Version Control Tool - Git

Step 1: Install Git

apt install git

Step 2: Configure your Git username and email address.

```
root@node215348-env-9987419:~# git --version
git version 2.34.1
root@node215348-env-9987419:~# git config --global user.name "Tejal Kale"
root@node215348-env-9987419:~# git config --global user.email "tejalbkale@gmail.com"
root@node215348-env-9987419:~#  cat .git/config
cat: .git/config: No such file or directory
root@node215348-env-9987419:~# git config --list
user.name=Tejal Kale
user.email=tejalbkale@gmail.com
```

Step 3: To pull file first create one directory.

```
root@node215348-env-9987419:~# mkdir devops_local
root@node215348-env-9987419:~# cd devops_local/
```

Step 4: Create one repository on the GitHub and clone repo with copied GitHub URL.

```
root@node215348-env-9987419:~/devops_local# git clone https://github.com/Tejalkale13/devops.git
Cloning into 'devops'...
remote: Enumerating objects: 6, done.
remote: Counting objects: 100% (6/6), done.
remote: Compressing objects: 100% (3/3), done.
remote: Total 6 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
Receiving objects: 100% (6/6), done.
root@node215348-env-9987419:~/devops_local# ls
devops
```

Step 5: Pull the Latest Changes from the remote.

git pull is a Git command used to fetch and integrate changes from a remote repository into your current local branch.

```
root@node215348-env-9987419:~/devops_local/devops# git pull 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), 946 bytes | 946.00 KiB/s, done.
From https://github.com/Tejalkale13/devops
 * branch            main       -> FETCH_HEAD
   125aaf8..48a3c84  main       -> origin/main
Updating 125aaf8..48a3c84
Fast-forward
 demo | 1 +
 1 file changed, 1 insertion(+)
```

Step 6: To push the file first set url.

http://enter_access_token_of_github_@_remaining_httpcode_url

```
root@node215348-env-9987419:~/devops_local/devops# git remote -v
origin  https://github.com/Tejalkale13/devops.git (fetch)
origin  https://github.com/Tejalkale13/devops.git (push)
root@node215348-env-9987419:~/devops_local/devops# git fetch
root@node215348-env-9987419:~/devops_local/devops# git remote set-url --push origin https://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@github.com/Tejalkale13/devops.git
root@node215348-env-9987419:~/devops_local/devops# git remote -v
origin  https://github.com/Tejalkale13/devops.git (fetch)
origin  https://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@github.com/Tejalkale13/devops.git (push)
```

Step 7: Add the files in local repository and commits the file.

s
```
root@node215348-env-9987419:~/devops_local/devops# ls
abc.txt  demo  README.md
root@node215348-env-9987419:~/devops_local/devops# git add abc.txt
root@node215348-env-9987419:~/devops_local/devops# git commit -m "added successfully"
[dev 73c7e83] added successfully
 1 file changed, 0 insertions(+), 0 deletions(-)
 create mode 100644 abc.txt
```
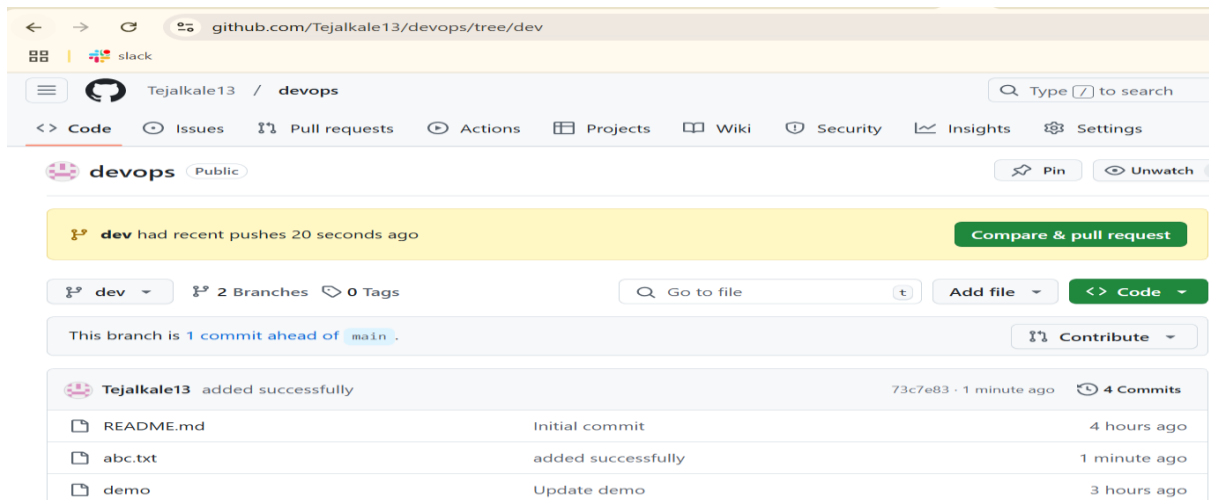
Step 8: . Run push command for pushing local modified file on the github.

```
root@node215348-env-9987419:~/devops_local/devops# git branch
* dev
  main
root@node215348-env-9987419:~/devops_local/devops# git push origin dev
Total 0 (delta 0), reused 0 (delta 0), pack-reused 0
remote:
remote: Create a pull request for 'dev' on GitHub by visiting:
remote:      https://github.com/Tejalkale13/devops/pull/new/dev
remote:
To https://github.com/Tejalkale13/devops.git
 * [new branch]      dev -> dev
```

To merge and Handled git conflict.

Step 1: Create a Branch in Git

Feature Branches:

Branches created from main for each feature or bug fix.

```
root@node215348-env-9987419:~/devops_local/devops# git branch demo1
root@node215348-env-9987419:~/devops_local/devops# git branch demo2
root@node215348-env-9987419:~/devops_local/devops# git branch demo3
root@node215348-env-9987419:~/devops_local/devops# git checkout -b demo4
Switched to a new branch 'demo4'
root@node215348-env-9987419:~/devops_local/devops# git branch
  demo1
  demo2
  demo3
* demo4
  dev
  main
```

Step 2: Merge Feature into Main

The git merge command integrates changes from one branch into another.

```
root@node215348-env-9987419:~/devops_local/devops# echo "Feature content" >> file.txt
root@node215348-env-9987419:~/devops_local/devops# git add file.txt
root@node215348-env-9987419:~/devops_local/devops# git commit -m "Add feature content"
[dev 90967d4] Add feature content
 1 file changed, 1 insertion(+)
 create mode 100644 file.txt
root@node215348-env-9987419:~/devops_local/devops# git checkout main
M       demo
Switched to branch 'main'
Your branch is up to date with 'origin/main'.
root@node215348-env-9987419:~/devops_local/devops# git merge dev
Updating 48a3c84..90967d4
Fast-forward
 abc.txt | 0
 file.txt | 1 +
 2 files changed, 1 insertion(+)
 create mode 100644 abc.txt
 create mode 100644 file.txt
```

Step 3: Handling Merge Conflicts

Conflicts occur when changes in the two branches affect the same lines in a file.

```
* main
root@node215348-env-9987419:~/devops_local/devops# echo "Main branch content" > file.txt
root@node215348-env-9987419:~/devops_local/devops#
root@node215348-env-9987419:~/devops_local/devops# git add file.txt
root@node215348-env-9987419:~/devops_local/devops#
root@node215348-env-9987419:~/devops_local/devops# git commit -m "Update file.txt in main branch"
[main 18a113d] Update file.txt in main branch
 1 file changed, 1 insertion(+), 1 deletion(-)
root@node215348-env-9987419:~/devops_local/devops#
root@node215348-env-9987419:~/devops_local/devops# git checkout dev
M       demo
Switched to branch 'dev'
root@node215348-env-9987419:~/devops_local/devops# echo "Feature branch content" > file.txt
root@node215348-env-9987419:~/devops_local/devops# git add file.txt
root@node215348-env-9987419:~/devops_local/devops# git commit -m "Update file.txt in feature branch"
[dev 7b690c4] Update file.txt in feature branch
 1 file changed, 1 insertion(+), 1 deletion(-)
```

Step 4: Switch back to main and attempt a merge

```
root@node215348-env-9987419:~/devops_local/devops# git merge dev
Auto-merging file.txt
CONFLICT (content): Merge conflict in file.txt
Automatic merge failed; fix conflicts and then commit the result.
root@node215348-env-9987419:~/devops_local/devops#
```

Step 5: Resolving the Conflict

Choose the content you want to keep, or combine both:

```
1
2 Main branch content
3 =======
4 Feature branch content
5
```

Complete the Merge

The git conflict is solved.

```
file.txt 92, 99B written
root@node215348-env-9987419:~/devops_local/devops# git add file.txt
root@node215348-env-9987419:~/devops_local/devops#
root@node215348-env-9987419:~/devops_local/devops# git commit -m "Resolve merge conflict in file.txt"
[main fe4bbb1] Resolve merge conflict in file.txt
root@node215348-env-9987419:~/devops_local/devops#
```