

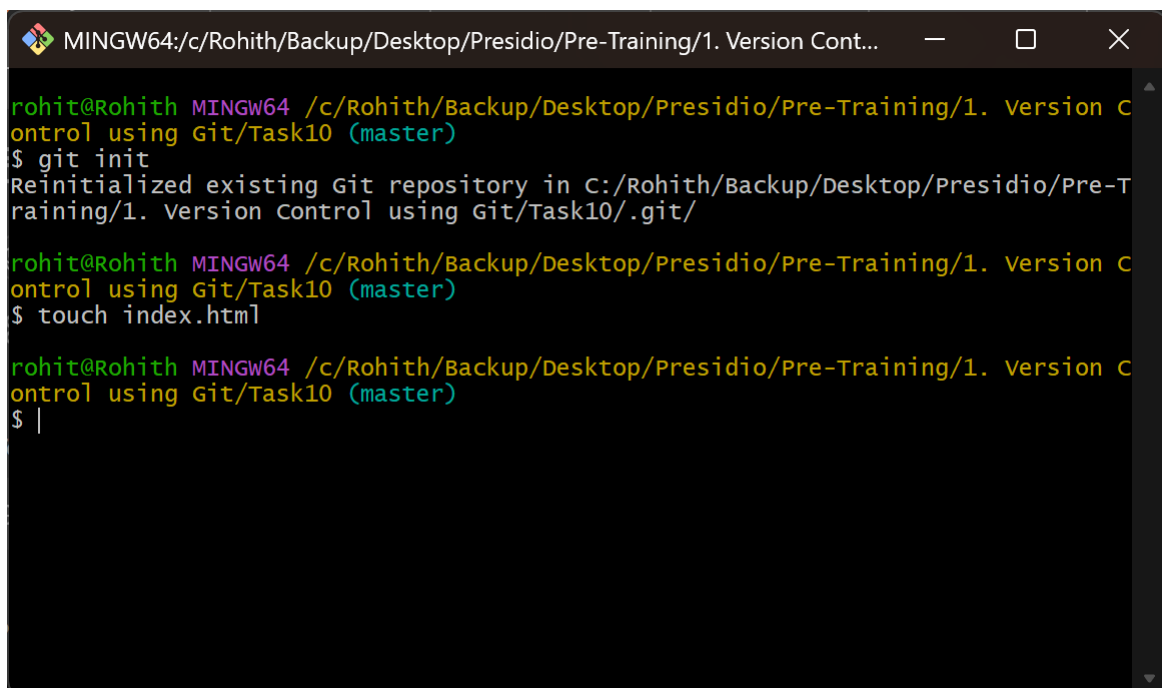
## Version Control Using Git

### 1. Comprehensive Workflow with Forced Pushes and RecoveryObjective:Requirements:

- Simulate an advanced Git scenario that includes forced pushes, recovering lost commits, and a multi-branch workflow.
- Create a repository with multiple branches representing features, bug fixes, and releases.
- Simulate a scenario where a forced push (git push --force) is required (for example, after rewriting history with an interactive rebase).
- Use git reflog to locate and recover lost commits after a mistaken force push.
- Document each step, explaining how and why forced pushes should be handled with care, and how git reflog can be a lifesaver.
- Discuss best practices for collaborating with teams when rewriting history and using force pushes.

### 1. Setting Up a Multi-Branch Repository

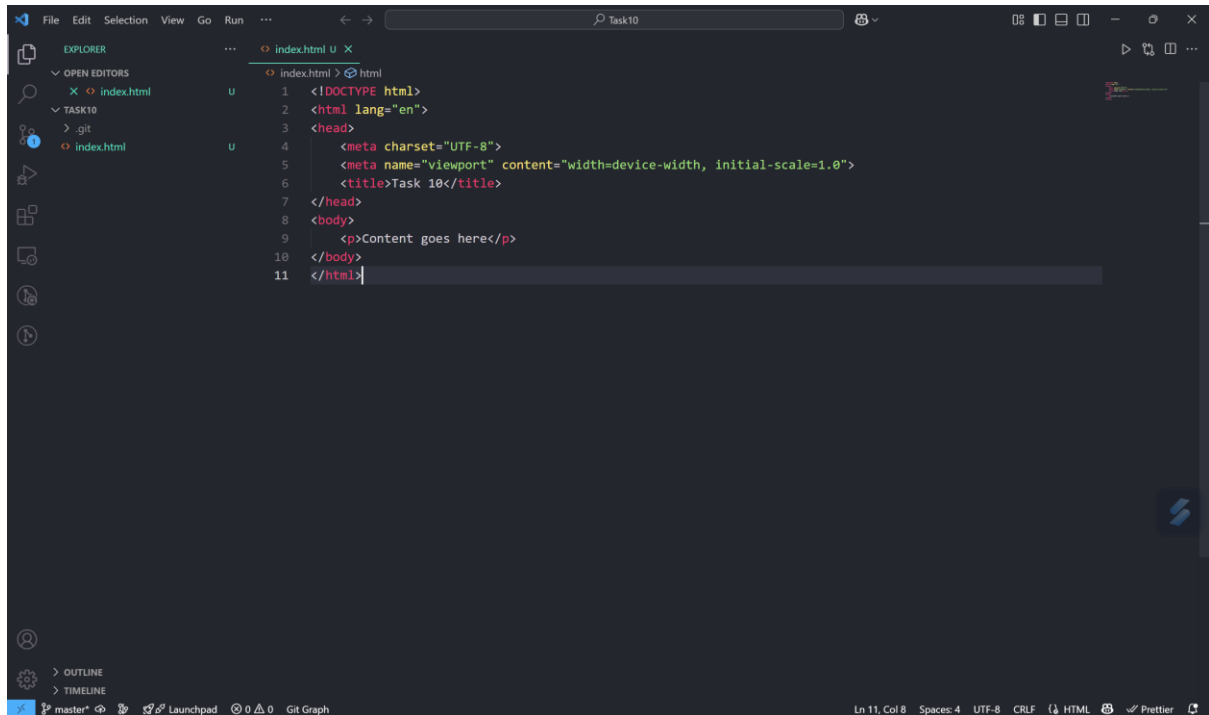
Step 1: Initialize and Create a Multi-Branch Workflow



