



Cloud Computing BSE-VB

Submitted By

Tooba Shafique (2023-BSE-065)

Submitted to

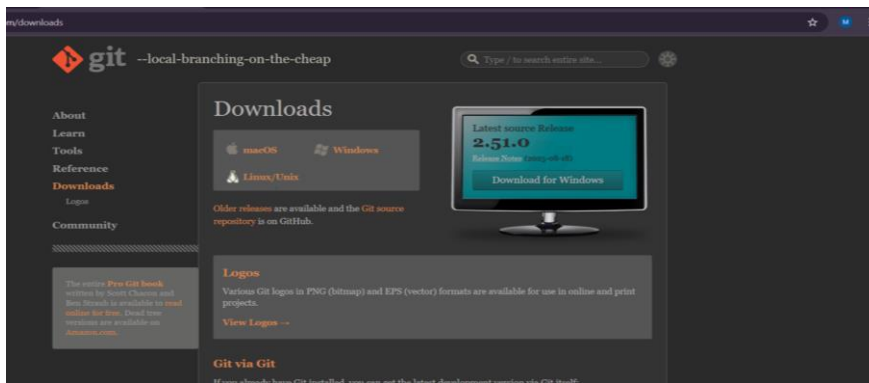
Sir Shoaib

LAB-02

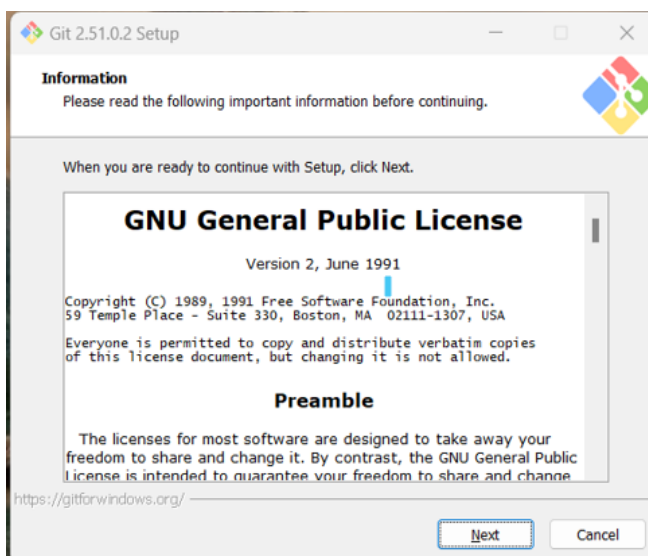
Getting Started

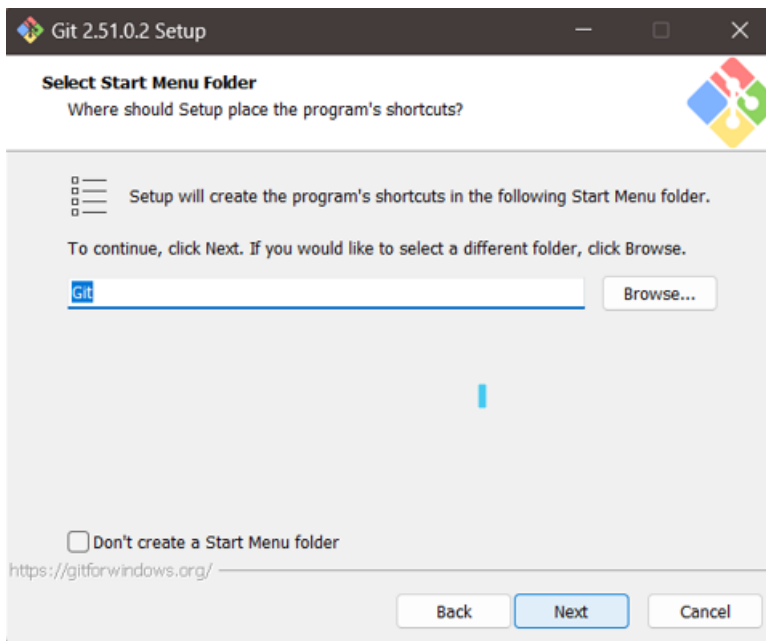
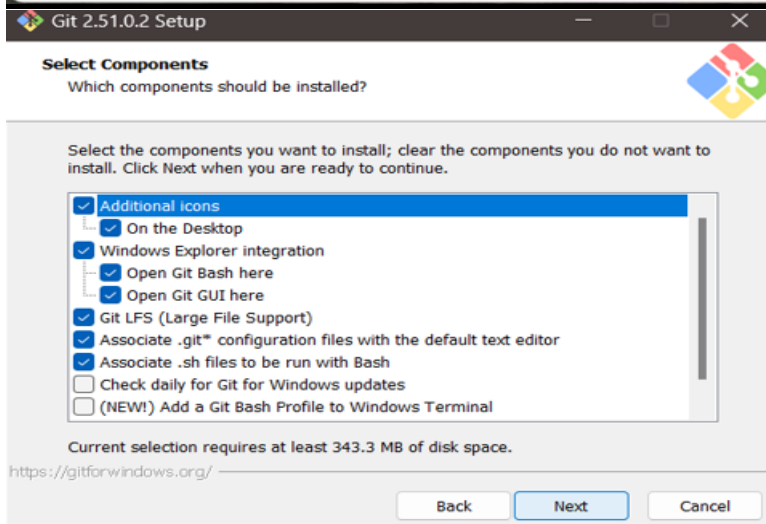
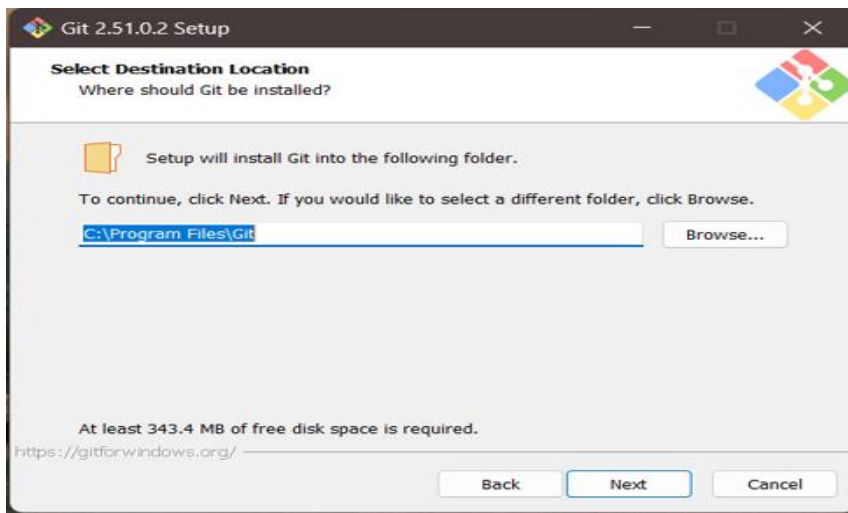
Install Git on your PC.

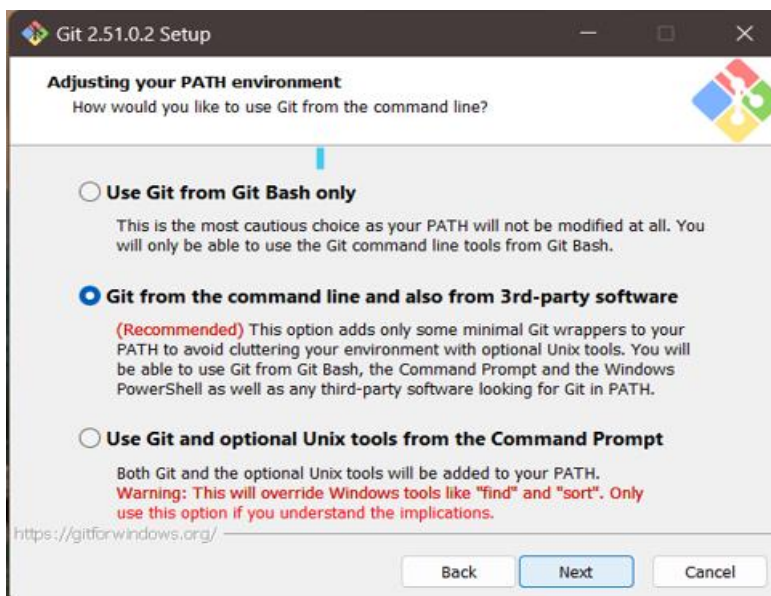
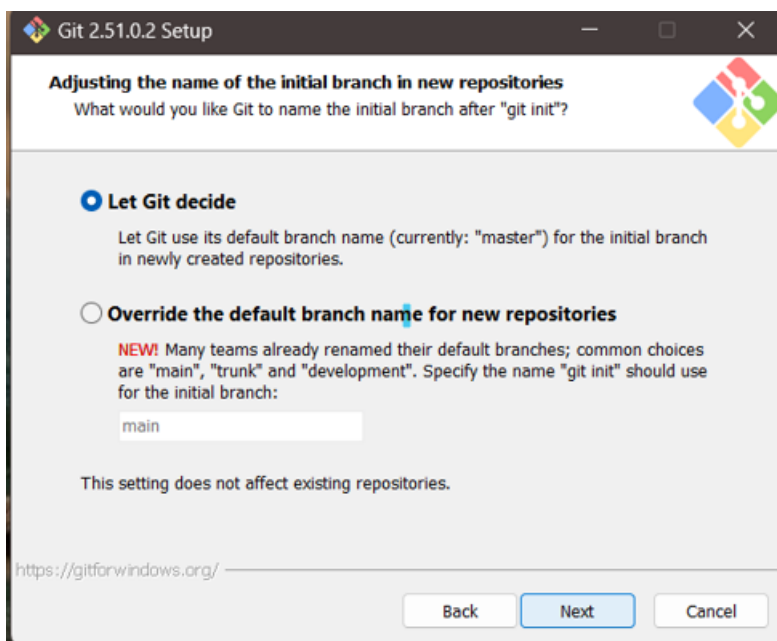
From google, download git for winndows

