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CLOUD COMPUTING

LAB 03



Task 1 – Handling Local and Remote Commit Conflicts (Pull vs Pull --rebase)

Steps:

Open your repository on GitHub and edit the README.md file directly in the browser.

A screenshot of a GitHub repository page. The repository is named 'KomalKashif / Lab-03'. The 'Code' tab is selected. In the main area, there is a 'Files' sidebar with a dropdown set to 'main' and a list containing 'README.md'. To the right, the 'Lab-03 / README.md' file is shown in edit mode. The preview shows the text 'This line was added remotely from GitHub.' A red box highlights this line of text.

Commit your change on GitHub (e.g., message: *Remote update to README*).

A screenshot of the GitHub commit history for the 'Lab-03' repository. The commit message is 'Remote update to README.md'. It shows two changes: one to 'README.md' and another to 'README'. The commit hash 'ccc72b...' is visible at the top right. The commit message 'This line was added remotely from GitHub.' is highlighted with a red box.

On your **local machine**, open the same repository folder. Edit the same README.md file locally,

```
*README - Notepad  
File Edit Format View Help  
This line was added remotely from GitHub.
```

```
Dell@DESKTOP-OPCO1NF MINGW64 ~  
$ cd Lab-03  
  
Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (main)  
$ notepad README.md  
  
Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (main)  
$ git add README.md  
  
Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (main)  
$ git commit -m "Local update to README"  
[main 294d8af] Local update to README  
 1 file changed, 1 insertion(+), 1 deletion(-)
```

Try to push:

```
Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (main)  
$ git push origin main  
To https://github.com/KomalKashif/Lab-03.git  
! [rejected]          main -> main (fetch first)  
error: failed to push some refs to 'https://github.com/KomalKashif/Lab-03.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.
```

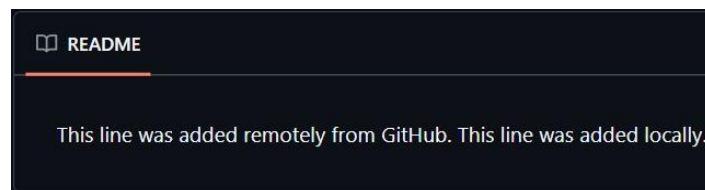
To fix this, pull the latest changes from remote:

```
Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (main)  
$ git pull --no-rebase origin main  
remote: Enumerating objects: 5, done.  
remote: Counting objects: 100% (5/5), done.  
remote: Total 3 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)  
Unpacking objects: 100% (3/3), 946 bytes | 189.00 KiB/s, done.  
From https://github.com/KomalKashif/Lab-03  
 * branch            main      -> FETCH_HEAD  
   002e913..eb8c816  main      -> origin/main  
Updating 002e913..eb8c816  
Fast-forward  
 README.md | 2 +-  
 1 file changed, 1 insertion(+), 1 deletion(-)
```

Git will **merge** your local and remote commits, creating a *merge commit*.

Push again:

```
Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (main)  
$ git push -u origin main  
branch 'main' set up to track 'origin/main'.  
Everything up-to-date
```



We see that both of our lines are added now.

Now repeat the same process, but this time use **rebase instead of merge**. Make another remote edit on GitHub in README.md.

The screenshot shows a GitHub commit page for a file named README.md. At the top, it says "KomalKashif Remote edit README.md". Below that is a navigation bar with "Preview", "Code", and "Blame" buttons, followed by "4 lines (3 loc) · 89 Bytes". The main content area contains the following text:
This line was added remotely from GitHub. This line is locally added. Remote edit again

Then make another local edit and commit it.



Instead of using git pull, run: git pull --rebase origin main

Git will **replay your local commits on top of the pulled commits**, keeping history linear.

```
Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (main)
$ git add README.md

Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (main)
$ git commit -m "Local Change"
[main ec5fcdd] Local Change
 1 file changed, 2 insertions(+)

Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (main)
$ git pull --rebase origin main
remote: Enumerating objects: 5, done.
remote: Counting objects: 100% (5/5), done.
remote: Compressing objects: 100% (2/2), done.
remote: Total 3 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
Unpacking objects: 100% (3/3), 954 bytes | 95.00 KiB/s, done.
From https://github.com/KomalKashif/Lab-03
 * branch    main      -> FETCH_HEAD
   eb8c816..4f22b5e main      -> origin/main
Auto-merging README.md
CONFLICT (content): Merge conflict in README.md
error: could not apply ec5fcdd... Local Change
hint: Resolve all conflicts manually, mark them as resolved with
hint: "git add/rm <conflicted_files>", then run "git rebase --continue".
hint: You can instead skip this commit: run "git rebase --skip".
hint: To abort and get back to the state before "git rebase", run "git rebase --
abort".
hint: Disable this message with "git config set advice.mergeConflict false"
Could not apply ec5fcdd... # Local Change
```

Push again:

```
Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (main)
$ git push -u origin main
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), 338 bytes | 169.00 KiB/s, done.
Total 3 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
To https://github.com/KomalKashif/Lab-03.git
  4f22b5e..72ab4a4 main -> main
branch 'main' set up to track 'origin/main'.
```

Now we see that:

KomalKashif Local update to README.md cd5bdd3 · 3 minutes ago 11 Commits

README.md Local update to README.md 3 minutes ago

README

This line was added remotely from GitHub. This line is locally added. Remote edit again Making a local change.

Task 2 – Creating and Resolving Merge Conflicts Manually

Steps:

On **GitHub (remote)**, open your README.md file and change an existing line. Commit your change with the message: *Remote conflicting change*

KomalKashif Remote conflicting change

Preview Code Blame 6 lines (4 loc) · 109 Bytes

This line was updated remotely again.

On your **local machine**, edit the **same line** in the same file but make a **different change**.

README - Notepad

File Edit Format View Help

This line was updated locally at the same time.

Try to push:

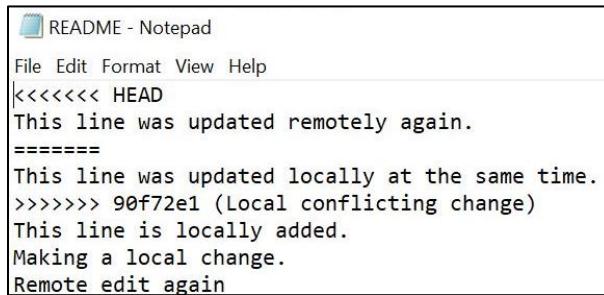
```
Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (main)
$ git add README.md

Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (main)
$ git commit -m "Local conflicting change"
[main 90f72e1] Local conflicting change
 1 file changed, 1 insertion(+), 1 deletion(-)
```

Pull with rebase to bring in remote changes:

```
Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (main)
$ git push -u origin main
To https://github.com/KomalKashif/Lab-03.git
 ! [rejected]      main -> main (fetch first)
error: failed to push some refs to 'https://github.com/KomalKashif/Lab-03.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.
```

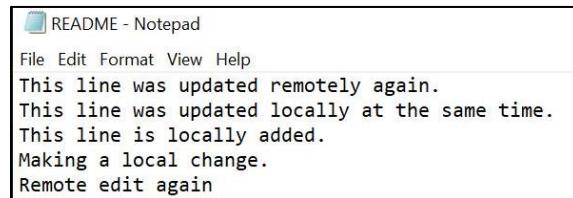
Open the README.md file in your editor — you'll see conflict markers.



README - Notepad

```
File Edit Format View Help
<<<<< HEAD
This line was updated remotely again.
=====
This line was updated locally at the same time.
>>>> 90f72e1 (Local conflicting change)
This line is locally added.
Making a local change.
Remote edit again
```

Manually edit the file to keep the correct line.



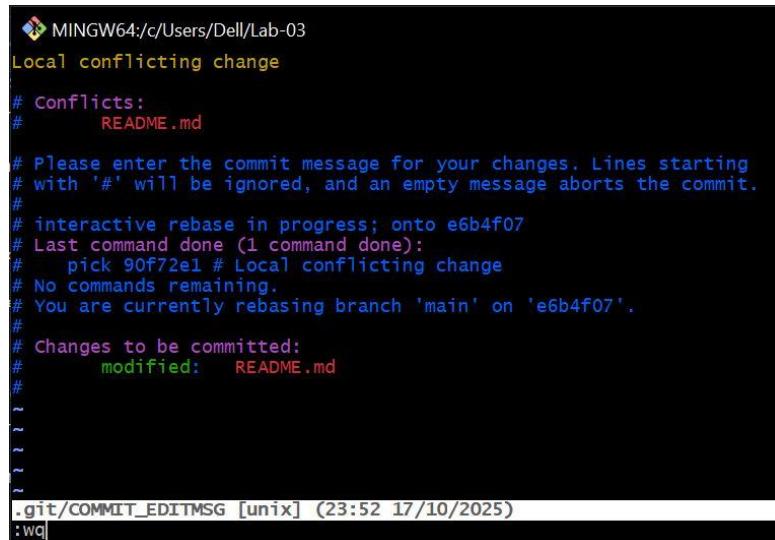
README - Notepad

```
File Edit Format View Help
This line was updated remotely again.
This line was updated locally at the same time.
This line is locally added.
Making a local change.
Remote edit again
```