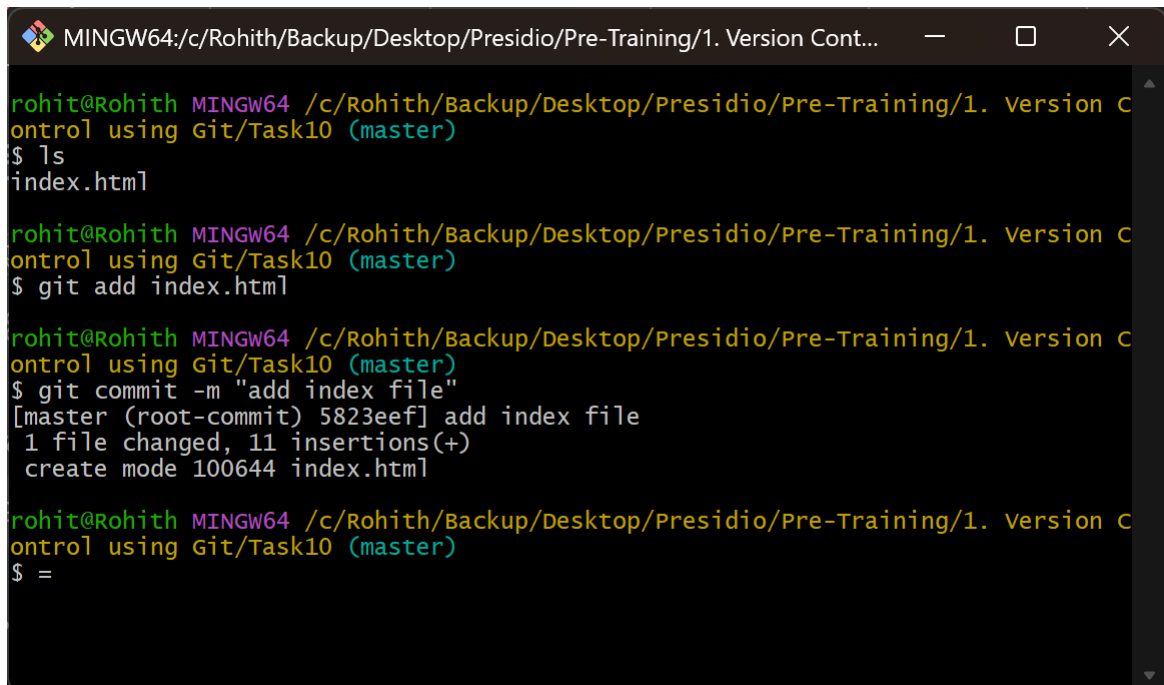
```
MINGW64:/c/Rohith/Backup/Desktop/Presidio/Pre-Training/1. Version Cont...
rohit@Rohith MINGW64 /c/Rohith/Backup/Desktop/Presidio/Pre-Training/1. Version Control using Git/Task10 (master)
$ git init
Reinitialized existing Git repository in C:/Rohith/Backup/Desktop/Presidio/Pre-Training/1. Version Control using Git/Task10/.git/

rohit@Rohith MINGW64 /c/Rohith/Backup/Desktop/Presidio/Pre-Training/1. Version Control using Git/Task10 (master)
$ touch index.html

rohit@Rohith MINGW64 /c/Rohith/Backup/Desktop/Presidio/Pre-Training/1. Version Control using Git/Task10 (master)
$ |
```



```
1 <!DOCTYPE html>
2 <html lang="en">
3 <head>
4   <meta charset="UTF-8">
5   <meta name="viewport" content="width=device-width, initial-scale=1.0">
6   <title>Task 10</title>
7 </head>
8 <body>
9   <p>Content goes here</p>
10 </body>
11 </html>
```



```
MINGW64:/c/Rohith/Backup/Desktop/Presidio/Pre-Training/1. Version Cont...
rohit@Rohith MINGW64 /c/Rohith/Backup/Desktop/Presidio/Pre-Training/1. Version Cont...
ontrol using Git/Task10 (master)
$ ls
index.html

rohit@Rohith MINGW64 /c/Rohith/Backup/Desktop/Presidio/Pre-Training/1. Version Cont...
ontrol using Git/Task10 (master)
$ git add index.html

rohit@Rohith MINGW64 /c/Rohith/Backup/Desktop/Presidio/Pre-Training/1. Version Cont...
ontrol using Git/Task10 (master)
$ git commit -m "add index file"
[master (root-commit) 5823eef] add index file
1 file changed, 11 insertions(+)
create mode 100644 index.html

rohit@Rohith MINGW64 /c/Rohith/Backup/Desktop/Presidio/Pre-Training/1. Version Cont...
ontrol using Git/Task10 (master)
$ =
```

