

CLOUD COMPUTING

Lab 02

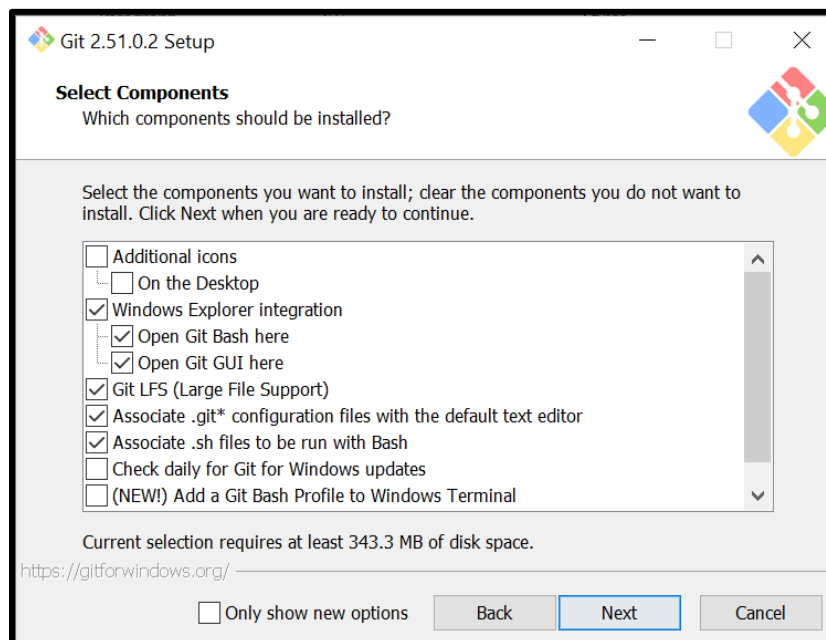
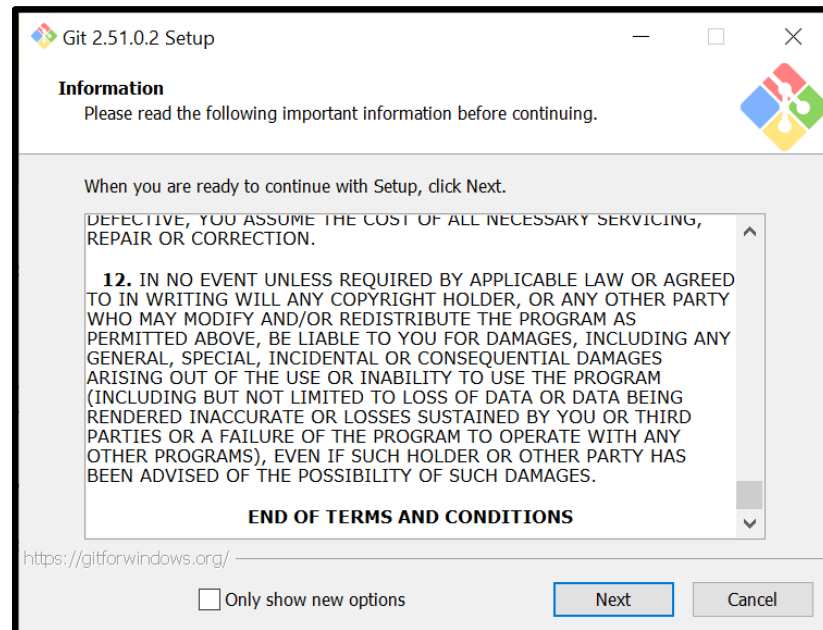
Name: Abiha Nadeem

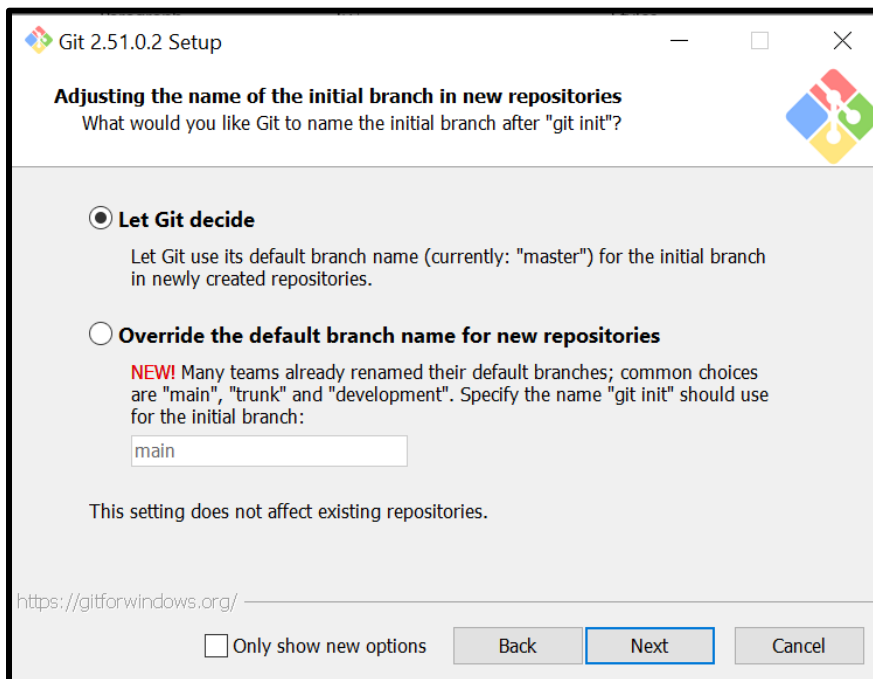
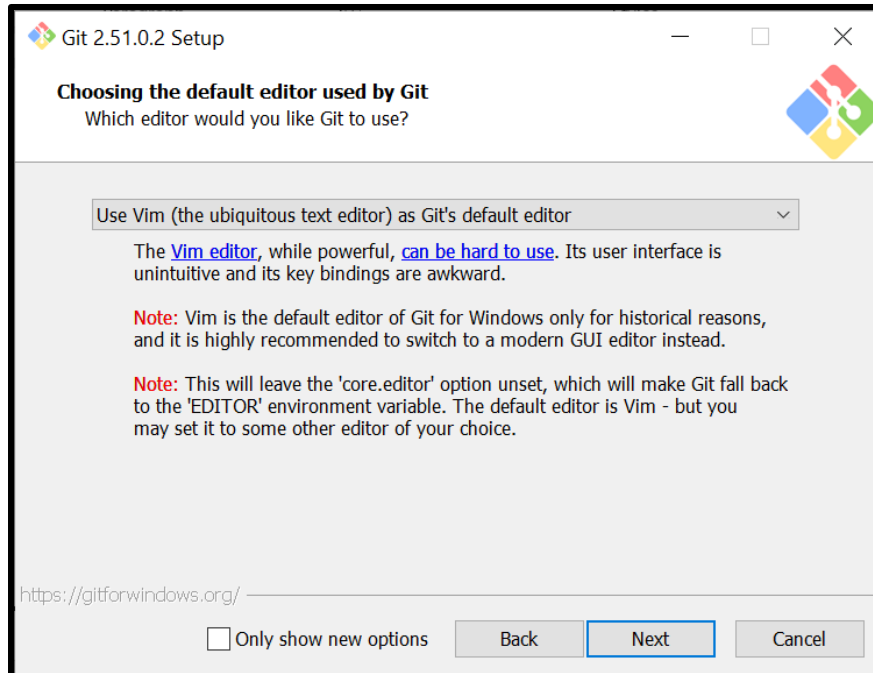
Roll no: 2023-BSE-001

