Gitflow Workflow Report

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GitHub: Gitflow Workflow
YouTube Video: Workflow Demonstration
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Objective Overview:

Simulate collaboration in a version-controlled development environment by creating multiple directories to represent different collaborators.

- Create and manage feature branches for development.
- Use a development branch to integrate changes.
- Maintain a main branch for stable releases using hotfix and release branches.

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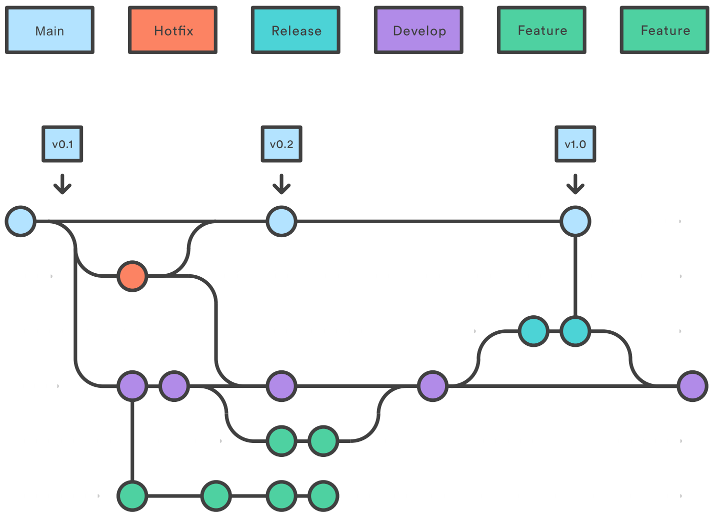
Project Description and Overview

This report documents the implementation of a collaborative workflow in a simulated development environment.

The project contains two simple text files to simulate collaborators (collaborator1.txt, collaborator2.txt). The collaborators were tasked to implement their features within their document on the feature branch, after the completion of their tasks they are expected to push their work to the remote repository. The admin of the develop branch then merges the collaborators work resolving conflicts if any and integrates the features or changes. A release branch is then created from the develop branch for final testing and preparation to create a stable version of the integrated file. Once completed, the release branch is merged into both main and develop branches.
A bug was simulated in the integrated file. To address this, a hotfix branch was created directly from the main branch. The bug was resolved in the hotfix branch and merged back into both the main and develop branches creating a new release tag.



