

Git Project

Objective:

Worked on a project involving a simple website. Learnt and practiced various Git concepts including branching, merging, handling merge conflicts, rebasing, pulling, versioning, and rolling back changes.

Project Setup

1. Installed Git

Set Up Git: Configure your Git username and email:

```
git config --global user.name "Your Name"
git config --global user.email "your.email@example.com"
```

2. Created a GitHub Repository:

Go to GitHub and create a new repository named `website-project`.

Clone the repository to local machine:

```
git clone https://github.com/your-username/website-project.git
```

3. Initialize the Project:

Navigate to the project directory:

```
cd website-project
```

Create initial project structure:

```
mkdir src
touch src/index.html
echo "<!DOCTYPE html><html><head><title>My
Website</title></head><body><h1>Welcome to my
website!</h1></body></html>" > src/index.html
```

Commit and push the initial project structure:

```
git add .
git commit -m "Initial commit: Added project structure and
index.html"
git push origin main
```

```

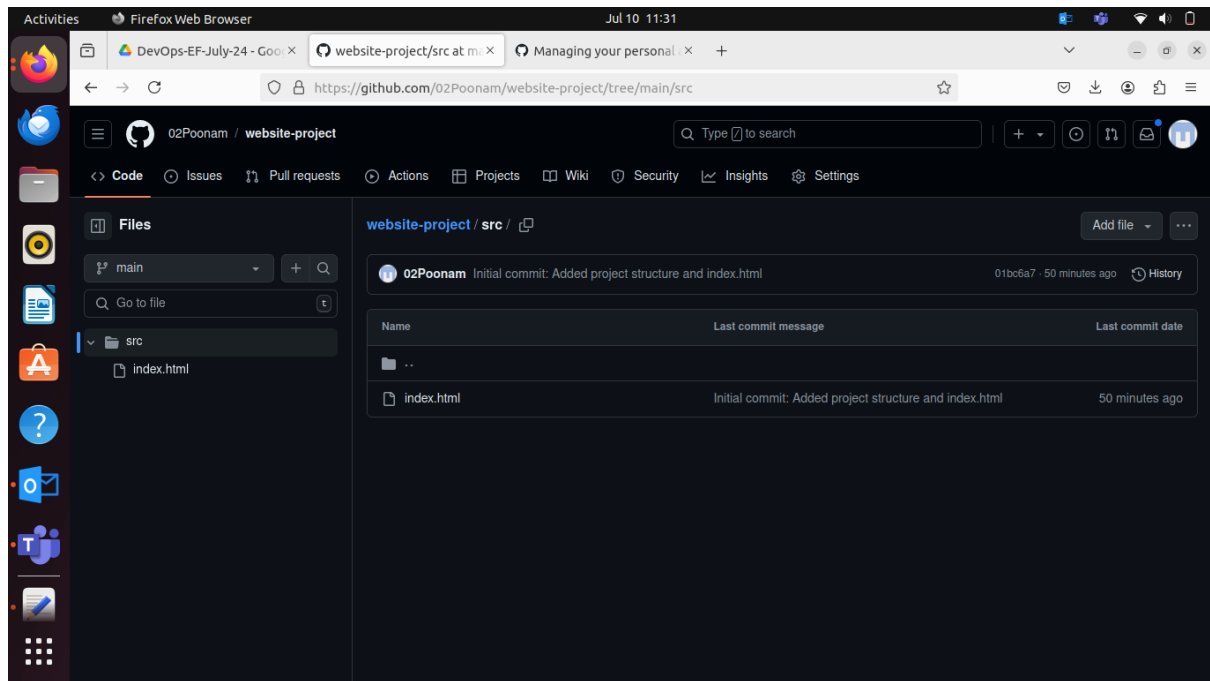
einfochips@AHMLPT2484:~$ git config --global user.name "02Poonam"
einfochips@AHMLPT2484:~$ git config --global user.email "poonambhavsar02@gmail.com"
einfochips@AHMLPT2484:~$ ls
Desktop      Downloads  Pictures  server_config.txt  Templates  website-project
Documents    Music      Public    snap               Videos
einfochips@AHMLPT2484:~$ cd
.cache/      .GlobalProtect/  Pictures/      .thunderbird/
.config/     .gnupg/          Public/        Videos/
Desktop/     .local/          snap/         website-project/
Documents/   .mozilla/        .ssh/
Downloads/   Music/           Templates/
einfochips@AHMLPT2484:~$ cd website-project
einfochips@AHMLPT2484:~/website-project$ ls
src
einfochips@AHMLPT2484:~/website-project$ cd src
einfochips@AHMLPT2484:~/website-project/src$ ls
index.html