After fixing the file, mark the conflict as resolved and continue the rebase.

```
Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (main)
$ git add README.md

Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (main)
$ git rebase --continue
```



```
MINGW64:/c/Users/Dell/Lab-03
Local conflicting change

# Conflicts:
#       README.md

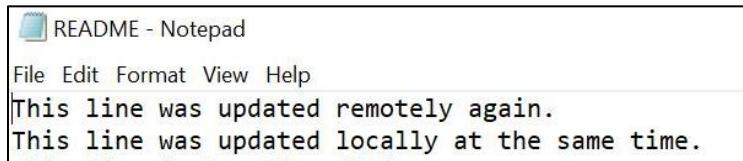
# Please enter the commit message for your changes. Lines starting
# with '#' will be ignored, and an empty message aborts the commit.
#
# interactive rebase in progress; onto e6b4f07
# Last command done (1 command done):
#   pick 90f72e1 # Local conflicting change
# No commands remaining.
# You are currently rebasing branch 'main' on 'e6b4f07'.
#
# Changes to be committed:
#       modified:   README.md
#
~
~
~
~
~

.git/COMMIT_EDITMSG [unix] (23:52 17/10/2025)
:wq|
```

```
[detached HEAD 13e3c94] Local conflicting change
 1 file changed, 1 insertion(+)
Successfully rebased and updated refs/heads/main.
```

Finally, push your changes:

```
Dell@DESKTOP-OPCOINF MINGW64 ~/Lab-03 (main)
$ git push -u origin main
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), 367 bytes | 91.00 KiB/s, done.
Total 3 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
To https://github.com/KomalKashif/Lab-03.git
  e6b4f07..13e3c94 main -> main
branch 'main' set up to track 'origin/main'.
```



Task 3 – Managing Ignored Files with .gitignore and Removing Tracked Files

Steps:

Create a new folder named textfiles inside your repository. Inside the textfiles folder, create three text files. Add and commit the new directory.

```
Dell@DESKTOP-OPCOINF MINGW64 ~/Lab-03 (main)
$ mkdir textfiles

Dell@DESKTOP-OPCOINF MINGW64 ~/Lab-03 (main)
$ echo "File A content" > textfiles/a.txt

Dell@DESKTOP-OPCOINF MINGW64 ~/Lab-03 (main)
$ echo "File B content" > textfiles/b.txt

Dell@DESKTOP-OPCOINF MINGW64 ~/Lab-03 (main)
$ echo "File C content" > textfiles/c.txt

Dell@DESKTOP-OPCOINF MINGW64 ~/Lab-03 (main)
$ git add .
warning: in the working copy of 'textfiles/a.txt', LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'textfiles/b.txt', LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'textfiles/c.txt', LF will be replaced by CRLF the next time Git touches it

Dell@DESKTOP-OPCOINF MINGW64 ~/Lab-03 (main)
$ git commit -m "Added textfiles directory with three files"
[main 32680e2] Added textfiles directory with three files
 3 files changed, 3 insertions(+)
 create mode 100644 textfiles/a.txt
 create mode 100644 textfiles/b.txt
 create mode 100644 textfiles/c.txt

Dell@DESKTOP-OPCOINF MINGW64 ~/Lab-03 (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% (3/3), done.
Writing objects: 100% (6/6), 470 bytes | 94.00 KiB/s, done.
Total 6 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
To https://github.com/KomalKashif/Lab-03.git
  13e3c94..32680e2 main -> main
```

Now, create a .gitignore file in the root of your repository.

```
Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (main)
$ echo "textfiles/*" > .gitignore

Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (main)
$ git add .gitignore
warning: in the working copy of '.gitignore', LF will be replaced by CRLF the next time Git touches it

Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (main)
$ git commit -m "Added .gitignore to ignore textfiles directory"
[main 25787bd] Added .gitignore to ignore textfiles directory
 1 file changed, 1 insertion(+)
 create mode 100644 .gitignore

Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (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% (2/2), done.
Writing objects: 100% (3/3), 358 bytes | 179.00 KiB/s, done.
Total 3 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
To https://github.com/KomalKashif/Lab-03.git
 32680e2..25787bd main -> main
```

Go to GitHub and check your repository — notice that the textfiles directory is still visible on the remote.

 KomalKashif	Added .gitignore to ignore textfiles directory	25787bd · 2 minutes ago	 19 Commits
 textfiles	Added textfiles directory with three files	8 minutes ago	
 .gitignore	Added .gitignore to ignore textfiles directory	2 minutes ago	
 README.md	Local conflicting change	30 minutes ago	

Remove already tracked files from Git (but not from your local system)

```
Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (main)
$ git rm -r --cached textfiles
rm 'textfiles/a.txt'
rm 'textfiles/b.txt'
rm 'textfiles/c.txt'

Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (main)
$ git add .

Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (main)
$ git commit -m "Removed tracked textfiles directory"
[main 378651f] Removed tracked textfiles directory
 3 files changed, 3 deletions(-)
 delete mode 100644 textfiles/a.txt
 delete mode 100644 textfiles/b.txt
 delete mode 100644 textfiles/c.txt

Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (main)
$ git push origin main
Enumerating objects: 3, done.
Counting objects: 100% (3/3), done.
Delta compression using up to 4 threads
Compressing objects: 100% (2/2), done.
Writing objects: 100% (2/2), 247 bytes | 123.00 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 https://github.com/KomalKashif/Lab-03.git
 25787bd..378651f main -> main
```

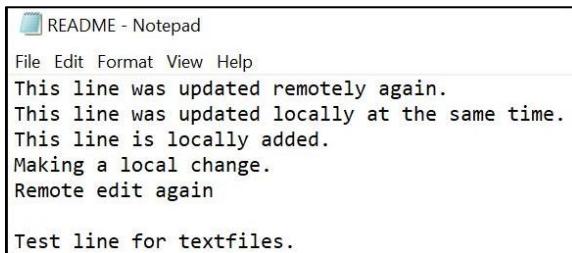
Check your GitHub repository again — the textfiles folder should now be deleted remotely.

 KomalKashif	Removed tracked textfiles directory	378651f · 2 minutes ago	 20 Commits
 .gitignore	Added .gitignore to ignore textfiles directory	7 minutes ago	
 README.md	Local conflicting change	34 minutes ago	

Task 4 – Create Temporary Changes and Use git stash

Steps:

Create a feature-branch. Modify any file (for example, README.md) by adding a few test lines.



Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (feature-branch)
\$ git add README.md

Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (feature-branch)
\$ git commit -m "Changes the README.md file"
[feature-branch bcd5411] Changes the README.md file
1 file changed, 3 insertions(+)

Modify any file (for example, README.md) by adding a few new lines.



Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (feature-branch)
\$ git add README.md

Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (feature-branch)
\$ git commit -m "Changes the README.md file"
[feature-branch bcd5411] Changes the README.md file
1 file changed, 3 insertions(+)

Without committing or stashing the changes, try to switch to another branch:

Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (feature-branch)
\$ git checkout main
error: Your local changes to the following files would be overwritten by checkout:
 README.md
Please commit your changes or stash them before you switch branches.
Aborting

To fix this, **stash your changes**:

```
Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (feature-branch)
$ git stash
Saved working directory and index state WIP on feature-branch: bcd5411 Changes the README.md file
```

Try switching branches again — it should now work:

```
Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (feature-branch)
$ git checkout main
Switched to branch 'main'
Your branch is up to date with 'origin/main'.
```

Return to your previous branch (for example, feature-branch):

```
Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (main)
$ git checkout feature-branch
Switched to branch 'feature-branch'

Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (feature-branch)
$ |
```

Check your working directory status:

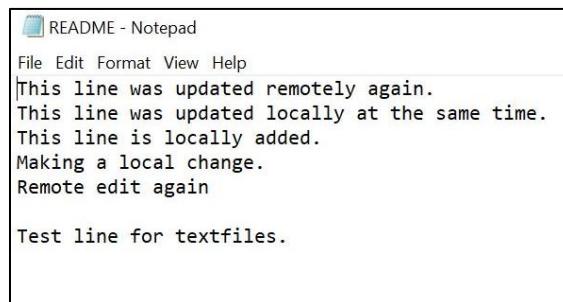
```
Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (feature-branch)
$ git status
On branch feature-branch
nothing to commit, working tree clean
```

Now restore your stashed changes:

```
Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (feature-branch)
$ git stash pop
On branch feature-branch
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:   README.md

no changes added to commit (use "git add" and/or "git commit -a")
Dropped refs/stash@{0} (32d570e82531143837ccb1fbaae7ec3833ec63a9)
```

Confirm that your previous edits are back in the file.



Task 5 – Checkout a Specific Commit Using git log

Steps:

View commit history:

git log –oneline

```

Dell@DESKTOP-OPC01NF MINGW64 ~/Lab-03 (feature-branch)
$ git log --oneline
bcd5411 (HEAD -> feature-branch) Changes the README.md file
378651f (origin/main, origin/HEAD, main) Removed tracked textfiles directory
25787bd Added .gitignore to ignore textfiles directory
32680e2 Added textfiles directory with three files
13e3c94 Local conflicting change
e6b4f07 Remote conflicting change
4d25548 Merge branch 'main' of https://github.com/KomalKashif/Lab-03
f324ff0 Local change
28e8ee7 Remote edit README.md
d5b2c92 Update README.md
cd5bdd3 Local update to README.md
476e451 Remote update to README.md
2bc3270 Remote update to README.md
72ab4a4 Local Change
4f22b5e Remote edit README.md
eb8c816 Remote update to README.md
002e913 Local change to README
294d8af Local update to README
4c64510 Remote update to README.md
0840136 Remote update to README.md
0c053ee Initial commit

```

Copy any previous commit hash. Checkout that commit:

```

Dell@DESKTOP-OPC01NF MINGW64 ~/Lab-03 (feature-branch)
$ git checkout f324ff0
Note: switching to 'f324ff0'.

You are in 'detached HEAD' state. You can look around, make experimental
changes and commit them, and you can discard any commits you make in this
state without impacting any branches by switching back to a branch.

If you want to create a new branch to retain commits you create, you may
do so (now or later) by using -c with the switch command. Example:

  git switch -c <new-branch-name>

or undo this operation with:

  git switch -

Turn off this advice by setting config variable advice.detachedHead to false

HEAD is now at f324ff0 Local change

```

Return to main branch:

```

Dell@DESKTOP-OPC01NF MINGW64 ~/Lab-03 ((f324ff0...))
$ git checkout main
Previous HEAD position was f324ff0 Local change
Switched to branch 'main'
Your branch is up to date with 'origin/main'.

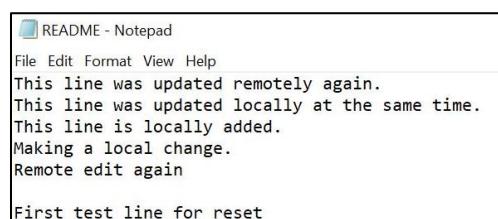
Dell@DESKTOP-OPC01NF MINGW64 ~/Lab-03 (main)
$ |

```

Task 6 – Resetting Commits (Soft vs Hard Reset) (With Verification Steps)

Steps:

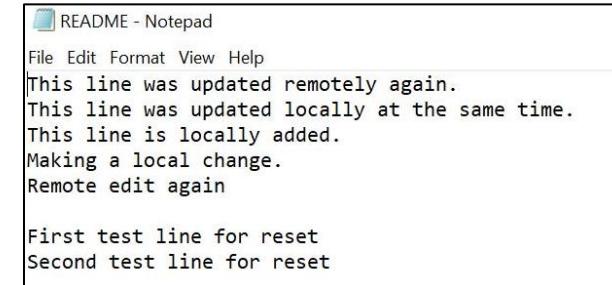
Add a new line in any file and commit it.



```
Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (main)
$ git add .

Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (main)
$ git commit -m "Added test line"
[main b3c3ddc] Added test line
 1 file changed, 3 insertions(+)
```

Add another change and commit again.



README - Notepad

```
File Edit Format View Help
This line was updated remotely again.
This line was updated locally at the same time.
This line is locally added.
Making a local change.
Remote edit again

First test line for reset
Second test line for reset
```

```
Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (main)
$ git add .

Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (main)
$ git commit -m "Second test commit"
[main 67c99d5] Second test commit
 1 file changed, 1 insertion(+), 1 deletion(-)
```

View the history before reset:

```
Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (main)
$ git log --oneline
67c99d5 (HEAD -> main) Second test commit
b3c3ddc Added test line
378651f (origin/main, origin/HEAD) Removed tracked textfiles directory
25787bd Added .gitignore to ignore textfiles directory
32680e2 Added textfiles directory with three files
13e3c94 Local conflicting change
e6b4f07 Remote conflicting change
4d25548 Merge branch 'main' of https://github.com/KomalKashif/Lab-03
f3244f0 Local change
28e8ee7 Remote edit README.md
d5b2c92 Update README.md
cd5bdd3 Local update to README.md
476e451 Remote update to README.md
2bc3270 Remote update to README.md
72ab4a4 Local Change
4f22b5e Remote edit README.md
eb8c816 Remote update to README.md
002e913 Local change to README
294d8af Local update to README
4c64510 Remote update to README.md
0840136 Remote update to README.md
0c053ee Initial commit
```

Check file contents for both changes. Open the edited file (e.g., README.md) and visually confirm BOTH added lines exist.

```
 README - Notepad
File Edit Format View Help
This line was updated remotely again.
This line was updated locally at the same time.
This line is locally added.
Making a local change.
Remote edit again

First test line for reset
Second test line for reset
```

Perform a soft reset (keeps changes in working directory):

```
Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (main)
$ git reset --soft HEAD~1
```

Check commit history after soft reset:

```
Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (main)
$ git log --oneline
b3c3ddc (HEAD -> main) Added test line
378651f (origin/main, origin/HEAD) Removed tracked textfiles directory
25787bd Added .gitignore to ignore textfiles directory
32680e2 Added textfiles directory with three files
13e3c94 Local conflicting change
e6b4f07 Remote conflicting change
4d25548 Merge branch 'main' of https://github.com/KomalKashif/Lab-03
f324ff0 Local change
28e8ee7 Remote edit README.md
d5b2c92 Update README.md
cd5bdd3 Local update to README.md
476e451 Remote update to README.md
2bc3270 Remote update to README.md
72ab4a4 Local Change
4f22b5e Remote edit README.md
eb8c816 Remote update to README.md
002e913 Local change to README
294d8af Local update to README
4c64510 Remote update to README.md
0840136 Remote update to README.md
0c053ee Initial commit
```

Verify changes in the file. Open the file again and confirm both edits are still present (nothing lost).

```
 README - Notepad
File Edit Format View Help
This line was updated remotely again.
This line was updated locally at the same time.
This line is locally added.
Making a local change.
Remote edit again

First test line for reset
Second test line for reset
```

Check git status:

```
 README - Notepad
File Edit Format View Help
This line was updated remotely again.
This line was updated locally at the same time.
This line is locally added.
Making a local change.
Remote edit again

First test line for reset
Second test line for reset
```

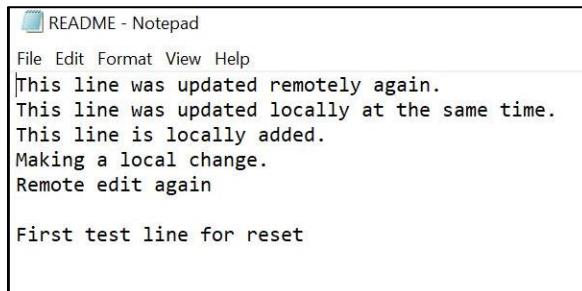
Perform a hard reset (discards changes completely):

```
Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (main)
$ git reset --hard HEAD~1
HEAD is now at b3c3ddc Added test line
```

Check commit history after hard reset:

```
Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (main)
$ git log --oneline
b3c3ddc (HEAD -> main) Added test line
378651f (origin/main, origin/HEAD) Removed tracked textfiles directory
25787bd Added .gitignore to ignore textfiles directory
32680e2 Added textfiles directory with three files
13e3c94 Local conflicting change
e6b4f07 Remote conflicting change
4d25548 Merge branch 'main' of https://github.com/KomalKashif/Lab-03
f324f0 Local change
28e8ee7 Remote edit README.md
d5b2c92 Update README.md
cd5bdd3 Local update to README.md
476e451 Remote update to README.md
2bc3270 Remote update to README.md
72ab4a4 Local Change
4f22b5e Remote edit README.md
eb8c816 Remote update to README.md
002e913 Local change to README
294d8af Local update to README
4c64510 Remote update to README.md
0840136 Remote update to README.md
0c053ee Initial commit
```

Verify changes in the file. Open the file and confirm the second edit is gone (reverted to previous commit).



Check git status:

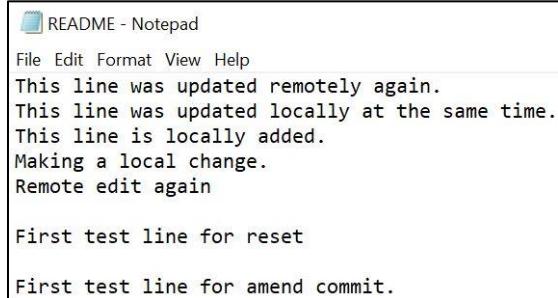
```
Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (main)
$ git status
On branch main
Your branch is ahead of 'origin/main' by 1 commit.
  (use "git push" to publish your local commits)

nothing to commit, working tree clean
```

Task 7 – Amending the Last Commit

Steps:

Make a small change in any file. Stage it and commit.



```
README - Notepad
File Edit Format View Help
This line was updated remotely again.
This line was updated locally at the same time.
This line is locally added.
Making a local change.
Remote edit again

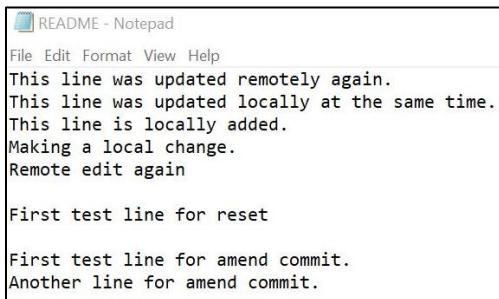
First test line for reset

First test line for amend commit.
```

```
Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (main)
$ git add .

Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (main)
$ git commit -m "Fix log message"
[main 2249397] Fix log message
 1 file changed, 2 insertions(+)
```

Realize you forgot to change another file. Update it now. Add it and amend the last commit:



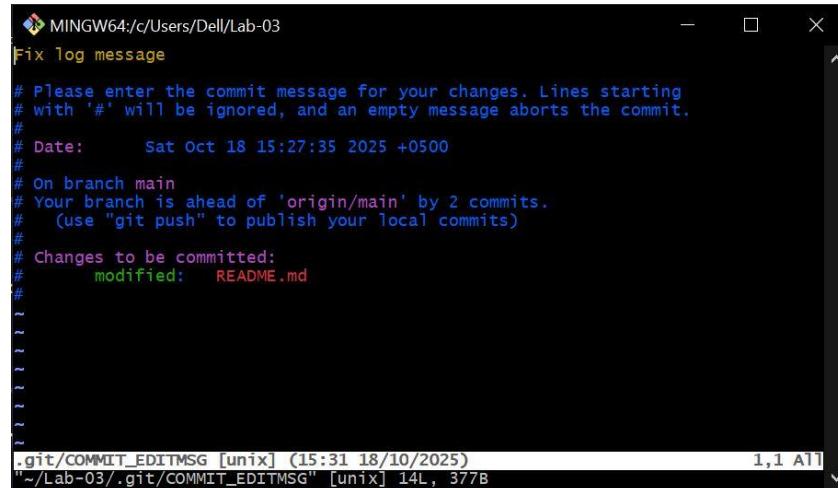
```
README - Notepad
File Edit Format View Help
This line was updated remotely again.
This line was updated locally at the same time.
This line is locally added.
Making a local change.
Remote edit again

First test line for reset

First test line for amend commit.
Another line for amend commit.
```

```
Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (main)
$ git add .

Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (main)
$ git commit --amend |
```



The terminal window shows a git commit message being edited. The message reads:

```
# Please enter the commit message for your changes. Lines starting
# with '#' will be ignored, and an empty message aborts the commit.
#
# Date:      Sat Oct 18 15:27:35 2025 +0500
#
# On branch main
# Your branch is ahead of 'origin/main' by 2 commits.
#   (use "git push" to publish your local commits)
#
# Changes to be committed:
#       modified:   README.md
#
# ~
# ~
# ~
# ~
# ~
# ~
```

At the bottom of the terminal, it says ".git/COMMIT_EDITMSG [unix] (15:31 18/10/2025) 1,1 All ~/Lab-03/.git/COMMIT_EDITMSG" [unix] 14L, 377B".

```
[main ed5827c] Fix log message
Date: Sat Oct 18 15:27:35 2025 +0500
1 file changed, 5 insertions(+)
```

Task 8 – Reverting a Commit (Safe Undo on Remote Branch)

Steps:

Make a change and commit it:

```
Dell@DESKTOP-OPCOINF MINGW64 ~/Lab-03 (main)
$ echo "temporary text" >> temp.txt

Dell@DESKTOP-OPCOINF MINGW64 ~/Lab-03 (main)
$ git add .
warning: in the working copy of 'temp.txt', LF will be replaced by CRLF the next
time Git touches it

Dell@DESKTOP-OPCOINF MINGW64 ~/Lab-03 (main)
$ git commit -m "Added temporary text file"
[main 7f2f3c3] Added temporary text file
 1 file changed, 1 insertion(+)
 create mode 100644 temp.txt

Dell@DESKTOP-OPCOINF MINGW64 ~/Lab-03 (main)
$ git push origin main
Enumerating objects: 11, done.
Counting objects: 100% (11/11), done.
Delta compression using up to 4 threads
Compressing objects: 100% (8/8), done.
Writing objects: 100% (9/9), 883 bytes | 126.00 KiB/s, done.
Total 9 (delta 3), reused 0 (delta 0), pack-reused 0 (from 0)
remote: Resolving deltas: 100% (3/3), completed with 1 local object.
To https://github.com/KomalKashif/Lab-03.git
  378651f..7f2f3c3  main -> main
```

Now revert that commit safely (do not delete it):

```
dell@DESKTOP-OPC01INF MINGW64 ~/Lab-03 (main)
$ git log --oneline
7f2f3c3 (HEAD -> main, origin/main, origin/HEAD) Added temporary text file
c6e9722 Fix log message
b3c3ddc Added test line
378651f Removed tracked textfiles directory
25787bd Added .gitignore to ignore textfiles directory
32680e2 Added textfiles directory with three files
13e3c94 Local conflicting change
e6b4f07 Remote conflicting change
4d25548 Merge branch 'main' of https://github.com/KomalKashif/Lab-03
f324ff0 Local change
28e8ee7 Remote edit README.md
d5b2c92 Update README.md
cd5bbdd3 Local update to README.md
476e451 Remote update to README.md
2bc3270 Remote update to README.md
72ab4a4 Local Change
4f22b5e Remote edit README.md
eb8c816 Remote update to README.md
002e913 Local change to README
294d8af Local update to README
4c64510 Remote update to README.md
0840136 Remote update to README.md
0c053ee Initial commit

dell@DESKTOP-OPC01INF MINGW64 ~/Lab-03 (main)
$ git revert 7f2f3c3 |
```

```
[main 2aea420] Revert "Added temporary text file"  
1 file changed, 1 deletion(-)  
 delete mode 100644 temp.txt
```

Push the revert commit:

```
Dell@DESKTOP-OPC01NF MINGW64 ~/Lab-03 (main)
$ git push origin main
Enumerating objects: 3, done.
Counting objects: 100% (3/3), done.
Delta compression using up to 4 threads
Compressing objects: 100% (2/2), done.
Writing objects: 100% (2/2), 267 bytes | 133.00 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 https://github.com/KomalKashif/Lab-03.git
  7f2f3c3..2aea420  main -> main

Dell@DESKTOP-OPC01NF MINGW64 ~/Lab-03 (main)
$ ls
README.md  textfiles/
```

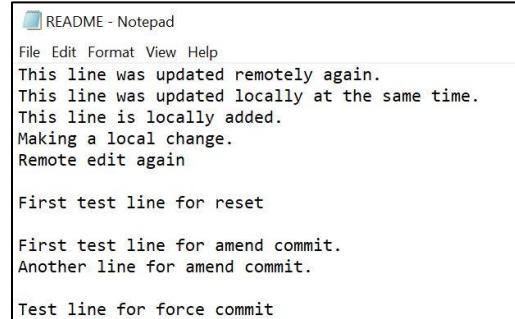
Task 9 – Force Push (With Caution)

Create a new branch:

```
Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (main)
$ git checkout -b test-force
Switched to a new branch 'test-force'

Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (test-force)
$ |
```

Make and commit a small change.



The screenshot shows a Notepad window with the following content:

```
README - Notepad
File Edit Format View Help
This line was updated remotely again.
This line was updated locally at the same time.
This line is locally added.
Making a local change.
Remote edit again

First test line for reset

First test line for amend commit.
Another line for amend commit.

Test line for force commit
```

```
Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (test-force)
$ git add .

Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (test-force)
$ git commit -m "Force commit change"
[test-force b324697] Force commit change
 1 file changed, 3 insertions(+)
```

Push it:

```
Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (test-force)
$ git push origin test-force
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), 344 bytes | 172.00 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 'test-force' on GitHub by visiting:
remote:     https://github.com/KomalKashif/Lab-03/pull/new/test-force
remote:
To https://github.com/KomalKashif/Lab-03.git
 * [new branch]      test-force -> test-force
```

Perform a hard reset:

```
Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (test-force)
$ git reset --hard HEAD~1
HEAD is now at 2aea420 Revert "Added temporary text file"
```

Push again

```
Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (test-force)
$ git push origin test-force
To https://github.com/KomalKashif/Lab-03.git
 ! [rejected]      test-force -> test-force (non-fast-forward)
error: failed to push some refs to 'https://github.com/KomalKashif/Lab-03.git'
hint: Updates were rejected because the tip of your current branch is behind
hint: its remote counterpart. If you want to integrate the remote changes,
hint: use 'git pull' before pushing again.
hint: See the 'Note about fast-forwards' in 'git push --help' for details.
```

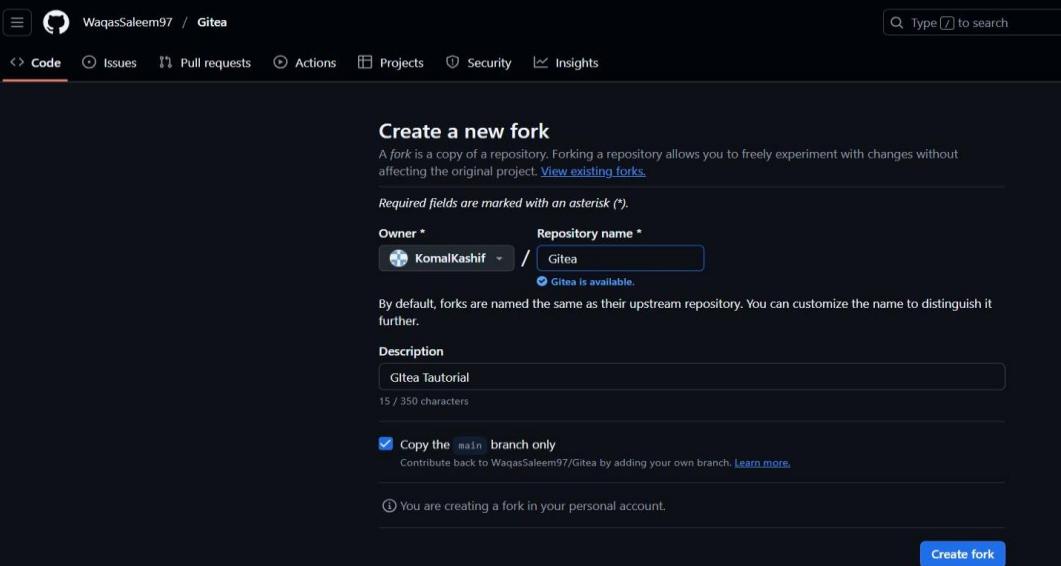
Now force-push to remote:

```
Dell@DESKTOP-OPC01NF MINGW64 ~/Lab-03 (test-force)
$ git push origin test-force --force
Total 0 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
To https://github.com/KomalKashif/Lab-03.git
  + b324697...2aea420 test-force -> test-force (forced update)
```

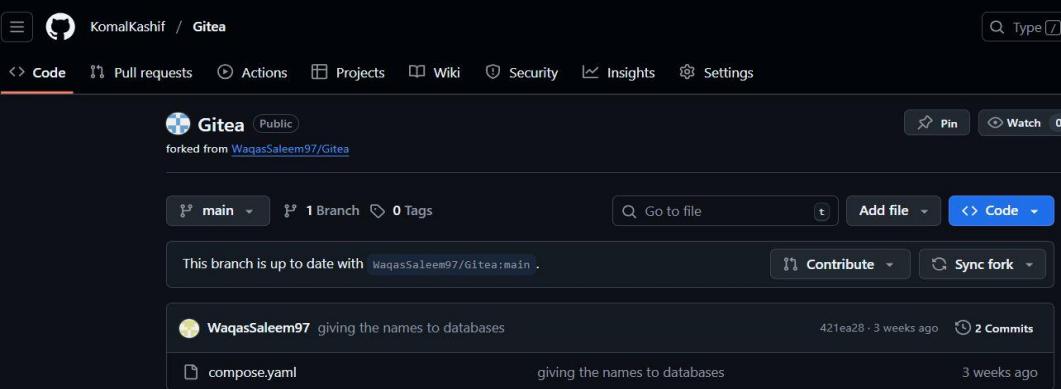
Task 10 – Running Gitea in GitHub Codespaces via Docker Compose

Steps

Fork the Gitea Repository:



The screenshot shows the GitHub fork creation interface for the 'Gitea' repository. The owner is set to 'KomalKashif' and the repository name is 'Gitea'. The 'Repository name' field contains 'Gitea'. A note indicates that forks are named the same as the upstream repository by default, with an option to customize it. The 'Description' field contains 'Gitea Tutorial'. The 'Copy the main branch only' checkbox is checked. A note below it says 'Contribute back to WaqasSaleem97/Gitea by adding your own branch.' A message at the bottom left says 'You are creating a fork in your personal account.' A blue 'Create fork' button is at the bottom right.

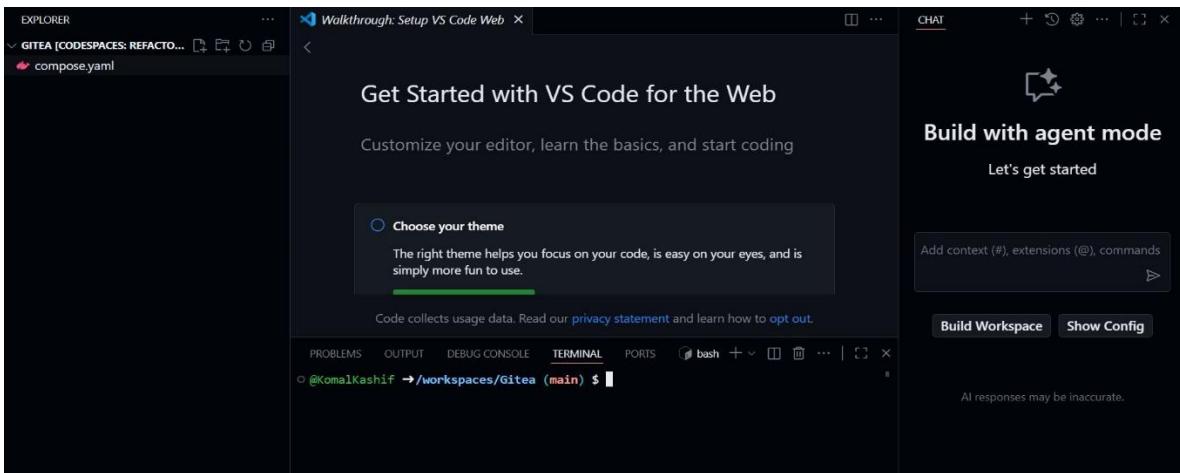


The screenshot shows the GitHub repository page for 'Gitea' (forked from 'WaqasSaleem97/Gitea'). The repository is public. It displays one branch ('main') and zero tags. A message says 'This branch is up to date with WaqasSaleem97/Gitea:main.' Below the branches, there are two commits: one from 'WaqasSaleem97' and one from 'compose.yaml'. The commit from 'WaqasSaleem97' was made 'giving the names to databases' and is dated '421ea28 · 3 weeks ago'. The commit from 'compose.yaml' is also dated '3 weeks ago'.

Open the Forked Repo in GitHub Codespaces

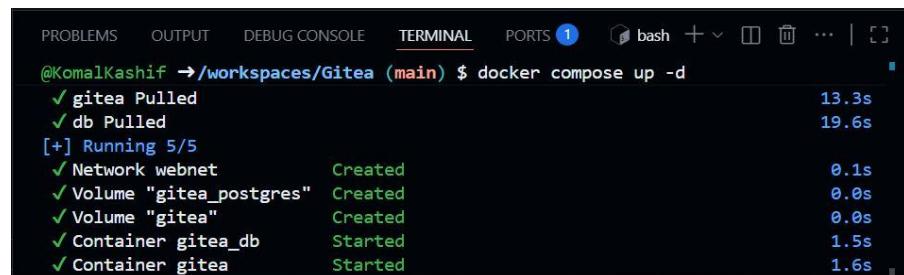


The screenshot shows the GitHub Codespaces interface. At the top, there are tabs for "Local" and "Codespaces". Below them, a section titled "Codespaces" displays the message "No codespaces" and "You don't have any codespaces with this repository checked out". A blue button labeled "Create codespace on main" is prominently displayed. Below this, a link "Learn more about codespaces..." is visible. A note at the bottom states "Codespace usage for this repository is paid for by KomalKashif."



The screenshot shows the VS Code Web interface. On the left, the Explorer sidebar shows a folder named "GITEA [CODESPACES: REFACTO...]" containing a "compose.yaml" file. The main area has a title "Get Started with VS Code for the Web" with the sub-instruction "Customize your editor, learn the basics, and start coding". A callout box says "Choose your theme" with the sub-instruction "The right theme helps you focus on your code, is easy on your eyes, and is simply more fun to use.". Below this, a terminal window shows the command "@KomalKashif → /workspaces/Gitea (main) \$". On the right, a "CHAT" panel has a "Build with agent mode" section with a "Let's get started" button and a text input field. Buttons for "Build Workspace" and "Show Config" are also present.

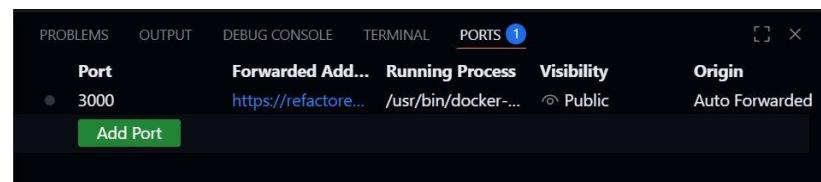
Start Gitea with Docker Compose



```
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS 1 bash + ⌂ ⌂ ... | ⌂
@KomalKashif → /workspaces/Gitea (main) $ docker compose up -d
✓ gitea Pulled
✓ db Pulled
[+] Running 5/5
✓ Network webnet      Created          13.3s
✓ Volume "gitea_postgres" Created        19.6s
✓ Volume "gitea"        Created          0.1s
✓ Container gitea_db   Started          0.0s
✓ Container gitea       Started          0.0s
1.5s
1.6s
```

Access Gitea Web Interface:

In Codespaces, forward port 3000 (see Codespaces port forwarding UI). Change the Visibility of port 3000 from private to public. Click the forwarded port 3000 link to open Gitea in your browser tab.



The screenshot shows the VS Code PORTS tab. It lists a single port entry: "Port 3000" with "Forwarded Add..." set to "https://refactore...", "Running Process" set to "/usr/bin/docker...", "Visibility" set to "Public", and "Origin" set to "Auto Forwarded". A green "Add Port" button is at the bottom.

Initial Configuration

If you run Gitea inside Docker, please read the [documentation](#) before changing any settings.

Database Settings

Gitea requires MySQL, PostgreSQL, MSSQL, SQLite3 or TiDB (MySQL protocol).

Database Type *	PostgreSQL
Host *	db:5432
Username *	gitea
Password *
Database Name *	gitea
SSL *	Disable
Schema	Leave blank for database default ("public").

Port number your SSH server listens on. Leave empty to disable.

Gitea HTTP Listen Port *	3000
Port number the Giteas web server will listen on.	
Gitea Base URL *	https://refactored-robot-gxw6v7pr939r99-3000.app.github.dev/
Base address for HTTP(S) clone URLs and email notifications.	
Log Path *	/data/gitea/log
Log files will be written to this directory.	
<input type="checkbox"/> Enable Update Checker <small>Checks for new version releases periodically by connecting to gitea.io.</small>	

Optional Settings

- ▶ Email Settings
- ▶ Server and Third-Party Service Settings
- ▶ Administrator Account Settings

These configuration options will be written into: /data/gitea/conf/app.ini [Edit](#)

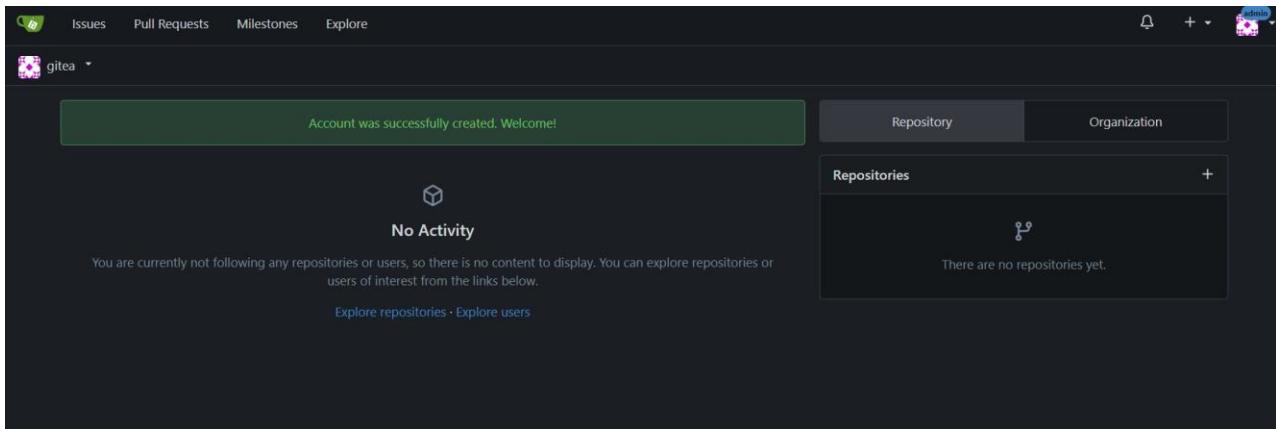
[Install Gitea](#)

Install Gitea:

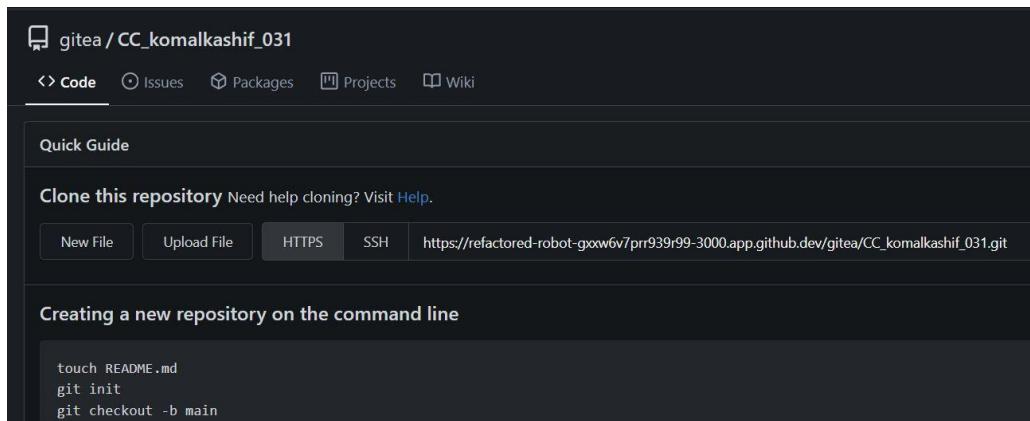
Register

Username *	gitea
Email Address *	23-22411-031@se.fjwu.edu.pk
Password *
Confirm Password *
Register Account	
or	
 Sign in with OpenID	
Already have an account? Sign in now!	

Log In to Gitea



Create a New Repository in Gitea:

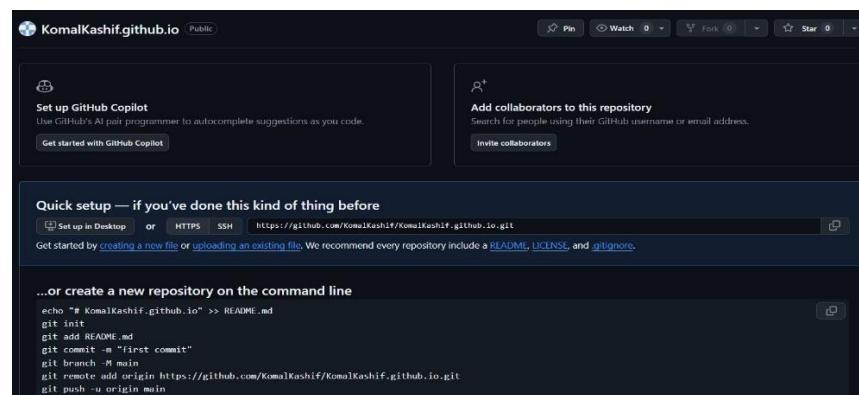


Save a screenshot of the new repository page as gitea_new_repo.png.

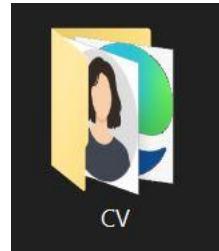
Task 11 – Creating a GitHub Pages Portfolio Site

Steps

Go to GitHub and create a new repository named <your-username>.github.io. Make sure the repository is public.



Add Static Website Code: Prepare a simple static website. Put your files in a local folder.



Push the Files to GitHub

```
Dell@DESKTOP-OPCO1NF MINGW64 ~
$ cd "C:\Users\DELL\Downloads\Lab 3\CV"

Dell@DESKTOP-OPCO1NF MINGW64 ~/Downloads/Lab 3/CV
$ git init
Initialized empty Git repository in C:/Users/DELL/Downloads/Lab 3/CV/.git/

Dell@DESKTOP-OPCO1NF MINGW64 ~/Downloads/Lab 3/CV (master)
$ git remote add origin git@github.com:KomalKashif/KomalKashif.i

Dell@DESKTOP-OPCO1NF MINGW64 ~/Downloads/Lab 3/CV (master)
$ git remote add origin git@github.com:KomalKashif/KomalKashif.github.io.git

Dell@DESKTOP-OPCO1NF MINGW64 ~
$ cd "C:\Users\DELL\Downloads\Lab 3\CV"

Dell@DESKTOP-OPCO1NF MINGW64 ~/Downloads/Lab 3/CV
$ git init
Initialized empty Git repository in C:/Users/DELL/Downloads/Lab 3/CV/.git/

Dell@DESKTOP-OPCO1NF MINGW64 ~/Downloads/Lab 3/CV (master)
$ git remote add origin https://github.com/KomalKashif/KomalKashif.github.io.git

Dell@DESKTOP-OPCO1NF MINGW64 ~/Downloads/Lab 3/CV (master)
$ git add .

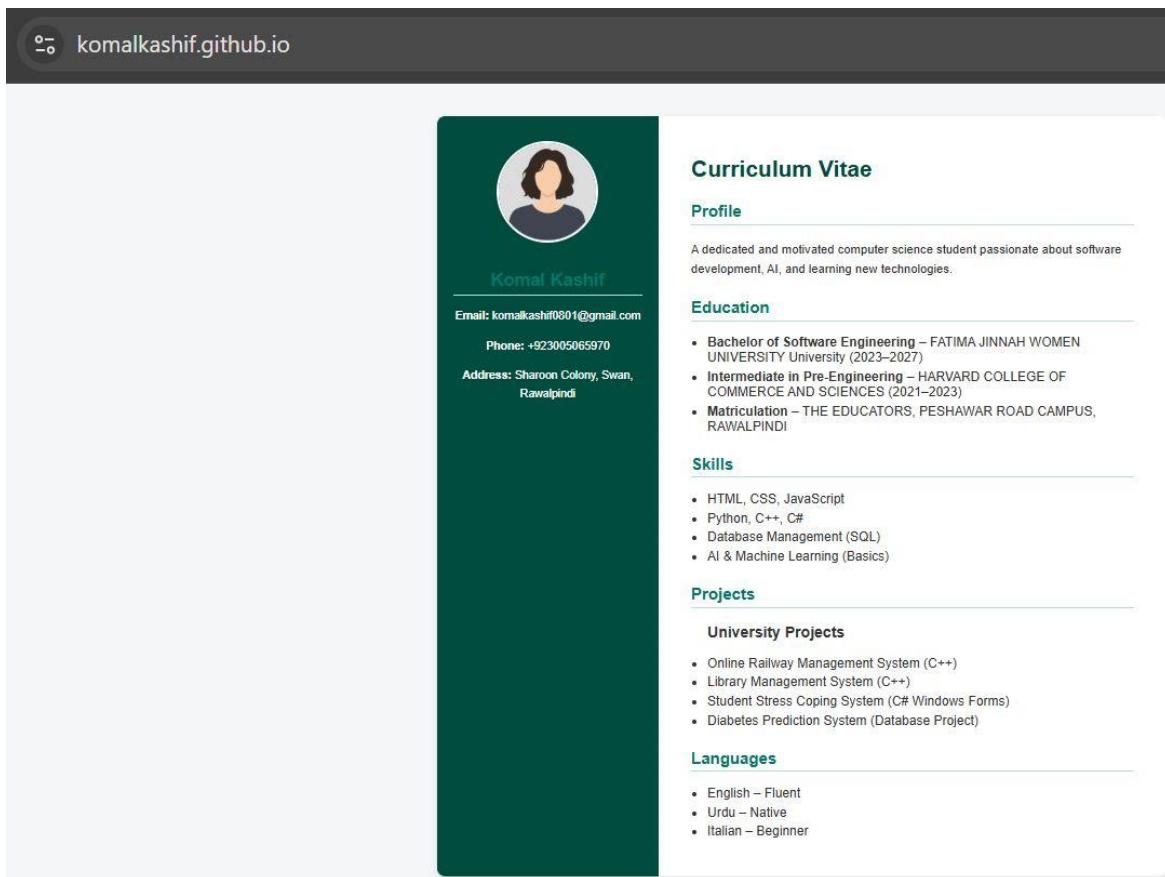
Dell@DESKTOP-OPCO1NF MINGW64 ~/Downloads/Lab 3/CV (master)
$ git commit -m "Add portfolio site Github Pages"
On branch master
Your branch is up to date with 'origin/master'.

nothing to commit, working tree clean
Dell@DESKTOP-OPCO1NF MINGW64 ~/Downloads/Lab 3/CV (master)
$ git push -u origin master
Enumerating objects: 4, done.
Counting objects: 100% (4/4), done.
Delta compression using up to 4 threads
Compressing objects: 100% (4/4), done.
Writing objects: 100% (4/4), 751.72 Kib | 15.99 MiB/s, done.
Total 4 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
To https://github.com/KomalKashif/KomalKashif.github.io.git
 * [new branch]      master -> master
branch 'master' set up to track 'origin/master'.
```

Go to your repository on GitHub. Click Settings > Pages. Confirm that your site is published and see the link to your live site (e.g., <https://your-username.github.io>).

The screenshot shows the GitHub Pages settings interface. At the top, it says "GitHub Pages". Below that, a message states "GitHub Pages is designed to host your personal, organization, or project pages from a GitHub repository." A central box contains the text "Your site is live at <https://komalkashif.github.io/>" and "Last deployed by KomalKashif 3 minutes ago". To the right of this box are two buttons: "Visit site" and "Unpublish site".

Visit Your Live Site



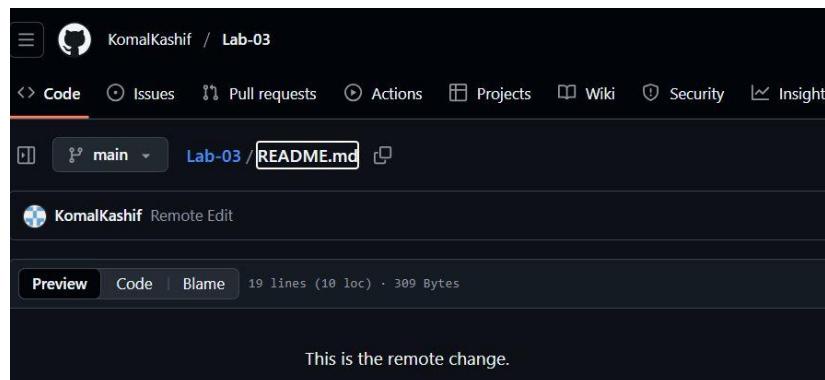
The screenshot shows a GitHub repository named "komalkashif.github.io". The repository page displays a live website for "Komal Kashif". The website has a dark green header with a profile picture of Komal Kashif. Below the header, there is contact information: Email: komalkashif0301@gmail.com, Phone: +923005065970, and Address: Sharoon Colony, Swan, Rawalpindi. The main content area is titled "Curriculum Vitae" and includes sections for Profile, Education, Skills, Projects, University Projects, Languages, and Experience. The "Education" section lists Bachelor of Software Engineering from Fatima Jinnah Women University (2023-2027), Intermediate in Pre-Engineering from Harvard College of Commerce and Sciences (2021-2023), and Matriculation from The Educators, Peshawar Road Campus, Rawalpindi. The "Skills" section lists HTML, CSS, JavaScript, Python, C++, C#, Database Management (SQL), and AI & Machine Learning (Basics). The "Projects" section lists Online Railway Management System (C++), Library Management System (C++), Student Stress Coping System (C# Windows Forms), and Diabetes Prediction System (Database Project). The "Languages" section lists English (Fluent), Urdu (Native), and Italian (Beginner).

Exam Evaluation Questions

1. Local vs Remote Conflict Resolution

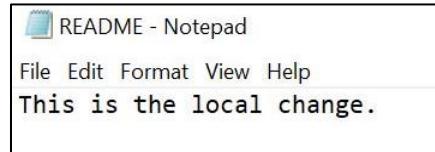
Steps:

1. On GitHub, edit a file (e.g., README.md) and commit the change.



The screenshot shows a GitHub repository named "KomalKashif / Lab-03". The repository page displays a live website for "KomalKashif". The main content area is titled "Curriculum Vitae" and includes sections for Profile, Education, Skills, Projects, University Projects, Languages, and Experience. The "Education" section lists Bachelor of Software Engineering from Fatima Jinnah Women University (2023-2027), Intermediate in Pre-Engineering from Harvard College of Commerce and Sciences (2021-2023), and Matriculation from The Educators, Peshawar Road Campus, Rawalpindi. The "Skills" section lists HTML, CSS, JavaScript, Python, C++, C#, Database Management (SQL), and AI & Machine Learning (Basics). The "Projects" section lists Online Railway Management System (C++), Library Management System (C++), Student Stress Coping System (C# Windows Forms), and Diabetes Prediction System (Database Project). The "Languages" section lists English (Fluent), Urdu (Native), and Italian (Beginner).

2. On your local machine, edit the same file differently (Avoid Conflict) and commit.



3. Try to push your local commit and observe the error.

```
Dell@DESKTOP-OPC01NF MINGW64 ~/Lab-03 (main)
$ git add README.md

Dell@DESKTOP-OPC01NF MINGW64 ~/Lab-03 (main)
$ git commit -m "Local edit for conflict test"
[main 65c24c6] Local edit for conflict test
 1 file changed, 2 insertions(+)

Dell@DESKTOP-OPC01NF MINGW64 ~/Lab-03 (main)
$ git push origin main
To https://github.com/KomalKashif/Lab-03.git
 ! [rejected]          main -> main (fetch first)
error: failed to push some refs to 'https://github.com/KomalKashif/Lab-03.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.
```

4. Resolve the conflict by running git pull (merge), then push.

```
Dell@DESKTOP-OPC01NF MINGW64 ~/Lab-03 (main)
$ git pull
remote: Enumerating objects: 8, done.
remote: Counting objects: 100% (8/8), done.
remote: Compressing objects: 100% (6/6), done.
remote: Total 6 (delta 2), reused 0 (delta 0), pack-reused 0 (from 0)
Unpacking objects: 100% (6/6), 1.87 KiB | 36.00 KiB/s, done.
From https://github.com/KomalKashif/Lab-03
    2aea420..08c1ffb main      -> origin/main
Auto-merging README.md
CONFLICT (content): Merge conflict in README.md
Automatic merge failed; fix conflicts and then commit the result.

Dell@DESKTOP-OPC01NF MINGW64 ~/Lab-03 (main|MERGING)
$ git add README.md

Dell@DESKTOP-OPC01NF MINGW64 ~/Lab-03 (main|MERGING)
$ git commit -m "Resolved merge conflict"
[main 63e1122] Resolved merge conflict

Dell@DESKTOP-OPC01NF MINGW64 ~/Lab-03 (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% (6/6), 667 bytes | 133.00 KiB/s, done.
Total 6 (delta 2), reused 0 (delta 0), pack-reused 0 (from 0)
remote: Resolving deltas: 100% (2/2), completed with 1 local object.
To https://github.com/KomalKashif/Lab-03.git
    08c1ffb..63e1122 main -> main
```

5. Repeat with another remote/local change, but resolve using git pull --rebase, then push.

```
Dell@DESKTOP-OPC01NF MINGW64 ~/Lab-03 (main)
$ git pull --rebase origin main
remote: Enumerating objects: 5, done.
remote: Counting objects: 100% (5/5), done.
remote: Compressing objects: 100% (3/3), done.
remote: Total 3 (delta 1), reused 0 (delta 0), pack-reused 0 (from 0)
Unpacking objects: 100% (3/3), 986 bytes | 24.00 KiB/s, done.
From https://github.com/KomalKashif/Lab-03
 * branch            main      -> FETCH_HEAD
   63e1122..f778e35 main      -> origin/main
Auto-merging README.md
CONFLICT (content): Merge conflict in README.md
error: could not apply 7f39dd6... Another local edit
hint: Resolve all conflicts manually, mark them as resolved with
hint: "git add/rm <conflicted_files>", then run "git rebase --continue".
Another local edit
```

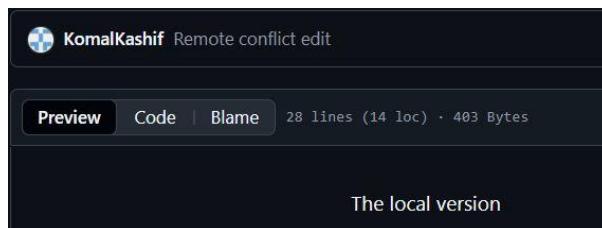
```
[detached HEAD 726a68c] Another local edit
 1 file changed, 3 insertions(+)
Successfully rebased and updated refs/heads/main.

dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (main)
$ git push -u 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), 349 bytes | 87.00 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 https://github.com/KomalKashif/Lab-03.git
  f778e35..726a68c main -> main
branch 'main' set up to track 'origin/main'.
```