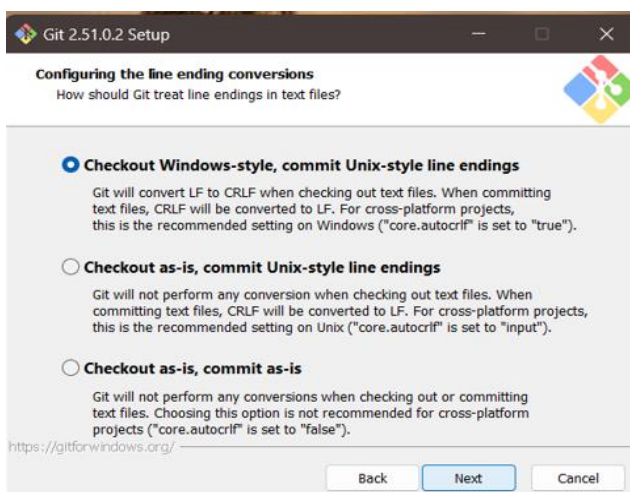
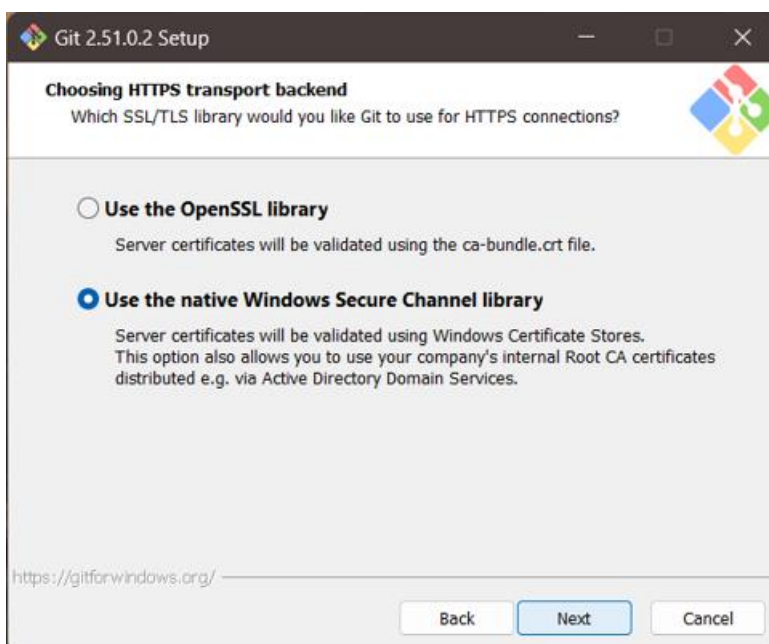
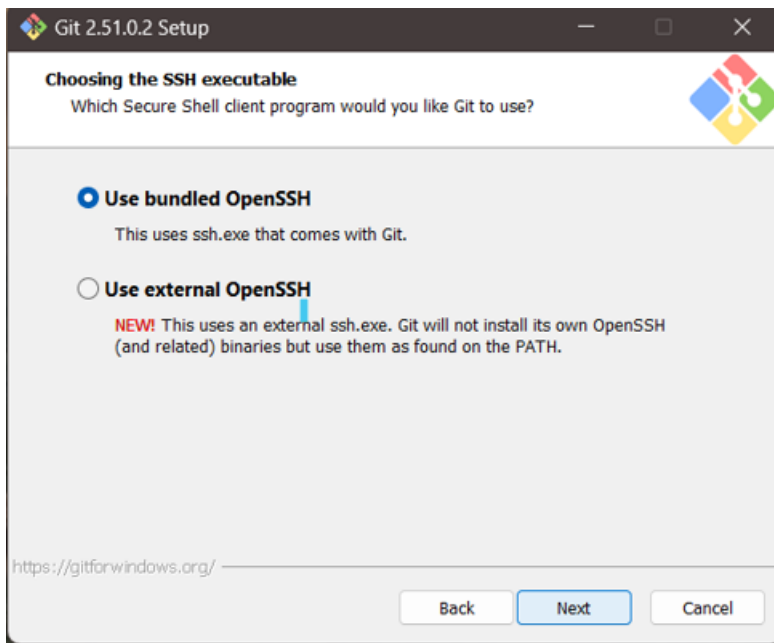


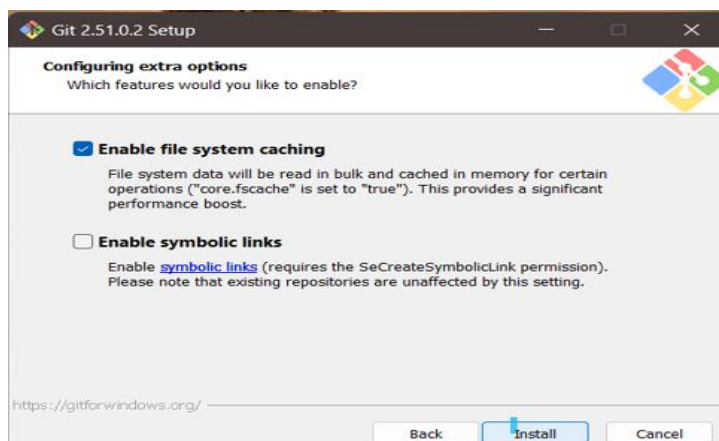
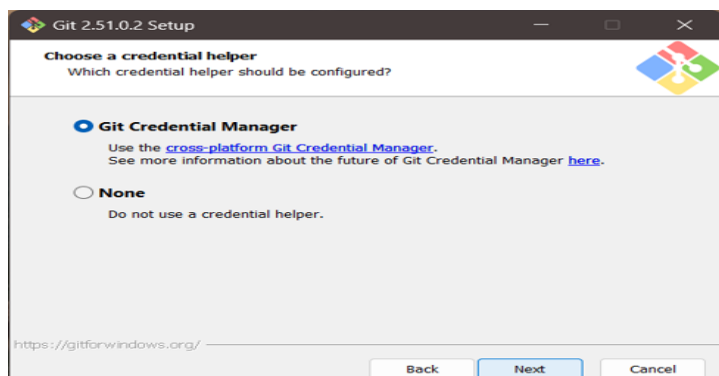
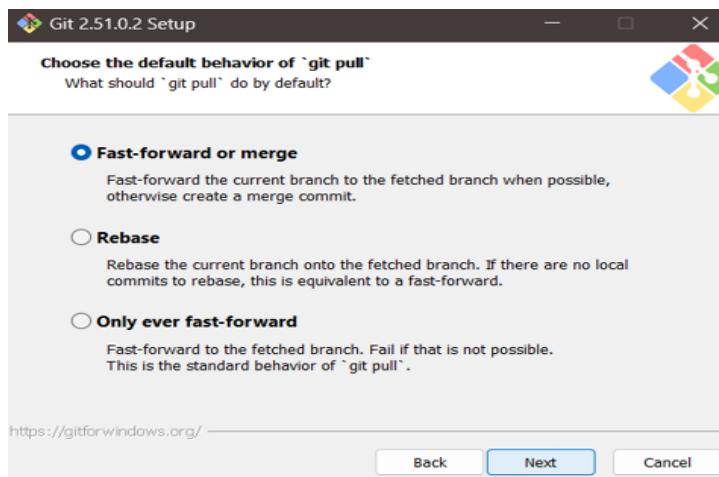
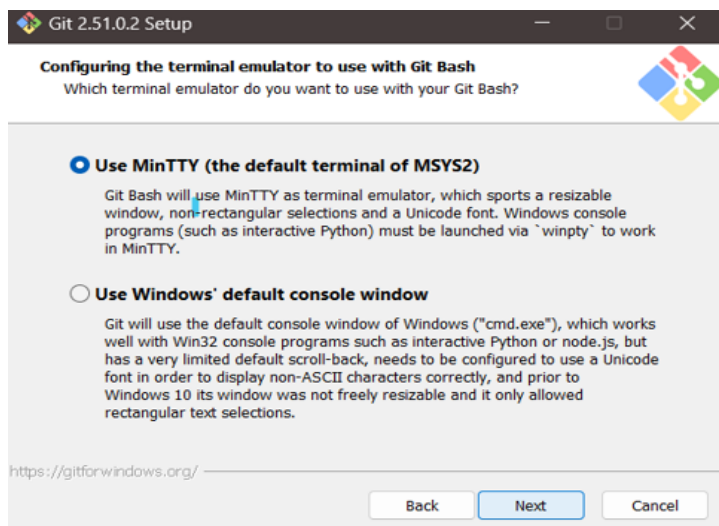
check the desired box and click on “next”



