

CLOUD COMPUTING

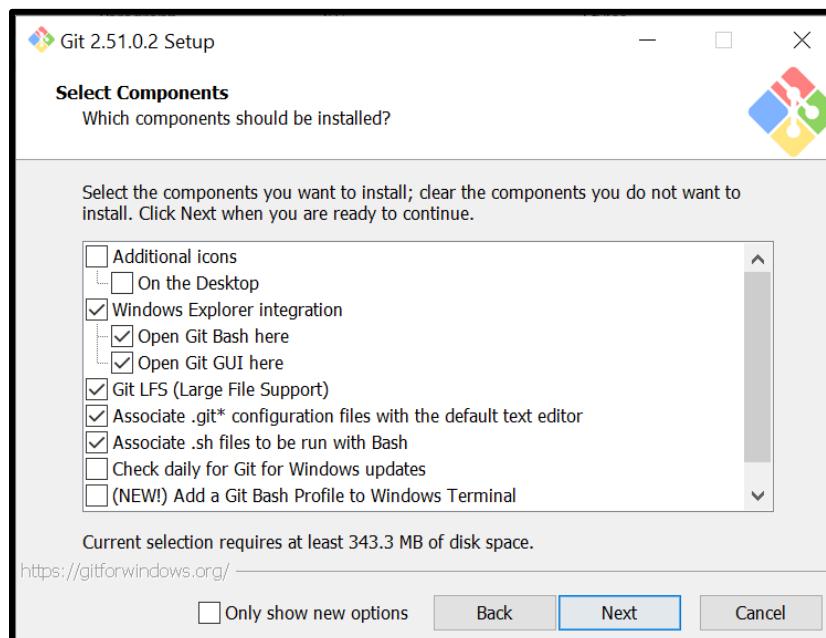
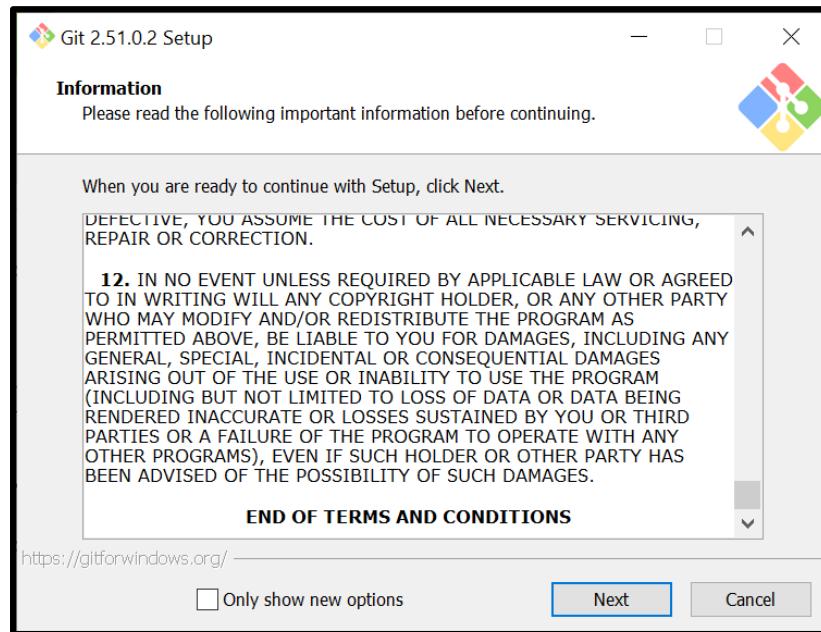
Lab 02