Create additional branches:

```
MINGW64:/c/Rohith/Backup/Desktop/Presidio/Pre-Training/1. Version Cont...
rohit@Rohith MINGW64 /c/Rohith/Backup/Desktop/Presidio/Pre-Training/1. Version C
ontrol using Git/Task10 (master)
$ git branch feature-branch

rohit@Rohith MINGW64 /c/Rohith/Backup/Desktop/Presidio/Pre-Training/1. Version C
ontrol using Git/Task10 (master)
$ git branch bugfix-branch

rohit@Rohith MINGW64 /c/Rohith/Backup/Desktop/Presidio/Pre-Training/1. Version C
ontrol using Git/Task10 (master)
$ git branch release-branch

rohit@Rohith MINGW64 /c/Rohith/Backup/Desktop/Presidio/Pre-Training/1. Version C
ontrol using Git/Task10 (master)
$ git branch
  bugfix-branch
  feature-branch
* master
  release-branch

rohit@Rohith MINGW64 /c/Rohith/Backup/Desktop/Presidio/Pre-Training/1. Version C
ontrol using Git/Task10 (master)
$
```

## 2. Simulating a Scenario Requiring a Forced Push

### Step 2: Make Some Commits in the Feature Branch

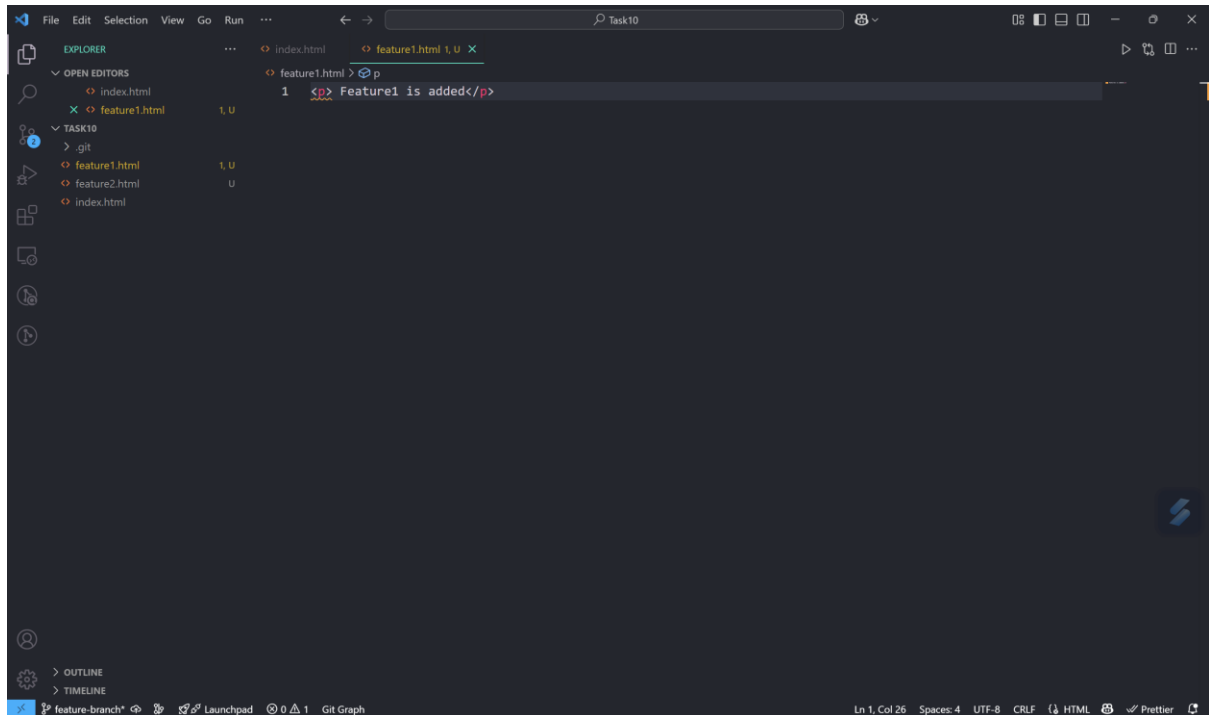
Switch to the feature branch:

```
MINGW64:/c/Rohith/Backup/Desktop/Presidio/Pre-Training/1. Version Cont...
rohit@Rohith MINGW64 /c/Rohith/Backup/Desktop/Presidio/Pre-Training/1. Version C
ontrol using Git/Task10 (master)
$ git checkout feature-branch
Switched to branch 'feature-branch'

rohit@Rohith MINGW64 /c/Rohith/Backup/Desktop/Presidio/Pre-Training/1. Version C
ontrol using Git/Task10 (feature-branch)
$ touch feature1.html

rohit@Rohith MINGW64 /c/Rohith/Backup/Desktop/Presidio/Pre-Training/1. Version C
ontrol using Git/Task10 (feature-branch)
$ touch feature2.html

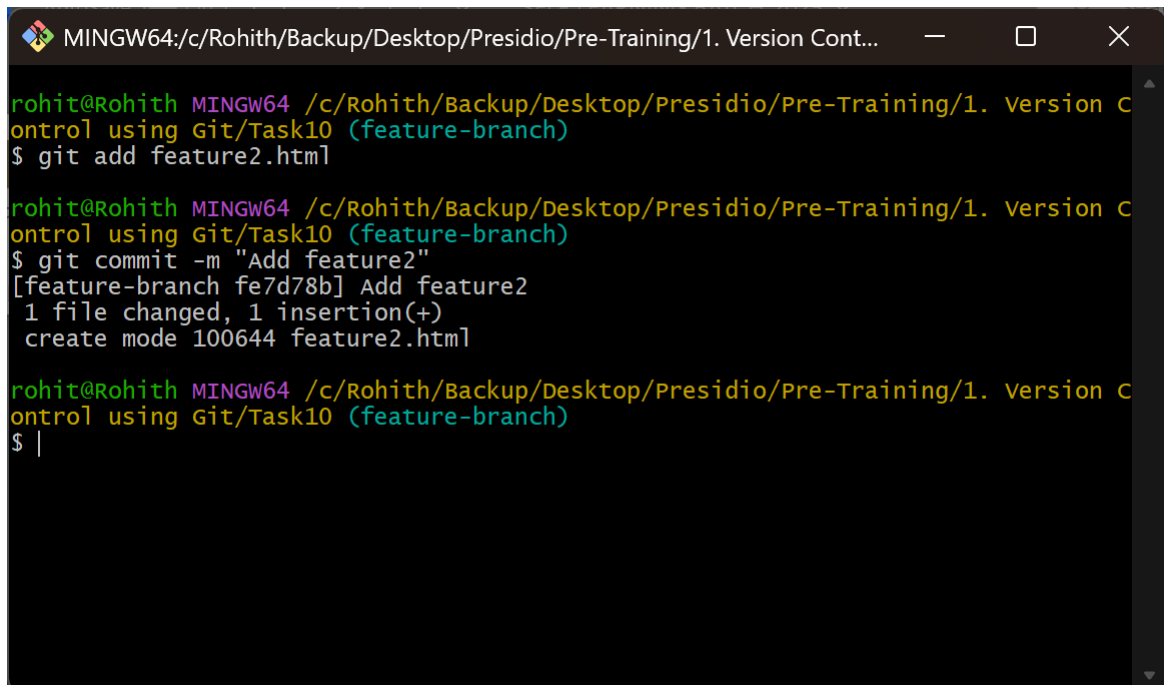
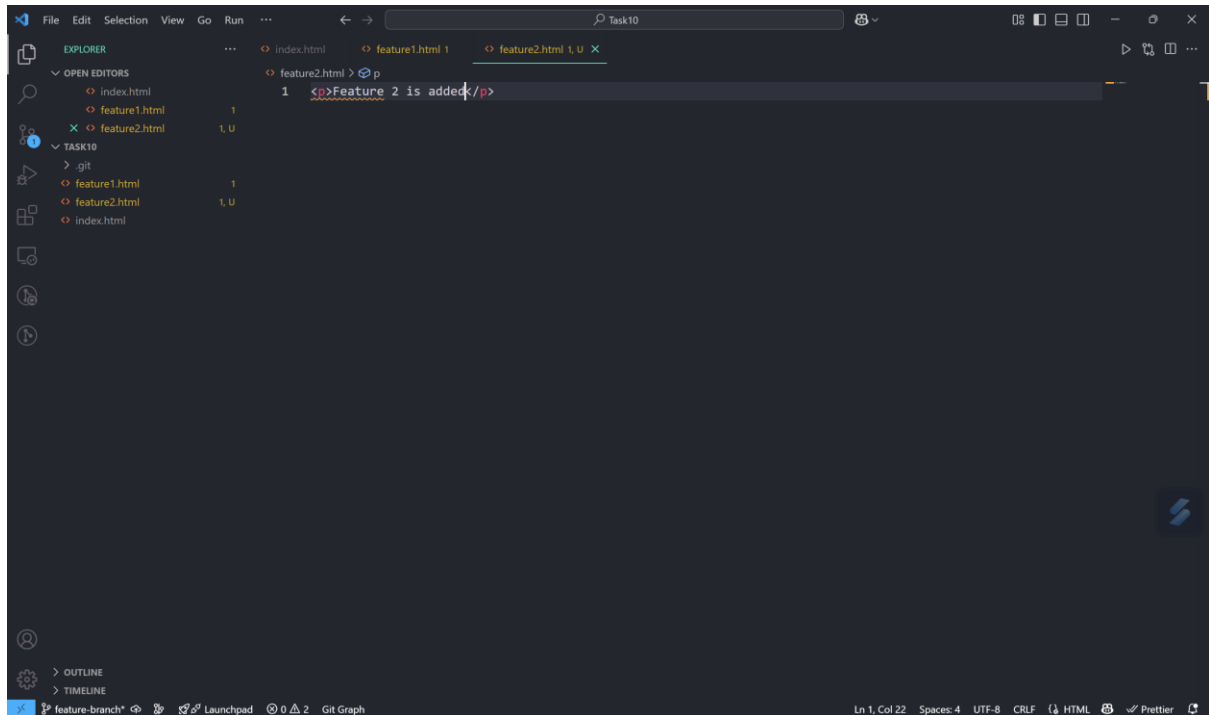
rohit@Rohith MINGW64 /c/Rohith/Backup/Desktop/Presidio/Pre-Training/1. Version C
ontrol using Git/Task10 (feature-branch)
$
```



```
MINGW64:/c/Rohith/Backup/Desktop/Presidio/Pre-Training/1. Version Cont...
rohit@Rohith MINGW64 /c/Rohith/Backup/Desktop/Presidio/Pre-Training/1. Version Cont...
$ git add feature1.html

rohit@Rohith MINGW64 /c/Rohith/Backup/Desktop/Presidio/Pre-Training/1. Version Cont...
$ git commit -m "Add feature1"
[feature-branch 50429a0] Add feature1
1 file changed, 1 insertion(+)
 create mode 100644 feature1.html

rohit@Rohith MINGW64 /c/Rohith/Backup/Desktop/Presidio/Pre-Training/1. Version Cont...
$
```



```
MINGW64:/c/Rohith/Backup/Desktop/Presidio/Pre-Training/1. Version Cont...