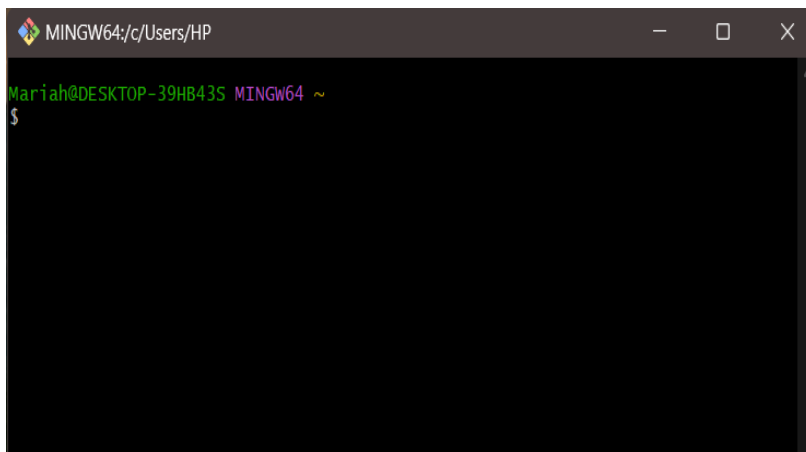






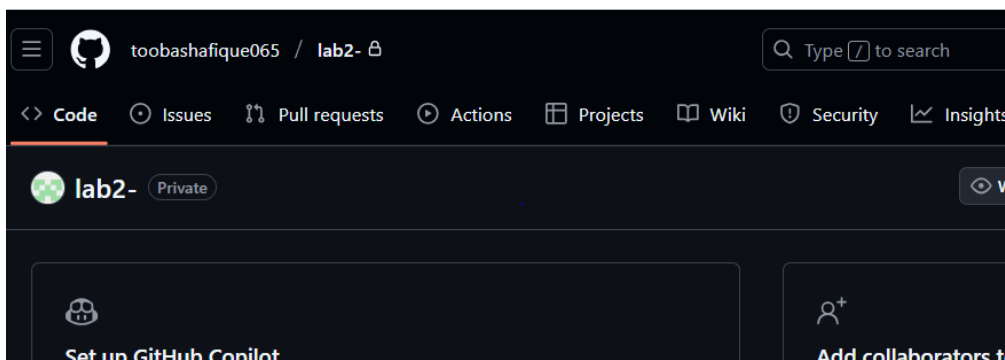
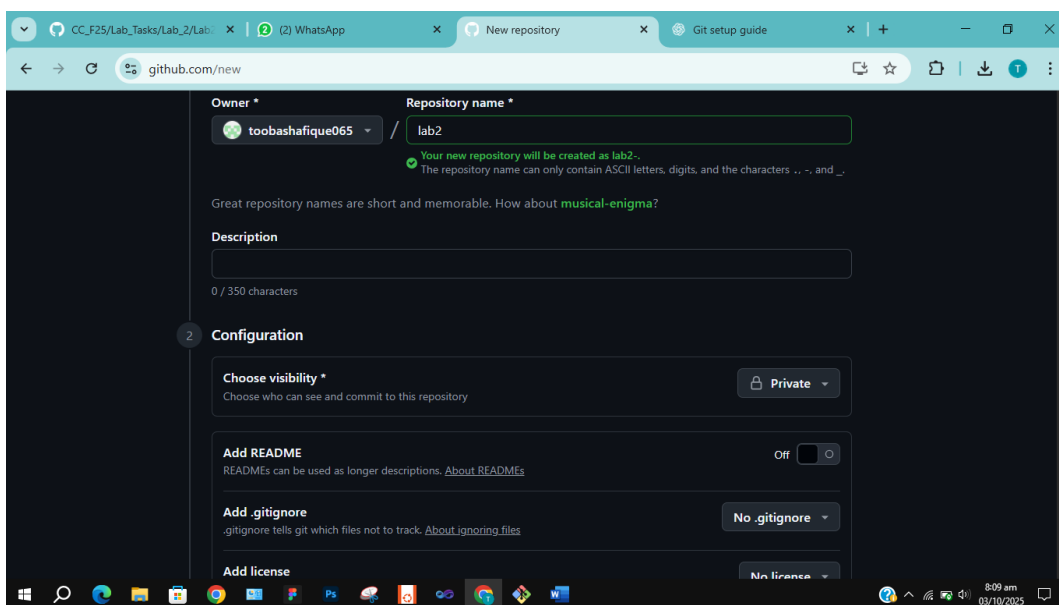


Installation Completed.



TASK NO 01:

Create Private GitHub Repository



TASK NO 02:

Connect Repository via SSH


```
malik@DESKTOP-N4U5EUV MINGW64 ~  
$ git clone http://github.com/toobashafique065/lab2-.git  
Cloning into 'lab2-'...  
warning: redirecting to https://github.com/toobashafique065/lab2-.git/  
warning: You appear to have cloned an empty repository.  
  
malik@DESKTOP-N4U5EUV MINGW64 ~
```

TASK NO 03:

Configure Git Username and Email

```
malik@DESKTOP-N4U5EUV MINGW64 ~  
$ git config --global user.name "toobashafique065"  
  
malik@DESKTOP-N4U5EUV MINGW64 ~  
$ git config --global user.email "23-22411-065@se.fjwu.edu.pk"  
  
malik@DESKTOP-N4U5EUV 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.name=toobashafique065  
user.email=23-22411-065@se.fjwu.edu.pk
```

TASK NO 04:

Explore the .git Folder

```
malik@DESKTOP-N4U5EUV MINGW64 ~  
$ cd lab2-  
  
malik@DESKTOP-N4U5EUV MINGW64 ~/lab2- (main)  
$ ls -a  
./ ../ .git/  
  
malik@DESKTOP-N4U5EUV MINGW64 ~/lab2- (main)  
$ ls -a .git  
./ ../ HEAD config description hooks/ info/ objects/ refs/
```

TASK NO 05:

Local Repository Management


```
malik@DESKTOP-N4U5EUV MINGW64 ~/lab2- (master)
$ echo "# Lab2 Git Practice" > README.md

malik@DESKTOP-N4U5EUV MINGW64 ~/lab2- (master)
$ git add README.md
warning: in the working copy of 'README.md', LF will be replaced by CRLF th

malik@DESKTOP-N4U5EUV MINGW64 ~/lab2- (master)
$ git commit -m "Initial commit"
[master (root-commit) f95d7e2] Initial commit
1 file changed, 1 insertion(+)
create mode 100644 README.md
```

```
malik@DESKTOP-N4U5EUV MINGW64 ~/lab2- (main)
$ git remote add origin git@github.com:toobashafique065/lab2-.git

malik@DESKTOP-N4U5EUV MINGW64 ~/lab2- (main)
$ git push -u origin main
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.
Enumerating objects: 3, done.
Counting objects: 100% (3/3), done.
Writing objects: 100% (3/3), 245 bytes | 245.00 KiB/s, done.
Total 3 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
To github.com:toobashafique065/lab2-.git
 * [new branch]      main -> main
branch 'main' set up to track 'origin/main'.
```

TASK NO 06:

File Status & Staging

```
malik@DESKTOP-N4U5EUV MINGW64 ~/lab2- (main)
$ echo "this is my note"> notes.txt

malik@DESKTOP-N4U5EUV MINGW64 ~/lab2- (main)
$ git status
On branch main
Your branch is up to date with 'origin/main'.

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)

malik@DESKTOP-N4U5EUV MINGW64 ~/lab2- (main)
$ git add notes.txt
warning: in the working copy of 'notes.txt', LF will be replaced by CRLF the next time Git touches

malik@DESKTOP-N4U5EUV MINGW64 ~/lab2- (main)
$ git commit -m "Add notes.txt"
[main 46d7f35] Add notes.txt
1 file changed, 1 insertion(+)
create mode 100644 notes.txt
```

```
malik@DESKTOP-N4USEUV MINGW64 ~/lab2- (main)
$ git commit -m "Add notes.txt"
On branch main
Your branch is ahead of 'origin/main' by 3 commits.
  (use "git push" to publish your local commits)

nothing to commit, working tree clean

malik@DESKTOP-N4USEUV MINGW64 ~/lab2- (main)
$ git push origin main
Enumerating objects: 10, done.
Counting objects: 100% (10/10), done.
Delta compression using up to 4 threads
Compressing objects: 100% (6/6), done.
Writing objects: 100% (9/9), 872 bytes | 145.00 KiB/s, done.
Total 9 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
To github.com:toobashafique065/lab2-.git
   f95d7e2..60e7dca  main -> main
```