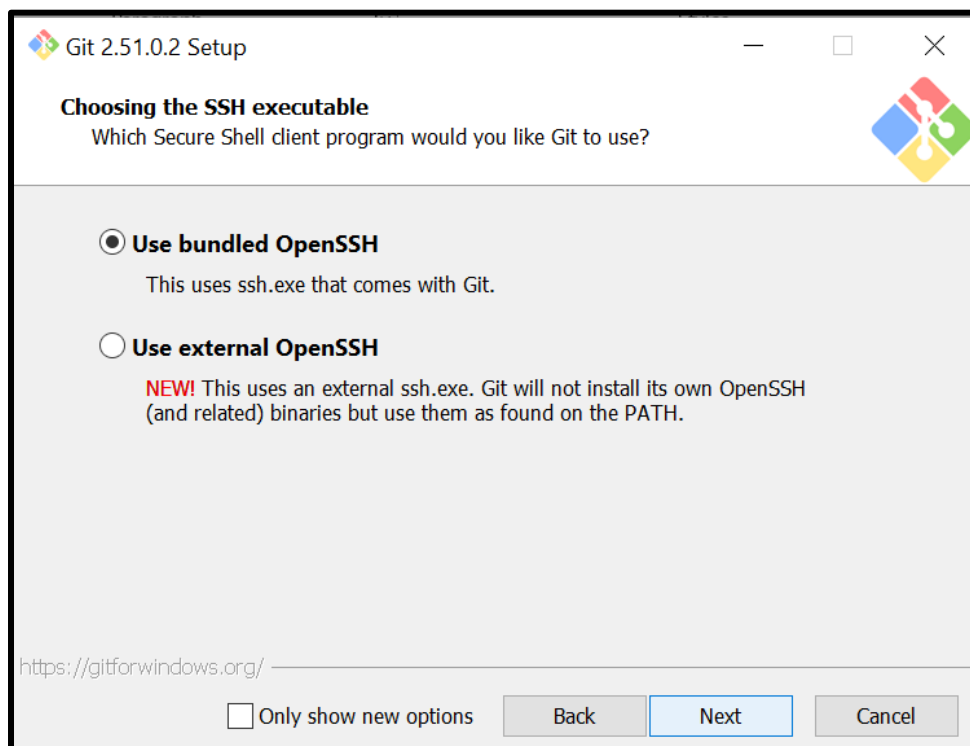
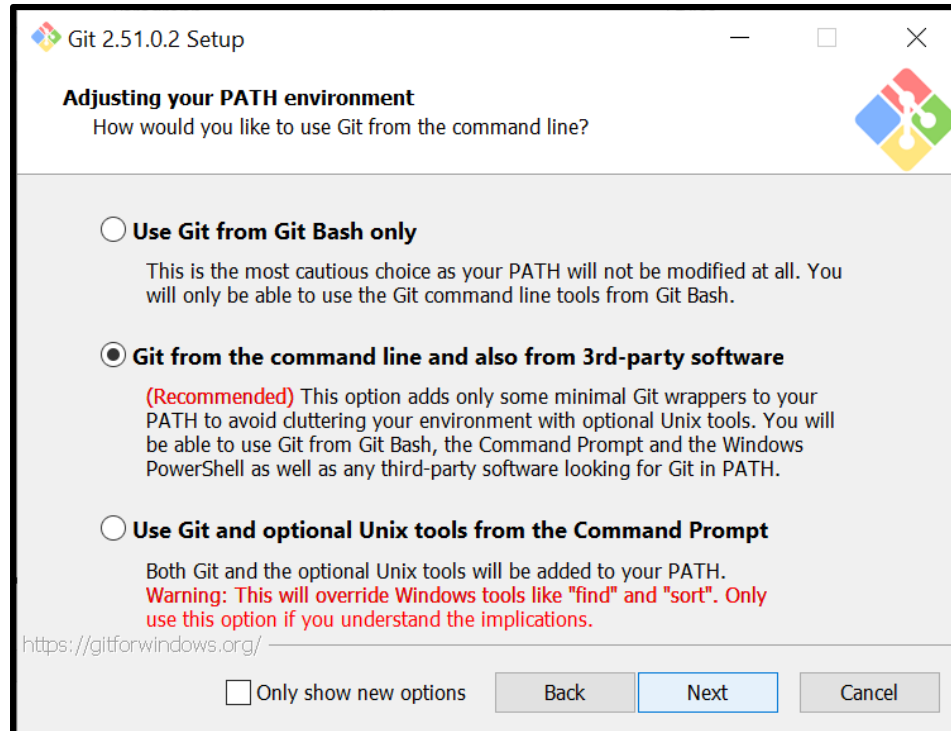
Submitted to: Engr. Muhammad Shoaib

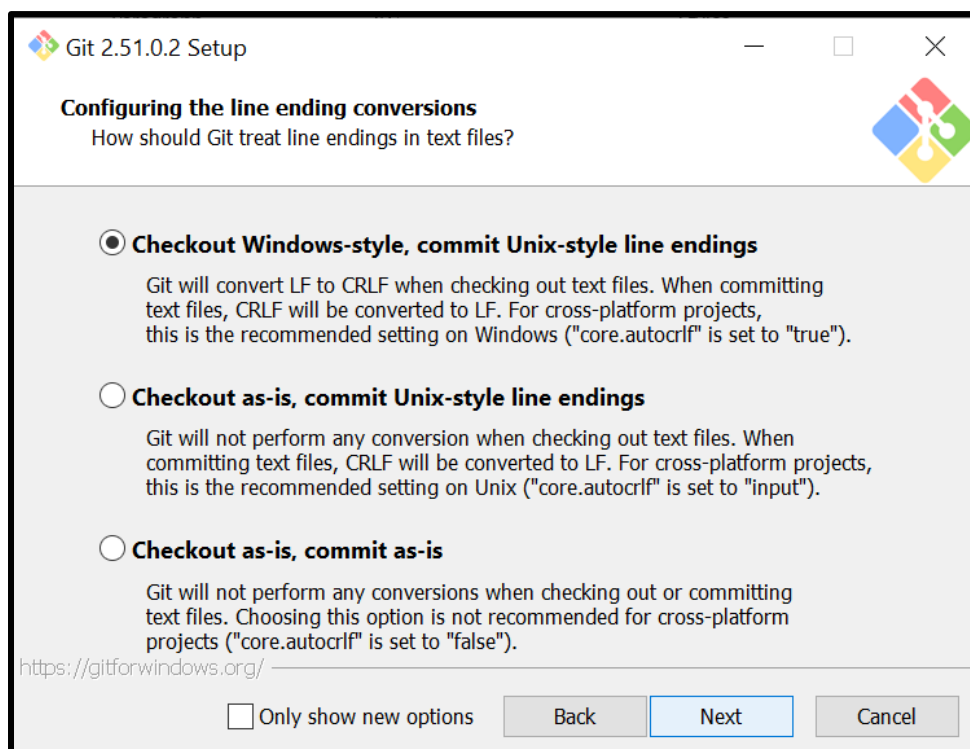
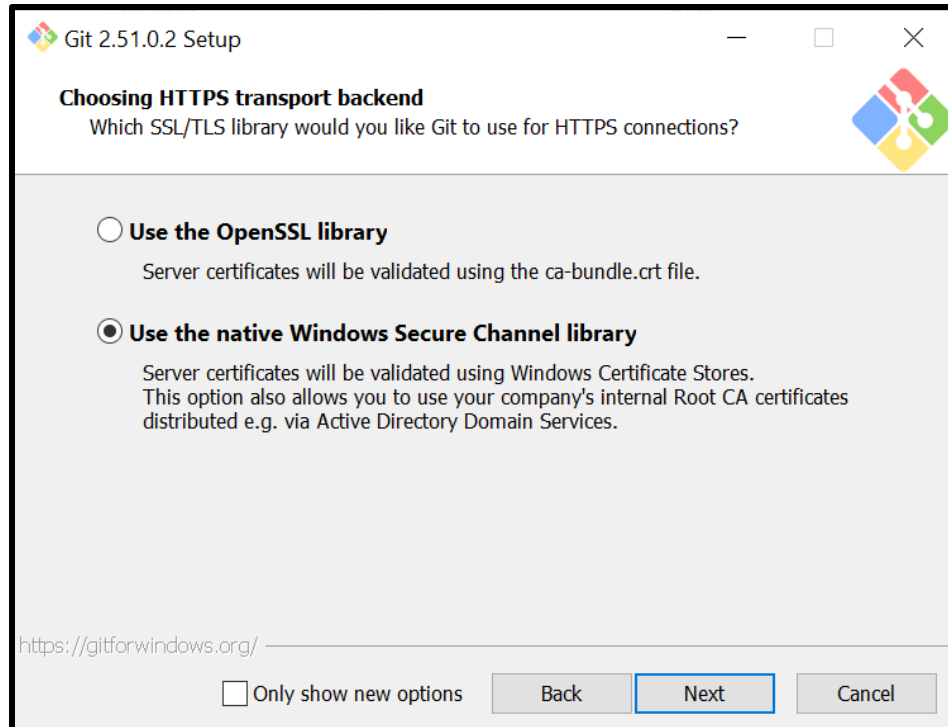
A series of five parallel diagonal lines in a light blue color, extending from the bottom left towards the top right of the page.

