Version control is a system that records changes to files over time, allowing you to recall specific versions later. GitHub is a popular tool for managing code versions due to its collaboration features, like branching, pull requests, and issue tracking. It helps maintain project integrity by keeping a history of changes, enabling collaboration without losing work, and providing a backup of the project.

To set up a new repository on GitHub, you first need to create a new repository on the GitHub website. Then, you can choose to add a README file, select a license, and add a .gitignore file to specify which files should be ignored in the version control. Key decisions include choosing between a public or private repository, initializing with a README, and adding a license.

The README file in a GitHub repository is crucial as it provides essential information about the project, such as its purpose, how to use it, installation instructions, and contribution guidelines. A well-written README contributes to effective collaboration by helping users understand the project quickly and encouraging contributions.

Public repositories on GitHub are visible to everyone, allowing for easy collaboration, while private repositories restrict access. Public repositories encourage transparency and open source contributions but may expose sensitive information. Private repositories offer security but limit collaboration to team members.

Making your first commit involves staging changes using 'git add', committing them with 'git commit', and pushing them to the remote repository with 'git push'. Commits are snapshots of your project at a specific point, helping track changes and manage different versions.

Branching in Git allows you to diverge from the main development line to work on features or fixes independently. It's essential for collaborative development as it enables parallel work without affecting the main codebase. Creating, using, and merging branches involves commands like 'git branch', 'git checkout', and 'git merge'.

Pull requests in GitHub are proposals to merge changes into the main branch. They facilitate code review, discussion, and collaboration by allowing team members to review and comment on the proposed changes. Creating a pull request involves selecting branches, adding a title, and description, while merging requires approval and can be done after resolving conflicts.

Forking a repository creates a copy of the original repository under your GitHub account, allowing you to make changes without affecting the original project. Forking differs from cloning as it copies the repository to your account on GitHub, making it useful for contributing to open source projects without direct access.

Issues and project boards on GitHub help track bugs, manage tasks, and improve project organization. Issues can be used to report problems or suggest enhancements, while project boards provide a visual overview of tasks. These tools enhance collaboration by providing a centralized place for communication and tracking progress.

Common challenges in using GitHub include understanding branching and merging, resolving conflicts, and managing permissions. Best practices include using descriptive commit messages, creating meaningful issues, and regularly updating the project. New users can overcome challenges by learning Git basics, following project guidelines, and actively participating in discussions to ensure smooth collaboration.