Updated:

```
malik@DESKTOP-N4USEUV MINGW64 ~/lab2- (main)
$ echo "More notes added." >> notes.txt

malik@DESKTOP-N4USEUV MINGW64 ~/lab2- (main)
$ git status
On branch main
Your branch is up to date with 'origin/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")

malik@DESKTOP-N4USEUV MINGW64 ~/lab2- (main)
$ git add notes.txt
warning: in the working copy of 'notes.txt', LF will be replaced by CRLF the next time you commit

malik@DESKTOP-N4USEUV MINGW64 ~/lab2- (main)
$ git commit -m "Update notes.txt"
[main 70e75b4] Update notes.txt
 1 file changed, 1 insertion(+)
```

```
malik@DESKTOP-N4USEUV MINGW64 ~/lab2- (main)
$ git push origin main
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), 327 bytes | 163.00 KiB/s, done.
Total 3 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
To github.com:toobashafique065/lab2-.git
   60e7dca..70e75b4  main -> main
```

```

malik@DESKTOP-N4U5EUV MINGW64 ~/lab2- (main)
$ ls -la ~/.ssh/
total 31
drwxr-xr-x 1 malik 197609  0 Oct  3 11:37 ./
drwxr-xr-x 1 malik 197609  0 Oct  3 09:10 ../
-rw-r--r-- 1 malik 197609  99 Oct  3 11:41 config.txt
-rw-r--r-- 1 malik 197609 419 Oct  3 08:22 id_ed25519
-rw-r--r-- 1 malik 197609 110 Oct  3 08:22 id_ed25519.pub
-rw-r--r-- 1 malik 197609 1671 Oct  3 09:41 known_hosts
-rw-r--r-- 1 malik 197609  938 Oct  3 09:41 known_hosts.old

malik@DESKTOP-N4U5EUV MINGW64 ~/lab2- (main)
$ mv ~/.ssh/config.txt ~/.ssh/config

malik@DESKTOP-N4U5EUV MINGW64 ~/lab2- (main)
$ ls -la ~/.ssh/
total 31
drwxr-xr-x 1 malik 197609  0 Oct  3 11:43 ./
drwxr-xr-x 1 malik 197609  0 Oct  3 09:10 ../
-rw-r--r-- 1 malik 197609  99 Oct  3 11:41 config
-rw-r--r-- 1 malik 197609 419 Oct  3 08:22 id_ed25519
-rw-r--r-- 1 malik 197609 110 Oct  3 08:22 id_ed25519.pub
-rw-r--r-- 1 malik 197609 1671 Oct  3 09:41 known_hosts
-rw-r--r-- 1 malik 197609  938 Oct  3 09:41 known_hosts.old

malik@DESKTOP-N4U5EUV MINGW64 ~/lab2- (main)
$ ssh -T git@github.com
/c/Users/malik/.ssh/config: line 4: Bad configuration option: identifyfile
/c/Users/malik/.ssh/config: terminating, 1 bad configuration options

malik@DESKTOP-N4U5EUV MINGW64 ~/lab2- (main)
$ ssh -T git@github.com
/c/Users/malik/.ssh/config: line 4: Bad configuration option: identifyfile
/c/Users/malik/.ssh/config: terminating, 1 bad configuration options

malik@DESKTOP-N4U5EUV MINGW64 ~/lab2- (main)
$ ssh -T git@github.com
/c/Users/malik/.ssh/config: line 4: Bad configuration option: identifyfile
/c/Users/malik/.ssh/config: terminating, 1 bad configuration options

malik@DESKTOP-N4U5EUV MINGW64 ~/lab2- (main)

```

```

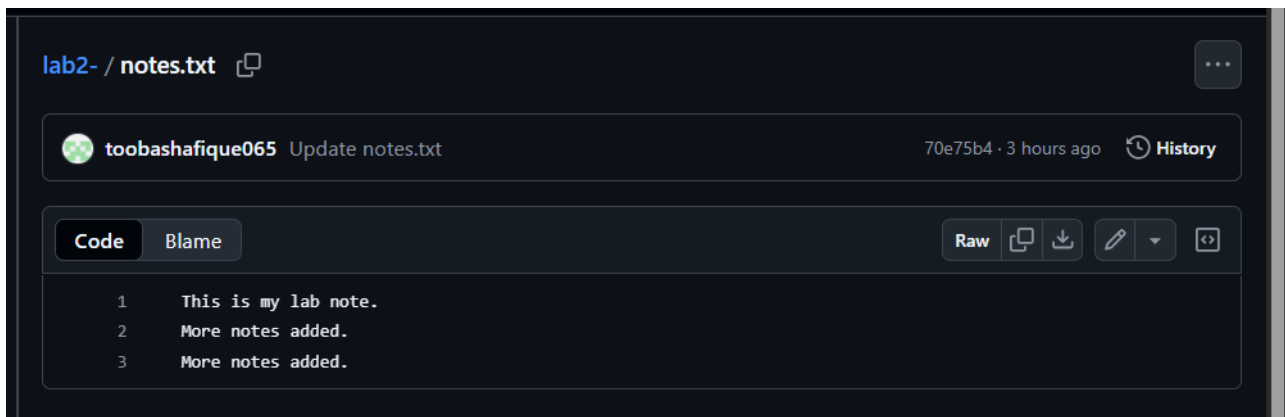
malik@DESKTOP-N4U5EUV MINGW64 ~/lab2- (main)
$ ls -la
total 22
drwxr-xr-x 1 malik 197609  0 Oct  3 09:45 ./
drwxr-xr-x 1 malik 197609  0 Oct  3 09:10 ../
drwxr-xr-x 1 malik 197609  0 Oct  3 11:54 .git/
-rw-r--r-- 1 malik 197609 20 Oct  3 09:21 README.md
-rw-r--r-- 1 malik 197609 39 Oct  3 10:16 notes.txt

malik@DESKTOP-N4U5EUV MINGW64 ~/lab2- (main)
$ ls -la ~/.ssh/
total 31
drwxr-xr-x 1 malik 197609  0 Oct  3 12:27 ./
drwxr-xr-x 1 malik 197609  0 Oct  3 09:10 ../
-rw-r--r-- 1 malik 197609 116 Oct  3 12:28 config
-rw-r--r-- 1 malik 197609 419 Oct  3 08:22 id_ed25519
-rw-r--r-- 1 malik 197609 110 Oct  3 08:22 id_ed25519.pub
-rw-r--r-- 1 malik 197609 1671 Oct  3 09:41 known_hosts
-rw-r--r-- 1 malik 197609  938 Oct  3 09:41 known_hosts.old

malik@DESKTOP-N4U5EUV MINGW64 ~/lab2- (main)
$ ssh -T git@github.com

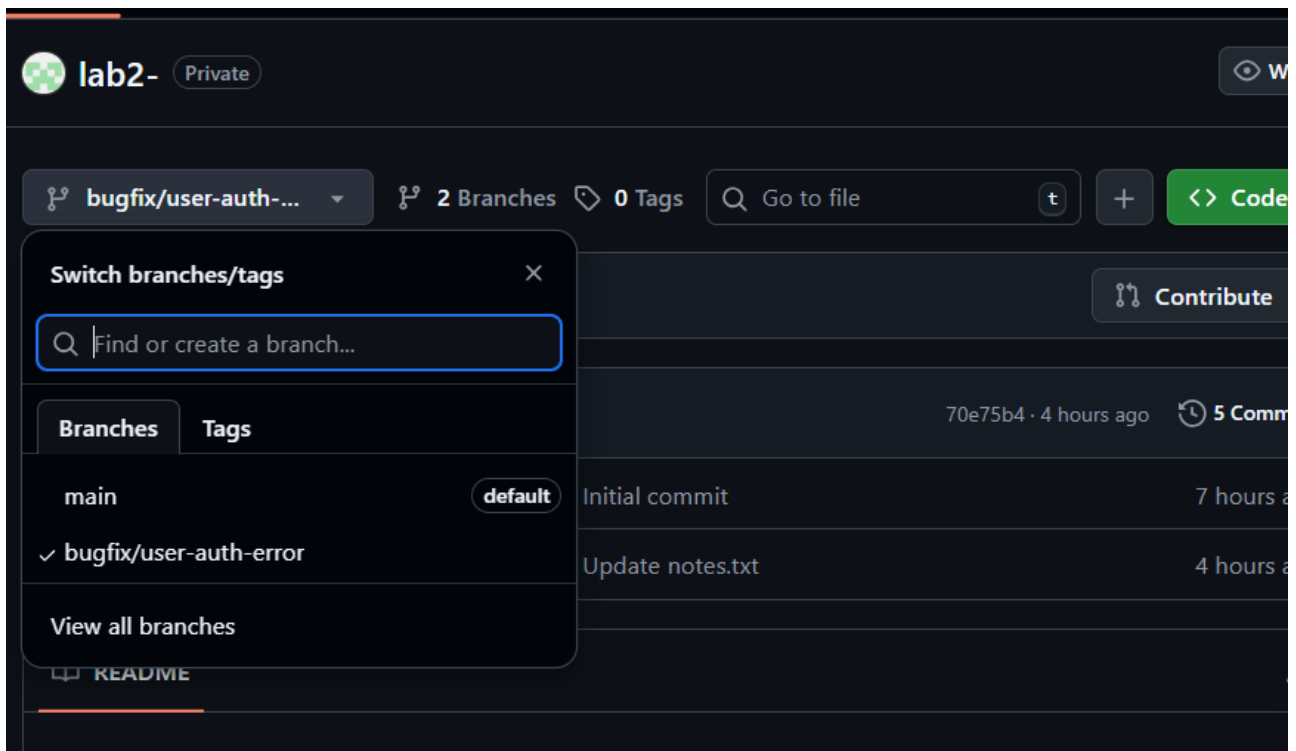
Hi toobashafique065! You've successfully authenticated, but GitHub does not provide shell access.

