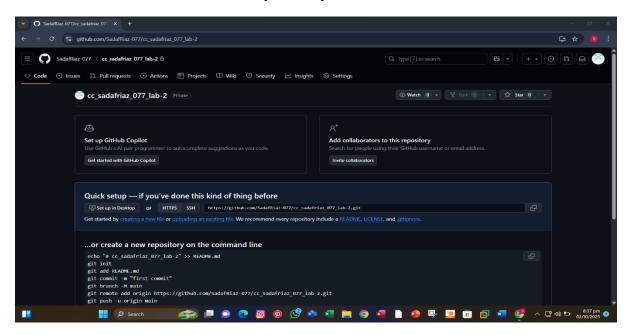
Name: Sadaf Riaz

Roll No: 2023-BSE-077

Class:BSE5-B Lab# 02

Task 1: Create Private GitHub Repository



Task 2: Connect Repository via SSH

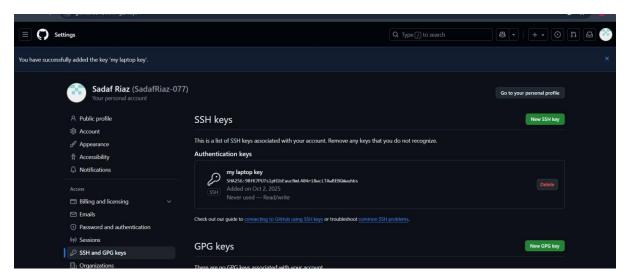
Generate a new SSH key using PowerShell

```
Lenovo@DESKTOP-MTNDM3D MINGW64 ~
$ ssh-keygen-t ed25519-c "sadafriaz184@gmail.com"
bash: ssh-keygen-t: command not found

Lenovo@DESKTOP-MTNDM3D MINGW64 ~
$ ssh-keygen-t: command not found

Lenovo@DESKTOP-MTNDM3D MINGW64 ~
$ \text{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colored}{\colo
```

Add your SSH public key to GitHub (Settings > SSH and GPG keys)



Clone your Lab2 repo using SSH

```
Lenovo@DESKTOP-MTNDM3D MINGW64 ~
$ ssh -T git@github.com
The authenticity of host 'github.com (20.207.73.82)' can't be established.
ED25519 key fingerprint is SHA256:+DiY3wvvV6TuJJhbpZisF/zLDA0zPMSVHdkr4UvCOqU.
This key is not known by any other names.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added 'github.com' (ED25519) to the list of known hosts.
Enter passphrase for key '/c/Users/Lenovo/.ssh/id_ed25519':
Hi SadafRiaz-077! You've successfully authenticated, but GitHub does not provide shell access.

Lenovo@DESKTOP-MTNDM3D MINGW64 ~
$ cd ~ # or any folder you like
git clone git@github.com:<yourusername>/Lab2.git
bash: yourusername: No such file or directory

Lenovo@DESKTOP-MTNDM3D MINGW64 ~
$ git clone git@github.com:<SadafRiaz-077>/Lab2.git
bash: SadafRiaz-077: No such file or directory

Lenovo@DESKTOP-MTNDM3D MINGW64 ~
$ git clone git@github.com:SadafRiaz-077/Lab2.git
Cloning into 'Lab2'...
Enter passphrase for key '/c/Users/Lenovo/.ssh/id_ed25519':
ERROR: Repository not found.
fatal: Could not read from remote repository.

Please make sure you have the correct access rights
and the repository exists.

Lenovo@DESKTOP-MTNDM3D MINGW64 ~
```

Task 3: Configure Git Username and Email

Set up your Git identity (this ensures all commits are linked to you)

```
Lenovo@DESKTOP-MTNDM3D MINGW64 ~

$ git config --global user.name "SadafRiaz-077"
git config --global user.email "23-22412-077@se.fjwu.edu.pk"

Lenovo@DESKTOP-MTNDM3D MINGW64 ~
```

Verify your configuration:

```
enovo@DESKTOP-MTNDM3D MINGW64
 git config --list
diff.astextplain.textconv=astextplain
ilter.lfs.clean=git-lfs clean -- %f
ilter.lfs.smudge=git-lfs smudge -- %f
ilter.lfs.process=git-lfs filter-process
ilter.lfs.required=true
http.sslbackend=schannel
ore.autocrlf=true
ore.fscache=true
ore.symlinks=false
pull.rebase=false
redential.helper=manager
redential.https://dev.azure.com.usehttppath=true
init.defaultbranch=master
user.name=SadafRiaz-077
user.email=23-22412-077@se.fjwu.edu.pk
enovo@DESKTOP-MTNDM3D MINGW64 ~
```

Task 4: Explore the .git Folder

Navigate into your cloned repository folder.

