

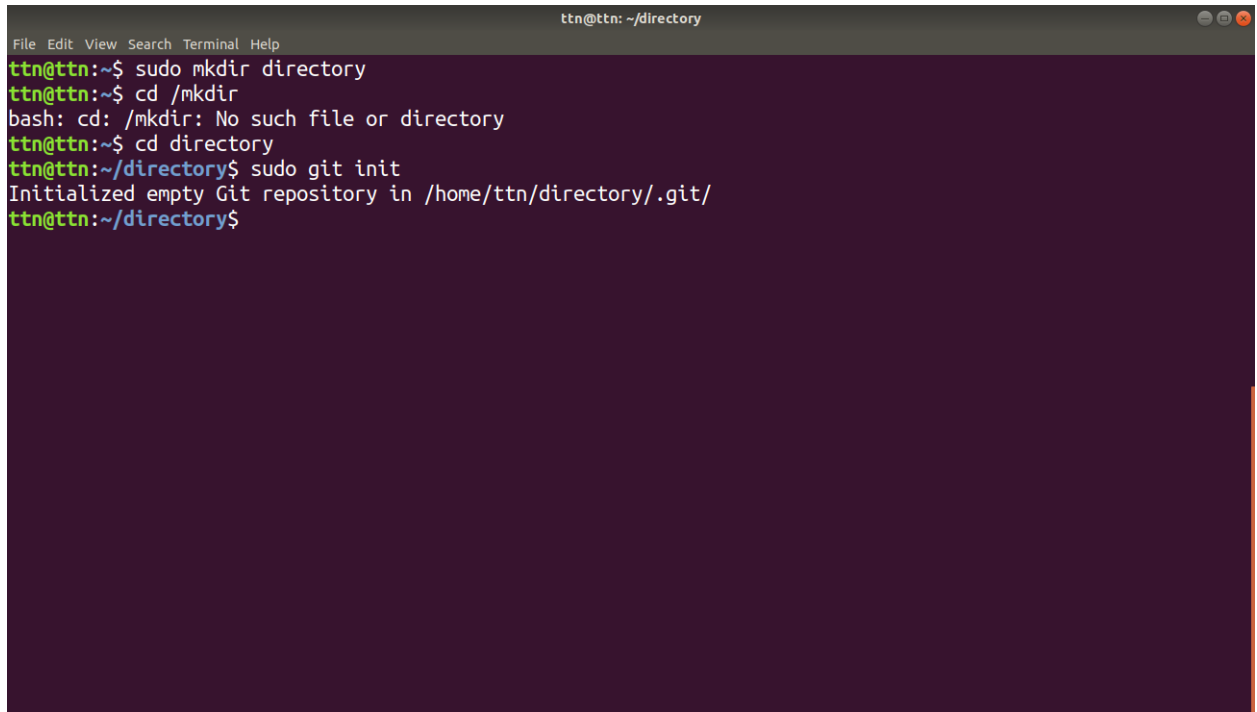
# Exercise for Introduction to Version Control

