

**SAPID:** 60004200082, 60004200066

**Names:** Pratham Bhoir, Aayushman Gupta

**Batch:** A2

## Experiment No. 10

**Aim:** Study of Configuration Management using GitHub

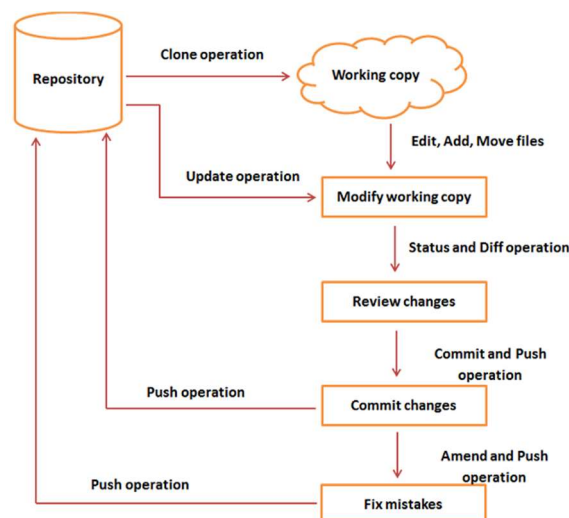
### **Theory:**

Git is a distributed revision control and source code management system with an emphasis on speed. Git was initially designed and developed by Linus Torvalds for Linux kernel development. Git is a free software distributed under the terms of the GNU General Public License version 2.

### Git Life Cycle

General workflow is as follows –

1. Clone the Git repository as a working copy.
2. Modify the working copy by adding/editing files.
3. If necessary, update the working copy by taking other developer's changes.
4. Review the changes before commit.
5. Commit changes. If everything is fine, then push the changes to the repository.
6. After committing, if something is wrong, then correct the last commit and push the changes to the repository.



Git Life Cycle

## 1. Creating Git Repository

Initialize a new repository by using **init** command followed by **--bare** option. It initializes the repository without a working directory. By convention, the bare repository must be named as **.git**.



```
Mindprep — -zsh — 80x24
[meithnv@Meith-Navlakha Mindprep % git init
hint: Using 'master' as the name for the initial branch. This default branch name
hint: is subject to change. To configure the initial branch name to use in all
hint: of your new repositories, which will suppress this warning, call:
hint:
hint:   git config --global init.defaultBranch <name>
hint:
hint: Names commonly chosen instead of 'master' are 'main', 'trunk' and
hint: 'development'. The just-created branch can be renamed via this command:
hint:
hint:   git branch -m <name>
Initialized empty Git repository in /Users/meithnv/Desktop/Mindprep/.git/
```

**Quick setup — if you've done this kind of thing before**

Set up in Desktop

 or 

HTTPS

SSH

https://github.com/meithnav/MindPrep.git

Get started by [creating a new file](#) or [uploading an existing file](#). We recommend every repository include a [README](#), [LICENSE](#), and [.gitignore](#).

**...or create a new repository on the command line**

echo "# MindPrep" >> README.md  
git init  
git add README.md  
git commit -m "first commit"  
git branch -M main  
git remote add origin https://github.com/meithnav/MindPrep.git  
git push -u origin main

**...or push an existing repository from the command line**

git remote add origin https://github.com/meithnav/MindPrep.git  
git branch -M main  
git push -u origin main

**...or import code from another repository**

You can initialize this repository with code from a Subversion, Mercurial, or TFS project.

