



## **Symbiosis Institute of Technology**

**Faculty of Engineering**

**CSE- Academic Year 2025-26**

**DevOps Lab Batch 2022-26**

### **Lab Assignment No:- 3**

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<b>Batch</b>	2022-26
<b>Class</b>	CS-B
<b>Academic Year &amp; Semester</b>	2024 7
<b>Title of Assignment</b>	Branching Development Model-Build a branching model to help your team understand the git workflow for faster work integration.
<b>Theory</b>	<p>Used Git Flow branching model to manage development and releases.</p> <p>1. <b>Main branch (main)</b></p> <ul style="list-style-type: none"><li>○ Contains the stable production-ready code.</li><li>○ Only release merges and hotfixes go here.</li><li>○ Example: Release v1.0 and urgent bug fix were merged into main.</li></ul> <p>2. <b>Development branch (develop)</b></p>

- Used for ongoing development and integration.
- New features are merged here before release.
- Example: Login feature branch was merged into develop.

### 3. Feature branches (feature/\*)

- Created from develop for new features.
- Merged back into develop once complete.
- Example: feature/login branch was created and merged.

### 4. Release branches (release/\*)

- Created from develop when preparing a new version.
- Allows final testing and fixes before release.
- Example: release/v1.0 prepared, then merged into both main and develop.

### 5. Hotfix branches (hotfix/\*)

- Created from main to fix urgent issues in production.
- Merged back into both main (for production) and develop (to keep codebase updated).
- Example: hotfix/urgent-bug was merged into both main and develop.

## Output Screenshot

### 1. Create a Git Repository:

```
-Air DevOps3 % mkdir branching-model-demo
-Air DevOps3 % cd branching-model-demo
-Air branching-model-demo % git init
```

### 2. Create a README file:

```
[samidhamanjrekar@Samidhas-Air branching-model-demo % git init
Initialized empty Git repository in /Users/samidhamanjrekar/Desktop/DevOps/DevOps3/branching-model-demo/.git/
[samidhamanjrekar@Samidhas-Air branching-model-demo % echo "# Branching Model Demo" > README.md
[samidhamanjrekar@Samidhas-Air branching-model-demo % git add README.md
[samidhamanjrekar@Samidhas-Air branching-model-demo % git commit -m "Initial commit"
[main (root-commit) d04674a] Initial commit
 1 file changed, 1 insertion(+)
 create mode 100644 README.md
[samidhamanjrekar@Samidhas-Air branching-model-demo % git log --oneline
d04674a (HEAD -> main) Initial commit
samidhamanjrekar@Samidhas-Air branching-model-demo % ]
```

### 3. Creating develop branch:

```
[samidhamanjrekar@Samidhas-Air branching-model-demo % git checkout -b develop
Switched to a new branch 'develop'
[samidhamanjrekar@Samidhas-Air branching-model-demo % git checkout main
git push -u origin main
Switched to branch 'main'
Enumerating objects: 3, done.
Counting objects: 100% (3/3), done.
Writing objects: 100% (3/3), 245 bytes | 245.00 KiB/s, done.
Total 3 (delta 0), reused 0 (delta 0), pack-reused 0
To https://github.com/SamidhaManjrekar/branching-model-demo.git
 * [new branch]      main -> main
branch 'main' set up to track 'origin/main'.
[samidhamanjrekar@Samidhas-Air branching-model-demo % git checkout develop
[git push -u origin develop
Switched to branch 'develop'
Total 0 (delta 0), reused 0 (delta 0), pack-reused 0
remote:
remote: Create a pull request for 'develop' on GitHub by visiting:
remote:     https://github.com/SamidhaManjrekar/branching-model-demo/pull/new/develop
remote:
To https://github.com/SamidhaManjrekar/branching-model-demo.git
 * [new branch]      develop -> develop
branch 'develop' set up to track 'origin/develop'.
[samidhamanjrekar@Samidhas-Air branching-model-demo % ]]
[samidhamanjrekar@Samidhas-Air branching-model-demo % git remote -v
origin  https://github.com/SamidhaManjrekar/branching-model-demo.git (fetch)
origin  https://github.com/SamidhaManjrekar/branching-model-demo.git (push)
[samidhamanjrekar@Samidhas-Air branching-model-demo % ]]
[samidhamanjrekar@Samidhas-Air branching-model-demo % git branch -a
* develop
  main
  remotes/origin/develop
  remotes/origin/main
[samidhamanjrekar@Samidhas-Air branching-model-demo % ]
```