## 1. Git Setup

```
ttn@ttn: ~/learnings
File Edit View Search Terminal Help
ttn@ttn:~/learnings$ sudo apt update
[sudo] password for ttn:
Hit:1 http://in.archive.ubuntu.com/ubuntu bionic InRelease
Hit:2 http://security.ubuntu.com/ubuntu bionic-security InRelease
Get:3 http://in.archive.ubuntu.com/ubuntu bionic-updates InRelease [88.7 kB]
Get:4 http://in.archive.ubuntu.com/ubuntu bionic-backports InRelease [74.6 kB]
Get:5 http://in.archive.ubuntu.com/ubuntu bionic-updates/main i386 Packages [446 kB]
Get:6 http://in.archive.ubuntu.com/ubuntu bionic-updates/main amd64 Packages [517 kB]
Get:7 http://in.archive.ubuntu.com/ubuntu bionic-updates/main amd64 DEP-11 Metadata [278 kB]
Get:8 http://in.archive.ubuntu.com/ubuntu bionic-updates/main DEP-11 48x48 Icons [66.7 kB]
Get:9 http://in.archive.ubuntu.com/ubuntu bionic-updates/main DEP-11 64x64 Icons [123 kB]
Get:10 http://in.archive.ubuntu.com/ubuntu bionic-updates/universe amd64 Packages [725 kB]
Get:11 http://in.archive.ubuntu.com/ubuntu bionic-updates/universe i386 Packages [716 kB]
Get:12 http://in.archive.ubuntu.com/ubuntu bionic-updates/universe amd64 DEP-11 Metadata [202 kB]
Get:13 http://in.archive.ubuntu.com/ubuntu bionic-updates/universe DEP-11 48x48 Icons [195 kB]
Get:14 http://in.archive.ubuntu.com/ubuntu bionic-updates/universe DEP-11 64x64 Icons [343 kB]
Get:15 http://in.archive.ubuntu.com/ubuntu bionic-updates/multiverse amd64 DEP-11 Metadata [2,464 B]
Get:16 http://in.archive.ubuntu.com/ubuntu bionic-backports/universe amd64 DEP-11 Metadata [7,344 B]
Fetched 3,786 kB in 3s (1,318 kB/s)
Reading package lists... Done
Building dependency tree
Reading state information... Done
430 packages can be upgraded. Run 'apt list --upgradable' to see them.
ttn@ttn:~/learnings$
```

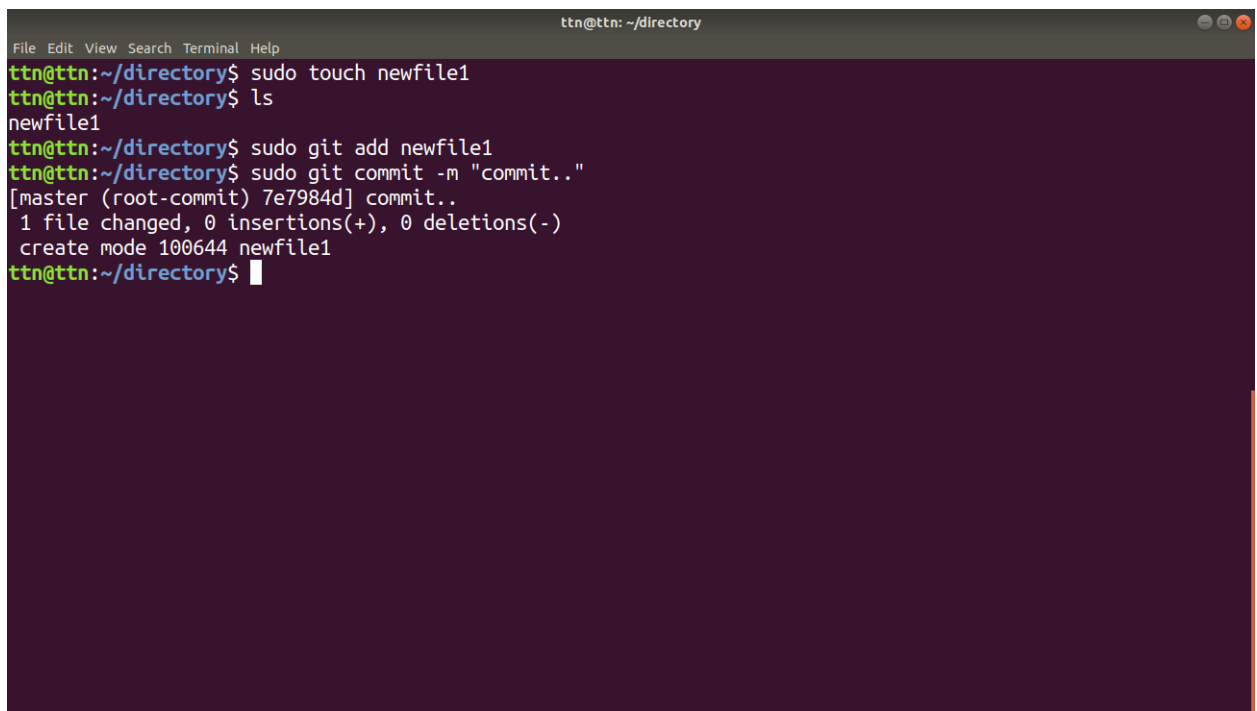
```
ttn@ttn: ~/learnings
File Edit View Search Terminal Help
ttn@ttn:~/learnings$ sudo apt-get install git
Reading package lists... Done
Building dependency tree
Reading state information... Done
git is already the newest version (1:2.17.1-1ubuntu0.4).
0 upgraded, 0 newly installed, 0 to remove and 430 not upgraded.
ttn@ttn:~/learnings$
```

