Experiment 1

Task: Demonstrate the use of Git as a Version Control System on a local machine for multiple users.

Steps To Achieve:

- Set up multiple users in Git by configuring separate user profiles.
- Create a repository where each user can commit code, create branches (forks), and merge changes.
- Assign a “team leader” role who can review and merge the “coder” branches.
- Use basic Git commands to demonstrate creating branches, comparing changes (diff), and merging code.
- Finally, we'll compare the main differences between Git and SVN.

Commands:

1. **Creating project and adding files to it.**

```
mkdir project

cd project

touch main.txt

git init

git add .

git commit -m "First commit"

touch main2.txt

git add .

git commit -m "Second commit"
```

2.Creating coder 1 And Branching the project And adding files.

```
git checkout -b coder1

git config user.name "c1"

 git config user.email "c1@gmail.com"

touch c1.txt

git add .

git commit -m "Coder 1 Feature"
```

3.Creating coder 2 And Branching the project And adding files.

```
git checkout master

git checkout -b c2

git config user.name "c2"

git config user.email "c2@gmail.com"

touch t2.txt

git add .

git commit -m "Second Coder Commit"
```

4.After Branching making changes to main branch.

```
git checkout master

 touch After_branch.txt

git add .

git commit -m "Bug Fixed"
```

5.Merging The branches.

```
git diff c1
```

```
git merge coder1
```

```
git merge c2
```

6.To see the Graph.

```
git log --all --graph
```

Feature	SVN (Subversion)	Git
Repository Type	Centralized (single repository server)	Distributed (each user has a complete repository)
Offline Capability	Limited; requires server access for most actions	Full offline access; can commit, branch, and merge
Branching and Merging	Branches are directory copies, often slower	Lightweight, faster branching and merging
Version Tracking	Tracks changes per file	Tracks snapshots of the entire project
Commit History	Linear and centralized	Non-linear; each user can have their own commit history
Storage	Stores changes on a per-file basis	Uses snapshots of the project tree

Output:

```
*   commit 083c75278f25859a8f98cdedf2793fc68acdfaaa (HEAD -> master)
|\  Merge: 1018a6c 8323689
| | Author: c2 <c2@gmail.com>
| | Date:   Sat Nov 9 10:35:11 2024 +0530
| |
| |     Merge branch 'c2'
| |
| * commit 83236897e9e37e2f00d4c3637dacb857f7b41c51 (c2)
| | Author: c2 <c2@gmail.com>
| | Date:   Sat Nov 9 10:34:15 2024 +0530
| |
| |     Second Coder Commit
| |
*   |   commit 1018a6c3131dcf1fd14bf7d166de6f20844b3e24
|\ \  Merge: 25a8217 57e6ebe
| | | Author: c2 <c2@gmail.com>
| | | Date:   Sat Nov 9 10:35:04 2024 +0530
| | |
| | |     Merge branch 'coder1'
| | |
| * | commit 57e6ebe794033574810c74a3b9b951f0de0ab3e7 (coder1)
| |/  Author: c1 <c1@gmail.com>
| |   Date:   Sat Nov 9 10:32:53 2024 +0530
:...skipping...
*   commit 083c75278f25859a8f98cdedf2793fc68acdfaaa (HEAD -> master)
|\  Merge: 1018a6c 8323689
| | Author: c2 <c2@gmail.com>
| | Date:   Sat Nov 9 10:35:11 2024 +0530
| |
| |     Merge branch 'c2'
| |
| * commit 83236897e9e37e2f00d4c3637dacb857f7b41c51 (c2)
| | Author: c2 <c2@gmail.com>
| | Date:   Sat Nov 9 10:34:15 2024 +0530
| |
| |     Second Coder Commit
| |
*   |   commit 1018a6c3131dcf1fd14bf7d166de6f20844b3e24
|\ \  Merge: 25a8217 57e6ebe
| | | Author: c2 <c2@gmail.com>
| | | Date:   Sat Nov 9 10:35:04 2024 +0530
| | |
| | |     Merge branch 'coder1'
| | |
| * | commit 57e6ebe794033574810c74a3b9b951f0de0ab3e7 (coder1)
| |/  Author: c1 <c1@gmail.com>
| |   Date:   Sat Nov 9 10:32:53 2024 +0530
| |
| |       Coder 1 Feature
| |
* | commit 25a8217851269eef66ce720cf674cd9e3fe15e9b
|/  Author: c2 <c2@gmail.com>
|   Date:   Sat Nov 9 10:34:45 2024 +0530
|
```

```
| | Author: c2 <c2@gmail.com>
| | Date:   Sat Nov 9 10:34:15 2024 +0530
| |
| |     Second Coder Commit
| |
*   commit 1018a6c3131dcf1fd14bf7d166de6f20844b3e24
|\ \  Merge: 25a8217 57e6ebe
| | | Author: c2 <c2@gmail.com>
| | | Date:   Sat Nov 9 10:35:04 2024 +0530
| | |
| | |     Merge branch 'coder1'
| | |
| * | commit 57e6ebe794033574810c74a3b9b951f0de0ab3e7 (coder1)
| |/  Author: c1 <c1@gmail.com>
| |   Date:   Sat Nov 9 10:32:53 2024 +0530
| |
| |       Coder 1 Feature
| |
* | commit 25a8217851269eef66ce720cf674cd9e3fe15e9b
|/  Author: c2 <c2@gmail.com>
|   Date:   Sat Nov 9 10:34:45 2024 +0530
|
|       Bug Fixed
|
* commit 80589d38ff43dcc2ac3603f6bf95596739975205
| Author: Rajan Lature <rajanlature@gmail.com>
| Date:   Sat Nov 9 10:31:55 2024 +0530
|
|     Second commit
|
* commit fc674d48270e164648fee53eb95b1c463ee663ba
  Author: Rajan Lature <rajanlature@gmail.com>
  Date:   Sat Nov 9 10:31:34 2024 +0530

      First commit
~
~
~
~
~
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~
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~
~
~
~
(END)
```