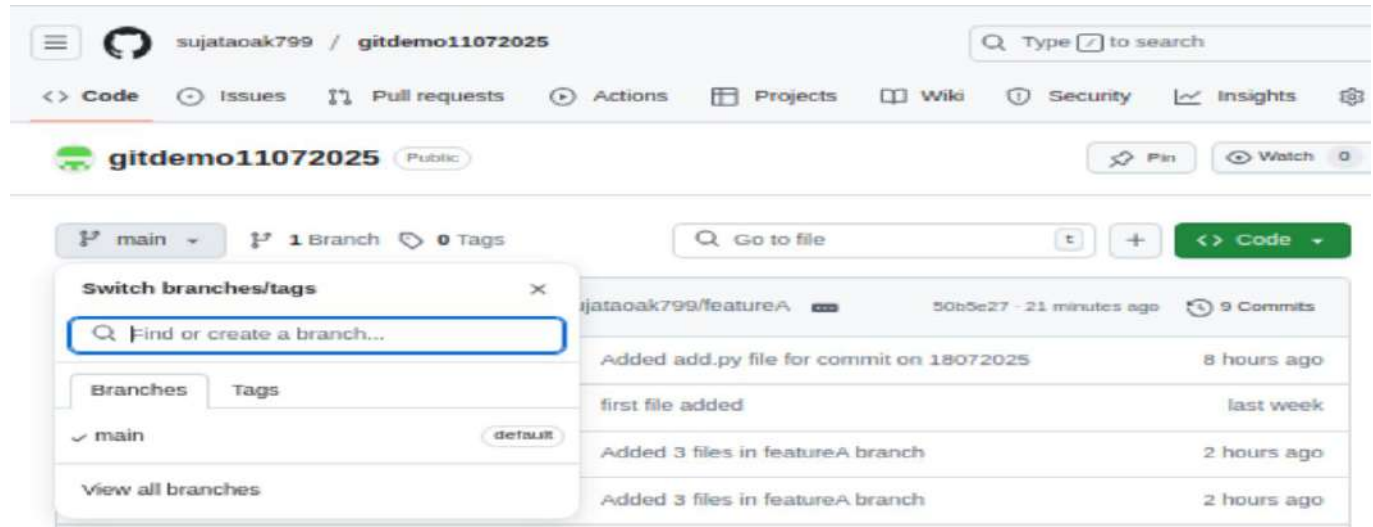
#git push --delete origin featureA

```
root@labvm:/home/devasc/Desktop/git-sujata/gitdemo11072025# git push --delete origin featureA
To https://github.com/sujataoak799/gitdemo11072025
- [deleted]          featureA
```

Refresh your github page



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### Conclusion:

In this experiment, we understood the use case of branching and merging. Also, different commands were used for the same such as checkout, branch and merge for displaying the changes between the initial and latter commits.