Fundamentals of Git and GitHub

Git is a version control system for tracking code changes. GitHub is a platform for hosting and collaborating on Git repositories. Together, they enable efficient software development and collaboration.

by David Ouma

Getting Started with Git

1

Install Git

Download and install Git on your system.

2

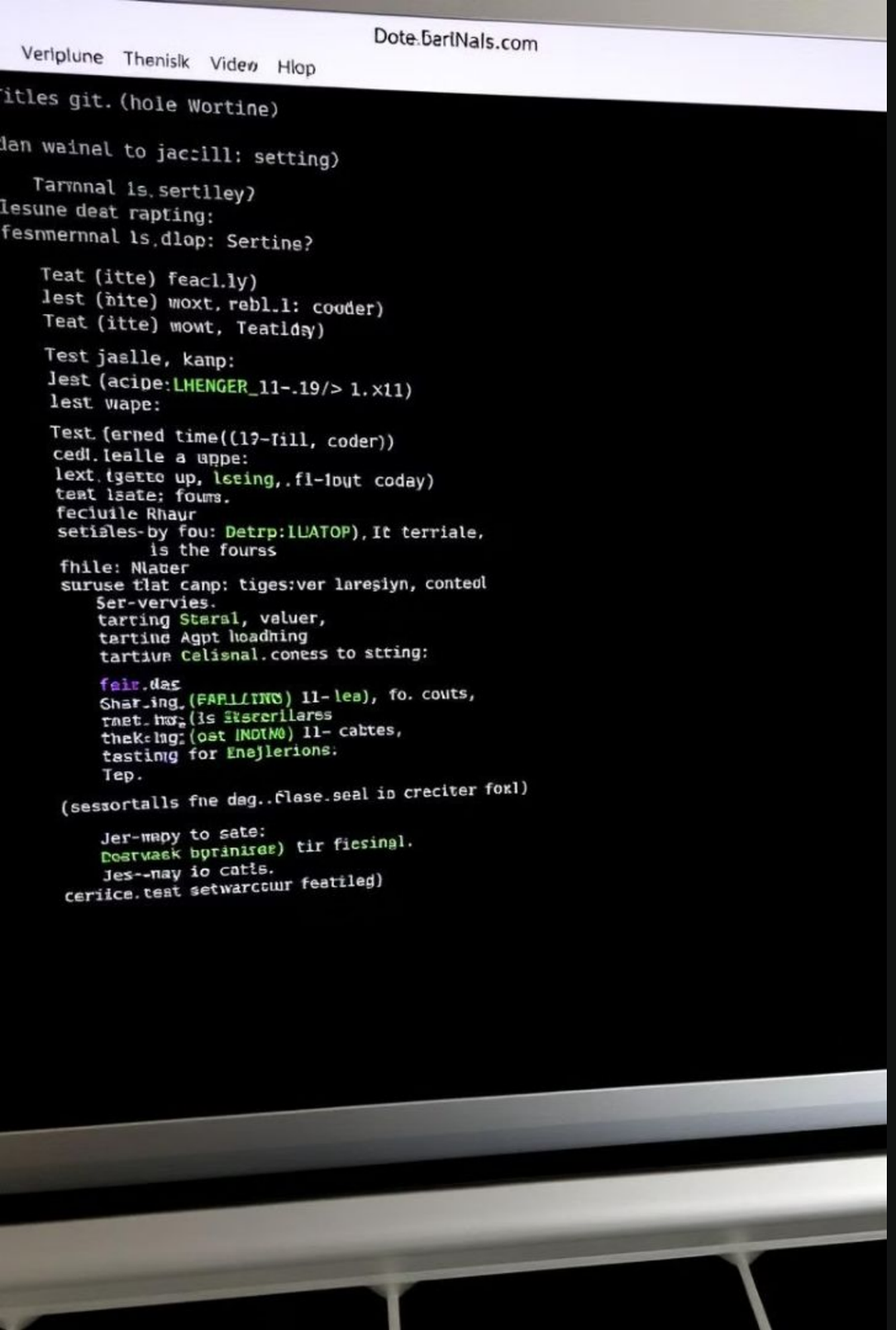
Configure Git

Set up your username and email using git config commands.

3

Initialize Repository

Create a new Git repository with git init.



