

FATIMA JINNAH WOMEN UNIVERSITY

Department of Software Engineering



LAB #03

SUBJECT: CLOUD COMPUTING

SUBMITTED TO: SIR MUHAMMAD SHOAIB

SUBMITTED BY: UMBER QASIM

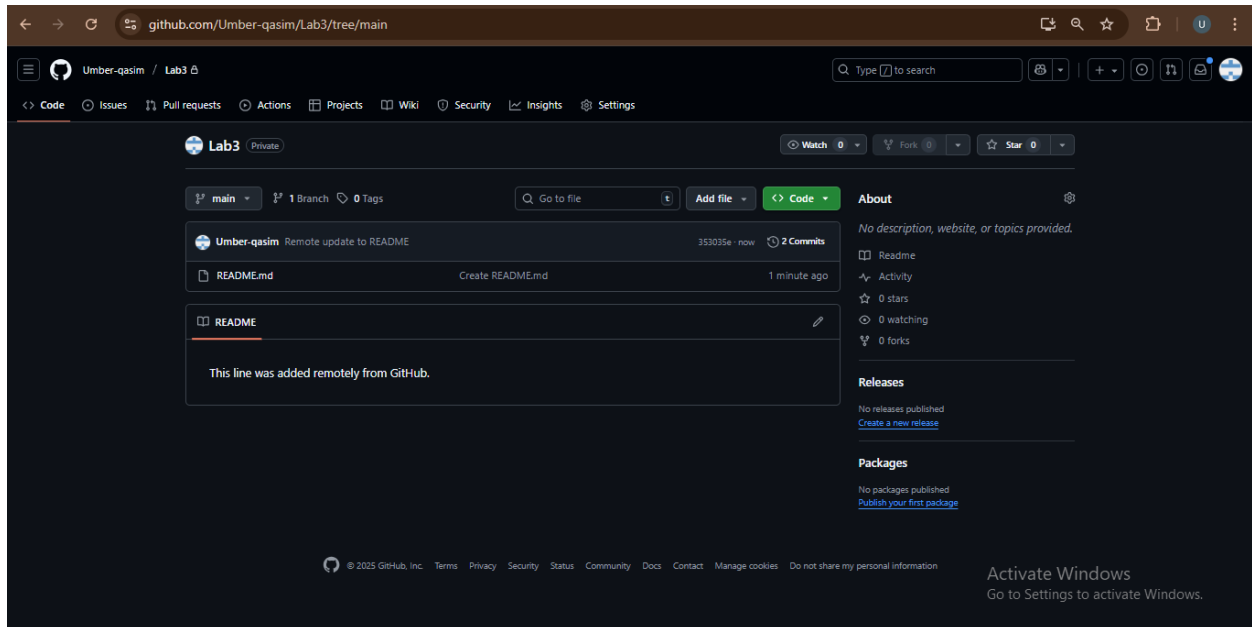
REGISTRATION NO: 2023-BSE-066

CLASS: BSSE V-B

Working with Git History, Stashing, and Reverting Commits

Task#01: Handling Local and Remote Commit Conflicts (Pull vs Pull --rebase)

Remote edit on GitHub



Make a local change

```
HP@DESKTOP-BGNOK42 MINGW64 ~/CC-UmberQasim-066 (main)
$ git clone https://github.com/Umber-qasim/Lab3.git
Cloning into 'Lab3'...
remote: Enumerating objects: 4, done.
remote: Counting objects: 100% (4/4), done.
remote: Compressing objects: 100% (2/2), done.
remote: Total 4 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
Receiving objects: 100% (4/4), done.

HP@DESKTOP-BGNOK42 MINGW64 ~/CC-UmberQasim-066 (main)
$ cd Lab3

HP@DESKTOP-BGNOK42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main)
$ dir
README.md

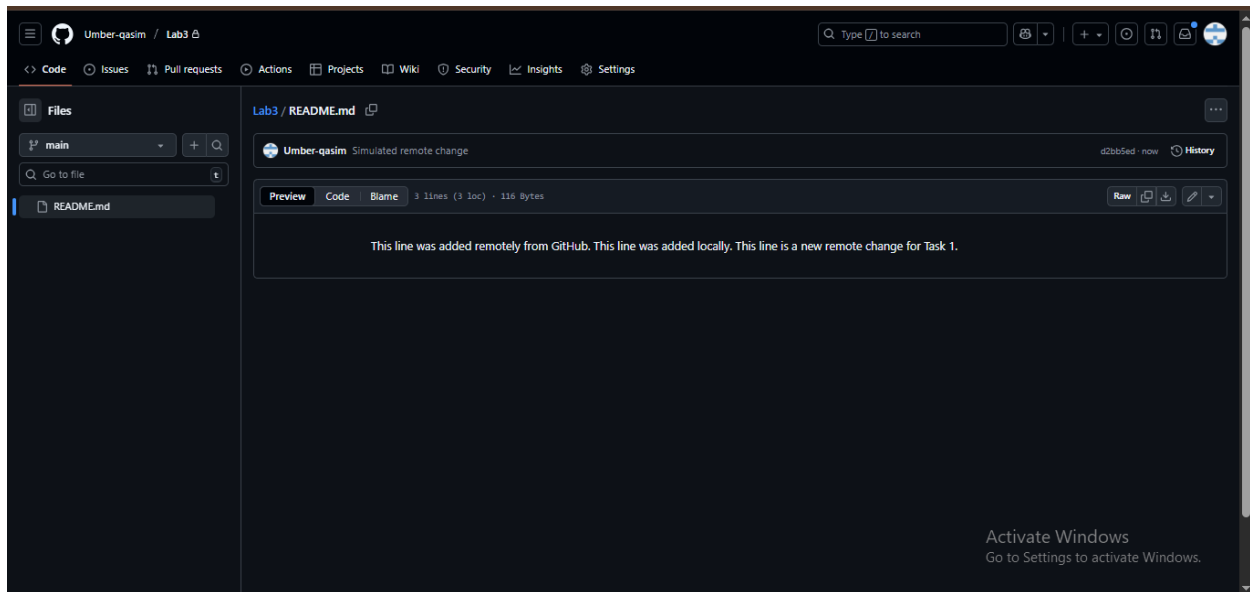
HP@DESKTOP-BGNOK42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main)
$ dir
README.md Screenshots

HP@DESKTOP-BGNOK42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main)
$ notepad README.md

HP@DESKTOP-BGNOK42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main)
$ git add README.md

HP@DESKTOP-BGNOK42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main)
$ git commit -m "Local update to README"
[main 0c3fcfd] Local update to README
1 file changed, 1 insertion(+)
```

This time it was pushed successfully so we try again:



```
HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main)
$ notepad README.md

HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main)
$ git add README.md

HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main)
$ git commit -m "Simulated local change"
[main 53e1b19] Simulated local change
1 file changed, 1 insertion(+)
```

Try pushing local change

```
HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main)
$ git push origin main
To https://github.com/Umber-qasim/Lab3.git
 ! [rejected]        main -> main (fetch first)
error: failed to push some refs to 'https://github.com/Umber-qasim/Lab3.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.
```

Pull with merge

```

HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main)
$ git pull --no-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), 977 bytes | 108.00 KiB/s, done.
From https://github.com/Umber-qasim/Lab3
 * branch          main      -> FETCH_HEAD
   0c3fcfd..d2bb5ed  main      -> origin/main
Auto-merging README.md
CONFLICT (content): Merge conflict in README.md
Automatic merge failed; fix conflicts and then commit the result.

HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main|MERGING)
$ git status
On branch main
Your branch and 'origin/main' have diverged,
and have 1 and 1 different commits each, respectively.
(use "git pull" if you want to integrate the remote branch with yours)

You have unmerged paths.
  (fix conflicts and run "git commit")
  (use "git merge --abort" to abort the merge)

Unmerged paths:
  (use "git add <file>..." to mark resolution)
        both modified:   README.md

Untracked files:
  (use "git add <file>..." to include in what will be committed)
        Screenshots/

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

HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main|MERGING)
$ notepad README.md

HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main|MERGING)
$ git add README.md

HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main|MERGING)
$ git commit -m "Resolved merge conflict in README.md"
[main 09db57d] Resolved merge conflict in README.md

```

Push after merge

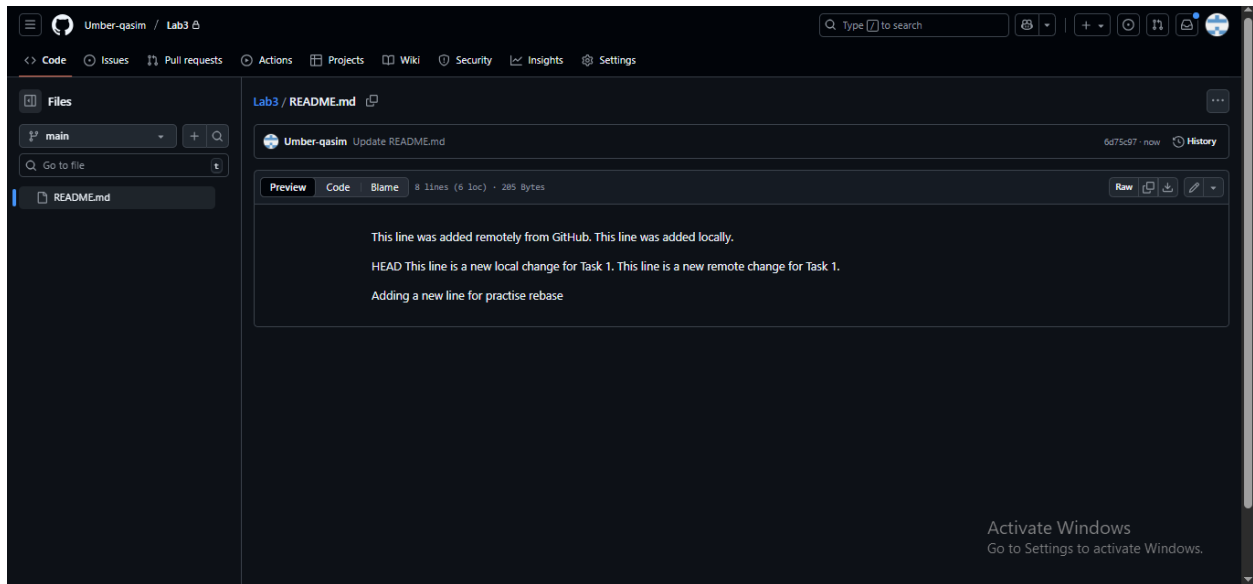
```

HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main)
$ git push -u origin main
Enumerating objects: 10, done.
Counting objects: 100% (10/10), done.
Delta compression using up to 4 threads
Compressing objects: 100% (4/4), done.
Writing objects: 100% (6/6), 667 bytes | 667.00 KiB/s, done.
Total 6 (delta 1), reused 0 (delta 0), pack-reused 0 (from 0)
remote: Resolving deltas: 100% (1/1), done.
To https://github.com/Umber-qasim/Lab3.git
   d2bb5ed..09db57d  main -> main
branch 'main' set up to track 'origin/main'.