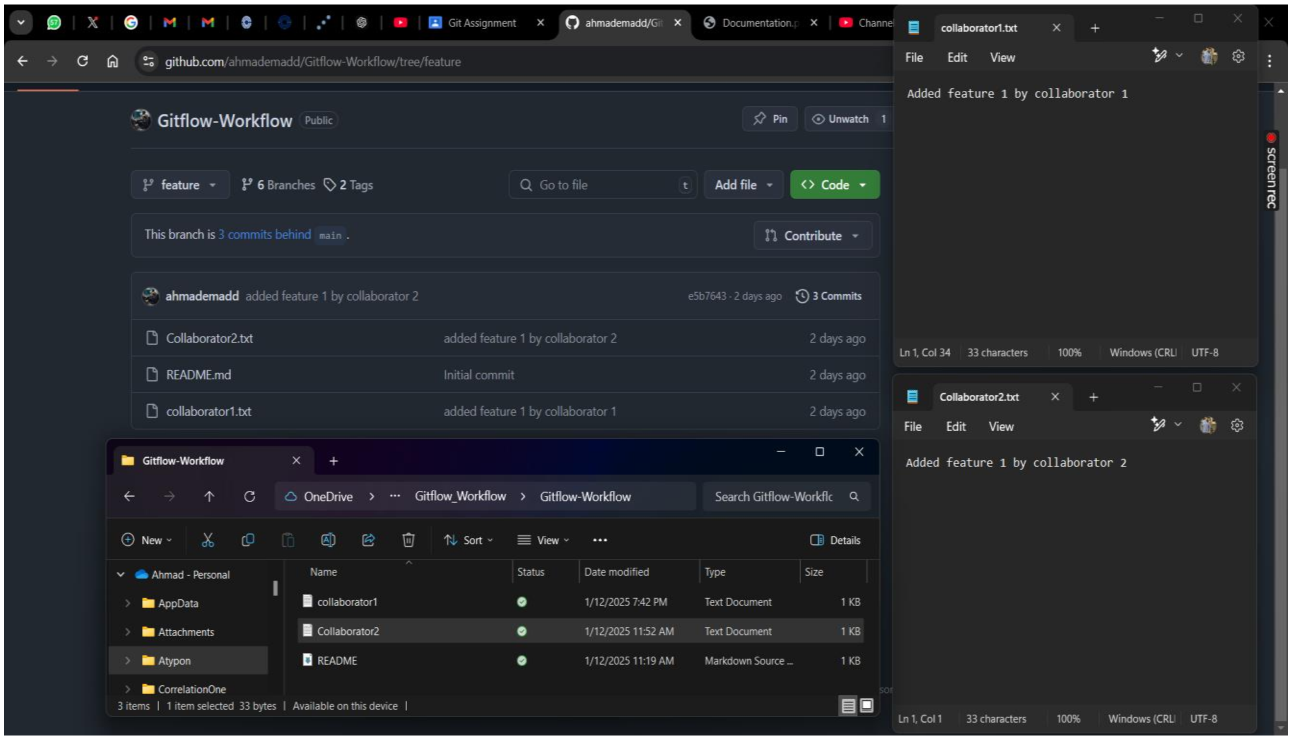
Workflow Diagram
On the left is a diagram representing the Git workflow used in this project. This visual representation illustrates the branching and merging activities.

Setup of the Git Repository

The project repository was created on GitHub and initialized with a README.md file on branch main as the initial commit then cloned to local directory.

Feature Branch

Branch feature is created from develop branch and collaborators (collaborator1.txt, collaborator2.txt) added features and committed them.



This branch is 3 commits behind main.

ahmademadd added feature 1 by collaborator 2 e5b7643 · 2 days ago 3 Commits

Collaborator2.txt	added feature 1 by collaborator 2	2 days ago
README.md	Initial commit	2 days ago
collaborator1.txt	added feature 1 by collaborator 1	2 days ago

```
Added feature 1 by collaborator 1
```

Ln 1, Col 34 | 33 characters | 100% | Windows (CRLF) | UTF-8

```
Added feature 1 by collaborator 2
```

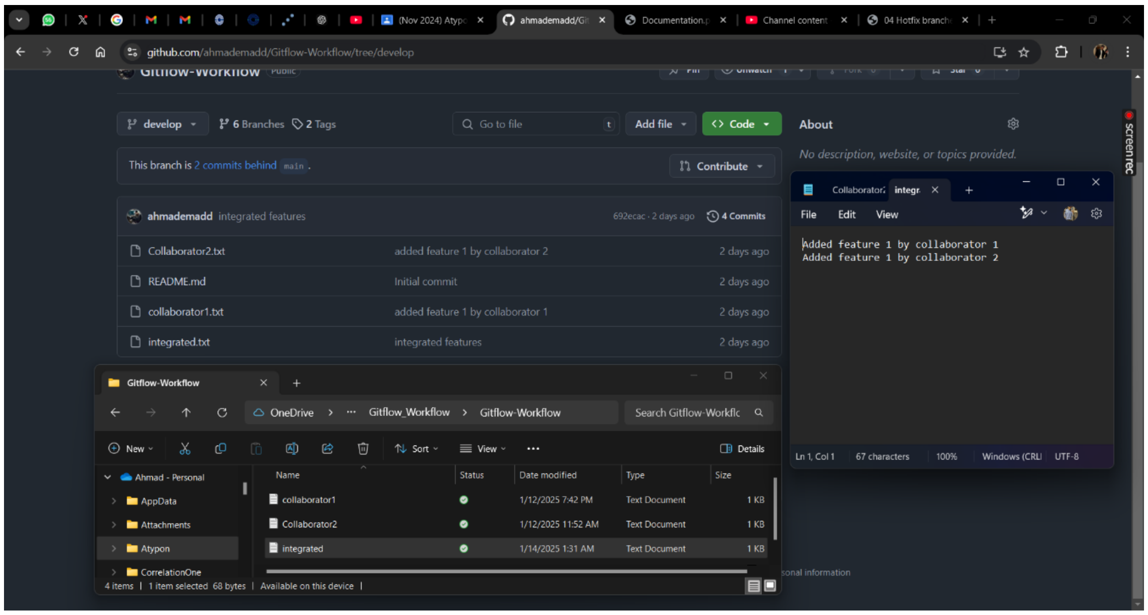
Ln 1, Col 1 | 33 characters | 100% | Windows (CRLF) | UTF-8

