

Efficient tools and techniques for modern software development

Git – Part 3

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<https://vineelkovvuri.github.io>



Agenda

- Github
- Remote
- Push
- Clone
- Fetch
- Pull

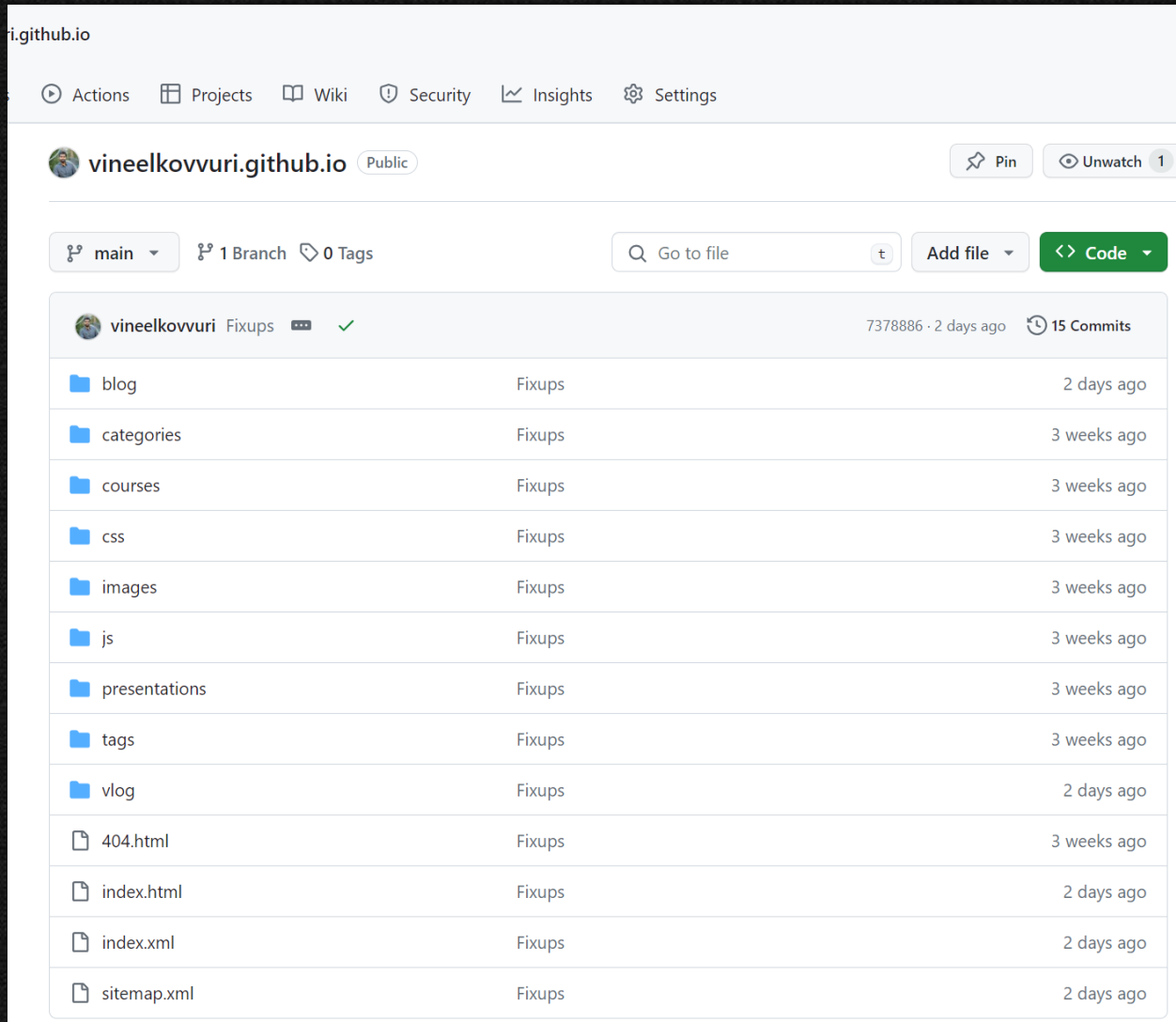
Recap

Part - 1

Part - 2

Create Repo	git init	Initialize a repository
Inspect Repo	git status	Know the status of the repository
Create Commits	git add	Add files for staging
	git commit	Create commit of the staged files
Inspect Commits	git log	View the commit log
	git diff/difftool	See changes between the commits
Undo Commits	git reset	Undo commit(unpack the commit)
	git checkout	Discard the changes
Branching Commands	git branch	List all branches
	git branch <new> <existing>	Create <new> branch from <existing> branch
	git checkout <branch>	Switch to <branch>