```

Rebase practice

Make another remote edit on GitHub README.md



Same as locally

```
HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main)
$ notepad README.md

HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main)
$ git add README.md

HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main)
$ git commit -m "Another local update for rebase"
[main 21d852b] Another local update for rebase
1 file changed, 2 insertions(+), 1 deletion(-)
```

Pull with rebase

```

HP@DESKTOP-BGNOK42 MINGW64 ~/CC-UmberQasim-066/Lab3 (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 1), reused 0 (delta 0), pack-reused 0 (from 0)
Unpacking objects: 100% (3/3), 966 bytes | 96.00 KiB/s, done.
From https://github.com/Umber-qasim/Lab3
 * branch      main      -> FETCH_HEAD
 * 09db57d..6d75c97 main  -> origin/main
Auto-merging README.md
CONFLICT (content): Merge conflict in README.md
error: could not apply 21d852b... Another local update for rebase
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 21d852b... # Another local update for rebase

HP@DESKTOP-BGNOK42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main|REBASE 1/1)
$ git status
interactive rebase in progress; onto 6d75c97
Last command done (1 command done):
  pick 21d852b # Another local update for rebase
No commands remaining.
You are currently rebasing branch 'main' on '6d75c97'.
  (fix conflicts and then run "git rebase --continue")
  (use "git rebase --skip" to skip this patch)
  (use "git rebase --abort" to check out the original branch)

Unmerged paths:
  (use "git restore --staged <file>..." to unstage)
  (use "git add <file>..." to mark resolution)
        both modified:   README.md

Untracked files:
  (use "git add <file>..." to include in what will be committed)
        Screenshots/

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

HP@DESKTOP-BGNOK42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main|REBASE 1/1)
$ notepad README.md

HP@DESKTOP-BGNOK42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main|REBASE 1/1)
$ git add README.md

HP@DESKTOP-BGNOK42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main|REBASE 1/1)
$ git rebase --continue
[detached HEAD f0932a0] Another local update for rebase
 1 file changed, 4 insertions(+)
Successfully rebased and updated refs/heads/main.

```

Push after rebase

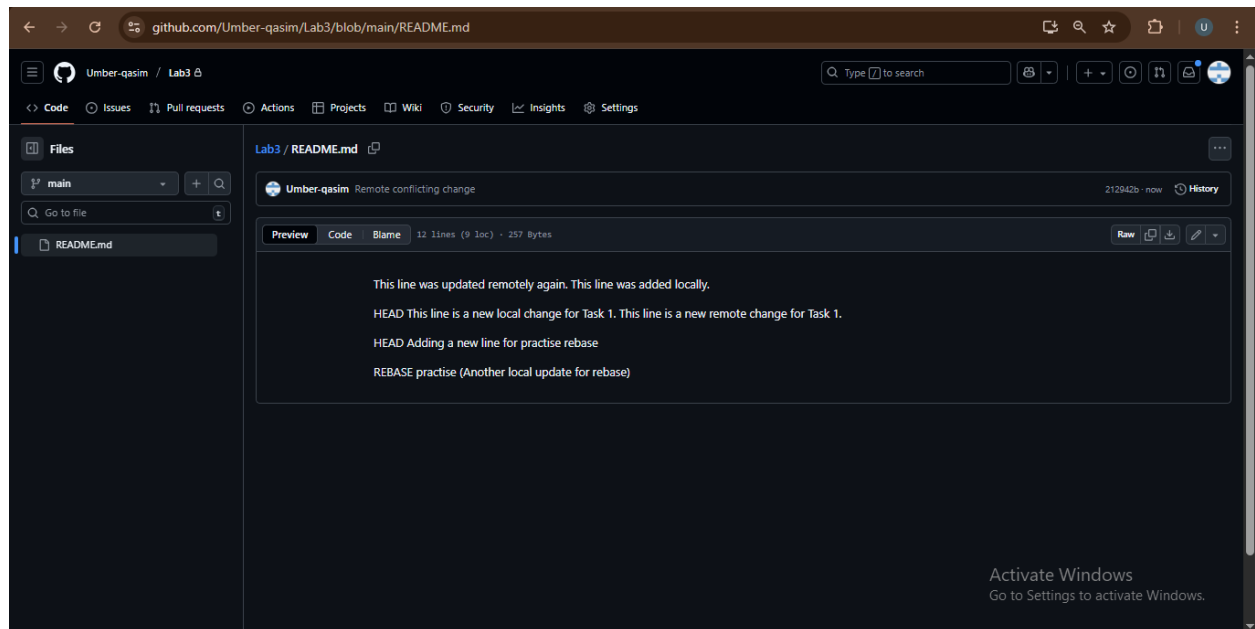
```

HP@DESKTOP-BGNOK42 MINGW64 ~/CC-UmberQasim-066/Lab3 (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), 359 bytes | 359.00 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/Umber-qasim/Lab3.git
  6d75c97..f0932a0 main -> main
branch 'main' set up to track 'origin/main'.

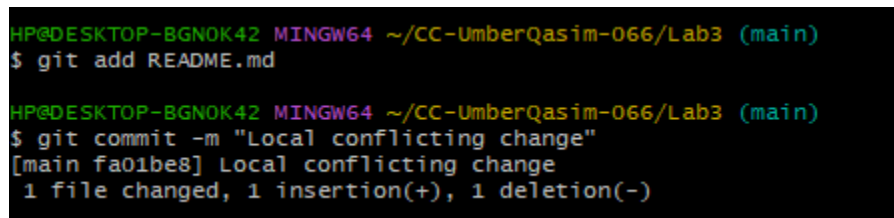
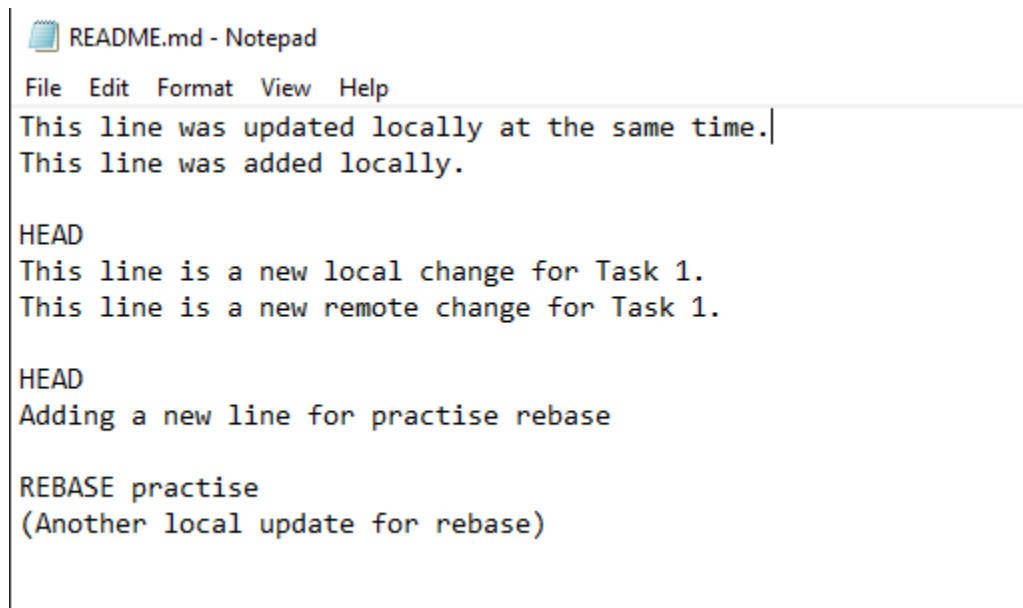
```

Task#02: Creating and Resolving Merge Conflicts Manually

Remote conflicting edit (GitHub)



Local conflicting edit



Try to push

```
HP@DESKTOP-BGNOK42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main)
$ git push -u origin main
To https://github.com/Umber-qasim/Lab3.git
 ! [rejected]        main -> main (fetch first)
error: failed to push some refs to 'https://github.com/Umber-qasim/Lab3.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.
```

Pull with rebase

```
HP@DESKTOP-BGNOK42 MINGW64 ~/CC-UmberQasim-066/Lab3 (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 1), reused 0 (delta 0), pack-reused 0 (from 0)
Unpacking objects: 100% (3/3), 970 bytes | 88.00 KiB/s, done.
From https://github.com/Umber-qasim/Lab3
 * branch            main      -> FETCH_HEAD
 * f0932a0..212942b    main      -> origin/main
Auto-merging README.md
CONFLICT (content): Merge conflict in README.md
error: could not apply fa01be8... Local conflicting 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 --
hint: abort".
hint: Disable this message with "git config set advice.mergeConflict false"
could not apply fa01be8... # Local conflicting change
```

Resolve conflict manually

```
README.md - Notepad
File Edit Format View Help
HEAD
This line was updated remotely again.
This line was updated locally at the same time.
|(Local conflicting change)
This line was added locally.

HEAD
This line is a new local change for Task 1.
This line is a new remote change for Task 1.

HEAD
Adding a new line for practise rebase

REBASE practise
(Another local update for rebase)
```


Mark conflict as resolved & continue rebase

```
HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main|REBASE 1/1)
$ git add README.md
fatal: pathspec 'README.md' did not match any files

HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main|REBASE 1/1)
$ git add README.md

HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main|REBASE 1/1)
$ git rebase --continue
[detached HEAD 5679928] Local conflicting change
1 file changed, 3 insertions(+)
Successfully rebased and updated refs/heads/main.
```

Push after resolving conflict

```
HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (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), 358 bytes | 358.00 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/Umberr-qasim/Lab3.git
212942b..5679928 main -> main
branch 'main' set up to track 'origin/main'.
```

Task#03: Managing Ignored Files with .gitignore and Removing Tracked Files

Create a folder textfiles with three text files inside it

```
HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main)
$ mkdir textfiles

HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main)
$ echo "File A content" > textfiles/a.txt
$ echo "File B content" > textfiles/b.txt
$ echo "File C content" > textfiles/c.txt
```

Stage and commit the new directory

```

HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (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

HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main)
$ git commit -m "Added textfiles directory with three files"
[main d596c11] Added textfiles directory with three files
21 files changed, 3 insertions(+)
create mode 100644 Screenshots/conflict_message.png
create mode 100644 Screenshots/conflict_push_error.png
create mode 100644 Screenshots/desktop.ini
create mode 100644 Screenshots/local_commit.png
create mode 100644 Screenshots/local_commit2.png
create mode 100644 Screenshots/local_conflict_commit.png
create mode 100644 Screenshots/local_conflict_edit.png
create mode 100644 Screenshots/merge_commit.png
create mode 100644 Screenshots/push_after_merge.png
create mode 100644 Screenshots/push_after_rebase.png
create mode 100644 Screenshots/push_after_resolve.png
create mode 100644 Screenshots/push_error.png
create mode 100644 Screenshots/rebase_continue.png
create mode 100644 Screenshots/rebase_pull.png
create mode 100644 Screenshots/remote_conflict_edit.png
create mode 100644 Screenshots/remote_edit.png
create mode 100644 Screenshots/remote_edit2.png
create mode 100644 Screenshots/resolved_readme.png
create mode 100644 textfiles/a.txt
create mode 100644 textfiles/b.txt
create mode 100644 textfiles/c.txt

HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main)
$ git push origin main
Enumerating objects: 26, done.
Counting objects: 100% (26/26), done.
Delta compression using up to 4 threads
Compressing objects: 100% (22/22), done.
Writing objects: 100% (25/25), 375.36 KiB | 14.44 MiB/s, done.
Total 25 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
To https://github.com/Umber-qasim/Lab3.git
5679928..d596c11 main -> main

```

Create a .gitignore file to ignore textfiles

```

HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main)
$ echo "textfiles/*" > .gitignore

```

Stage & commit .gitignore

```

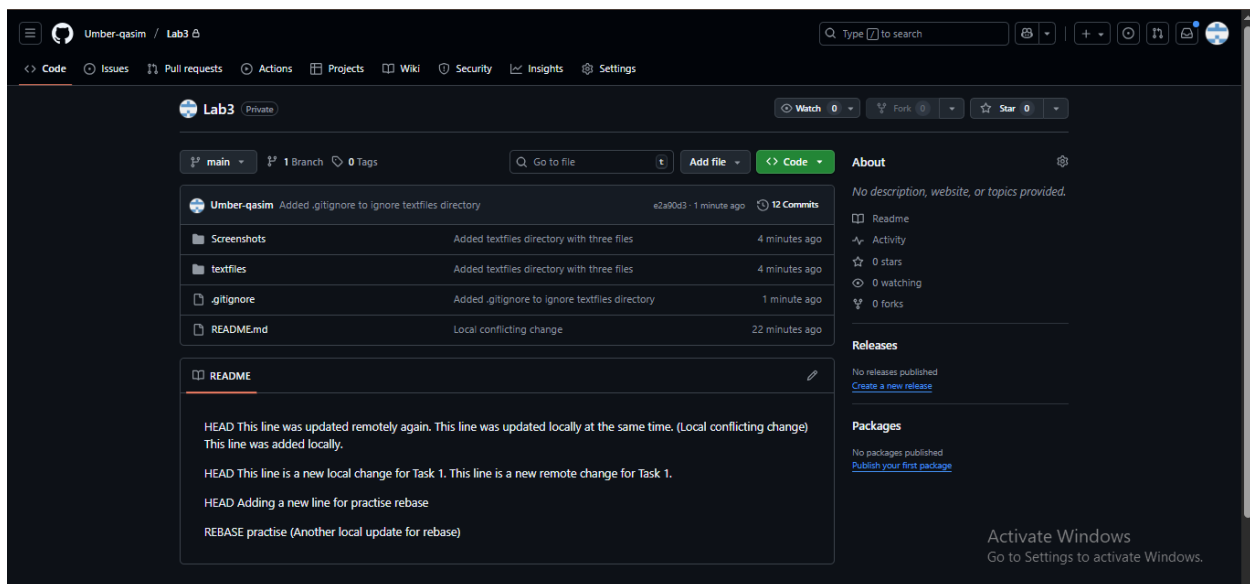
HP@DESKTOP-BGNOK42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main)
$ git add .gitignore
warning: in the working copy of '.gitignore', LF will be replaced by CRLF the next time Git touches it

HP@DESKTOP-BGNOK42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main)
$ git commit -m "Added .gitignore to ignore textfiles directory"
[main e2a90d3] Added .gitignore to ignore textfiles directory
1 file changed, 1 insertion(+)
create mode 100644 .gitignore

HP@DESKTOP-BGNOK42 MINGW64 ~/CC-UmberQasim-066/Lab3 (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), 391 bytes | 391.00 KiB/s, done.
Total 3 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
To https://github.com/Umberr-qasim/Lab3.git
d596c11..e2a90d3  main -> main

```

Check repo on GitHub



Reason: **Git already tracked the files before .gitignore**

Remove tracked files but keep locally

```

HP@DESKTOP-BGNOK42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main)
$ git rm -r --cached textfiles
rm 'textfiles/a.txt'
rm 'textfiles/b.txt'
rm 'textfiles/c.txt'

```

Commit & push changes

```

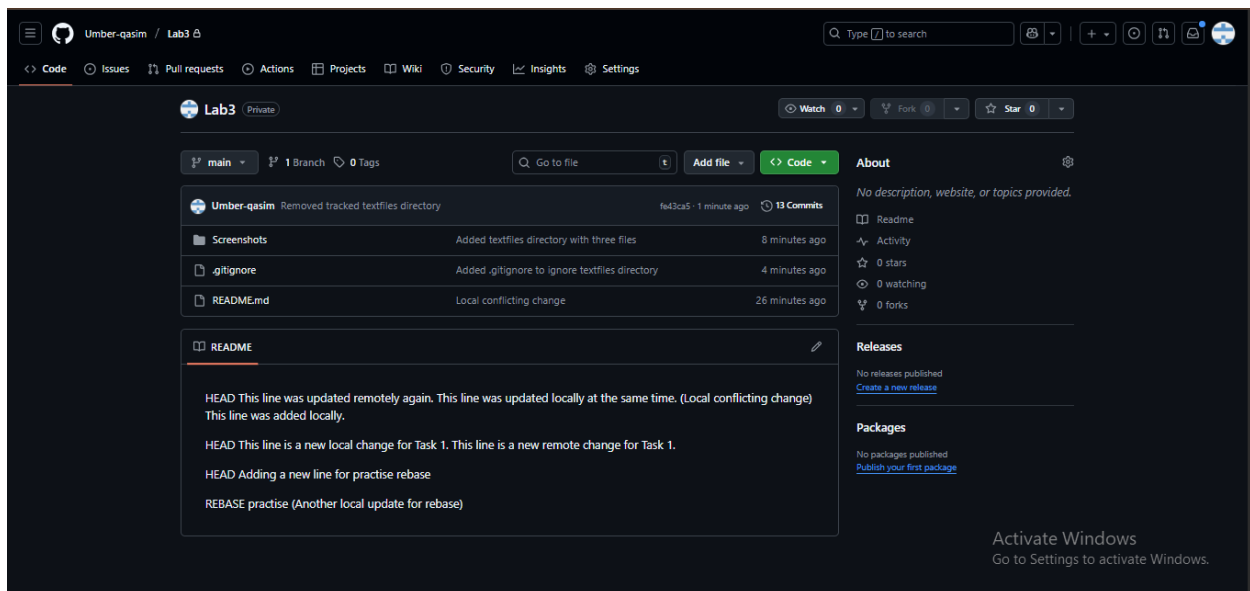
HP@DESKTOP-BGNOK42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main)
$ git add .

HP@DESKTOP-BGNOK42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main)
$ git commit -m "Removed tracked textfiles directory"
[main fe43ca5] 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

HP@DESKTOP-BGNOK42 MINGW64 ~/CC-UmberQasim-066/Lab3 (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), 245 bytes | 245.00 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/Umber-qasim/Lab3.git
e2a90d3..fe43ca5 main -> main

```

Check GitHub repo



Task#04: Create Temporary Changes and Use git stash

Create a new branch feature-branch then modify README.md and commit

```

HP@DESKTOP-BGNOK42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main)
$ git checkout -b feature-branch
Switched to a new branch 'feature-branch'

HP@DESKTOP-BGNOK42 MINGW64 ~/CC-UmberQasim-066/Lab3 (feature-branch)
$ notepad README.md

```

README.md - Notepad

File Edit Format View Help

HEAD

This line was updated remotely again.
This line was updated locally at the same time.
(Local conflicting change)
This line was added locally.

HEAD

This line is a new local change for Task 1.
This line is a new remote change for Task 1.

HEAD

Adding a new line for practise rebase

REBASE practise

(Another local update for rebase)

This is a temporary change for feature-branch.|

Stage & commit:

```
HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (feature-branch)
$ git add README.md

HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (feature-branch)
$ git commit -m "Changes the README.md file"
[feature-branch 7815eee] Changes the README.md file
1 file changed, 2 insertions(+)
```

Make new uncommitted changes

```
HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (feature-branch)
$ notepad README.md
```

README.md - Notepad

File Edit Format View Help

HEAD

This line was updated remotely again.
This line was updated locally at the same time.
(Local conflicting change)
This line was added locally.

HEAD

This line is a new local change for Task 1.
This line is a new remote change for Task 1.

HEAD

Adding a new line for practise rebase

REBASE practise

(Another local update for rebase)

This is a temporary change for feature-branch.
Adding some more test lines without committing.|

Try switching branch

```
HP@DESKTOP-BGNOK42 MINGW64 ~/CC-UmberQasim-066/Lab3 (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
```

Stash your changes

```
HP@DESKTOP-BGNOK42 MINGW64 ~/CC-UmberQasim-066/Lab3 (feature-branch)
$ git stash
Saved working directory and index state WIP on feature-branch: 7815ee Changes the READM
E.md file
```

Switch branch (now it works)

```
HP@DESKTOP-BGNOK42 MINGW64 ~/CC-UmberQasim-066/Lab3 (feature-branch)
$ git checkout main
Switched to branch 'main'
Your branch is up to date with 'origin/main'.
```

Return to feature-branch

```
HP@DESKTOP-BGNOK42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main)
$ git checkout feature-branch
Switched to branch 'feature-branch'
```

Check working directory status

```
HP@DESKTOP-BGNOK42 MINGW64 ~/CC-UmberQasim-066/Lab3 (feature-branch)
$ git status
On branch feature-branch
Untracked files:
  (use "git add <file>..." to include in what will be committed)
    Screenshots/gitignore_push.png
    Screenshots/push_textfiles.png
    Screenshots/repo_still_has_textfiles.png
    Screenshots/repo_textfiles_removed.png
    Screenshots/rm_cached_push.png

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

Restore stashed changes

```
HP@DESKTOP-BGNOK42 MINGW64 ~/CC-UmberQasim-066/Lab3 (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

Untracked files:
  (use "git add <file>..." to include in what will be committed)
    Screenshots/gitignore_push.png
    Screenshots/push_textfiles.png
    Screenshots/repo_still_has_textfiles.png
    Screenshots/repo_textfiles_removed.png
    Screenshots/rm_cached_push.png

no changes added to commit (use "git add" and/or "git commit -a")
Dropped refs/stash@{0} (9b0f882ba0c272ba636c8ac4c7e24c2dbb3a659c)
```

Task#05: Checkout a Specific Commit Using git log

View commit history

```
HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (feature-branch)
$ git log --oneline
7815eee (HEAD -> feature-branch) Changes the README.md file
fe43ca5 (origin/main, origin/HEAD, main) Removed tracked textfiles directory
e2a90d3 Added .gitignore to ignore textfiles directory
d596c11 Added textfiles directory with three files
5679928 Local conflicting change
212942b Remote conflicting change
f0932a0 Another local update for rebase
6d75c97 Update README.md
09db57d Resolved merge conflict in README.md
53e1b19 Simulated local change
d2bb5ed Simulated remote change
0c3fcfd Local update to README
353035e Remote update to README
8262c0d Create README.md
```

Copy any **previous commit hash**

```
HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (feature-branch)
$ git checkout 6d75c97
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

HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (feature-branch)
$ git stash
Saved working directory and index state WIP on feature-branch: 7815eee Changes the READM
E.md file

HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (feature-branch)
$ git checkout 6d75c97
Note: switching to '6d75c97'.

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 6d75c97 Update README.md
```

Return to main branch

```

HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 ((6d75c97...))
$ git checkout main
Previous HEAD position was 6d75c97 Update README.md
Switched to branch 'main'
Your branch is up to date with 'origin/main'.

HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main)
$ git stash pop
Auto-merging README.md
CONFLICT (content): Merge conflict in README.md
On branch main
Your branch is up to date with 'origin/main'.

Unmerged paths:
  (use "git restore --staged <file>..." to unstage)
  (use "git add <file>..." to mark resolution)
    both modified:   README.md

Untracked files:
  (use "git add <file>..." to include in what will be committed)
    Screenshots/back_to_feature.png
    Screenshots/branch_switched.png
    Screenshots/checkout_error.png
    Screenshots/gitignore_push.png
    Screenshots/modified_readme.png
    Screenshots/push_textfiles.png
    Screenshots/repo_still_has_textfiles.png
    Screenshots/repo_textfiles_removed.png
    Screenshots/rm_cached_push.png
    Screenshots/stash_command.png
    Screenshots/stash_pop.png
    Screenshots/status_clean.png

no changes added to commit (use "git add" and/or "git commit -a")
The stash entry is kept in case you need it again.

```

Task#06: Resetting Commits (Soft vs Hard Reset) (With Verification Steps)

Add a new line in any file and commit it

```

HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main)
$ notepad README.MD

HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main)
$ git add .

HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main)
$ git commit -m "Added test line"
[main Odd21e1] Added test line
16 files changed, 8 insertions(+)
create mode 100644 Screenshots/back_to_feature.png
create mode 100644 Screenshots/back_to_main.png
create mode 100644 Screenshots/branch_switched.png
create mode 100644 Screenshots/checkout_error.png
create mode 100644 Screenshots/detached_head.png
create mode 100644 Screenshots/gitignore_push.png
create mode 100644 Screenshots/log_before_checkout.png
create mode 100644 Screenshots/modified_readme.png
create mode 100644 Screenshots/push_textfiles.png
create mode 100644 Screenshots/repo_still_has_textfiles.png
create mode 100644 Screenshots/repo_textfiles_removed.png
create mode 100644 Screenshots/rm_cached_push.png
create mode 100644 Screenshots/stash_command.png
create mode 100644 Screenshots/stash_pop.png
create mode 100644 Screenshots/status_clean.png

```

Add another change and commit again


```
HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main)
$ notepad README.MD

HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main)
$ git add .

HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main)
$ git commit -m "Second test commit"
[main 80de95b] Second test commit
1 file changed, 2 insertions(+), 1 deletion(-)
```

View commit history before reset

```
HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main)
$ git log --oneline
80de95b (HEAD -> main) Second test commit
0dd21e1 Added test line
fe43ca5 (origin/main, origin/HEAD) Removed tracked textfiles directory
e2a90d3 Added .gitignore to ignore textfiles directory
d596c11 Added textfiles directory with three files
5679928 Local conflicting change
212942b Remote conflicting change
f0932a0 Another local update for rebase
6d75c97 Update README.md
09db57d Resolved merge conflict in README.md
53e1b19 Simulated local change
d2bb5ed Simulated remote change
0c3fcfd Local update to README
353035e Remote update to README
8262c0d Create README.md
```

Confirm both changes are in the file



README.md - Notepad

File Edit Format View Help

HEAD

This line was updated remotely again.
This line was updated locally at the same time.
(Local conflicting change)
This line was added locally.

HEAD

This line is a new local change for Task 1.
This line is a new remote change for Task 1.

HEAD

Adding a new line for practise rebase

REBASE practise

(Another local update for rebase)

<<<<<< Updated upstream

=====

This is a temporary change for feature-branch.
Adding some more test lines without committing.
>>>>>> Stashed changes

First test line

Second test line

Perform a soft reset


```
HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main)
$ notepad README.MD

HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main)
$ git reset --soft HEAD~1
```

Check commit history again

```
HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main)
$ git log --oneline
0dd21e1 (HEAD -> main) Added test line
fe43ca5 (origin/main, origin/HEAD) Removed tracked textfiles directory
e2a90d3 Added .gitignore to ignore textfiles directory
d596c11 Added textfiles directory with three files
5679928 Local conflicting change
212942b Remote conflicting change
f0932a0 Another local update for rebase
6d75c97 Update README.md
09db57d Resolved merge conflict in README.md
53e1b19 Simulated local change
d2bb5ed Simulated remote change
0c3fcfd Local update to README
353035e Remote update to README
8262c0d Create README.md
```

Check file content after soft reset

 README.md - Notepad

File Edit Format View Help

HEAD

This line was updated remotely again.
This line was updated locally at the same time.
(Local conflicting change)
This line was added locally.

HEAD

This line is a new local change for Task 1.
This line is a new remote change for Task 1.

HEAD

Adding a new line for practise rebase

REBASE practise

(Another local update for rebase)

<<<<<< Updated upstream

=====

This is a temporary change for feature-branch.
Adding some more test lines without committing.
>>>>>> Stashed changes

First test line

Second test line

Check git status

```
HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main)
$ git status
On branch main
Your branch is ahead of 'origin/main' by 1 commit.
  (use "git push" to publish your local commits)

Changes to be committed:
  (use "git restore --staged <file>..." to unstage)
        modified:   README.md
```

If it shows staged changes, you can re-commit:

```
HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main)
$ git commit -m "Second Test commit"
[main 8532149] Second Test commit
 1 file changed, 2 insertions(+), 1 deletion(-)
```

Perform a hard reset

```
HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main)
$ git reset --hard HEAD~1
HEAD is now at Odd21e1 Added test line
```

Check commit history again

```
HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main)
$ git log --oneline
Odd21e1 (HEAD -> main) Added test line
fe43ca5 (origin/main, origin/HEAD) Removed tracked textfiles directory
e2a90d3 Added .gitignore to ignore textfiles directory
d596c11 Added textfiles directory with three files
5679928 Local conflicting change
212942b Remote conflicting change
f0932a0 Another local update for rebase
6d75c97 Update README.md
09db57d Resolved merge conflict in README.md
53e1b19 Simulated local change
d2bb5ed Simulated remote change
0c3fcfd Local update to README
353035e Remote update to README
8262c0d Create README.md
```

Open file again

README.md - Notepad

File Edit Format View Help

HEAD

This line was updated remotely again.
This line was updated locally at the same time.
(Local conflicting change)
This line was added locally.

HEAD

This line is a new local change for Task 1.
This line is a new remote change for Task 1.

HEAD

Adding a new line for practise rebase

REBASE practise

(Another local update for rebase)

<<<<<< Updated upstream
=====

This is a temporary change for feature-branch.
Adding some more test lines without committing.
>>>>>> Stashed changes

First test line

Check git status

```
HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (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#07: Amending the Last Commit

Amending the Last Commit

Make a small change in README.md file and Stage & commit normally

```

HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main)
$ notepad README.MD

HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main)
$ git add .

HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main)
$ git commit -m "Fix log message"
[main 732b4bf] Fix log message
14 files changed, 2 insertions(+), 1 deletion(-)
create mode 100644 Screenshots/file_after_commit_soft_reset.png
create mode 100644 Screenshots/file_after_hard_reset.png
create mode 100644 Screenshots/file_after_soft_reset.png
create mode 100644 Screenshots/file_before_reset.png
create mode 100644 Screenshots/first_commit.png
create mode 100644 Screenshots/hard_reset.png
create mode 100644 Screenshots/log_after_hard_reset.png
create mode 100644 Screenshots/log_after_soft_reset.png
create mode 100644 Screenshots/log_before_reset.png
create mode 100644 Screenshots/second_commit.png
create mode 100644 Screenshots/soft_reset.png
create mode 100644 Screenshots/status_after_soft_reset.png
create mode 100644 Screenshots/status_clean_after_hard_reset.png

```

Move back to the same file and add another new line then Stage the new change and amend your last commit

```

HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main)
$ notepad README.MD

HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main)
$ git add .

HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main)
$ git commit --amend
[main 2e54d01] Fix log message
Date: Sun Oct 12 16:34:29 2025 +0500
14 files changed, 3 insertions(+), 1 deletion(-)
create mode 100644 Screenshots/file_after_commit_soft_reset.png
create mode 100644 Screenshots/file_after_hard_reset.png
create mode 100644 Screenshots/file_after_soft_reset.png
create mode 100644 Screenshots/file_before_reset.png
create mode 100644 Screenshots/first_commit.png
create mode 100644 Screenshots/hard_reset.png
create mode 100644 Screenshots/log_after_hard_reset.png
create mode 100644 Screenshots/log_after_soft_reset.png
create mode 100644 Screenshots/log_before_reset.png
create mode 100644 Screenshots/second_commit.png
create mode 100644 Screenshots/soft_reset.png
create mode 100644 Screenshots/status_after_soft_reset.png
create mode 100644 Screenshots/status_clean_after_hard_reset.png

```

Amended commit is complete and active.

```

HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main)
$ git log --oneline -1
2e54d01 (HEAD -> main) Fix log message

```

Task#08: Reverting a Commit (Safe Undo on Remote Branch)

Make a new file and commit it

```
HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main)
$ echo "temporary text" >> temp.txt

HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main)
$ git add .
warning: in the working copy of 'temp.txt', LF will be replaced by CRLF the n
ext time Git touches it

HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main)
$ git commit -m "Added temporary text file"
[main 5c38277] Added temporary text file
3 files changed, 1 insertion(+)
create mode 100644 Screenshots/amend_commit.png
create mode 100644 Screenshots/first_amend_commit.png
create mode 100644 temp.txt

HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main)
$ git push origin main
Enumerating objects: 45, done.
Counting objects: 100% (45/45), done.
Delta compression using up to 4 threads
Compressing objects: 100% (41/41), done.
Writing objects: 100% (42/42), 532.21 KiB | 13.30 MiB/s, done.
Total 42 (delta 5), reused 0 (delta 0), pack-reused 0 (from 0)
remote: Resolving deltas: 100% (5/5), completed with 1 local object.
To https://github.com/Umberr-qasim/Lab3.git
fe43ca5..5c38277 main -> main
```

Check commit history

```
HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main)
$ git log --oneline
5c38277 (HEAD -> main, origin/main, origin/HEAD) Added temporary text file
2e54d01 Fix log message
0dd21e1 Added test line
fe43ca5 Removed tracked textfiles directory
e2a90d3 Added .gitignore to ignore textfiles directory
d596c11 Added textfiles directory with three files
5679928 Local conflicting change
212942b Remote conflicting change
f0932a0 Another local update for rebase
6d75c97 Update README.md
09db57d Resolved merge conflict in README.md
53e1b19 Simulated local change
d2bb5ed Simulated remote change
0c3fcfd Local update to README
353035e Remote update to README
8262c0d Create README.md
```

Revert that commit

```
HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main)
$ git revert 5c38277
[main a433724] Revert "Added temporary text file"
3 files changed, 1 deletion(-)
delete mode 100644 Screenshots/amend_commit.png
delete mode 100644 Screenshots/first_amend_commit.png
delete mode 100644 temp.txt
```

Push the revert commit

```
HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (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), 332 bytes | 332.00 KiB/s, done.
Total 3 (delta 2), reused 0 (delta 0), pack-reused 0 (from 0)
remote: Resolving deltas: 100% (2/2), completed with 2 local objects.
To https://github.com/Umber-qasim/Lab3.git
5c38277..a433724 main -> main
```

Task#09: Force Push (With Caution)

Create a new branch

```
HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main)
$ git checkout -b test-force
Switched to a new branch 'test-force'
```

Make a small change

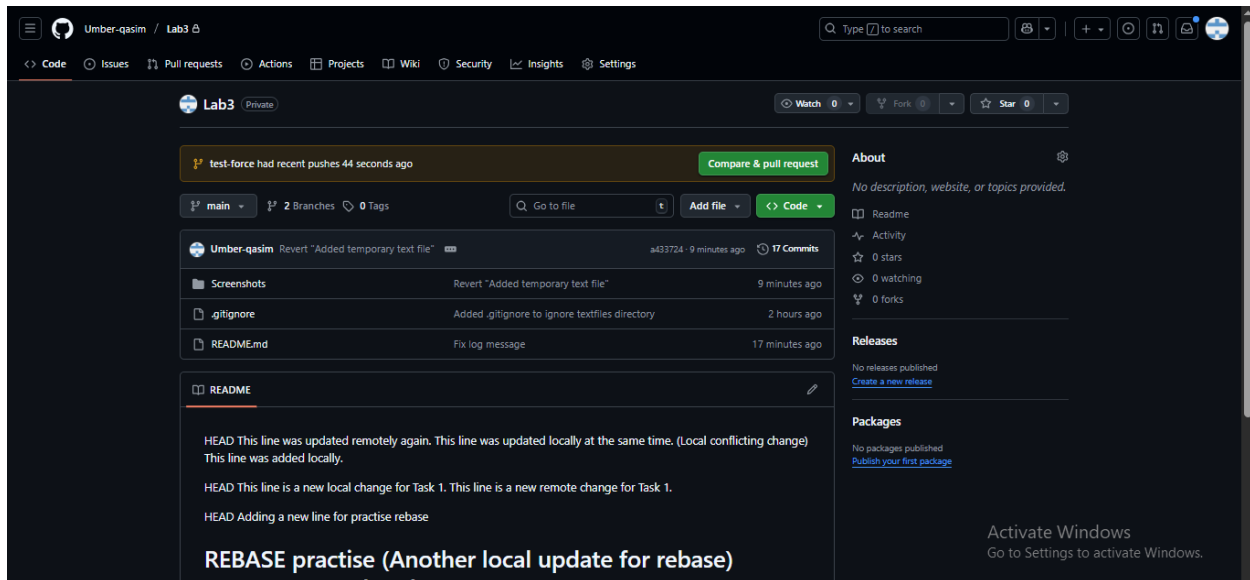
```
HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (test-force)
$ echo "force push test" >> force.txt

HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (test-force)
$ git add .
warning: in the working copy of 'force.txt', LF will be replaced by CRLF the next time Git touches it

HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (test-force)
$ git commit -m "Test commit for force push"
[test-force cda7f86] Test commit for force push
4 files changed, 1 insertion(+)
create mode 100644 Screenshots/commit_temp_file.png
create mode 100644 Screenshots/revert_commit.png
create mode 100644 Screenshots/revert_push.png
create mode 100644 force.txt
```

Push your new branch

```
HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (test-force)
$ git push origin test-force
Enumerating objects: 9, done.
Counting objects: 100% (9/9), done.
Delta compression using up to 4 threads
Compressing objects: 100% (6/6), done.
Writing objects: 100% (7/7), 46.24 KiB | 9.25 MiB/s, done.
Total 7 (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/Umber-qasim/Lab3/pull/new/test-force
remote:
To https://github.com/Umber-qasim/Lab3.git
* [new branch]      test-force -> test-force
```



Perform a hard reset

```
HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (test-force)
$ git reset --hard HEAD~1
HEAD is now at a433724 Revert "Added temporary text file"
```

Try normal push

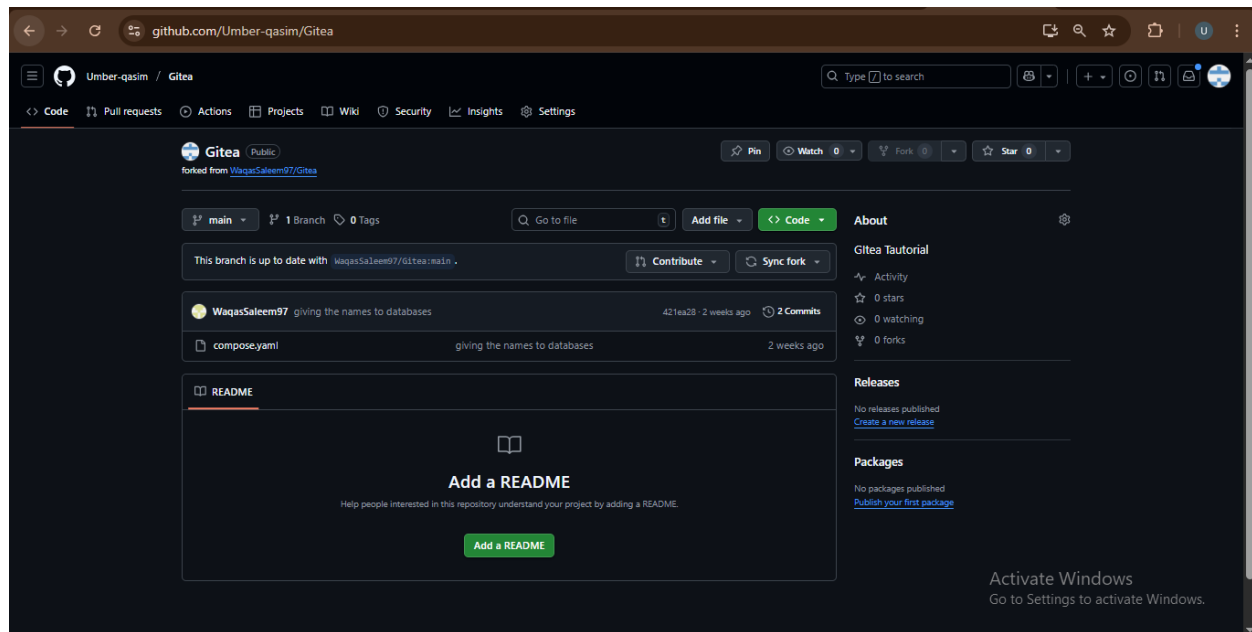
```
HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (test-force)
$ git push origin test-force
To https://github.com/Umber-qasim/Lab3.git
! [rejected]        test-force -> test-force (non-fast-forward)
error: failed to push some refs to 'https://github.com/Umber-qasim/Lab3.git'
hint: Updates were 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.
```

Force push

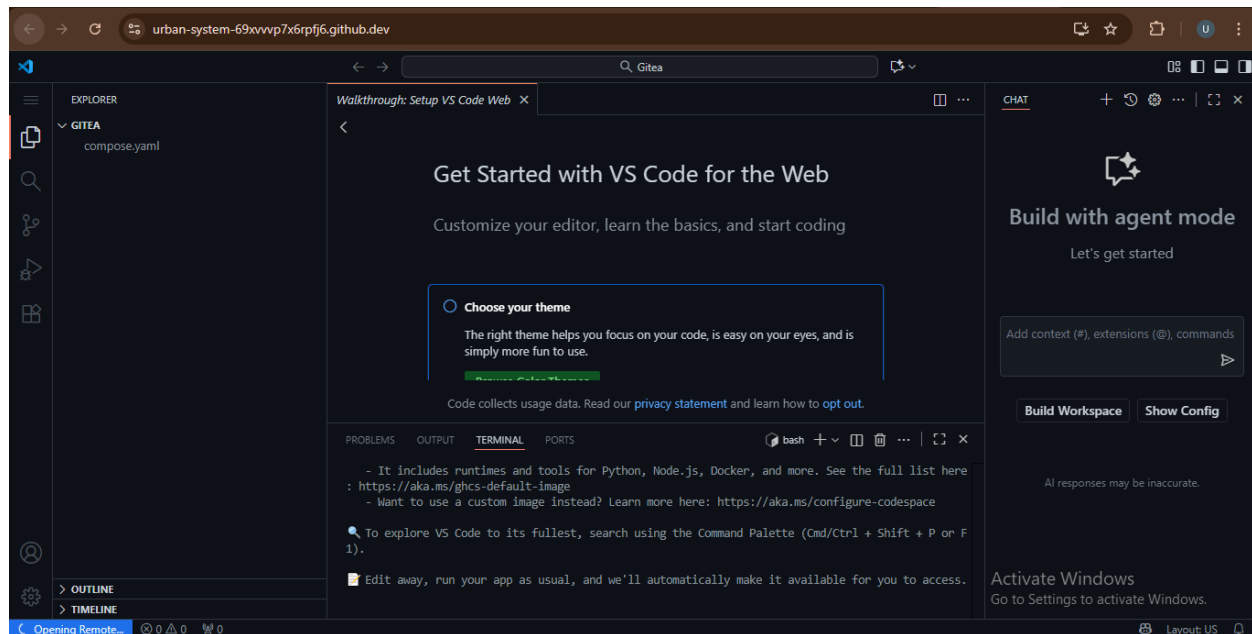
```
HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (test-force)
$ git push origin test-force --force
Total 0 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
To https://github.com/Umber-qasim/Lab3.git
+ cda7f86...a433724 test-force -> test-force (forced update)
```

Task#10: Running Gitea in GitHub Codespaces via Docker Compose

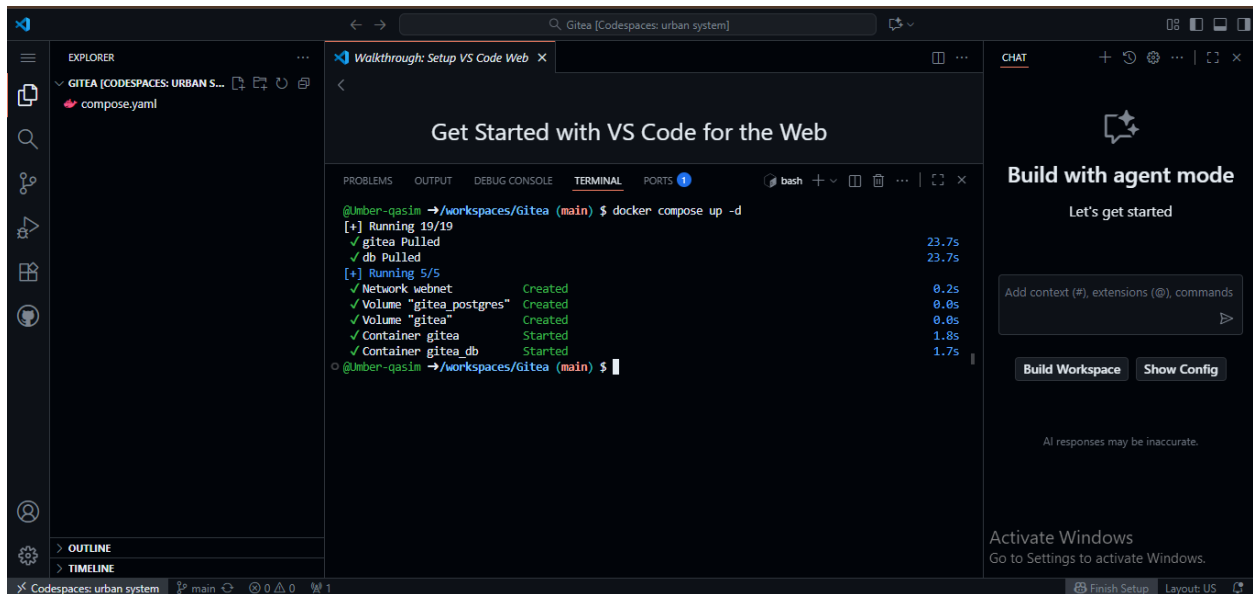
Fork the Repository



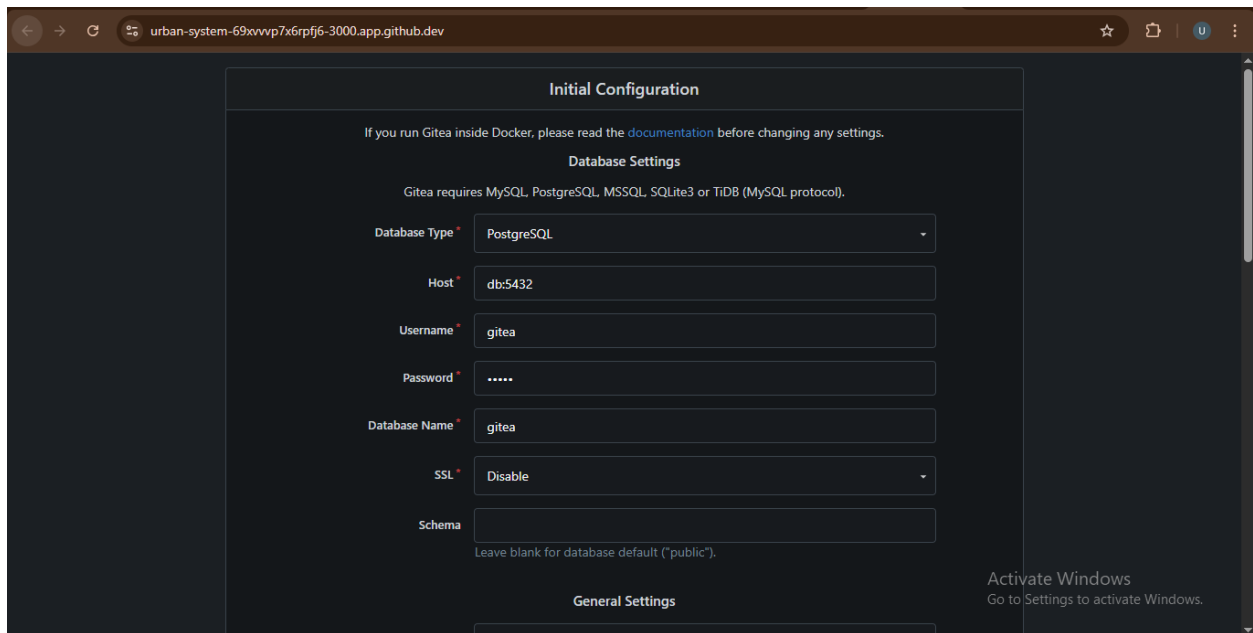
Open the Forked Repo in GitHub Codespaces



Start Gitea with Docker Compose



Access Gitea Web Interface



Install Gitea

The screenshot shows the 'Optional Settings' page of the Gitea installer. The browser address bar shows 'urban-system-69xvvp7x6rpfj6-3000.app.github.dev'. The page has a dark theme. Under the 'Optional Settings' header, there are three expandable sections: 'Email Settings', 'Server and Third-Party Service Settings', and 'Administrator Account Settings' (which is currently expanded). A message states: 'Creating an administrator account is optional. The first registered user will automatically become an administrator.' Below this, there are four input fields: 'Administrator Username' (containing 'admin'), 'Email Address' (containing '23-22411-066@se.fjwu.edu.pk'), 'Password' (masked with dots), and 'Confirm Password' (masked with dots). Below the fields, it says 'These configuration options will be written into: /data/gitea/conf/app.ini' with a copy icon. An 'Install Gitea' button is at the bottom. A Windows watermark is visible in the bottom right corner.

Optional Settings

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

Creating an administrator account is optional. The first registered user will automatically become an administrator.

Administrator Username:

Email Address:

Password:

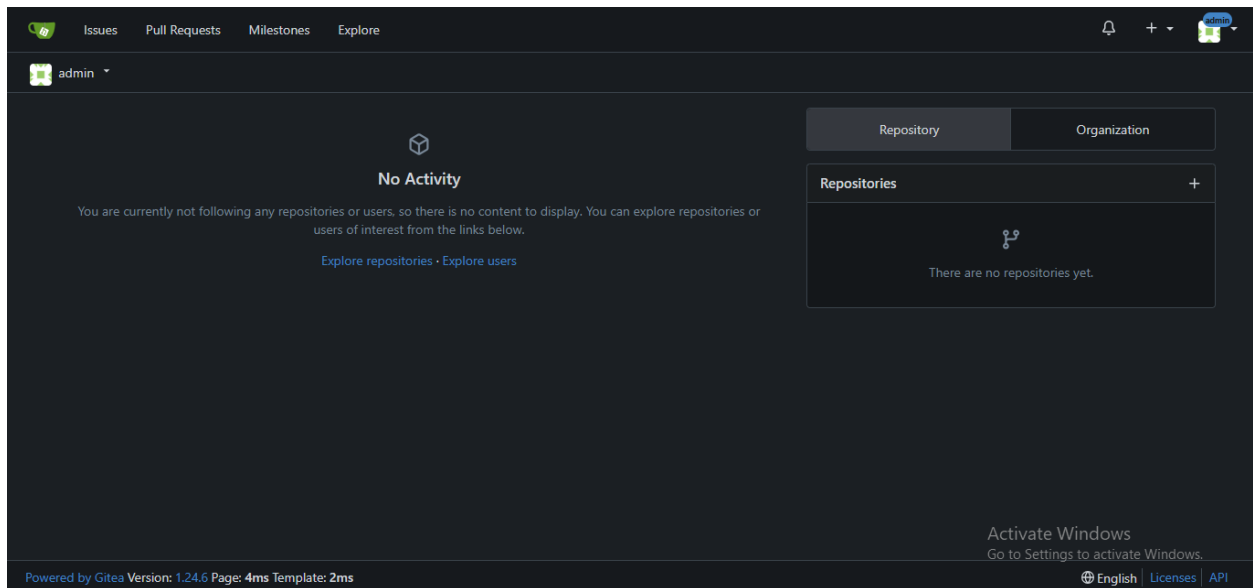
Confirm Password:

These configuration options will be written into: `/data/gitea/conf/app.ini`

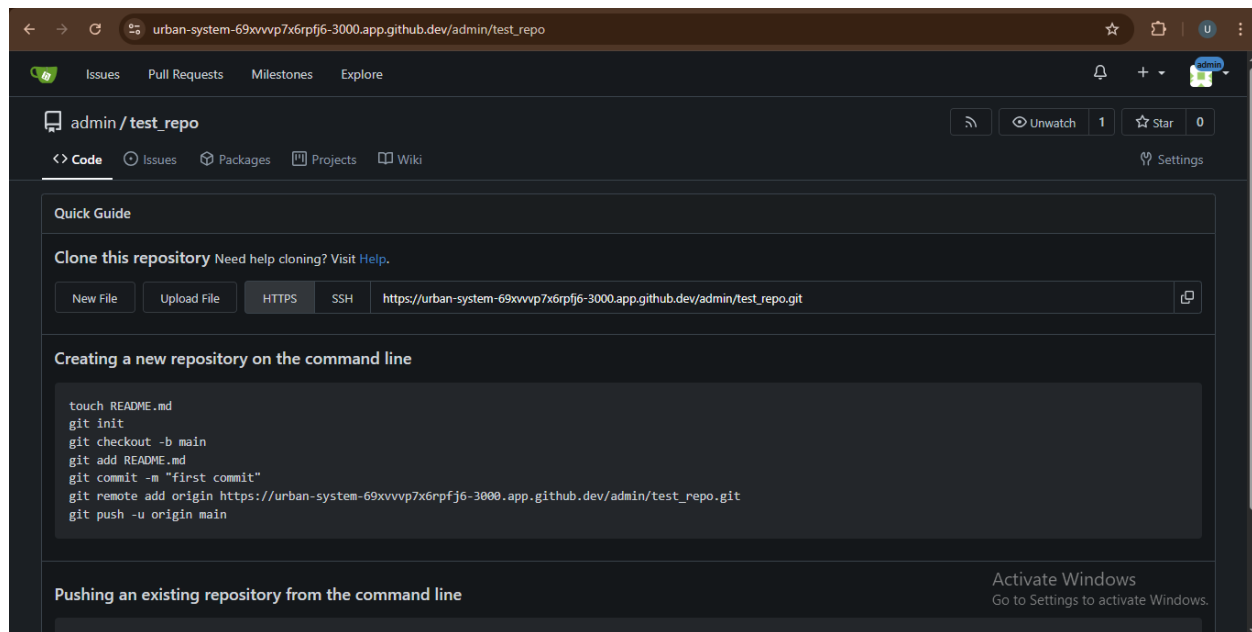
[Install Gitea](#)

Activate Windows
Go to Settings to activate Windows.

Log In

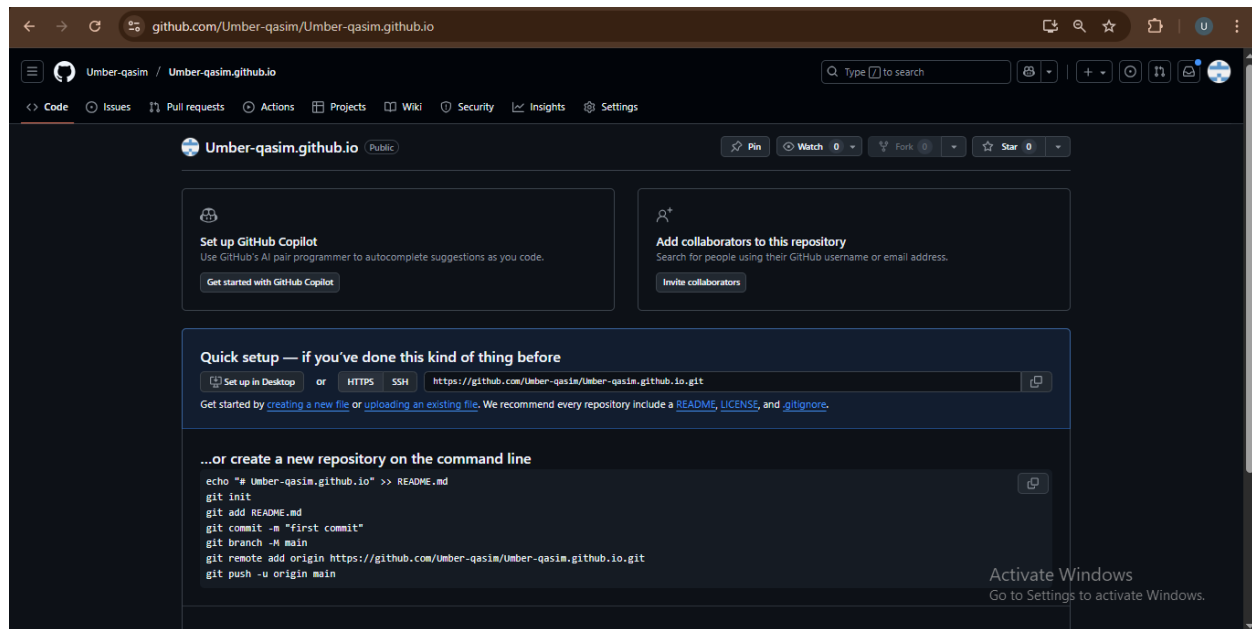


Create a New Repository

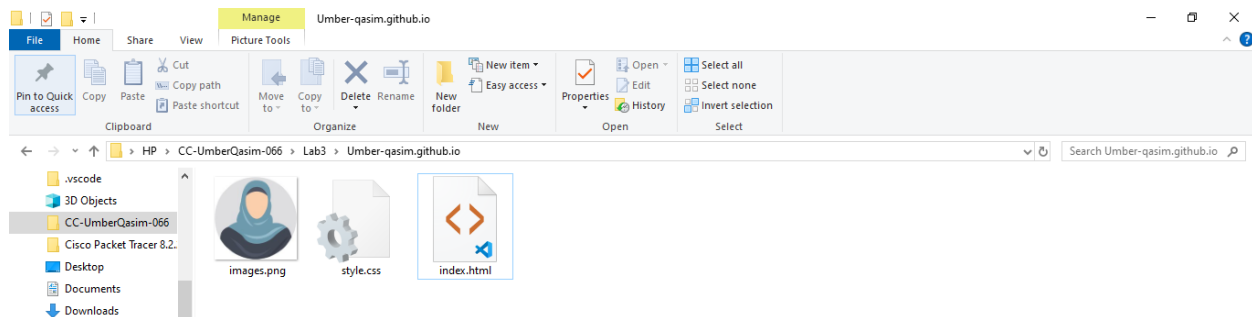


Task#11: Creating a GitHub Pages Portfolio Site

Create a GitHub Pages Repository



Add Static Website Code



Push the Files to GitHub

```
MINGW64:/c/Users/HP/CC-UmberQasim-066/Lab3/Umber-qasim.github.io

HP@DESKTOP-BGN0K42 MINGW64 ~
$ cd "C:\Users\HP\CC-UmberQasim-066\Lab3\Umber-qasim.github.io"

HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3/Umber-qasim.github.io (test-force)
$ ls
images.png  index.html  style.css

HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3/Umber-qasim.github.io (test-force)
$ git init
Initialized empty Git repository in C:/Users/HP/CC-UmberQasim-066/Lab3/Umber-qasim.github.io/.git/

HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3/Umber-qasim.github.io (master)
$ git branch -M main

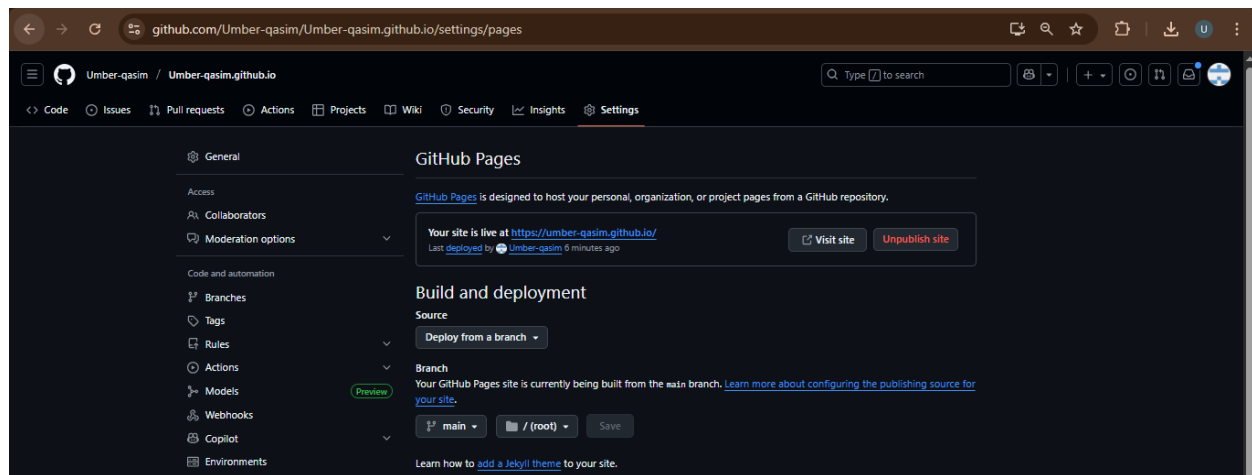
HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3/Umber-qasim.github.io (main)
$ git remote add origin https://github.com/Umber-qasim/Umber-qasim.github.io.git

HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3/Umber-qasim.github.io (main)
$ git add .
warning: in the working copy of 'style.css', LF will be replaced by CRLF the next time G
it touches it

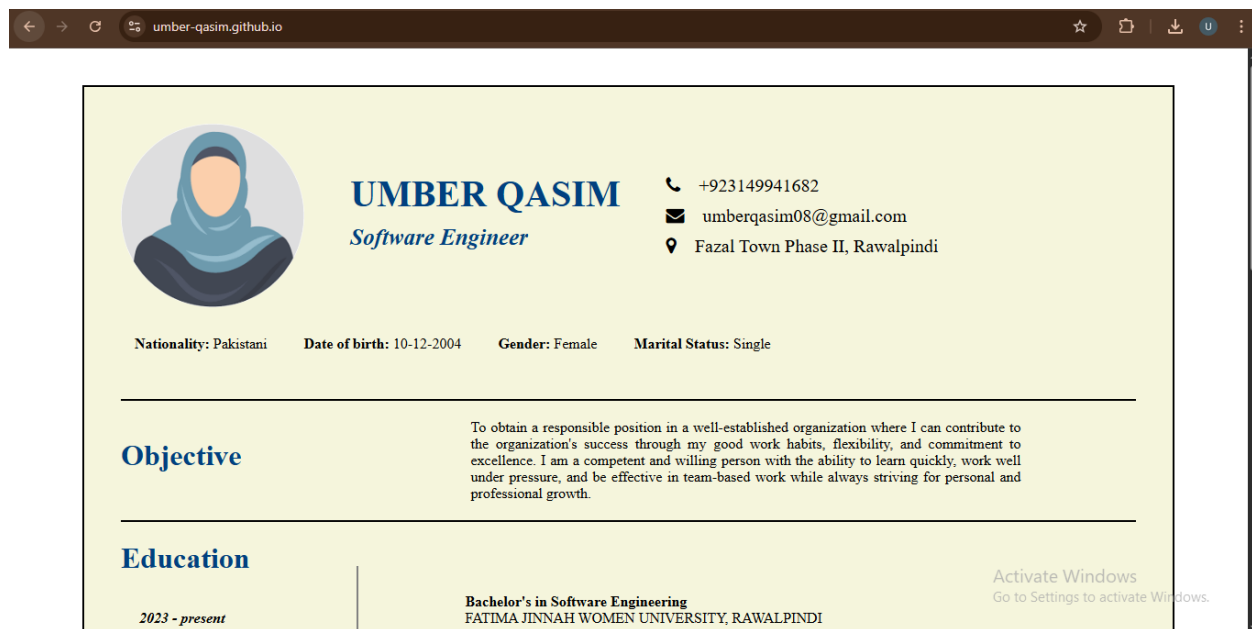
HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3/Umber-qasim.github.io (main)
$ git commit -m "Add portfolio site for GitHub Pages"
[main (root-commit) 120371e] Add portfolio site for GitHub Pages
3 files changed, 299 insertions(+)
create mode 100644 images.png
create mode 100644 index.html
create mode 100644 style.css

HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3/Umber-qasim.github.io (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% (5/5), done.
Writing objects: 100% (5/5), 7.96 KiB | 2.65 MiB/s, done.
Total 5 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
To https://github.com/Umber-qasim/Umber-qasim.github.io.git
 * [new branch]      main -> main
branch 'main' set up to track 'origin/main'.
```

Check GitHub Pages Settings



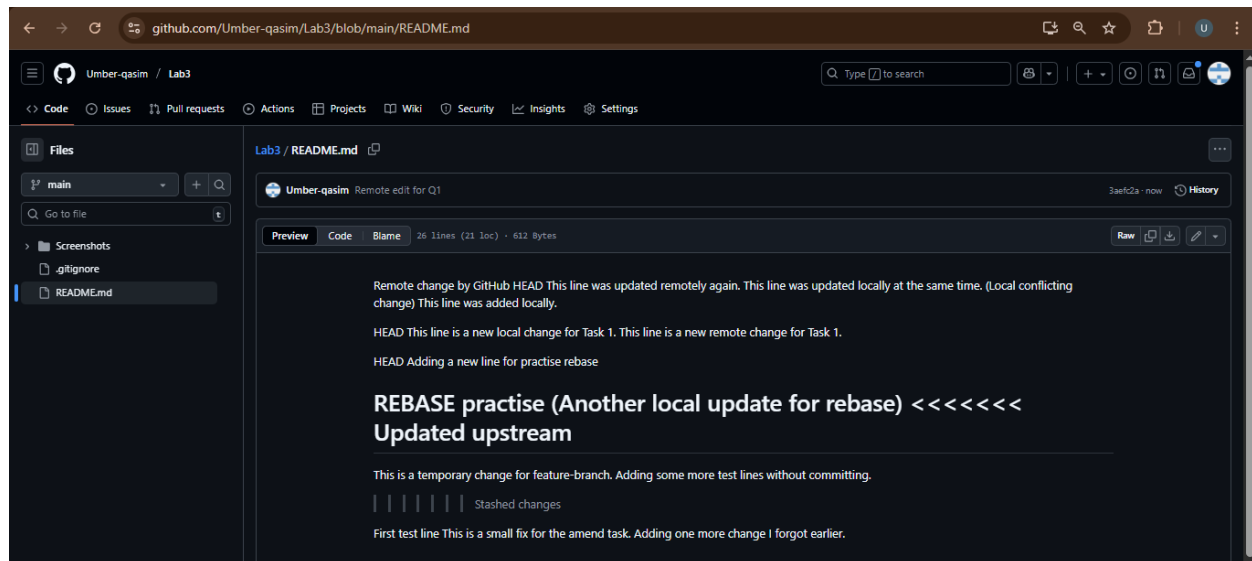
Visit Your Live Site



Exam Evaluation Questions

I. Local vs Remote Conflict Resolution

Make a Remote Edit on GitHub



Make a Local Edit (to create a conflict)

```

README.md - Notepad
File Edit Format View Help
Local change by Umber|
HEAD
This line was updated remotely again.
This line was updated locally at the same time.
(Local conflicting change)
This line was added locally.
HEAD

```

```

HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main)
$ notepad README.md

HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main)
$ git add README.md

HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main)
$ git commit -m "Local edit for Q1"
[main 0f9fc2b] Local edit for Q1
1 file changed, 1 insertion(+)

```

Try to Push

```

HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main)
$ git push origin main
To https://github.com/Umber-qasim/Lab3.git
! [rejected]        main -> main (fetch first)
error: failed to push some refs to 'https://github.com/Umber-qasim/Lab3.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.

```

Resolve Conflict using git pull (Merge)

```
HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main)
$ git pull 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 1 (delta 0), pack-reused 0 (from 0)
Unpacking objects: 100% (3/3), 1022 bytes | 146.00 KiB/s, done.
From https://github.com/Umber-qasim/Lab3
 * branch          main      -> FETCH_HEAD
 * a433724..3aefc2a  main      -> origin/main
Auto-merging README.md
CONFLICT (content): Merge conflict in README.md
Automatic merge failed; fix conflicts and then commit the result.

HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main|MERGING)
$ notepad README.md

HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main|MERGING)
$ git add README.md

HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main|MERGING)
$ git commit -m "Resolved merge conflict manually"
[main 0b835d5] Resolved merge conflict manually

HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (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), 771 bytes | 771.00 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/Umber-qasim/Lab3.git
   3aefc2a..0b835d5  main -> main
```

REBASE resolution

Perform same work as above till push command


```

HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (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), 1.02 KiB | 30.00 KiB/s, done.
From https://github.com/Umber-qasim/Lab3
* branch      main      -> FETCH_HEAD
0b835d5..b2d02ff main    -> origin/main
Auto-merging README.md
CONFLICT (content): Merge conflict in README.md
error: could not apply 4350159... Local edit for rebase test
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 4350159... # Local edit for rebase test

HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main|REBASE 1/1)
$ notepad README.md

HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main|REBASE 1/1)
$ git add README.md

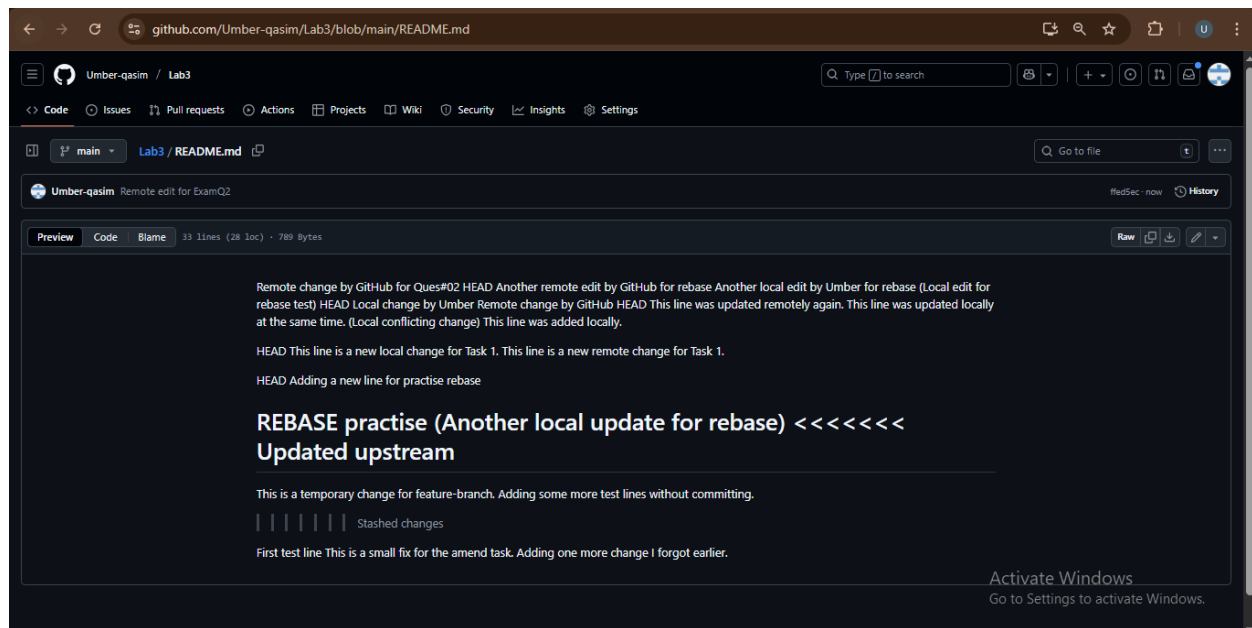
HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main|REBASE 1/1)
$ git rebase --continue
[detached HEAD 4b331ab] Local edit for rebase test
1 file changed, 3 insertions(+)
Successfully rebased and updated refs/heads/main.

HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (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), 428 bytes | 428.00 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/Umber-qasim/Lab3.git
b2d02ff..4b331ab main -> main

