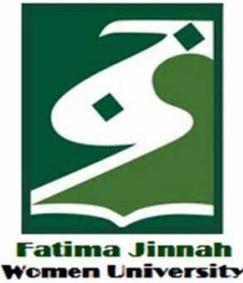


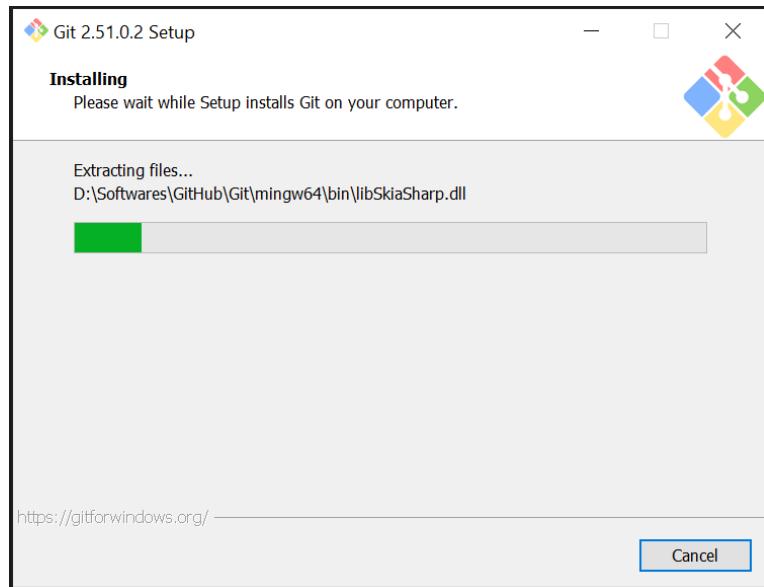
CLOUD COMPUTING
LAB 02
HANDS-ON GIT & VERSION CONTROL LAB



SUBMITTED TO
ENGR. SHOAIB

SUBMITTED BY
Komal Kashif
BSE- VA
2023-BSE-031

Installation GitBash:



GitBash was installed and started.

TASK 1

Create Private GitHub Repository

Private repository

The screenshot shows the "Create a new repository" form on GitHub. It's a two-step process:

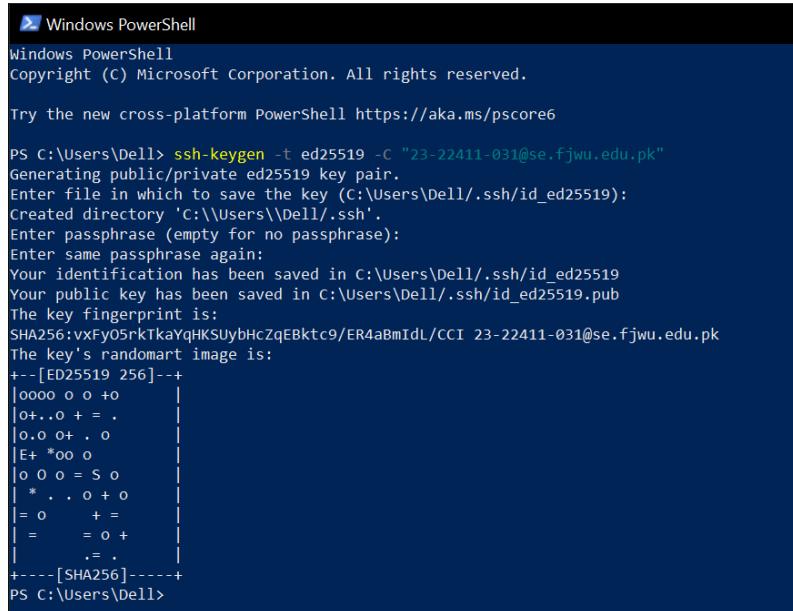
- Step 1: General**
 - Owner ***: KomalKashif
 - Repository name ***: Lab-02 (checkbox: Lab-02 is available)
 - Description**: (empty field)
- Step 2: Configuration**
 - Choose visibility ***: Private
 - Add README**: On
 - Add .gitignore**: No .gitignore
 - Add license**: No license

At the bottom right is a blue "Create repository" button.