### 4. Feature Branch:

```
[samidhamanjrekar@Samidhas-Air branching-model-demo % git checkout develop
Already on 'develop'
Your branch is up to date with 'origin/develop'.
[samidhamanjrekar@Samidhas-Air branching-model-demo % git checkout -b feature/login
Switched to a new branch 'feature/login'
[samidhamanjrekar@Samidhas-Air branching-model-demo % echo "console.log('Login feature');" > login.js
[samidhamanjrekar@Samidhas-Air branching-model-demo % git add login.js
[samidhamanjrekar@Samidhas-Air branching-model-demo % git commit -m "Add login feature"
[feature/login b939fd6] Add login feature
 1 file changed, 1 insertion(+)
  create mode 100644 login.js
[samidhamanjrekar@Samidhas-Air branching-model-demo % git push -u origin feature/login
Enumerating objects: 4, done.
Counting objects: 100% (4/4), done.
Delta compression using up to 8 threads
Compressing objects: 100% (2/2), done.
Writing objects: 100% (3/3), 315 bytes | 315.00 KiB/s, done.
Total 3 (delta 0), reused 0 (delta 0), pack-reused 0
remote:
remote: Create a pull request for 'feature/login' on GitHub by visiting:
remote:     https://github.com/SamidhaManjrekar/branching-model-demo/pull/new/feature/login
remote:
To https://github.com/SamidhaManjrekar/branching-model-demo.git
 * [new branch]      feature/login -> feature/login
branch 'feature/login' set up to track 'origin/feature/login'.
[samidhamanjrekar@Samidhas-Air branching-model-demo % ]
```

### 5. Newly created branch:

```
[samidhamanjrekar@Samidhas-Air branching-model-demo % git branch -a
  develop
* feature/login
  main
  remotes/origin/develop
  remotes/origin/feature/login
  remotes/origin/main
samidhamanjrekar@Samidhas-Air branching-model-demo %

[samidhamanjrekar@Samidhas-Air branching-model-demo % git log --oneline --graph --all
* b939fd6 (HEAD -> feature/login, origin/feature/login) Add login feature
* d04674a (origin/main, origin/develop, main, develop) Initial commit
samidhamanjrekar@Samidhas-Air branching-model-demo %
```

## 6. Merge Feature into Develop:

```
[samidhamanjrekar@Samidhas-Air branching-model-demo % git checkout develop
Switched to branch 'develop'
Your branch is up to date with 'origin/develop'.
[samidhamanjrekar@Samidhas-Air branching-model-demo % git merge feature/login --no-ff -m "Merge login feature"
Merge made by the 'ort' strategy.
  login.js | 1 +
  1 file changed, 1 insertion(+)
  create mode 100644 login.js
[samidhamanjrekar@Samidhas-Air branching-model-demo % git push origin develop
Enumerating objects: 1, done.
Counting objects: 100% (1/1), done.
Writing objects: 100% (1/1), 222 bytes | 222.00 KiB/s, done.
Total 1 (delta 0), reused 0 (delta 0), pack-reused 0
To https://github.com/SamidhaManjrekar/branching-model-demo.git
  d04674a..79310ea  develop -> develop
[samidhamanjrekar@Samidhas-Air branching-model-demo % git log --oneline --graph --all
* 79310ea (HEAD -> develop, origin/develop) Merge login feature
  |
  | * b939fd6 (origin/feature/login, feature/login) Add login feature
  |
* d04674a (origin/main, main) Initial commit
samidhamanjrekar@Samidhas-Air branching-model-demo %
```