	git checkout -b <new> <existing>	Create a new branch and switch to that branch
Merge Command	git merge <feature>	Merge current branch with <feature> branch
Rebase Command	git rebase <feature>	Rebase current branch with <feature> branch

Github – Walk through



The screenshot shows the GitHub interface for the repository `vineelkovvuri.github.io`. The repository is public and has 1 branch and 0 tags. The current branch is `main`. The repository has 7378886 files, last updated 2 days ago, and 15 commits. The file list includes:

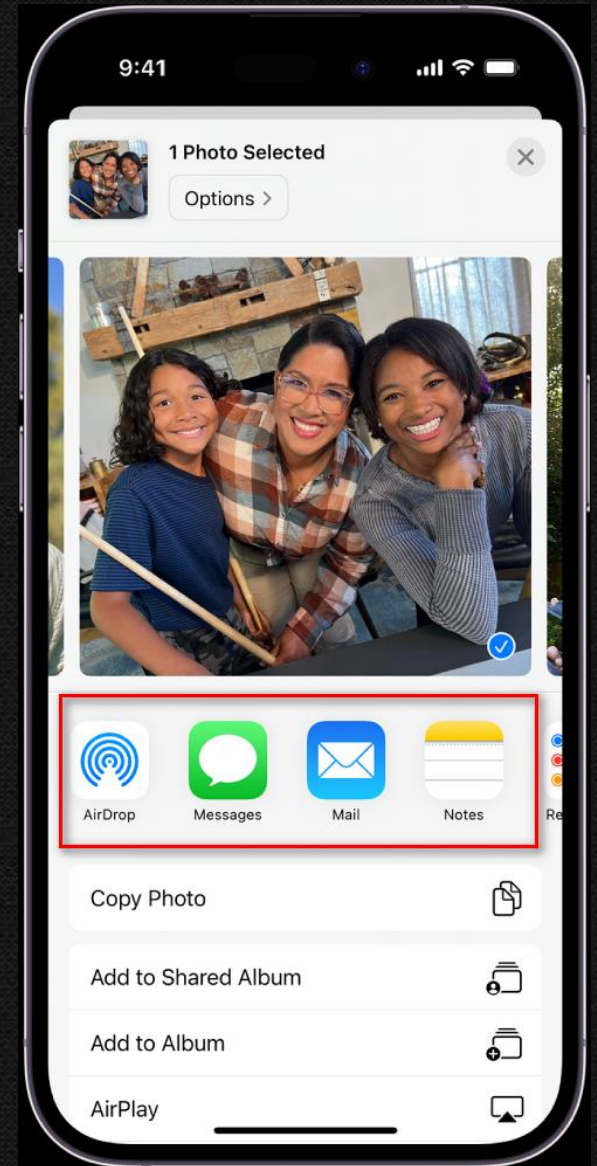
File/Folder	Last Updated
blog	2 days ago
categories	3 weeks ago
courses	3 weeks ago
css	3 weeks ago
images	3 weeks ago
js	3 weeks ago
presentations	3 weeks ago
tags	3 weeks ago
vlog	2 days ago
404.html	3 weeks ago
index.html	2 days ago
index.xml	2 days ago
sitemap.xml	2 days ago