TASK 2

Connect Repository via SSH

SSH key-generation

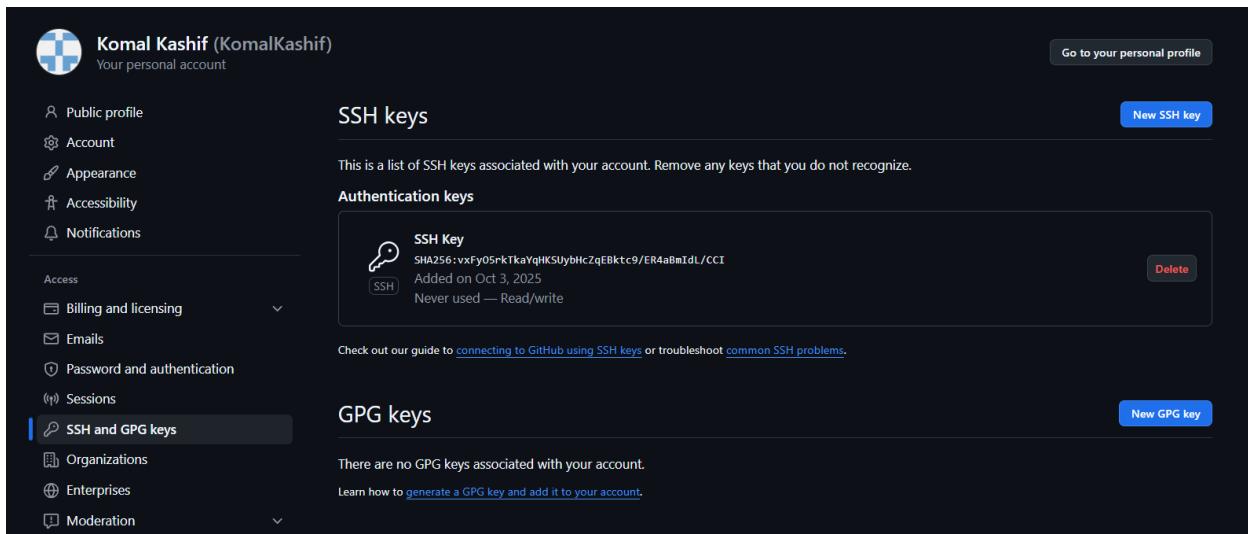


```
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

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

PS C:\Users\DELL> ssh-keygen -t ed25519 -C "23-22411-031@se.fjwu.edu.pk"
Generating public/private ed25519 key pair.
Enter file in which to save the key (C:/Users/DELL/.ssh/id_ed25519):
Created directory 'C:\\Users\\DELL\\.ssh'.
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in C:/Users/DELL/.ssh/id_ed25519
Your public key has been saved in C:/Users/DELL/.ssh/id_ed25519.pub
The key fingerprint is:
SHA256:vxFy05rkTkaYqHKSUybHcZqEBktc9/ER4aBmIdL/CCI 23-22411-031@se.fjwu.edu.pk
The key's randomart image is:
+--[ED25519 256]--+
|oooo o o +o   |
|o+..o + = .   |
|o.o o+ . o   |
|E+ *oo o   |
|o o o = S o   |
| * . . o + o |
|= o       + = |
|=           = o + |
|           .= . |
+---[SHA256]----+
PS C:\Users\DELL>
```

Github ssh key



Komal Kashif (KomalKashif)
Your personal account

SSH keys

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

New SSH key

SSH Key	Actions
SHA256:vxFy05rkTkaYqHKSUybHcZqEBktc9/ER4aBmIdL/CCI (SSH)	Added on Oct 3, 2025 Never used — Read/write Delete

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

GPG keys

New GPG key

There are no GPG keys associated with your account.

Learn how to [generate a GPG key and add it to your account](#).

SSH_clone

```
Dell@DESKTOP-OPCO1NF MINGW64 ~
$ git clone git@github.com:KomalKashif/Lab-02.git
Cloning into 'Lab-02'...
The authenticity of host 'github.com (20.207.73.82)' can't be established.
ED25519 key fingerprint is SHA256:+DiY3wvV6TuJJhbPZisF/zLDA0zPMsvHdkr4UvC0qU.
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.
remote: Enumerating objects: 3, done.
remote: Counting objects: 100% (3/3), done.
remote: Total 3 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
Receiving objects: 100% (3/3), done.
```

TASK 3

Configure Git Username and Email

Git_identity

```
Dell@DESKTOP-OPCO1NF MINGW64 ~
$ git config --global user.name "KomalKashif"

Dell@DESKTOP-OPCO1NF MINGW64 ~
$ git config --global user.email "23-22411-031@se.fjwu.edu.pk"
```

Git config -list

```
Dell@DESKTOP-OPCO1NF 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=KomalKashif
user.email=23-22411-031@se.fjwu.edu.pk
```

TASK 4

Explore the .git Folder

Git_folder

```
Dell@DESKTOP-OPCO1NF MINGW64 ~
$ cd Lab-02

Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-02 (main)
$ ls -a
./ ../ .git/ README.md

Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-02 (main)
$ ls -a .git
./ HEAD config description hooks/ index info/ logs/ objects/ packed-refs refs/
```

TASK 5

Local Repository Management

Delete_git

```
Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-02 (main)
$ rm -rf .git
```

Git_init

```
Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-02
$ git init
Initialized empty Git repository in C:/Users/Dell/Lab-02/.git/
```

First_commit

```
Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-02 (master)
$ echo "# Lab-02 Git Practice"

Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-02 (master)
$ git add README.md

Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-02 (master)
$ git commit -m "Initial commit"
[master (root-commit) aefadf1] Initial commit
 1 file changed, 1 insertion(+)
 create mode 100644 README.md

Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-02 (master)
$ echo "# Lab-02 Git Practice" > README.md
```

First_push

```
Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-02 (master)
$ git remote add origin git@github.com:Komalkashif/Lab-02.git
Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-02 (master)
$ git push -u origin master
Enumerating objects: 6, done.
Counting objects: 100% (6/6), done.
Delta compression using up to 4 threads
Compressing objects: 100% (2/2), done.
Writing objects: 100% (6/6), 470 bytes | 42.00 KiB/s, done.
Total 6 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
remote:
remote: create a pull request for 'master' on GitHub by visiting:
remote:   https://github.com/Komalkashif/Lab-02/pull/new/master
remote:
To github.com:Komalkashif/Lab-02.git
 * [new branch]      master -> master
branch 'master' set up to track 'origin/master'.
```



TASK 6

File Status & Staging

Status1

```
dell@DESKTOP-OPCOINF MINGW64 ~/Lab-02 (master)
$ echo "This is my first notes file" > notes.txt

dell@DESKTOP-OPCOINF MINGW64 ~/Lab-02 (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)
```

