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Submitted to:

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Subject:

Intro to data science

Roll no:

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**Task # 1: Set Up a GitHub Repository
and Clone It :**

- **Step 1:** Sign in to GitHub, create a new repository named *my-first- repo*, and choose its visibility (Public/Private).
- **Step 2:** Copy the repository URL, open a terminal, navigate to your desired directory, and use git clone to download the

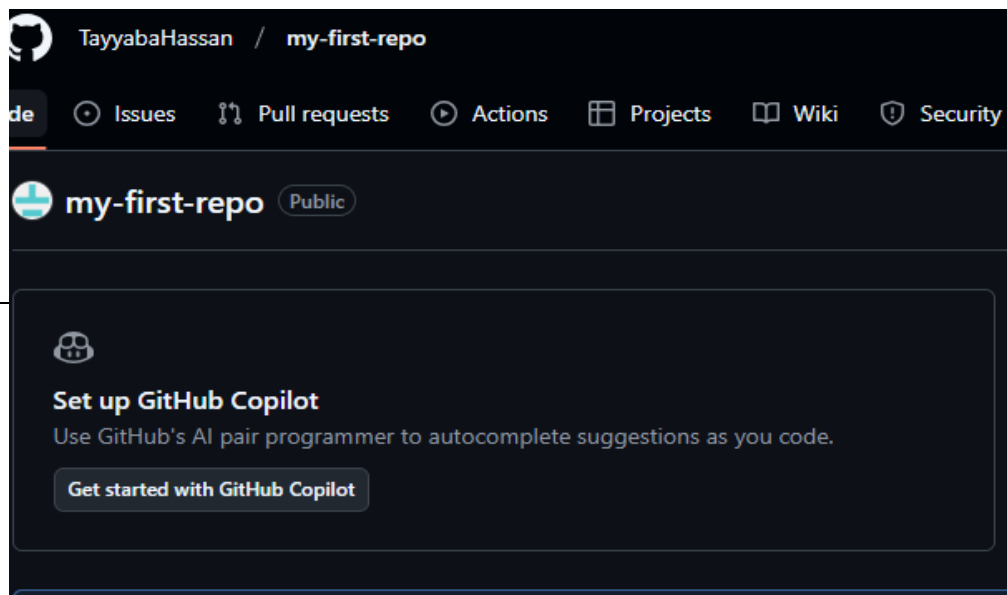
repository locally.

```
C:\Users\imadu>git clone https://github.com/TayyabaHassan/my-first-repo.git
Cloning into 'my-first-repo'...
warning: You appear to have cloned an empty repository.

C:\Users\imadu>cd my-first-repo

C:\Users\imadu\my-first-repo>
```

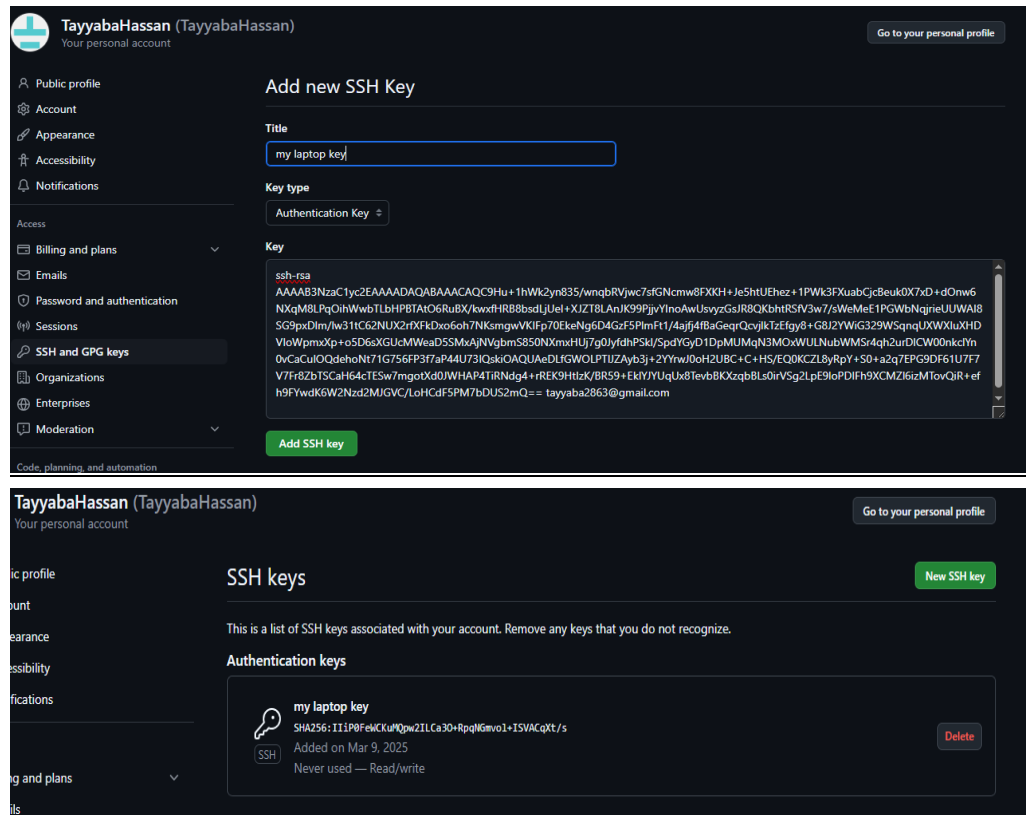
- **Step 3:**
- Create a README.md file inside the cloned repository, add some content, stage the file, commit the changes, and push them to GitHub.