## 2. Initialize a Git Repository



```
ttn@ttn: ~/directory
File Edit View Search Terminal Help
ttn@ttn:~$ sudo mkdir directory
ttn@ttn:~$ cd /mkdir
bash: cd: /mkdir: No such file or directory
ttn@ttn:~$ cd directory
ttn@ttn:~/directory$ sudo git init
Initialized empty Git repository in /home/ttn/directory/.git/
ttn@ttn:~/directory$
```

## 3. Add files to the repository



```
ttn@ttn: ~/directory
File Edit View Search Terminal Help
ttn@ttn:~/directory$ sudo touch newfile1
ttn@ttn:~/directory$ ls
newfile1
ttn@ttn:~/directory$ sudo git add newfile1
ttn@ttn:~/directory$ sudo git commit -m "commit.."
[master (root-commit) 7e7984d] commit..
1 file changed, 0 insertions(+), 0 deletions(-)
create mode 100644 newfile1
ttn@ttn:~/directory$
```

## 4. Unstage 1 file

```
ttn@ttn: ~/directory
File Edit View Search Terminal Help
ttn@ttn:~/directory$ sudo vi newfile1
ttn@ttn:~/directory$ git status
On branch master
Changes not staged for commit:
  (use "git add <file>..." to update what will be committed)
  (use "git checkout -- <file>..." to discard changes in working directory)

        modified:   newfile1

no changes added to commit (use "git add" and/or "git commit -a")
ttn@ttn:~/directory$ sudo git reset HEAD newfile1
Unstaged changes after reset:
M       newfile1
ttn@ttn:~/directory$
```

## 5. Commit the file

```
ttn@ttn: ~/directory
File Edit View Search Terminal Help
ttn@ttn:~/directory$ sudo git status
On branch master
Changes to be committed:
  (use "git reset HEAD <file>..." to unstage)

        modified:   newfile1

ttn@ttn:~/directory$ sudo git commit -m "commit newfile1"
[master b68d490] commit newfile1
1 file changed, 1 insertion(+)
ttn@ttn:~/directory$
```

## 6. Add a remote

```
ttn@ttn: ~/repo1
File Edit View Search Terminal Help
ttn@ttn:~$ cd repo1
ttn@ttn:~/repo1$ sudo git init
Initialized empty Git repository in /home/ttn/repo1/.git/
ttn@ttn:~/repo1$ sudo git clone https://github.com/harshitgupta19/assignment2.git
Cloning into 'assignment2'...
remote: Enumerating objects: 9, done.
remote: Counting objects: 100% (9/9), done.
remote: Compressing objects: 100% (6/6), done.
remote: Total 9 (delta 1), reused 0 (delta 0), pack-reused 0
Unpacking objects: 100% (9/9), done.
ttn@ttn:~/repo1$ sudo git remote add remote1 https://github.com/harshitgupta19/assignment2.git
ttn@ttn:~/repo1$
```

## 7. Undo changes to a particular file

```
ttn@ttn: ~/repo1/assignment2
File Edit View Search Terminal Help
ttn@ttn:~/repo1/assignment2$ sudo vi file1
ttn@ttn:~/repo1/assignment2$ cat file1
file1
hiii..
hello
ttn@ttn:~/repo1/assignment2$ sudo git checkout file1
ttn@ttn:~/repo1/assignment2$ cat file1
hiii..
hello
ttn@ttn:~/repo1/assignment2$
```