Commit_notes:

```
dell@DESKTOP-OPCOINF MINGW64 ~/Lab-02 (master)
$ echo "This is an important update" >> notes.txt

dell@DESKTOP-OPCOINF MINGW64 ~/Lab-02 (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")

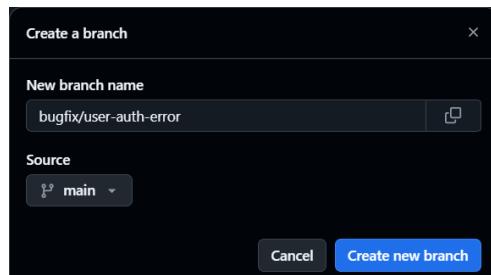
dell@DESKTOP-OPCOINF MINGW64 ~/Lab-02 (master)
$ git add notes.txt
warning: in the working copy of 'notes.txt', LF will be replaced by CRLF the next time Git touches it

dell@DESKTOP-OPCOINF MINGW64 ~/Lab-02 (master)
$ git commit -m "Update notes.txt with new information"
[master 4d96371] Update notes.txt with new information
 1 file changed, 1 insertion(+)
```

TASK 7

Branch Creation Using GitHub GUI

Bugfix_branch_gui



Bugfix_branch_local

```
dell@DESKTOP-OPCOINF MINGW64 ~/Lab-02 (feature-update)
$ 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'

dell@DESKTOP-OPCOINF MINGW64 ~/Lab-02 (bugfix/user-auth-error)
$ git branch
* bugfix/user-auth-error
  main
  master
```

TASK 8

Branch Creation and Push Using Git Bash

feature_db_branch:

```
Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-02 (main)
$ git checkout -b feature/db-connection
Switched to a new branch 'feature/db-connection'

Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-02 (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/KomalKashif/Lab-02/pull/new/feature/db-connection
remote:
To https://github.com/KomalKashif/Lab-02
 * [new branch]      feature/db-connection -> feature/db-connection
```

TASK 9

Branching & Merging

branch_create:

```
Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-02 (feature/db-connection)
$ git checkout -b feature-1
Switched to a new branch 'feature-1'

Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-02 (feature-1)
```

feature_commit:

```
Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-02 (feature-1)
$ echo "def greet():\n    print('Hello from feature-1 branch')" > main.py

Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-02 (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

Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-02 (feature-1)
$ ls
README.md  main.py  notes.txt

Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-02 (feature-1)
$ git commit -m "Added new function to main.py"
[feature-1 e3130d9] Added new function to main.py
 1 file changed, 1 insertion(+)
 create mode 100644 main.py
```

merge:

```
Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-02 (feature-1)
$ git checkout main
Switched to branch 'main'
Your branch is up to date with 'origin/main'.

Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-02 (main)
$ git merge feature-1
Updating e98b59a..e3130d9
Fast-forward
 main.py | 1 +
 1 file changed, 1 insertion(+)
 create mode 100644 main.py
```

push_branches:

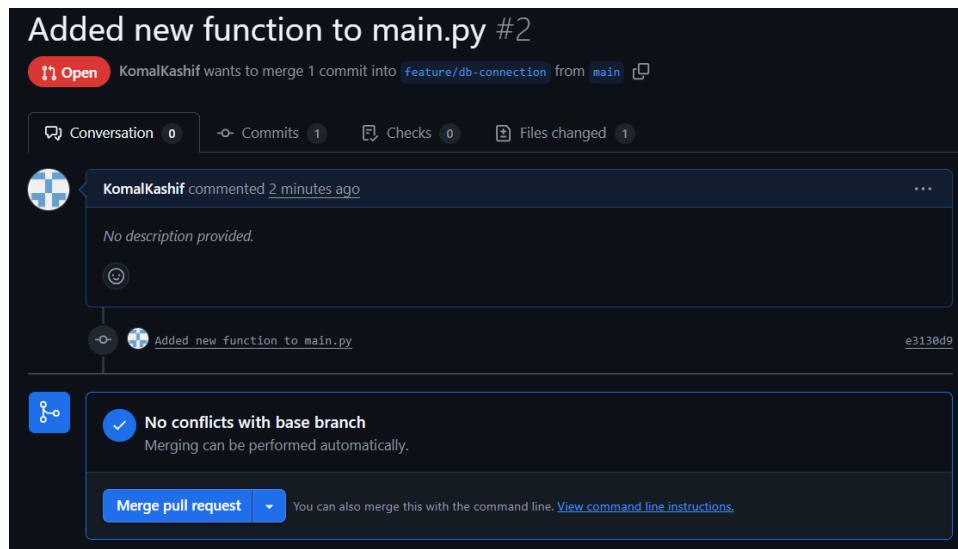
```
Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-02 (main)
$ git push origin main
Enumerating objects: 4, done.
Counting objects: 100% (4/4), done.
Delta compression using up to 4 threads
Compressing objects: 100% (3/3), done.
Writing objects: 100% (3/3), 382 bytes | 382.00 KiB/s, done.
Total 3 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
To https://github.com/KomalKashif/Lab-02
  e98b59a..e3130d9  main -> main

Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-02 (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/KomalKashif/Lab-02/pull/new/feature-1
remote:
To https://github.com/KomalKashif/Lab-02
 * [new branch]      feature-1 -> feature-1
```