## 7. Release Branch:

```
[samidhamanjrekar@Samidhas-Air branching-model-demo % git checkout -b release/v1.0 develop
Switched to a new branch 'release/v1.0'
[samidhamanjrekar@Samidhas-Air branching-model-demo % echo "Version 1.0 release notes" > RELEASE.md
[samidhamanjrekar@Samidhas-Air branching-model-demo % git add RELEASE.md
[samidhamanjrekar@Samidhas-Air branching-model-demo % git commit -m "Prepare release v1.0"
[release/v1.0 70e1bfc] Prepare release v1.0
  1 file changed, 1 insertion(+)
  create mode 100644 RELEASE.md
[samidhamanjrekar@Samidhas-Air branching-model-demo % git push -u origin release/v1.0
Enumerating objects: 4, done.
Counting objects: 100% (4/4), done.
Delta compression using up to 8 threads
Compressing objects: 100% (2/2), done.
Writing objects: 100% (3/3), 343 bytes | 343.00 KiB/s, done.
Total 3 (delta 0), reused 0 (delta 0), pack-reused 0
remote:
remote: Create a pull request for 'release/v1.0' on GitHub by visiting:
remote:   https://github.com/SamidhaManjrekar/branching-model-demo/pull/new/release/v1.0
remote:
To https://github.com/SamidhaManjrekar/branching-model-demo.git
 * [new branch]      release/v1.0 -> release/v1.0
branch 'release/v1.0' set up to track 'origin/release/v1.0'.
[samidhamanjrekar@Samidhas-Air branching-model-demo % git branch -a
  develop
  feature/login
  main
* release/v1.0
  remotes/origin/develop
  remotes/origin/feature/login
  remotes/origin/main
  remotes/origin/release/v1.0
samidhamanjrekar@Samidhas-Air branching-model-demo %
```

## 8. Merge Release into Main and Tag:

```
[samidhamanjurekar@Samidhas-Air branching-model-demo % git checkout main
Switched to branch 'main'.
Your branch is up to date with 'origin/main'.
[samidhamanjurekar@Samidhas-Air branching-model-demo % git merge release/v1.0 --no-ff -m "Release v1.0"
Merge made by the 'ort' strategy.
 RELEASE.md | 1 +
 login.js  | 1 +
 2 files changed, 2 insertions(+)
 create mode 100644 RELEASE.md
 create mode 100644 login.js
[samidhamanjurekar@Samidhas-Air branching-model-demo % git tag v1.0
[samidhamanjurekar@Samidhas-Air branching-model-demo % git push origin main --tags
Enumerating objects: 1, done.
Counting objects: 100% (1/1), done.
Writing objects: 100% (1/1), 218 bytes | 218.00 KiB/s, done.
Total 1 (delta 0), reused 0 (delta 0), pack-reused 0
To https://github.com/SamidhaManjurekar/branching-model-demo.git
  d04674a..093271a  main -> main
 * [new tag]         v1.0 -> v1.0
[samidhamanjurekar@Samidhas-Air branching-model-demo % ]
```

## 9. Hotfix branch:

```
[samidhamanjurekar@Samidhas-Air branching-model-demo % git checkout -b hotfix/urgent-bug main
Switched to a new branch 'hotfix/urgent-bug'.
[samidhamanjurekar@Samidhas-Air branching-model-demo % echo "console.log('Fixed urgent bug');" > hotfix.js
[samidhamanjurekar@Samidhas-Air branching-model-demo % git add hotfix.js
[samidhamanjurekar@Samidhas-Air branching-model-demo % git commit -m "Fix urgent bug"
[hotfix/urgent-bug a828681] Fix urgent bug
 1 file changed, 1 insertion(+)
 create mode 100644 hotfix.js
[samidhamanjurekar@Samidhas-Air branching-model-demo % git push -u origin hotfix/urgent-bug
Enumerating objects: 4, done.
Counting objects: 100% (4/4), done.
Delta compression using up to 8 threads
Compressing objects: 100% (2/2), done.
Writing objects: 100% (3/3), 380 bytes | 380.00 KiB/s, done.
Total 3 (delta 0), reused 0 (delta 0), pack-reused 0
remote:
remote: Create a pull request for 'hotfix/urgent-bug' on GitHub by visiting:
remote:   https://github.com/SamidhaManjurekar/branching-model-demo/pull/new/hotfix/urgent-bug
remote:
To https://github.com/SamidhaManjurekar/branching-model-demo.git
 * [new branch]         hotfix/urgent-bug -> hotfix/urgent-bug
branch 'hotfix/urgent-bug' set up to track 'origin/hotfix/urgent-bug'.
[samidhamanjurekar@Samidhas-Air branching-model-demo % ]
```