Show hidden files and locate the .git directory.

Explore what's inside

Task 5: Local Repository Management

1. Delete the existing .git folder from cloned repo using Git Bash

```
Lenovo@DESKTOP-MTNDM3D MINGW64 ~/cc_sadafriaz_077_lab-2 (main)

$ rm -rf .git
ls -a  # confirm .git is gone
-/ ../
```

2. Re-initialize the local git repository

```
_enovo@DESKTOP-MTNDM3D MINGW64 ~/cc_sadafriaz_077_lab-2
$ git init
git branch -M main
Initialized empty Git repository in C:/Users/Lenovo/cc_sadafriaz_077_lab-2/.git/
```

3. Add a file named README.md and commit

```
Lenovo@DESKTOP-MTNDM3D MINGW64 ~/cc_sadafriaz_077_lab-2 (main)

$ ^[[200~echo "# Lab2 Git Practice" > README.md
bash: $'\E[200~echo': command not found

Lenovo@DESKTOP-MTNDM3D MINGW64 ~/cc_sadafriaz_077_lab-2 (main)
$ git add README.md

Lenovo@DESKTOP-MTNDM3D MINGW64 ~/cc_sadafriaz_077_lab-2 (main)
$ git commit -m "Initial commit"

[main (root-commit) Obdcfd2] Initial commit
1 file changed, 0 insertions(+), 0 deletions(-)
create mode 100644 README.md

Lenovo@DESKTOP-MTNDM3D MINGW64 ~/cc_sadafriaz_077_lab-2 (main)
$ echo "# cc_sadafriaz_077_lab-2Practice" > README.md
git add README.md
git commit -m "Initial commit"

warning: in the working copy of 'README.md', LF will be replaced by CRLF the next time Git touches it
[main cl51d16] Initial commit
1 file changed, 1 insertion(+)
```

4. Connect your local repo to GitHub and push

```
Lenovo@DESKTOP-MTNDM3D MINGW64 ~/cc_sadafriaz_077_lab-2 (main)

$ git remote add origin git@github.com:<SadafRiaz-077>/cc_sadafriaz_077_lab-2
git push -u origin main
bash: SadafRiaz-077: No such file or directory
Enter passphrase for key '/c/Users/Lenovo/.ssh/id_ed25519':
ERROR: Repository not found.
fatal: Could not read from remote repository.

Please make sure you have the correct access rights
and the repository exists.

Lenovo@DESKTOP-MTNDM3D MINGW64 ~/cc_sadafriaz_077_lab-2 (main)

$
```

Task 6: File Status & Staging

- 1. Create a new file notes.txt and write a note.
- 2. Check status
- 3. Stage and commit

```
lenovo@DESKTOP-MTNDM3D MINGW64 ~/cc_sadafriaz_077_lab-2 (main)

§ git status
On branch main
Untracked files:
(use "git add <file>..." to include in what will be committed)
motes.txt

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

Lenovo@DESKTOP-MTNDM3D MINGW64 ~/cc_sadafriaz_077_lab-2 (main)
§ echo "My first note" > notes.txt
git status
On branch main
Untracked files:
(use "git add <file>..." to include in what will be committed)
motes.txt

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

Lenovo@DESKTOP-MTNDM3D MINGW64 ~/cc_sadafriaz_077_lab-2 (main)
§ echo "I updated my note" >> notes.txt
git status
git add notes.txt
git commit -m "Update notes.txt"
On branch main
Untracked files:
(use "git add <file>..." to include in what will be committed)
motes.txt
nothing added to commit but untracked files present (use "git add" to track)

nothing added to commit but untracked files present (use "git add" to track)
motes.txt

nothing added to commit but untracked files present (use "git add" to track)
marning: in the working copy of 'notes.txt', LF will be replaced by CRLF the next time Git touches it
Inain aSc8714] Update notes.txt

1 file changed, 2 insertions(+)
create mode 100644 notes.txt
```

