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Experiment No. 10

Aim: Study of Configuration Management using GitHub

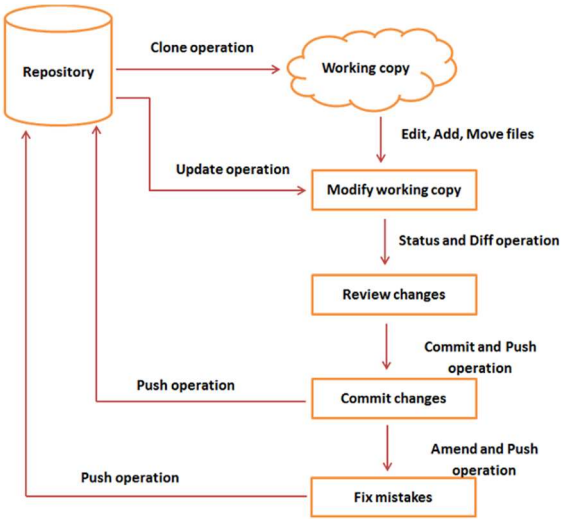
Theory:

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 −

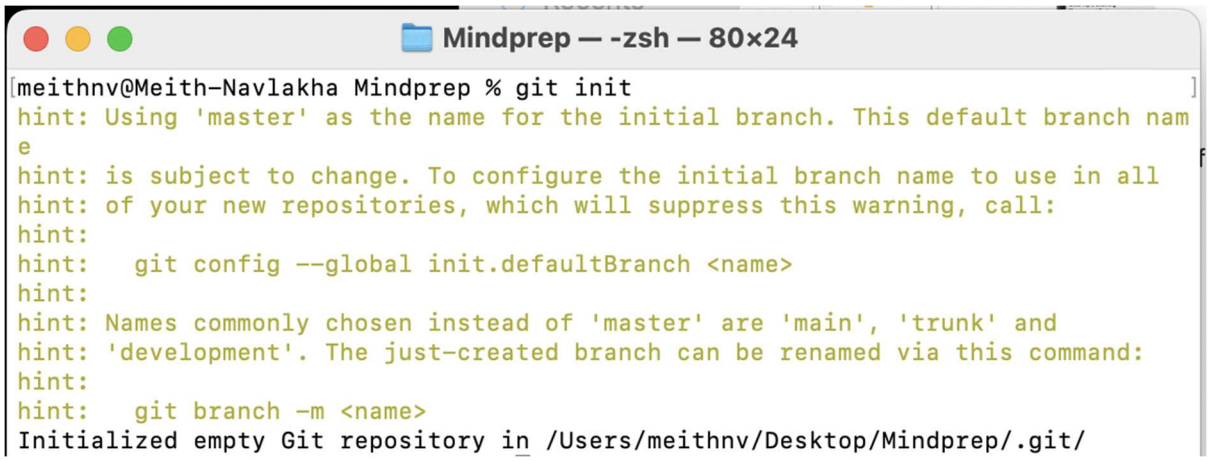
1. Clone the Git repository as a working copy.
2. Modify the working copy by adding/editing files.
3. If necessary, update the working copy by taking other developer's changes.
4. Review the changes before commit.
5. Commit changes. If everything is fine, then push the changes to the repository.
6. After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

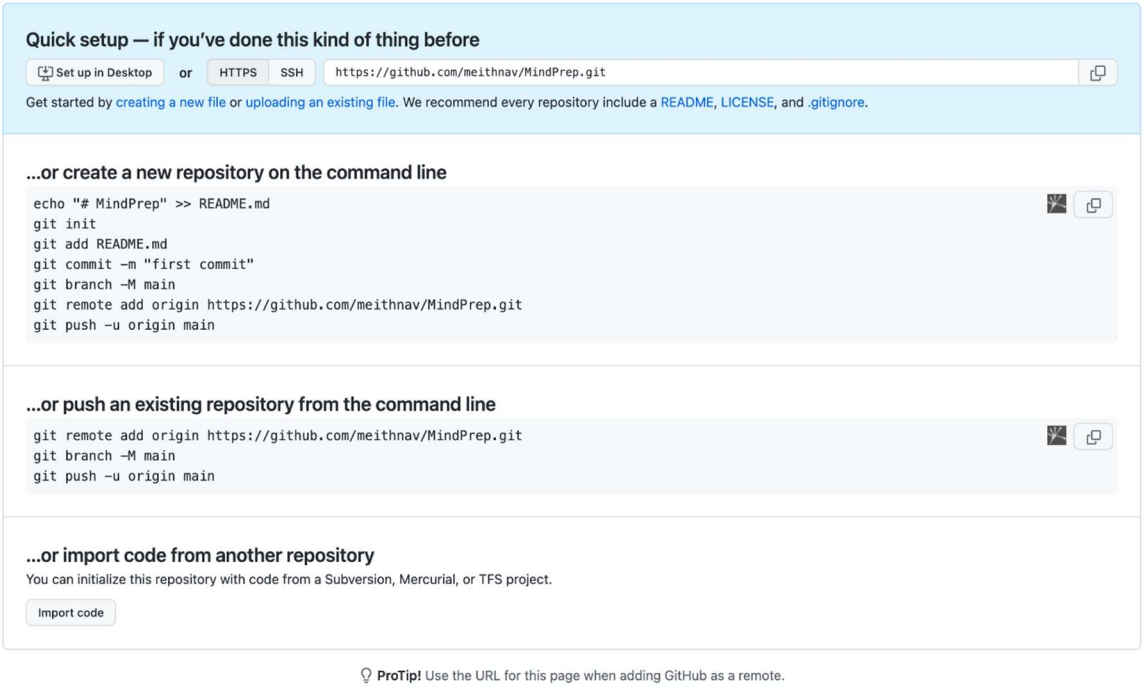


Git Life Cycle

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**.





Create branch

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

git clone

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.