Remote

- **Remote** is a place where you can upload your git source code. Github is one such place
- There can be **more than one** remote for a given repository

```
C:\repos\wimlib>git remote -v  
origin https://github.com/ebiggers/wimlib.git (fetch)  
origin https://github.com/ebiggers/wimlib.git (push)
```

- **origin** is the name given to the default remote



Github – Configure ssh

```
Administrator: Command Prompt
Microsoft Windows [Version 10.0.18362.778]
(c) 2019 Microsoft Corporation. All rights reserved.

C:\Users\Dejan>ssh-keygen
Generating public/private rsa key pair.
Enter file in which to save the key (C:\Users\Dejan/.ssh/id_rsa):
C:\Users\Dejan/.ssh/id_rsa already exists.
Overwrite (y/n)? y
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in C:\Users\Dejan/.ssh/id_rsa.
Your public key has been saved in C:\Users\Dejan/.ssh/id_rsa.pub.
The key fingerprint is:
SHA256:HbFmWkFZ4ahf2MtKCbGNI0CsKYeeNuHn4eL9smyme64 dejan@DESKTOP-VCSD786
The key's randomart image is:
+---[RSA 2048]-----+
|..      o o          |
|..      o X .       |
|+.      . O o       |
|=...   . = +       |
|+.o . + S o o      |
|* o . = o + .     |
|. = . . . + o     |
|.oB              |
|.EX=+.          |
+---[SHA256]-----+

C:\Users\Dejan>
```

Vineel Kovvuri (vineelkovvuri)
Your personal account



Go to your personal profile

- Public profile
- Account
- Appearance
- Accessibility
- Notifications

SSH keys New SSH key

This is a list of SSH keys associated with your account. Remove any keys that you do not recognize.

Authentication keys

 vinee@VIN-ADL-5 SHA256:Lfx8B8mv7QnBvzF8W58MEwbgFcRBCnePMeG2ML7NT7k Added on Jan 17, 2024 Last used within the last week — Read/write	Delete
 HP-OMEN16 SHA256:BPVkmGovt8t072c5bzCMbTChzFYzIIAaoT92r1HS4 Added on Feb 18, 2024 Last used within the last week — Read/write	Delete

Check out our guide to [connecting to GitHub using SSH keys](#) or troubleshoot [common SSH problems](#).

Github – How to Create a new repo?

☰ New repository

Create a new repository

A repository contains all project files, including the revision history. [Import a repository.](#)

Required fields are marked with an asterisk (*).

Owner * / Repository name *

Public
Anyone on the internet can see this repository. You choose who can see and commit to this repository.

Private
You choose who can see and commit to this repository.

Initialize this repository with:

Add a README file
This is where you can write a long description for your project.

Add .gitignore

.gitignore template: **None**

Choose which files not to track from a list of templates. [Learn more](#)

Choose a license

License: **None**

A license tells others what they can and can't do with your code. [Learn more](#)

You are creating a public repository in your personal account.

☰ vineelkovvuri / HelloWorldProject

Code Issues Pull requests Actions Projects Wiki Security Insights Settings

🌐 HelloWorldProject Public

📌 Pin Unwatch 1 Fork 0 Star 0

Set up GitHub Copilot

Use GitHub's AI pair programmer to autocomplete suggestions as you code.

Get started with GitHub Copilot

Add collaborators to this repository

Search for people using their GitHub username or email address.

Invite collaborators

Quick setup — if you've done this kind of thing before

📄 Set up in Desktop or **HTTPS** **SSH**

Get started by [creating a new file](#) or [uploading an existing file](#). We recommend every repository include a [README](#), [LICENSE](#), and [.gitignore](#).