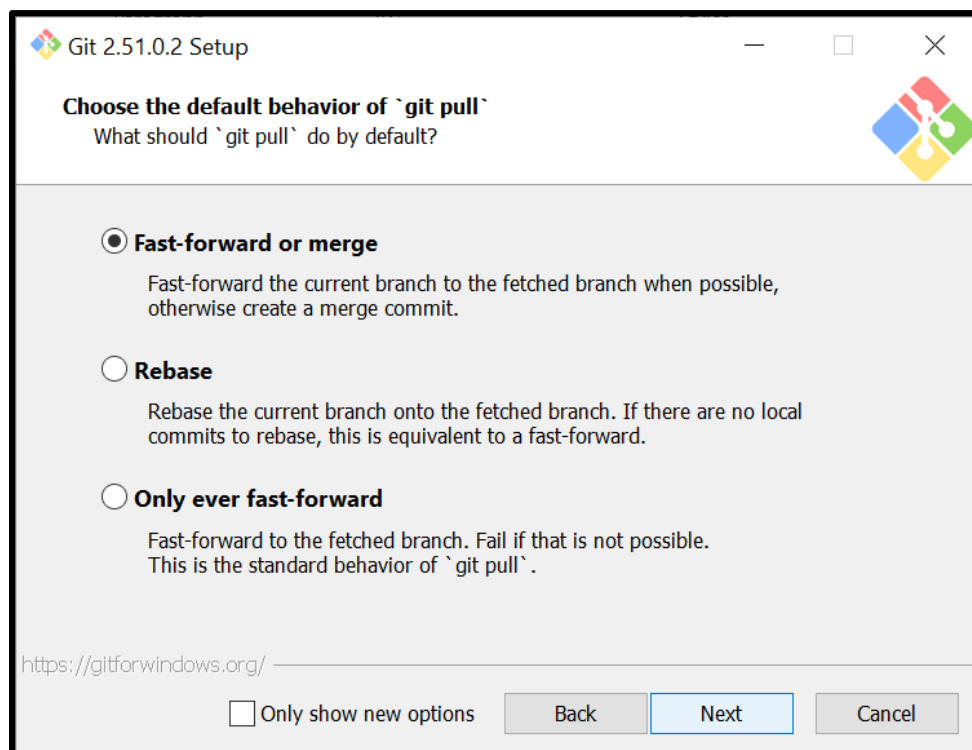
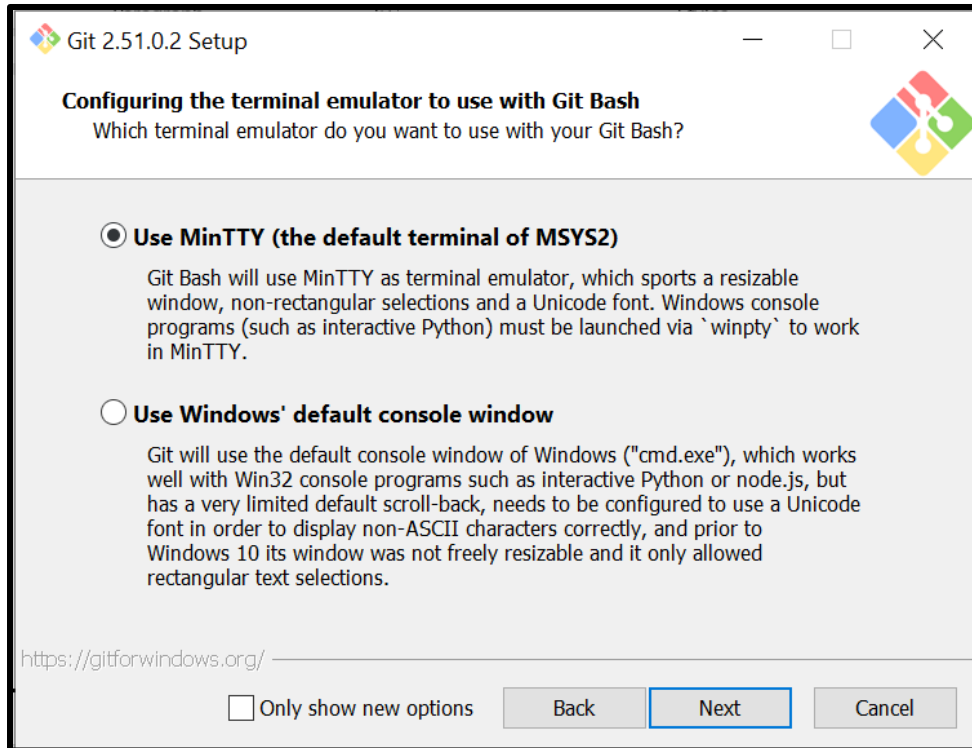
- **Install Git on your PC**