rohit@Rohith MINGW64 /c/Rohith/Backup/Desktop/Presidio/Pre-Training/1. Version C
ontrol using Git/Task10 (feature-branch)
$ git remote add origin https://github.com/rohith18111407/Task10.git

rohit@Rohith MINGW64 /c/Rohith/Backup/Desktop/Presidio/Pre-Training/1. Version C
ontrol using Git/Task10 (feature-branch)
$ git remote -v
origin https://github.com/rohith18111407/Task10.git (fetch)
origin https://github.com/rohith18111407/Task10.git (push)

rohit@Rohith MINGW64 /c/Rohith/Backup/Desktop/Presidio/Pre-Training/1. Version C
ontrol using Git/Task10 (feature-branch)
$ git push origin feature-branch
Enumerating objects: 9, done.
Counting objects: 100% (9/9), done.
Delta compression using up to 16 threads
Compressing objects: 100% (6/6), done.
Writing objects: 100% (9/9), 946 bytes | 105.00 KiB/s, done.
Total 9 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
To https://github.com/rohith18111407/Task10.git
 * [new branch]      feature-branch -> feature-branch

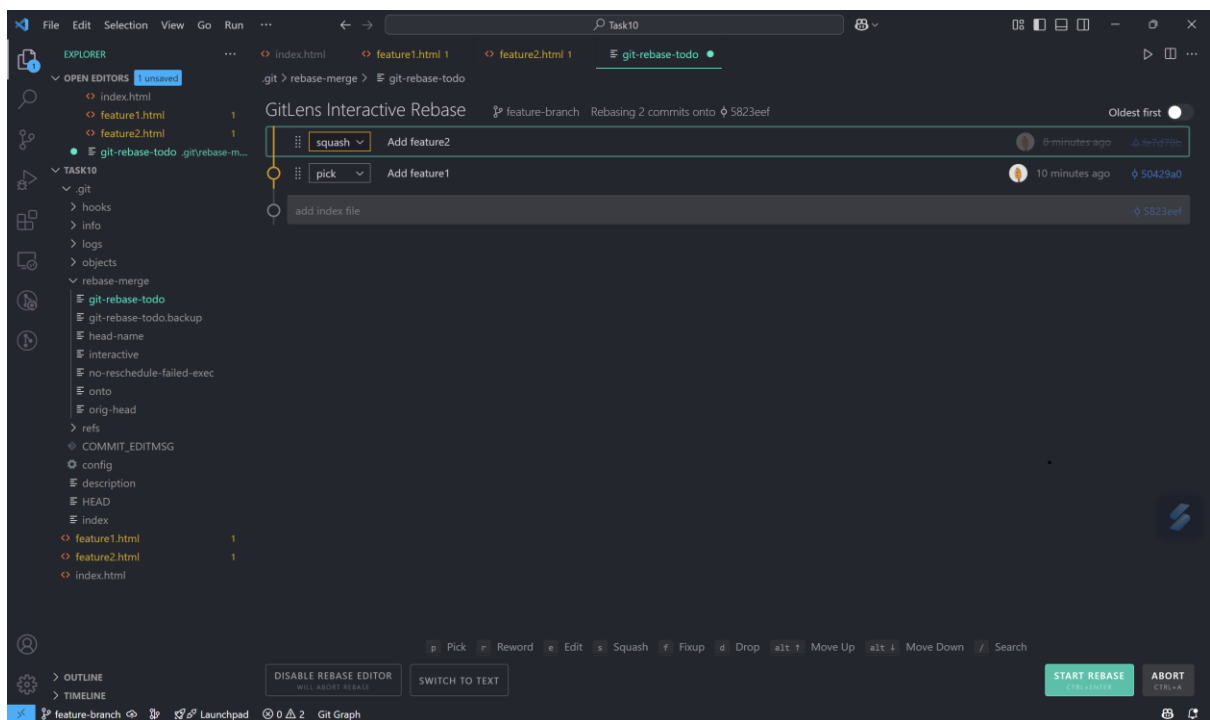
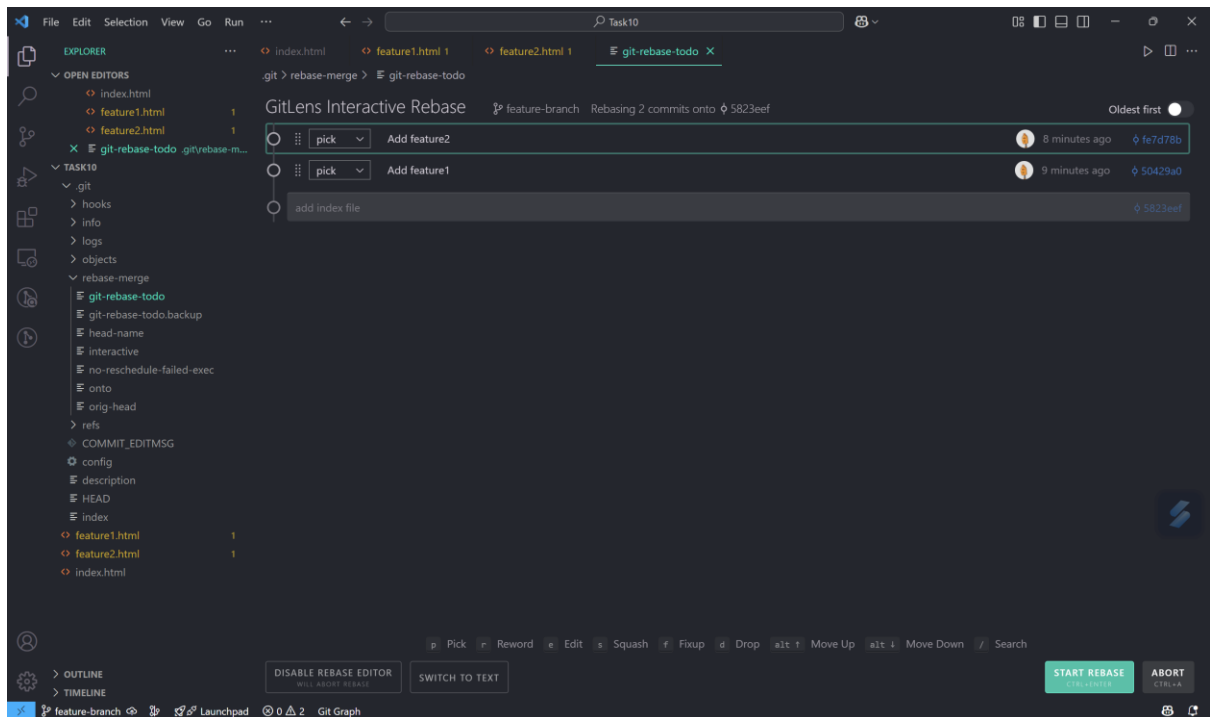
rohit@Rohith MINGW64 /c/Rohith/Backup/Desktop/Presidio/Pre-Training/1. Version C
ontrol using Git/Task10 (feature-branch)
```

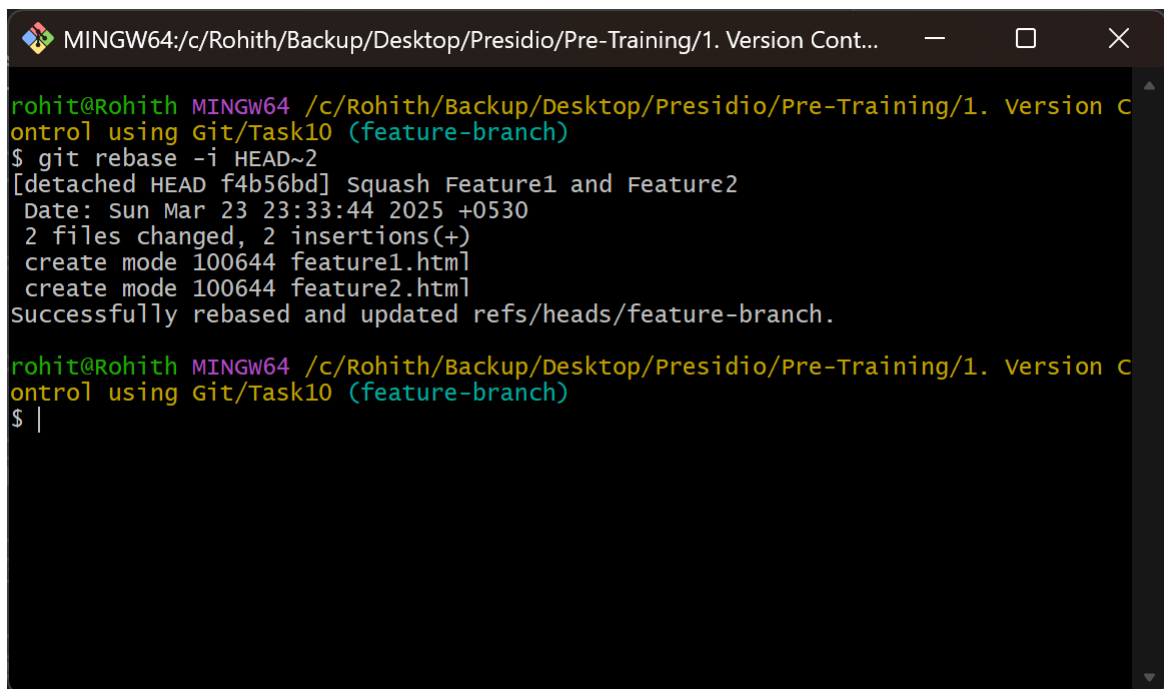
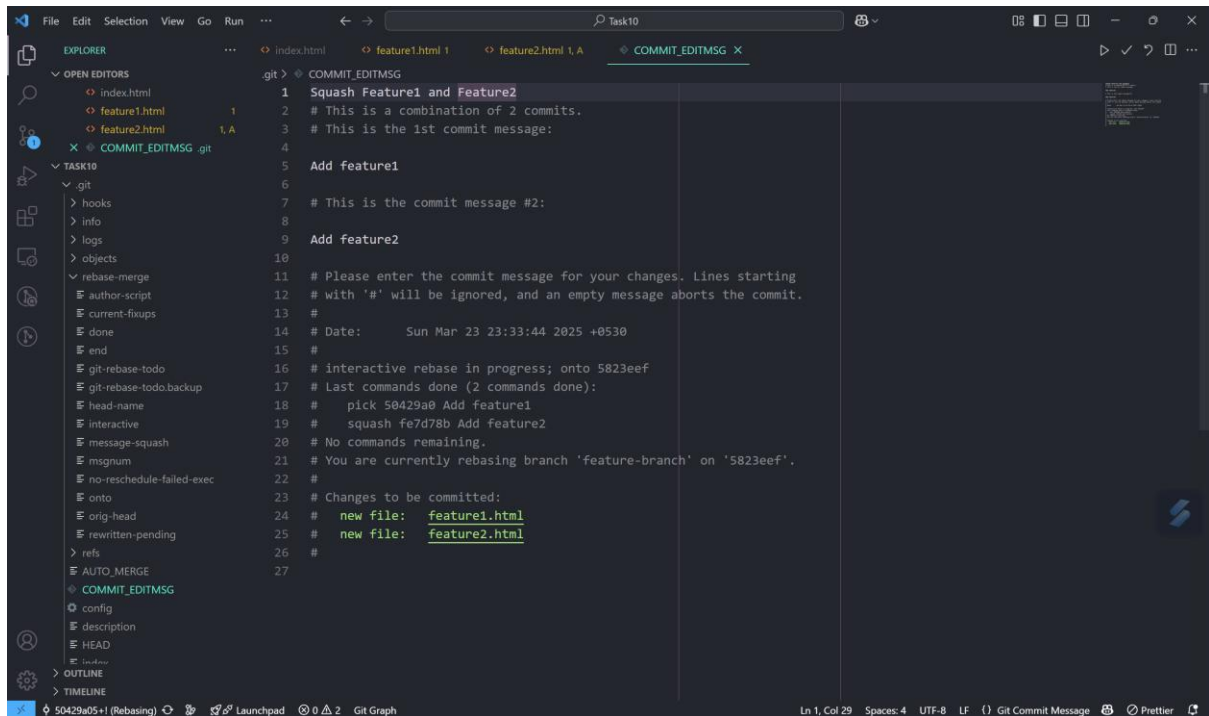
### 3. Rewriting History with Interactive Rebase