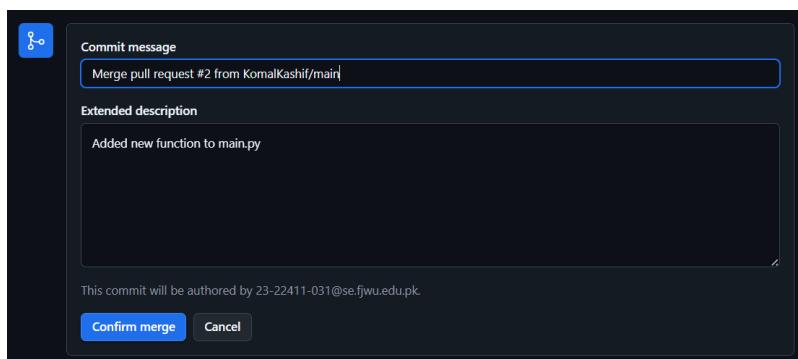
TASK 10

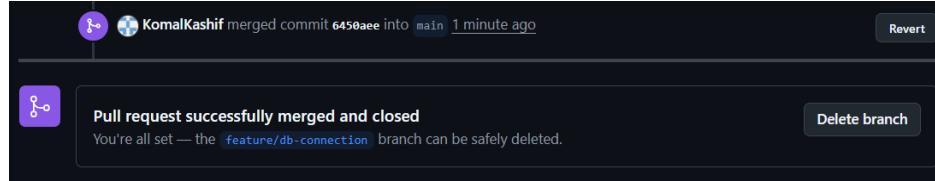
Pull Request and Branch Review (GitHub GUI)

Created Pull Request from feature/db-connection to main, pr_creation:

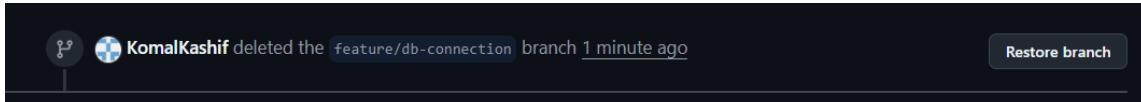


Click Merge Pull Request, pr_merge:





Click Delete branch, branch_deleted:



TASK 11

Detailed Branch Strategy (Develop/Staging)

First creating all branches:

```
Dell@DESKTOP-OPCOINF MINGW64 ~/Lab-02 (main)
$ git checkout -b develop
switched to a new branch 'develop'

Dell@DESKTOP-OPCOINF MINGW64 ~/Lab-02 (develop)
$ git push origin 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/Komalkashif/Lab-02/pull/new/develop
remote:
remote: To https://github.com/Komalkashif/Lab-02
 * [new branch]      develop -> develop

Dell@DESKTOP-OPCOINF MINGW64 ~/Lab-02 (develop)
$ git checkout -b staging
switched to a new branch 'staging'

Dell@DESKTOP-OPCOINF MINGW64 ~/Lab-02 (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/Komalkashif/Lab-02/pull/new/staging
remote:
remote: To https://github.com/Komalkashif/Lab-02
 * [new branch]      staging -> staging
```

```
Dell@DESKTOP-OPCOINF MINGW64 ~/Lab-02 (staging)
$ git checkout develop
switched to branch 'develop'

Dell@DESKTOP-OPCOINF MINGW64 ~/Lab-02 (develop)
$ git checkout -b feature/new-ui
switched to a new branch 'feature/new-ui'

Dell@DESKTOP-OPCOINF MINGW64 ~/Lab-02 (feature/new-ui)
$ echo "print('New UI Feature') >> main.py
Dell@DESKTOP-OPCOINF MINGW64 ~/Lab-02 (feature/new-ui)
$ git add main.py
warning: in the working copy of 'main.py', LF will be replaced by CRLF the next time Git touches it

Dell@DESKTOP-OPCOINF MINGW64 ~/Lab-02 (feature/new-ui)
$ git commit -m "Add New UI Feature"
[feature/new-ui d6077e7] Add New UI Feature
 1 file changed, 1 insertion(+), 1 deletion(-)

Dell@DESKTOP-OPCOINF MINGW64 ~/Lab-02 (feature/new-ui)
$ git push origin feature/new-ui
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), 350 bytes | 350.00 KiB/s, done.
Total 3 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
remote:
remote: Create a pull request for 'feature/new-ui' on GitHub by visiting:
remote:   https://github.com/Komalkashif/Lab-02/pull/new/feature/new-ui
remote:
remote: To https://github.com/Komalkashif/Lab-02
 * [new branch]      feature/new-ui -> feature/new-ui
```

```

dell@DESKTOP-OPCOINF MINGW64 ~/Lab-02 (feature/new-ui)
$ git checkout develop
switched to branch 'develop'
dell@DESKTOP-OPCOINF MINGW64 ~/Lab-02 (develop)
$ git checkout -b bugfix/fix-ui-error
switched to a new branch 'bugfix/fix-ui-error'
dell@DESKTOP-OPCOINF MINGW64 ~/Lab-02 (bugfix/fix-ui-error)
$ echo "print('Fix UI Error')" >> main.py

dell@DESKTOP-OPCOINF MINGW64 ~/Lab-02 (bugfix/fix-ui-error)
$ git add main.py
warning: in the working copy of 'main.py', LF will be replaced by CRLF the next time Git touches it

dell@DESKTOP-OPCOINF MINGW64 ~/Lab-02 (bugfix/fix-ui-error)
$ git commit -m "Fix UI Error"
[bugfix/fix-ui-error 6646891] Fix UI Error
 1 file changed, 1 insertion(+), 1 deletion(-)

dell@DESKTOP-OPCOINF MINGW64 ~/Lab-02 (bugfix/fix-ui-error)
$ git push origin bugfix/fix-ui-error
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), 342 bytes | 342.00 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-ui-error' on GitHub by visiting:
remote:   https://github.com/KomalKashif/Lab-02/pull/new/bugfix/fix-ui-error
remote:
To https://github.com/KomalKashif/Lab-02
 * [new branch]      bugfix/fix-ui-error -> bugfix/fix-ui-error

```

All the required branches are created and pushed. Now, listing branches, branch_strategy:

```

dell@DESKTOP-OPCOINF MINGW64 ~/Lab-02 (bugfix/fix-ui-error)
$ git branch
* bugfix/fix-ui-error
  bugfix/user-auth-error
  collab
  collab3
  develop
  feature-1
  feature/db-connection
  feature/new-ui
  main
  master
  staging