Name	Status	Date modified	Type	Size
collaborator1	✓	1/12/2025 7:42 PM	Text Document	1 KB
Collaborator2	✓	1/12/2025 11:52 AM	Text Document	1 KB
README	✓	1/12/2025 11:19 AM	Markdown Source ...	1 KB

3 items | 1 item selected 33 bytes | Available on this device |

Develop Branch

After completing development in the feature branch admin of develop branch merges the feature branch and creates integrated.txt file to simulate integrating the features of collaborators and resolves conflicts resulting from the merge if any.



github.com/ahmademadd/Gitflow-Workflow/tree/develop

develop · 6 Branches · 2 Tags

This branch is 2 commits behind main.

ahmademadd integrated features · 692ecac · 2 days ago · 4 Commits

Collaborator2.txt	added feature 1 by collaborator 2	2 days ago
README.md	Initial commit	2 days ago
collaborator1.txt	added feature 1 by collaborator 1	2 days ago
integrated.txt	integrated features	2 days ago

```
Added feature 1 by collaborator 1
Added feature 1 by collaborator 2
```

Ln 1, Col 1 · 67 characters · 100% · Windows (CRLF) · UTF-8

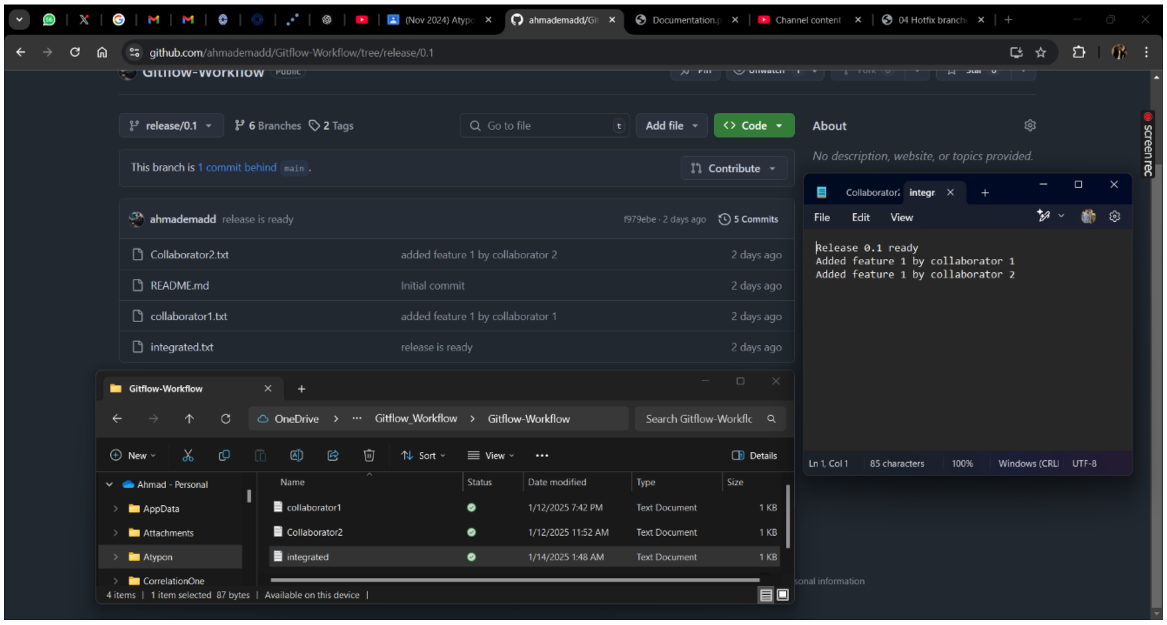
OneDrive > ··· > Gitflow_Workflow > Gitflow-Workflow