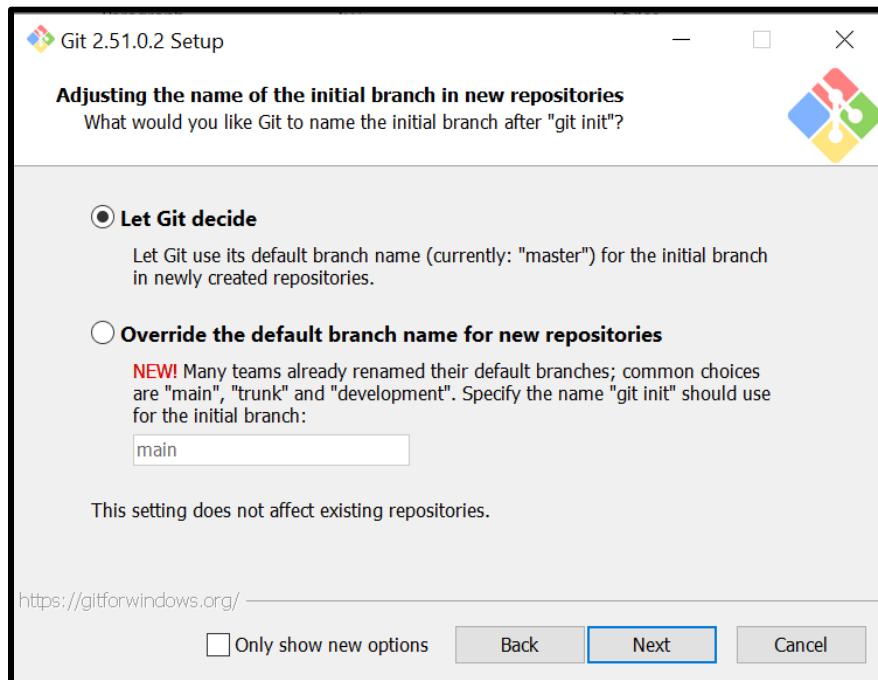
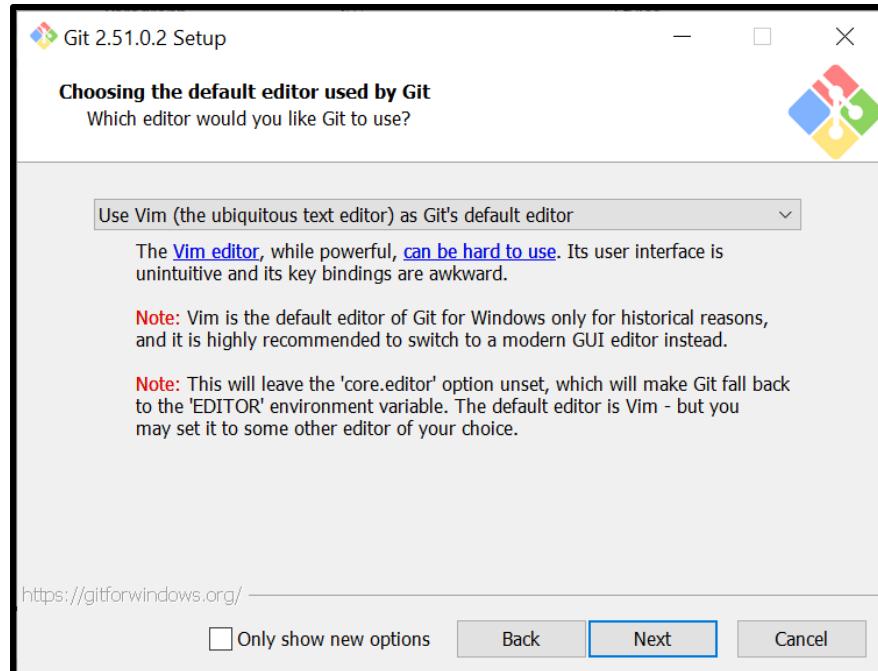
Name: Abiha Nadeem