#### Step 3: Squash Commits Using Rebase

Now, assume you want to combine the last two commits into one:

```
MINGW64:/c/Rohith/Backup/Desktop/Presidio/Pre-Training/1. Version Cont...
rohit@Rohith MINGW64 /c/Rohith/Backup/Desktop/Presidio/Pre-Training/1. Version C
ontrol using Git/Task10 (feature-branch)
$ git rebase -i HEAD~2
hint: waiting for your editor to close the file... |
```







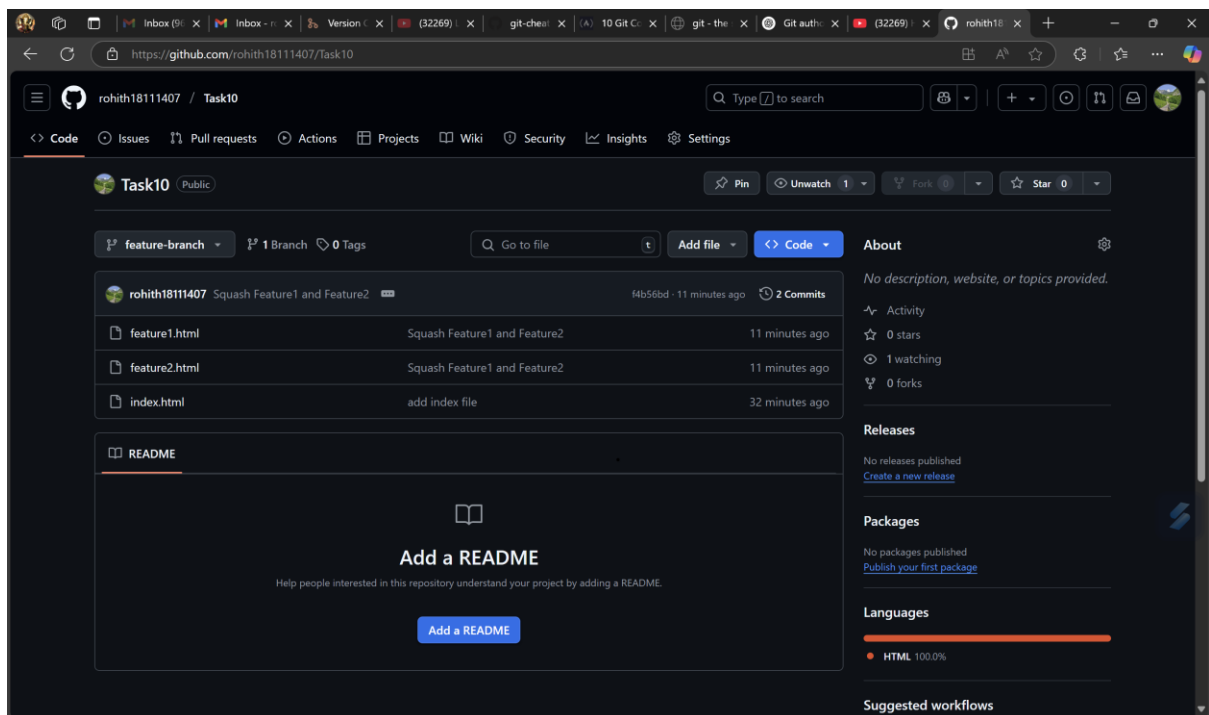
## 4. Forcing a Push After Rewriting History