```

Merging branch feature/new-ui, branch_merges:

```

dell@DESKTOP-OPCOINF MINGW64 ~/Lab-02 (bugfix/fix-ui-error)
$ git checkout develop
Switched to branch 'develop'

dell@DESKTOP-OPCOINF MINGW64 ~/Lab-02 (develop)
$ git merge feature/new-ui
Updating e3130d9..a6077e7
Fast-forward
  main.py | 2 ++
    1 file changed, 1 insertion(+), 1 deletion(-)

dell@DESKTOP-OPCOINF MINGW64 ~/Lab-02 (develop)
$ git merge bugfix/fix-ui-error
Auto-merging main.py
[develop cb63b9b] Merge branch 'bugfix/fix-ui-error' into develop
dell@DESKTOP-OPCOINF MINGW64 ~/Lab-02 (develop)
$ git push origin develop
Enumerating objects: 7, done.
Counting objects: 100% (7/7), done.
Delta compression using up to 4 threads
Compressing objects: 100% (2/2), done.
Writing objects: 100% (3/3), 412 bytes | 206.00 KiB/s, done.
Total 3 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
To https://github.com/KomalKashif/Lab-02
  e3130d9..cb63b9b  develop -> develop

dell@DESKTOP-OPCOINF MINGW64 ~/Lab-02 (develop)
$ git checkout staging
Switched to branch 'staging'

dell@DESKTOP-OPCOINF MINGW64 ~/Lab-02 (staging)
$ git merge develop
Updating e3130d9..cb63b9b
Fast-forward
  main.py | 5 +----
    1 file changed, 4 insertions(+), 1 deletion(-)

dell@DESKTOP-OPCOINF MINGW64 ~/Lab-02 (staging)
$ git push origin staging
Total 0 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
To https://github.com/KomalKashif/Lab-02
  e3130d9..cb63b9b  staging -> staging

```

final_merge:

```
Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-02 (staging)
$ git checkout main
Switched to branch 'main'
Your branch is up to date with 'origin/main'.

Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-02 (main)
$ git merge staging
Updating e3130d9..cb63b9b
Fast-forward
 main.py | 5 +---->
 1 file changed, 4 insertions(+), 1 deletion(-)

Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-02 (main)
$ git push origin main
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), 689 bytes | 172.00 KiB/s, done.
Total 6 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
To https://github.com/KomalKashif/Lab-02
    4060675..8ee1212  main -> main
```

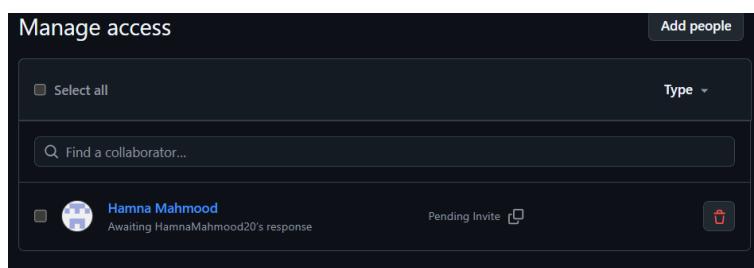
BONUS TASK

Simulated Team Collaboration

Creating branch collab:

```
Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-02 (master)
$ git checkout -b collab
Switched to a new branch 'collab'
```

Adding Hamna as collaborator:



Adding text to notes.txt:

```
Name: Komal Kashif
Fun Fact: I love learning different languages
```

Pushing file on newly created branch, collab_commit:

```
Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-02 (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

Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-02 (collab)
$ git commit -m "Added name and fun fact to notes.txt"
[collab 9f98e8e] Added name and fun fact to notes.txt
 1 file changed, 5 insertions(+), 2 deletions(-)

Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-02 (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), 366 bytes | 183.00 KiB/s, done.
Total 3 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
To https://github.com/komalakashif/Lab-02
    b3aa3ca..9f98e8e  collab -> collab
```

On Hamna's PC:

```
ABC@DESKTOP-7VVTN59 MINGW64 ~/Lab-2-Collab3
$ git clone https://github.com/KomalKashif/Lab-02

Cloning into 'Lab-02'...
remote: Enumerating objects: 16, done.
remote: Counting objects: 100% (16/16), done.
remote: Compressing objects: 100% (10/10), done.
remote: Total 16 (delta 1), reused 14 (delta 0), pack-reused 0 (from 0)
Receiving objects: 100% (16/16), done.
Resolving deltas: 100% (1/1), done.

ABC@DESKTOP-7VVTN59 MINGW64 ~/Lab-2-Collab3/Lab-02 (collab3)
$ git add notes.txt

ABC@DESKTOP-7VVTN59 MINGW64 ~/Lab-2-Collab3/Lab-02 (collab3)
$ git commit -m "Added notes.txt"
[collab3 31c0324] Added notes.txt
 1 file changed, 1 insertion(+)
 create mode 100644 notes.txt

ABC@DESKTOP-7VVTN59 MINGW64 ~/Lab-2-Collab3/Lab-02 (collab3)
$ git push origin collab3
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), 337 bytes | 168.00 KiB/s, done.
Total 3 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
remote:
remote: Create a pull request for 'collab3' on GitHub by visiting:
remote:     https://github.com/KomalKashif/Lab-02/pull/new/collab3
remote:
To https://github.com/KomalKashif/Lab-02
 * [new branch]      collab3 -> collab3

ABC@DESKTOP-7VVTN59 MINGW64 ~/Lab-2-Collab3/Lab-02 (collab3)
$ git checkout main
M      README.md
Switched to branch 'main'
Your branch is up to date with 'origin/main'.

ABC@DESKTOP-7VVTN59 MINGW64 ~/Lab-2-Collab3/Lab-02 (main)
$ git pull origin main
remote: Enumerating objects: 15, done.
remote: Counting objects: 100% (15/15), done.
remote: Compressing objects: 100% (8/8), done.
remote: Total 9 (delta 1), reused 8 (delta 0), pack-reused 0 (from 0)
Unpacking objects: 100% (9/9), 958 bytes | 12.00 KiB/s, done.
From https://github.com/KomalKashif/Lab-02
 * branch            main      -> FETCH_HEAD
   d3ad177..6f34bba  main      -> origin/main
```