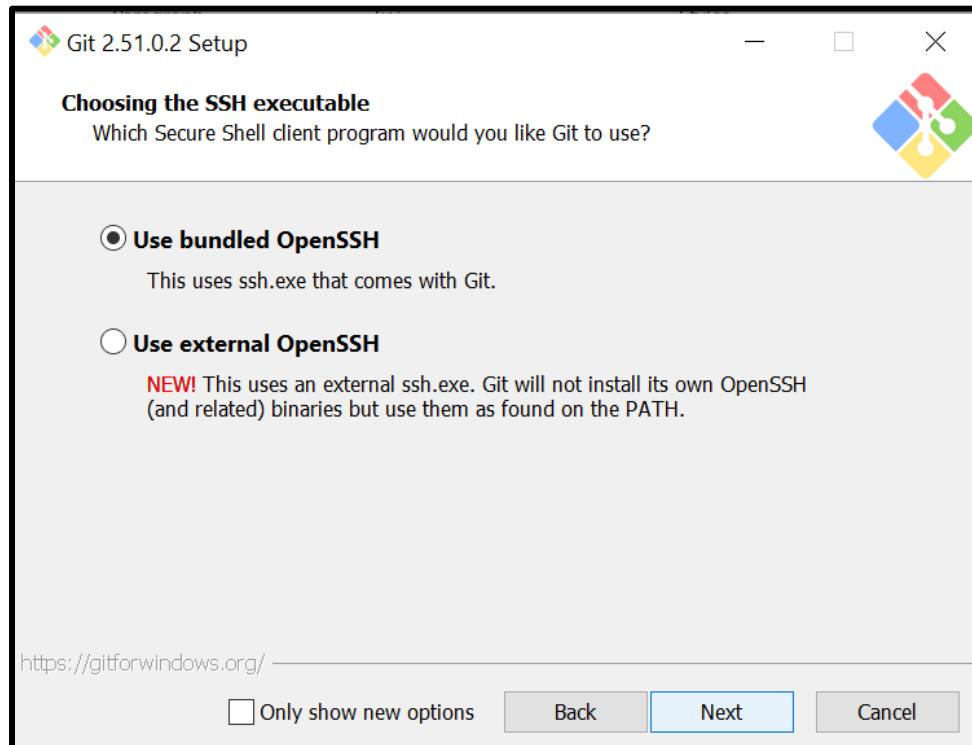
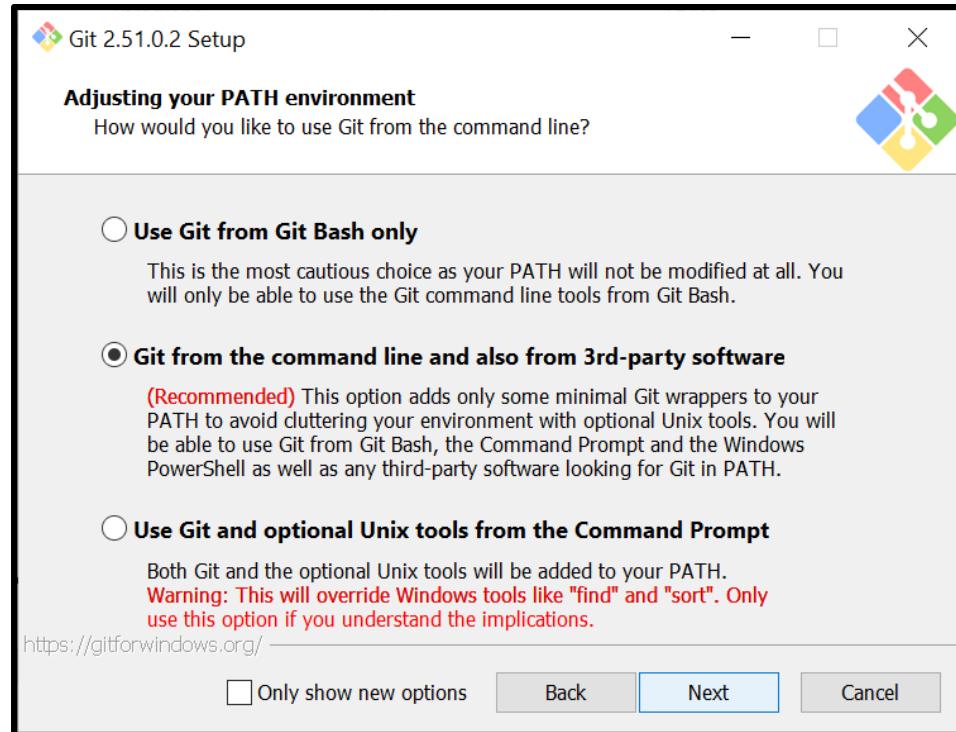
Roll no: 2023-BSE-001