...or create a new repository on the command line

```
echo "# HelloWorldProject" >> README.md
git init
git add README.md
git commit -m "first commit"
git branch -M main
git remote add origin git@github.com:vineelkovvuri/HelloWorldProject.git
git push -u origin main
```

...or push an existing repository from the command line

```
git remote add origin git@github.com:vineelkovvuri/HelloWorldProject.git
git branch -M main
git push -u origin main
```

...or import code from another repository

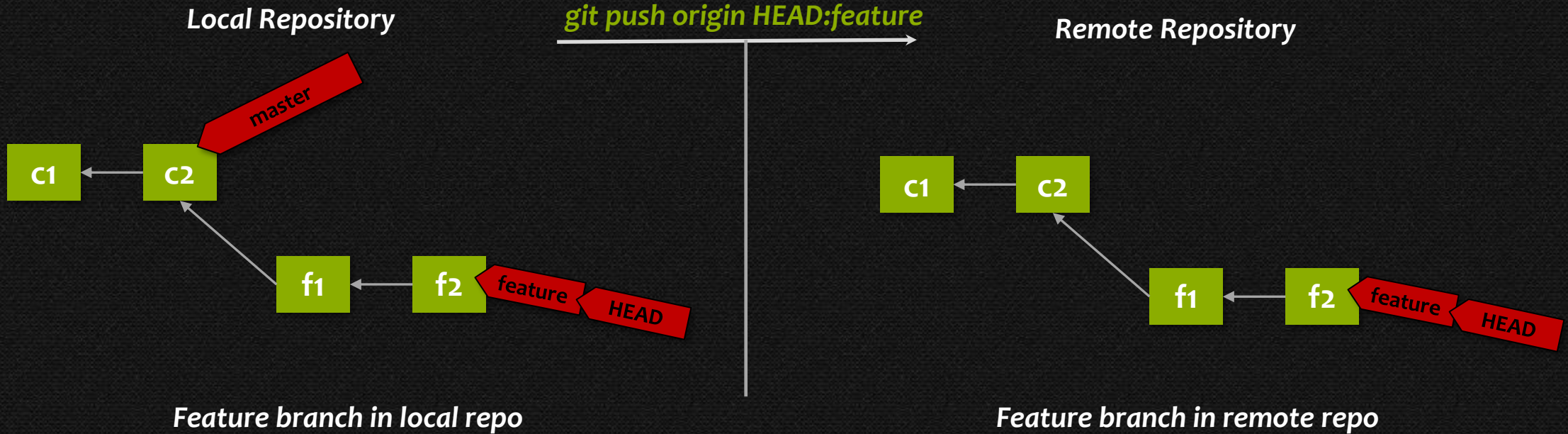
You can initialize this repository with code from a Subversion, Mercurial, or TFS project.

Import code

🔔 ProTip! Use the URL for this page when adding GitHub as a remote.

How to push to a new remote repository?

- `git push origin HEAD:<branchname>`
 - Push the local branch to remote branch with the name `<branchname>`

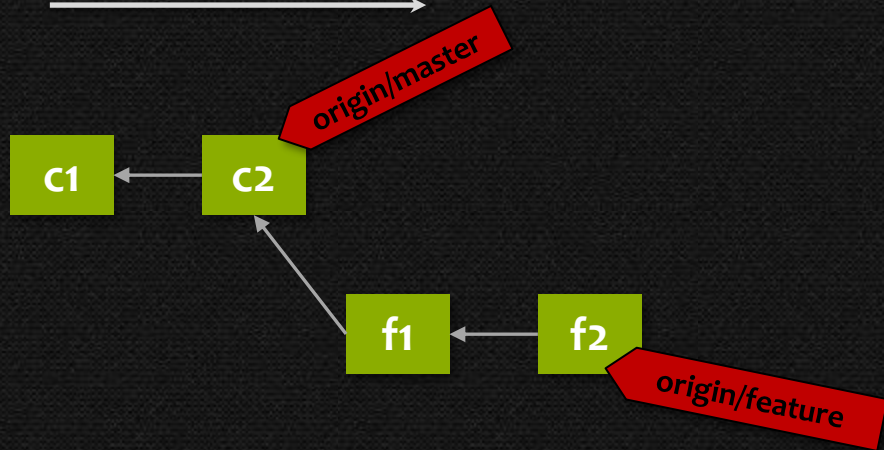


Cloning an existing remote repository

- `git clone` is used to create a new copy of remote repository in local machine
- Git clone completely copies all the branches from the remote repository
- By default, git will add the cloned remote as `origin`