Import code

 **ProTip!** Use the URL for this page when adding GitHub as a remote.

Create branch

```
[meithnv@Meith-Navlakha Mindprep % git branch -M main  
meithnv@Meith-Navlakha Mindprep %
```

git clone



```
meithnv@Meith-Navlakha Desktop % git clone https://github.com/meithnav/MindPrep.git  
Cloning into 'MindPrep'...  
remote: Enumerating objects: 4, done.  
remote: Counting objects: 100% (4/4), done.  
remote: Compressing objects: 100% (4/4), done.  
remote: Total 4 (delta 0), reused 4 (delta 0), pack-reused 0  
Receiving objects: 100% (4/4), 4.58 MiB | 13.94 MiB/s, done.  
meithnv@Meith-Navlakha Desktop %
```

```
echo 'TODO:Add contents for README' > README
```

```
meithnv@Meith-Navlakha Desktop % echo 'TODO:Add contents for README'  
TODO:Add contents for README
```

---

git status

```
[meithnv@Meith-Navlakha Desktop % cd MindPrep  
[meithnv@Meith-Navlakha MindPrep % git status  
On branch main  
Your branch is up to date with 'origin/main'.  
  
nothing to commit, working tree clean
```

git add .

```
Initialized empty Git repository in /Users/meithnv/Desktop/Mindprep/.git/  
meithnv@Meith-Navlakha Mindprep % git add .  
meithnv@Meith-Navlakha Mindprep %
```

## 2. Generate Public-Private RSA Key Pair

```
User1@CentOS ~]$ pwd  
/home/user1  
  
[user1@CentOS ~]$ ssh-keygen
```

### 3. Adding keys to authorized keys

Suppose there are two developers working on a project. Both users have generated public keys.

Both add their public key to the server by using `ssh-copy-id` command as given below

```
[user1@CentOS ~]$ pwd
/home/user1

[user2@CentOS ~]$ ssh-copy-id -i ~/.ssh/id_rsa.pub gituser@git.server.com
```

### 4. Push changes to the repository

We have created a bare repository on the server and allowed access for two users. Both users can push their changes to the repository by adding it as a remote.

Git init command creates **.git** directory to store metadata about the repository every time it reads the configuration from the **.git/config** file.

User1 creates a new directory, adds README file, and commits his change as initial commit. After commit, he verifies the commit message by running the **git log** command.

```
[meithnv@Meith-Navlakha Mindprep % git push origin main
Enumerating objects: 4, done.
Counting objects: 100% (4/4), done.
Delta compression using up to 10 threads
Compressing objects: 100% (4/4), done.
Writing objects: 100% (4/4), 4.58 MiB | 4.25 MiB/s, done.
Total 4 (delta 0), reused 0 (delta 0), pack-reused 0
To https://github.com/meithnav/MindPrep.git
 * [new branch]      main -> main
meithnv@Meith-Navlakha Mindprep %
```

## 5. Checking log message by executing the git log command.

```
[meithnv@Meith-Navlakha MindPrep % git log --oneline  
37598f1 (HEAD -> main, origin/main, origin/HEAD) MindPrep Repo initiliased
```

## 6. Commit changes

To commit the changes, he used the git commit command followed by -m option. If we omit -m option. Git will open a text editor where we can write multiline commit message

```
[meithnv@Meith-Navlakha Mindprep % git commit -m "MindPrep Repo initiliased"  
[main (root-commit) 37598f1] MindPrep Repo initiliased  
2 files changed, 0 insertions(+), 0 deletions(-)  
create mode 100644 SRS-MindPrep.docx.pdf  
create mode 100644 gantt.png
```

Final Repository after pushing the commit

```
[meithnv@Meith-Navlakha Mindprep % git commit -m "MindPrep Repo initiliased"  
[main (root-commit) 37598f1] MindPrep Repo initiliased  
2 files changed, 0 insertions(+), 0 deletions(-)  
create mode 100644 SRS-MindPrep.docx.pdf  
create mode 100644 gantt.png  
meithnv@Meith-Navlakha Mindprep % █
```

## Performance:

1. Perform all the commands using Git
2. Take screenshots of each of the command and respective output
3. Explore the commands for merging the documents and show the screenshots.

## Conclusion:

Configuration management using Github has been studied and different git commands have been executed. In this experiment, we have created a Github repository and commands like add, commit, push, pull, clone, echo have also been implemented. The code for the same have been observed and attached.