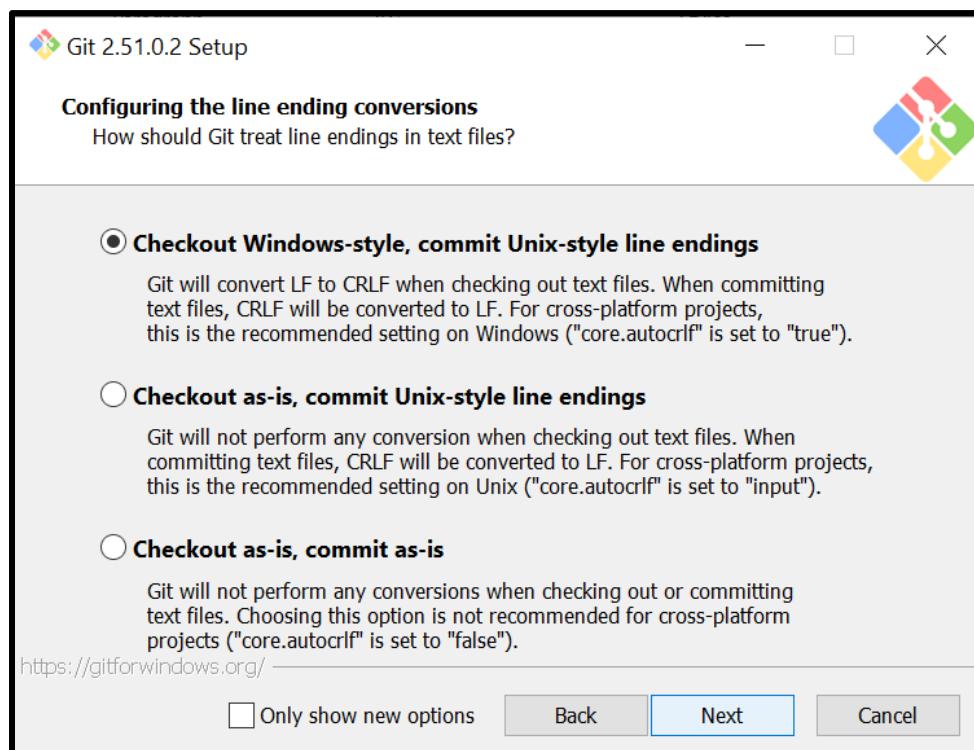
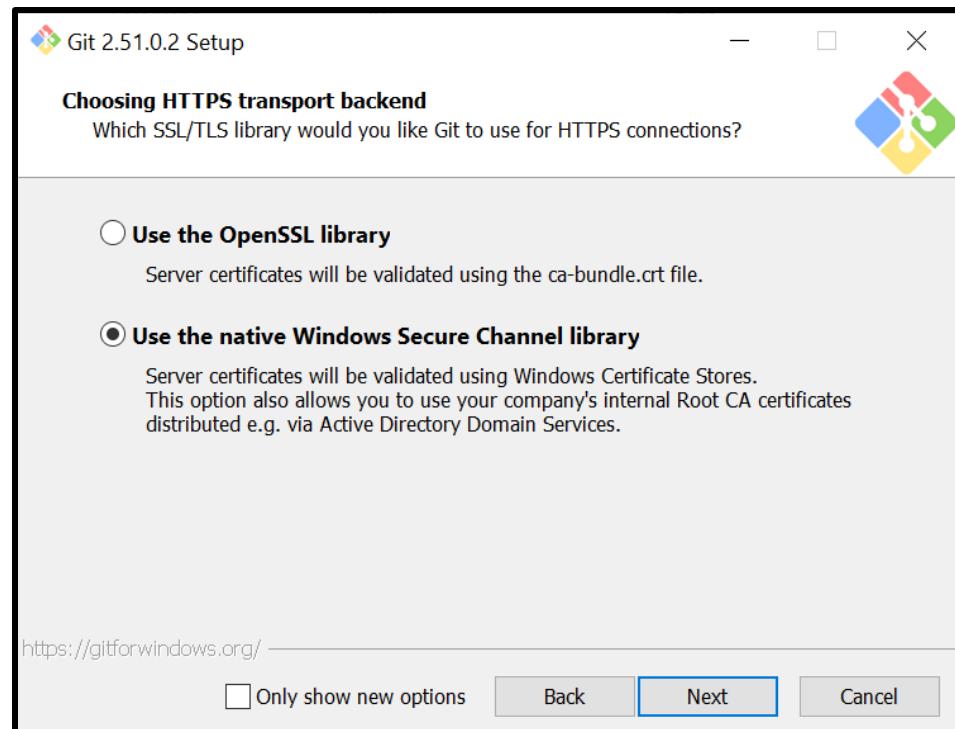
Submitted to: Engr. Muhammad Shoaib