```



TASK NO 07:

Branch Creation Using GitHub GUI



```
malik@DESKTOP-N4USEUV MINGW64 ~/lab2- (main)
$ git fetch origin
From github.com:toobashafique065/lab2-
* [new branch]      bugfix/user-auth-error -> origin/bugfix/user-auth-error

malik@DESKTOP-N4USEUV MINGW64 ~/lab2- (main)
$ git checkout bugfix/user-auth-error
branch 'bugfix/user-auth-error' set up to track 'origin/bugfix/user-auth-error'.
Switched to a new branch 'bugfix/user-auth-error'
```

TASK NO 08:

Branch Creation and Push Using Git Bash

```

malik@DESKTOP-N4U5EUV MINGW64 ~/lab2- (bugfix/user-auth-error)
$ git checkout -b feature/db-connection
Switched to a new branch 'feature/db-connection'

malik@DESKTOP-N4U5EUV MINGW64 ~/lab2- (feature/db-connection)
$ git push origin feature/db-connection
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/toobashafique065/lab2-/pull/new/feature/db-connection
remote:
To github.com:toobashafique065/lab2-.git
 * [new branch]      feature/db-connection -> feature/db-connection

malik@DESKTOP-N4U5EUV MINGW64 ~/lab2- (feature/db-connection)
$ git branch -a
  bugfix/user-auth-error
* feature/db-connection
  main
remotes/origin/HEAD -> origin/main
remotes/origin/bugfix/user-auth-error
remotes/origin/feature/db-connection
remotes/origin/main

```

TASK NO 09:

Branching & Merging

```

malik@DESKTOP-N4U5EUV MINGW64 ~/lab2- (feature/db-connection)
$ git checkout -b feature-1
Switched to a new branch 'feature-1'

```

```

malik@DESKTOP-N4U5EUV MINGW64 ~/lab2- (feature-1)
$ echo "def new_function():" > main.py

malik@DESKTOP-N4U5EUV MINGW64 ~/lab2- (feature-1)
$ echo "    print('hello from feature-1 branch')" >> main.py

malik@DESKTOP-N4U5EUV 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

malik@DESKTOP-N4U5EUV MINGW64 ~/lab2- (feature-1)
$ git commit -m "Add new function to main.py"
[feature-1 2673a46] Add new function to main.py
 1 file changed, 2 insertions(+)
 create mode 100644 main.py

```

```

malik@DESKTOP-N4U5EUV MINGW64 ~/lab2- (feature-1)
$ git checkout main
Switched to branch 'main'
Your branch is up to date with 'origin/main'.

malik@DESKTOP-N4U5EUV MINGW64 ~/lab2- (main)
$ git merge feature-1
Updating 70e75b4..2673a46
Fast-forward
 main.py | 2 ++
 1 file changed, 2 insertions(+)
 create mode 100644 main.py

```

```

malik@DESKTOP-N4U5EUV MINGW64 ~/lab2- (main)
$ git push origin main
Enumerating objects: 4, done.
Counting objects: 100% (4/4), done.
Delta compression using up to 4 threads
Compressing objects: 100% (3/3), done.
Writing objects: 100% (3/3), 391 bytes | 195.00 KiB/s, done.
Total 3 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
To github.com:toobashafique065/lab2-.git
70e75b4..2673a46  main -> main

malik@DESKTOP-N4U5EUV MINGW64 ~/lab2- (main)
$ 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/toobashafique065/lab2-/pull/new/feature-1
remote:
To github.com:toobashafique065/lab2-.git
* [new branch]      feature-1 -> feature-1

```

TASK NO 10:

I made changes in origin feature/db-connection to create pull request.

```

malik@DESKTOP-N4U5EUV MINGW64 ~/lab2- (main)
$ git checkout feature/db-connection
Switched to branch 'feature/db-connection'

malik@DESKTOP-N4U5EUV MINGW64 ~/lab2- (feature/db-connection)
$ echo "Demo change for PR" > db_notes.txt

malik@DESKTOP-N4U5EUV MINGW64 ~/lab2- (feature/db-connection)
$ git add db_notes.txt
warning: in the working copy of 'db_notes.txt', LF will be replaced by CRLF the n

malik@DESKTOP-N4U5EUV MINGW64 ~/lab2- (feature/db-connection)
$ git commit -m "Add demo file for PR testing"
[feature/db-connection 8065e3a] Add demo file for PR testing
1 file changed, 1 insertion(+)
create mode 100644 db_notes.txt

malik@DESKTOP-N4U5EUV MINGW64 ~/lab2- (feature/db-connection)
$ git push origin feature/db-connection
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), 351 bytes | 175.00 KiB/s, done.
Total 3 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
To github.com:toobashafique065/lab2-.git
70e75b4..8065e3a  feature/db-connection -> feature/db-connection

```

Pull Request and Branch Review (GitHub GUI)

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

Add a title

Add demo file for PR testing

Add a description

Write

Preview

H

B

I

≡

<>

🔗

≡

≡

≡

📎

@

↗

↶

🗑

"This PR adds a demo file in feature/db-connection branch for testing purposes."

Markdown is supported

Paste, drop, or click to add files

Create pull request

Open

Add demo file for PR testing #1

toobashafique065 wants to merge 1 commit into `main` from `feature/db-connect...`



Commit message

Merge pull request #1 from toobashafique065/feature/db-connection

Extended description

Add demo file for PR testing

This commit will be authored by 23-22411-065@se.fjwu.edu.pk.

Confirm merge

Cancel

Labels

None yet

Projects

None yet

Milestone

No milestone

Development

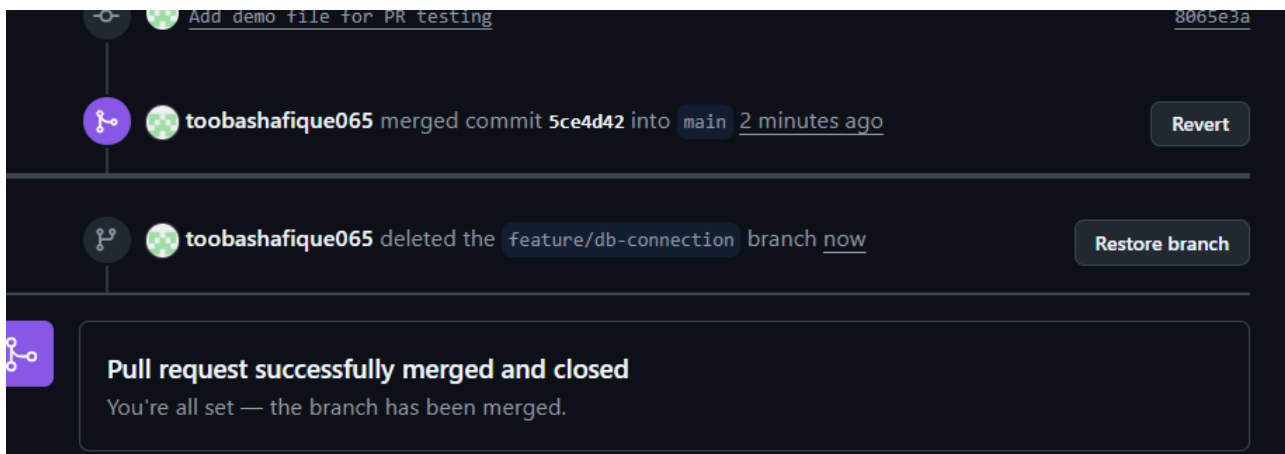
Successfully merged issues.