```

II. Manual Merge Conflict Handling

Remote change (on GitHub)



Local change (on your PC)

```
HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/LAB3 (main)
$ notepad README.md

HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/LAB3 (main)
$ git add .

HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/LAB3 (main)
$ git commit -m "Local conflicting edit"
[main 3af5668] Local conflicting edit
1 file changed, 1 insertion(+)
```

Push and see conflict

```
HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/LAB3 (main)
$ git push origin main
To https://github.com/Umber-qasim/Lab3.git
 ! [rejected]        main -> main(fetch first)
error: failed to push some refs to 'https://github.com/Umber-qasim/Lab3.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.
```

Pull with rebase

```

HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/LAB3 (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), 1016 bytes | 63.00 KiB/s, done.
From https://github.com/Umber-qasim/Lab3
* branch          main      -> FETCH_HEAD
  10f6cdb..ffed5ec  main      -> origin/main
Auto-merging README.md
CONFLICT (content): Merge conflict in README.md
error: could not apply 3af5668... Local conflicting 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 3af5668... # Local conflicting edit

```

Resolve conflict manually



README.md - Notepad

File Edit Format View Help

HEAD

Remote change by GitHub for Ques#02

Local change by GitHub for Ques#02

(Local conflicting edit)

HEAD

Another remote edit by GitHub for rebase

Another local edit by Umber for rebase

(Local edit for rebase test)

HEAD

Mark as resolved and finish rebase

```

HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/LAB3 (main|REBASE 1/1)
$ notepad README.md

HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/LAB3 (main|REBASE 1/1)
$ git add README.md

HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/LAB3 (main|REBASE 1/1)
$ git rebase --continue
[detached HEAD e847e74] Local conflicting edit
1 file changed, 3 insertions(+)
Successfully rebased and updated refs/heads/main.

HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/LAB3 (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), 408 bytes | 408.00 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/Umber-qasim/Lab3.git
   ffed5ec..e847e74  main -> main

```

III. Managing Ignored and Tracked Files

Create folder and files

```

HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/LAB3 (main)
$ mkdir DocFiles
cd DocFiles
echo "My first doc" > file1.txt
echo "My second doc" > file2.txt

HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/LAB3/DocFiles (main)
$ cd ..

HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/LAB3 (main)
$ ls
DocFiles/  README.md  Screenshots/  textfiles/

HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/LAB3 (main)
$ cd DocFiles

HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/LAB3/DocFiles (main)
$ ls
file1.txt  file2.txt

```

Add, commit, push (to GitHub)

```

HP@DESKTOP-BGNOK42 MINGW64 ~/CC-UmberQasim-066/LAB3 (main)
$ git add DocFiles
git commit -m "Added DocFiles folder"
git push origin main
warning: in the working copy of 'DocFiles/file1.txt', LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'DocFiles/file2.txt', LF will be replaced by CRLF the next time Git touches it
[main 8ec5657] Added DocFiles folder
 2 files changed, 2 insertions(+)
 create mode 100644 DocFiles/file1.txt
 create mode 100644 DocFiles/file2.txt
Enumerating objects: 6, done.
Counting objects: 100% (6/6), done.
Delta compression using up to 4 threads
Compressing objects: 100% (3/3), done.
Writing objects: 100% (5/5), 476 bytes | 238.00 KiB/s, done.
Total 5 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
To https://github.com/Umber-qasim/Lab3.git
 23f13f1..8ec5657  main -> main

```

The screenshot shows the GitHub repository page for 'Umber-qasim/Lab3'. The repository is public and has 0 stars, 0 forks, and 0 watchers. The main branch is 'main' with 2 branches and 0 tags. The repository contains a README file, a .gitignore file, and a DocFiles folder. The commit history shows a recent commit 'Added DocFiles folder' by 'Umber-qasim' 2 minutes ago. The README file contains text about local changes and remote updates.

Add to .gitignore

.gitignore - Notepad

File Edit Format View Help

```

textfiles/*
DocFiles/

```

Commit and push .gitignore

```

HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/LAB3 (main)
$ git add .gitignore
git commit -m "Added DocFiles to .gitignore"
git push origin main
[main 9ca9e69] Added DocFiles to .gitignore
 1 file changed, 1 insertion(+)
Enumerating objects: 5, done.
Counting objects: 100% (5/5), done.
Delta compression using up to 4 threads
Compressing objects: 100% (2/2), done.
Writing objects: 100% (3/3), 387 bytes | 387.00 KiB/s, done.
Total 3 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
To https://github.com/Umber-qasim/Lab3.git
 8ec5657..9ca9e69  main -> main

```

Remove folder from Git tracking

```

HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/LAB3 (main)
$ git rm -r --cached DocFiles
git commit -m "Stopped tracking DocFiles folder"
git push origin main
rm 'DocFiles/file1.txt'
rm 'DocFiles/file2.txt'
[main d4ea728] Stopped tracking DocFiles folder
 2 files changed, 2 deletions(-)
 delete mode 100644 DocFiles/file1.txt
 delete mode 100644 DocFiles/file2.txt
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), 249 bytes | 249.00 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/Umber-qasim/Lab3.git
 9ca9e69..d4ea728  main -> main

```

Verify

The screenshot shows the GitHub repository page for `Umber-qasim/Lab3`. The repository is public and has 2 branches and 0 tags. The commit history shows a commit titled "Stopped tracking DocFiles folder" by Umber-qasim, which deleted two files: `DocFiles/file1.txt` and `DocFiles/file2.txt`. The file list shows `Screenshots`, `.gitignore`, `README.md`, and `README`. The README file is highlighted.

IV. Commit History Manipulation and Recovery

Add a new line in any file and commit it

```
HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main)
$ notepad README.MD

HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main)
$ git add .

HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main)
$ git commit -m "Added test line"
[main Odd21e1] Added test line
16 files changed, 8 insertions(+)
create mode 100644 Screenshots/back_to_feature.png
create mode 100644 Screenshots/back_to_main.png
create mode 100644 Screenshots/branch_switched.png
create mode 100644 Screenshots/checkout_error.png
create mode 100644 Screenshots/detached_head.png
create mode 100644 Screenshots/gitignore_push.png
create mode 100644 Screenshots/log_before_checkout.png
create mode 100644 Screenshots/modified_readme.png
create mode 100644 Screenshots/push_textfiles.png
create mode 100644 Screenshots/repo_still_has_textfiles.png
create mode 100644 Screenshots/repo_textfiles_removed.png
create mode 100644 Screenshots/rm_cached_push.png
create mode 100644 Screenshots/stash_command.png
create mode 100644 Screenshots/stash_pop.png
create mode 100644 Screenshots/status_clean.png
```

Add another change and commit again

```
HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main)
$ notepad README.MD

HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main)
$ git add .

HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main)
$ git commit -m "Second test commit"
[main 80de95b] Second test commit
1 file changed, 2 insertions(+), 1 deletion(-)
```

View commit history before reset

```
HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main)
$ git log --oneline
80de95b (HEAD -> main) Second test commit
Odd21e1 Added test line
fe43ca5 (origin/main, origin/HEAD) Removed tracked textfiles directory
e2a90d3 Added .gitignore to ignore textfiles directory
d596c11 Added textfiles directory with three files
5679928 Local conflicting change
212942b Remote conflicting change
f0932a0 Another local update for rebase
6d75c97 Update README.md
09db57d Resolved merge conflict in README.md
53e1b19 Simulated local change
d2bb5ed Simulated remote change
0c3fcfd Local update to README
353035e Remote update to README
8262c0d Create README.md
```

Confirm both changes are in the file

README.md - Notepad

File Edit Format View Help

HEAD
 This line was updated remotely again.
 This line was updated locally at the same time.
 (Local conflicting change)
 This line was added locally.

HEAD
 This line is a new local change for Task 1.
 This line is a new remote change for Task 1.

HEAD
 Adding a new line for practise rebase

REBASE practise
 (Another local update for rebase)
 <<<<<< Updated upstream
 =====

This is a temporary change for feature-branch.
 Adding some more test lines without committing.
 >>>>>> Stashed changes

First test line
 Second test line

Perform a soft reset

```
HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main)
$ notepad README.MD

HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main)
$ git reset --soft HEAD~1
```

Check commit history again

```
HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main)
$ git log --oneline
0dd21e1 (HEAD -> main) Added test line
fe43ca5 (origin/main, origin/HEAD) Removed tracked textfiles directory
e2a90d3 Added .gitignore to ignore textfiles directory
d596c11 Added textfiles directory with three files
5679928 Local conflicting change
212942b Remote conflicting change
f0932a0 Another local update for rebase
6d75c97 Update README.md
09db57d Resolved merge conflict in README.md
53e1b19 Simulated local change
d2bb5ed Simulated remote change
0c3fcfd Local update to README
353035e Remote update to README
8262c0d Create README.md
```

Check file content after soft reset

README.md - Notepad

File Edit Format View Help

HEAD
This line was updated remotely again.
This line was updated locally at the same time.
(Local conflicting change)
This line was added locally.

HEAD
This line is a new local change for Task 1.
This line is a new remote change for Task 1.

HEAD
Adding a new line for practise rebase

REBASE practise
(Another local update for rebase)
<<<<<< Updated upstream
=====

This is a temporary change for feature-branch.
Adding some more test lines without committing.
>>>>>> Stashed changes

First test line
Second test line

Check git status

```
HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main)
$ git status
On branch main
Your branch is ahead of 'origin/main' by 1 commit.
  (use "git push" to publish your local commits)

Changes to be committed:
  (use "git restore --staged <file>..." to unstage)
        modified:   README.md
```

If it shows staged changes, you can re-commit:

```
HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main)
$ git commit -m "Second Test commit"
[main 8532149] Second Test commit
 1 file changed, 2 insertions(+), 1 deletion(-)
```


Perform a hard reset

```
HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main)
$ git reset --hard HEAD~1
HEAD is now at Odd21e1 Added test line
```

Check commit history again

```
HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (main)
$ git log --oneline
0dd21e1 (HEAD -> main) Added test line
fe43ca5 (origin/main, origin/HEAD) Removed tracked textfiles directory
e2a90d3 Added .gitignore to ignore textfiles directory
d596c11 Added textfiles directory with three files
5679928 Local conflicting change
212942b Remote conflicting change
f0932a0 Another local update for rebase
6d75c97 Update README.md
09db57d Resolved merge conflict in README.md
53e1b19 Simulated local change
d2bb5ed Simulated remote change
0c3fcfd Local update to README
353035e Remote update to README
8262c0d Create README.md
```

Open file again

 README.md - Notepad

File Edit Format View Help

HEAD

This line was updated remotely again.
 This line was updated locally at the same time.
 (Local conflicting change)
 This line was added locally.

HEAD

This line is a new local change for Task 1.
 This line is a new remote change for Task 1.

HEAD

Adding a new line for practise rebase

REBASE practise

(Another local update for rebase)

<<<<<< Updated upstream

=====

This is a temporary change for feature-branch.
 Adding some more test lines without committing.
 >>>>>> Stashed changes

First test line

Check git status

```
HP@DESKTOP-BGN0K42 MINGW64 ~/CC-UmberQasim-066/Lab3 (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
```