Name	Status	Date modified	Type	Size
collaborator1	●	1/12/2025 7:42 PM	Text Document	1 KB
Collaborator2	●	1/12/2025 11:52 AM	Text Document	1 KB
integrated	●	1/14/2025 1:31 AM	Text Document	1 KB

4 items | 1 item selected 68 bytes | Available on this device

Release/<release version> Branch

A release branch (release/v0.1.0) is created from the develop branch for final testing and preparation of version 0.1. Minor adjustments, such as updating the header, were made in this branch. The branch is then merged into main for production resulting in tag v0.1.0



github.com/ahmademadd/Gitflow-Workflow/tree/release/0.1

release/0.1 · 6 Branches · 2 Tags

This branch is 1 commit behind main.

ahmademadd release is ready · f979ebe · 2 days ago · 5 Commits

Collaborator2.txt	added feature 1 by collaborator 2	2 days ago
README.md	Initial commit	2 days ago
collaborator1.txt	added feature 1 by collaborator 1	2 days ago
integrated.txt	release is ready	2 days ago

```
Release 0.1 ready
Added feature 1 by collaborator 1
Added feature 1 by collaborator 2
```

Ln 1, Col 1 · 85 characters · 100% · Windows (CRLF) · UTF-8

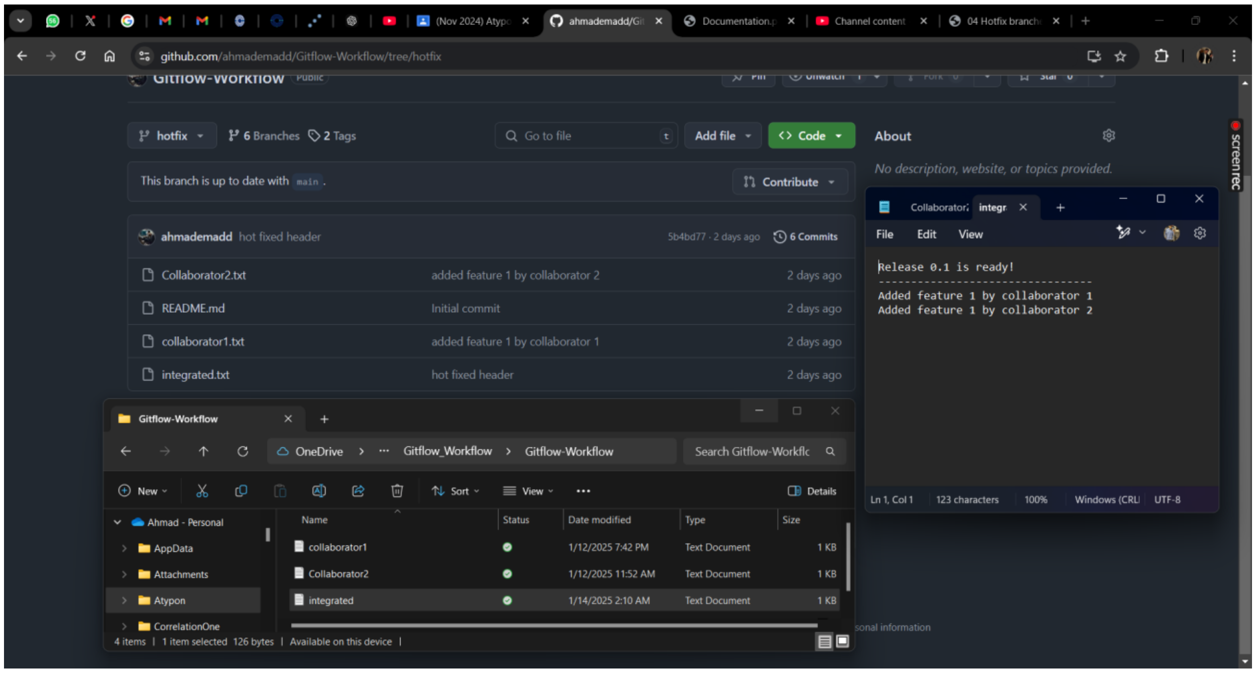
OneDrive > ··· > Gitflow_Workflow > Gitflow-Workflow

