

FATIMA JINNAH WOMEN UNIVERSITY

Department of Software Engineering



LAB #02

SUBJECT: CLOUD COMPUTING

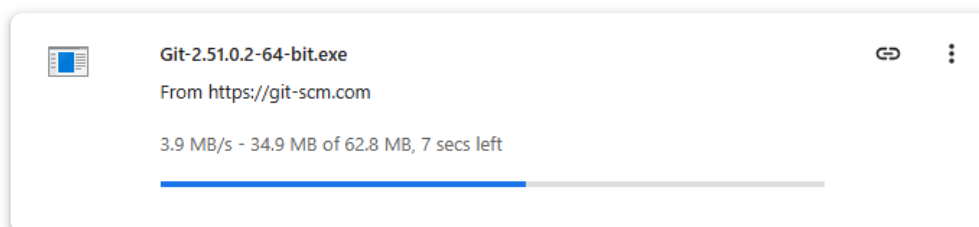
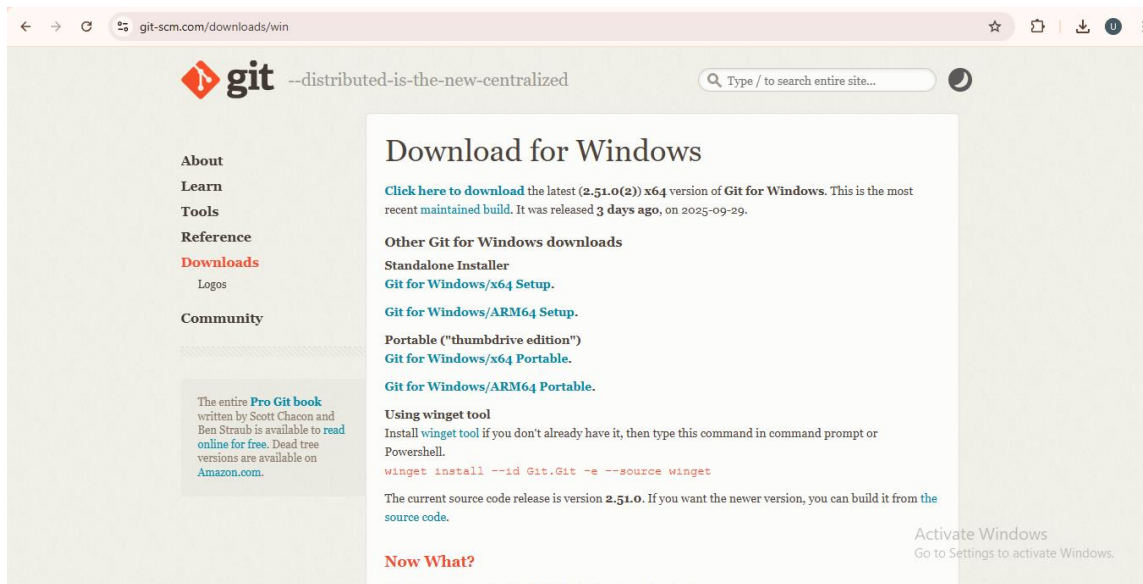
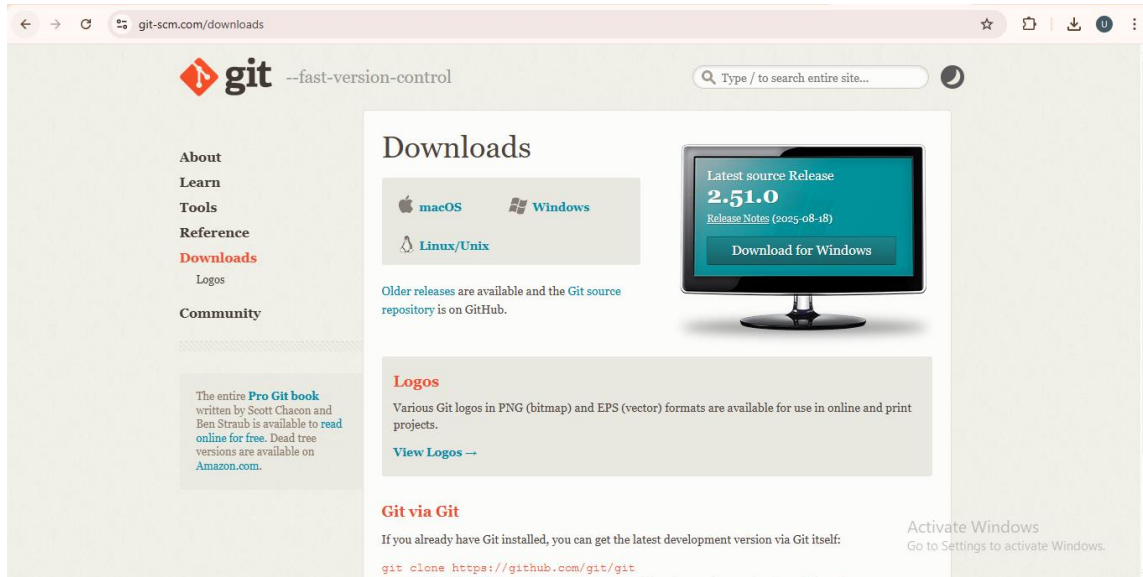
SUBMITTED TO: SIR MUHAMMAD SHOAIB

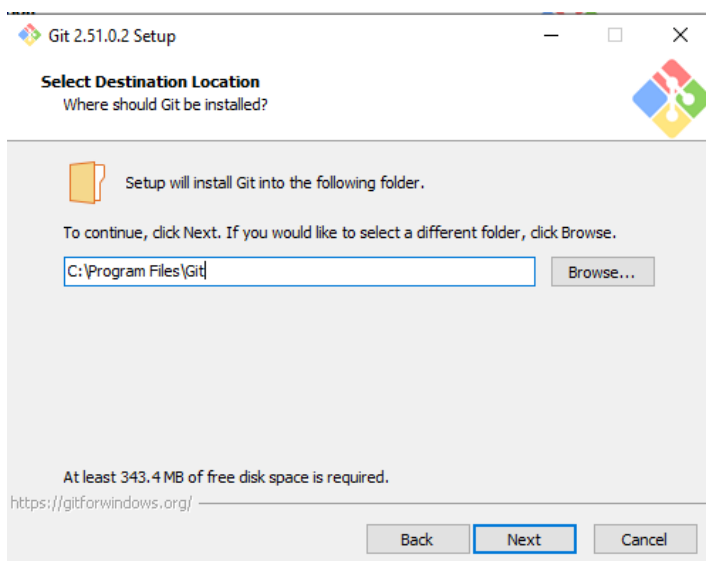
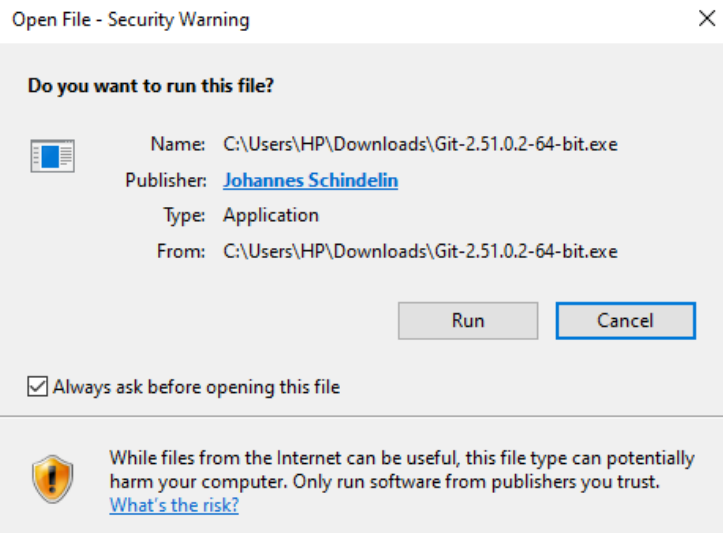
SUBMITTED BY: UMBER QASIM

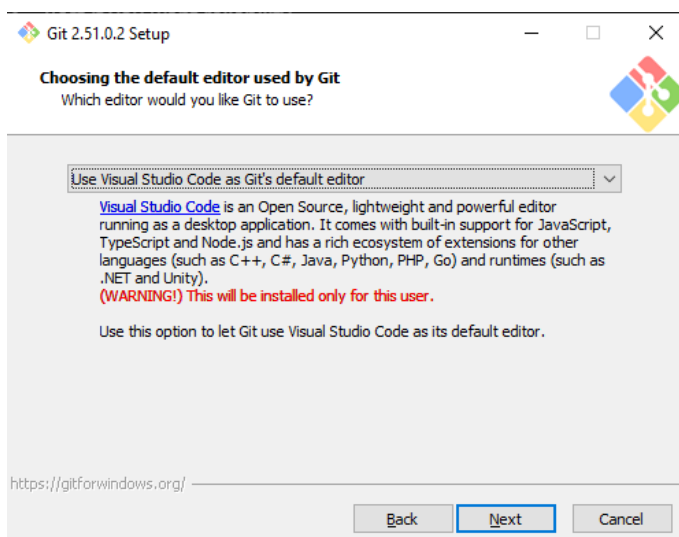
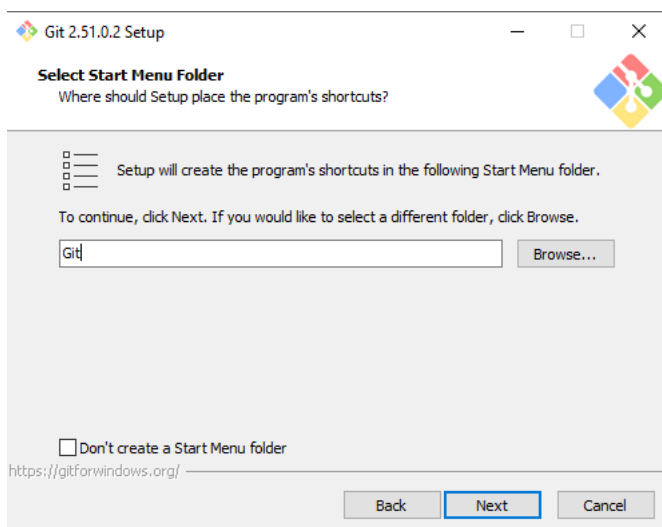
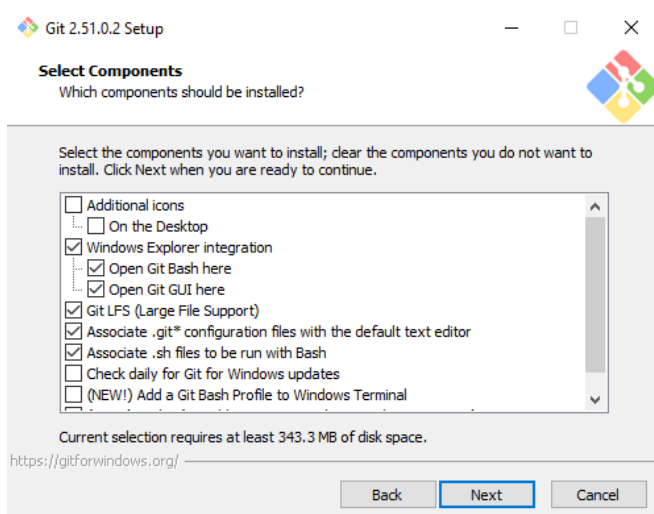
REGISTRATION NO: 2023-BSE-066

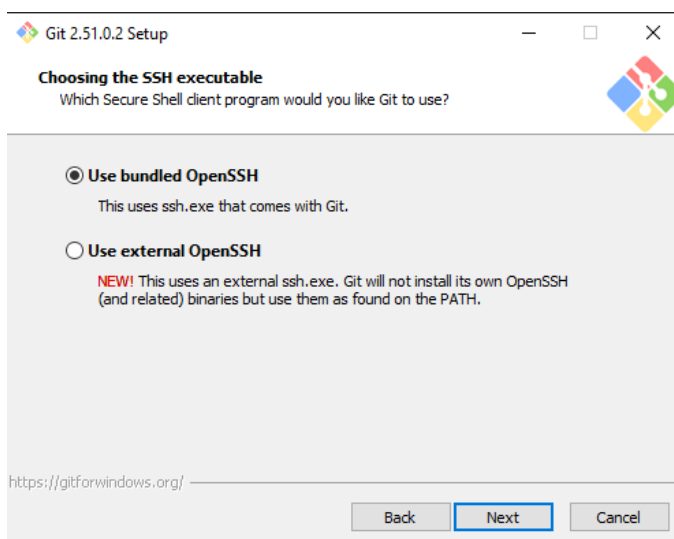
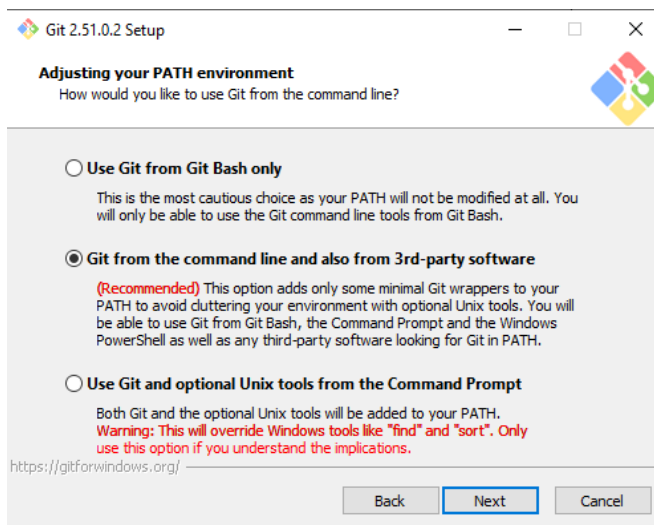
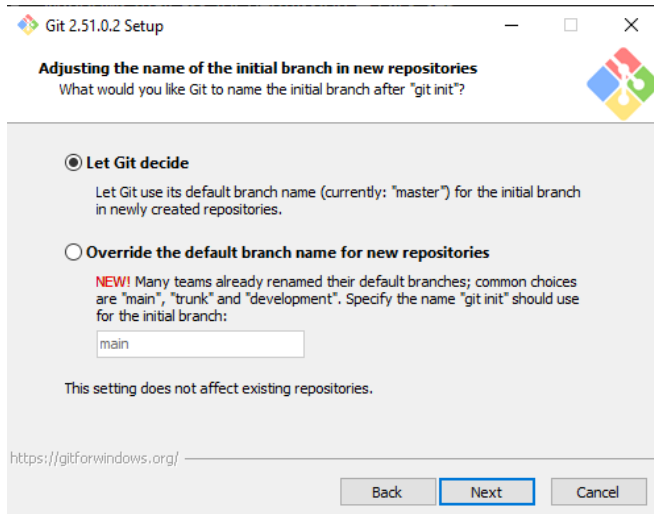
CLASS: BSSE V-B