4. Edit notes. txt and repeat status/commit steps.

```
Lenovo@DESKTOP-MTNDM3D MINGW64 ~/cc_sadafriaz_077_lab-2 (main)
$ git add notes.txt
warning: in the working copy of 'notes.txt', LF will be replaced by CRLF the next time Git touches it

Lenovo@DESKTOP-MTNDM3D MINGW64 ~/cc_sadafriaz_077_lab-2 (main)
$ AC

Lenovo@DESKTOP-MTNDM3D MINGW64 ~/cc_sadafriaz_077_lab-2 (main)
$ git commit - m "Update notes.txt with new content"

[main 9e17fa7] Update notes.txt with new content
1 file changed, 1 insertion(+), 2 deletions(-)

Lenovo@DESKTOP-MTNDM3D MINGW64 ~/cc_sadafriaz_077_lab-2 (main)
$ git status
On branch main
nothing to commit, working tree clean
```

Task 7: Branch Creation Using GitHub GUI

```
Lenovo@DESKTOP-MTNDM3D MINGW64 ~/cc_sadafriaz_077_lab-2 (bugfix/user-auth-error)
$ git branch -a
* bugfix/user-auth-error
main
remotes/origin/bugfix/user-auth-error
```

```
Lenovo@DESKTOP-MTNDM3D MINGW64 ~/cc_sadafriaz_077_lab-2 (main)

$ git pull origin bugfix/user-auth-error
Enter passphrase for key '/c/Users/Lenovo/.ssh/id_ed25519':
Enter passphrase for key '/c/Users/Lenovo/.ssh/id_ed25519':
ERROR: Repository not found.
fatal: Could not read from remote repository.

Please make sure you have the correct access rights
and the repository exists.
```

```
Lenovo@DESKTOP-MTNDM3D MINGW64 ~/cc_sadafriaz_077_lab-2 (main)

$ git status
On branch main
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: notes.txt

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

Lenovo@DESKTOP-MTNDM3D MINGW64 ~/cc_sadafriaz_077_lab-2 (main)

$ git status
On branch main
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: notes.txt

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

Task 8: Branch Creation and Push Using Git Bash

Create a branch named feature/db-connection using Git Bash

Push the branch to the remote repository

```
enovo@DESKTOP-MTNDM3D MINGW64 ~/cc_sadafriaz_077_lab-2 (feature/db-connection)
git checkout -b feature/db-connection
fatal: a branch named 'feature/db-connection' already exists
```

```
Lenovo@DESKTOP-MTNDM3D MINGW64 ~/cc_sadafriaz_077_lab-2 (feature/db-connection)
$ git push origin feature/db-connection
Everything up-to-date
```

Task 9: Branching & Merging

1-Create and switch to a branch feature-1:

```
Lenovo@DESKTOP-MTNDM3D MINGW64 ~/cc_sadafriaz_077_lab-2 (feature/db-connection)

$ git checkout -b feature-1
Switched to a new branch 'feature-1'
Lenovo@DESKTOP_MTNDM3D MTNGW64 av/cc_sadafriaz_077_lab-2 (feature-1)
```

2-Modify main.py (add a function) and commit

```
Lenovo@DESKTOP-MTNDM3D MINGW64 ~/cc_sadafriaz_077_lab-2 (feature-1)

$ git add main.py
git commit -m "Add new function to main.py"
warning: in the working copy of 'main.py', LF will be replaced by CRLF the next time Git touches it
[feature-1 e577eb9] Add new function to main.py
1 file changed, 1 insertion(+)
create mode 100644 main.py
```

3.Switch back to main and merge

```
Lenovo@DESKTOP-MTNDM3D MINGW64 ~/cc_sadafriaz_077_lab-2 (feature-1)

$ git checkout main
Switched to branch 'main'

Lenovo@DESKTOP-MTNDM3D MINGW64 ~/cc_sadafriaz_077_lab-2 (main)

$ git merge feature-1

Updating 9e17fa7..e577eb9

Fast-forward

main.py | 1 +

1 file changed, 1 insertion(+)

create mode 100644 main.py
```

4. Push all branches

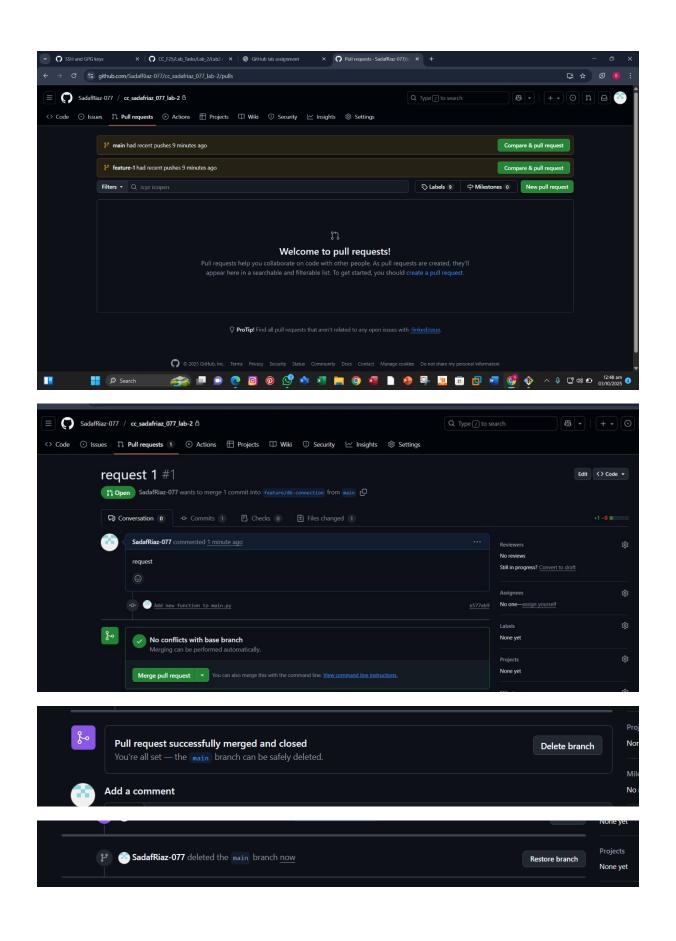
```
Lenovo@DESKTOP-MTNDM3D MINGW64 ~/cc_sadafriaz_077_lab-2 (main)

§ git push origin main
git push origin feature-1
Enumerating objects: 4, done.
Counting objects: 100% (4/4), done.
Delta compression using up to 8 threads
Compressing objects: 100% (3/3), done.
Writing objects: 100% (3/3), 384 bytes | 192.00 KiB/s, done.
Total 3 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
remote:
remote: Create a pull request for 'main' on GitHub by visiting:
remote: https://github.com/SadafRiaz-077/cc_sadafriaz_077_lab-2/pull/new/main
remote:
To github.com:SadafRiaz-077/cc_sadafriaz_077_lab-2.git
* [new branch] main -> main
Total 0 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
remote:
remote: Create a pull request for 'feature-1' on GitHub by visiting:
remote: https://github.com/SadafRiaz-077/cc_sadafriaz_077_lab-2/pull/new/feature-1
remote:
To github.com:SadafRiaz-077/cc_sadafriaz_077_lab-2.git
* [new branch] feature-1 -> feature-1
Lenovo@DESKTOP-MTNDM3D MINGW64 ~/cc_sadafriaz_077_lab-2 (main)

§
```

Task 10: Pull Request and Branch Review (GitHub GUI)

- 1. On GitHub, create a Pull Request from the branch feature/db-connection to main.
- 2. Review the Pull Request and merge it using the GitHub GUI.
- 3.After merging, delete the feature/db-connection branch using the GitHub GUI



Task 11: Detailed Branch Strategy (Develop/Staging)

- 1. Create the following branches to simulate a professional branching strategy:
 - develop
 - staging
 - feature/*
 - bugfix/*
- 2. Example workflow:
 - O Developers work on feature/* and bugfix/* branches.
 - O Merge into develop after completion.
 - o develop is merged into staging for testing.
 - O Finally, staging is merged into main (production).
- 3. Document the workflow with screenshots:
 - O Branch list (branch_strategy.png)
 - O Merges into develop and staging (branch_merges.png)
 - Final merge into main (final_merge.png)

```
git checkout -b feature/user-login
git push origin feature/user-login
git checkout -b bugfix/login-error
git push origin bugfix/login-error
Switched to a new branch 'feature/user-login'
Total 0 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
 remote:
 remote: Create a pull request for 'feature/user-login' on GitHub by visiting:
remote: https://github.com/SadafRiaz-077/cc_sadafriaz_077_lab-2/pull/new/feature/user-login
 remote:
To github.com:SadafRiaz-077/cc_sadafriaz_077_lab-2.git
* [new branch] feature/user-login -> feature/user-login
Switched to a new branch 'bugfix/login-error'
Total 0 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
 remote:
 remote: Create a pull request for 'bugfix/login-error' on GitHub by visiting:
remote: https://github.com/SadafRiaz-077/cc_sadafriaz_077_lab-2/pull/new/bugfix/login-error
 To github.com:SadafRiaz-077/cc_sadafriaz_077_lab-2.git
* [new branch] bugfix/login-error -> bugfix/login-error
          o@DESKTOP-MTNDM3D MINGW64 ~/cc_sadafriaz_077_lab-2 (bugfix/login-error)
   git checkout bugfix/login-error
   fix bug
git add .
git commit -m "Fix login error bug"
git push origin bugfix/login-error
Already on 'bugfix/login-error'
On branch bugfix/login-error
 nothing to commit, working tree clean
  verything up-to-date
             DESKTOP-MTNDM3D MINGW64 ~/cc_sadafriaz_077_lab-2 (bugfix/login-error)
  git checkout develop
git pull origin develop
      merge feature/user-login
merge bugfix/login-error
  it push origin develop
witched to branch 'develop'
  rom github.com:SadafRiaz-077/cc_sadafriaz_077_lab-2
  * branch
                                    develop
                                                        -> FETCH_HEAD
Already up to date.
Already up to date.
Already up to date.
Everything up-to-date
```

```
.enovo@DESKTOP-MTNDM3D MINGW64 ~/cc_sadafriaz_077_lab-2 (staging)
$ git checkout main
git pull origin main
git merge staging
git push origin main
Switched to branch 'main'
fatal: couldn't find remote ref main
Already up to date.
Total Ó (delta 0), reused O (delta 0), pack-reused O (from 0)
remote:
remote: Create a pull request for 'main' on GitHub by visiting:
              https://github.com/SadafRiaz-077/cc_sadafriaz_077_lab-2/pull/new/main
remote:
remote:
Lenovo@DESKTOP-MTNDM3D MINGW64 ~/cc_sadafriaz_077_lab-2 (main)
$ git push origin --delete feature/user-login
git push origin --delete bugfix/login-error
To github.com:SadafRiaz-077/cc_sadafriaz_077_lab-2.git
- [deleted] feature/user-login
To github.com:SadafRiaz-077/cc_sadafriaz_077_lab-2.git
- [deleted] bugfix/login-error
```

Bonus Task: Simulated Team Collaboration

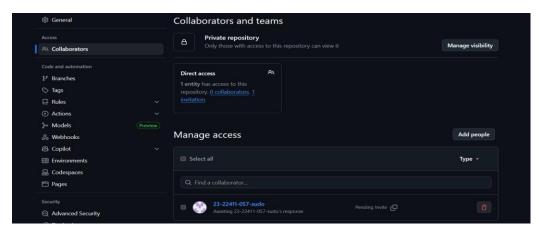
```
S main - collab branch - multiple collaborators bash: main: command not found lenovoBDESKTOP-MINDM3D MINGW64 -/cc_sadafriaz_077_lab-2 (main)

S git checkout main git pull origin main jull origin jull origin main jull origin jull origin main jull origin jull or
```

```
Lenovo@DESKTOP-MTNDM3D MINGW64 ~/cc_sadafriaz_077_lab-2 (collab)

$ git checkout main
git pull origin main
git merge collab
git push origin main
Switched to branch 'main'
From github.com:SadafRiaz-077/cc_sadafriaz_077_lab-2

* branch main -> FETCH_HEAD
Already up to date.
Updating e577eb9..a9baa2f
Fast-forward
notes.txt | 1 +
1 file changed, 1 insertion(+)
Total 0 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
To github.com:SadafRiaz-077/cc_sadafriaz_077_lab-2.git
e577eb9..a9baa2f main -> main
```

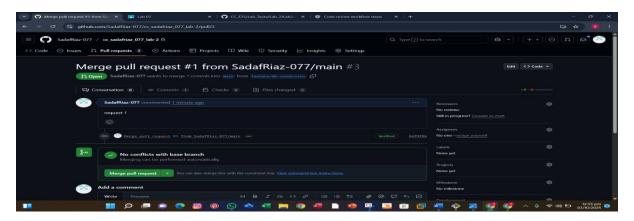


Task 12: Code Review Workflow

Create a Pull Request (PR) / Merge Request (MR):

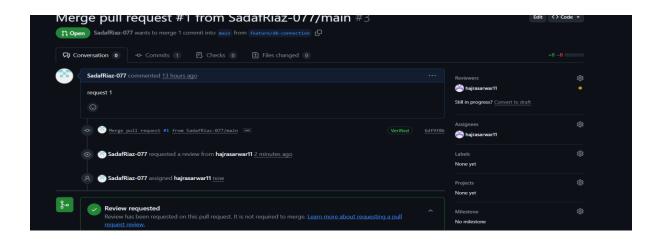


Assign a reviewer (teammate or second account).



1. Reviewer Actions (capture screenshots for each):

- o Approve the PR
- Request changes and add comments





Author Actions:

- Fix issues in the same branch and push new commits.
- PR updates automatically.
- Screenshot updated PR with new commits

```
Lenovo@DESKTOP-MTNDM3D MINGW64 ~/cc_sadafriaz_077_lab-2 (main)
$ feature/db-connection: No such file or directory

Lenovo@DESKTOP-MTNDM3D MINGW64 ~/cc_sadafriaz_077_lab-2 (main)
$ git checkout feature/db-connection
Switched to branch 'feature/db-connection'
Your branch is up to date with 'origin/feature/db-connection'.

Lenovo@DESKTOP-MTNDM3D MINGW64 ~/cc_sadafriaz_077_lab-2 (feature/db-connection)
$ git add .

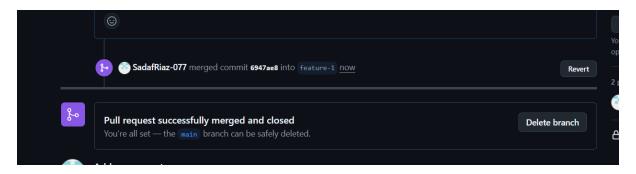
Lenovo@DESKTOP-MTNDM3D MINGW64 ~/cc_sadafriaz_077_lab-2 (feature/db-connection)
$ git commit - m "Fixed review comments"
On branch feature/db-connection
Your branch is up to date with 'origin/feature/db-connection'.

nothing to commit, working tree clean

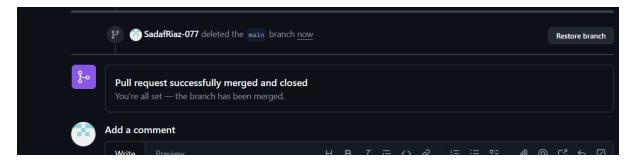
Lenovo@DESKTOP-MTNDM3D MINGW64 ~/cc_sadafriaz_077_lab-2 (feature/db-connection)
$ git push origin feature/db-connection
Enter passphrase for key '\c/Users\Lenovo\.ssh\/id_ed25519':
Total 0 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
remote:
remote: Create a pull request for 'feature/db-connection' on GitHub by visiting:
remote: https://github.com/SadafRiaz_077/cc_sadafriaz_077_lab-2/pull/new/feature/db-connection
remote:
To github.com:SadafRiaz_077/cc_sadafriaz_077_lab-2.git
* [new branch] feature/db-connection -> feature/db-connection
```

Merge the PR:

Reviewer approves → merge using GitHub/GitLab UI.



Branch Handling After Merge:



Task 13

Delete Remote Branch After Merge

Update Local Repository:

