



BITS Pilani
Pilani Campus

Assignment - 1

Introduction to DEVOPS

Submitted by

Satish Kumar Sharma (2022MT93327)

Problem statement

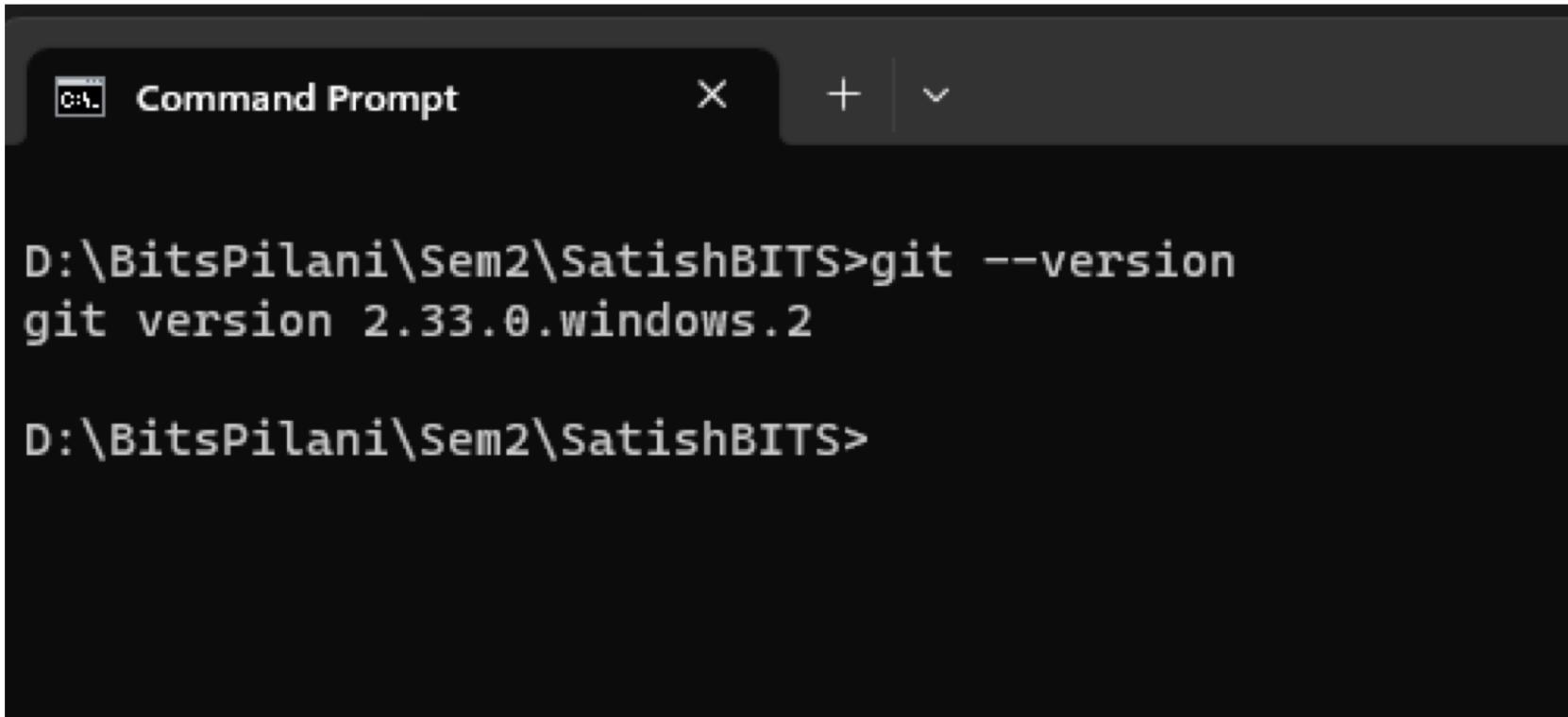
ABC Organization would like to opt for the distributed version control system to upgrade their environment, where Git has been selected as the solution. You been assigned as a consultant to educate the migration process to move their Source Code from Centralized to Distributed systems. As a phase one, you would like to go ahead with a workshop to demonstrate below operation to make the ABC team comfortable.

- i) Create a Repository
- ii) Add Tow Directory and some raw code files to the repository
- iii) Move Code from One directory to Another Directory
- iv) Update one source code file and display the difference
- v) Create a Branch
- vi) Add some raw code to the branch
- vii) Merge the Branch with Main line

And at the end provide the Summary of advantages of moving from Centralized Source Code to Distributed Version Control.

Git Basic installation/version check

Git install Command: git --version



```
D:\BitsPilani\Sem2\SatishBITS>git --version
git version 2.33.0.windows.2

D:\BitsPilani\Sem2\SatishBITS>
```

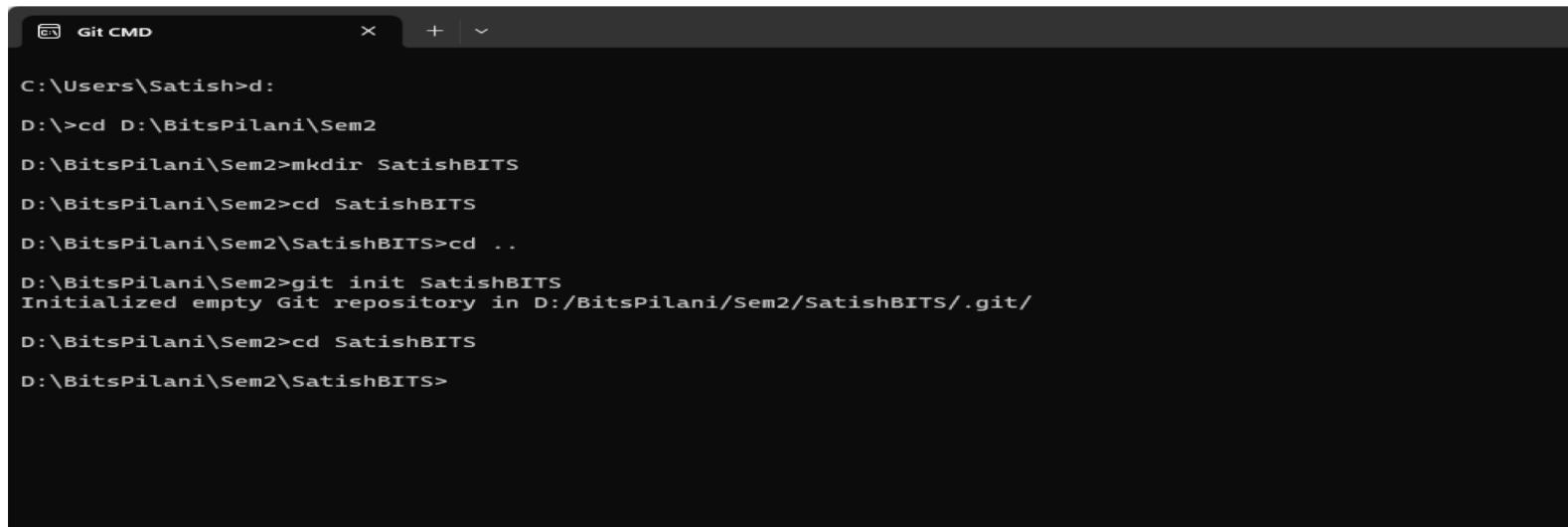
i) Create Repository

First creating a local directory and initiating the directory as git repository, Create a remote repository on git, set remote URL to local repo and then push the local to remote repository. Setup the repository with user and email.

```
>mkdir SatisfBITS  
>git init SatisfBITS  
>git log  
>git add .  
>git commit -m "first commit"  
>git remote add origin  
https://github.com/iamsatishsharma/BITS\_DevOps\_Assignment1.git  
>git push --set-upstream origin main
```

Note: --set-upstream command is required when we push repo with branch to origin where it does not exists.

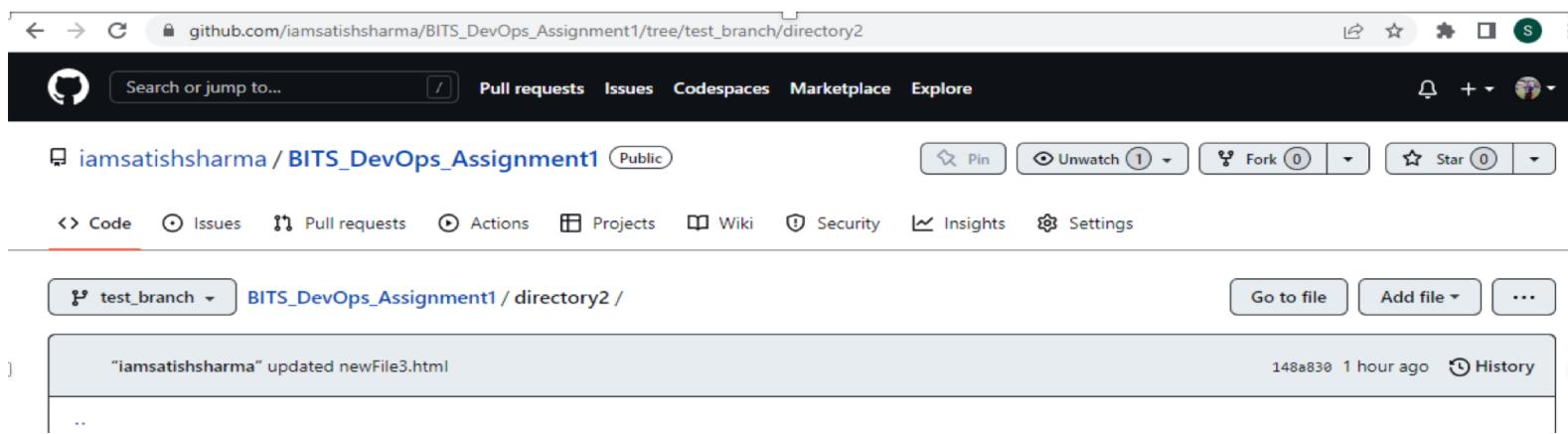
Screenshots



```

Git CMD

C:\Users\Satish>d:
D:\>cd D:\BitsPilani\Sem2
D:\BitsPilani\Sem2>mkdir SatishBITS
D:\BitsPilani\Sem2>cd SatishBITS
D:\BitsPilani\Sem2\SatishBITS>cd ..
D:\BitsPilani\Sem2>git init SatishBITS
Initialized empty Git repository in D:/BitsPilani/Sem2/SatishBITS/.git/
D:\BitsPilani\Sem2>cd SatishBITS
D:\BitsPilani\Sem2\SatishBITS>
  
```



github.com/iamsatishsharma/BITS_DevOps_Assignment1/tree/test_branch/directory2

iamsatishsharma / BITS_DevOps_Assignment1 Public

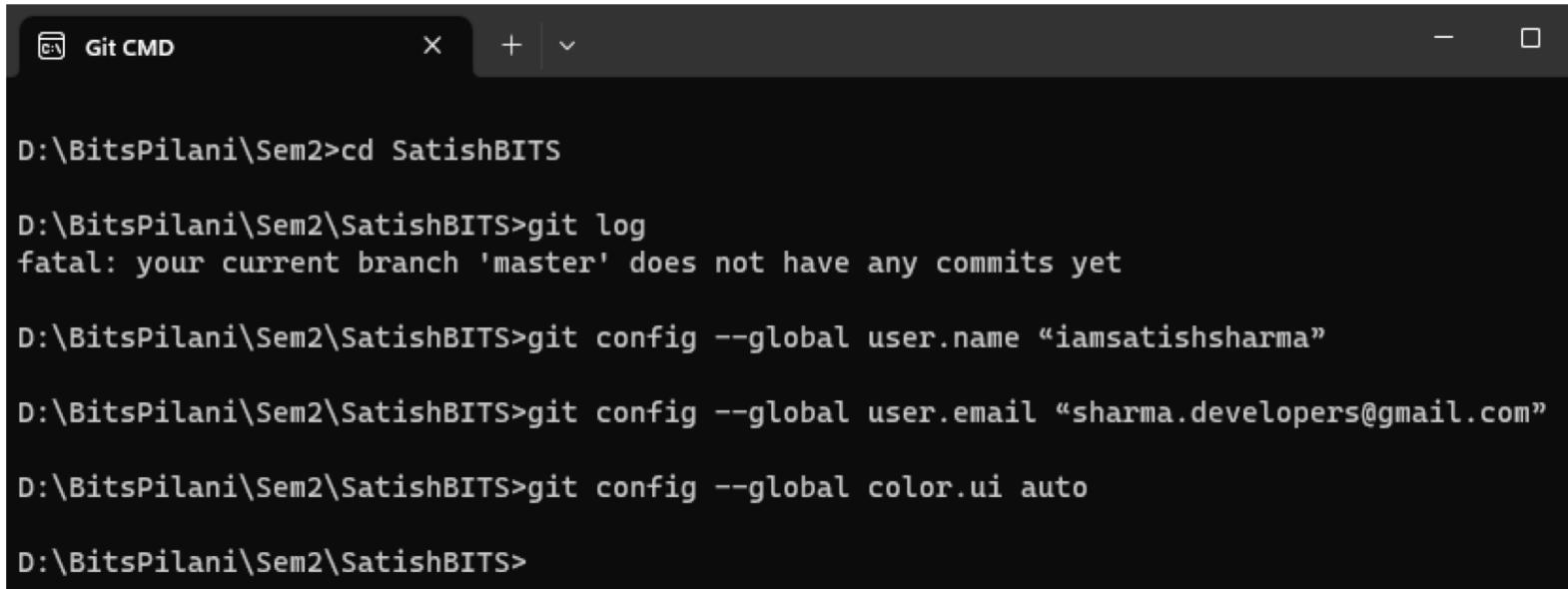
Code Issues Pull requests Actions Projects Wiki Security Insights Settings

test_branch / BITS_DevOps_Assignment1 / directory2 /

“iamsatishsharma” updated newFile3.html 148a830 1 hour ago History

...

- git config --global user.name “iamsatishsharma”
- git config --global user.email “sharma.developers@gmail.com”
- git config --global color.ui auto



```
Git CMD
D:\BitsPilani\Sem2>cd SatishBITS
D:\BitsPilani\Sem2\SatishBITS>git log
fatal: your current branch 'master' does not have any commits yet
D:\BitsPilani\Sem2\SatishBITS>git config --global user.name "iamsatishsharma"
D:\BitsPilani\Sem2\SatishBITS>git config --global user.email "sharma.developers@gmail.com"
D:\BitsPilani\Sem2\SatishBITS>git config --global color.ui auto
D:\BitsPilani\Sem2\SatishBITS>
```

ii) Add Two Directory and some raw code files to the repository

Command:

```
>mkdir directory1      (to create directory1)
```

```
>mkdir directory2
```

```
>echo newFile1.html
```

```
>git add newFile1.html
```

```
>git commit -m "added a new file1 ib directory 1"
```

```
>echo "<!DOCTYPE html>" > newFile1.html
```

```
>echo newFile2.html
```

```
>git add newFile2.html
```

```
>git commit -m "added new file2"
```

```
>echo "<!DOCTYPE html>" > newFile2.html
```

```
>git commit -m "added new file2"
```

```
>echo "Put any content here" >> Newfile2.java
```

Screenshot

```
Git CMD x + v

D:\BitsPilani\Sem2\SatishBITS>dir
Volume in drive D is New Volume
Volume Serial Number is 44C7-89CA

Directory of D:\BitsPilani\Sem2\SatishBITS

03/08/2023  01:38 PM    <DIR>        .
03/08/2023  01:37 PM    <DIR>        ..
0   File(s)          0 bytes
2 Dir(s)  966,266,589,184 bytes free

D:\BitsPilani\Sem2\SatishBITS>mkdir directory1

D:\BitsPilani\Sem2\SatishBITS>mkdir directory2

D:\BitsPilani\Sem2\SatishBITS>ls -a
'ls' is not recognized as an internal or external command,
operable program or batch file.

D:\BitsPilani\Sem2\SatishBITS>dir
Volume in drive D is New Volume
Volume Serial Number is 44C7-89CA

Directory of D:\BitsPilani\Sem2\SatishBITS

03/08/2023  01:45 PM    <DIR>        .
03/08/2023  01:37 PM    <DIR>        ..
03/08/2023  01:45 PM    <DIR>        directory1
03/08/2023  01:45 PM    <DIR>        directory2
0   File(s)          0 bytes
4 Dir(s)  966,266,589,184 bytes free

D:\BitsPilani\Sem2\SatishBITS>
```

Screenshot

```
Git CMD x + v

D:\BitsPilani\Sem2\SatishBITS\directory1>echo newFile1.html
newFile1.html

D:\BitsPilani\Sem2\SatishBITS\directory1>echo "<!DOCTYPE html>" > newFile1.html

D:\BitsPilani\Sem2\SatishBITS\directory1>git add newFile1.html

D:\BitsPilani\Sem2\SatishBITS\directory1>git commit -m "added a new file1 in directory 1"
[master (root-commit) 6cf1ad1] added a new file1 in directory 1
 1 file changed, 1 insertion(+)
 create mode 100644 directory1/newFile1.html

D:\BitsPilani\Sem2\SatishBITS\directory1>cd ..

D:\BitsPilani\Sem2\SatishBITS>cd directory2

D:\BitsPilani\Sem2\SatishBITS\directory2>echo newFile2.html
newFile2.html

D:\BitsPilani\Sem2\SatishBITS\directory2>echo "<!DOCTYPE html>" > newFile2.html

D:\BitsPilani\Sem2\SatishBITS\directory2>git commit -m "added a new file2 in directory 2"
On branch master
Untracked files:
  (use "git add <file>..." to include in what will be committed)
  ./

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

D:\BitsPilani\Sem2\SatishBITS\directory2>git add newFile2.html

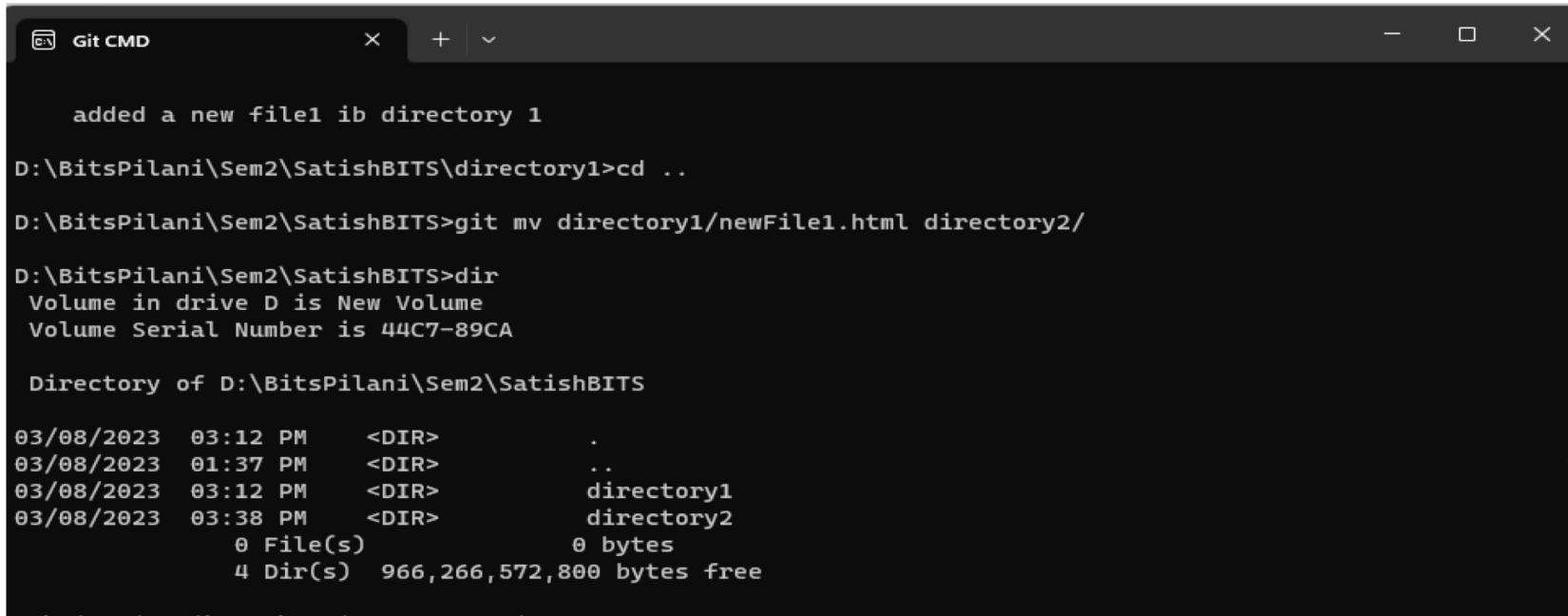
D:\BitsPilani\Sem2\SatishBITS\directory2>git commit -m "added a new file2 in directory 2"
[master 19ce930] added a new file2 in directory 2
 1 file changed, 1 insertion(+)
 create mode 100644 directory2/newFile2.html

D:\BitsPilani\Sem2\SatishBITS\directory2>
```

3) Move Code from One directory to Another Directory

Command:

```
>git mv directory1/newFile1.html directory2/----move file from directory1 to directory2
>dir
>git status
```



```
Git CMD

added a new file1 in directory 1

D:\BitsPilani\Sem2\SatishBITS\directory1>cd ..

D:\BitsPilani\Sem2\SatishBITS>git mv directory1/newFile1.html directory2/

D:\BitsPilani\Sem2\SatishBITS>dir
Volume in drive D is New Volume
Volume Serial Number is 44C7-89CA

Directory of D:\BitsPilani\Sem2\SatishBITS

03/08/2023  03:12 PM    <DIR>        .
03/08/2023  01:37 PM    <DIR>        ..
03/08/2023  03:12 PM    <DIR>        directory1
03/08/2023  03:38 PM    <DIR>        directory2
              0 File(s)        0 bytes
              4 Dir(s)  966,266,572,800 bytes free
```

Screenshot

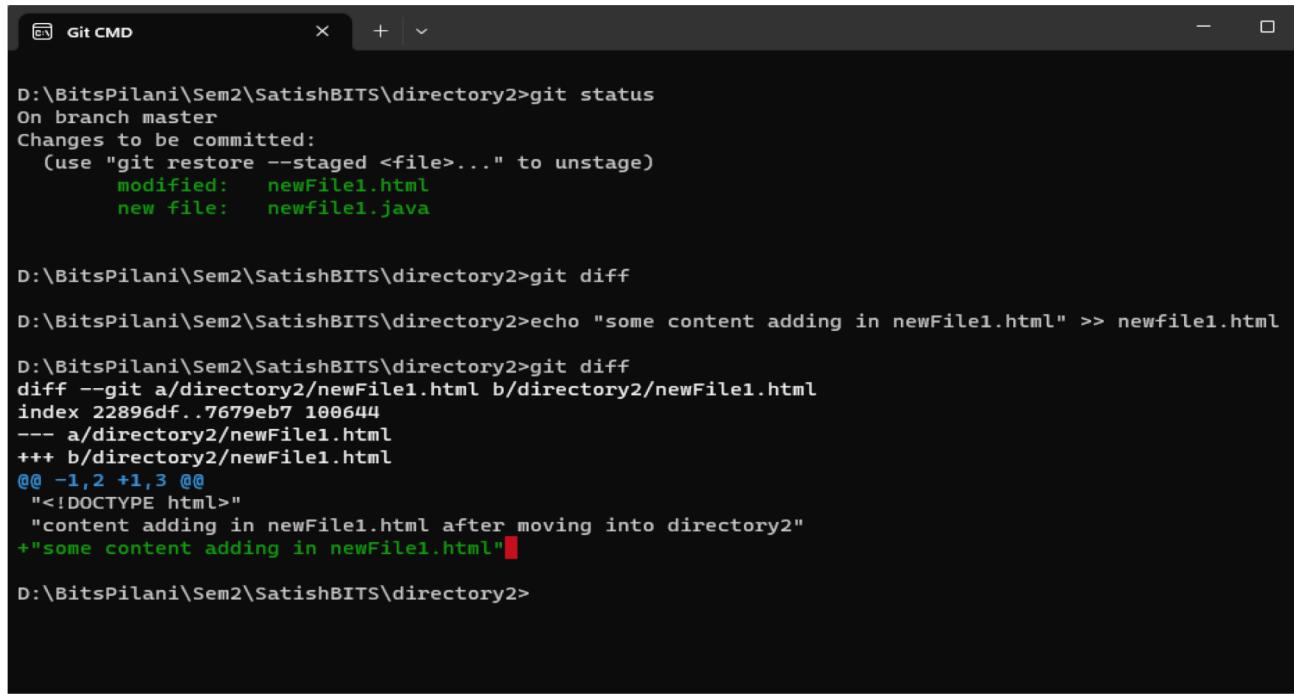
```
Git CMD  X  +  v  -  
  
D:\BitsPilani\Sem2\SatishBITS>git status  
On branch master  
Changes to be committed:  
  (use "git restore --staged <file>..." to unstage)  
    new file:   directory2/newFile1.html  
  
D:\BitsPilani\Sem2\SatishBITS>git commit -m "Moving newFile1.html from directory1 to directory2"  
[master 16389fe] Moving newFile1.html from directory1 to directory2  
 1 file changed, 1 insertion(+)  
 create mode 100644 directory2/newFile1.html  
  
D:\BitsPilani\Sem2\SatishBITS>git status  
On branch master  
nothing to commit, working tree clean  
  
D:\BitsPilani\Sem2\SatishBITS>
```

4. Update one source code file and display the difference

Command:

```
>git status
```

```
>git diff
```



```
Git CMD

D:\BitsPilani\Sem2\SatishBITS\directory2>git status
On branch master
Changes to be committed:
  (use "git restore --staged <file>..." to unstage)
    modified:   newFile1.html
    new file:   newFile1.java

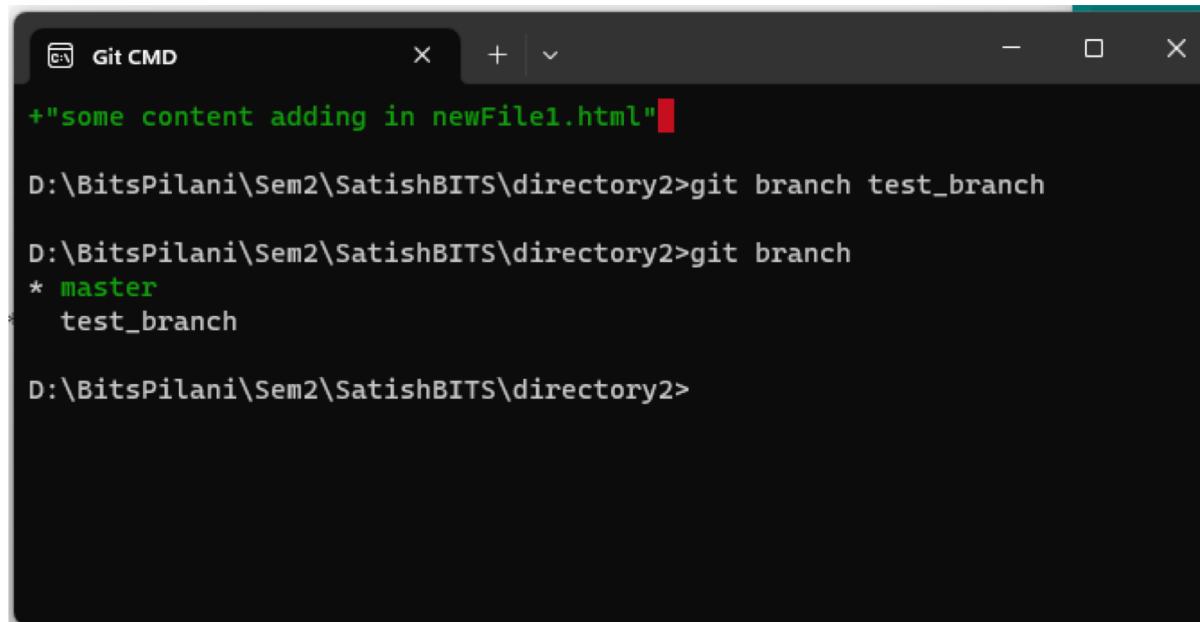
D:\BitsPilani\Sem2\SatishBITS\directory2>git diff
D:\BitsPilani\Sem2\SatishBITS\directory2>echo "some content adding in newFile1.html" >> newfile1.html
D:\BitsPilani\Sem2\SatishBITS\directory2>git diff
diff --git a/directory2/newFile1.html b/directory2/newFile1.html
index 22896df..7679eb7 100644
--- a/directory2/newFile1.html
+++ b/directory2/newFile1.html
@@ -1,2 +1,3 @@
 <!DOCTYPE html>
 "content adding in newFile1.html after moving into directory2"
+"some content adding in newFile1.html"

D:\BitsPilani\Sem2\SatishBITS\directory2>
```

5. Create a Branch

Command:

```
>git branch test_branch  
>git branch
```

A screenshot of a Windows Command Prompt window titled "Git CMD". The window shows the following command-line session:

```
Git CMD  
+  
+ "some content adding in newFile1.html"  
D:\BitsPilani\Sem2\SatishBITS\directory2>git branch test_branch  
D:\BitsPilani\Sem2\SatishBITS\directory2>git branch  
* master  
  test_branch  
D:\BitsPilani\Sem2\SatishBITS\directory2>
```

The command `git branch test_branch` is entered and executed, creating a new branch named `test_branch`. The asterisk (*) in the output indicates that the `master` branch is the current active branch.

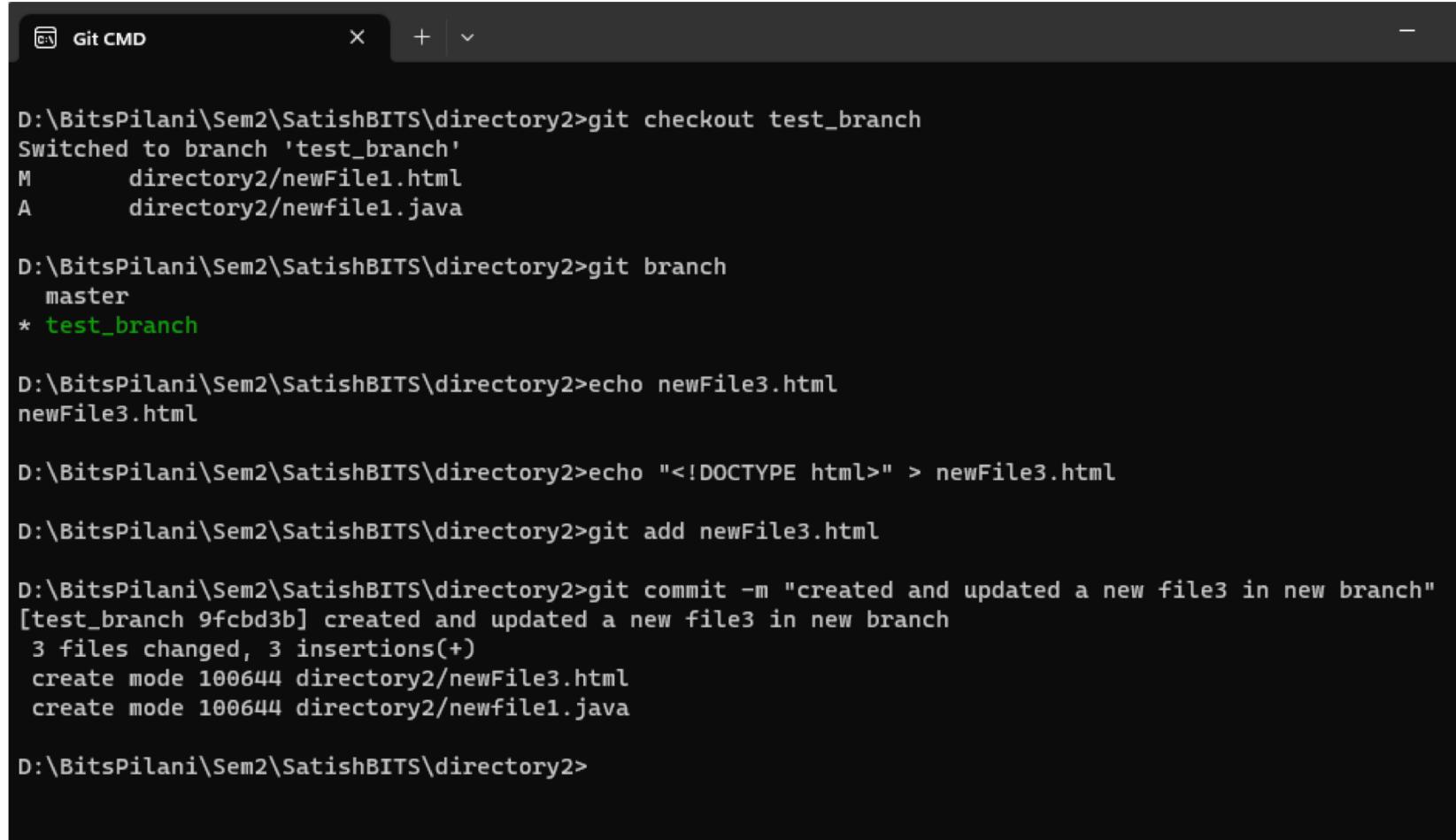
6.Add some raw code to the branch

Checkout to test branch and add new file and update.

Command:

```
>git checkout test_branch  
>git branch  
>echo newFile3.html  
>echo "<!DOCTYPE html>" > newFile3.html  
>git commit -m "created and updated a new file3 in  
new branch"  
>git diff master test_branch newFile1.html
```

Screenshot



Git CMD

```
D:\BitsPilani\Sem2\SatishBITS\directory2>git checkout test_branch
Switched to branch 'test_branch'
M      directory2/newFile1.html
A      directory2/newfile1.java

D:\BitsPilani\Sem2\SatishBITS\directory2>git branch
  master
* test_branch

D:\BitsPilani\Sem2\SatishBITS\directory2>echo newFile3.html
newFile3.html

D:\BitsPilani\Sem2\SatishBITS\directory2>echo "<!DOCTYPE html>" > newFile3.html

D:\BitsPilani\Sem2\SatishBITS\directory2>git add newFile3.html

D:\BitsPilani\Sem2\SatishBITS\directory2>git commit -m "created and updated a new file3 in new branch"
[test_branch 9fcbd3b] created and updated a new file3 in new branch
 3 files changed, 3 insertions(+)
 create mode 100644 directory2/newFile3.html
 create mode 100644 directory2/newfile1.java

D:\BitsPilani\Sem2\SatishBITS\directory2>
```

7. Merge the Branch with Main line

Command:

```
>git branch  
> git commit -a -m "updated newFile3.html"  
>git status  
>git checkout master  
>git branch  
>git merge test_branch
```

Screenshots

```
Git CMD
D:\BitsPilani\Sem2\SatishBITS>git branch
  master
* test_branch

D:\BitsPilani\Sem2\SatishBITS>git checkout master
error: Your local changes to the following files would be overwritten by checkout:
  directory2/newFile1.html
Please commit your changes or stash them before you switch branches.
Aborting

D:\BitsPilani\Sem2\SatishBITS>git commit -a -m "updated newFile3.html"
[test_branch 148a830] updated newFile3.html
  1 file changed, 1 insertion(+)

D:\BitsPilani\Sem2\SatishBITS>git status
On branch test_branch
nothing to commit, working tree clean

D:\BitsPilani\Sem2\SatishBITS>git checkout master
Switched to branch 'master'

D:\BitsPilani\Sem2\SatishBITS>git branch
* master
  test_branch

D:\BitsPilani\Sem2\SatishBITS>git merge test_branch
Updating 16389fe..148a830
Fast-forward
  directory2/newFile1.html | 2 ++
  directory2/newFile3.html | 1 +
  directory2/newfile1.java | 1 +
  3 files changed, 4 insertions(+)
  create mode 100644 directory2/newFile3.html
  create mode 100644 directory2/newfile1.java
```

Push to remote with update

Final Push to remote:

```
>git remote add origin
```

```
https://github.com/iamsatishsharma/BITS_DevOps_Assignment1  
.git
```

```
>git add .
```

```
>git commit -m "Final commit"
```

```
>git branch -M test_branch
```

```
>git push -u origin test_branch
```

Screenshot

```
Git CMD

D:\BitsPilani\Sem2\SatishBITS>git config --global user.email "ssharma.developers@gmail.com"

D:\BitsPilani\Sem2\SatishBITS>git remote add origin https://github.com/iamsatishsharma/BITS_DevOps_Assignment1.git

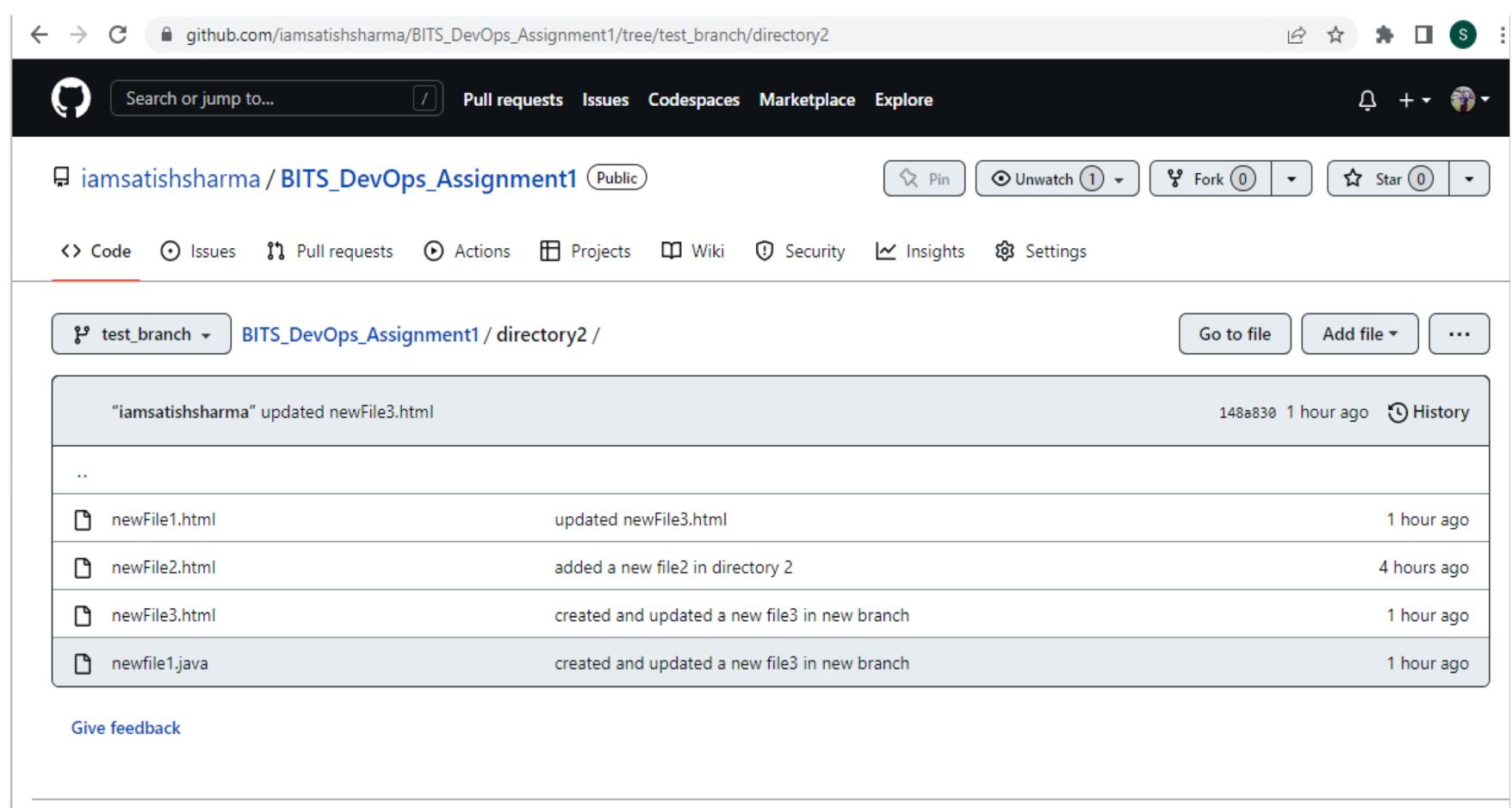
D:\BitsPilani\Sem2\SatishBITS>git branch -M test_branch

D:\BitsPilani\Sem2\SatishBITS>git push -u origin test_branch
info: please complete authentication in your browser...
Enumerating objects: 21, done.
Counting objects: 100% (21/21), done.
Delta compression using up to 12 threads
Compressing objects: 100% (12/12), done.
Writing objects: 100% (21/21), 1.86 KiB | 634.00 KiB/s, done.
Total 21 (delta 3), reused 0 (delta 0), pack-reused 0
remote: Resolving deltas: 100% (3/3), done.
To https://github.com/iamsatishsharma/BITS_DevOps_Assignment1.git
 * [new branch] test_branch -> test_branch
Branch 'test_branch' set up to track remote branch 'test_branch' from 'origin'.

D:\BitsPilani\Sem2\SatishBITS>git remote -v
origin https://github.com/iamsatishsharma/BITS_DevOps_Assignment1.git (fetch)
origin https://github.com/iamsatishsharma/BITS_DevOps_Assignment1.git (push)

D:\BitsPilani\Sem2\SatishBITS>
```