```

```

einfochips@AHMLPT2484:~/website-project$ git add .
einfochips@AHMLPT2484:~/website-project$ git commit -m "Initial commit: Added project structure and index.html"
On branch main
nothing to commit, working tree clean
einfochips@AHMLPT2484:~/website-project$ git push origin main
Username for 'https://github.com': ghp_7JTUJbGob65bJQ9mcmfjxcyNM4pAzu46U63j
Password for 'https://ghp_7JTUJbGob65bJQ9mcmfjxcyNM4pAzu46U63j@github.com':
Enumerating objects: 4, done.
Counting objects: 100% (4/4), done.
Delta compression using up to 8 threads
Compressing objects: 100% (2/2), done.
Writing objects: 100% (4/4), 375 bytes | 375.00 KiB/s, done.
Total 4 (delta 0), reused 0 (delta 0), pack-reused 0
To https://github.com/02Poonam/website-project.git
 * [new branch]      main -> main

```



Exercise 1: Branching and Basic Operations (10 minutes)

Create a New Branch:

```
git checkout -b feature/add-about-page
```

1. Add a New Page:

Create `about.html`:

```
touch src/about.html
```

```
echo "<!DOCTYPE html><html><head><title>About  
Us</title></head><body><h1>About Us</h1></body></html>" >  
src/about.html
```

Commit and push changes:

```
git add src/about.html
```

```
git commit -m "Added about page"
```

```
git push origin feature/add-about-page
```

```

einfochips@AHMLPT2484:~/website-project/src$ nano about.html
einfochips@AHMLPT2484:~/website-project/src$ cd ..
einfochips@AHMLPT2484:~/website-project$ git add src/about.html
einfochips@AHMLPT2484:~/website-project$ git commit -m "Added about page"
[feature/add-about-page 70b0e13] Added about page
 1 file changed, 12 insertions(+)
 create mode 100644 src/about.html
einfochips@AHMLPT2484:~/website-project$ git push origin feature/add-about-page
Username for 'https://github.com': ghp_7JTUJbGob65bJQ9mcmfjxcyNM4pAzu46U63j
Password for 'https://ghp_7JTUJbGob65bJQ9mcmfjxcyNM4pAzu46U63j@github.com':
Enumerating objects: 6, done.
Counting objects: 100% (6/6), done.
Delta compression using up to 8 threads
Compressing objects: 100% (3/3), done.
Writing objects: 100% (4/4), 389 bytes | 389.00 KiB/s, done.
Total 4 (delta 0), reused 0 (delta 0), pack-reused 0
remote:
remote: Create a pull request for 'feature/add-about-page' on GitHub by visiting
:
remote:      https://github.com/02Poonam/website-project/pull/new/feature/add-ab
out-page
remote:
To https://github.com/02Poonam/website-project.git
 * [new branch]      feature/add-about-page -> feature/add-about-page

```

The screenshot shows a web browser window with the URL `https://github.com/02Poonam/website-project/tree/feature/add-about-page/src`. The page displays the 'src' directory with files 'about.html' and 'index.html'. A commit history table shows the 'about.html' file was added 21 minutes ago.

Name	Last commit message	Last commit date
..		
about.html	Added about page	21 minutes ago
index.html	Initial commit: Added project structure and index.html	1 hour ago

Exercise 2: Merging and Handling Merge Conflicts (15 minutes)

Create Another Branch:

```
git checkout main
git checkout -b feature/update-homepage
```