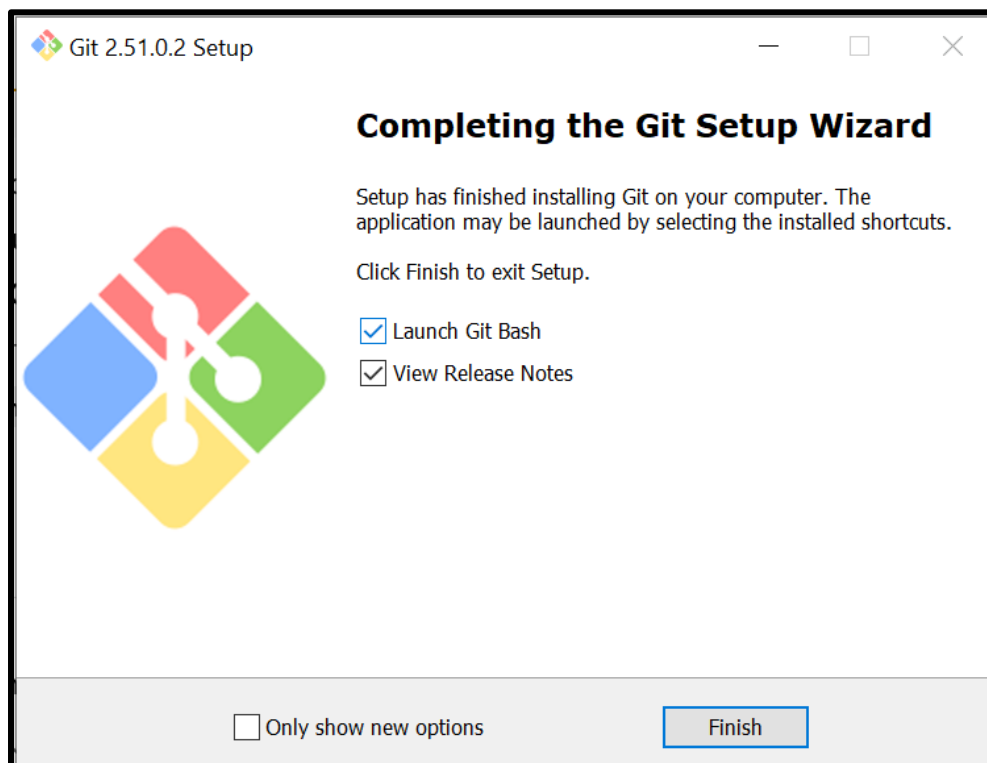
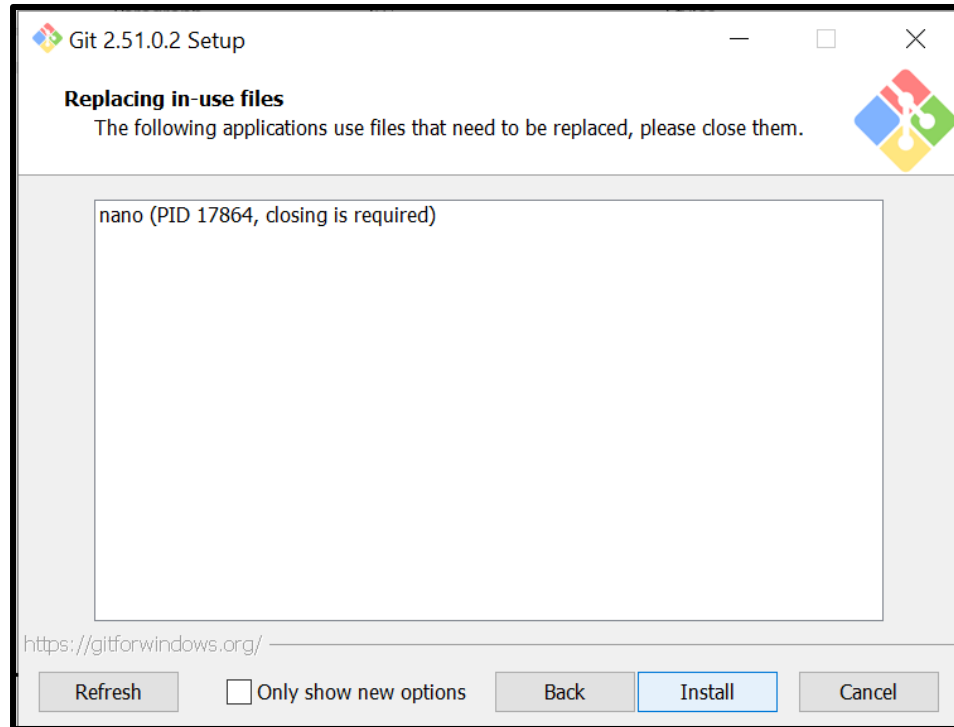













Task 1: Create Private GitHub Repository

General

Owner *

 AbihaNadeem005

Repository name *

Lab02

✓ Lab02 is available.

Great repository names are short and memorable. How about [animated-succotash?](#)


Description

0 / 350 characters

Configuration

Choose visibility *

Choose who can see and commit to this repository

 Private

Add README

READMEs can be used as longer descriptions. [About READMEs](#)

On ☒

Add .gitignore

.gitignore tells git which files not to track. [About ignoring files](#)

No .gitignore

Add license

Licenses explain how others can use your code. [About licenses](#)

No license

Task 2: Connect Repository via SSH

```
Windows PowerShell
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

Try the new cross-platform PowerShell https://aka.ms/pscore6

PS C:\Users\MOHSIN> ssh-keygen -t ed25519 -C "23-22411-001@se.fjwu.edu.pk"
Generating public/private ed25519 key pair.
Enter file in which to save the key (C:\Users\MOHSIN\.ssh/id_ed25519):
C:\Users\MOHSIN\.ssh/id_ed25519 already exists.
Overwrite (y/n)? y
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in C:\Users\MOHSIN\.ssh/id_ed25519
Your public key has been saved in C:\Users\MOHSIN\.ssh/id_ed25519.pub
The key fingerprint is:
SHA256:937rjNK2AS6EYzatDnlj5hINUhm0ydSxjU1HfMhKUTs 23-22411-001@se.fjwu.edu.pk
The key's randomart image is:
+--[ED25519 256]--+
|    .+...O*+.    |
|    O =.*..+..   |
|    B O.O.E.     |
|    B = . .      |
|    = & S O       |
|    O * O O      |
|    O . ..O      |
|    ...O+.       |
|    O+++.        |
+----[SHA256]-----+
PS C:\Users\MOHSIN>
```



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

SSH keys

[New SSH key](#)

This is a list of SSH keys associated with your account. Remove any keys that you do not recognize.

Authentication keys


SSH

Public SSH Key

SHA256:937rjNK2AS6EYzatDNlj5HiNUhm0ydsxjU1HfMhKUTs

Added on Oct 3, 2025

Never used — Read/write

[Delete](#)

Check out our guide to [connecting to GitHub using SSH keys](#) or troubleshoot [common SSH problems](#).