None yet

Notifications

You're receiving

Add a comment



TASK NO 11:

Detailed Branch Strategy (Develop/Staging)

- Create long-lived branches develop and staging (and push them)

```
malik@DESKTOP-N4U5EUV MINGW64 ~/lab2- (main)
$ git checkout -b develop
git push -u origin develop
Switched to a new branch 'develop'
Total 0 (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/toobashafique065/lab2-/pull/new/develop
remote:
To github.com:toobashafique065/lab2-.git
* [new branch]      develop -> develop
branch 'develop' set up to track 'origin/develop'.
```

```
malik@DESKTOP-N4U5EUV MINGW64 ~/lab2- (develop)
$ git checkout main
git checkout -b staging
git push -u origin staging
Switched to branch 'main'
Your branch is up to date with 'origin/main'.
Switched to a new branch '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/toobashafique065/lab2-/pull/new/staging
remote:
To github.com:toobashafique065/lab2-.git
* [new branch]      staging -> staging
branch 'staging' set up to track 'origin/staging'.
```

```
malik@DESKTOP-N4U5EUV MINGW64 ~/lab2- (staging)
$ git branch -a
bugfix/user-auth-error
develop
feature-1
feature/db-connection
main
* staging
remotes/origin/HEAD -> origin/main
remotes/origin/bugfix/user-auth-error
remotes/origin/develop
remotes/origin/feature-1
remotes/origin/feature/db-connection
remotes/origin/main
remotes/origin/staging
```

- Create example feature and bugfix branches (off develop) and push them

```
malik@DESKTOP-N4U5EUV MINGW64 ~/lab2- (develop)
$ git checkout -b feature/new-api
echo "demo feature file for new-api" > feature_new_api.txt
git add feature_new_api.txt
git commit -m "Add demo file for feature/new-api"
git push -u origin feature/new-api
Switched to a new branch 'feature/new-api'
warning: in the working copy of 'feature_new_api.txt', LF will be replaced by CRLF the next time you
touch it
[feature/new-api 9f3ac6d] Add demo file for feature/new-api
1 file changed, 1 insertion(+)
create mode 100644 feature_new_api.txt
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), 331 bytes | 165.00 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/new-api' on GitHub by visiting:
remote:   https://github.com/toobashafique065/lab2-/pull/new/feature/new-api
remote:
To github.com:toobashafique065/lab2-.git
* [new branch]      feature/new-api -> feature/new-api
branch 'feature/new-api' set up to track 'origin/feature/new-api'.
```

```
malik@DESKTOP-N4U5EUV MINGW64 ~/lab2- (feature/new-api)
$ git checkout develop
git checkout -b bugfix/fix-readme-typo
echo "# fix typo" >> README.md
git add README.md
git commit -m "Fix typo in README"
git push -u origin bugfix/fix-readme-typo
Switched to branch 'develop'
Your branch is up to date with 'origin/develop'.
Switched to a new branch 'bugfix/fix-readme-typo'
warning: in the working copy of 'README.md', LF will be replaced by CRLF the next time you
touch it
[bugfix/fix-readme-typo 2e4877d] Fix typo in README
1 file changed, 1 insertion(+)
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), 388 bytes | 194.00 KiB/s, done.
Total 3 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
remote:
remote: Create a pull request for 'bugfix/fix-readme-typo' on GitHub by visiting:
remote:   https://github.com/toobashafique065/lab2-/pull/new/bugfix/fix-readme-typo
remote:
To github.com:toobashafique065/lab2-.git
* [new branch]      bugfix/fix-readme-typo -> bugfix/fix-readme-typo
branch 'bugfix/fix-readme-typo' set up to track 'origin/bugfix/fix-readme-typo'.
```

```
malik@DESKTOP-N4USEUV MINGW64 ~/lab2- (bugfix/fix-readme-typo)
$ git branch -a
* bugfix/fix-readme-typo
  bugfix/user-auth-error
  develop
  feature-1
  feature/db-connection
  feature/new-api
  main
  staging
remotes/origin/HEAD -> origin/main
remotes/origin/bugfix/fix-readme-typo
remotes/origin/bugfix/user-auth-error
remotes/origin/develop
remotes/origin/feature-1
remotes/origin/feature/db-connection
remotes/origin/feature/new-api
remotes/origin/main
remotes/origin/staging
```

- Merge feature/bugfix into develop

```
malik@DESKTOP-N4USEUV MINGW64 ~/lab2- (develop)
$ git merge --no-ff feature/new-api -m "Merge feature/new-api into develop"
git push origin develop
Merge made by the 'ort' strategy.
  feature_new_api.txt | 1 +
  1 file changed, 1 insertion(+)
  create mode 100644 feature_new_api.txt
Enumerating objects: 1, done.
Counting objects: 100% (1/1), done.
Writing objects: 100% (1/1), 240 bytes | 240.00 KiB/s, done.
Total 1 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
To github.com:toobashafique065/lab2-.git
  5ce4d42..3b7447c  develop -> develop

malik@DESKTOP-N4USEUV MINGW64 ~/lab2- (develop)
$ git merge --no-ff bugfix/fix-readme-typo -m "Merge bugfix/fix-readme-typo into develop"
git push origin develop
Merge made by the 'ort' strategy.
  README.md | 1 +
  1 file changed, 1 insertion(+)
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), 330 bytes | 330.00 KiB/s, done.
Total 2 (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:toobashafique065/lab2-.git
  3b7447c..47fd1af  develop -> develop
```

- Merge develop into staging (testing)

```
malik@DESKTOP-N4USEUV MINGW64 ~/lab2- (develop)
$ git checkout staging
git pull origin staging

git merge --no-ff develop -m "Merge develop into staging for testing"
git push origin staging
Switched to branch 'staging'
Your branch is up to date with 'origin/staging'.
From github.com:toobashafique065/lab2-
  * branch          staging      -> FETCH_HEAD
Already up to date.
Merge made by the 'ort' strategy.
  README.md      | 1 +
  feature_new_api.txt | 1 +
  2 files changed, 2 insertions(+)
  create mode 100644 feature_new_api.txt
Enumerating objects: 1, done.
Counting objects: 100% (1/1), done.
Writing objects: 100% (1/1), 244 bytes | 244.00 KiB/s, done.
Total 1 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
To github.com:toobashafique065/lab2-.git
  5ce4d42..22a1eb5  staging -> staging
```

- Final: merge staging into main (production)

```

malik@DESKTOP-N4U5EUV MINGW64 ~/lab2- (staging)
$ git checkout main
git pull origin main

git merge --no-ff staging -m "Promote staging to main (production)"
git push origin main
Switched to branch 'main'
Your branch is up to date with 'origin/main'.
From github.com:toobashafique065/lab2-
 * branch          main          -> FETCH_HEAD
Already up to date.
Merge made by the 'ort' strategy.
 README.md         | 1 +
 feature_new_api.txt | 1 +
 2 files changed, 2 insertions(+)
 create mode 100644 feature_new_api.txt
Enumerating objects: 1, done.
Counting objects: 100% (1/1), done.
Writing objects: 100% (1/1), 242 bytes | 242.00 KiB/s, done.
Total 1 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
To github.com:toobashafique065/lab2-.git
 5ce4d42..e6307dc main -> main

```

- Clean-up

```

malik@DESKTOP-N4U5EUV MINGW64 ~/lab2- (main)
$ git branch -d feature/new-api
git branch -d bugfix/fix-readme-typo
Deleted branch feature/new-api (was 9f3ac6d).
Deleted branch bugfix/fix-readme-typo (was 2e4877d).

malik@DESKTOP-N4U5EUV MINGW64 ~/lab2- (main)
$ git push origin --delete feature/new-api
git push origin --delete bugfix/fix-readme-typo
To github.com:toobashafique065/lab2-.git
 - [deleted]          feature/new-api
To github.com:toobashafique065/lab2-.git
 - [deleted]          bugfix/fix-readme-typo

```

Bonus Task:

Simulated Team Collaboration

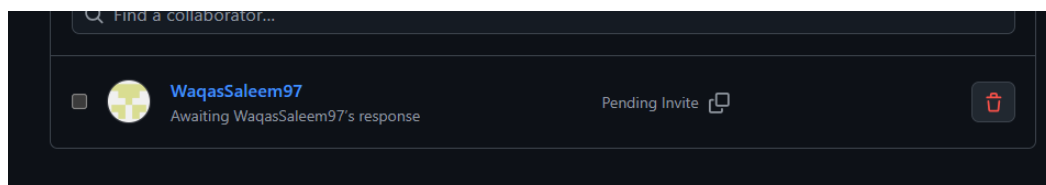
Step 1 — Create and switch to collab branch

```

malik@DESKTOP-N4U5EUV MINGW64 ~/lab2- (main)
$ git checkout -b collab
Switched to a new branch 'collab'

```

Step 2 – (Add collaborator)



Step 3 – Simulate “both users” editing the file

```
malik@DESKTOP-N4U5EUV MINGW64 ~/lab2- (collab)
$ echo "Tooba - Loves Learning Git!" >> notes.txt
git add notes.txt
git commit -m "Tooba added her fun fact"
warning: in the working copy of 'notes.txt', LF will be replaced by CRLF the next time Git touches it
[collab 143bfda] Tooba added her fun fact
1 file changed, 1 insertion(+)

malik@DESKTOP-N4U5EUV MINGW64 ~/lab2- (collab)
$ echo "Malik - Enjoys solving coding challenges!" >> notes.txt
git add notes.txt
git commit -m "Malik added his fun fact"
warning: in the working copy of 'notes.txt', LF will be replaced by CRLF the next time Git touches it
[collab d2ccc53] Malik added his fun fact
1 file changed, 1 insertion(+)

malik@DESKTOP-N4U5EUV MINGW64 ~/lab2- (collab)
$ git push origin collab
Enumerating objects: 17, done.
Counting objects: 100% (17/17), done.
Delta compression using up to 4 threads
Compressing objects: 100% (13/13), done.
Writing objects: 100% (15/15), 1.49 KiB | 217.00 KiB/s, done.
Total 15 (delta 7), reused 0 (delta 0), pack-reused 0 (from 0)
remote: Resolving deltas: 100% (7/7), completed with 1 local object.
remote:
remote: Create a pull request for 'collab' on GitHub by visiting:
remote:   https://github.com/toobashafique065/lab2-/pull/new/collab
remote:
To github.com:toobashafique065/lab2-.git
 * [new branch]      collab -> collab
```

Step 4 – Merge collab → main

```
malik@DESKTOP-N4U5EUV MINGW64 ~/lab2- (collab)
$ git checkout main
git merge collab
git push origin main
Switched to branch 'main'
Your branch is ahead of 'origin/main' by 4 commits.
(use "git push" to publish your local commits)
Updating 52224d7..d2ccc53
Fast-forward
 notes.txt | 2 ++
1 file changed, 2 insertions(+)
Total 0 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
To github.com:toobashafique065/lab2-.git
 e6307dc..d2ccc53  main -> main
```

TASK NO 12:

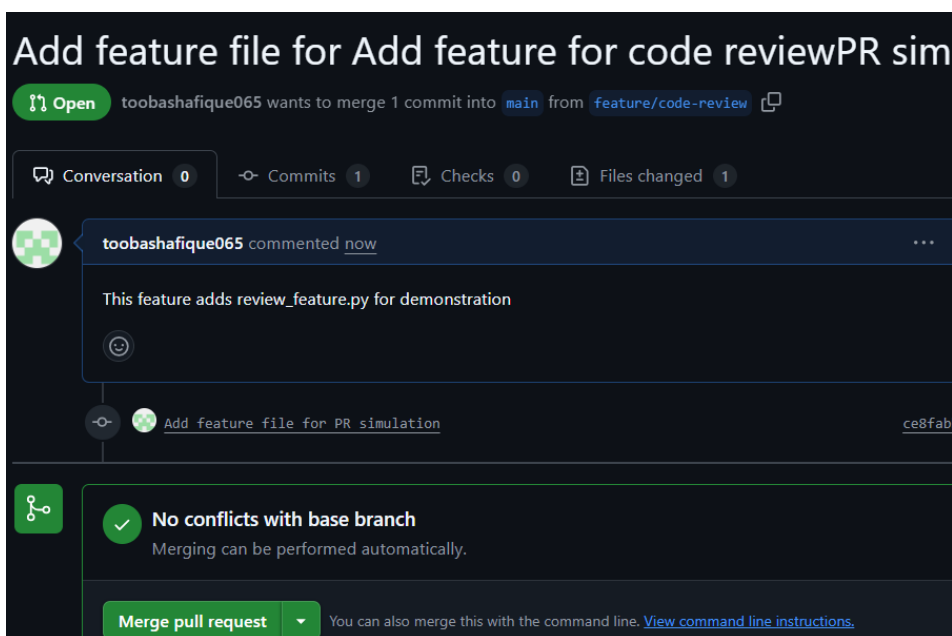
Step 1 – Create a feature branch locally

```

malik@DESKTOP-N4U5EUV MINGW64 ~/lab2- (main)
$ git checkout -b feature/code-review
echo "print('Feature for code review')" > review_feature.py
git add review_feature.py
git commit -m "Add feature file for PR simulation"
git push origin feature/code-review
Switched to a new branch 'feature/code-review'
warning: in the working copy of 'review_feature.py', LF will be replaced by CRLF
the next time Git touches it
[feature/code-review ce8fabb] Add feature file for PR simulation
1 file changed, 1 insertion(+)
create mode 100644 review_feature.py
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), 343 bytes | 171.00 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/code-review' on GitHub by visiting:
remote:   https://github.com/toobashafique065/lab2-/pull/new/feature/code-review
remote:
To github.com:toobashafique065/lab2-.git
* [new branch]      feature/code-review -> feature/code-review

```

Step 2 – Create the Pull Request (GitHub UI)



Add feature file for Add feature for code reviewPR sim

Open toobashafique065 wants to merge 1 commit into `main` from `feature/code-review`

Conversation 0 Commits 1 Checks 0 Files changed 1

toobashafique065 commented now

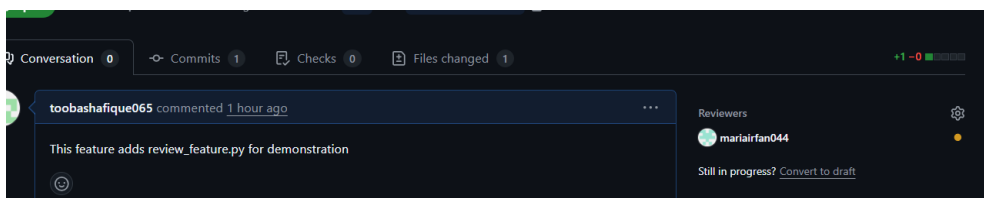
This feature adds review_feature.py for demonstration

Add feature file for PR simulation `ce8fabb`

No conflicts with base branch
Merging can be performed automatically.

Merge pull request You can also merge this with the command line. [View command line instructions.](#)

Step 3 – Assign a Reviewer



Conversation 0 Commits 1 Checks 0 Files changed 1 +1 -0

toobashafique065 commented 1 hour ago

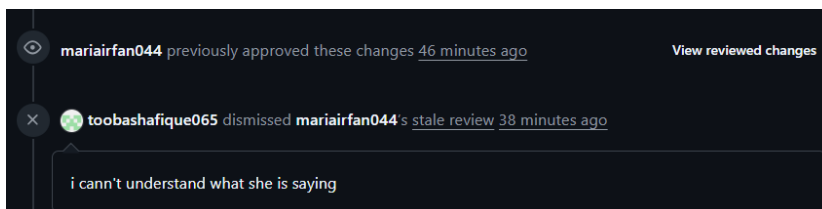
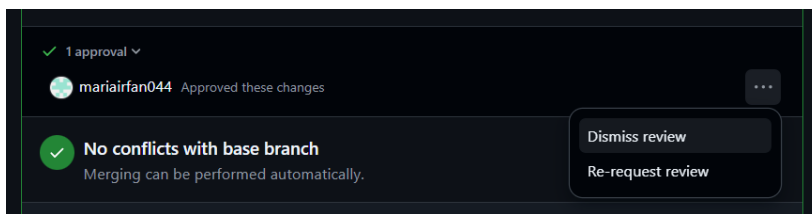
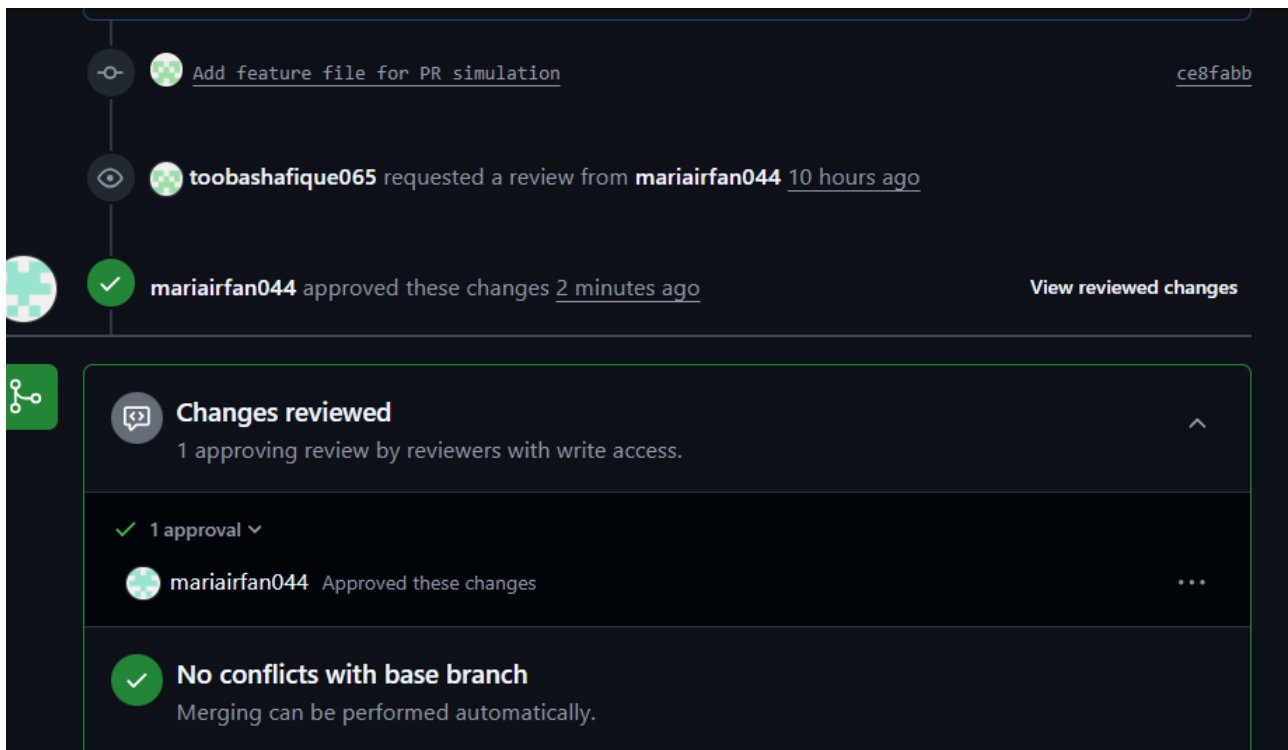
This feature adds review_feature.py for demonstration

Reviewers

mariairfan044

Still in progress? [Convert to draft](#)

Step 4 – Reviewer Actions



Step 5 – Author fixes issues

```
malik@DESKTOP-N4U5EUV MINGW64 ~/lab2- (feature/code-review)
$ # Make a fix in the same branch
echo "print('Code review fix added')" >> review_feature.py
git add review_feature.py
git commit -m "Fix: minor change after review"
git push origin feature/code-review
warning: in the working copy of 'review_feature.py', LF will be replaced by
the next time Git touches it
[feature/code-review 4293efa] Fix: minor change after review
1 file changed, 1 insertion(+)
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), 331 bytes | 165.00 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:toobashafique065/lab2-.git
ce8fabb..4293efa feature/code-review -> feature/code-review
```

Step 6 – Merge PR

Commit message

Merge pull request #2 from toobashafique065/feature/code-review

Extended description

Add feature file for Add feature for code reviewPR simulation

This commit will be authored by 23-22411-065@se.fjwu.edu.pk.

Confirm merge **Cancel**

Pull request successfully merged and closed

You're all set — the [feature/code-review](#) branch can be safely deleted.

Delete branch

Step 7 – Branch handling after merge

toobashafique065 merged commit 5532e12 into main 4 minutes ago **Revert**

toobashafique065 deleted the [feature/code-review](#) branch **now** **Restore branch**

TASK NO 13:

Step 1 – Delete Remote Branch After Merg

toobashafique065 merged commit 5532e12 into main 4 minutes ago **Revert**

toobashafique065 deleted the [feature/code-review](#) branch **now** **Restore branch**

Step 2 – Update Local Repository

```
malik@DESKTOP-N4U5EUV MINGW64 ~/lab2- (feature/code-review)
$ git checkout main
git pull origin main
git branch -d feature/code-review
git branch
Switched to branch 'main'
Your branch is up to date with 'origin/main'.
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), 940 bytes | 235.00 KiB/s, done.
From github.com:toobashafique065/lab2-
* branch          main      -> FETCH_HEAD
d2ccc53..5532e12  main      -> origin/main
Updating d2ccc53..5532e12
Fast-forward
 review_feature.py | 2 ++
 1 file changed, 2 insertions(+)
 create mode 100644 review_feature.py
Deleted branch feature/code-review (was 4293efa).
bugfix/user-auth-error
collab
collaborator1
collaborator2
develop
exam-feature
feature-1
feature-login
feature/db-connection
* main
staging
```

Exam evaluation questions:

Q1: Advanced Branching & Merge Verification

Step 1 — Create a new branch

```
malik@DESKTOP-N4U5EUV MINGW64 ~/lab2- (main)
$ git checkout -b exam-feature
Switched to a new branch 'exam-feature'
```

Step 2 — Make a small change & commit

```
malik@DESKTOP-N4U5EUV MINGW64 ~/lab2- (exam-feature)
$ echo "This is exam feature branch" >> exam.txt
git add exam.txt
git commit -m "Add line in exam.txt for Q1"
warning: in the working copy of 'exam.txt', LF will be replaced
[exam-feature 5507fae] Add line in exam.txt for Q1
1 file changed, 1 insertion(+)
create mode 100644 exam.txt
```

Step 3 — Merge into main

```
malik@DESKTOP-N4U5EUV MINGW64 ~/lab2- (exam-feature)
$ git checkout main
git merge exam-feature
Switched to branch 'main'
Your branch is up to date with 'origin/main'.
Updating e6307dc..5507fae
Fast-forward
 exam.txt | 1 +
1 file changed, 1 insertion(+)
create mode 100644 exam.txt
```

Step 4 — Show history verifying merge

```
malik@DESKTOP-N4U5EUV MINGW64 ~/lab2- (main)
$ git log --oneline --graph --all
* 5507fae (HEAD -> main, exam-feature) Add line in exam.txt for Q1
* e6307dc (origin/main, origin/HEAD) Promote staging to main (production)
|
| * 22a1eb5 (origin/staging, staging) Merge develop into staging for testing
|/
| * 47fd1af (origin/develop, develop) Merge bugfix/fix-readme-typo into develop
|/
| * 2e4877d Fix typo in README
|/
| * 3b7447c Merge feature/new-api into develop
|/
| * 9f3ac6d Add demo file for feature/new-api
|/
* 5ce4d42 Merge pull request #1 from toobashafique065/feature/db-connection
|/
| * 8065e3a (origin/feature/db-connection, feature/db-connection) Add demo file for PR testing
| * 2673a46 (origin/feature-1, feature-1) Add new function to main.py
|/
* 70e75b4 (origin/bugfix/user-auth-error, bugfix/user-auth-error) Update notes.txt
* 60e7dca Update notes.txt
* b93b05e Add notes.txt
* 46d7f35 Add notes.txt
* f95d7e2 Initial commit
```

Q2: Multi-Stage Workflow Simulation

Step 1 — Switch to develop and create a new feature branch

```
malik@DESKTOP-N4U5EUV MINGW64 ~/lab2- (main)
$ git checkout develop
git checkout -b feature-login
Switched to branch 'develop'
Your branch is up to date with 'origin/develop'.
Switched to a new branch 'feature-login'
```

Step 2 — Add a small change and commit it

```
malik@DESKTOP-N4U5EUV MINGW64 ~/lab2- (feature-login)
$ echo "print('Login feature added')" > login.py
git add login.py
git commit -m "Add login feature file for Q2"
warning: in the working copy of 'login.py', LF will be replaced by CRLF the
[feature-login a21913f] Add login feature file for Q2
1 file changed, 1 insertion(+)
create mode 100644 login.py
```

Step 3 — Merge feature-login → develop

```
malik@DESKTOP-N4U5EUV MINGW64 ~/lab2- (feature-login)
$ git checkout develop
git merge feature-login
Switched to branch 'develop'
Your branch is up to date with 'origin/develop'.
Updating 47fd1af..a21913f
Fast-forward
 login.py | 1 +
1 file changed, 1 insertion(+)
create mode 100644 login.py
```

Step 4 — Merge develop → staging

```
malik@DESKTOP-N4U5EUV MINGW64 ~/lab2- (develop)
$ git checkout staging
git merge develop
Merge made by the 'ort' strategy.
 login.py | 1 +
1 file changed, 1 insertion(+)
create mode 100644 login.py
```

Step 5 — Merge staging → main

```
malik@DESKTOP-N4U5EUV MINGW64 ~/lab2- (develop)
Merge branch 'develop' into staging
```

```
Merge branch 'staging'
```

```
Merge made by the 'ort' strategy.
 login.py | 1 +
1 file changed, 1 insertion(+)
create mode 100644 login.py
```

Step 6 — Verify the change reached all branches

```
malik@DESKTOP-N4U5EUV MINGW64 ~/lab2- (main)
$ ls
cat login.py
README.md db_notes.txt exam.txt feature_new_api.txt login.py main.py notes.txt
print('Login feature added')
```

Q3: Collaboration & Conflict Resolution

- Step 1: Work with a collaborator (create separate branches and edits)

```
malik@DESKTOP-N4U5EUV MINGW64 ~/lab2- (main)
$ git checkout main
git checkout -b collaborator1
echo "Line from collaborator 1" > collab.txt
git add collab.txt
git commit -m "Add line from collaborator 1"
Already on 'main'
Your branch is ahead of 'origin/main' by 4 commits.
(use "git push" to publish your local commits)
Switched to a new branch 'collaborator1'
warning: in the working copy of 'collab.txt', LF will be replaced by CRLF the next time Git tou
[collaborator1 a3091d1] Add line from collaborator 1
1 file changed, 1 insertion(+)
create mode 100644 collab.txt

malik@DESKTOP-N4U5EUV MINGW64 ~/lab2- (collaborator1)
$ git checkout main
git checkout -b collaborator2
echo "Line from collaborator 2" > collab.txt
git add collab.txt
git commit -m "Add line from collaborator 2"
Switched to branch 'main'
Your branch is ahead of 'origin/main' by 4 commits.
(use "git push" to publish your local commits)
Switched to a new branch 'collaborator2'
warning: in the working copy of 'collab.txt', LF will be replaced by CRLF the next time Git tou
[collaborator2 569b369] Add line from collaborator 2
1 file changed, 1 insertion(+)
create mode 100644 collab.txt
```

- Step 2: Attempt to Merge (create conflict)

```
malik@DESKTOP-N4U5EUV MINGW64 ~/lab2- (collaborator2)
$ git checkout collaborator1
git merge collaborator2
Switched to branch 'collaborator1'
Auto-merging collab.txt
CONFLICT (add/add): Merge conflict in collab.txt
Automatic merge failed; fix conflicts and then commit the result.
```

- Step 3: Resolve the Conflict (keep both contributors' lines)

```
MINGW64:/c/Users/malik/lab2-
GNU nano 8.6 collab.txt
line from collaborator 1
line from collaborator 2
```

```
malik@DESKTOP-N4U5EUV MINGW64 ~/lab2- (collaborator1|MERGING)
$ git add collab.txt
git commit -m "Resolve merge conflict keeping both lines"
[collaborator1 63989bb] Resolve merge conflict keeping both lines
```

- Step 4: Verify final file (both lines preserved)

```
malik@DESKTOP-N4U5EUV MINGW64 ~/lab2- (collaborator1)
$ cat collab.txt

Line from collaborator 1
Line from collaborator 2
```