## 8. Push changes to Github

```
ttn@ttn: ~/repo1/assignment2
File Edit View Search Terminal Help
ttn@ttn:~/repo1/assignment2$ sudo touch file3
ttn@ttn:~/repo1/assignment2$ sudo vi file3
ttn@ttn:~/repo1/assignment2$ sudo git push origin master
Username for 'https://github.com': harshitgupta19
Password for 'https://harshitgupta19@github.com':
Everything up-to-date
ttn@ttn:~/repo1/assignment2$ sudo git add file3
ttn@ttn:~/repo1/assignment2$ sudo git commit -m "commit file3"
[master 044d776] commit file3
 2 files changed, 3 insertions(+)
 create mode 100644 file3
ttn@ttn:~/repo1/assignment2$ sudo git push origin master
Username for 'https://github.com': harshitgupta19
Password for 'https://harshitgupta19@github.com':
Counting objects: 4, done.
Delta compression using up to 4 threads.
Compressing objects: 100% (2/2), done.
Writing objects: 100% (4/4), 355 bytes | 355.00 KiB/s, done.
Total 4 (delta 0), reused 0 (delta 0)
To https://github.com/harshitgupta19/assignment2.git
 954caa8..044d776 master -> master
ttn@ttn:~/repo1/assignment2$
```

## 9. Clone the repository

```
ttn@ttn: ~/repo1
File Edit View Search Terminal Help
ttn@ttn:~$ cd repo1
ttn@ttn:~/repo1$ sudo git init
Initialized empty Git repository in /home/ttn/repo1/.git/
ttn@ttn:~/repo1$ sudo git clone https://github.com/harshitgupta19/assignment2.git
Cloning into 'assignment2'...
remote: Enumerating objects: 9, done.
remote: Counting objects: 100% (9/9), done.
remote: Compressing objects: 100% (6/6), done.
remote: Total 9 (delta 1), reused 0 (delta 0), pack-reused 0
Unpacking objects: 100% (9/9), done.
ttn@ttn:~/repo1$ sudo git remote add remote1 https://github.com/harshitgupta19/assignment2.git
ttn@ttn:~/repo1$
```

10. Add changes to one of the copies and pull the changes in the other.

```
ttn@ttn: ~/repo2
File Edit View Search Terminal Help
ttn@ttn:~$ cd repo1
ttn@ttn:~/repo1$ cd assignment2
ttn@ttn:~/repo1/assignment2$ sudo vi file4
ttn@ttn:~/repo1/assignment2$ sudo git add file4
ttn@ttn:~/repo1/assignment2$ sudo git commit -m "file4"
[master df4b7bf] file4
 1 file changed, 1 insertion(+), 1 deletion(-)
ttn@ttn:~/repo1/assignment2$ sudo git push origin master
Username for 'https://github.com': harshitgupta19
Password for 'https://harshitgupta19@github.com':
Counting objects: 6, done.
Delta compression using up to 4 threads.
Compressing objects: 100% (4/4), done.
Writing objects: 100% (6/6), 488 bytes | 488.00 KiB/s, done.
Total 6 (delta 2), reused 0 (delta 0)
remote: Resolving deltas: 100% (2/2), completed with 1 local object.
To https://github.com/harshitgupta19/assignment2.git
   044d776..df4b7bf  master -> master
ttn@ttn:~/repo1/assignment2$ cd ..
ttn@ttn:~/repo1$ cd ..
ttn@ttn:~$ cd repo2
ttn@ttn:~/repo2$ sudo git remote add remote2 https://github.com/harshitgupta19/assignment2.git
fatal: not a git repository (or any parent up to mount point /)
Stopping at filesystem boundary (GIT_DISCOVERY_ACROSS_FILESYSTEM not set).
ttn@ttn:~/repo2$

ttn@ttn:~/repo2$ sudo git pull remote2 master
remote: Enumerating objects: 19, done.
remote: Counting objects: 100% (19/19), done.
remote: Compressing objects: 100% (10/10), done.
remote: Total 19 (delta 3), reused 10 (delta 2), pack-reused 0
Unpacking objects: 100% (19/19), done.
From https://github.com/harshitgupta19/assignment2
 * branch          master      -> FETCH_HEAD
 * [new branch]    master      -> remote2/master
ttn@ttn:~/repo2$ ls
file1 file2 file3 file4
ttn@ttn:~/repo2$
```