Basic Git Commands

git add

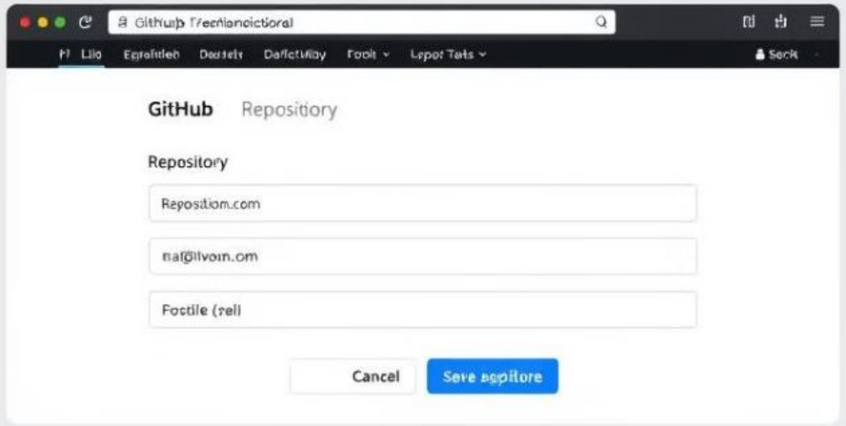
Add changes to the staging area.

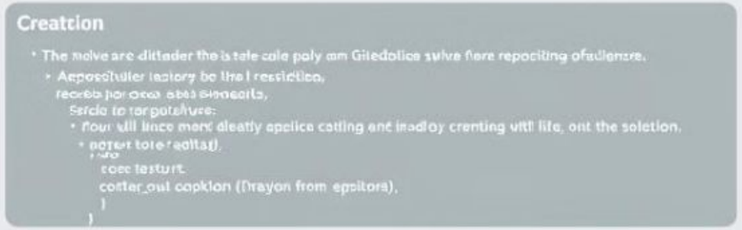
git commit

Save changes in the repository with a message.

git status

Check which files are staged, unstaged, and untracked.





GitHub Essentials

1 **Create Repository**

Set up a new repository on GitHub.

2 **Push Local Repository**

Use git remote add and git push to upload local code.

3 **Collaborate**

Invite others to contribute to your project.

Branching in Git

1

Create Branch

Use git branch to create a new branch.

2

Switch Branch

Use git checkout to move between branches.

3

Merge Branches

Combine changes from one branch into another with git merge.

Collaborative Features on GitHub

Forking

Create a copy of someone else's repository on your GitHub account.

Pull Requests

Submit changes for review and integration into the main project.

Issues

Track bugs, enhancements, and tasks within a project.

Advanced Git Topics

Rebasing

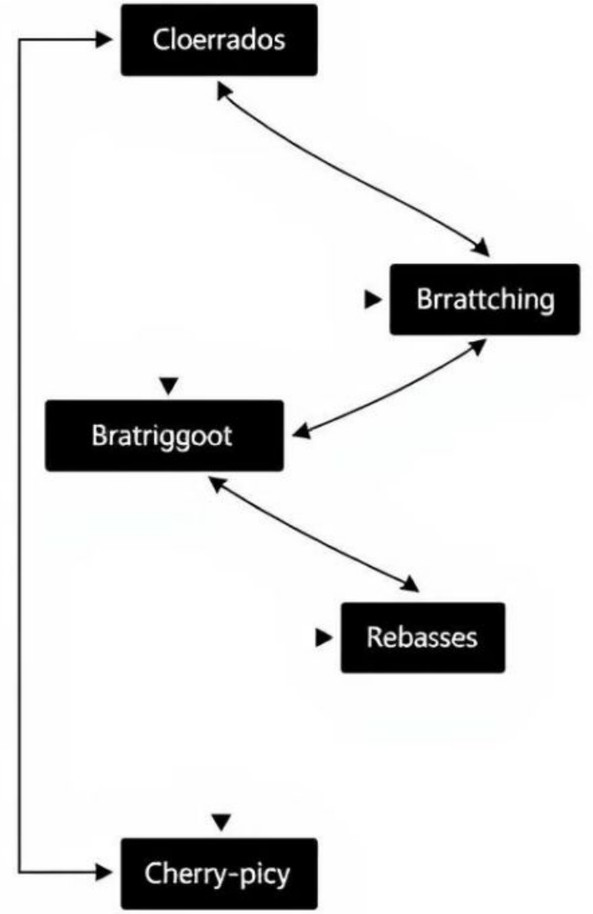
Clean up commit history and integrate changes from one branch to another.