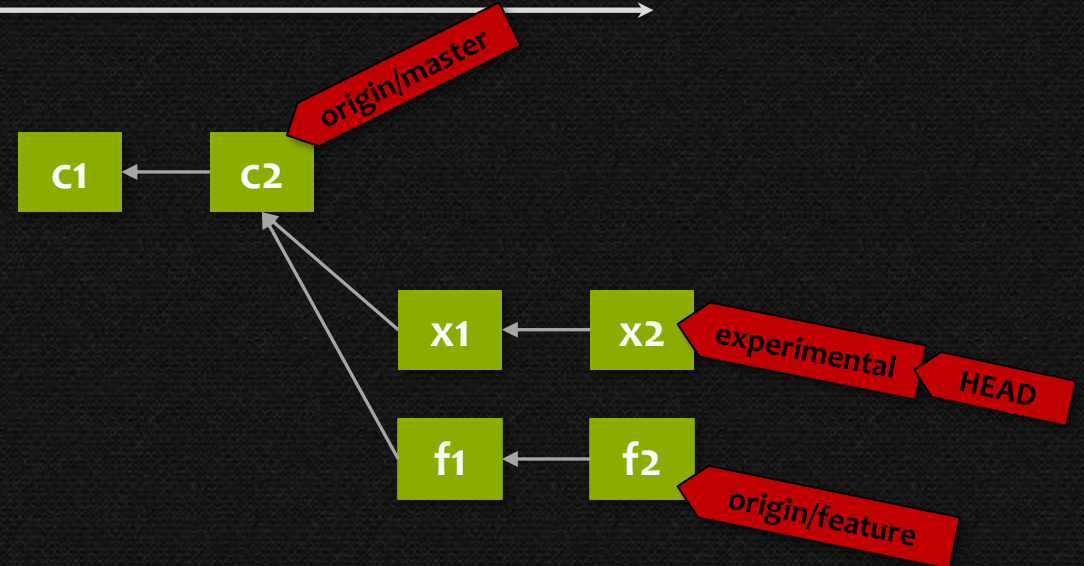
Create local branch with remote branch reference

`git clone http://...`



All branches from remote repository are Cloned into local repo after a git clone

`git branch experimental origin/master`



New experimental branch created from `origin/master`

Listing local and remote branches

- `git branch -r` can be used to list only remote branches

```
C:\RemoteHelloWorld>git branch -r
origin/feature
origin/master

C:\RemoteHelloWorld>git branch -r -vv
origin/feature 119aaed Added help file to use multiply function
origin/master 6ec5b63 Converted int to long to fix overflow

C:\RemoteHelloWorld>
```

- `git branch -a -vv` list all(-a) branches(both local and remote) with tracking information(-vv)