## 10. Merge into both main and develop:

```
[samidhamanjurekar@Samidhas-Air branching-model-demo % git checkout main
Switched to branch 'main'.
Your branch is up to date with 'origin/main'.
[samidhamanjurekar@Samidhas-Air branching-model-demo % git merge hotfix/urgent-bug --no-ff -m "Merge urgent bug fix"
Merge made by the 'ort' strategy.
 hotfix.js | 1 +
 1 file changed, 1 insertion(+)
 create mode 100644 hotfix.js
[samidhamanjurekar@Samidhas-Air branching-model-demo % git push origin main
Enumerating objects: 1, done.
Counting objects: 100% (1/1), done.
Writing objects: 100% (1/1), 227 bytes | 227.00 KiB/s, done.
Total 1 (delta 0), reused 0 (delta 0), pack-reused 0
To https://github.com/SamidhaManjurekar/branching-model-demo.git
  093271a..d66aaaa  main -> main
[samidhamanjurekar@Samidhas-Air branching-model-demo % git checkout develop
Switched to branch 'develop'.
Your branch is up to date with 'origin/develop'.
[samidhamanjurekar@Samidhas-Air branching-model-demo % git merge hotfix/urgent-bug --no-ff -m "Merge urgent bug fix"
Merge made by the 'ort' strategy.
 RELEASE.md | 1 +
 hotfix.js  | 1 +
 2 files changed, 2 insertions(+)
 create mode 100644 RELEASE.md
 create mode 100644 hotfix.js
[samidhamanjurekar@Samidhas-Air branching-model-demo % git push origin develop
Enumerating objects: 1, done.
Counting objects: 100% (1/1), done.
Writing objects: 100% (1/1), 226 bytes | 226.00 KiB/s, done.
Total 1 (delta 0), reused 0 (delta 0), pack-reused 0
To https://github.com/SamidhaManjurekar/branching-model-demo.git
  79310ea..57bdef5  develop -> develop
[samidhamanjurekar@Samidhas-Air branching-model-demo % ]
```

## 11. All the commits:

Merge pull request #1 from SamidhaManjrekar/develop	cde17d3
SamidhaManjrekar authored now	
Merge urgent bug fix	57bdef5
SamidhaManjrekar committed 5 minutes ago	
Merge urgent bug fix	d66aaaa
SamidhaManjrekar committed 6 minutes ago	
Fix urgent bug	a828681
SamidhaManjrekar committed 7 minutes ago	
Release v1.0	093271a
SamidhaManjrekar committed 8 minutes ago	
Prepare release v1.0	70e1bfc
SamidhaManjrekar committed 9 minutes ago	
Merge login feature	79310ea
SamidhaManjrekar committed 10 minutes ago	
Add login feature	b939fd6
SamidhaManjrekar committed 11 minutes ago	
Initial commit	d04674a
SamidhaManjrekar committed 17 minutes ago	

### 12. The final graph of all the commits:

```
[samidhamanjrekar@Samidhas-Air branching-model-demo % git log --oneline --graph --decorate --all
*   57bdef5 (HEAD -> develop, origin/develop) Merge urgent bug fix
| \
| *   d66aaaa (origin/main, main) Merge urgent bug fix
| |
| |
| |
| |
| * | a828681 (origin/hotfix/urgent-bug, hotfix/urgent-bug) Fix urgent bug
| |
| |
| * | 093271a (tag: v1.0) Release v1.0
| |
| * | 70e1bfc (origin/release/v1.0, release/v1.0) Prepare release v1.0
| |
| |
| * | 79310ea Merge login feature
| |
| |
| |
| * | b939fd6 (origin/feature/login, feature/login) Add login feature
| |
| |
* d04674a Initial commit
samidhamanjrekar@Samidhas-Air branching-model-demo %
```

### 13. All the final branches:

```
[samidhamanjrekar@Samidhas-Air branching-model-demo % git branch -a
* develop
  feature/login
  hotfix/urgent-bug
  main
  release/v1.0
  remotes/origin/develop
  remotes/origin/feature/login
  remotes/origin/hotfix/urgent-bug
  remotes/origin/main
  remotes/origin/release/v1.0
```

## Conclusion

In this experiment, we successfully implemented the Git Flow branching model to manage a software project. The model provided a structured way to handle feature development, release preparation, and urgent bug fixes while keeping the main branch stable for production.