## 11. Check differences between a file and its staged version

```
ttn@ttn: ~/repo2
File Edit View Search Terminal Help
ttn@ttn:~/repo2$ ls
file1 file2 file3 file4
ttn@ttn:~/repo2$ sudo vi file1
ttn@ttn:~/repo2$ sudo git diff
diff --git a/file1 b/file1
index 9a614df..f356b8d 100644
--- a/file1
+++ b/file1
@@ -1,3 +1,3 @@
-
+sgfdhjhj
 hiii..
 hello
ttn@ttn:~/repo2$
```

## 12. Ignore a few files to be checked in

```
ttn@ttn: ~/repo2
File Edit View Search Terminal Help
ttn@ttn:~/repo2$ ls
aa bb cc file1 file2 file3 file4
ttn@ttn:~/repo2$ sudo vi .gitignore
[sudo] password for ttn:
ttn@ttn:~/repo2$ git status
On branch master
Changes not staged for commit:
  (use "git add <file>..." to update what will be committed)
  (use "git checkout -- <file>..." to discard changes in working directory)

        modified:   .gitignore
        modified:   file1

no changes added to commit (use "git add" and/or "git commit -a")
ttn@ttn:~/repo2$
```

### 13. Create a new branch.

```
ttn@ttn: ~/repo2
File Edit View Search Terminal Help
ttn@ttn:~/repo2$ sudo git branch demo
ttn@ttn:~/repo2$ sudo git branch
demo
* master
ttn@ttn:~/repo2$
```

### 14. Diverge them with commits

```
ttn@ttn: ~/repo2
File Edit View Search Terminal Help
ttn@ttn:~/repo2$ sudo git checkout b1
M .gitignore
M file1
Switched to branch 'b1'
ttn@ttn:~/repo2$ sudo git push remote2 master
Username for 'https://github.com': harshitgupta19
Password for 'https://harshitgupta19@github.com':
Counting objects: 7, done.
Delta compression using up to 4 threads.
Compressing objects: 100% (4/4), done.
Writing objects: 100% (7/7), 655 bytes | 655.00 KiB/s, done.
Total 7 (delta 1), reused 0 (delta 0)
remote: Resolving deltas: 100% (1/1), done.
To https://github.com/harshitgupta19/assignment2.git
df4b7bf..cf3fb7d master -> master
ttn@ttn:~/repo2$ sudo git push remote2 b1
Username for 'https://github.com': harshitgupta19
Password for 'https://harshitgupta19@github.com':
Counting objects: 3, done.
Delta compression using up to 4 threads.
Compressing objects: 100% (2/2), done.
Writing objects: 100% (3/3), 279 bytes | 279.00 KiB/s, done.
Total 3 (delta 1), reused 0 (delta 0)
remote: Resolving deltas: 100% (1/1), completed with 1 local object.
remote:
remote: Create a pull request for 'b1' on GitHub by visiting:
remote:   https://github.com/harshitgupta19/assignment2/pull/new/b1
remote:
To https://github.com/harshitgupta19/assignment2.git
* [new branch]      b1 -> b1
ttn@ttn:~/repo2$
```



## 15. Edit the same file at the same line on both branches and commit

```
ttn@ttn: ~/repo2
File Edit View Search Terminal Help
ttn@ttn:~/repo2$ sudo git checkout b1
M      .gitignore
M      file1
Switched to branch 'b1'
ttn@ttn:~/repo2$ sudo git push remote2 master
Username for 'https://github.com': harshitgupta19
Password for 'https://harshitgupta19@github.com':
Counting objects: 7, done.
Delta compression using up to 4 threads.
Compressing objects: 100% (4/4), done.
Writing objects: 100% (7/7), 655 bytes | 655.00 KiB/s, done.
Total 7 (delta 1), reused 0 (delta 0)
remote: Resolving deltas: 100% (1/1), done.
To https://github.com/harshitgupta19/assignment2.git
   df4b7bf..cf3fb7d  master -> master
ttn@ttn:~/repo2$ sudo git push remote2 b1
Username for 'https://github.com': harshitgupta19
Password for 'https://harshitgupta19@github.com':
Counting objects: 3, done.
Delta compression using up to 4 threads.
Compressing objects: 100% (2/2), done.
Writing objects: 100% (3/3), 279 bytes | 279.00 KiB/s, done.
Total 3 (delta 1), reused 0 (delta 0)
remote: Resolving deltas: 100% (1/1), completed with 1 local object.
remote:
remote: Create a pull request for 'b1' on GitHub by visiting:
remote:   https://github.com/harshitgupta19/assignment2/pull/new/b1
remote:
To https://github.com/harshitgupta19/assignment2.git
 * [new branch]      b1 -> b1
ttn@ttn:~/repo2$
```