Name	Status	Date modified	Type	Size
collaborator1	●	1/12/2025 7:42 PM	Text Document	1 KB
Collaborator2	●	1/12/2025 11:52 AM	Text Document	1 KB
integrated	●	1/14/2025 1:48 AM	Text Document	1 KB

4 items | 1 item selected 87 bytes | Available on this device

Hotfix Branch

A bug was simulated in the header of the integrated.txt file. To address this, a hotfix branch was created directly from the main branch. The bug was resolved in the hotfix branch and merged back into the main branch resulting in tag v0.1.1



github.com/ahmademadd/Gitflow-Workflow/tree/hotfix

hotfix · 6 Branches · 2 Tags

This branch is up to date with `main`.

ahmademadd hot fixed header · 5b4bd77 · 2 days ago · 6 Commits

Collaborator2.txt	added feature 1 by collaborator 2	2 days ago
README.md	Initial commit	2 days ago
collaborator1.txt	added feature 1 by collaborator 1	2 days ago
integrated.txt	hot fixed header	2 days ago

```
Release 0.1 is ready!
--------------------------------
Added feature 1 by collaborator 1
Added feature 1 by collaborator 2
```

Name	Status	Date modified	Type	Size
collaborator1	✓	1/12/2025 7:42 PM	Text Document	1 KB
Collaborator2	✓	1/12/2025 11:52 AM	Text Document	1 KB
integrated	✓	1/14/2025 2:10 AM	Text Document	1 KB

Instruction Sample:

```
git checkout main

git checkout -b hotfix

git add .
git commit -m"hot fixed header"



git checkout main

git merge hotfix

git push
```

Challenges and Solutions

Reverting Mistakes After Push

- Mistakes made after pushing changes were reverted safely using git revert instead of rewriting history, ensuring the integrity of the repository and maintaining collaboration continuity.

Handling Simultaneous Changes in Multiple Branches

- When multiple branches were being worked on simultaneously, careful coordination was required to avoid overwriting changes. For example, frequent merging of feature branch onto the develop branch ensured that all collaborators worked with the latest updates.

Learning Experience and Insights

Implementing Git in a simulated team environment provided valuable insights into the workflow's efficiency and organizational benefits. Key takeaways include:

- Structured Workflow: Git offers a clear structure for managing feature development, releases, and hotfixes.
- Collaboration: It facilitates collaboration by allowing multiple team members to work on unique features simultaneously without interfering with each other's progress.
- Version Control: The separation of main and develop branches ensures that production code remains stable.

Conclusion

The Gitflow workflow significantly enhances version control and team collaboration ensuring smooth and reliable software delivery. This project demonstrated the practical application of Git, highlighting its benefits and challenges. The experience gained will be invaluable for applying Git in real-world scenarios, ensuring efficient and organized development processes.