Task # 2: Configure SSH for GitHub

- **Step 1:** Generate an SSH key using ssh-keygen, save it in the default location, copy the public key,

and add it to GitHub under *Settings* → *SSH and GPG keys*.



- **Step 2:** Add the private key to your system using `ssh-add`, test the connection with `ssh -T git@github.com`, and clone a repository using SSH key

```

C:\Users\imadu>ssh-keygen -t rsa -b 4096 -C tayyaba2863@gmail.com
Generating public/private rsa key pair.
Enter file in which to save the key (C:\Users\imadu/.ssh/id_rsa):
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Passphrases do not match. Try again.
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Passphrases do not match. Try again.
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in C:\Users\imadu/.ssh/id_rsa
Your public key has been saved in C:\Users\imadu/.ssh/id_rsa.pub
The key fingerprint is:
SHA256:IIiP0FewCKuMQpw2ILCa30+RpqNGmvol+ISVACqXt/s tayyaba2863@gmail.com
The key's randomart image is:
+---[RSA 4096]-----+
|* .. .o.          |
|*+..+.o.          |
|B** + .           |
|XBo+ o .          |
|Bo+.. S           |
|.= ...           |
|=.o o=           |
|o+ ++..          |
|+o+...E           |
+-----[SHA256]-----+

```

Task # 3: Implement Branching and Merging

- **Step 1:** In your local repository, create a new branch using git branch feature-branch and switch

to it.

```
C:\> Command Prompt
Microsoft Windows [Version 10.0.19045.5487]
(c) Microsoft Corporation. All rights reserved.

C:\Users\imadu>mkdir my-first-repo
A subdirectory or file my-first-repo already exists.

C:\Users\imadu>cd my-first-repo

C:\Users\imadu\my-first-repo>git branch feature-branch

C:\Users\imadu\my-first-repo>git checkout feature-branch
Switched to branch 'feature-branch'

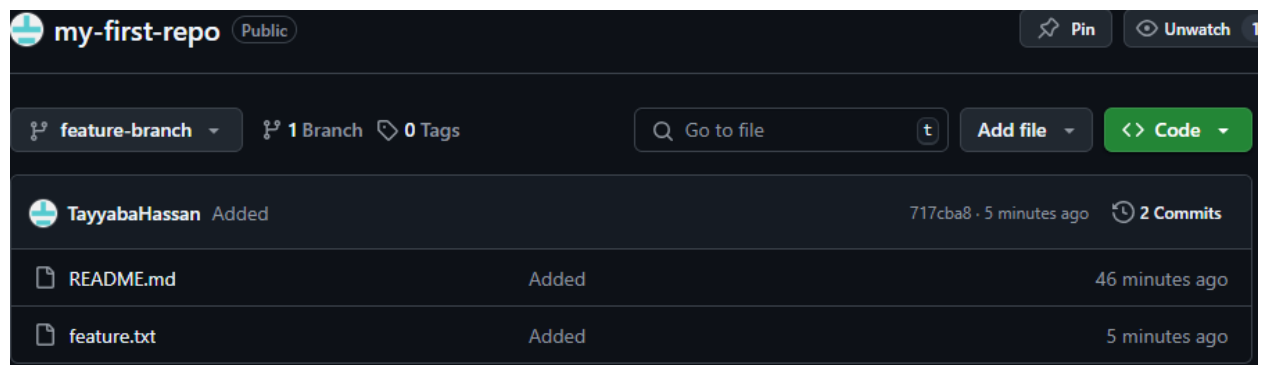
C:\Users\imadu\my-first-repo>echo This is a new feature > feature.txt

C:\Users\imadu\my-first-repo>git add feature.txt

C:\Users\imadu\my-first-repo>git commit -m Added feature.txt
[feature-branch 717cba8] Added
 1 file changed, 1 insertion(+)
 create mode 100644 feature.txt

C:\Users\imadu\my-first-repo>git push origin feature-branch
info: please complete authentication in your browser...
```

- **Step 2:** Add a new file named feature.txt, stage and commit it, and push the branch to GitHub.