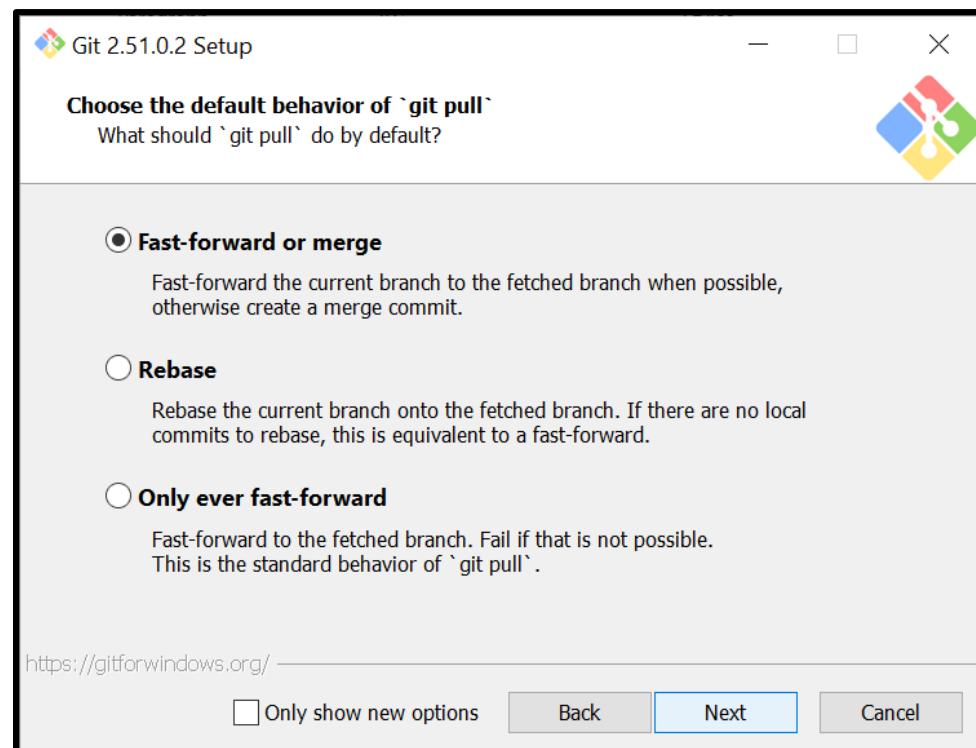
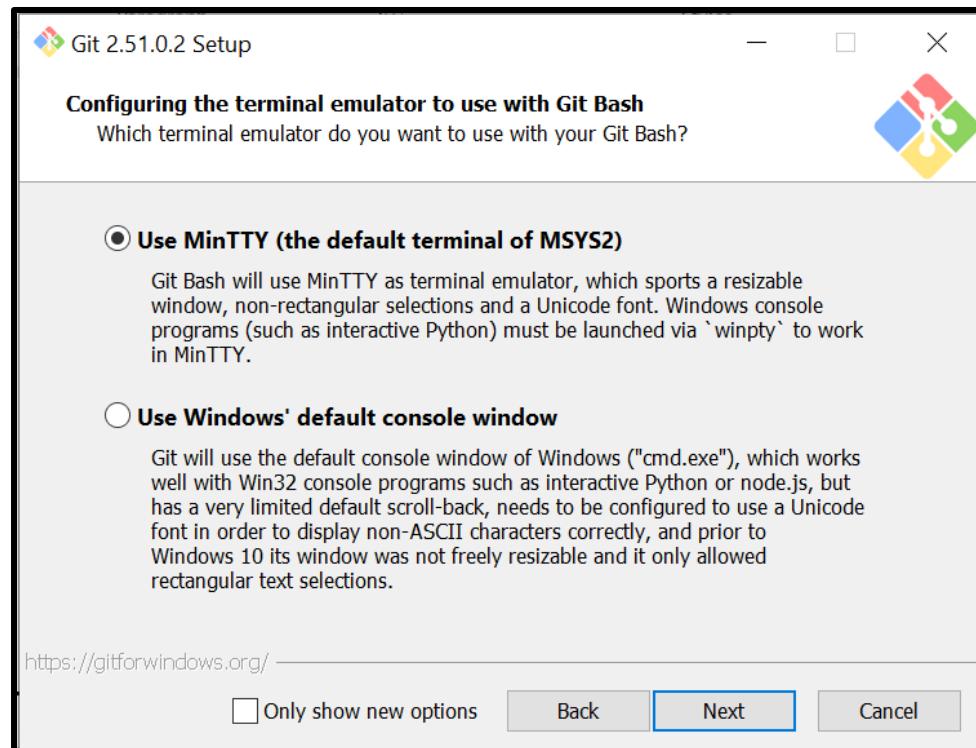
- **Install Git on your PC**