Merging both files, collab_merge:

```
Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-02 (collab)
$ git checkout main
branch 'main' set up to track 'origin/main'.
Switched to a new branch 'main'

Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-02 (main)
$ git merge collab
Updating d3ad177..f3e3b88
Fast-forward
 README.md | 2 ++
 notes.txt | 5 +++++
 2 files changed, 6 insertions(+), 1 deletion(-)
 create mode 100644 notes.txt

Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-02 (main)
$ git merge remotes/origin/collab3
[main 6f34bba] Merge remote-tracking branch 'remotes/origin/collab3'
Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-02 (main)
$ git push origin main
Enumerating objects: 12, done.
Counting objects: 100% (12/12), done.
Delta compression using up to 4 threads
Compressing objects: 100% (5/5), done.
Writing objects: 100% (6/6), 703 bytes | 140.00 KiB/s, done.
Total 6 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
To https://github.com/KomalKashif/Lab-02
  d3ad177..6f34bba  main -> main
Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-02 (main)
$ cat notes.txt
Name: Komal Kashif

Fun Fact: I love learning different languages

Hamna Mahmood- I love reading fictional novels
```

Lab-02 / notes.txt □

 KomalKashif Merge remote-tracking branch 'remotes/origin/collab3'

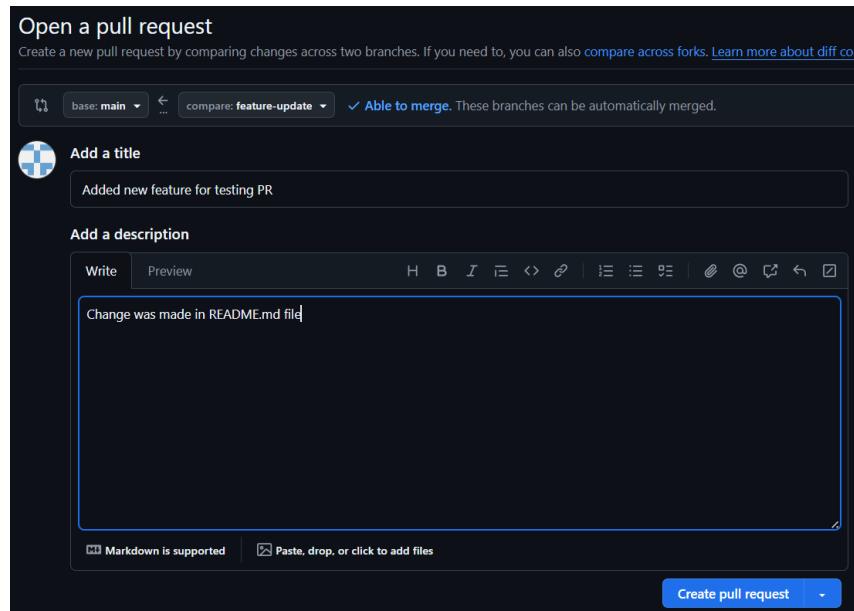
Code Blame 7 lines (3 loc) · 116 Bytes

```
1 Name: Komal Kashif
2
3 Fun Fact: I love learning different languages
4
5
6 Hamna Mahmood- I love reading fictional novels
```

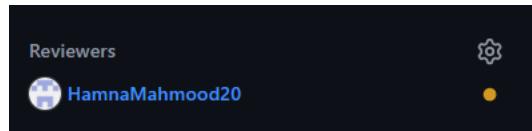
TASK 12

Code Review Workflow

Create a Pull Request, pr_create_details:



Assigning Hamna as reviewer, pr_assigned_reviewer,



Adding a new branch and making a change to README.md, then committing changes:

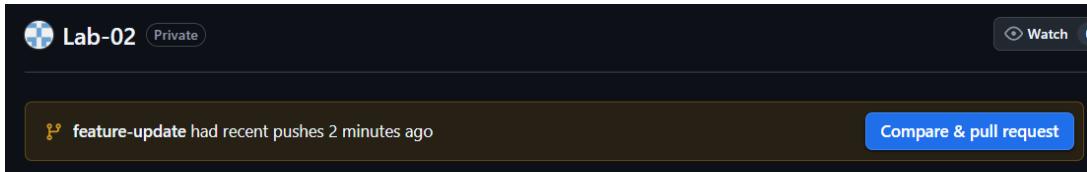
```
De11@DESKTOP-OPC01NF MINGW64 ~/Lab-02 (main)
$ git checkout -b feature-update
Switched to a new branch 'feature-update'

De11@DESKTOP-OPC01NF MINGW64 ~/Lab-02 (feature-update)
$ notepad README.md

De11@DESKTOP-OPC01NF MINGW64 ~/Lab-02 (feature-update)
$ git add .

De11@DESKTOP-OPC01NF MINGW64 ~/Lab-02 (feature-update)
$ git commit -m "Added new feature for testing PR"
[feature-update 721d986] Added new feature for testing PR
 1 file changed, 1 insertion(+), 1 deletion(-)

De11@DESKTOP-OPC01NF MINGW64 ~/Lab-02 (feature-update)
$ git push origin feature-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), 329 bytes | 164.00 KiB/s, done.
Total 3 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
remote:
remote: Create a pull request for 'feature-update' on GitHub by visiting:
remote:   https://github.com/Komalkashif/Lab-02/pull/new/feature-update
remote:
To https://github.com/Komalkashif/Lab-02
 * [new branch]      feature-update -> feature-update
```