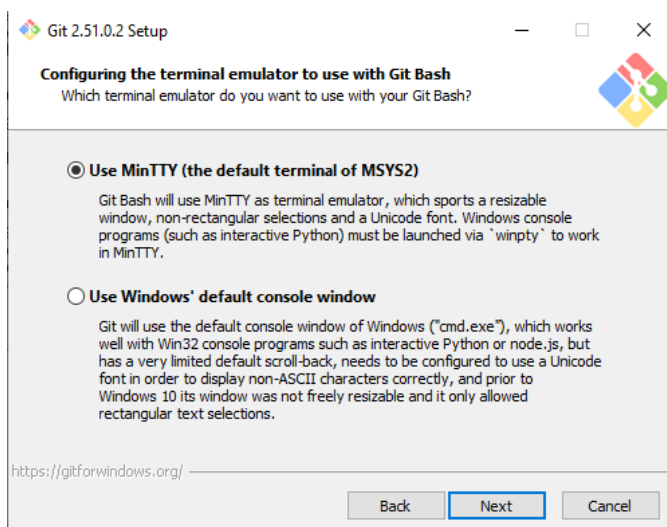
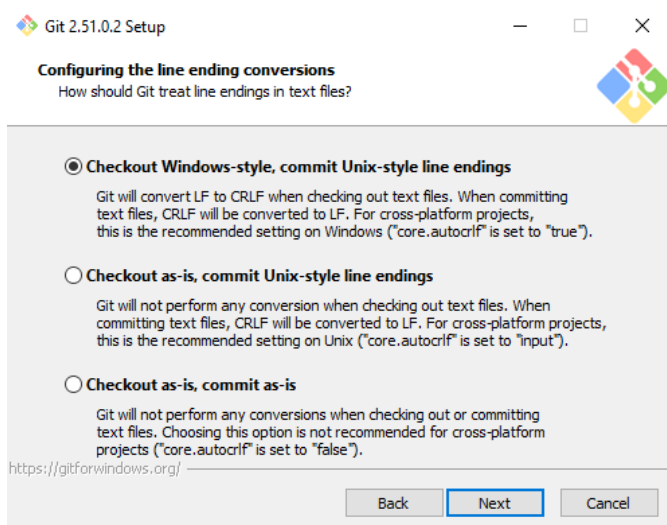
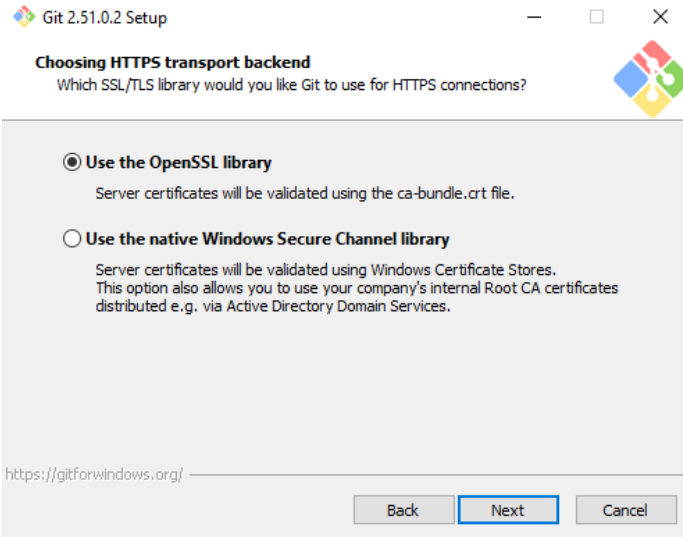
Installation of Git Bash:

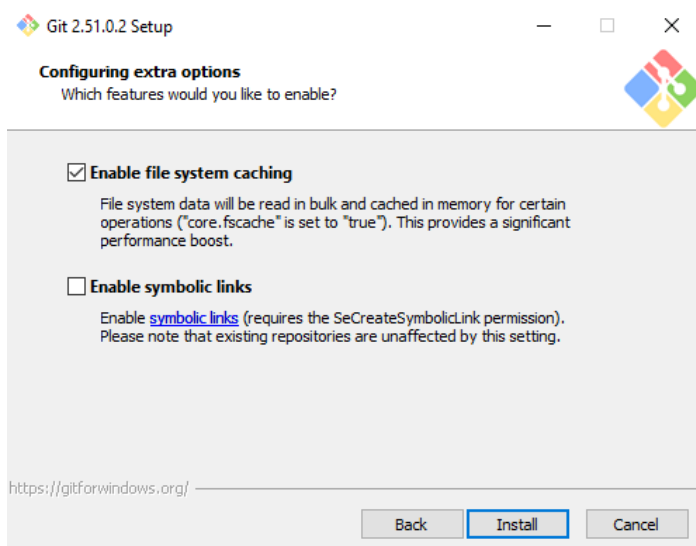
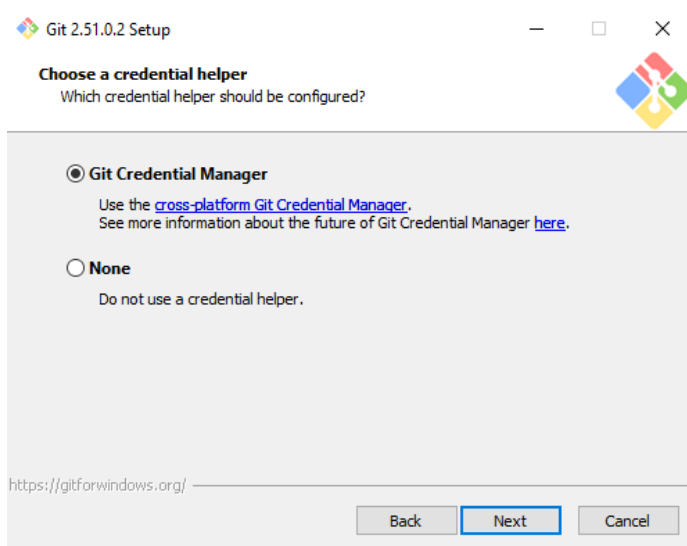
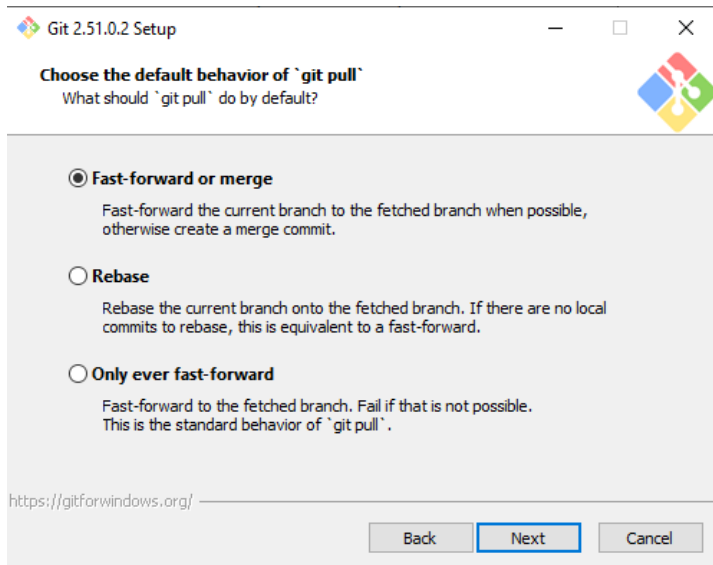


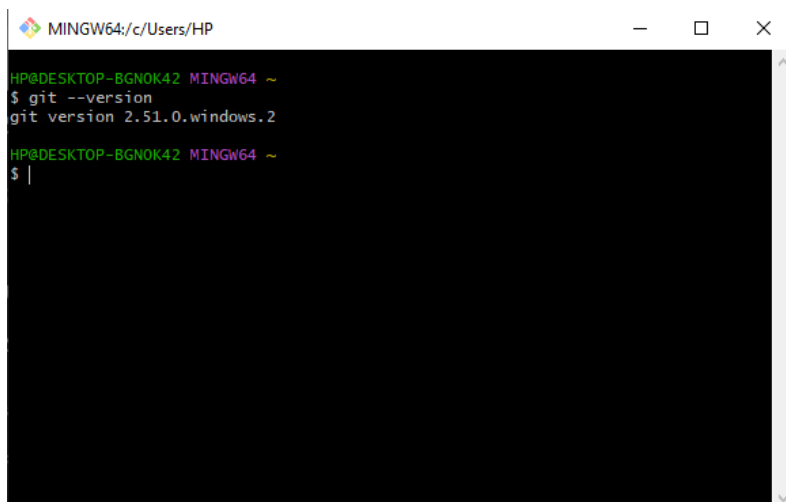
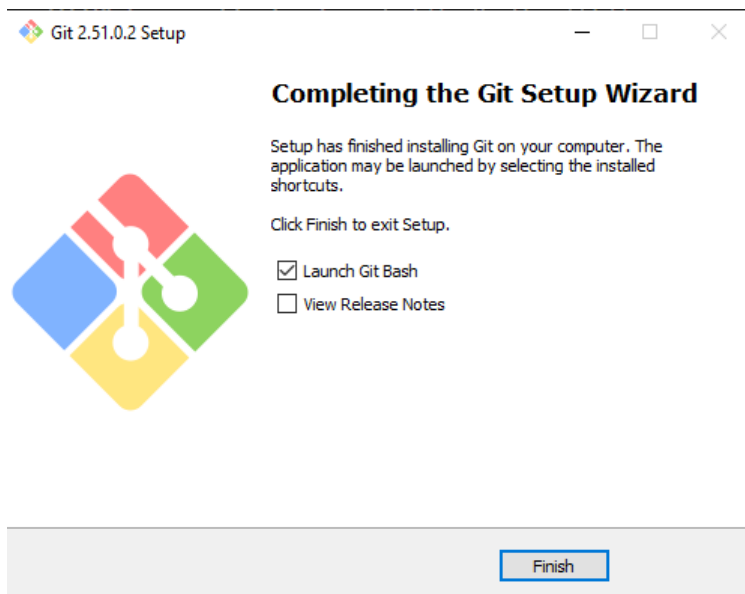
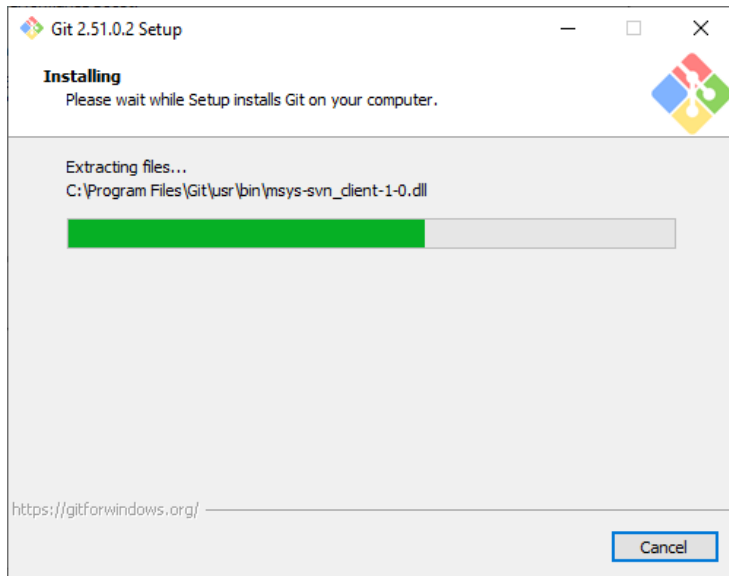












Task#01: Create Private GitHub Repository

github.com/new

Create a new repository

Repositories contain a project's files and version history. Have a project elsewhere? [Import a repository.](#)
Required fields are marked with an asterisk (*).

1 General

Owner * Umer-qasim Repository name * Lab2
Lab2 is available.

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

Description
0 / 350 characters

2 Configuration

Choose visibility * Private
Choose who can see and commit to this repository

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

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

[Create repository](#)

Activate Windows
Go to Settings to activate Windows.

Task#02: Connect Repository via SSH

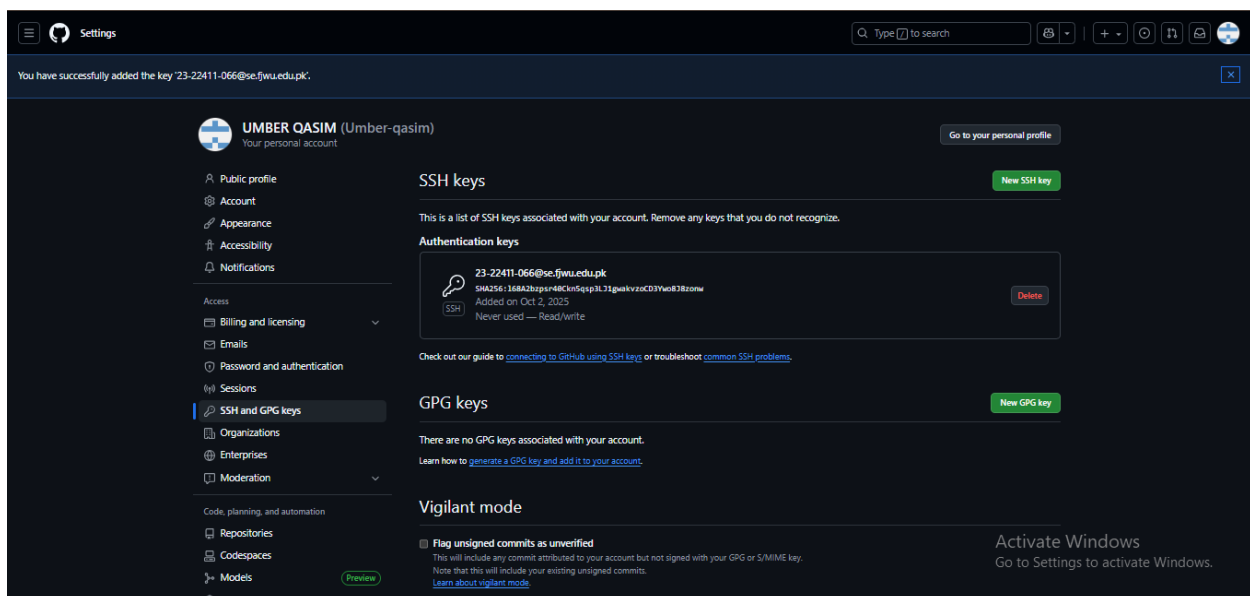
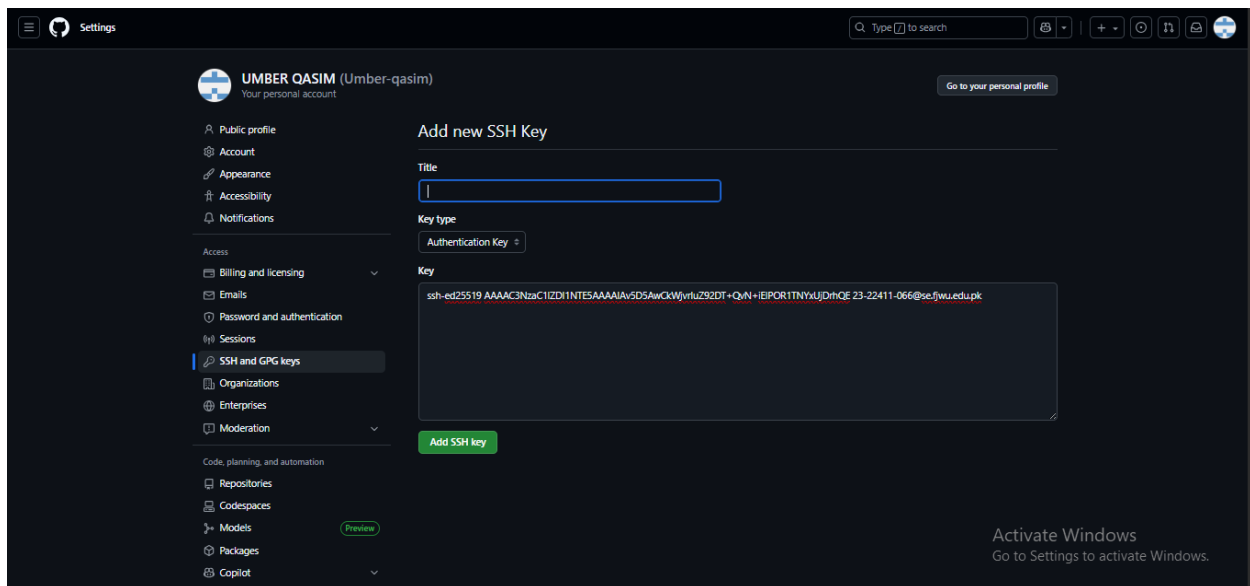
MINGW64:/c/Users/HP

```
HP@DESKTOP-BGN0K42 MINGW64 ~
$ ssh-keygen -t ed25519 -C "23-22411-066@se.fjwu.edu.pk"
Generating public/private ed25519 key pair.
Enter file in which to save the key (/c/Users/HP/.ssh/id_ed25519):
Created directory '/c/Users/HP/.ssh'.
Enter passphrase for "/c/Users/HP/.ssh/id_ed25519" (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /c/Users/HP/.ssh/id_ed25519
Your public key has been saved in /c/Users/HP/.ssh/id_ed25519.pub
The key's fingerprint is:
SHA256:168A2bzpsr40Ckn5qsp3LJ1gwakvzoCD3Ywo8J8zonw 23-22411-066@se.fjwu.edu.pk
The key's randomart image is:
+--[ED25519 256]--+
|
|  . .
|  = + .
| . + . o S o
|+* O . + .
| B O B + + .
| *o.EoO.o . .
| *B=. *+++ .
+-----[SHA256]-----+
```

```
HP@DESKTOP-BGN0K42 MINGW64 ~
$ |
```

```
HP@DESKTOP-BGN0K42 MINGW64 ~
$ cat ~/.ssh/id_ed25519.pub
ssh-ed25519 AAAAC3NzaC1lZDI1NTE5AAAAIAv5D5AwCkWjvrIuZ92DT+QvN+iE1POR1TNYxUjDrhQE 23-22411-066@se.fjwu.edu.pk

HP@DESKTOP-BGN0K42 MINGW64 ~
$ |
```



```
HP@DESKTOP-BGNOK42 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:+DiY3wvV6TUJJhbpZisF/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.  
Hi Umber-qasim! You've successfully authenticated, but GitHub does not provide shell access.
```

```
HP@DESKTOP-BGNOK42 MINGW64 ~  
$ git clone git@github.com:Umber-qasim/Lab2.git  
Cloning into 'Lab2'...  
warning: You appear to have cloned an empty repository.
```

Task#03: Configure Git Username and Email

```
HP@DESKTOP-BGN0K42 MINGW64 ~  
$ git config --global user.name "Umber Qasim"
```

```
HP@DESKTOP-BGN0K42 MINGW64 ~  
$ git config --global user.email "23-22411-066@se.fjwu.edu.pk"
```

```
HP@DESKTOP-BGN0K42 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=openssl  
http.sslcainfo=C:/Program Files/Git/mingw64/etc/ssl/certs/ca-bundle.crt  
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  
core.editor="C:\\Users\\HP\\AppData\\Local\\Programs\\Microsoft VS Code\\bin\\code" --wait  
user.name=Umber Qasim  
user.email=23-22411-066@se.fjwu.edu.pk
```

Task#04: Explore the .git Folder

```
HP@DESKTOP-BGN0K42 MINGW64 ~  
$ cd Lab2  
  
HP@DESKTOP-BGN0K42 MINGW64 ~/Lab2 (main)  
$ ls -a  
./ ../ .git/  
  
HP@DESKTOP-BGN0K42 MINGW64 ~/Lab2 (main)  
$ ls -a .git  
./ ../ HEAD config description hooks/ info/ objects/ refs/
```

Task#05: Local Repository Management

```
HP@DESKTOP-BGN0K42 MINGW64 ~/Lab2 (main)  
$ rm -rf .git  
  
HP@DESKTOP-BGN0K42 MINGW64 ~/Lab2  
$ ls -a  
./ ../
```

```
HP@DESKTOP-BGN0K42 MINGW64 ~/Lab2  
$ git init  
Initialized empty Git repository in C:/Users/HP/Lab2/.git/
```

```

HP@DESKTOP-BGNOK42 MINGW64 ~/Lab2 (master)
$ echo "# Lab2 Git Practice" > README.md

HP@DESKTOP-BGNOK42 MINGW64 ~/Lab2 (master)
$ git add README.md
warning: in the working copy of 'README.md', LF will be replaced by CRLF the next time Git touches it

HP@DESKTOP-BGNOK42 MINGW64 ~/Lab2 (master)
$ git commit -m "Initial commit"
[master (root-commit) 70af45c] Initial commit
1 file changed, 1 insertion(+)
create mode 100644 README.md

```


```

HP@DESKTOP-BGNOK42 MINGW64 ~/Lab2 (master)
$ git remote add origin git@github.com:Umber-qasim/Lab2.git

HP@DESKTOP-BGNOK42 MINGW64 ~/Lab2 (master)
$ git push -u origin master
Enumerating objects: 3, done.
Counting objects: 100% (3/3), done.
Writing objects: 100% (3/3), 244 bytes | 81.00 KiB/s, done.
Total 3 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
To github.com:Umber-qasim/Lab2.git
 * [new branch]      master -> master
branch 'master' set up to track 'origin/master'.

```

Task#06: File Status & Staging

 MINGW64:/c/Users/HP/Lab2

```

HP@DESKTOP-BGNOK42 MINGW64 ~/Lab2 (master)
$ echo "Hi, it's me Umber Qasim, RegNo# 2023-BSE-066" > notes.txt

HP@DESKTOP-BGNOK42 MINGW64 ~/Lab2 (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)
    notes.txt

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

```

```

HP@DESKTOP-BGNOK42 MINGW64 ~/Lab2 (master)
$ git add notes.txt
warning: in the working copy of 'notes.txt', LF will be replaced by CRLF the next time Git touches it

HP@DESKTOP-BGNOK42 MINGW64 ~/Lab2 (master)
$ git commit -m "Add notes.txt"
[master 4dea012] Add notes.txt
1 file changed, 1 insertion(+)
create mode 100644 notes.txt

```

MINGW64:/c/Users/HP/Lab2

```
HP@DESKTOP-BGNOK42 MINGW64 ~/Lab2 (master)
$ nano notes.txt

HP@DESKTOP-BGNOK42 MINGW64 ~/Lab2 (master)
$ git status
On branch master
Your branch is ahead of 'origin/master' by 1 commit.
(use "git push" to publish your local commits)

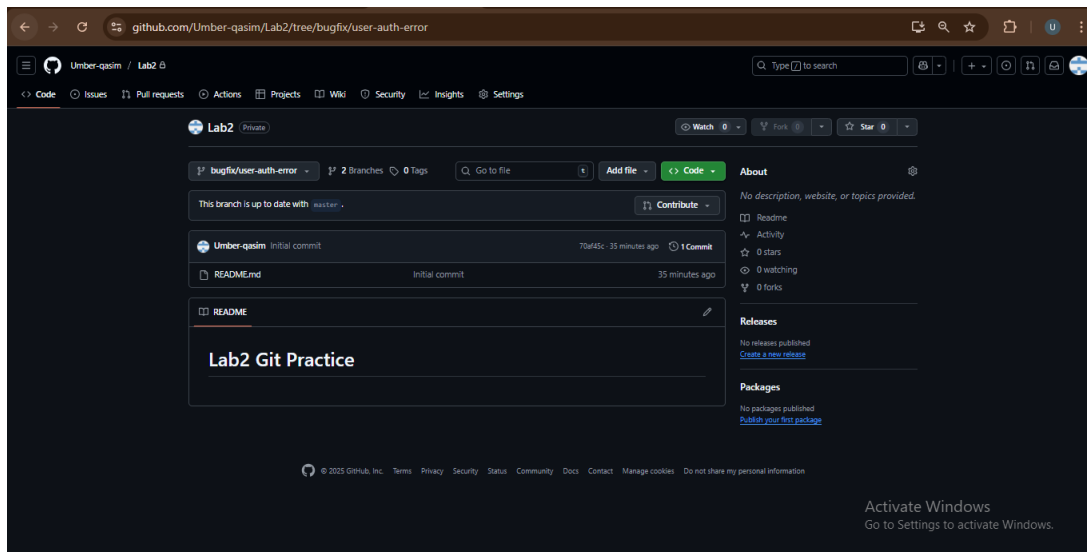
Changes not staged for commit:
  (use "git add <file>..." to update what will be committed)
  (use "git restore <file>..." to discard changes in working directory)
        modified:   notes.txt

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

HP@DESKTOP-BGNOK42 MINGW64 ~/Lab2 (master)
$ git add notes.txt
warning: in the working copy of 'notes.txt', LF will be replaced by CRLF the next time Git touches it


HP@DESKTOP-BGNOK42 MINGW64 ~/Lab2 (master)
$ git commit -m "Update notes"
[master 6bd5d0f] Update notes
1 file changed, 1 insertion(+), 1 deletion(-)
```

Task#07: Branch Creation Using GitHub GUI



```
HP@DESKTOP-BGNOK42 MINGW64 ~/Lab2 (master)
$ git pull origin bugfix/user-auth-error
From github.com:Umber-qasim/Lab2
 * branch                bugfix/user-auth-error -> FETCH_HEAD
 * [new branch]          bugfix/user-auth-error -> origin/bugfix/user-auth-error
Already up to date.
```


Task#08: Branch Creation and Push Using Git Bash

 MINGW64:/c/Users/HP/Lab2

```
HP@DESKTOP-BGN0K42 MINGW64 ~/Lab2 (master)
$ git checkout -b feature/db-connection
Switched to a new branch 'feature/db-connection'

HP@DESKTOP-BGN0K42 MINGW64 ~/Lab2 (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), 632 bytes | 158.00 KiB/s, done.
Total 6 (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/Umber-qasim/Lab2/pull/new/feature/db-connection
remote:
To github.com:Umber-qasim/Lab2.git
 * [new branch]      feature/db-connection -> feature/db-connection
```

Task#09: Branching & Merging

 MINGW64:/c/Users/HP/Lab2

```
HP@DESKTOP-BGN0K42 MINGW64 ~/Lab2 (feature/db-connection)
$ git checkout -b feature-1
Switched to a new branch 'feature-1'
```

```
HP@DESKTOP-BGN0K42 MINGW64 ~/Lab2 (feature-1)
$ git add main.py
fatal: pathspec 'main.py' did not match any files

HP@DESKTOP-BGN0K42 MINGW64 ~/Lab2 (feature-1)
$ nano main.py

HP@DESKTOP-BGN0K42 MINGW64 ~/Lab2 (feature-1)
$ git add main.py
warning: in the working copy of 'main.py', LF will be replaced by CRLF the next
time Git touches it

HP@DESKTOP-BGN0K42 MINGW64 ~/Lab2 (feature-1)
$ git commit -m "Add new function to main.py"
[feature-1 0ae126a] Add new function to main.py
1 file changed, 2 insertions(+)
create mode 100644 main.py
```

```
HP@DESKTOP-BGN0K42 MINGW64 ~/Lab2 (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)

HP@DESKTOP-BGN0K42 MINGW64 ~/Lab2 (master)
$ git merge feature-1
Updating 6bd5d0f..0ae126a
Fast-forward
 main.py | 2 ++
1 file changed, 2 insertions(+)
create mode 100644 main.py
```

```

HP@DESKTOP-BGN0K42 MINGW64 ~/Lab2 (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), 366 bytes | 183.00 KiB/s, done.
Total 3 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
To github.com:Umber-qasim/Lab2.git
    70af45c..0ae126a  master -> master

HP@DESKTOP-BGN0K42 MINGW64 ~/Lab2 (master)
$ git push origin feature-1
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/Umber-qasim/Lab2/pull/new/feature-1
remote:
To github.com:Umber-qasim/Lab2.git
 * [new branch]      feature-1 -> feature-1

```

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

```

HP@DESKTOP-BGN0K42 MINGW64 ~/Lab2 (master)
$ git checkout feature/db-connection
Switched to branch 'feature/db-connection'

HP@DESKTOP-BGN0K42 MINGW64 ~/Lab2 (feature/db-connection)
$ echo "This is a test change for PR screenshots" > dummy.txt

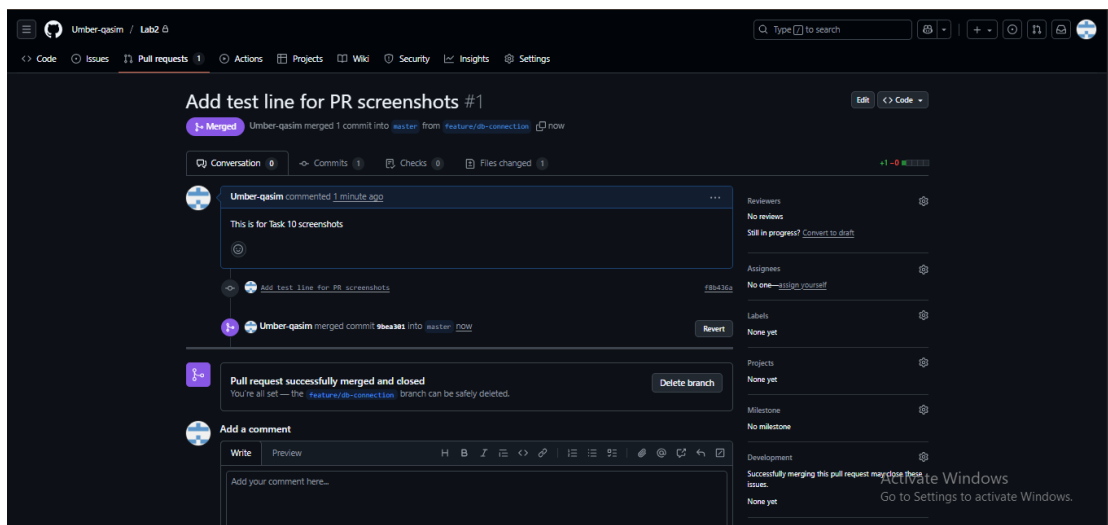
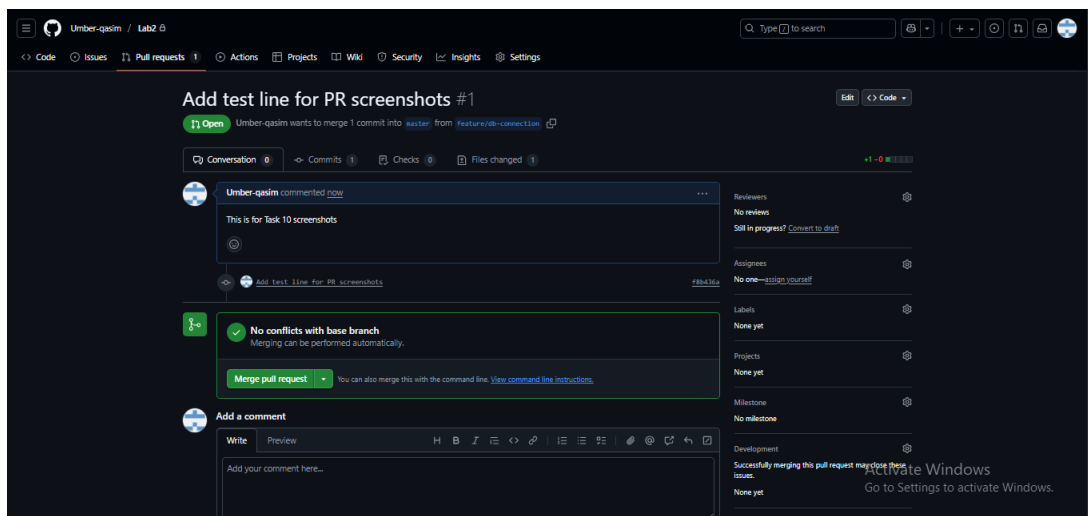
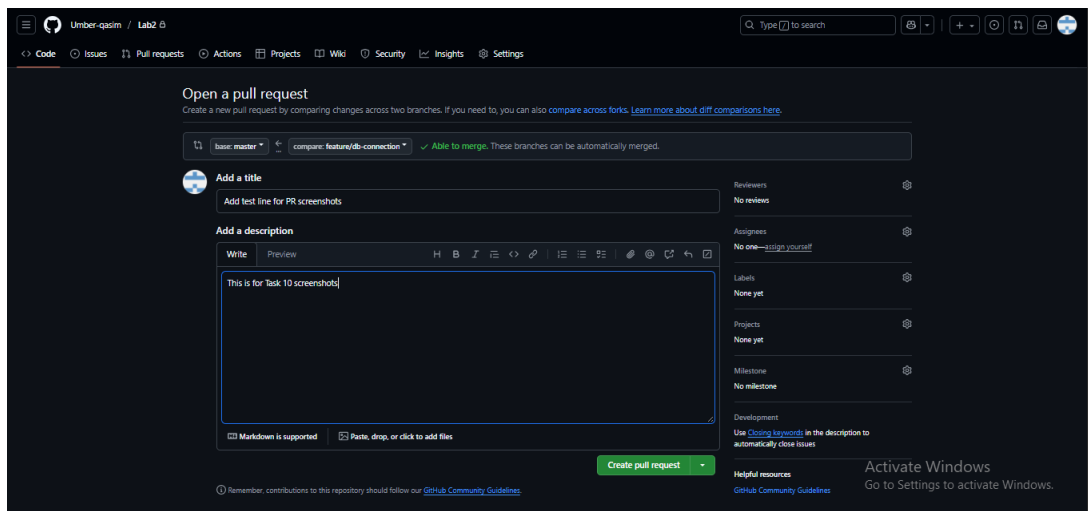
HP@DESKTOP-BGN0K42 MINGW64 ~/Lab2 (feature/db-connection)
$ nano README.md

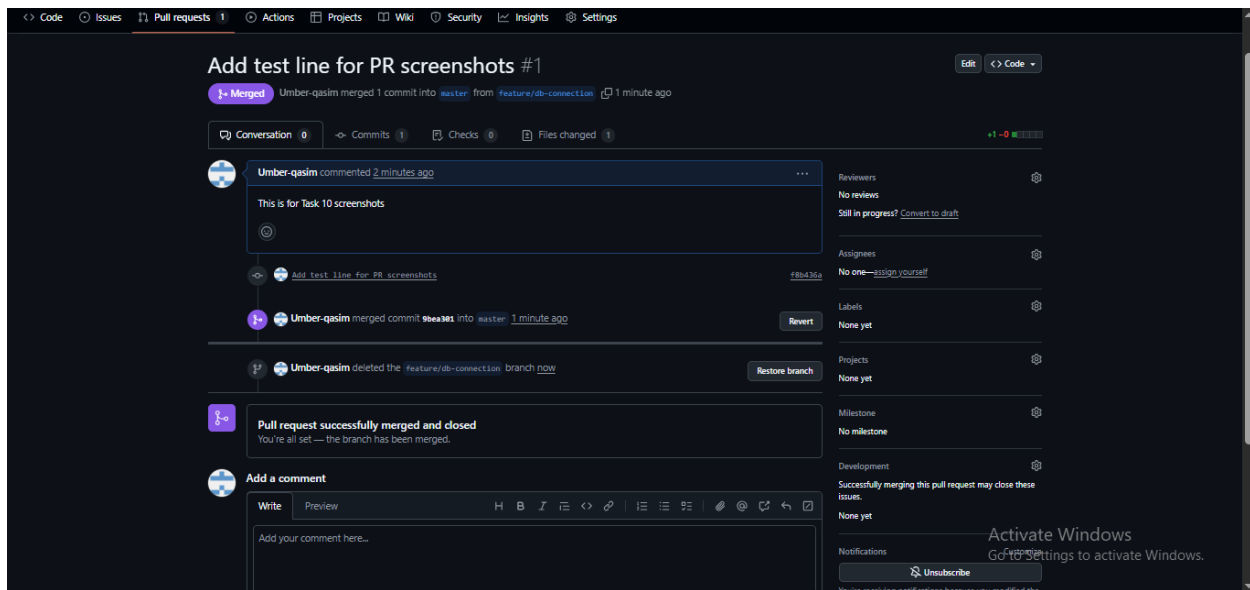
HP@DESKTOP-BGN0K42 MINGW64 ~/Lab2 (feature/db-connection)
$ git add README.md
warning: in the working copy of 'README.md', LF will be replaced by CRLF the next time Git touches it

HP@DESKTOP-BGN0K42 MINGW64 ~/Lab2 (feature/db-connection)
$ git commit -m "Add test line for PR screenshots"
[feature/db-connection f8b436a] Add test line for PR screenshots
1 file changed, 1 insertion(+)

HP@DESKTOP-BGN0K42 MINGW64 ~/Lab2 (feature/db-connection)
$ git push origin feature/db-connection
Enumerating objects: 5, done.
Counting objects: 100% (5/5), done.
Delta compression using up to 4 threads
Compressing objects: 100% (2/2), done.
Writing objects: 100% (3/3), 352 bytes | 176.00 KiB/s, done.
Total 3 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
To github.com:Umber-qasim/Lab2.git
    6bd5d0f..f8b436a  feature/db-connection -> feature/db-connection

```





Bonus Task: Simulated Team Collaboration

MINGW64:/c/Users/HP/Lab2

HP@DESKTOP-BGNOK42 MINGW64 ~/Lab2 (feature/ui-update)

```
$ git checkout -b collab
Switched to a new branch 'collab'
```

HP@DESKTOP-BGNOK42 MINGW64 ~/Lab2 (collab)

```
$ pit push origin collab
bash: pit: command not found
```

HP@DESKTOP-BGNOK42 MINGW64 ~/Lab2 (collab)

```
$ git push origin collab
Enumerating objects: 11, done.
Counting objects: 100% (11/11), done.
Delta compression using up to 4 threads
Compressing objects: 100% (6/6), done.
Writing objects: 100% (8/8), 1.66 KiB | 340.00 KiB/s, done.
Total 8 (delta 2), reused 0 (delta 0), pack-reused 0 (from 0)
remote: Resolving deltas: 100% (2/2), completed with 1 local object.
remote:
remote: Create a pull request for 'collab' on GitHub by visiting:
remote:   https://github.com/Umber-qasim/Lab2/pull/new/collab
remote:
To github.com:Umber-qasim/Lab2.git
 * [new branch]    collab -> collab
```

HP@DESKTOP-BGNOK42 MINGW64 ~/Lab2 (collab)

```
$ git pull origin collab
From github.com:Umber-qasim/Lab2
 * branch          collab      -> FETCH_HEAD
Already up to date.
```

HP@DESKTOP-BGNOK42 MINGW64 ~/Lab2 (collab)

```
$ nano notes.txt
```

HP@DESKTOP-BGNOK42 MINGW64 ~/Lab2 (collab)

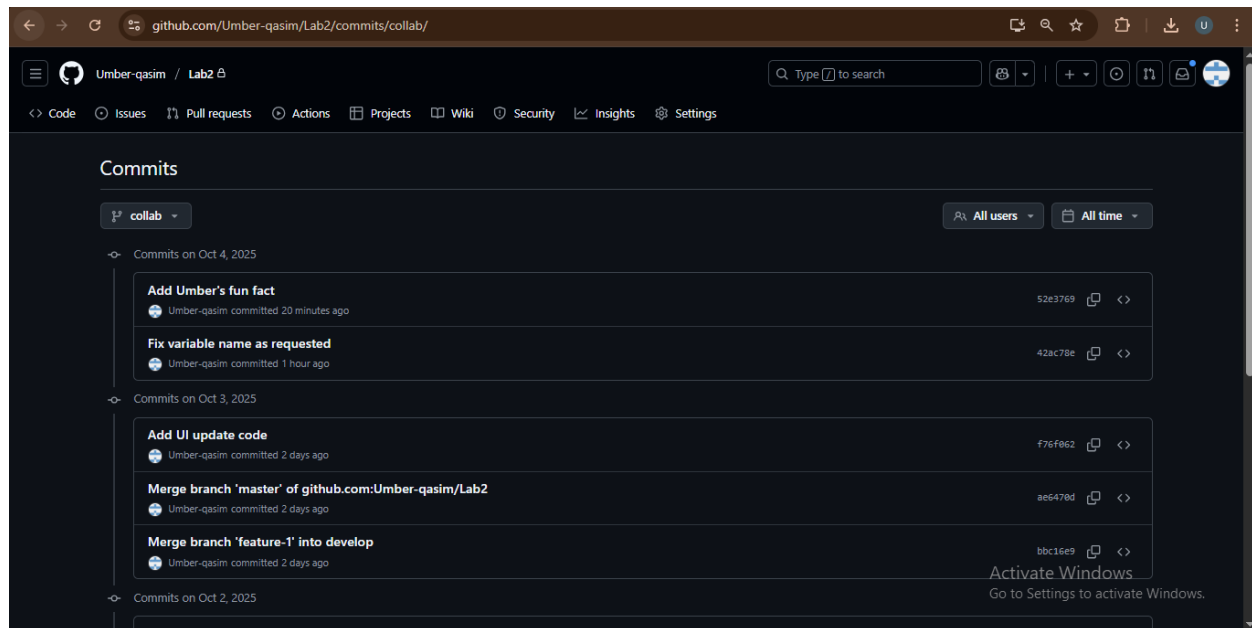
```
$ git add notes.txt
warning: in the working copy of 'notes.txt', LF will be replaced by CRLF the next time Git touches it
```

HP@DESKTOP-BGNOK42 MINGW64 ~/Lab2 (collab)

```
$ git commit -m "Add Umber's fun fact"
[collab 52e3769] Add Umber's fun fact
1 file changed, 2 insertions(+)
```

HP@DESKTOP-BGNOK42 MINGW64 ~/Lab2 (collab)

```
$ git push origin collab
Enumerating objects: 5, done.
Counting objects: 100% (5/5), done.
Delta compression using up to 4 threads
Compressing objects: 100% (3/3), done.
Writing objects: 100% (3/3), 349 bytes | 349.00 KiB/s, done.
```



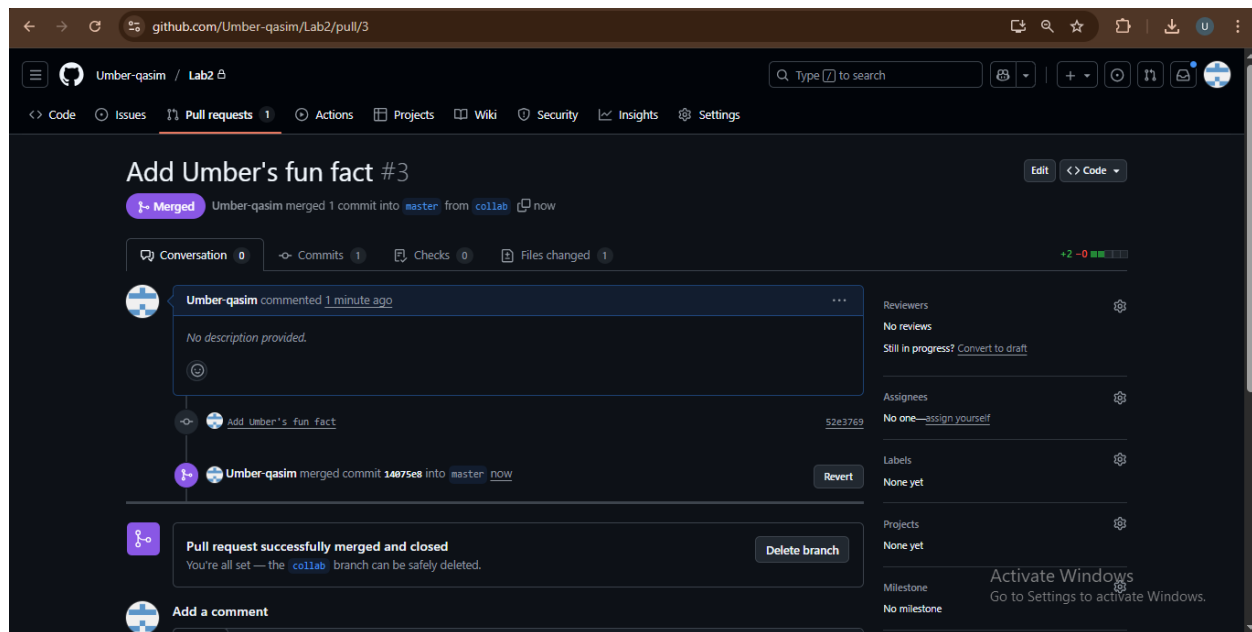
```
MINGW64:/c/Users/HP/Lab2
HP@DESKTOP-BGNOK42 MINGW64 ~/Lab2 (collab)
$ git checkout master
Switched to branch 'master'
Your branch is up to date with 'origin/master'.

HP@DESKTOP-BGNOK42 MINGW64 ~/Lab2 (master)
$ git merge collab
Updating ae6470d..52e3769
Fast-forward
 notes.txt | 2 ++
 ui.py     | 1 +
 2 files changed, 3 insertions(+)
 create mode 100644 ui.py

HP@DESKTOP-BGNOK42 MINGW64 ~/Lab2 (master)
$ git push origin master
To github.com:Umber-qasim/Lab2.git
 ! [rejected]        master -> master (fetch first)
error: failed to push some refs to 'github.com:Umber-qasim/Lab2.git'
hint: Updates were rejected because the remote contains work that you do not
hint: have locally. This is usually caused by another repository pushing to
hint: the same ref. If you want to integrate the remote changes, use
hint: 'git pull' before pushing again.
hint: See the 'Note about fast-forwards' in 'git push --help' for details.

HP@DESKTOP-BGNOK42 MINGW64 ~/Lab2 (master)
$ git pull origin master --rebase
remote: Enumerating objects: 1, done.
remote: Counting objects: 100% (1/1), done.
remote: Total 1 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
Unpacking objects: 100% (1/1), 910 bytes | 303.00 KiB/s, done.
From github.com:Umber-qasim/Lab2
 * branch            master       -> FETCH_HEAD
 ae6470d..cdd50d0    master       -> origin/master
Successfully rebased and updated refs/heads/master.

HP@DESKTOP-BGNOK42 MINGW64 ~/Lab2 (master)
$ git push origin master
Enumerating objects: 5, done.
Counting objects: 100% (5/5), done.
Delta compression using up to 4 threads
Compressing objects: 100% (3/3), done.
Writing objects: 100% (3/3), 353 bytes | 353.00 KiB/s, done.
Total 3 (delta 1), reused 0 (delta 0), pack-reused 0 (from 0)
remote: Resolving deltas: 100% (1/1), completed with 1 local object.
To github.com:Umber-qasim/Lab2.git
 cdd50d0..de7c8e1  master -> master
```



Task#11: Detailed Branch Strategy (Develop/Staging)

1. Create the following branches to simulate a professional branching strategy:

Create the branches

```
MINGW64:/c/Users/HP/Lab2

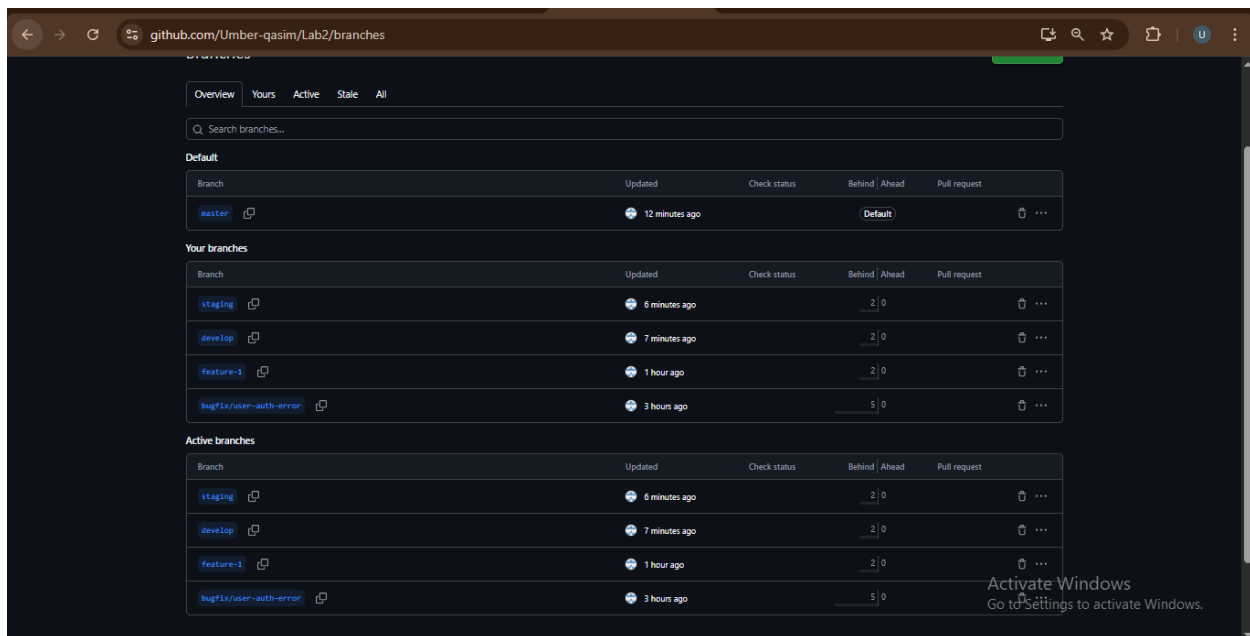
HP@DESKTOP-BGNOK42 MINGW64 ~/Lab2 (feature/db-connection)
$ git checkout -b develop
Switched to a new branch 'develop'

HP@DESKTOP-BGNOK42 MINGW64 ~/Lab2 (develop)
$ git push origin develop
Enumerating objects: 5, done.
Counting objects: 100% (5/5), done.
Delta compression using up to 4 threads
Compressing objects: 100% (2/2), done.
Writing objects: 100% (3/3), 352 bytes | 176.00 KiB/s, done.
Total 3 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
remote:
remote: Create a pull request for 'develop' on GitHub by visiting:
remote:   https://github.com/Umber-qasim/Lab2/pull/new/develop
remote:
To github.com:Umber-qasim/Lab2.git
 * [new branch]      develop -> develop

HP@DESKTOP-BGNOK42 MINGW64 ~/Lab2 (develop)
$ git checkout -b staging
Switched to a new branch 'staging'

HP@DESKTOP-BGNOK42 MINGW64 ~/Lab2 (staging)
$ git push origin staging
Total 0 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
remote:
remote: Create a pull request for 'staging' on GitHub by visiting:
remote:   https://github.com/Umber-qasim/Lab2/pull/new/staging
remote:
To github.com:Umber-qasim/Lab2.git
 * [new branch]      staging -> staging
```

Now we have **develop** and **staging** branches on GitHub.



Merge a feature into develop and staging

```

MINGW64/c/Users/HP/Lab2
HP@DESKTOP-BGNOK42 MINGW64 ~/Lab2 (staging)
$ git checkout develop
Switched to branch 'develop'

HP@DESKTOP-BGNOK42 MINGW64 ~/Lab2 (develop)
$ git merge feature-1
Merge made by the 'ort' strategy.
 main.py | 2 ++
 1 file changed, 2 insertions(+)
 create mode 100644 main.py

HP@DESKTOP-BGNOK42 MINGW64 ~/Lab2 (develop)
$ git push origin develop
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% (2/2), 354 bytes | 354.00 KiB/s, done.
Total 2 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
To github.com:Umber-qasim/Lab2.git
 f8b436a..bbc16e9 develop -> develop

HP@DESKTOP-BGNOK42 MINGW64 ~/Lab2 (develop)
$ git merge bugfix/user-auth-error
merge: bugfix/user-auth-error - not something we can merge

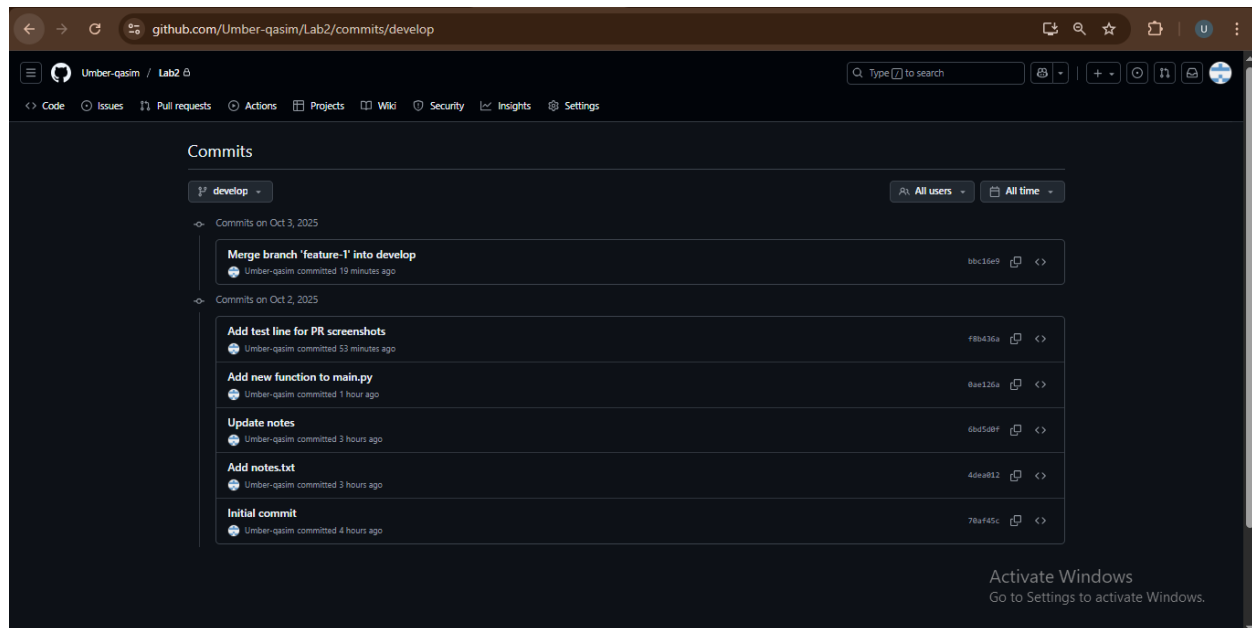
HP@DESKTOP-BGNOK42 MINGW64 ~/Lab2 (develop)
$ git push origin develop
Everything up-to-date

HP@DESKTOP-BGNOK42 MINGW64 ~/Lab2 (develop)
$ git checkout staging
Switched to branch 'staging'

HP@DESKTOP-BGNOK42 MINGW64 ~/Lab2 (staging)
$ git merge develop
Updating f8b436a..bbc16e9
Fast-forward
 main.py | 2 ++
 1 file changed, 2 insertions(+)
 create mode 100644 main.py

HP@DESKTOP-BGNOK42 MINGW64 ~/Lab2 (staging)
$ git push origin staging
Total 0 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
To github.com:Umber-qasim/Lab2.git
 f8b436a..bbc16e9 staging -> staging

```



Merge staging into master (production)

```
HP@DESKTOP-BGNOK42 MINGW64 ~/Lab2 (staging)
$ git checkout master
Switched to branch 'master'
Your branch is up to date with 'origin/master'.

HP@DESKTOP-BGNOK42 MINGW64 ~/Lab2 (master)
$ git merge staging
Updating 0ae126a..bbc16e9
Fast-forward
 README.md | 1 +
 1 file changed, 1 insertion(+)

HP@DESKTOP-BGNOK42 MINGW64 ~/Lab2 (master)
$ git push origin master
To github.com:Umber-qasim/Lab2.git
 ! [rejected]        master -> master (fetch first)
error: failed to push some refs to 'github.com:Umber-qasim/Lab2.git'
hint: Updates were rejected because the remote contains work that you do not
hint: have locally. This is usually caused by another repository pushing to
hint: the same ref. If you want to integrate the remote changes, use
hint: 'git pull' before pushing again.
hint: See the 'Note about fast-forwards' in 'git push --help' for details.
```

```
HP@DESKTOP-BGNOK42 MINGW64 ~
$ cd ~/Lab2

HP@DESKTOP-BGNOK42 MINGW64 ~/Lab2 (master)
$ git status
On branch master
Your branch is ahead of 'origin/master' by 2 commits.
  (use "git push" to publish your local commits)

Untracked files:
  (use "git add <file>..." to include in what will be committed)
remote: Enumerating objects: 4, done.
remote: Counting objects: 100% (4/4), done.
remote: Compressing objects: 100% (2/2), done.
remote: Total 2 (delta 0), reused 1 (delta 0), pack-reused 0 (from 0)
Unpacking objects: 100% (2/2), 1.02 KiB | 130.00 KiB/s, done.
From github.com:Umber-qasim/Lab2
 * branch            master       -> FETCH_HEAD
   0ae126a..9bea301 master       -> origin/master
Merge made by the 'ort' strategy.
```

```

HP@DESKTOP-BGN0K42 MINGW64 ~/Lab2 (master)
$ git checkout master
Already on 'master'
Your branch is ahead of 'origin/master' by 2 commits.
  (use "git push" to publish your local commits)

HP@DESKTOP-BGN0K42 MINGW64 ~/Lab2 (master)
$ git pull origin master
From github.com:Umber-qasim/Lab2
 * branch          master       -> FETCH_HEAD
Already up to date.

HP@DESKTOP-BGN0K42 MINGW64 ~/Lab2 (master)
$ git merge staging
Already up to date.

HP@DESKTOP-BGN0K42 MINGW64 ~/Lab2 (master)
$ git push origin master
Enumerating objects: 1, done.
Counting objects: 100% (1/1), done.
Writing objects: 100% (1/1), 254 bytes | 127.00 KiB/s, done.
Total 1 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
To github.com:Umber-qasim/Lab2.git
 9bea301..ae6470d  master -> master

```

The screenshot shows the GitHub interface for a repository named 'Lab2' by user 'Umber-qasim'. The repository is private and has 5 branches and 0 tags. The main branch is 'master'. The repository has 0 watches, 0 forks, and 0 stars. The repository description is 'No description, website, or topics provided.' The repository contains a README, a main.py file, and a notes.txt file. The README is titled 'Lab2 Git Practice' and contains the text 'Test line for PR screenshots'. The repository has 8 commits, with the latest commit 'ae6470d' made 19 minutes ago. The repository also has sections for Releases, Packages, and Languages. The Languages section shows Python at 100.0%. At the bottom, there is a message to 'Activate Windows' and a link to 'Go to Settings to activate Windows.'.

Task#12: Code Review Workflow

```

HP@DESKTOP-BGN0K42 MINGW64 ~
$ cd ~/Lab2

HP@DESKTOP-BGN0K42 MINGW64 ~/Lab2 (feature/ui-update)
$ git checkout -b feature/ui-update
fatal: a branch named 'feature/ui-update' already exists

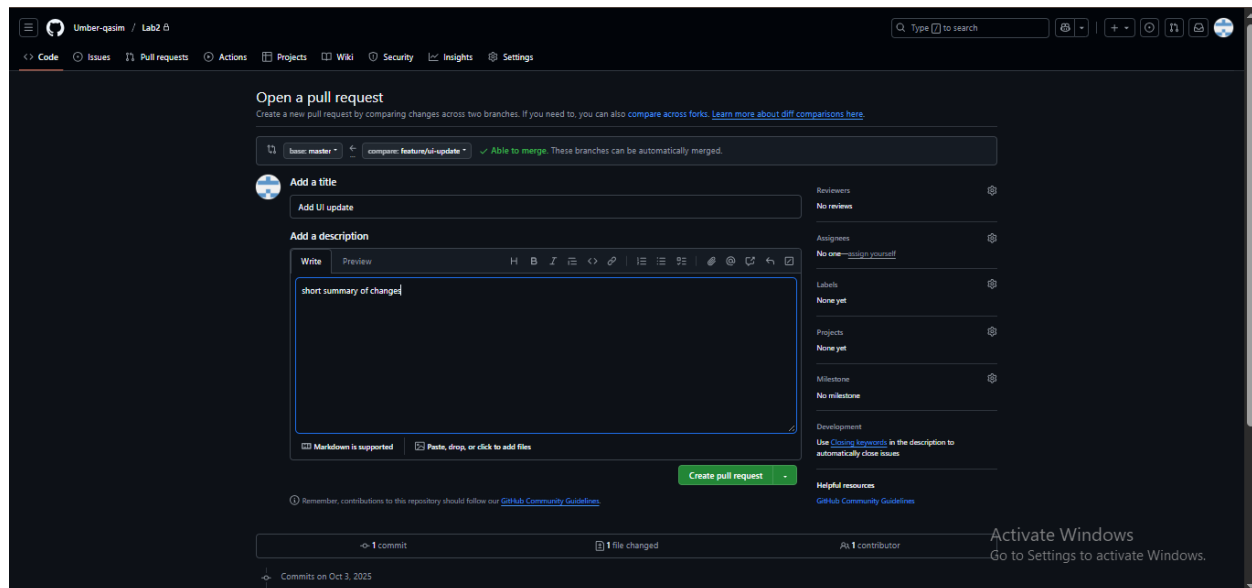
HP@DESKTOP-BGN0K42 MINGW64 ~/Lab2 (feature/ui-update)
$ echo "print('UI updated')" >ui.py

HP@DESKTOP-BGN0K42 MINGW64 ~/Lab2 (feature/ui-update)
$ git add ui.py
warning: in the working copy of 'ui.py', LF will be replaced by CRLF the next time Git touches it

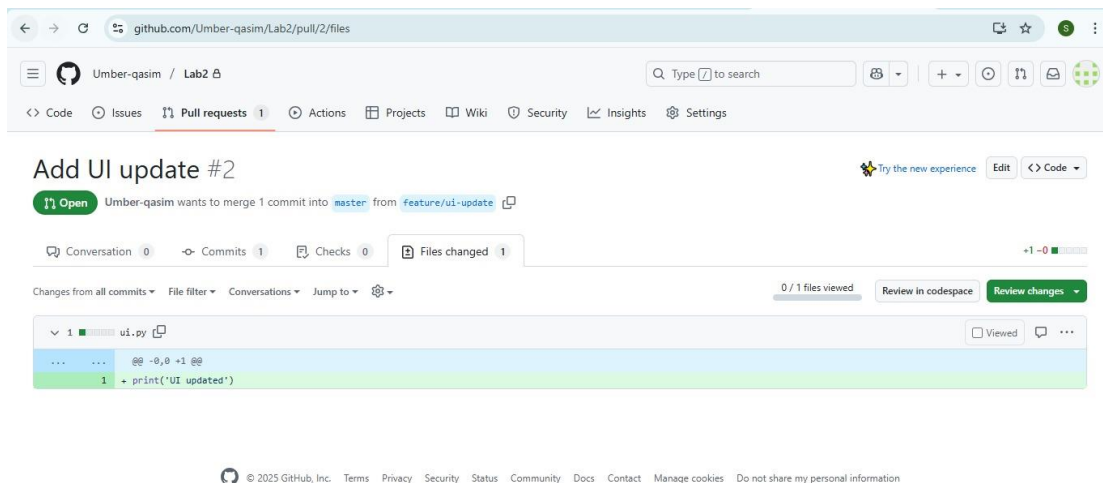
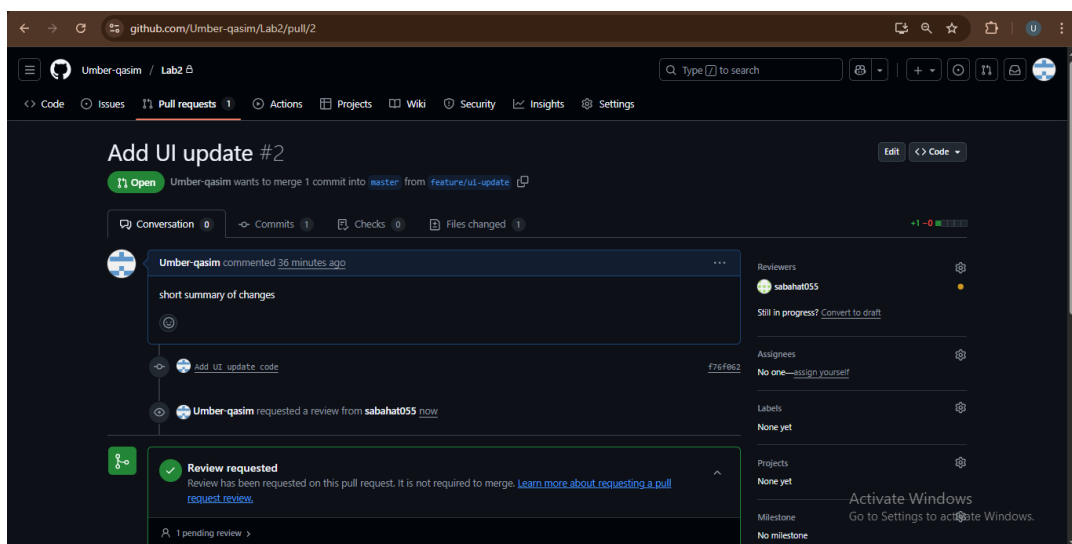
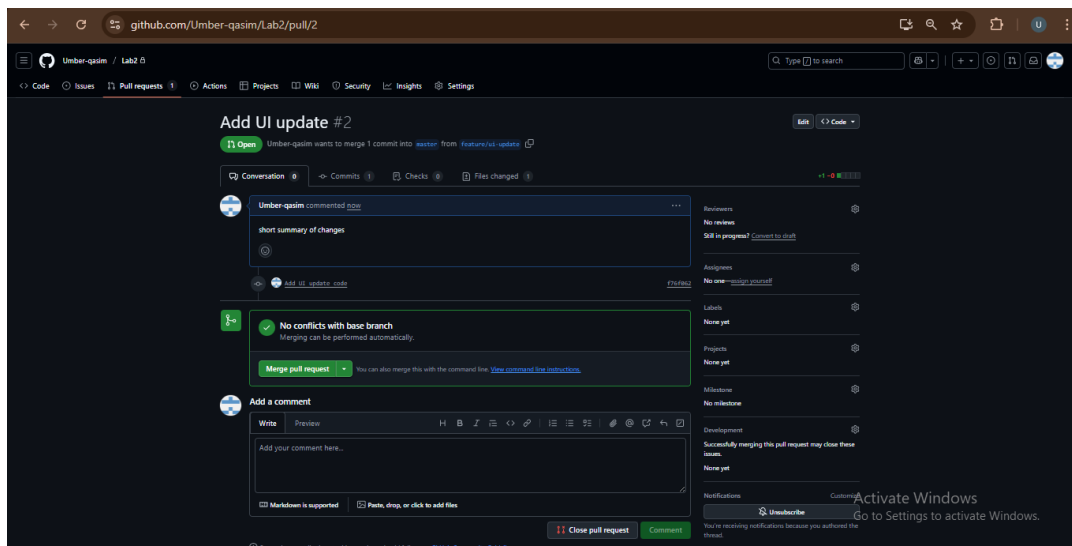
HP@DESKTOP-BGN0K42 MINGW64 ~/Lab2 (feature/ui-update)
$ git commit -m "Add UI update code"
[feature/ui-update f76f062] Add UI update code
1 file changed, 1 insertion(+)
create mode 100644 ui.py

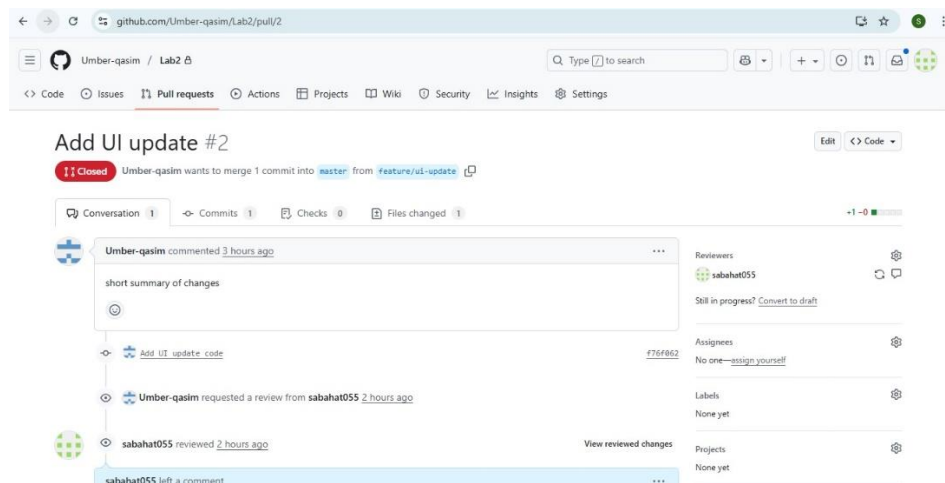
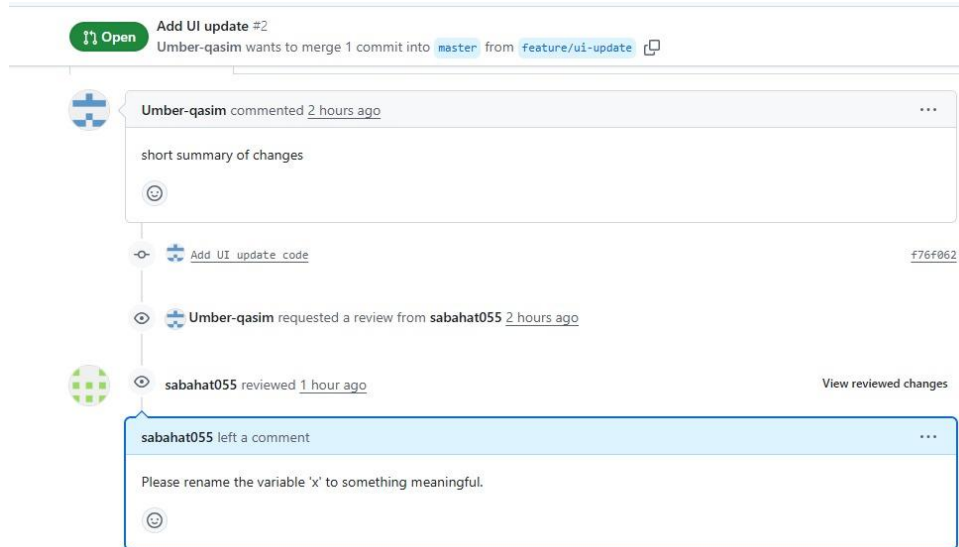
HP@DESKTOP-BGN0K42 MINGW64 ~/Lab2 (feature/ui-update)
$ git push origin feature/ui-update
Enumerating objects: 4, done.
Counting objects: 100% (4/4), done.
Delta compression using up to 4 threads
Compressing objects: 100% (2/2), done.
Writing objects: 100% (3/3), 299 bytes | 299.00 KiB/s, done.
Total 3 (delta 1), reused 0 (delta 0), pack-reused 0 (from 0)
remote: Resolving deltas: 100% (1/1), completed with 1 local object.
remote:
remote: Create a pull request for 'feature/ui-update' on GitHub by visiting:
remote:   https://github.com/Umber-qasim/Lab2/pull/new/feature/ui-update
remote:
To github.com:Umber-qasim/Lab2.git
 * [new branch]      feature/ui-update -> feature/ui-update

```



The screenshot shows the GitHub web interface for the repository 'Umber-qasim / Lab2'. The 'Open a pull request' page is displayed, comparing the 'basic: master' branch with the 'compare: feature/ui-update' branch. The interface indicates that the branches are 'Able to merge' and can be automatically merged. The 'Add a title' section contains the text 'Add UI update'. The 'Add a description' section has a text area with the placeholder 'short summary of changes'. On the right side, there are sections for 'Reviewers' (No reviews), 'Assignees' (No one—assign yourself), 'Labels' (None yet), 'Projects' (None yet), and 'Milestone' (No milestone). At the bottom, there is a 'Create pull request' button and a summary bar showing '1 commit', '1 file changed', and '1 contributor'. An 'Activate Windows' watermark is visible in the bottom right corner.



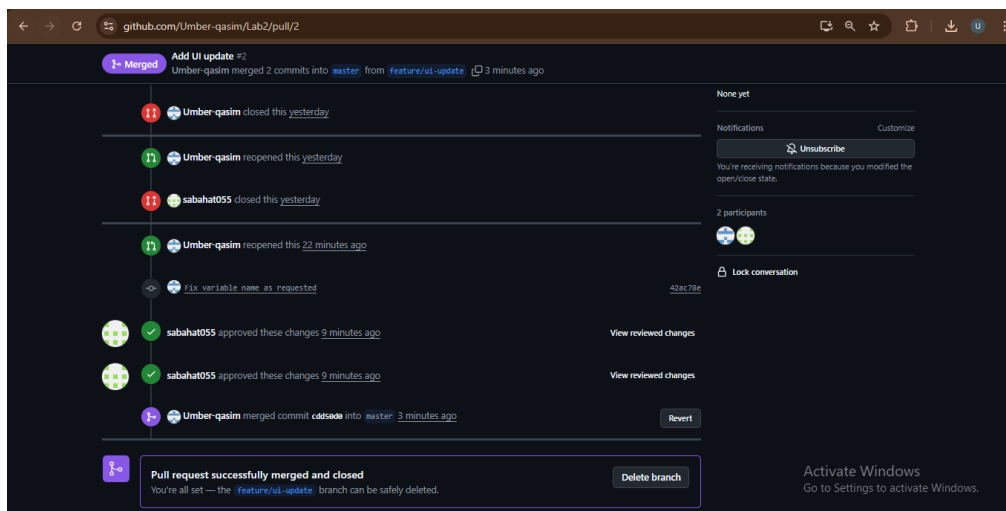
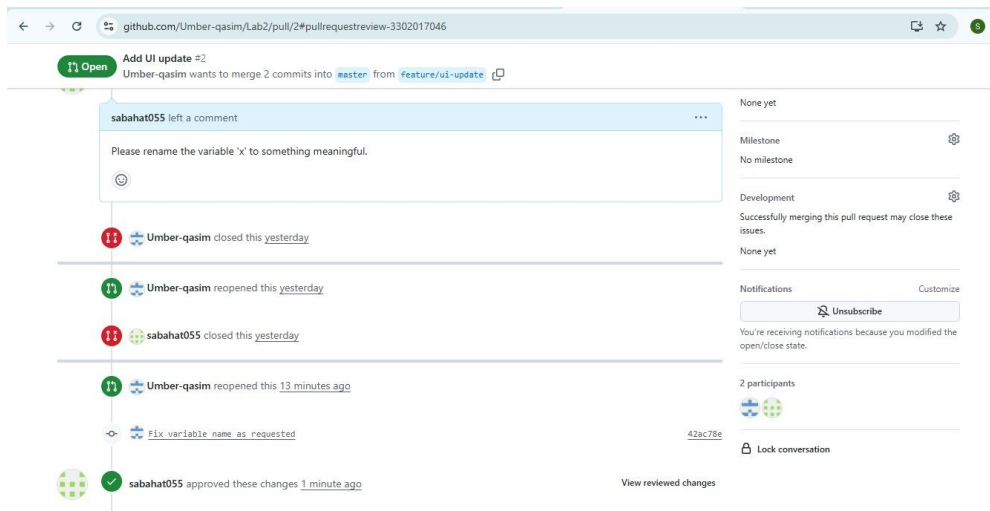
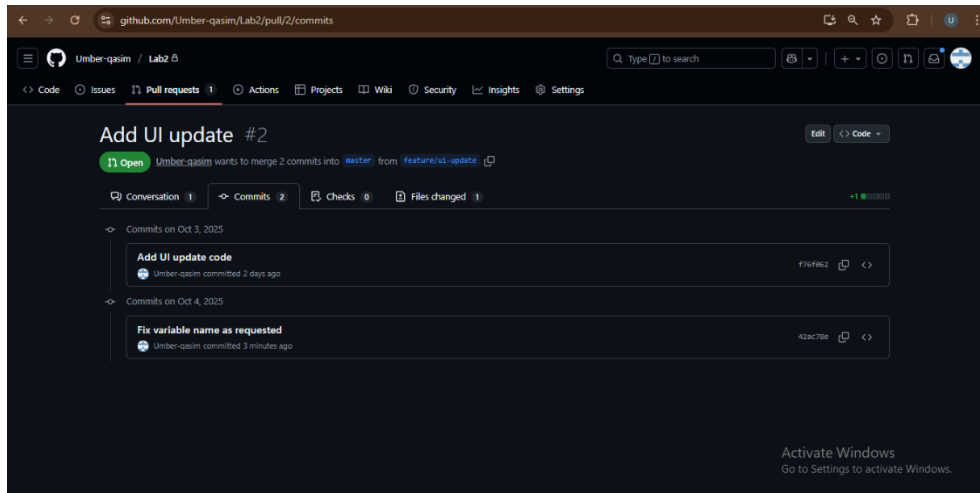


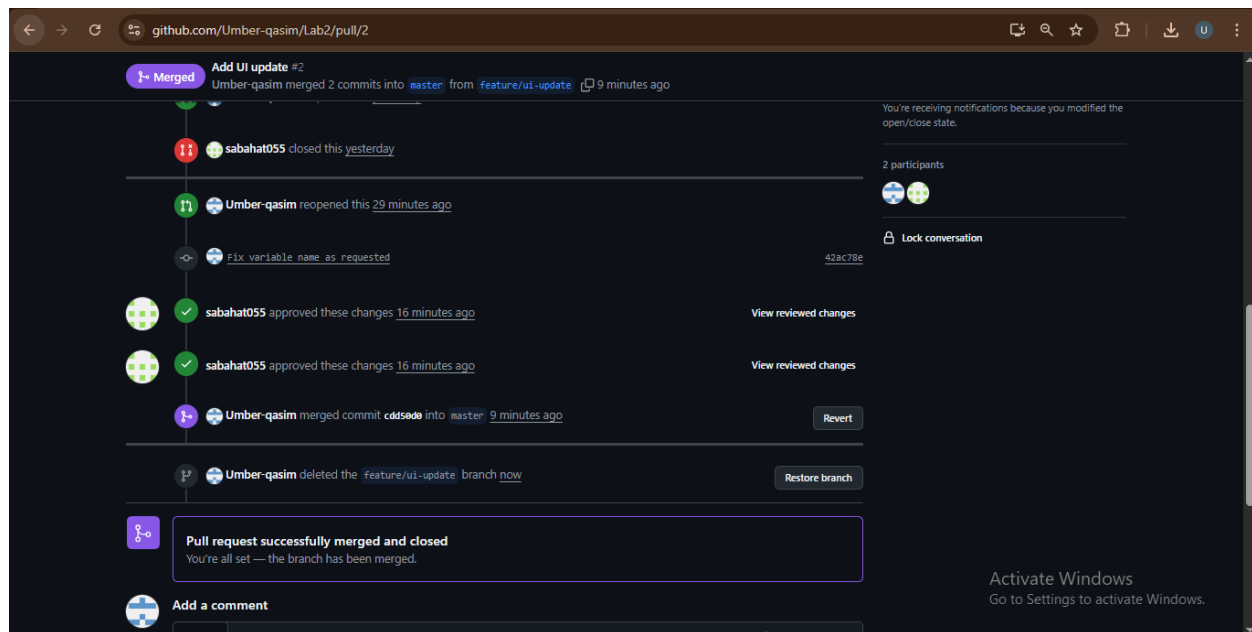
```
HP@DESKTOP-BGN0K42 MINGW64 ~/Lab2 (feature/ui-update)
$ echo "print('UI updated - fixed version')" >ui.py

HP@DESKTOP-BGN0K42 MINGW64 ~/Lab2 (feature/ui-update)
$ git add ui.py
warning: in the working copy of 'ui.py', LF will be replaced by CRLF the next time Git touches it

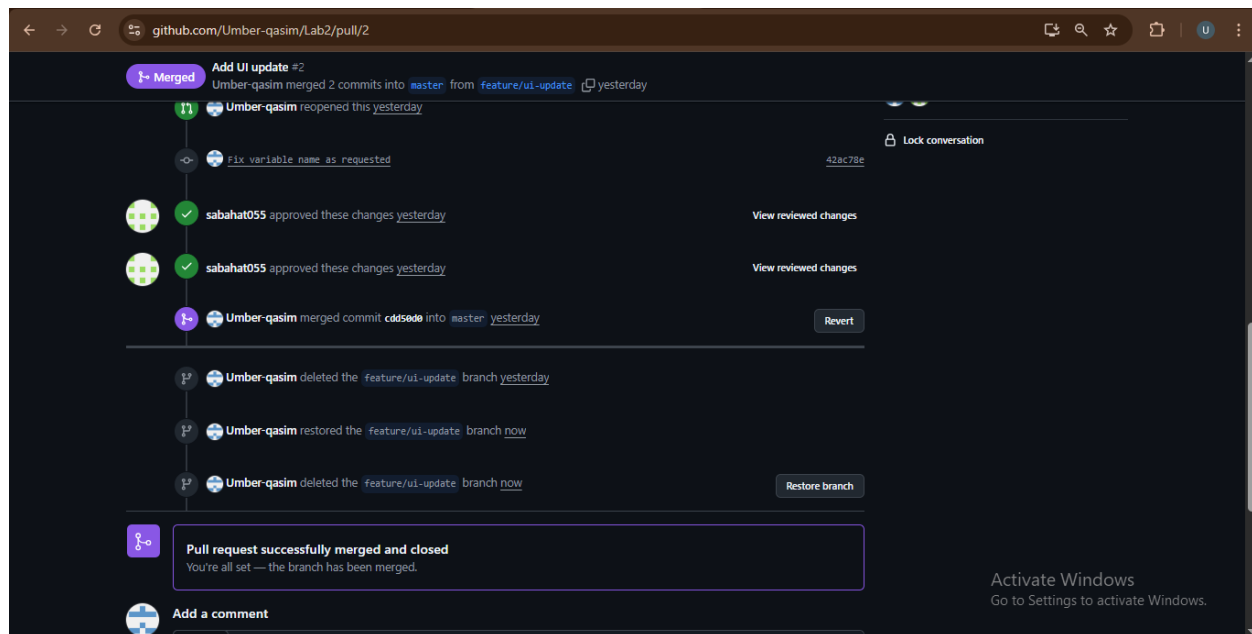
HP@DESKTOP-BGN0K42 MINGW64 ~/Lab2 (feature/ui-update)
$ git commit -m "Fix variable name as requested"
[feature/ui-update 42ac78e] Fix variable name as requested
1 file changed, 1 insertion(+), 1 deletion(-)

HP@DESKTOP-BGN0K42 MINGW64 ~/Lab2 (feature/ui-update)
$ git push origin feature/ui-update
Enumerating objects: 5, done.
Counting objects: 100% (5/5), done.
Delta compression using up to 4 threads
Compressing objects: 100% (2/2), done.
Writing objects: 100% (3/3), 314 bytes | 314.00 KiB/s, done.
Total 3 (delta 1), reused 0 (delta 0), pack-reused 0 (from 0)
remote: Resolving deltas: 100% (1/1), completed with 1 local object.
To github.com:Umber-qasim/Lab2.git
f76f062..42ac78e feature/ui-update -> feature/ui-update
```





Task#13: Branch Cleanup Best Practices



```

HP@DESKTOP-BGN0K42 MINGW64 ~/Lab2 (master)
$ git checkout master
Already on 'master'
Your branch is up to date with 'origin/master'.

HP@DESKTOP-BGN0K42 MINGW64 ~/Lab2 (master)
$ git pull origin master
remote: Enumerating objects: 1, done.
remote: Counting objects: 100% (1/1), done.
remote: Total 1 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
Unpacking objects: 100% (1/1), 909 bytes | 227.00 KiB/s, done.
From github.com:Umber-qasim/Lab2
 * branch          master      -> FETCH_HEAD
    de7c8e1..14075e8 master    -> origin/master
Updating de7c8e1..14075e8
Fast-forward


HP@DESKTOP-BGN0K42 MINGW64 ~/Lab2 (master)
$ git branch -d feature/ui-update
Deleted branch feature/ui-update (was 42ac78e).

HP@DESKTOP-BGN0K42 MINGW64 ~/Lab2 (master)
$ git branch
  collab
  develop
  feature-1
  feature/db-connection
* master
  staging

```

Exam Evaluation Questions

Q1: Advanced Branching & Merge Verification

 MINGW64:/c/Users/HP/Lab2

```

HP@DESKTOP-BGN0K42 MINGW64 ~/Lab2 (master)
$ git checkout -b exam-feature
Switched to a new branch 'exam-feature'

```

```

HP@DESKTOP-BGN0K42 MINGW64 ~/Lab2 (exam-feature)
$ nano notes.txt

HP@DESKTOP-BGN0K42 MINGW64 ~/Lab2 (exam-feature)
$ git add .
warning: in the working copy of 'dummy.txt', LF will be replaced by CRLF the next time Git touches it

HP@DESKTOP-BGN0K42 MINGW64 ~/Lab2 (exam-feature)
$ git commit -m "Q1: Add exam feature test"
[exam-feature 784eb8b] Q1: Add exam feature test
2 files changed, 2 insertions(+), 1 deletion(-)
create mode 100644 dummy.txt

```

```

HP@DESKTOP-BGN0K42 MINGW64 ~/Lab2 (exam-feature)
$ git checkout master
Switched to branch 'master'
Your branch is up to date with 'origin/master'.

HP@DESKTOP-BGN0K42 MINGW64 ~/Lab2 (master)
$ git merge exam-feature
Updating 14075e8..784eb8b
Fast-forward
 dummy.txt | 1 +
 notes.txt | 2 +-
 2 files changed, 2 insertions(+), 1 deletion(-)
 create mode 100644 dummy.txt

```

MINGW64:/c/Users/HP/Lab2

```

HP@DESKTOP-BGN0K42 MINGW64 ~/Lab2 (exam-feature)
* 784eb8b (HEAD -> master, exam-feature) Q1: Add exam feature test
* 14075e8 (origin/master) Merge pull request #3 from Umber-qasim/collab
| \
| * 52e3769 (origin/collab, collab) Add Umber's fun fact
| * | de7c8e1 Add Umber's fun fact
| * | cdd50d0 Merge pull request #2 from Umber-qasim/feature/ui-update
| \
| \
| * 42ac78e (origin/feature/ui-update) Fix variable name as requested
| * f76f062 Add UI update code
| \
| * ae6470d Merge branch 'master' of github.com:Umber-qasim/Lab2
| \
| * 9bea301 Merge pull request #1 from Umber-qasim/feature/db-connection
| \
| \
| * | bbc16e9 (origin/staging, origin/develop, staging, develop) Merge branch 'feature-1' into develop
| \
| \
| \
| * 0ae126a (origin/feature-1, feature-1) Add new function to main.py
| * | f8b436a (origin/feature/db-connection, feature/db-connection) Add test line for PR screenshots
| \
| \
...skipping...
* 784eb8b (HEAD -> master, exam-feature) Q1: Add exam feature test
* 14075e8 (origin/master) Merge pull request #3 from Umber-qasim/collab
| \
| * 52e3769 (origin/collab, collab) Add Umber's fun fact
| * | de7c8e1 Add Umber's fun fact
| * | cdd50d0 Merge pull request #2 from Umber-qasim/feature/ui-update
| \
| \
| * 42ac78e (origin/feature/ui-update) Fix variable name as requested
| * f76f062 Add UI update code
| \
| \
| * ae6470d Merge branch 'master' of github.com:Umber-qasim/Lab2
| \
| * 9bea301 Merge pull request #1 from Umber-qasim/feature/db-connection
| \
| \
| * | bbc16e9 (origin/staging, origin/develop, staging, develop) Merge branch 'feature-1' into develop
| \
| \
| \
| * 0ae126a (origin/feature-1, feature-1) Add new function to main.py
| * | f8b436a (origin/feature/db-connection, feature/db-connection) Add test line for PR screenshots
| \
| \
| * 6bd5d0f Update notes
| * 4dea012 Add notes.txt
| * 70af45c (origin/bugfix/user-auth-error) Initial commit
| \
| \

```

Q2: Multi-Stage Workflow Simulation

```
HP@DESKTOP-BGNOK42 MINGW64 ~/Lab2 (master)
$ git checkout -b develop
git push origin develop
git checkout -b staging
git push origin staging
fatal: a branch named 'develop' already exists
Everything up-to-date
fatal: a branch named 'staging' already exists
Everything up-to-date
```

```
HP@DESKTOP-BGNOK42 MINGW64 ~/Lab2 (master)
$ git checkout develop
git checkout -b feature-exam
echo "Feature for exam workflow" >> notes.txt
git add notes.txt
git commit -m "Q2: Feature branch change"
Switched to branch 'develop'
Switched to a new branch 'feature-exam'
warning: in the working copy of 'notes.txt', LF will be replaced by CRLF the next time Git touches it
[feature-exam 65269d3] Q2: Feature branch change
1 file changed, 1 insertion(+)
```

```
HP@DESKTOP-BGNOK42 MINGW64 ~/Lab2 (feature-exam)
$ git checkout develop
git merge feature-exam
Switched to branch 'develop'
Updating bbc16e9..65269d3
Fast-forward
 notes.txt | 1 +
1 file changed, 1 insertion(+)
```

```
HP@DESKTOP-BGNOK42 MINGW64 ~/Lab2 (develop)
$ git checkout staging
git merge develop
Switched to branch 'staging'
Updating bbc16e9..65269d3
Fast-forward
 notes.txt | 1 +
1 file changed, 1 insertion(+)
```

```
HP@DESKTOP-BGNOK42 MINGW64 ~/Lab2 (staging)
$ git checkout master
git merge staging
Switched to branch 'master'
Your branch is ahead of 'origin/master' by 1 commit.
(use "git push" to publish your local commits)
Auto-merging notes.txt
CONFLICT (content): Merge conflict in notes.txt
Automatic merge failed; fix conflicts and then commit the result.
```

```
HP@DESKTOP-BGNOK42 MINGW64 ~/Lab2 (master|MERGING)
$ cat notes.txt
HI, IT'S ME UMBER QASIM, REGNO# 2023-BSE-066
<<<<<< HEAD
Uंबर - I love coding and coffee
Exam feature test
=====
Feature for exam workflow
>>>>>> staging
```

Q3: Collaboration & Conflict Resolution

```
HP@DESKTOP-BGN0K42 MINGW64 ~/Lab2 (master|MERGING)
$ git checkout -b collabA
Switched to a new branch 'collabA'
```

```
Dell@DESKTOP-IJ69HG9 MINGW64 ~/Lab2_work/Lab2 (collabB)
$ git remote set-url origin git@github.com:Umber-qasim/Lab2.git

Dell@DESKTOP-IJ69HG9 MINGW64 ~/Lab2_work/Lab2 (collabB)
$ git push origin collabB
Enumerating objects: 27, done.
Counting objects: 100% (27/27), done.
Delta compression using up to 8 threads
Compressing objects: 100% (24/24), done.
Writing objects: 100% (27/27), 4.72 KiB | 805.00 KiB/s, done.
Total 27 (delta 12), reused 0 (delta 0), pack-reused 0 (from 0)
remote: Resolving deltas: 100% (12/12), done.
remote:
remote: Create a pull request for 'collabB' on GitHub by visiting:
remote:   https://github.com/Umber-qasim/Lab2/pull/new/collabB
remote:
To github.com:Umber-qasim/Lab2.git
 * [new branch]      collabB -> collabB
```

```
HP@DESKTOP-BGN0K42 MINGW64 ~/Lab2 (collabA)
$ git fetch origin
git checkout collabB
git checkout collabA
git merge collabB
remote: Enumerating objects: 27, done.
remote: Counting objects: 100% (27/27), done.
remote: Compressing objects: 100% (12/12), done.
remote: Total 27 (delta 12), reused 27 (delta 12), pack-reused 0 (from 0)
Unpacking objects: 100% (27/27), 4.70 KiB | 33.00 KiB/s, done.
From github.com:Umber-qasim/Lab2
 * [new branch]      collabB -> origin/collabB
branch 'collabB' set up to track 'origin/collabB'.
Switched to a new branch 'collabB'
Switched to branch 'collabA'
fatal: refusing to merge unrelated histories

HP@DESKTOP-BGN0K42 MINGW64 ~/Lab2 (collabA)
$ git merge collabB --allow-unrelated-histories
Auto-merging README.md
CONFLICT (add/add): Merge conflict in README.md
Auto-merging main.py
CONFLICT (add/add): Merge conflict in main.py
Auto-merging notes.txt
CONFLICT (add/add): Merge conflict in notes.txt
Automatic merge failed; fix conflicts and then commit the result.
```

```

HP@DESKTOP-BGN0K42 MINGW64 ~/Lab2 (collabA|MERGING)
$ nano notes.txt

HP@DESKTOP-BGN0K42 MINGW64 ~/Lab2 (collabA|MERGING)
$ git add notes.txt

HP@DESKTOP-BGN0K42 MINGW64 ~/Lab2 (collabA|MERGING)
$ git commit -m "Q3: Resolved conflict, kept both Umber and Collaborator changes"
U      README.md
U      main.py
error: Committing is not possible because you have unmerged files.
hint: Fix them up in the work tree, and then use 'git add/rm <file>'
hint: as appropriate to mark resolution and make a commit.
fatal: Exiting because of an unresolved conflict.

HP@DESKTOP-BGN0K42 MINGW64 ~/Lab2 (collabA|MERGING)
$ nano README.MD

HP@DESKTOP-BGN0K42 MINGW64 ~/Lab2 (collabA|MERGING)
$ git add notes.txt README.md main.py

HP@DESKTOP-BGN0K42 MINGW64 ~/Lab2 (collabA|MERGING)
$ git commit -m "Q3: Resolved all conflicts, kept both Umber and Collaborator changes"
[collabA 21f19a3] Q3: Resolved all conflicts, kept both Umber and Collaborator changes

```

```

HP@DESKTOP-BGN0K42 MINGW64 ~/Lab2 (collabA)
$ cat notes.txt
<<<<<<< HEAD
HI, IT'S ME UMBER QASIM, REGNO# 2023-BSE-066
<<<<<<< HEAD
Umber - I love coding and coffee
Exam feature test
Feature for exam workflow
>>>>>>> staging
Line from Umber
Name: Sabahat Fatima
Note: This is for Lab2 tasks.
Updated note: Now testing Git staging and committing again.
Work on new feature
Feature for exam workflow
Line from Collaborator
collabB

HP@DESKTOP-BGN0K42 MINGW64 ~/Lab2 (collabA)
$ cat README.md
# Lab2 Git Practice
HEAD
Test line for PR screenshots
collabB

HP@DESKTOP-BGN0K42 MINGW64 ~/Lab2 (collabA)
$ cat main.py
<<<<<<< HEAD
def greet():
    print("Hello, Lab2!")
=====
def add(a,b):
    """Simple add function for lab."""
    return a + b

if __name__ == "__main__":
    print(add(2,3))
>>>>>>> collabB

```