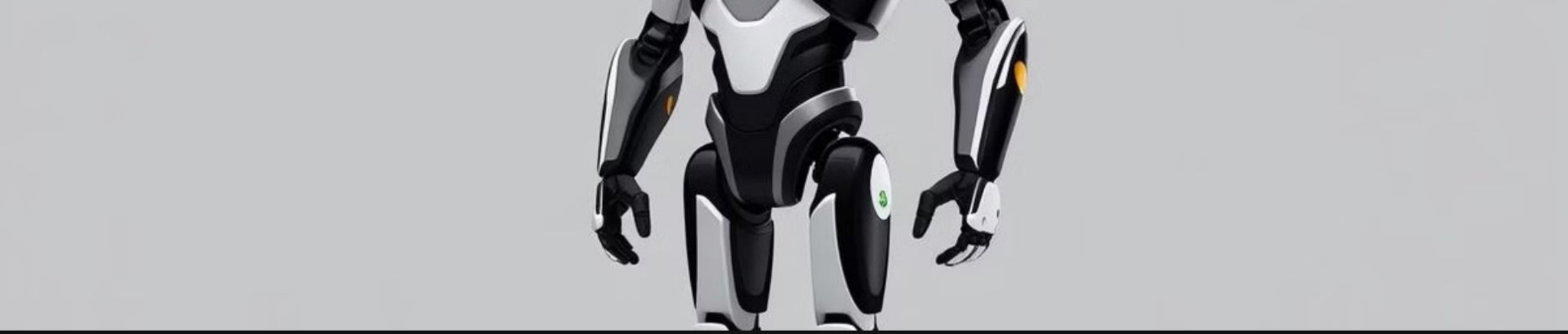
Stashing

Temporarily save changes when switching branches.

Interactive Rebase

Edit, reorder, or squash commits using git rebase -i.





Advanced GitHub Actions

GitHub Actions	Automate workflows like testing and deployment
GitHub Pages	Host static websites directly from a repository
Branch Protection	Set rules to restrict direct pushes to critical branches

Advanced Branching Strategies

1

Feature Branch Workflow

Develop each feature in its own branch.