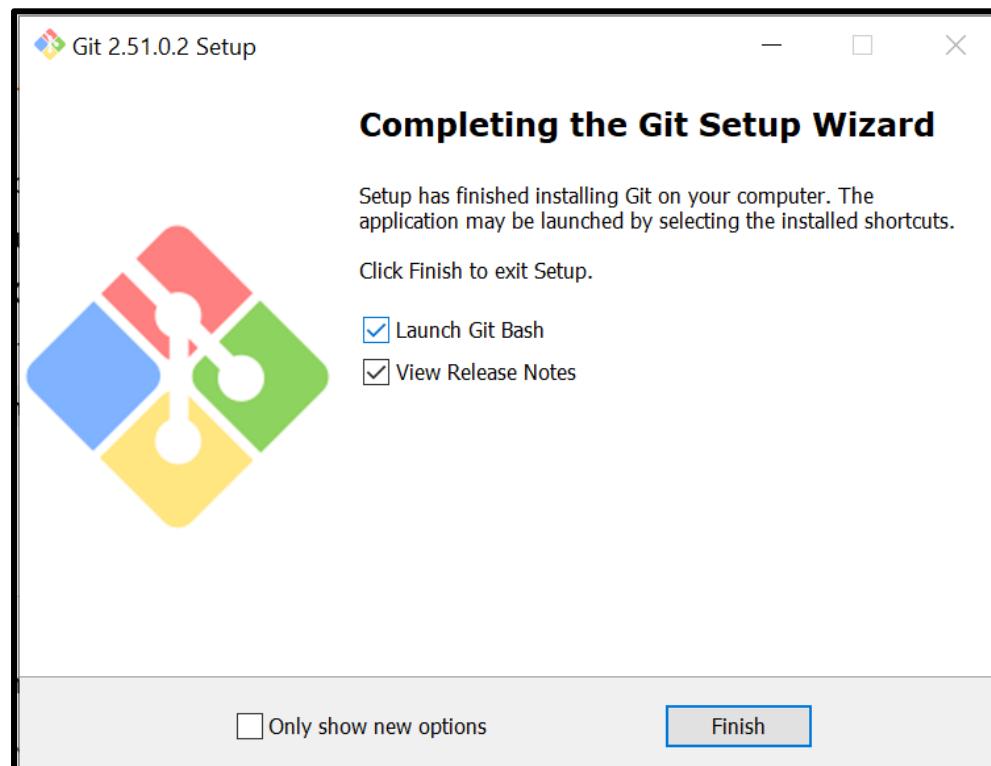
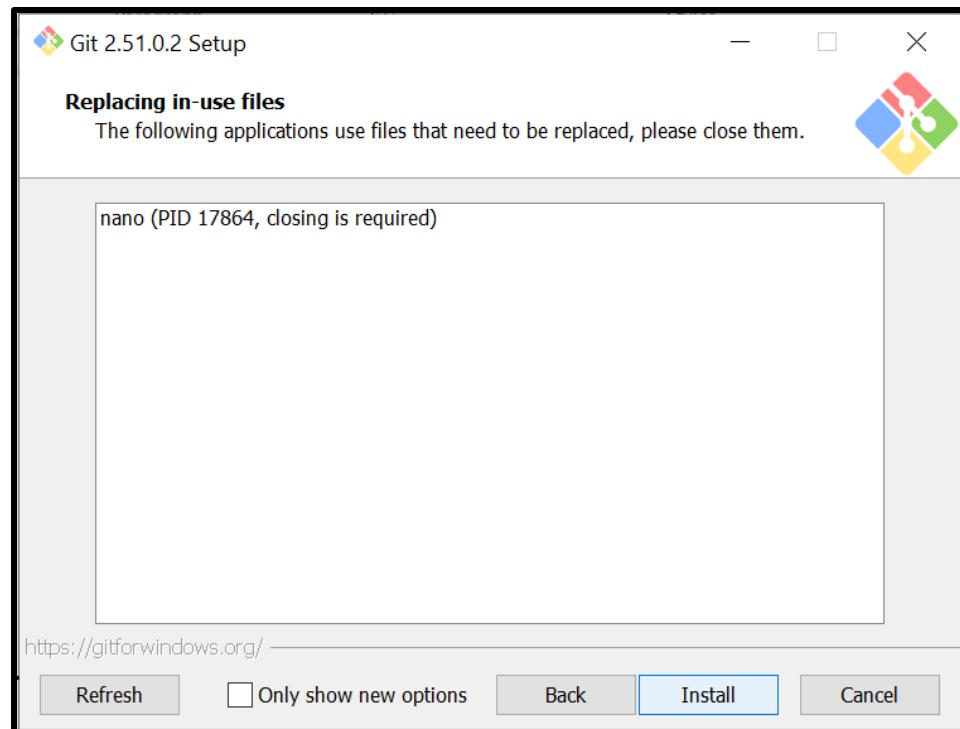












Task 1: Create Private GitHub Repository

General

Owner *  AbihaNadeem005 / Repository name * Lab02
Lab02 is available.