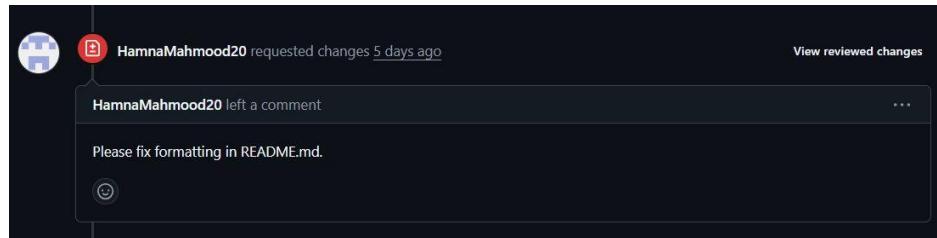


Reviewer's Actions:

pr_approved:

The screenshot shows a GitHub pull request review interface. The main area displays a diff of a README.md file with one change: "Making a change for review". A modal window titled "Finish your review" is open, containing a "Write" tab with a rich text editor, a "Comment" section, and three radio buttons for "Comment", "Approve", and "Request changes". The "Approve" option is selected. At the bottom right of the modal is a green "Submit review" button.

pr_request_changes:



Author's Actions:

Making changes:

```
Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-02 (feature-update)
$ git add .

Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-02 (feature-update)
$ git commit -m "Fixed issue from review"
[feature-update cac917a] Fixed issue from review
 1 file changed, 2 insertions(+)

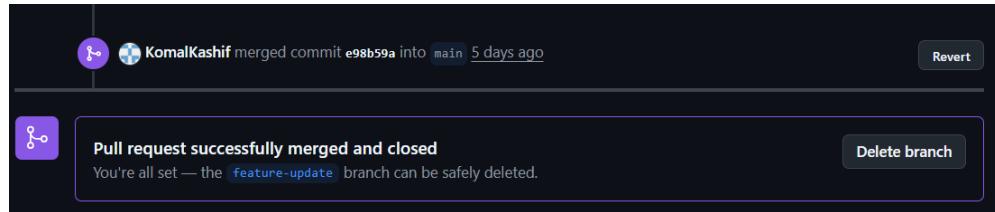
Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-02 (feature-update)
$ git push origin feature-update
Enumerating objects: 5, done.
Counting objects: 100% (5/5), done.
Delta compression using up to 4 threads
Compressing objects: 100% (3/3), done.
Writing objects: 100% (3/3), 335 bytes | 167.00 KiB/s, done.
Total 3 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
To https://github.com/KomalKashif/Lab-02
    721d986..cac917a  feature-update -> feature-update
```

pr_updated_with_commits:

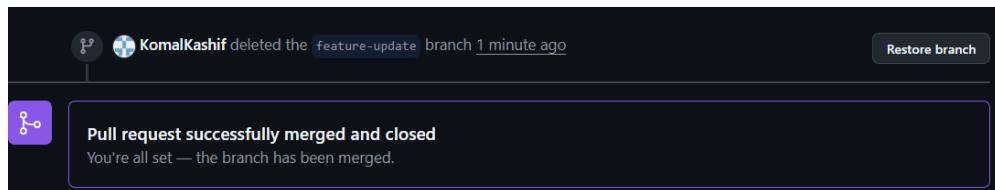
A screenshot of a GitHub pull request interface. At the top, it says "Fixed issue from review" and "feature-update (#1)". Below that, it shows a commit by "KomalKashif committed 7 minutes ago". The commit message is "Making a change for review" and "Making another change for review". A diff viewer shows the changes made to the README.md file.

Merge the PR:

pr_merged:



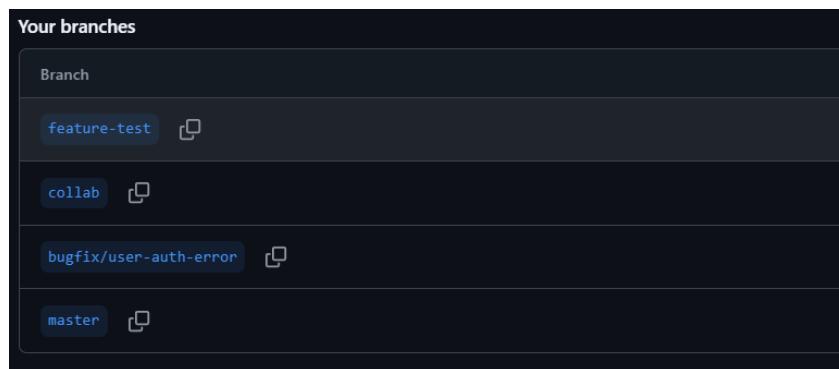
Click on **Delete branch**, pr_branch_deleted:



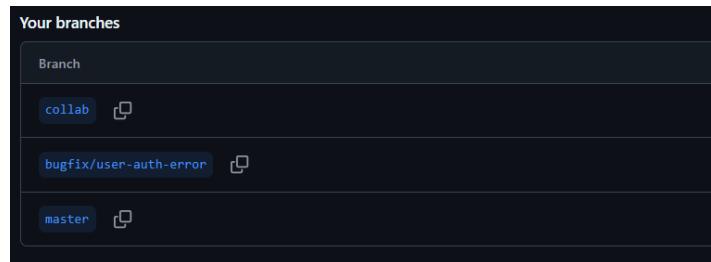
The branch can be restored by clicking on **Restore branch**.