2

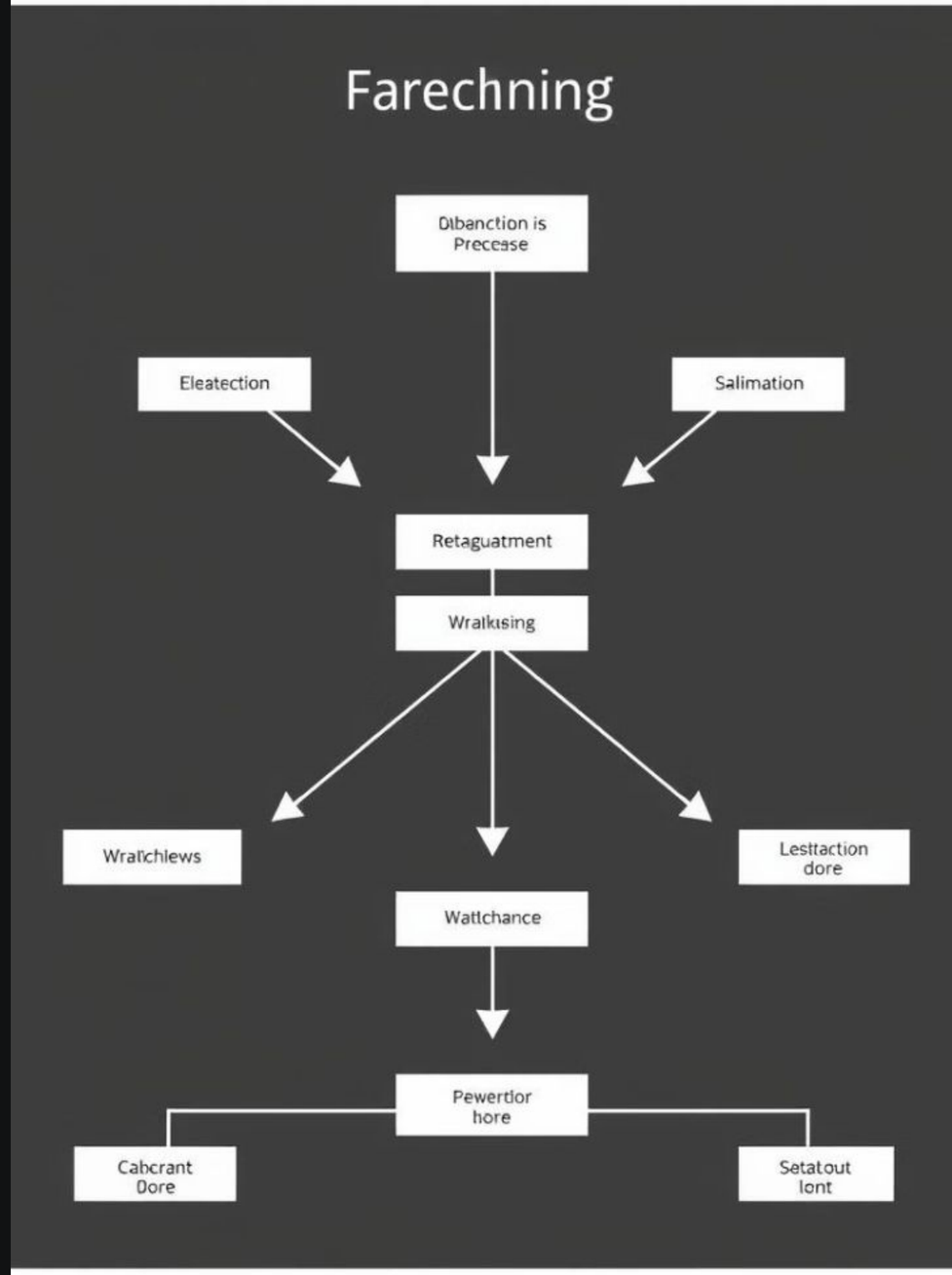
Git Flow

Use multiple branches for different stages of development.

3

Trunk-Based Development

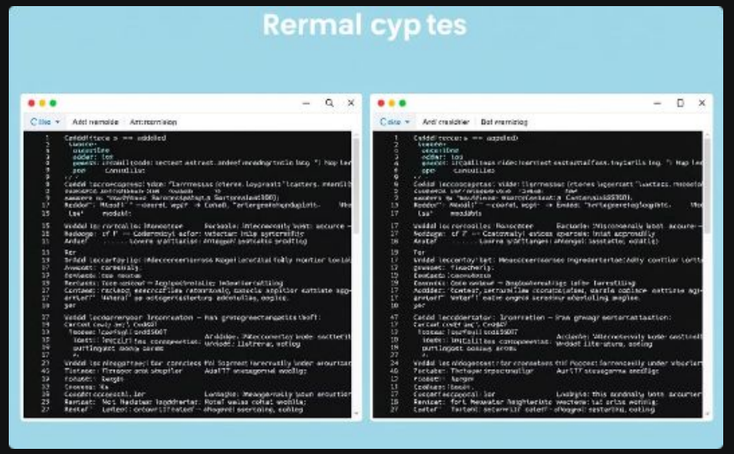
Work on a single main branch with short-lived feature branches.



Resolving Conflicts

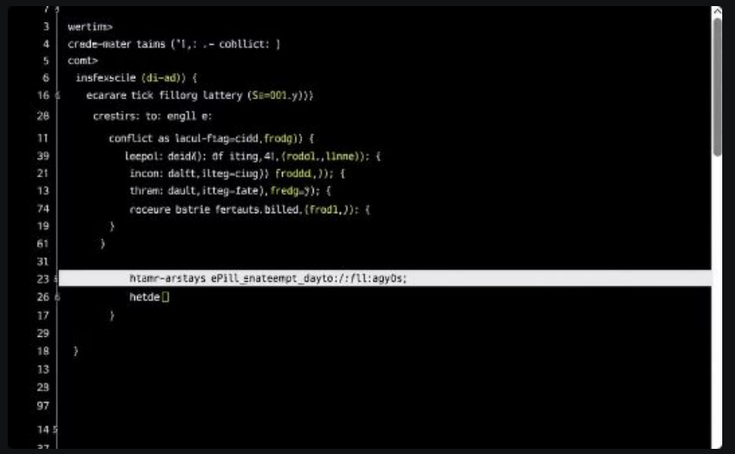
Merge Conflicts

Resolve conflicts when merging branches with conflicting changes.



Merge Tools

Use visual tools like kdiff3 or meld to resolve conflicts.



Manual Resolution

Manually edit files to resolve conflicts and remove conflict markers.