



GITHUB, GITHUB FOR WINDOWS & GIT IN VS CODE

TechRacine Solutions Academy

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Study Guide

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Introduction to Git and GitHub

Git is a distributed version control system used by developers to track code changes.

GitHub is a cloud-based platform used to host Git repositories.

Git and GitHub help developers collaborate, manage projects, and maintain source code history.

Modern software companies widely use Git and GitHub.

What is Version Control

Version control helps developers track changes made to files and source code.

It allows teams to work together without overwriting each other's changes.

Developers can restore older versions when needed.

Version control improves collaboration and project management.

Features of GitHub

GitHub provides several useful features for developers.

1. Repository hosting
2. Branch management
3. Pull requests
4. Collaboration tools
5. Issue tracking
6. GitHub Actions and automation
7. Security and access management

Creating a GitHub Account

Developers can create a free GitHub account from github.com.

Repositories can be public or private.

GitHub profiles help developers showcase projects and contributions.

What is GitHub for Windows

GitHub for Windows is a desktop application for managing GitHub repositories.

It provides a graphical interface for cloning, committing, pushing, and pulling code.

It is useful for beginners who are not comfortable with terminal commands.

Installing GitHub for Windows

Download GitHub Desktop from the official GitHub website.

Install the application and sign in using GitHub credentials.

Repositories can then be cloned and managed easily.

Installing Git

Git must be installed to use Git commands in terminal.

Git for Windows includes Git Bash and terminal tools.

After installation, Git commands become available inside VS Code terminal.

```
git --version
```

Introduction to VS Code Git Integration

VS Code provides built-in Git integration.

Developers can commit, push, pull, and manage branches directly from the editor.

The Source Control panel displays modified files.

Git Basics

Git tracks changes in source code files.

Repositories store project history.

Commits save snapshots of project changes.

Branches allow parallel development.

Creating a Local Repository

A Git repository can be initialized inside a project folder.

The .git folder stores repository information.

```
git init
```

Connecting Local Project to GitHub

After creating a GitHub repository, the local project can be linked using remote origin.

The origin represents the remote GitHub repository.

```
git remote add origin https://github.com/username/project.git
```

Cloning Repositories

Cloning downloads a repository from GitHub to the local computer.

This allows developers to work on existing projects.

```
git clone https://github.com/TechRacine-Solutions/TRWebsiteNew.git
```

Git Commands in VS Code Terminal

VS Code terminal allows developers to execute Git commands directly.

These commands are commonly used during development.

```
git status
```

```
git add .
```

```
git commit -m "Initial Commit"
```

```
git push origin main
```

```
git pull origin main
```

Git Branches

Branches help developers work on features independently.

The main branch usually contains stable production code.

Feature branches are commonly used during development.

```
git branch
```

```
git checkout -b feature-login
```

Pushing and Pulling Changes

Push uploads local commits to GitHub.

Pull downloads latest changes from GitHub.

Regular pulling avoids merge conflicts.

```
git push origin main
```

```
git pull origin main
```

Commit Best Practices

Write meaningful commit messages.

Commit related changes together.

Avoid committing temporary or unnecessary files.

Commit frequently during development.

Resolving Merge Conflicts

Merge conflicts occur when multiple developers modify the same file.

Git highlights conflicting sections.

Developers must manually resolve conflicts before committing.

Using .gitignore

.gitignore prevents unnecessary files from being tracked.

Common ignored files include logs, cache, and environment configuration files.

```
vendor/  
node_modules/  
.env
```

Best Practices

Use Git regularly during development.

Push code frequently to GitHub.

Use branches for new features.

Keep repositories organized.

Protect sensitive data using .gitignore.

Review code before merging.

Summary

Git and GitHub are essential tools for modern software development.

GitHub for Windows helps beginners manage repositories easily.

VS Code provides powerful Git integration for efficient development.

Understanding Git commands and workflows improves team collaboration and project management.