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

Description

0 / 350 characters

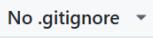
Configuration

Choose visibility *  Private

Choose who can see and commit to this repository

Add README  On

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

Add .gitignore  No .gitignore

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

Add license  No license

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

Task 2: Connect Repository via SSH

```
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

Public SSH Key	Action
 SHA256:937rjNK2AS6EYZatDNlj5HiNUhm0ydSxjU1HfMhKUTs Added on Oct 3, 2025 Never used — Read/write	<button>Delete</button>

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/ 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/
A 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.

The screenshot shows a table titled 'Your branches'. It has columns for 'Branch', 'Updated', 'Check status', 'Behind', 'Ahead', and 'Pull request'. A single row is visible for the branch 'bugfix/user-auth-error'. The 'Check status' column shows a green icon with the text 'now'. The 'Behind' and 'Ahead' columns both show '0 | 0'. There are three dots at the bottom right of the table.

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:abihanaadeem005/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.

The screenshot shows a GitHub interface for comparing branches. At the top, it says "Comparing changes" and "base: main". A message indicates "Able to merge. These branches can be automatically merged." Below this, there's a section for "Discuss and review the changes in this comparison with others." A "Create pull request" button is visible. The commit details show "1 commit", "1 file changed", and "1 contributor". It notes "Commits on Oct 3, 2025" and lists a commit by "AbihaNadeem005" with the message "Add temporary file to enable Pull Request". The commit hash is "b5a1994". At the bottom, it says "Showing 1 changed file with 1 addition and 0 deletions." and has "Split" and "Unified" options.

2. Review the Pull Request and merge it using the GitHub GUI.

A screenshot of a GitHub pull request interface. At the top, there are tabs for Conversation (0), Commits (1), Checks (0), and Files changed (1). The status bar shows '+1 -0' with a green progress bar. The main area shows a comment from 'AbihaNadeem005' stating 'No description provided.' Below this is a commit message: 'Add temporary file to enable Pull Request'. A note says 'No conflicts with base branch' and 'Merging can be performed automatically.' A green button at the bottom right says 'Merge pull request' with a dropdown arrow. To the right of the pull request details, there are sections for Reviewers, Assignees, Labels, Projects, Milestone, and Development, each with a gear icon for settings.

A screenshot of a GitHub pull request interface. At the top, it says 'Merged' followed by 'AbihaNadeem005 merged 1 commit into main from feature/db-connection now'. The main area shows a comment from 'AbihaNadeem005' stating 'No description provided.' Below this is a commit message: 'Add temporary file to enable Pull Request'. A note says 'AbihaNadeem005 merged commit 314c0ca into main now'. A purple button labeled 'Revert' is visible. Below the commit, a message says 'Pull request successfully merged and closed' with a note: 'You're all set — the feature/db-connection branch can be safely deleted.' A 'Delete branch' button is present. To the right of the pull request details, there are sections for Reviewers, Assignees, Labels, Projects, Milestone, and Development, each with a gear icon for settings.

3. After merging, delete the feature/db-connection branch using the GitHub GUI.