## 16. Try merging and resolve merge conflicts

```
ttn@ttn: ~/repo4
File Edit View Search Terminal Help
ttn@ttn:~/repo4$ sudo git pull remote4 master
remote: Enumerating objects: 26, done.
remote: Counting objects: 100% (26/26), done.
remote: Compressing objects: 100% (13/13), done.
remote: Total 26 (delta 5), reused 16 (delta 3), pack-reused 0
Unpacking objects: 100% (26/26), done.
From https://github.com/harshitgupta19/assignment2
 * branch                master      -> FETCH_HEAD
 * [new branch]          master      -> remote4/master
ttn@ttn:~/repo4$ ls
aa  bb  cc  file1  file2  file3  file4  file_diverge
ttn@ttn:~/repo4$ sudo vi file1
ttn@ttn:~/repo4$ sudo git push remote4 master
Username for 'https://github.com': harshitgupta19
Password for 'https://harshitgupta19@github.com':
Everything up-to-date
ttn@ttn:~/repo4$ sudo git add file1
ttn@ttn:~/repo4$ sudo git commit -m "commit repo4"
[master 404c5be] commit repo4
 1 file changed, 1 insertion(+), 1 deletion(-)
ttn@ttn:~/repo4$ sudo git push remote4 master
Username for 'https://github.com': harshitgupta19
Password for 'https://harshitgupta19@github.com':
Counting objects: 3, done.
Delta compression using up to 4 threads.
Compressing objects: 100% (2/2), done.
Writing objects: 100% (3/3), 275 bytes | 275.00 KiB/s, done.
Total 3 (delta 1), reused 0 (delta 0)
remote: Resolving deltas: 100% (1/1), completed with 1 local object.
To https://github.com/harshitgupta19/assignment2.git
   cf3fb7d..404c5be  master -> master
```

## 17. Stash the changes and pop them

```
ttn@ttn: ~/repo3
File Edit View Search Terminal Help
ttn@ttn:~/repo3$ sudo vi file1
ttn@ttn:~/repo3$ sudo git add file1
ttn@ttn:~/repo3$ sudo git status
On branch master
Changes to be committed:
  (use "git reset HEAD <file>..." to unstage)

        modified:   file1

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

        file_stash

ttn@ttn:~/repo3$ sudo git stash
Saved working directory and index state WIP on master: 7970a69 commit repo3
ttn@ttn:~/repo3$ git status
On branch master
Untracked files:
  (use "git add <file>..." to include in what will be committed)

        file_stash

nothing added to commit but untracked files present (use "git add" to track)
ttn@ttn:~/repo3$ sudo git stash pop
On branch master
Changes not staged for commit:
  (use "git add <file>..." to update what will be committed)
  (use "git checkout -- <file>..." to discard changes in working directory)

        modified:   file1
```

```
ttn@ttn: ~/repo3
File Edit View Search Terminal Help
ttn@ttn:~/repo3$ sudo git stash -u
Saved working directory and index state WIP on master: 7970a69 commit repo3
ttn@ttn:~/repo3$ sudo git stash pop
On branch master
Changes not staged for commit:
  (use "git add <file>..." to update what will be committed)
  (use "git checkout -- <file>..." to discard changes in working directory)

        modified:   file1

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

        file_stash

no changes added to commit (use "git add" and/or "git commit -a")
Dropped refs/stash@{0} (4fadd6afe0b1c64da2bff266d4590387dee2ac6f)
ttn@ttn:~/repo3$ clear
```