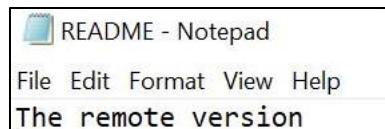
2. Manual Merge Conflict Handling

Steps:

1. On GitHub, change a specific line in a file and commit.



2. Locally, change the same line differently and commit.



3. Try to push your local change and observe the conflict error.

```
Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (main)
$ git add README.md

Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (main)
$ git commit -m "Local conflict edit"
[main decc19c] Local conflict edit
 1 file changed, 2 insertions(+)

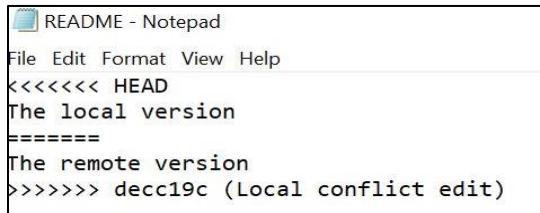
Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (main)
$ git push origin main
To https://github.com/KomalKashif/Lab-03.git
 ! [rejected]      main -> main (fetch first)
error: failed to push some refs to 'https://github.com/KomalKashif/Lab-03.git'
hint: Updates were rejected because the remote contains work that 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.
```

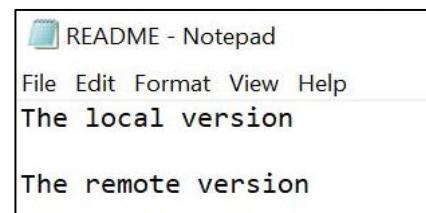
4. Use git pull --rebase to fetch changes and trigger the conflict.

```
Dell@DESKTOP-OPC01NF MINGW64 ~/Lab-03 (main)
$ git pull --rebase
remote: Enumerating objects: 8, done.
remote: Counting objects: 100% (8/8), done.
remote: Compressing objects: 100% (6/6), done.
remote: Total 6 (delta 2), reused 0 (delta 0), pack-reused 0 (from 0)
Unpacking objects: 100% (6/6), 1.90 KiB | 34.00 KiB/s, done.
From https://github.com/KomalKashif/Lab-03
  726a68c..4525b23 main    -> origin/main
Auto-merging README.md
CONFLICT (content): Merge conflict in README.md
error: could not apply decc19c... Local conflict edit
hint: Resolve all conflicts manually, mark them as resolved with
hint: "git add/rm <conflicted_files>", then run "git rebase --continue".
hint: You can instead skip this commit: run "git rebase --skip".
hint: To abort and get back to the state before "git rebase", run "git rebase --abort".
hint: Disable this message with "git config set advice.mergeConflict false"
Could not apply decc19c... # Local conflict edit

Dell@DESKTOP-OPC01NF MINGW64 ~/Lab-03 (main|REBASE 1/1)
$ |
```

5. Edit the conflicted file to resolve the conflict manually.


 README - Notepad
 File Edit Format View Help
 <<<<< HEAD
 The local version
 =====
 The remote version
 >>>>> decc19c (Local conflict edit)


 README - Notepad
 File Edit Format View Help
 The local version
 The remote version

6. Mark the conflict resolved (git add <file>, git rebase --continue) and push.

```
[detached HEAD b149565] Local conflict edit
 1 file changed, 2 insertions(+)
Successfully rebased and updated refs/heads/main.

Dell@DESKTOP-OPC01NF MINGW64 ~/Lab-03 (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), 335 bytes | 111.00 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 https://github.com/KomalKashif/Lab-03.git
  4525b23..b149565 main -> main
```

3. Managing Ignored and Tracked Files

Steps:

1. Create a new folder (e.g., DocFiles) and add several files inside.

```
Dell@DESKTOP-OPC01NF MINGW64 ~/Lab-03 (main)
$ mkdir textfiles

Dell@DESKTOP-OPC01NF MINGW64 ~/Lab-03 (main)
$ echo "File A content" > textfiles/a.txt

Dell@DESKTOP-OPC01NF MINGW64 ~/Lab-03 (main)
$ echo "File B content" > textfiles/b.txt

Dell@DESKTOP-OPC01NF MINGW64 ~/Lab-03 (main)
$ echo "File C content" > textfiles/c.txt
```

2. Commit and push the folder/files to GitHub.

```
Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (main)
$ git add .
warning: in the working copy of 'textfiles/a.txt', LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'textfiles/b.txt', LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'textfiles/c.txt', LF will be replaced by CRLF the next time Git touches it

Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (main)
$ git commit -m "Added textfiles directory with three files"
[main 32680e2] Added textfiles directory with three files
 3 files changed, 3 insertions(+)
   create mode 100644 textfiles/a.txt
   create mode 100644 textfiles/b.txt
   create mode 100644 textfiles/c.txt

Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (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% (3/3), done.
Writing objects: 100% (6/6), 470 bytes | 94.00 KiB/s, done.
Total 6 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
To https://github.com/KomalKashif/Lab-03.git
  13e3c94..32680e2 main -> main
```

3. Add the folder to your .gitignore file.

```
Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (main)
$ echo "textfiles/*" > .gitignore

Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (main)
$ git add .gitignore
warning: in the working copy of '.gitignore', LF will be replaced by CRLF the next time Git touches it
```

4. Commit and push the .gitignore update.

```
Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (main)
$ git commit -m "Added .gitignore to ignore textfiles directory"
[main 25787bd] Added .gitignore to ignore textfiles directory
 1 file changed, 1 insertion(+)
   create mode 100644 .gitignore

Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (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% (2/2), done.
Writing objects: 100% (3/3), 358 bytes | 179.00 KiB/s, done.
Total 3 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
To https://github.com/KomalKashif/Lab-03.git
  32680e2..25787bd main -> main
```

5. Remove the folder from tracking using git rm -r --cached <folder>.

```
Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (main)
$ git rm -r --cached textfiles
rm 'textfiles/a.txt'
rm 'textfiles/b.txt'
rm 'textfiles/c.txt'
```

6. Commit and push the change, then verify the folder is no longer tracked on GitHub.

```
Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (main)
$ git add .

Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (main)
$ git commit -m "Removed tracked textfiles directory"
[main 378651f] Removed tracked textfiles directory
 3 files changed, 3 deletions(-)
   delete mode 100644 textfiles/a.txt
   delete mode 100644 textfiles/b.txt
   delete mode 100644 textfiles/c.txt

Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (main)
$ git push origin main
Enumerating objects: 3, done.
Counting objects: 100% (3/3), done.
Delta compression using up to 4 threads
Compressing objects: 100% (2/2), done.
Writing objects: 100% (2/2), 247 bytes | 123.00 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 https://github.com/KomalKashif/Lab-03.git
  25787bd..378651f main -> main
```

4. Commit History Manipulation and Recovery

Steps:

1. Make a change and commit it.

```
Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (main)
$ notepad README.md
Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (main)
$ git add README.md
Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (main)
$ git commit -m "Local change again"
[main da3bb88] Local change again
 1 file changed, 2 insertions(+)
```

2. Make another change and commit again.

```
Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (main)
$ notepad README.md
Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (main)
$ git add README.md
Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (main)
$ git commit -m "Second local change"
[main 1075a4c] Second local change
 1 file changed, 1 insertion(+)
```

3. View your commit history.

```
Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (main)
$ git log
1075a4c (HEAD -> main) Second local change
da3bb88 Local change again
b149565 (origin/main, origin/HEAD) Local conflict edit
4525b23 Remote conflict edit
e55917b Update README.md
726a68c Another local edit
f778e35 Remote Edit
63e1122 Resolved merge conflict
65c24c6 Local edit for conflict test
08c1ffb Remote Edit
4edd9ef Remote Edit
2aea420 (origin/test-force, test-force) Revert "Added temporary text file"
7f2f3c3 Added temporary text file
c6e9722 Fix log message
b3c3ddc Added test line
```

4. Perform a soft reset (git reset --soft HEAD~1) and observe your file and history.

```
Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (main)
$ git reset --soft HEAD-1
Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (main)
$ git log --oneline
da3bb88 (HEAD -> main) Local change again
b149565 (origin/main, origin/HEAD) Local conflict edit
4525b23 Remote conflict edit
e55917b Update README.md
726a68c Another local edit
f778e35 Remote Edit
63e1122 Resolved merge conflict
65c24c6 Local edit for conflict test
08c1ffb Remote Edit
4edd9ef Remote Edit
2aea420 (origin/test-force, test-force) Revert "Added temporary text file"
7f2f3c3 Added temporary text file
```

5. Make commit again.

```
Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (main)
$ notepad README.md
Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (main)
$ git add README.md
Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (main)
$ git commit -m "Third Commit"
[main aeb5070] Third Commit
 1 file changed, 2 insertions(+)
```

6. Perform a hard reset (git reset --hard HEAD~1) and observe the changes.

```
Dell@DESKTOP-OPCO1NF MINGW64 ~/Lab-03 (main)
$ git reset --hard HEAD-1
HEAD is now at da3bb88 Local change again
```