Clone your Lab2 repo using SSH.

```
MOHSIN@DESKTOP-UIDARLS MINGW64 ~ (master)
$ git clone git@github.com:abihanadeem005/Lab02.git
Cloning into 'Lab02'...
remote: Enumerating objects: 22, done.
remote: Counting objects: 100% (22/22), done.
remote: Compressing objects: 100% (20/20), done.
remote: Total 22 (delta 5), reused 0 (delta 0), pack-reused 0 (from 0)
Receiving objects: 100% (22/22), 280.24 KiB | 1003.00 KiB/s, done.
Resolving deltas: 100% (5/5), done.

MOHSIN@DESKTOP-UIDARLS MINGW64 ~ (master)
$ |
```

Task 3: Configure Git Username and Email

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

```
MOHSIN@DESKTOP-UIDARLS MINGW64 ~
$ git config --global user.name "Abiha Nadeem"
git config --global user.email "23-22411-001@se.fjwu.edu.pk"

MOHSIN@DESKTOP-UIDARLS MINGW64 ~
$
```

Verify your configuration:

```
MOHSIN@DESKTOP-UIDARLS MINGW64 ~  
$ git config --list  
diff.astextplain.textconv=astextplain  
filter.lfs.clean=git-lfs clean -- %f  
filter.lfs.smudge=git-lfs smudge -- %f  
filter.lfs.process=git-lfs filter-process  
filter.lfs.required=true  
http.sslbackend=schannel  
core.autocrlf=true  
core.fscache=true  
core.symlinks=false  
pull.rebase=false  
credential.helper=manager  
credential.https://dev.azure.com.usehttppath=true  
init.defaultbranch=master  
user.email=23-22411-001@se.fjwu.edu.pk  
user.name=Abiha Nadeem  
  
MOHSIN@DESKTOP-UIDARLS MINGW64 ~  
$
```

Task 4: Explore the .git Folder

```
MOHSIN@DESKTOP-UIDARLS MINGW64 ~/Lab02 (main)  
$ ls -a  
./      README.md      git_installation.png  ssh_clone.png  
../     git_config_list.png  github_sshkey.png     ssh_keygen.png  
.  
./      git_identity.png  repo_private.png  
  
MOHSIN@DESKTOP-UIDARLS MINGW64 ~/Lab02 (main)  
$
```

Task 5: Local Repository Management

```
MOHSIN@DESKTOP-UIDARLS MINGW64 ~/Lab02 (main)  
$ rm -rf .git  
  
MOHSIN@DESKTOP-UIDARLS MINGW64 ~/Lab02 (master)  
$
```

Re-initialize the local git repository:

```
MOHSIN@DESKTOP-UIDARLS MINGW64 ~/Lab02 (master)
$ git init
Initialized empty Git repository in C:/Users/MOHSIN/Lab02/.git/

MOHSIN@DESKTOP-UIDARLS MINGW64 ~/Lab02 (master)
$ |
$ echo "# Lab02 Git Practice" > 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
[master (root-commit) c23a352] Initial commit
1 file changed, 1 insertion(+)
create mode 100644 README.md

MOHSIN@DESKTOP-UIDARLS MINGW64 ~/Lab02 (master)
$
```

Connect your local repo to GitHub and push:

```
MOHSIN@DESKTOP-UIDARLS MINGW64 ~/Lab02 (master)
$ git remote add origin git@github.com:abihanadeem005/Lab02.git
git push -u origin master
error: remote origin already exists.
Enumerating objects: 3, done.
Counting objects: 100% (3/3), done.
Writing objects: 100% (3/3), 242 bytes | 121.00 KiB/s, done.
Total 3 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
remote: This repository moved. Please use the new location:
remote:   git@github.com:AbihaNadeem005/Lab02.git
remote:
remote: Create a pull request for 'master' on GitHub by visiting:
remote:   https://github.com/AbihaNadeem005/Lab02/pull/new/master
remote:
To github.com:abihanadeem005/Lab02.git
 * [new branch]      master -> master
branch 'master' set up to track 'origin/master'.

MOHSIN@DESKTOP-UIDARLS MINGW64 ~/Lab02 (master)
$ |
```

Task 6: File Status & Staging

1. Create a new file notes.txt and write a note.
2. Check status

```

MOHSIN@DESKTOP-UIDARLS MINGW64 ~/Lab02 (master)
$ cd ~/Lab02

MOHSIN@DESKTOP-UIDARLS MINGW64 ~/Lab02 (master)
$ echo "This is my first note." > notes.txt

MOHSIN@DESKTOP-UIDARLS MINGW64 ~/Lab02 (master)
$ git status
On branch master
Your branch is up to date with 'origin/master'.

Untracked files:
  (use "git add <file>..." to include in what will be committed)
    git_config_list.png
    git_identity.png
    git_installation.png
    github_sshkey.png
    notes.txt
    repo_private.png
    ssh_clone.png
    ssh_keygen.png

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

MOHSIN@DESKTOP-UIDARLS MINGW64 ~/Lab02 (master)
$

```

3. Stage and commit

```

MOHSIN@DESKTOP-UIDARLS MINGW64 ~/Lab02 (master)
$ git add notes.txt
git commit -m "Add notes.txt"
warning: in the working copy of 'notes.txt', LF will be replaced by CRLF the next time Git touches it
[master f847dd4] Add notes.txt
 1 file changed, 1 insertion(+)
 create mode 100644 notes.txt

MOHSIN@DESKTOP-UIDARLS MINGW64 ~/Lab02 (master)
$

```

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

```

MOHSIN@DESKTOP-UIDARLS MINGW64 ~/Lab02 (master)
$ echo "This is my updated note." >> notes.txt

MOHSIN@DESKTOP-UIDARLS MINGW64 ~/Lab02 (master)
$ git status
On branch master
Your branch is ahead of 'origin/master' by 1 commit.
  (use "git push" to publish your local commits)

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

Untracked files:
  (use "git add <file>..." to include in what will be committed)
        git_config_list.png
        git_identity.png
        git_installation.png
        github_sshkey.png
        notes.txt~
        repo_private.png
        ssh_clone.png
        ssh_keygen.png

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

MOHSIN@DESKTOP-UIDARLS MINGW64 ~/Lab02 (master)
$ |

```

```




MOHSIN@DESKTOP-UIDARLS MINGW64 ~/Lab02 (master)
$ git add notes.txt
git commit -m "Add notes.txt"
warning: in the working copy of 'notes.txt', LF will be replaced by CRLF the next time Git touches it
[master 3692f6c] Add notes.txt
 1 file changed, 1 insertion(+)

MOHSIN@DESKTOP-UIDARLS MINGW64 ~/Lab02 (master)
$ |

```

Task 7: Branch Creation Using GitHub GUI

1. On GitHub (web interface), create a branch named bugfix/user-auth-error.

Your branches				
Branch	Updated	Check status	Behind Ahead	Pull request
bugfix/user-auth-error 	 now		0 0	 ...

2. Pull the branch to your local repository to sync.

```

MOHSIN@DESKTOP-UIDARLS MINGW64 ~/Lab02 (master)
$ git fetch origin
remote: Enumerating objects: 49, done.
remote: Counting objects: 100% (49/49), done.
remote: Compressing objects: 100% (46/46), done.
remote: Total 49 (delta 14), reused 0 (delta 0), pack-reused 0 (from 0)
Unpacking objects: 100% (49/49), 482.55 KiB | 410.00 KiB/s, done.
From github.com:abihanadeem005/Lab02
 * [new branch]      bugfix/user-auth-error -> origin/bugfix/user-auth-error
 * [new branch]      main -> origin/main

MOHSIN@DESKTOP-UIDARLS MINGW64 ~/Lab02 (master)
$ git checkout bugfix/user-auth-error
error: the following untracked working tree files would be overwritten by checkout:
        git_config_list.png

```

Task 8: Branch Creation and Push Using Git Bash

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

```
MOHSIN@DESKTOP-UIDARLS MINGW64 ~/Lab02 (master)
$ git checkout -b feature/db-connection
Switched to a new branch 'feature/db-connection'

MOHSIN@DESKTOP-UIDARLS MINGW64 ~/Lab02 (feature/db-connection)
$
```

2. Push the branch to the remote repository:

```
MOHSIN@DESKTOP-UIDARLS MINGW64 ~/Lab02 (feature/db-connection)
$ git push origin feature/db-connection
Enumerating objects: 7, done.
Counting objects: 100% (7/7), done.
Delta compression using up to 4 threads
Compressing objects: 100% (4/4), done.
Writing objects: 100% (6/6), 593 bytes | 197.00 KiB/s, done.
Total 6 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
remote: This repository moved. Please use the new location:
remote:   git@github.com:AbihaNadeem005/Lab02.git
remote:
remote: Create a pull request for 'feature/db-connection' on GitHub by visiting:
remote:   https://github.com/AbihaNadeem005/Lab02/pull/new/feature/db-connection
remote:
To github.com:abihaNadeem005/Lab02.git
 * [new branch]      feature/db-connection -> feature/db-connection

MOHSIN@DESKTOP-UIDARLS MINGW64 ~/Lab02 (feature/db-connection)
$

MOHSIN@DESKTOP-UIDARLS MINGW64 ~/Lab02 (feature/db-connection)
$ git checkout -b feature-1
Switched to a new branch 'feature-1'

MOHSIN@DESKTOP-UIDARLS MINGW64 ~/Lab02 (feature-1)
$ |
```

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

```
MOHSIN@DESKTOP-UIDARLS MINGW64 ~/Lab02 (feature-1)
$ git add main.py
git commit -m "Add new function to main.py"
[feature-1 84eee26] Add new function to main.py
1 file changed, 1 insertion(+)
create mode 100644 main.py

MOHSIN@DESKTOP-UIDARLS MINGW64 ~/Lab02 (feature-1)
$
```

3. Switch back to main and merge

```
MOHSIN@DESKTOP-UIDARLS MINGW64 ~/Lab02 (feature-1)
$ git checkout master
Switched to branch 'master'
Your branch is ahead of 'origin/master' by 2 commits.
(use "git push" to publish your local commits)

MOHSIN@DESKTOP-UIDARLS MINGW64 ~/Lab02 (master)
$ git merge feature-1
Updating 3692f6c..84eee26
Fast-forward
 main.py | 1 +
1 file changed, 1 insertion(+)
create mode 100644 main.py

MOHSIN@DESKTOP-UIDARLS MINGW64 ~/Lab02 (master)
$
```

4. Push all branches:

```

MOHSIN@DESKTOP-UIDARLS MINGW64 ~/Lab02 (master)
$ git push origin master
Enumerating objects: 4, done.
Counting objects: 100% (4/4), done.
Delta compression using up to 4 threads
Compressing objects: 100% (2/2), done.
Writing objects: 100% (3/3), 346 bytes | 173.00 KiB/s, done.
Total 3 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
remote: This repository moved. Please use the new location:
remote:   git@github.com:AbihaNadeem005/Lab02.git
To github.com:abihanadeem005/Lab02.git
    c23a352..84eee26  master -> master

MOHSIN@DESKTOP-UIDARLS MINGW64 ~/Lab02 (master)
$ git push origin feature-1
Total 0 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
remote: This repository moved. Please use the new location:
remote:   git@github.com:AbihaNadeem005/Lab02.git
remote:
remote: Create a pull request for 'feature-1' on GitHub by visiting:
remote:   https://github.com/AbihaNadeem005/Lab02/pull/new/feature-1
remote:
To github.com:abihanadeem005/Lab02.git
 * [new branch]      feature-1 -> feature-1

MOHSIN@DESKTOP-UIDARLS MINGW64 ~/Lab02 (master)
$ |

```

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

1. On GitHub, create a Pull Request from the branch feature/db-connection to main.

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: feature/db-connection
✓ Able to merge. These branches can be automatically merged.

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

Create pull request

1 commit

1 file changed

1 contributor

Commits on Oct 3, 2025

Add temporary file to enable Pull Request

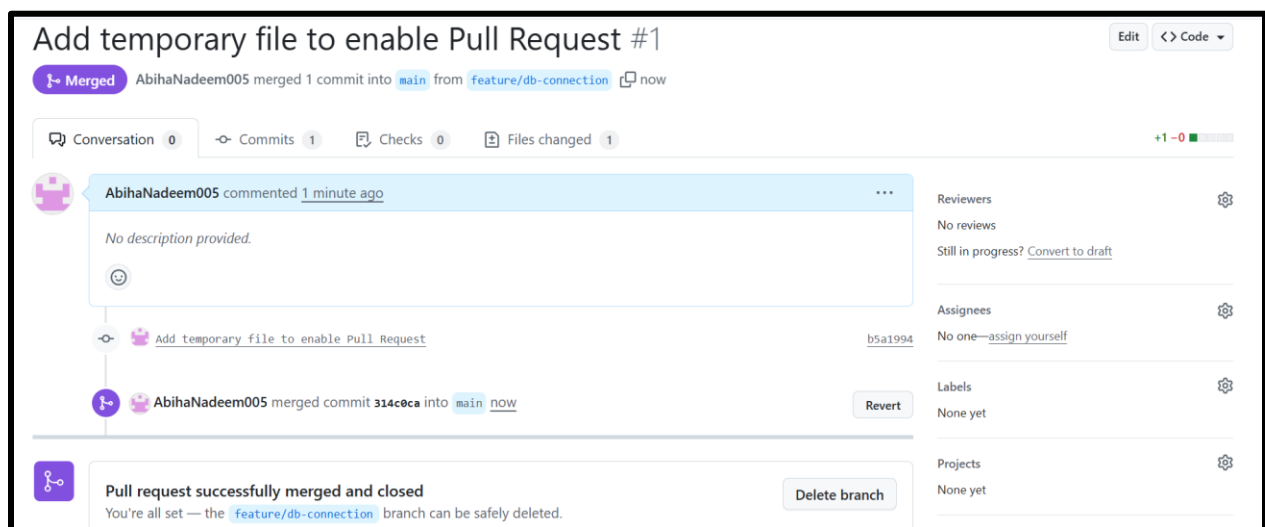
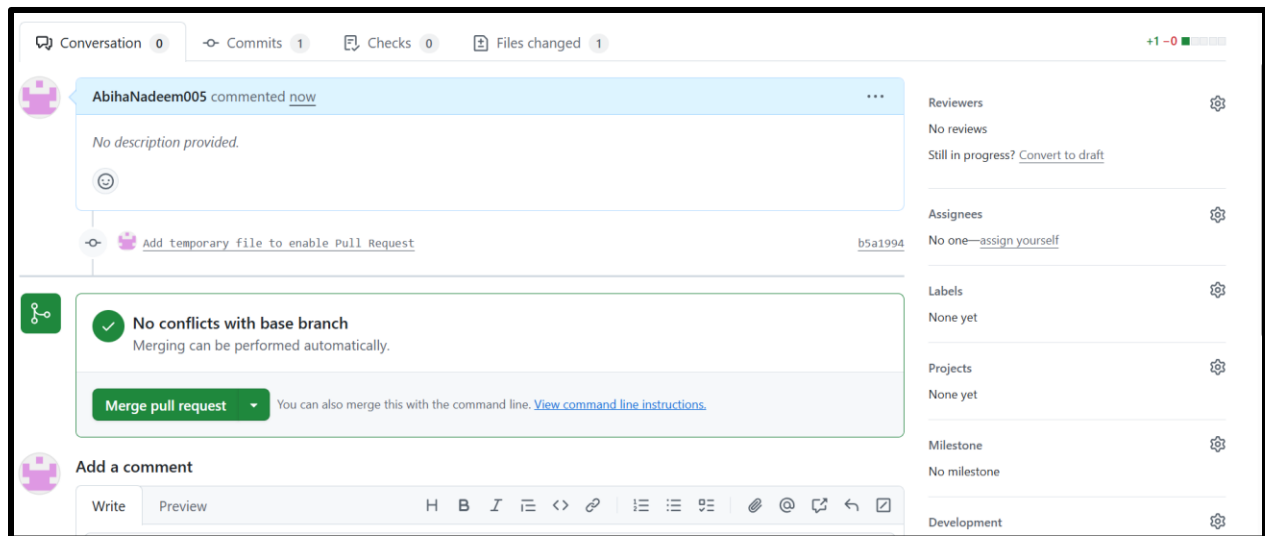
AbihaNadeem005 committed 6 minutes ago

b5a1994

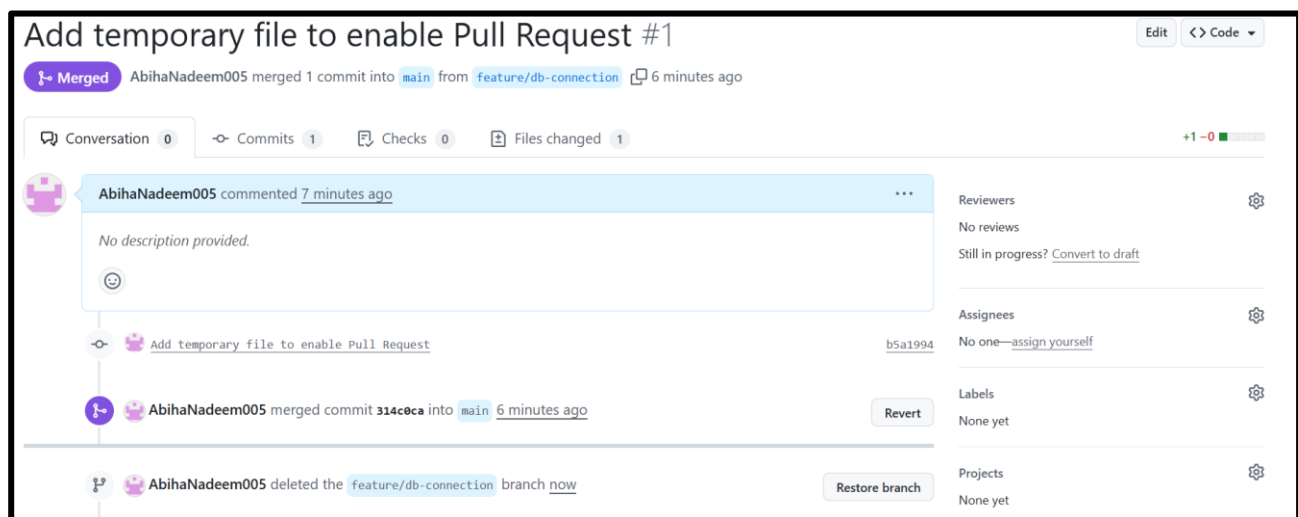
Showing 1 changed file with 1 addition and 0 deletions.

Split Unified

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)

Branch list (branch_strategy.png)

Branch	Updated	Check status	Behind	Ahead	Pull request
Feature-2	2 minutes ago		1	0	
develop	3 minutes ago		2	5	
bugfix/navbar	7 minutes ago		2	4	#3
feature-1	8 minutes ago		26	5	#2
feature	1 hour ago		2	0	
staging	2 hours ago		2	0	
bugfix/user-auth-error	3 hours ago		14	10	
master	3 hours ago		26	1	

Merges into develop and staging (branch_merges.png)

Merged

Develop #5

AbihaNadeem005 merged 10 commits into `staging` from `develop` now

Restore README.md from main

Add navbar fix

Merge pull request #3 from AbihaNadeem005/bugfix/navbar

Add example file for Feature-2

Merge pull request #4 from AbihaNadeem005/Feature-2

Add files via upload

Delete branch_merges.png

d14d436

c78a166

29f0b55

0b522d8

4f6795f

04f767f

d46e724

Verified

Verified

Verified

Verified

Verified

Milestone

No milestone

Development

Successfully merging this pull request may close these issues.

None yet

Notifications

Unsubscribe

1 participant

Pull request successfully merged and closed

You're all set — the `develop` branch can be safely deleted.

Delete branch

Final merge into main (final_merge.png)

Merged

Staging #6

AbihaNadeem005 merged 10 commits into `main` from `staging` now

Add navbar fix

Merge pull request #3 from AbihaNadeem005/bugfix/navbar

Add example file for Feature-2

Merge pull request #4 from AbihaNadeem005/Feature-2

Add files via upload

Delete branch_merges.png

Merge pull request #5 from AbihaNadeem005/develop

c78a166

29f0b55

0b522d8

4f6795f

04f767f

d46e724

b17fa80

Verified

Verified

Verified

Verified

Verified

Milestone

No milestone

Development

Successfully merging this pull request may close these issues.

None yet

Notifications

Unsubscribe

1 participant

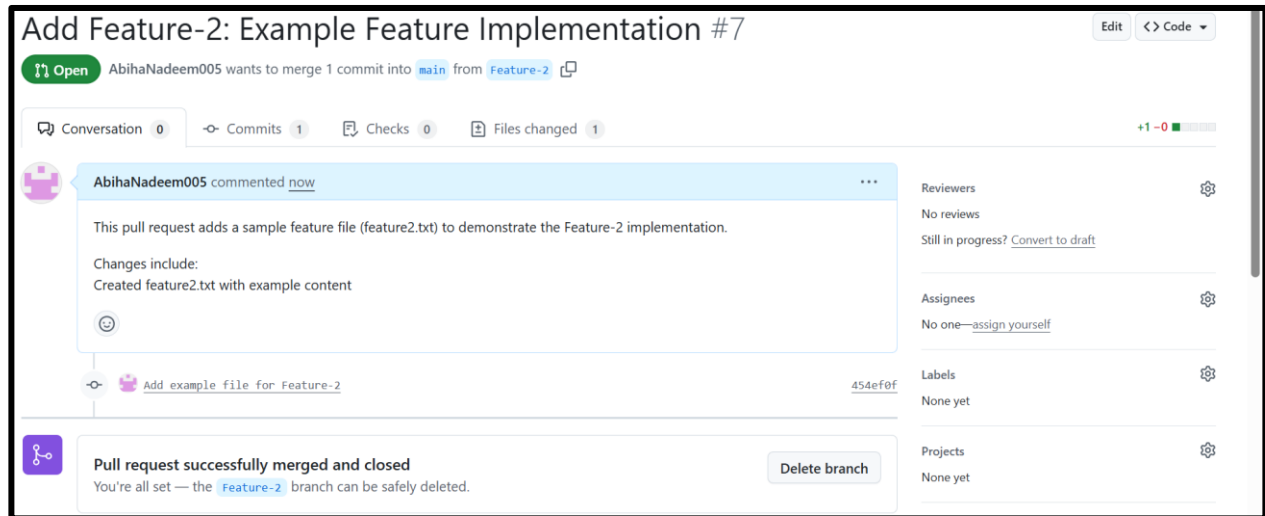
Pull request successfully merged and closed

You're all set — the `staging` branch can be safely deleted.

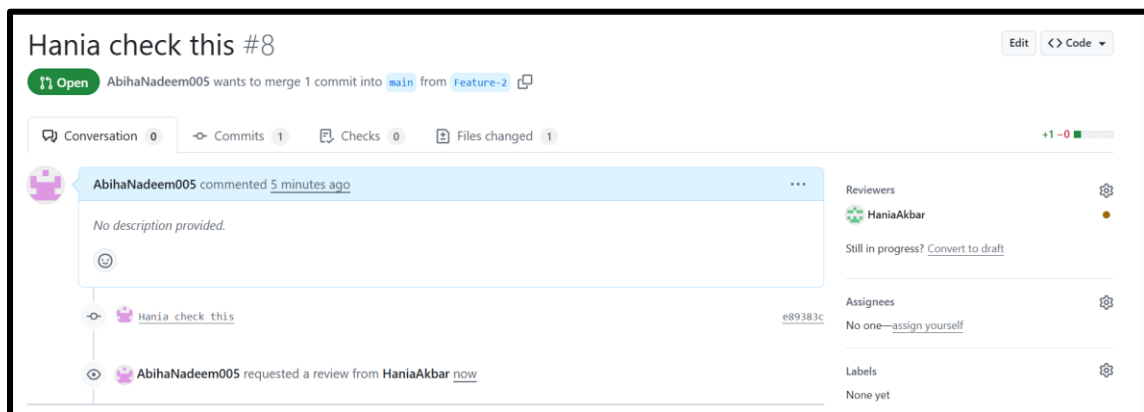
Delete branch

Task 12: Code Review Workflow

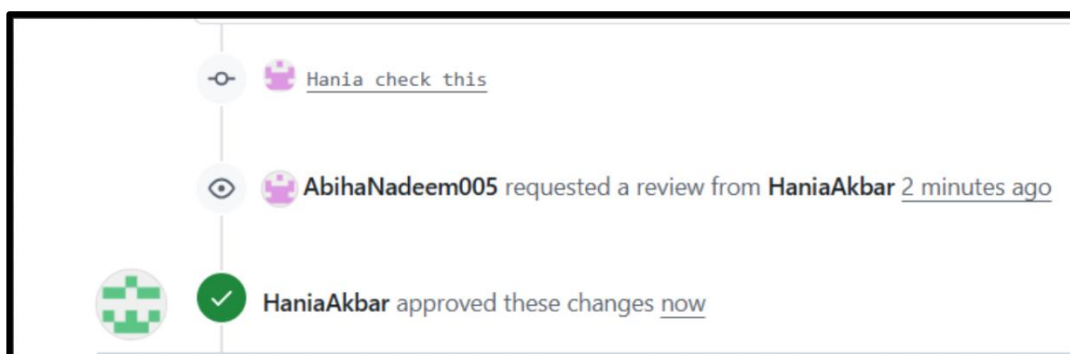
Create a Pull Request (PR) / Merge Request (MR):



1. **Assign a reviewer** (teammate or second account).
 - o Screenshot as pr_assigned_reviewer.png.

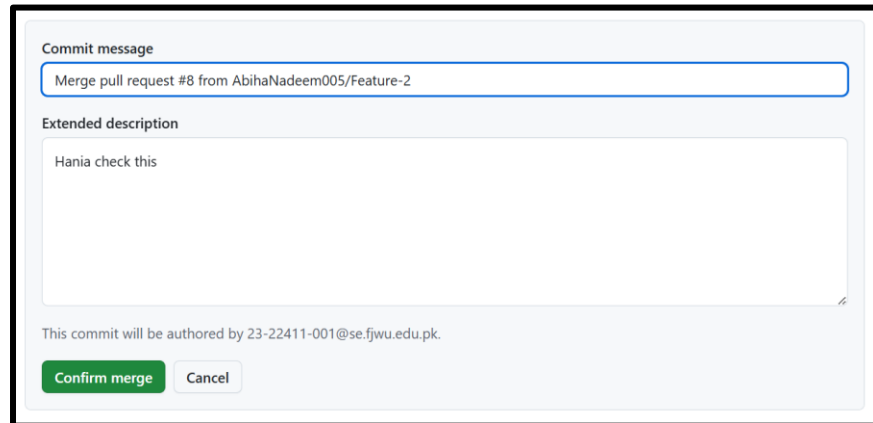


1. **Reviewer Actions (capture screenshots for each):**
 - o Approve the PR → pr_approved.png



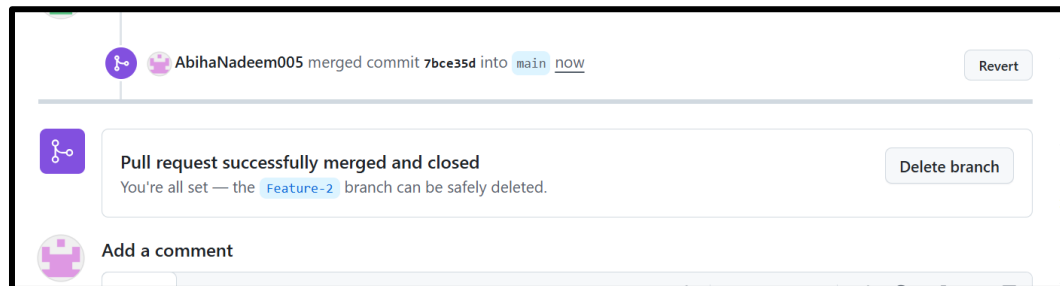
5. Merge the PR:

- a. Screenshot confirmation → pr_merge_confirm.png.



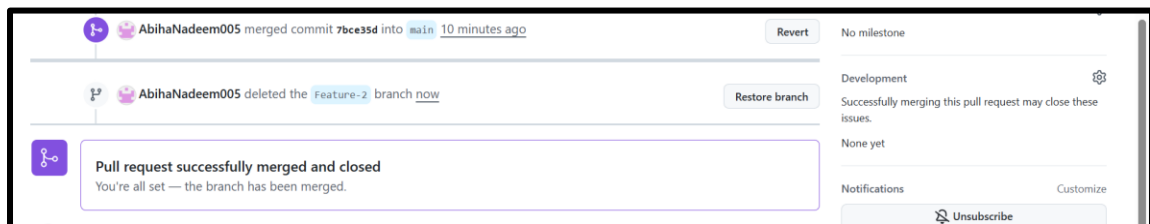
This screenshot shows the 'Confirm merge' dialog in GitHub. It has a 'Commit message' field containing 'Merge pull request #8 from AbihaNadeem005/Feature-2'. Below it is an 'Extended description' field with the text 'Hania check this'. At the bottom, it states 'This commit will be authored by 23-22411-001@se.fju.edu.pk.' and has two buttons: 'Confirm merge' (green) and 'Cancel' (grey).

- b. Screenshot result → pr_merged.png.



Branch Handling After Merge:

- If deleted, screenshot → pr_branch_deleted.png.



Task 13: Branch Cleanup Best Practices

1. Delete Remote Branch After Merge:

- Use GitHub UI → screenshot remote_branch_deleted.png.



```
MOHSIN@DESKTOP-UIDARLS MINGW64 ~ (master)
$ git fetch -p

MOHSIN@DESKTOP-UIDARLS MINGW64 ~ (master)
$ git branch -r

MOHSIN@DESKTOP-UIDARLS MINGW64 ~ (master)
$
```