- **Step 3:** Switch back to the main branch, merge feature-branch into main, and push the updated branch to GitHub.

```
Command Prompt
Counting objects: 100% (6/6), done.
Delta compression using up to 4 threads
Compressing objects: 100% (3/3), done.
Writing objects: 100% (6/6), 490 bytes | 61.00 KiB/s, done.
Total 6 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
To https://github.com/TayyabaHassan/my-first-repo.git
 * [new branch]      feature-branch -> feature-branch

C:\Users\imadu\my-first-repo>git checkout main
Switched to branch 'main'
Your branch is based on 'origin/main', but the upstream is gone.
(use "git branch --unset-upstream" to fixup)

C:\Users\imadu\my-first-repo>git merge feature-branch
Updating 4d1f7e0..717cba8
Fast-forward
 feature.txt | 1 +
 1 file changed, 1 insertion(+)
 create mode 100644 feature.txt
```

Branch	Updated
feature-branch 	 20 hours ago
Your branches	
Branch	Updated
main 	 14 minutes ago
conflict-branch 	 1 hour ago

Task # 4: Handle Merge Conflicts

- **Step 1:** Create a new branch (conflict-branch), modify README.md, stage, and commit the changes. Then switch to main, edit the same file differently, stage, and commit the changes.

```
C:\Users\imadu\my-first-repo>git branch
* conflict-branch
  feature-branch
  main

C:\Users\imadu\my-first-repo>git push origin conflict-branch
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), 347 bytes | 115.00 KiB/s, done.
Total 3 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
remote:
remote: Create a pull request for 'conflict-branch' on GitHub by visiting:
remote:   https://github.com/TayyabaHassan/my-first-repo/pull/new/conflict-branch
remote:
To https://github.com/TayyabaHassan/my-first-repo.git
 * [new branch]      conflict-branch -> conflict-branch

C:\Users\imadu\my-first-repo>git checkout main
Switched to branch 'main'
Your branch is up to date with 'origin/main'.

C:\Users\imadu\my-first-repo>git pull origin main
From https://github.com/TayyabaHassan/my-first-repo
 * branch            main       -> FETCH_HEAD
Already up to date.

C:\Users\imadu\my-first-repo>git merge conflict-branch
Updating 717cbe9..555bd45
```

```

C:\Users\imadu\my-first-repo>git checkout conflict-branch
Switched to branch 'conflict-branch'

C:\Users\imadu\my-first-repo>git add README.md

C:\Users\imadu\my-first-repo>git commit -m "Update README.md in c
[conflict-branch 6e49e71] Update README.md in conflict branch
1 file changed, 4 insertions(+)

C:\Users\imadu\my-first-repo>git push origin conflict-branch
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), 383 bytes | 191.00 KiB/s, done.
Total 3 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
To https://github.com/TayyabaHassan/my-first-repo.git
55fbd1f..6e49e71 conflict-branch -> conflict-branch

C:\Users\imadu\my-first-repo>git checkout main
Switched to branch 'main'
Your branch is up to date with 'origin/main'.

```

- **Step 2:** Merge conflict-branch into main, manually resolve conflicts in the README.md file, remove conflict markers (<<<<<<, =====, >>>>>>), commit the resolved file, and push it to GitHub.