A screenshot of a GitHub pull request interface. At the top, it says 'Merged' followed by 'AbihaNadeem005 merged 1 commit into main from feature/db-connection now 6 minutes ago'. The main area shows a comment from 'AbihaNadeem005' stating 'No description provided.' Below this is a commit message: 'Add temporary file to enable Pull Request'. A note says 'AbihaNadeem005 merged commit 314c0ca into main 6 minutes ago'. A purple button labeled 'Revert' is visible. Below the commit, a message says 'AbihaNadeem005 deleted the feature/db-connection branch now' with a 'Restore branch' button. To the right of the pull request details, there are sections for Reviewers, Assignees, Labels, Projects, Milestone, and Development, each with a gear icon for settings.

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)

Develop #5
AbihaNadeem005 merged 10 commits into [staging](#) from [develop](#) [now](#)

- Restore README.md from main [d14d436](#) [Milestone](#) [No milestone](#)
- Add navbar fix [c78a166](#) [Verified](#) [29f0b55](#)
- Merge pull request #3 from AbihaNadeem005/bugfix/navbar [...](#)
- Add example file for Feature-2 [0b522d8](#) [Development](#) [Successfully merging this pull request may close these issues.](#)
- Merge pull request #4 from AbihaNadeem005/Feature-2 [...](#) [Verified](#) [4f6795f](#) [None yet](#)
- Add files via upload [04f767f](#) [Verified](#)
- Delete branch merges.png [d46e724](#) [Notifications](#) [Customize](#)

AbihaNadeem005 merged commit [b17fa80](#) into [staging](#) [now](#) [Revert](#)

Pull request successfully merged and closed You're all set — the [develop](#) branch can be safely deleted. [Delete branch](#)

1 participant

- Final merge into main (final_merge.png)

Staging #6
AbihaNadeem005 merged 10 commits into [main](#) from [staging](#) [now](#)

- Add navbar fix [c78a166](#) [None yet](#)
- Merge pull request #3 from AbihaNadeem005/bugfix/navbar [...](#) [Verified](#) [29f0b55](#) [Milestone](#) [No milestone](#)
- Add example file for Feature-2 [0b522d8](#) [Development](#) [Successfully merging this pull request may close these issues.](#)
- Merge pull request #4 from AbihaNadeem005/Feature-2 [...](#) [Verified](#) [4f6795f](#) [None yet](#)
- Add files via upload [04f767f](#) [Verified](#)
- Delete branch merges.png [d46e724](#) [Notifications](#) [Customize](#)
- Merge pull request #5 from AbihaNadeem005/develop [...](#) [Verified](#) [b17fa80](#) [Notifications](#) [Customize](#)

AbihaNadeem005 merged commit [c1c2e5c](#) into [main](#) [now](#) [Revert](#)

Pull request successfully merged and closed You're all set — the [staging](#) branch can be safely deleted. [Delete branch](#)

1 participant

Task 12: Code Review Workflow

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

Add Feature-2: Example Feature Implementation #7

AbihaNadeem005 wants to merge 1 commit into `main` from `Feature-2`

Conversation 0 Commits 1 Checks 0 Files changed 1

AbihaNadeem005 commented now

This pull request adds a sample feature file (feature2.txt) to demonstrate the Feature-2 implementation.

Changes include:
Created feature2.txt with example content

Pull request successfully merged and closed
You're all set — the `Feature-2` branch can be safely deleted.

Reviewers: No reviews
Still in progress? Convert to draft

Assignees: No one—assign yourself

Labels: None yet

Projects: None yet

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

Hania check this #8

AbihaNadeem005 wants to merge 1 commit into `main` from `Feature-2`

Conversation 0 Commits 1 Checks 0 Files changed 1

AbihaNadeem005 commented 5 minutes ago

No description provided.

Hania check this

AbihaNadeem005 requested a review from HaniaAkbar now

Reviewers: HaniaAkbar

Assignees: No one—assign yourself

Labels: None yet

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

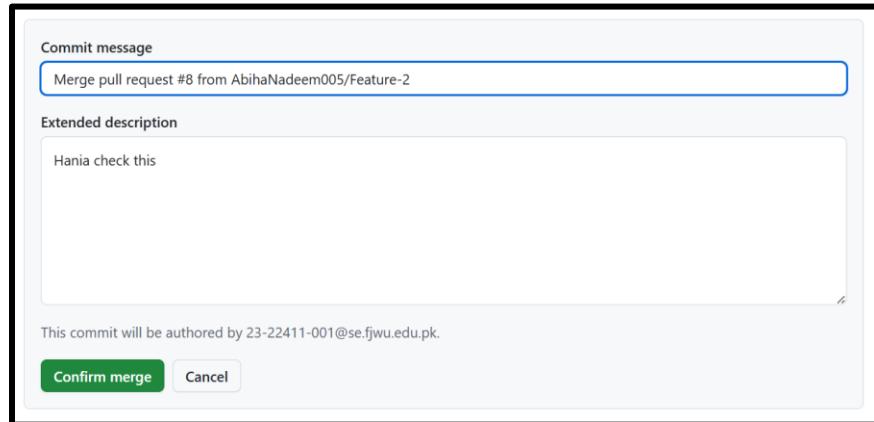
Hania check this

AbihaNadeem005 requested a review from HaniaAkbar 2 minutes ago

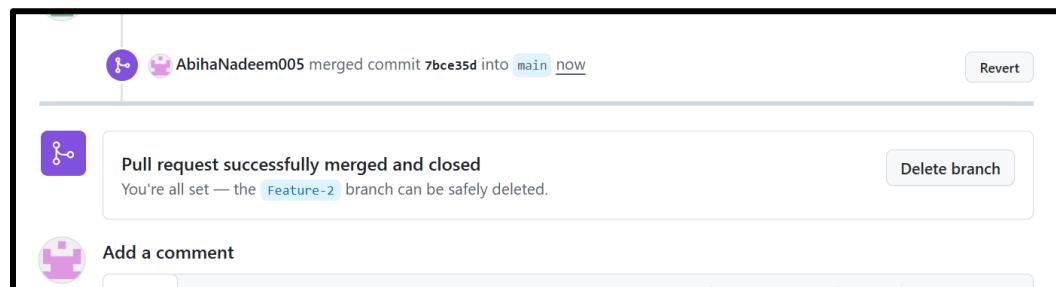
HaniaAkbar approved these changes now

5. Merge the PR:

- a. Screenshot confirmation → pr_merge_confirm.png.



- 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)
$
```