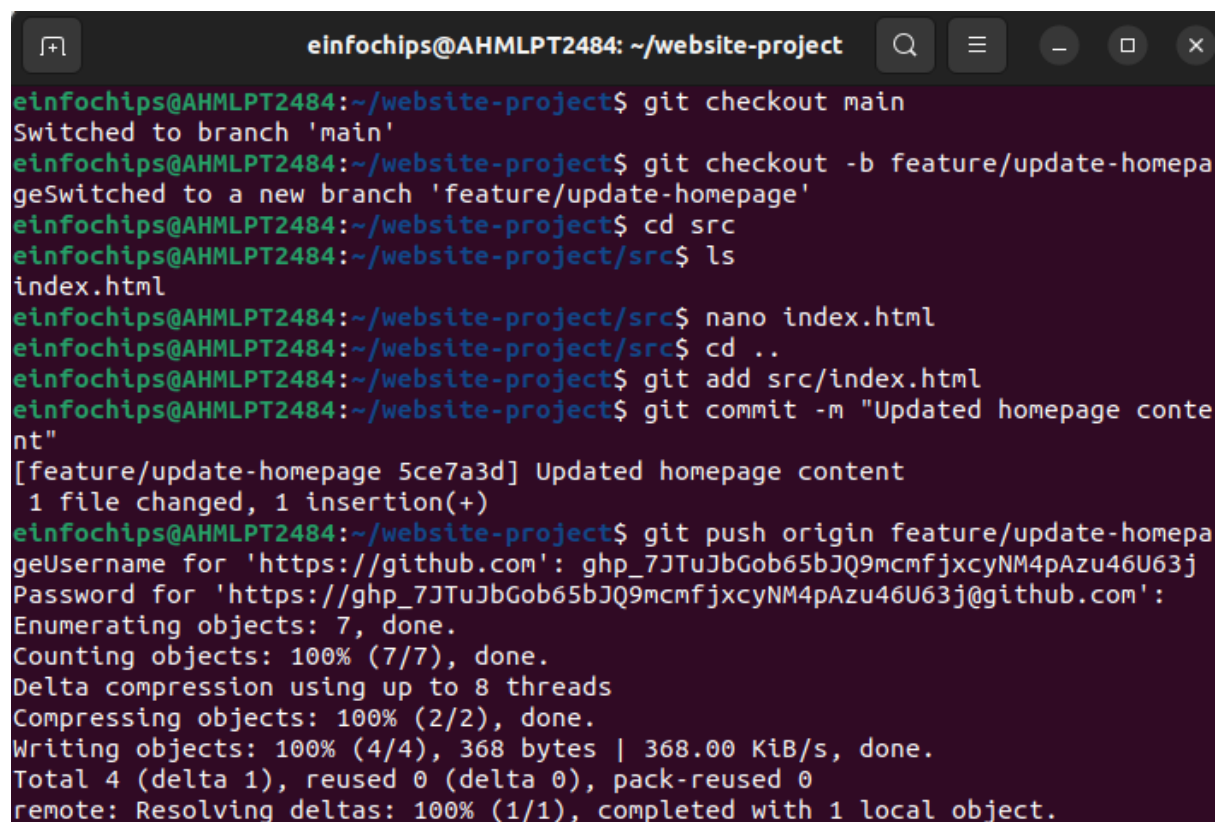
1. Update the Homepage:

Modify `index.html`:

```
echo "<p>Updated homepage content</p>" >> src/index.html
```

Commit and push changes:

```
git add src/index.html
git commit -m "Updated homepage content"
git push origin feature/update-homepage
```



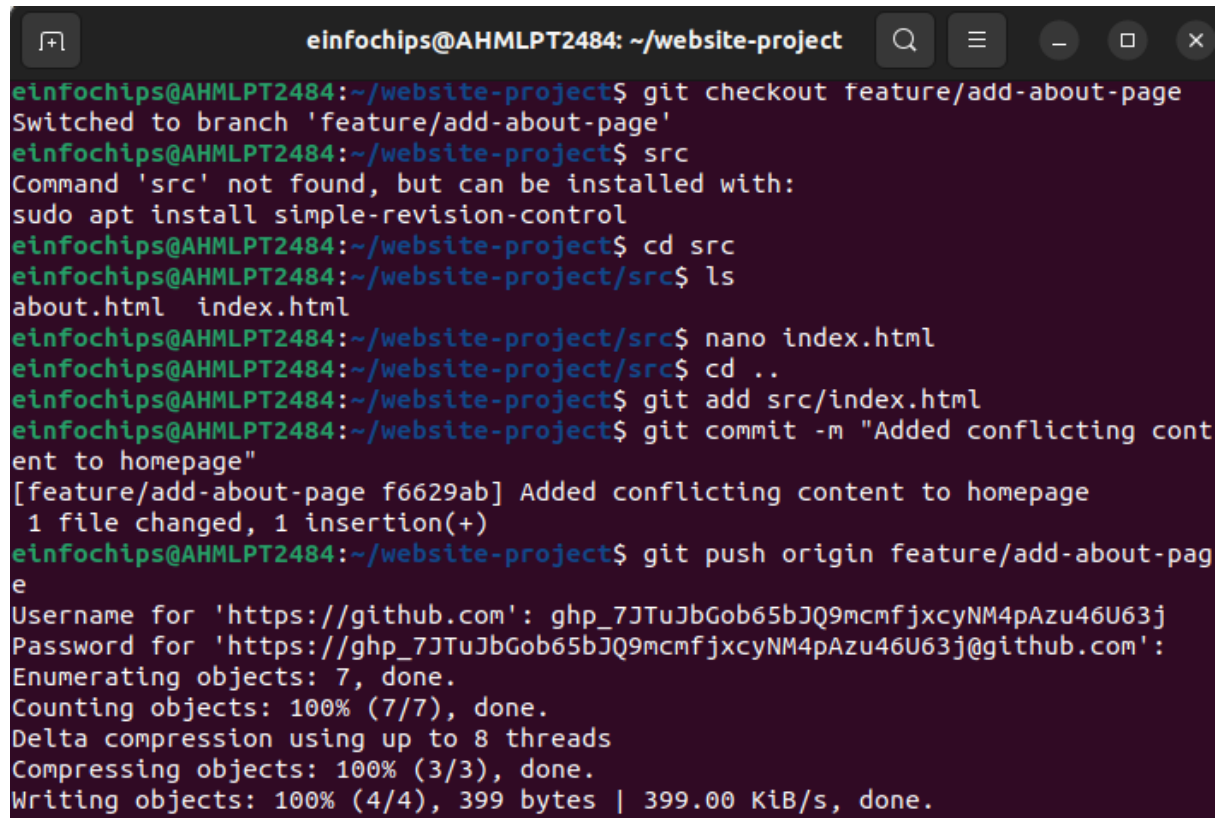
```
einfochips@AHMLPT2484: ~/website-project
einfochips@AHMLPT2484:~/website-project$ git checkout main
Switched to branch 'main'
einfochips@AHMLPT2484:~/website-project$ git checkout -b feature/update-homepage
Switched to a new branch 'feature/update-homepage'
einfochips@AHMLPT2484:~/website-project$ cd src
einfochips@AHMLPT2484:~/website-project/src$ ls
index.html
einfochips@AHMLPT2484:~/website-project/src$ nano index.html
einfochips@AHMLPT2484:~/website-project/src$ cd ..
einfochips@AHMLPT2484:~/website-project$ git add src/index.html
einfochips@AHMLPT2484:~/website-project$ git commit -m "Updated homepage content"
[feature/update-homepage 5ce7a3d] Updated homepage content
 1 file changed, 1 insertion(+)
einfochips@AHMLPT2484:~/website-project$ git push origin feature/update-homepage
Username for 'https://github.com': ghp_7JTUJbGob65bJQ9mcmfjxcyNM4pAzu46U63j
Password for 'https://ghp_7JTUJbGob65bJQ9mcmfjxcyNM4pAzu46U63j@github.com':
Enumerating objects: 7, done.
Counting objects: 100% (7/7), done.
Delta compression using up to 8 threads
Compressing objects: 100% (2/2), done.
Writing objects: 100% (4/4), 368 bytes | 368.00 KiB/s, done.
Total 4 (delta 1), reused 0 (delta 0), pack-reused 0
remote: Resolving deltas: 100% (1/1), completed with 1 local object.
```

2. Create a Merge Conflict:

Modify `index.html` on the `feature/add-about-page` branch:

```
git checkout feature/add-about-page
```

```
echo "<p>Conflict content</p>" >> src/index.html
git add src/index.html
git commit -m "Added conflicting content to homepage"
git push origin feature/add-about-page
```

A terminal window titled 'einfochips@AHMLPT2484: ~/website-project' showing a series of Git commands and their outputs. The user checks out the 'feature/add-about-page' branch, navigates to the 'src' directory, and adds a new file 'index.html' with conflicting content. The commit message is 'Added conflicting content to homepage'. The push to the origin is successful.

```
einfochips@AHMLPT2484: ~/website-project
einfochips@AHMLPT2484:~/website-project$ git checkout feature/add-about-page
Switched to branch 'feature/add-about-page'
einfochips@AHMLPT2484:~/website-project$ src
Command 'src' not found, but can be installed with:
sudo apt install simple-revision-control
einfochips@AHMLPT2484:~/website-project$ cd src
einfochips@AHMLPT2484:~/website-project/src$ ls
about.html  index.html
einfochips@AHMLPT2484:~/website-project/src$ nano index.html
einfochips@AHMLPT2484:~/website-project/src$ cd ..
einfochips@AHMLPT2484:~/website-project$ git add src/index.html
einfochips@AHMLPT2484:~/website-project$ git commit -m "Added conflicting content to homepage"
[feature/add-about-page f6629ab] Added conflicting content to homepage
1 file changed, 1 insertion(+)
einfochips@AHMLPT2484:~/website-project$ git push origin feature/add-about-page
Username for 'https://github.com': ghp_7JTUJbGob65bJQ9mcmfjxcyNM4pAzu46U63j
Password for 'https://ghp_7JTUJbGob65bJQ9mcmfjxcyNM4pAzu46U63j@github.com':
Enumerating objects: 7, done.
Counting objects: 100% (7/7), done.
Delta compression using up to 8 threads
Compressing objects: 100% (3/3), done.
Writing objects: 100% (4/4), 399 bytes | 399.00 KiB/s, done.
```

3. Merge and Resolve Conflict:

Attempt to merge `feature/add-about-page` into `main`:

```
git checkout main
git merge feature/add-about-page
```

Resolve the conflict in `src/index.html`, then:

```
git add src/index.html
git commit -m "Resolved merge conflict in homepage"
git push origin main
```

```
einfochips@AHMLPT2484: ~/website-project
remote: Resolving deltas: 100% (1/1), completed with 1 local object.
To https://github.com/02Poonam/website-project.git
  70b0e13..f6629ab  feature/add-about-page -> feature/add-about-page
einfochips@AHMLPT2484:~/website-project$ git checkout main
Switched to branch 'main'
einfochips@AHMLPT2484:~/website-project$ git merge feature/add-about-page
Updating 01bc6a7..f6629ab
Fast-forward
 src/about.html | 12 ++++++++
 src/index.html |  1 +
 2 files changed, 13 insertions(+)
 create mode 100644 src/about.html
einfochips@AHMLPT2484:~/website-project$ git add src/index.html
einfochips@AHMLPT2484:~/website-project$ git commit -m "Resolved merge conflict in homepage"
On branch main
nothing to commit, working tree clean
einfochips@AHMLPT2484:~/website-project$ git push origin main
Username for 'https://github.com': ghp_7JTUJbGob65bJQ9mcmfjxcyNM4pAzu46U63j
Password for 'https://ghp_7JTUJbGob65bJQ9mcmfjxcyNM4pAzu46U63j@github.com':
Total 0 (delta 0), reused 0 (delta 0), pack-reused 0
To https://github.com/02Poonam/website-project.git
  01bc6a7..f6629ab  main -> main
einfochips@AHMLPT2484:~/website-project$
```

Exercise 3: Rebasing (10 minutes)

1. **Rebase a Branch:**

Rebase `feature/update-homepage` onto `main`:

```
git checkout feature/update-homepage
```

```
git rebase main
```

- Resolve any conflicts that arise during rebase.


```
einfochips@AHMLPT2484: ~/website-project
einfochips@AHMLPT2484:~/website-project$ git checkout feature/update-homepage
Switched to branch 'feature/update-homepage'
einfochips@AHMLPT2484:~/website-project$ git rebase main
Auto-merging src/index.html
CONFLICT (content): Merge conflict in src/index.html
error: could not apply 5ce7a3d... Updated homepage content
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".
Could not apply 5ce7a3d... Updated homepage content
einfochips@AHMLPT2484:~/website-project$ git status
interactive rebase in progress; onto f6629ab
Last command done (1 command done):
  pick 5ce7a3d Updated homepage content
No commands remaining.
You are currently rebasing branch 'feature/update-homepage' on 'f6629ab'.
  (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)
```

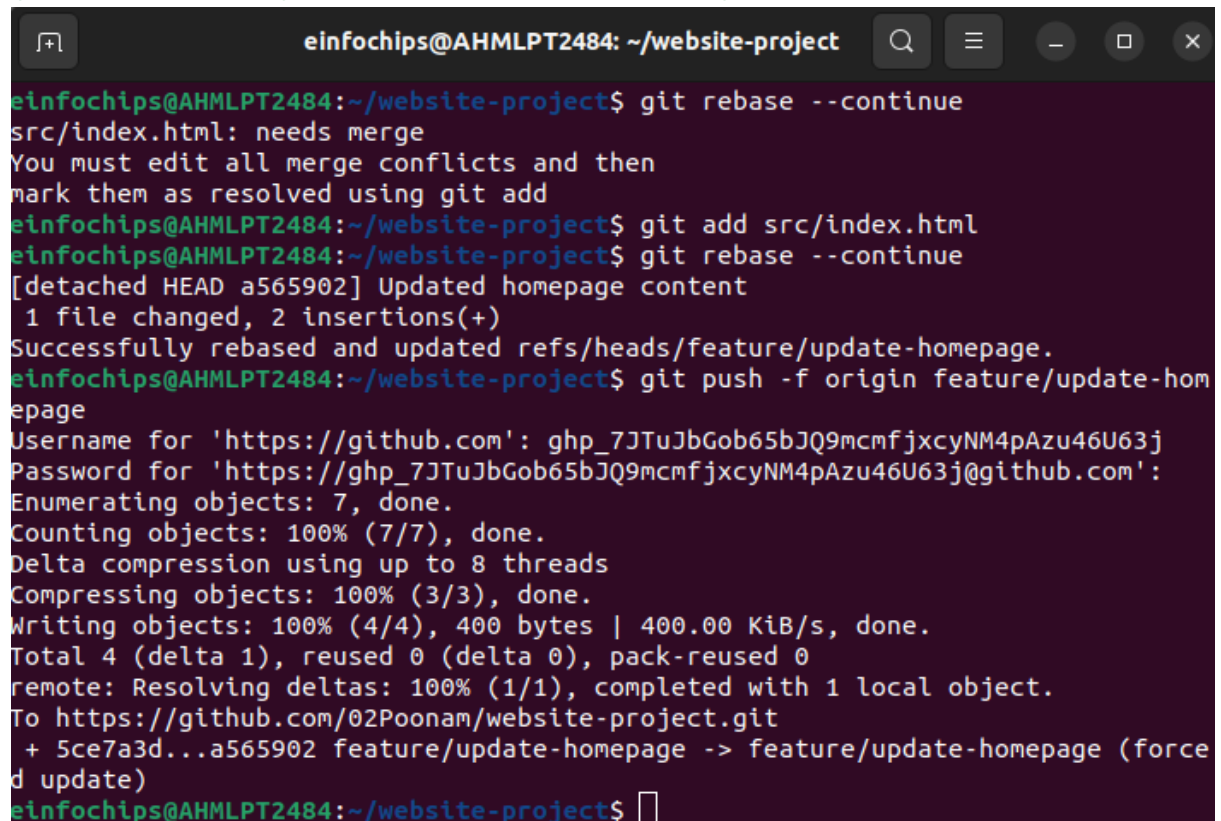
```
einfochips@AHMLPT2484: ~/website-project
einfochips@AHMLPT2484:~/website-project/src$ nano index.html
einfochips@AHMLPT2484:~/website-project/src$ git status
On branch master
Changes not staged for commit:
  (use "git add <file>..." to update what will be committed)
  (use "git restore <file>..." to discard changes in working directory)
    modified:   index.html

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

no changes added to commit (use "git add" and/or "git commit -a")
einfochips@AHMLPT2484:~/website-project/src$ git rebase --continue
fatal: No rebase in progress?
einfochips@AHMLPT2484:~/website-project/src$ cd ..
einfochips@AHMLPT2484:~/website-project$ git rebase --continue
src/index.html: needs merge
You must edit all merge conflicts and then
mark them as resolved using git add
einfochips@AHMLPT2484:~/website-project$ git add src/index.html
einfochips@AHMLPT2484:~/website-project$ git rebase --continue
[detached HEAD a565902] Updated homepage content
 1 file changed, 2 insertions(+)
```


Push the Rebased Branch:

```
git push -f origin feature/update-homepage
```

A terminal window titled 'einfochips@AHMLPT2484: ~/website-project' showing a series of git commands. The user runs 'git rebase --continue' which prompts for a merge of 'src/index.html'. They then run 'git add src/index.html' and 'git rebase --continue'. The terminal shows the rebase is successful and updates the 'feature/update-homepage' branch. Finally, they run 'git push -f origin feature/update-homepage', which prompts for GitHub credentials and shows the push progress, including object counting and compression, before successfully pushing the branch to GitHub.

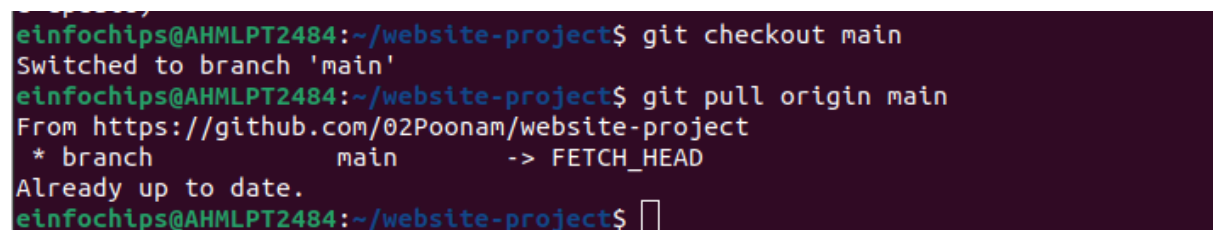
```
einfochips@AHMLPT2484: ~/website-project$ git rebase --continue
src/index.html: needs merge
You must edit all merge conflicts and then
mark them as resolved using git add
einfochips@AHMLPT2484:~/website-project$ git add src/index.html
einfochips@AHMLPT2484:~/website-project$ git rebase --continue
[detached HEAD a565902] Updated homepage content
 1 file changed, 2 insertions(+)
Successfully rebased and updated refs/heads/feature/update-homepage.
einfochips@AHMLPT2484:~/website-project$ git push -f origin feature/update-homepage
Username for 'https://github.com': ghp_7JTUJbGob65bJQ9mcmfjxcyNM4pAzu46U63j
Password for 'https://ghp_7JTUJbGob65bJQ9mcmfjxcyNM4pAzu46U63j@github.com':
Enumerating objects: 7, done.
Counting objects: 100% (7/7), done.
Delta compression using up to 8 threads
Compressing objects: 100% (3/3), done.
Writing objects: 100% (4/4), 400 bytes | 400.00 KiB/s, done.
Total 4 (delta 1), reused 0 (delta 0), pack-reused 0
remote: Resolving deltas: 100% (1/1), completed with 1 local object.
To https://github.com/02Poonam/website-project.git
 + 5ce7a3d...a565902 feature/update-homepage -> feature/update-homepage (forced update)
einfochips@AHMLPT2484:~/website-project$
```

Exercise 4: Pulling and Collaboration (10 minutes)

1. Pull Changes from Remote:

Ensure the `main` branch is up-to-date:

```
git checkout main
git pull origin main
```

A terminal window showing the execution of 'git checkout main' and 'git pull origin main'. The checkout command switches the user to the 'main' branch. The pull command fetches updates from the remote repository. The terminal output indicates that the local 'main' branch is already up-to-date with the remote.

```
einfochips@AHMLPT2484:~/website-project$ git checkout main
Switched to branch 'main'
einfochips@AHMLPT2484:~/website-project$ git pull origin main
From https://github.com/02Poonam/website-project
 * branch          main          -> FETCH_HEAD
Already up to date.
einfochips@AHMLPT2484:~/website-project$
```

2. Simulate a Collaborator's Change:

- Make a change on GitHub directly (e.g., edit `index.html`).

3. Pull Collaborator's Changes:

Pull the changes made by the collaborator:

```
git pull origin main
```

```
Already up to date.
einfochips@AHMLPT2484:~/website-project$ git pull origin main
remote: Enumerating objects: 7, done.
remote: Counting objects: 100% (7/7), done.
remote: Compressing objects: 100% (3/3), done.
remote: Total 4 (delta 1), reused 0 (delta 0), pack-reused 0
Unpacking objects: 100% (4/4), 992 bytes | 330.00 KiB/s, done.
From https://github.com/02Poonam/website-project
 * branch                main                -> FETCH_HEAD
   f6629ab..1d14ae8      main                -> origin/main
Updating f6629ab..1d14ae8
Fast-forward
 src/index.html | 2 +-
 1 file changed, 1 insertion(+), 1 deletion(-)
einfochips@AHMLPT2484:~/website-project$
```

Exercise 5: Versioning and Rollback (15 minutes)

1. Tagging a Version:

Tag the current commit as v1.0:

```
git tag -a v1.0 -m "Version 1.0: Initial release"
git push origin v1.0
```

```
einfochips@AHMLPT2484:~/website-project$ git tag -a v1.0 -m "Version 1.0: Initial release"
einfochips@AHMLPT2484:~/website-project$ git push origin v1.0
Username for 'https://github.com': ghp_7JTUJbGob65bJQ9mcmfjxcyNM4pAzu46U63j
Password for 'https://ghp_7JTUJbGob65bJQ9mcmfjxcyNM4pAzu46U63j@github.com':
Enumerating objects: 1, done.
Counting objects: 100% (1/1), done.
Writing objects: 100% (1/1), 176 bytes | 176.00 KiB/s, done.
Total 1 (delta 0), reused 0 (delta 0), pack-reused 0
To https://github.com/02Poonam/website-project.git
 * [new tag]          v1.0 -> v1.0
einfochips@AHMLPT2484:~/website-project$
```

2. Made a Change that Needs Reversion:

Modified index.html:

```
echo "<p>Incorrect update</p>" >> src/index.html
git add src/index.html
git commit -m "Incorrect update"
git push origin main
```

```
einfochips@AHMLPT2484: ~/website-project
* [new tag]          v1.0 -> v1.0
einfochips@AHMLPT2484:~/website-project$ echo "<p>Incorrect update</p>" >> src/index.html
einfochips@AHMLPT2484:~/website-project$ nano index.html
einfochips@AHMLPT2484:~/website-project$ cd src
einfochips@AHMLPT2484:~/website-project/src$ nano index.html
einfochips@AHMLPT2484:~/website-project/src$ cd ..
einfochips@AHMLPT2484:~/website-project$ git add src/index.html
einfochips@AHMLPT2484:~/website-project$ git commit -m "Incorrect update"
[main c946dbe] Incorrect update
 1 file changed, 1 insertion(+)
einfochips@AHMLPT2484:~/website-project$ git push origin main
Username for 'https://github.com': ghp_7JTUJbGob65bJQ9mcmfjxcyNM4pAzu46U63j
Password for 'https://ghp_7JTUJbGob65bJQ9mcmfjxcyNM4pAzu46U63j@github.com':
Enumerating objects: 7, done.
Counting objects: 100% (7/7), done.
Delta compression using up to 8 threads
Compressing objects: 100% (3/3), done.
Writing objects: 100% (4/4), 371 bytes | 371.00 KiB/s, done.
Total 4 (delta 1), reused 0 (delta 0), pack-reused 0
remote: Resolving deltas: 100% (1/1), completed with 1 local object.
To https://github.com/02Poonam/website-project.git
   1d14ae8..c946dbe  main -> main
einfochips@AHMLPT2484:~/website-project$
```