With conflict:

```

# Project Overview
<<<<<< main
This project is designed to manage user data efficiently.
=====
This project is built to enhance user experience with advanced features.
>>>>>> conflict-branch

```

Conflict resolved:

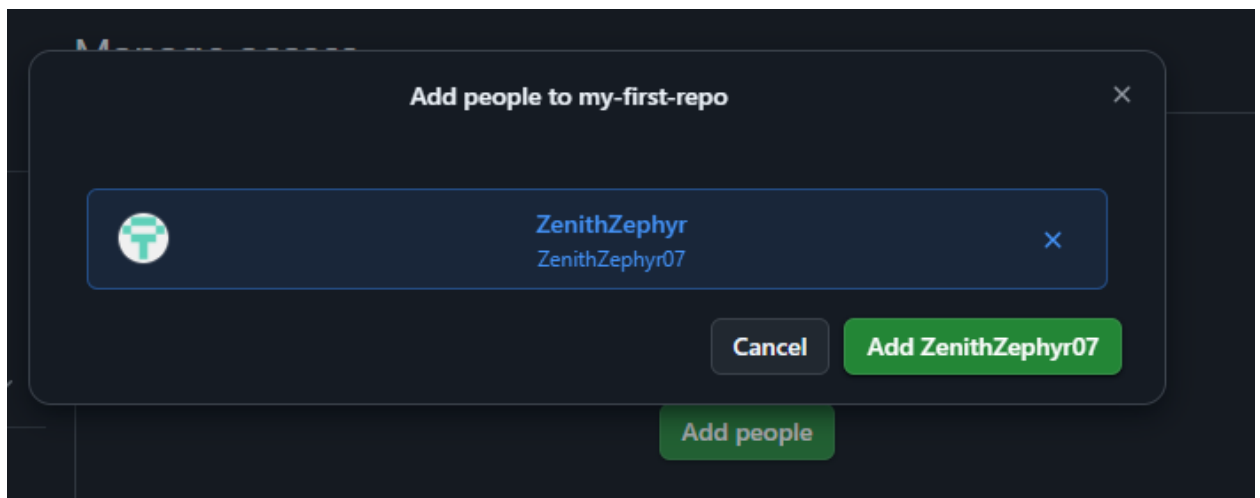
```

# Project Overview
main
This project is designed to manage user data efficiently.
This project is built to enhance user experience with advanced features. conflict-branch

```


Task # 5: Work with Collaborators

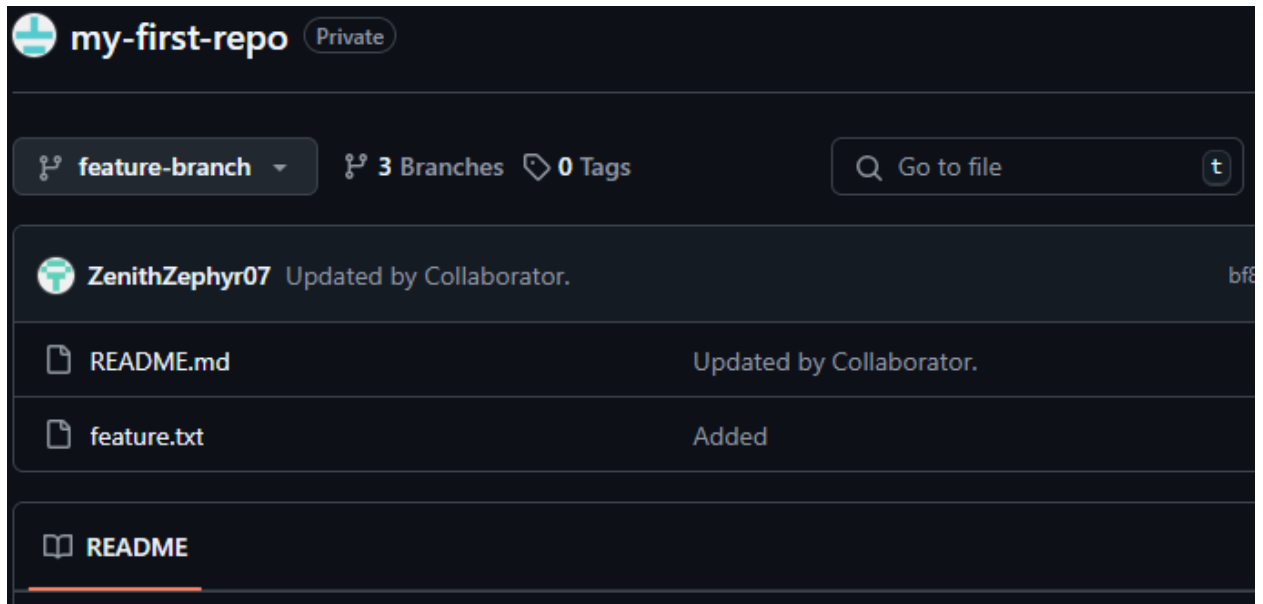
- **Step 1:** Go to your repository's *Settings* → *Collaborators*, add a collaborator using their GitHub username/email, and wait for them to accept the invitation.