### Step 4: Push with Force

Since the commit history has changed, Git will reject a normal push. Instead, force push:

```
MINGW64:/c/Rohith/Backup/Desktop/Presidio/Pre-Training/1. Version Cont...
rohit@Rohith MINGW64 /c/Rohith/Backup/Desktop/Presidio/Pre-Training/1. Version C
ontrol using Git/Task10 (feature-branch)
$ git push origin feature-branch
To https://github.com/rohith1811407/Task10.git
! [rejected]        feature-branch -> feature-branch (non-fast-forward)
error: failed to push some refs to 'https://github.com/rohith1811407/Task10.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.

rohit@Rohith MINGW64 /c/Rohith/Backup/Desktop/Presidio/Pre-Training/1. Version C
ontrol using Git/Task10 (feature-branch)
$ git push --force origin feature-branch
Enumerating objects: 5, done.
Counting objects: 100% (5/5), done.
Delta compression using up to 16 threads
Compressing objects: 100% (2/2), done.
Writing objects: 100% (4/4), 389 bytes | 194.00 KiB/s, done.
Total 4 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
To https://github.com/rohith1811407/Task10.git
+ fe7d78b...f4b56bd feature-branch -> feature-branch (forced update)
```



## 5. Recovering Lost Commits Using git relog

### Step 5: Simulating a Mistaken Force Push

Let's assume someone else pushed changes to the same branch, and your force push accidentally removed their work.

To find lost commits:

```
MINGW64:/c/Rohith/Backup/Desktop/Presidio/Pre-Training/1. Version Cont...
rohit@Rohith MINGW64 /c/Rohith/Backup/Desktop/Presidio/Pre-Training/1. Version Cont...
$ git log --oneline
f4b56bd (HEAD -> feature-branch, origin/feature-branch) Squash Feature1 and Feature2
5823eef (release-branch, master, bugfix-branch) add index file

rohit@Rohith MINGW64 /c/Rohith/Backup/Desktop/Presidio/Pre-Training/1. Version Cont...
$ git relog
f4b56bd (HEAD -> feature-branch, origin/feature-branch) HEAD@{0}: rebase (finish): returning to refs/heads/feature-branch
f4b56bd (HEAD -> feature-branch, origin/feature-branch) HEAD@{1}: rebase (squash): Squash Feature1 and Feature2
50429a0 HEAD@{2}: rebase (start): checkout HEAD~2
fe7d78b HEAD@{3}: commit: Add feature2
50429a0 HEAD@{4}: commit: Add feature1
5823eef (release-branch, master, bugfix-branch) HEAD@{5}: checkout: moving from master to feature-branch
5823eef (release-branch, master, bugfix-branch) HEAD@{6}: commit (initial): add index file

rohit@Rohith MINGW64 /c/Rohith/Backup/Desktop/Presidio/Pre-Training/1. Version Cont...
$
```

```
MINGW64:/c/Rohith/Backup/Desktop/Presidio/Pre-Training/1. Version Cont...
$ git checkout 50429a0
Note: switching to '50429a0'.

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 50429a0 Add feature1

rohit@Rohith MINGW64 /c/Rohith/Backup/Desktop/Presidio/Pre-Training/1. Version Cont...
$
```

```
MINGW64:/c/Rohith/Backup/Desktop/Presidio/Pre-Training/1. Version Cont...
rohit@Rohith MINGW64 /c/Rohith/Backup/Desktop/Presidio/Pre-Training/1. Version C
ontrol using Git/Task10 ((50429a0...))
$ git branch recovered-feature-branch

rohit@Rohith MINGW64 /c/Rohith/Backup/Desktop/Presidio/Pre-Training/1. Version C
ontrol using Git/Task10 ((50429a0...))
$ git log --oneline
50429a0 (HEAD, recovered-feature-branch) Add feature1
5823eef (release-branch, master, bugfix-branch) add index file

rohit@Rohith MINGW64 /c/Rohith/Backup/Desktop/Presidio/Pre-Training/1. Version C
ontrol using Git/Task10 ((50429a0...))
$ git branch
* (HEAD detached at 50429a0)
  bugfix-branch
  feature-branch
  master
  recovered-feature-branch
  release-branch

rohit@Rohith MINGW64 /c/Rohith/Backup/Desktop/Presidio/Pre-Training/1. Version C
ontrol using Git/Task10 ((50429a0...))
$ |
```