Lecture: Introduction to Git and GitHub (Part 1)

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Git and GitHub Basics

Git: Version Control System

Definition: Git is a distributed version control system used to track changes in source code and collaborate on software development projects.

GitHub: Online Platform for Git Repositories

Definition: GitHub is a web-based platform that provides hosting for Git repositories, collaborative tools, and more.

Configuration

Git Configuration: Customize Git settings globally.

- `git config --global user.name "YourUserName"`
- `git config --global user.email YourEmail@example.com`
- `git config --list: List Git configuration settings.`

Understanding Git Status

- **Untracked:** New files.
- **Modified:** Previously tracked files with changes.
- **Stage (Staging Area):** Files ready for commit.
- **Unmodified:** Files after a commit.

Checking Status

- Short status: `git status -s`
- Full status: `git status`

File Management and Committing

- To upload all files: `git add .` or `git add -A`
- To upload a single file: `git add yourfilename`
- Commit: `git commit`
- Type "i," write your commit message, press "Esc," then `:wq`, and press Enter.
- Commit with message: `git commit -m "your commit`"

Adding & Committing

To write add and commit commands in short: `git commit -a -m"your commit`"

Working Tree

Working tree: The area where you work on your files.

Committing Changes

Committing is the process of saving your changes in Git.

Remote Process

- Add a remote repository: `git remote add origin YourRepoURL`

"origin" is a name you assign; it can be customized.

- View remote URLs: `git remote -v`
- Change remote URL: `git remote set-url origin NewURL`

Pushing to Remote Repository

- Push to the "master" branch: `git push origin master`
- Universal push: `git push -u origin master`

After the initial setup, you can use git push without specifying the branch name.

Terminal Commands

Clear your terminal: `clear`

Recovering Data

Restore data from the last commit:

- For one file: **`git checkout yourfilename`**
- For all files: **`git checkout -f`**

Viewing Commit History

- View commit history: `git log`
- Exit log: Type "Q"
- View a specific commit: `git log -1` (Can replace with the desired commit number)

Git Extra Commands

Basic File Operations:

- `touch filename`: Create a new file.
- `ls`: List the contents of the current directory.
- `ls -lart`: Detailed directory listing, including hidden files.
- `pwd`: Display the current directory.
- `cd abc/`: Navigate to another folder.
- `cd ..`: Navigate back to the parent folder.

Differences

View differences between the working directory and the repository: `git diff`

View differences between staged and repository: `git diff –staged`

Branches

- View existing branches: `git branch`
- Create a new branch: `git checkout -b YourBranchName`
- Switch to an existing branch: `git checkout YourAnyExistingBranchName`
- Delete a branch: `git branch -d YourAnyExistingBranchName`
- Rename a branch: `git branch -m NewName`