- **Step 2:** The collaborator clones the repository, makes modifications, commits the changes, and pushes them to GitHub.

```
C:\Users\user\Documents>mkdir GitTayyaba
C:\Users\user\Documents>cd GitTayyaba
C:\Users\user\Documents\GitTayyaba>git clone https://github.com/TayyabaHassan/my-first-repo.git
Cloning into 'my-first-repo'...
remote: Enumerating objects: 21, done.
remote: Counting objects: 100% (21/21), done.
remote: Compressing objects: 100% (17/17), done.
remote: Total 21 (delta 1), reused 20 (delta 0), pack-reused 0 (from 0)
Receiving objects: 100% (21/21), done.
Resolving deltas: 100% (1/1), done.
```

- **Step 3:** Pull the collaborator's changes to your local repository and verify the updates.



- Step 4: clone collaborator's repository and make changes to it

```
C:\Users\imadu>cd areeba

C:\Users\imadu\areeba>git clone https://github.com/ZenithZephyr07/my-first-repo.git
Cloning into 'my-first-repo'...
remote: Enumerating objects: 32, done.
remote: Counting objects: 100% (32/32), done.
remote: Compressing objects: 100% (23/23), done.
remote: Total 32 (delta 6), reused 29 (delta 4), pack-reused 0 (from 0)
Receiving objects: 100% (32/32), 4.44 KiB | 413.00 KiB/s, done.
Resolving deltas: 100% (6/6), done.

C:\Users\imadu\areeba>cd my-first-repo

C:\Users\imadu\areeba\my-first-repo>git add .

C:\Users\imadu\areeba\my-first-repo>git commit -m "Updated README with new changes"
On branch main
Your branch is up to date with 'origin/main'.

nothing to commit, working tree clean

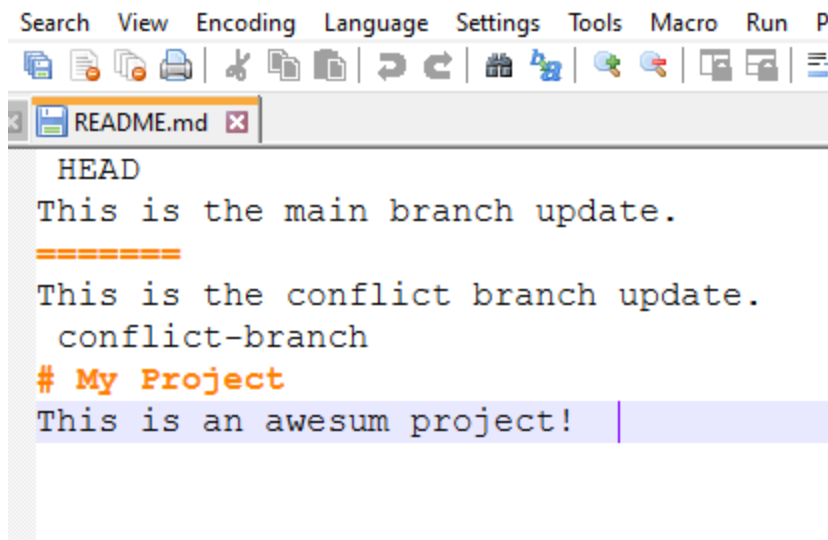
C:\Users\imadu\areeba\my-first-repo>git push origin main
Everything up-to-date
```

Task # 6: Revert Changes in Git

- **Step 1:** Introduce an intentional mistake in README.md, save and commit it.

```
C:\Users\imadu\my-first-repo>git add README.md

C:\Users\imadu\my-first-repo>git commit -m "Added incorrect line in README.md"
[main 49e2774] Added incorrect line in README.md
1 file changed, 1 insertion(+), 3 deletions(-)
```



```
Search View Encoding Language Settings Tools Macro Run P
[Icons]
3 README.md x
HEAD
This is the main branch update.
=====
This is the conflict branch update.
conflict-branch
# My Project
This is an awesum project!
```

- **Step 2:** Undo the last commit using `git reset --soft HEAD~1` or `git revert HEAD`, then push the changes to GitHub.

```
C:\Users\imadu\my-first-repo>git reset --soft HEAD~1

C:\Users\imadu\my-first-repo>git push origin main
Enumerating objects: 8, done.
Counting objects: 100% (8/8), done.
Delta compression using up to 4 threads
Compressing objects: 100% (6/6), done.
Writing objects: 100% (6/6), 684 bytes | 342.00 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/TayyabaHassan/my-first-repo.git
   b3c9c91..16e88dd  main -> main
```