

Assignment 3: Collaborative Development Using Git

Name : Souvik Roy

Id : 25SUB4508_56133

Objective:

To demonstrate collaborative development concepts using Git. Forking, pull request, and code review are simulated using local repositories and Git based workflows.

Section 1: Create Original (Central) Repository

Commands:

```
mkdir original-repo  
cd original-repo  
git init
```

```
echo Central repository>main.txt  
git add main.txt  
git commit -m "Initial commit in original repository"
```

Output:

Initialized empty Git repository

Screenshot :

```
S:\25SUB4508_Repo>mkdir original-repo  
S:\25SUB4508_Repo>cd original-repo  
S:\25SUB4508_Repo\original-repo>git init  
Initialized empty Git repository in S:/25SUB4508_Repo/original-repo/.git/  
S:\25SUB4508_Repo\original-repo>echo Central repository>main.txt  
S:\25SUB4508_Repo\original-repo>git add main.txt  
S:\25SUB4508_Repo\original-repo>git commit -m "Initial commit in original repository"  
[master (root-commit) 2a7e5ac] Initial commit in original repository  
 1 file changed, 1 insertion(+)  
  create mode 100644 main.txt
```

Section 2: Simulate Fork by Cloning Repository

Commands:

```
cd ..  
git clone original-repo fork-repo
```

Output:

```
Cloning into 'fork-repo'...  
done.
```

Screenshot :

```
S:\25SUB4508_Repo\original-repo>cd ..  
  
S:\25SUB4508_Repo>git clone original-repo fork-repo  
Cloning into 'fork-repo'...  
done.  
  
S:\25SUB4508_Repo>
```

Section 3: Configure Upstream Repository

Commands:

```
cd fork-repo  
git remote -v  
git remote add upstream ../original-repo  
git remote -v
```

Output:

```
origin  ../original-repo (fetch)  
upstream ../original-repo (fetch)
```

Screenshot :

```
S:\25SUB4508_Repo>cd fork-repo  
  
S:\25SUB4508_Repo\fork-repo>git remote -v  
origin  S:/25SUB4508_Repo/original-repo (fetch)  
origin  S:/25SUB4508_Repo/original-repo (push)  
  
S:\25SUB4508_Repo\fork-repo>git remote add upstream ../original-repo  
  
S:\25SUB4508_Repo\fork-repo>git remote -v  
origin  S:/25SUB4508_Repo/original-repo (fetch)  
origin  S:/25SUB4508_Repo/original-repo (push)  
upstream      ../original-repo (fetch)  
upstream      ../original-repo (push)
```

Section 4: Sync Fork with Original Repository

Commands:

```
git fetch upstream  
git merge upstream/master
```

Output:

Already up to date.

Screenshot :

```
S:\25SUB4508_Repo\fork-repo>git fetch upstream  
From ..\original-repo  
 * [new branch]      master    -> upstream/master  
  
S:\25SUB4508_Repo\fork-repo>git merge upstream/master  
Already up to date.
```

Section 5: Make Changes in Forked Repository

Commands:

```
echo Change from forked repository>>main.txt  
git status  
git add main.txt  
git commit -m "Change from forked repository"
```

Output:

```
1 file changed, 1 insertion(+)
```

Screenshot :

```
S:\25SUB4508_Repo\fork-repo>echo Change from forked repository>>main.txt  
  
S:\25SUB4508_Repo\fork-repo>git status  
On branch master  
Your branch is up to date with 'origin/master'.  
  
Changes not staged for commit:  
  (use "git add <file>..." to update what will be committed)  
  (use "git restore <file>..." to discard changes in working directory)  
    modified:   main.txt  
  
no changes added to commit (use "git add" and/or "git commit -a")  
  
S:\25SUB4508_Repo\fork-repo>git add main.txt  
  
S:\25SUB4508_Repo\fork-repo>git commit -m "Change from forked repository"  
[master c33335e] Change from forked repository  
  1 file changed, 1 insertion(+)
```

Section 6: Simulate Pull Request using Patch

Commands:

```
git format-patch upstream/master
```

Output:

```
0001-Change-from-forked-repository.patch
```

Screenshot :

```
S:\25SUB4508_Repo\fork-repo>git format-patch upstream/master  
0001-Change-from-forked-repository.patch
```

Section 7: Code Review and Merge in Original Repository

Commands:

```
cd ..\original-repo  
git apply ..\fork-repo\0001-Change-from-forked-repository.patch  
type main.txt  
git add main.txt  
git commit -m "Merged changes after code review"
```

Output:

```
1 file changed, 1 insertion(+)
```

Screenshot :

```
S:\25SUB4508_Repo\fork-repo>cd ..\original-repo  
S:\25SUB4508_Repo\original-repo>git apply ..\fork-repo\0001-Change-from-fork  
ed-repository.patch  
S:\25SUB4508_Repo\original-repo>type main.txt  
Central repository  
Change from forked repository  
S:\25SUB4508_Repo\original-repo>git add main.txt  
'git' is not recognized as an internal or external command,  
operable program or batch file.  
S:\25SUB4508_Repo\original-repo>git commit -m "Merged changes after code rev  
iew"  
[master d55cbf1] Merged changes after code review  
 1 file changed, 1 insertion(+)
```

Section 8: Simple Code Review Process

Steps:

1. Changes reviewed using patch file.
 2. File content verified before applying.
 3. Commit message checked.
 4. Patch applied after approval.
 5. Changes merged into original repository.
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External References:

1. Git SCM Official Documentation
2. Pro Git Book – Scott Chacon
3. Atlassian Git Tutorials