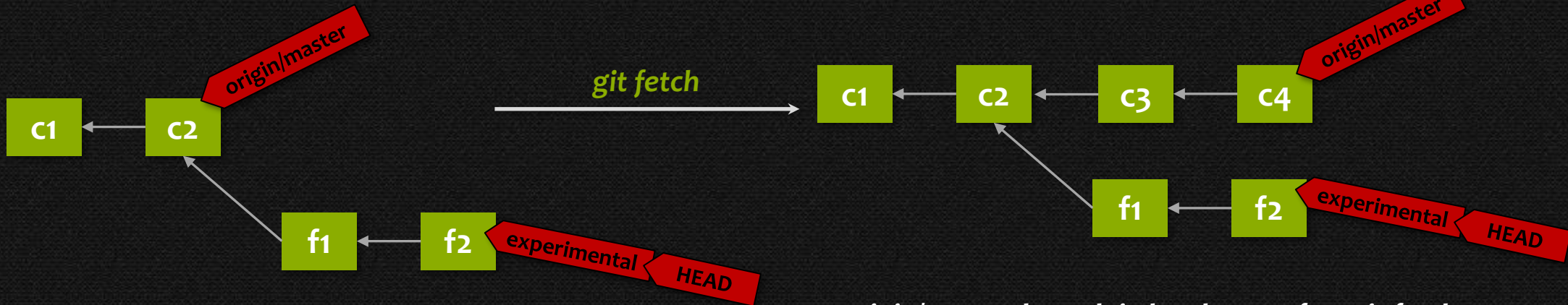
```
C:\RemoteHelloWorld>git checkout -b experimental origin/master
Branch experimental set up to track remote branch master from origin.
Switched to a new branch 'experimental'

C:\RemoteHelloWorld>git branch -a -vv
* experimental 95f2e83 [origin/master] Initial multiplication commit
master        95f2e83 [origin/master] Initial multiplication commit
remotes/origin/master 95f2e83 Initial multiplication commit

C:\RemoteHelloWorld>
```

Fetching

- `git fetch` gets and updates all the remote branches
- It will not update any local branches

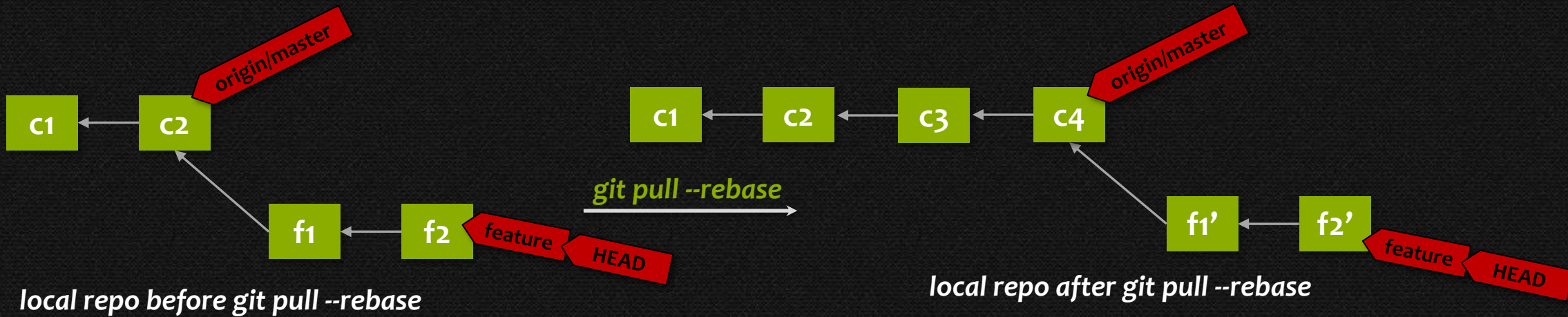


origin/master branch in local repo before git fetch

origin/master branch in local repo after git fetch

Pull

- `git pull --rebase` fetches and also rebases the current branch with the origin/master



`git pull --rebase = git fetch + git rebase(current branch)`

Recap

Clone Command	<code>git clone <url></code>	Clone a git repository
Branch Command	<code>git branch -r</code>	Show only remote branches
Push Command	<code>git push origin HEAD:<branch></code>	Push current branch as <branch> to origin
Fetch Command	<code>git fetch</code>	Update all locally cloned remote branches(aka origin/...) with any updates from origin
Pull Command	<code>git pull --rebase</code>	Update all locally cloned remote branches(aka origin/...) with any updates from origin and also rebases the current local branch

References

- <https://github.com/vineelkovvuri/gvpcoe-sessions-2024/blob/master/Git-Part3>
- <https://stackoverflow.com/>

Thank You