Screenshot



github.com/iamsatishsharma/BITS_DevOps_Assignment1/tree/test_branch/directory2

iamsatishsharma / BITS_DevOps_Assignment1 Public

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test_branch / [BITS_DevOps_Assignment1 / directory2 /](#)

"iamsatishsharma" updated newFile3.html 148a830 1 hour ago [History](#)

...

[newFile1.html](#) updated newFile3.html 1 hour ago

[newFile2.html](#) added a new file2 in directory 2 4 hours ago

[newFile3.html](#) created and updated a new file3 in new branch 1 hour ago

[newfile1.java](#) created and updated a new file3 in new branch 1 hour ago

[Give feedback](#)

Addition: Logs to show the activity's



```
D:\BitsPilani\Sem2\SatishBITS>git log
commit 148a830bd358265d299f391b495a46fe18b43bb1 (HEAD -> master, test_branch)
Author: "iamsatishsharma" <sharma.developers@gmail.com>
Date:   Wed Mar 8 16:25:04 2023 +0400

    updated newFile3.html

commit 9fcabd3b28e9382f4598062c6b9e9d89b868faac8
Author: "iamsatishsharma" <sharma.developers@gmail.com>
Date:   Wed Mar 8 16:19:17 2023 +0400

    created and updated a new file3 in new branch

commit 16389fef007d99606bd35502cc56db9224a4ae1f
Author: "iamsatishsharma" <sharma.developers@gmail.com>
Date:   Wed Mar 8 15:51:39 2023 +0400

    Moving newFile1.htmpl from directory1 to directory2

commit a41c74598e18fdbdd8296e6ed147021f629f61a7
Author: "iamsatishsharma" <sharma.developers@gmail.com>
Date:   Wed Mar 8 15:15:34 2023 +0400

    Fist commit after creating two directory and two files

commit 19ce9305b29f550dc82fea3b947097e37f2656cf
Author: "iamsatishsharma" <sharma.developers@gmail.com>
Date:   Wed Mar 8 14:00:22 2023 +0400

    added a new file2 in directory 2

commit 6cf1ad1ec7d1785c76cd2f16cd7d81fb77824
Author: "iamsatishsharma" <sharma.developers@gmail.com>
Date:   Wed Mar 8 13:58:23 2023 +0400
    ....skipping...
commit 148a830bd358265d299f391b495a46fe18b43bb1 (HEAD -> master, test_branch)
Author: "iamsatishsharma" <sharma.developers@gmail.com>
Date:   Wed Mar 8 16:25:04 2023 +0400

    updated newFile3.html

commit 9fcabd3b28e9382f4598062c6b9e9d89b868faac8
Author: "iamsatishsharma" <sharma.developers@gmail.com>
Date:   Wed Mar 8 16:19:17 2023 +0400

    created and updated a new file3 in new branch
```

Advantages of Moving from Centralized Source Code to Distributed Version control.

- Unlike a centralized version control system (VCS), a distributed version control system enables every user to have a local copy of the running history on their machine, so if there's an outage, every local copy becomes a backup copy and team members can continue to development offline.
- A distributed version control doesn't have a single point of failure, because developers clone repositories on their distributed version control workstations, creating multiple backup copies.
- DVCS has the biggest advantage in that it allows you to work offline and gives flexibility. You have the entire history of the code in your own hard drive, so all the changes you will be making in your own server or to Your own repository which doesn't require an internet connection, but this is not in the case of CVCS.
- DVCS is faster than CVCS because you don't need to communicate with the remote server for each and every command.

-
- You do everything locally which gives you the benefit to work faster than CVCS.
 - Working on branches is easy in DVCS. Every developer has an entire history of the code in DVCS, so developers can share their changes before merging all the 'sets of changes to the remote server.
 - In CVCS it's difficult and time-consuming to work on branches because it requires to communicate with the server directly.
 - Merge conflicts with other developer's code are less in DVCS. Because every developer work on their own piece of code. Merge conflicts are more in CVCS in comparison to DVCS.
 - DVCS has more advantages and it's more popular than CVCS

Key learnings by Satish Kumar Sharma (2022MT93327)

My key learnings are summarized as below:

- ❑ Learning how to use **Git is even better**, because it makes you understand GitHub in depth like *create git repository, do changes, create branch, create directory, storing, manipulate file, tracking, manipulate and collaborating on software projects*.

Thank You