3. Revert to a Previous Version:

Use `git revert` to undo the last commit:

```
git revert HEAD
```

```
git push origin main
```

```
einfochips@AHMLPT2484:~/website-project$ git revert HEAD
[main c49b278] Revert "Incorrect update"
 1 file changed, 1 deletion(-)
einfochips@AHMLPT2484:~/website-project$ git push origin main
Username for 'https://github.com': ghp_7JTUJbGob65bJQ9mcmfjxcyNM4pAzu46U63j
Password for 'https://ghp_7JTUJbGob65bJQ9mcmfjxcyNM4pAzu46U63j@github.com':
Enumerating objects: 7, done.
Counting objects: 100% (7/7), done.
Delta compression using up to 8 threads
Compressing objects: 100% (3/3), done.
Writing objects: 100% (4/4), 373 bytes | 373.00 KiB/s, done.
Total 4 (delta 1), reused 0 (delta 0), pack-reused 0
remote: Resolving deltas: 100% (1/1), completed with 1 local object.
To https://github.com/02Poonam/website-project.git
   c946dbe..c49b278  main -> main
einfochips@AHMLPT2484:~/website-project$
```

Alternatively, reset to a specific commit (use with caution):

```
sh
```

Copy code

```
git reset --hard v1.0
```

```
git push -f origin main
```

```

Delta compression using up to 8 threads
Compressing objects: 100% (3/3), done.
Writing objects: 100% (4/4), 373 bytes | 373.00 KiB/s, done.
Total 4 (delta 1), reused 0 (delta 0), pack-reused 0
remote: Resolving deltas: 100% (1/1), completed with 1 local object.
To https://github.com/02Poonam/website-project.git
   c946dbe..c49b278  main -> main
einfochips@AHMLPT2484:~/website-project$ git reset --hard v1.0
HEAD is now at 1d14ae8 Update index.html
einfochips@AHMLPT2484:~/website-project$ git push -f origin main
Username for 'https://github.com': ghp_7JTUJbGob65bJQ9mcmfjxcyNM4pAzu46U63j
Password for 'https://ghp_7JTUJbGob65bJQ9mcmfjxcyNM4pAzu46U63j@github.com':
Total 0 (delta 0), reused 0 (delta 0), pack-reused 0
To https://github.com/02Poonam/website-project.git
   + c49b278...1d14ae8  main -> main (forced update)
einfochips@AHMLPT2484:~/website-project$

```

Extra activities (10 minutes)

1. Stashing Changes:

Make some local changes without committing:

```
echo "<p>Uncommitted changes</p>" >> src/index.html
```

○

Stash the changes:

```
git stash
```

Apply the stashed changes:

```
git stash apply
```

```

Total 0 (delta 0), reused 0 (delta 0), pack-reused 0
To https://github.com/02Poonam/website-project.git
   + c49b278...1d14ae8  main -> main (forced update)
einfochips@AHMLPT2484:~/website-project$ echo "<p>Uncommitted changes</p>" >>
src/index.html
einfochips@AHMLPT2484:~/website-project$ git stash
Saved working directory and index state WIP on main: 1d14ae8 Update index.html
einfochips@AHMLPT2484:~/website-project$ git stash apply
On branch main
Changes not staged for commit:
  (use "git add <file>..." to update what will be committed)
  (use "git restore <file>..." to discard changes in working directory)
        modified:   src/index.html

no changes added to commit (use "git add" and/or "git commit -a")
einfochips@AHMLPT2484:~/website-project$

```

2. Viewing Commit History:

Use `git log` to view commit history:

`git log --oneline`

```
einfochips@AHMLPT2484:~/website-project$ git log --oneline
1d14ae8 (HEAD -> main, tag: v1.0, origin/main) Update index.html
f6629ab (origin/feature/add-about-page, feature/add-about-page) Added conflict
ing content to homepage
70b0e13 Added about page
01bc6a7 Initial commit: Added project structure and index.html
einfochips@AHMLPT2484:~/website-project$
```

3. Cherry-Picking Commits:

Create a new branch and cherry-pick a commit from another branch:

`git checkout -b feature/cherry-pick`

`git cherry-pick <commit-hash>`

`git push origin feature/cherry-pick`

```
einfochips@AHMLPT2484:~/website-project$ git checkout -b feature/cherry-pick
fatal: A branch named 'feature/cherry-pick' already exists.
einfochips@AHMLPT2484:~/website-project$ git cherry-pick abc1234
fatal: bad revision 'abc1234'
einfochips@AHMLPT2484:~/website-project$ git push origin feature/cherry-pick
Username for 'https://github.com': ghp_7JTUJbGob65bJQ9mcmfjxcyNM4pAzu46U63j
Password for 'https://ghp_7JTUJbGob65bJQ9mcmfjxcyNM4pAzu46U63j@github.com':
Total 0 (delta 0), reused 0 (delta 0), pack-reused 0
remote:
remote: Create a pull request for 'feature/cherry-pick' on GitHub by visiting
remote:   https://github.com/02Poonam/website-project/pull/new/feature/che
ry-pick
remote:
To https://github.com/02Poonam/website-project.git
 * [new branch]      feature/cherry-pick -> feature/cherry-pick
einfochips@AHMLPT2484:~/website-project$
```