TASK 13

Branch Cleanup Best Practices



remote_branch_deleted:



Update Local repository:

```
Dell@DESKTOP-OPC01NF MINGW64 ~/Lab-02 (feature-test)
$ git branch
  bugfix/user-auth-error
  collab
  collab3
* feature-test
  main
  master

Dell@DESKTOP-OPC01NF MINGW64 ~/Lab-02 (feature-test)
$ git checkout main
Switched to branch 'main'
Your branch is up to date with 'origin/main'.

Dell@DESKTOP-OPC01NF MINGW64 ~/Lab-02 (main)
$ git pull 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), 916 bytes | 229.00 KiB/s, done.
From https://github.com/Komalkashif/Lab-02
  * branch            main      -> FETCH_HEAD
    6f34bba..e98b59a main      -> origin/main
Updating 6f34bba..e98b59a
Fast-forward
  README.md | 2 ++
  1 file changed, 2 insertions(+)

Dell@DESKTOP-OPC01NF MINGW64 ~/Lab-02 (main)
$ git branch -d feature-test
Deleted branch feature-test (was 6f34bba).

Dell@DESKTOP-OPC01NF MINGW64 ~/Lab-02 (main)
$ git branch
  bugfix/user-auth-error
  collab
  collab3
* main
  master
```

EXAM EVALUATION QUESTIONS:

1. Advanced Branching & Merge Verification

Create a new branch in your repository.

```
Dell@DESKTOP-OPC01NF MINGW64 ~/Lab-02 (main)
$ git checkout -b feature-q1
Switched to a new branch 'feature-q1'

Dell@DESKTOP-OPC01NF MINGW64 ~/Lab-02 (feature-q1)
```

Make a small change in a file and commit it.

```
Dell@DESKTOP-OPCOINF MINGW64 ~/Lab-02 (feature-q1)
$ git add notes.txt

Dell@DESKTOP-OPCOINF MINGW64 ~/Lab-02 (feature-q1)
$ git commit -m "Merge branch 'feature-q1' into main"
[feature-q1 fcelala] Added change for Eval Q1
 1 file changed, 2 insertions(+)
```

Merge this branch back into the main branch.

```
Dell@DESKTOP-OPCOINF MINGW64 ~/Lab-02 (feature-q1)
$ git checkout main
Switched to branch 'main'
Your branch is up to date with 'origin/main'.

Dell@DESKTOP-OPCOINF MINGW64 ~/Lab-02 (main)
$ git merge feature-q1
Updating 8ee1212..fce1ala
Fast-forward
  notes.txt | 2 ++
  1 file changed, 2 insertions(+)
```

Show the history of commits in a way that verifies the merge.

```
Dell@DESKTOP-OPCOINF MINGW64 ~/Lab-02 (main)
$ git log --oneline --graph --all
* 4d3c989 (HEAD -> main) Merge branch 'feature-q1' into main
|\ 
| * fce1ala (feature-q1) Added change for Eval Q1
|/
|/
```

2. Multi-Stage Workflow Simulation

Set up a branching workflow with three branches: main, develop, and staging.

```
Dell@DESKTOP-OPCOINF MINGW64 ~/Lab-02 (main)
$ git branch
  bugfix/fix-ui-error
  bugfix/user-auth-error
  collab
  collab3
  develop
  feature-1
  feature-q1
  feature/db-connection
  feature/new-ui
* main
  master
  staging
```

Create a feature branch from develop, make changes, and commit them.

```
Dell@DESKTOP-OPCOINF MINGW64 ~/Lab-02 (main)
$ git checkout develop
Switched to branch 'develop'

Dell@DESKTOP-OPCOINF MINGW64 ~/Lab-02 (develop)
$ git checkout -b feature/new-branch
Switched to a new branch 'feature/new-branch'

Dell@DESKTOP-OPCOINF MINGW64 ~/Lab-02 (main)
$ git checkout feature/new-branch
Switched to branch 'feature/new-branch'

Dell@DESKTOP-OPCOINF MINGW64 ~/Lab-02 (feature/new-branch)
$ notepad README.md

Dell@DESKTOP-OPCOINF MINGW64 ~/Lab-02 (feature/new-branch)
$ git add .

Dell@DESKTOP-OPCOINF MINGW64 ~/Lab-02 (feature/new-branch)
$ git commit -m "New line for Eval Q2"
[feature/new-branch 95cf2ed] New line for Eval Q2
 1 file changed, 3 insertions(+), 1 deletion(-)
```

Merge the feature branch into develop:

```
Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-02 (feature/new-branch)
$ git checkout develop
Switched to branch 'develop'

Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-02 (develop)
$ git merge feature/new-branch
Updating cb63b9b..95cf2ed
Fast-forward
 README.md | 4 +++-
 1 file changed, 3 insertions(+), 1 deletion(-)
```

Merge develop into staging:

```
Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-02 (develop)
$ git checkout staging
Switched to branch 'staging'

Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-02 (staging)
$ git merge develop
Updating cb63b9b..95cf2ed
Fast-forward
 README.md | 4 +++-
 1 file changed, 3 insertions(+), 1 deletion(-)
```

Merge staging into main:

```
Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-02 (main)
$ git checkout main
Already on 'main'

Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-02 (main)
$ git merge staging
Merge made by the 'ort' strategy.
 README.md | 4 +++-
 1 file changed, 3 insertions(+), 1 deletion(-)
```

Screenshot showing all branches with updates:

