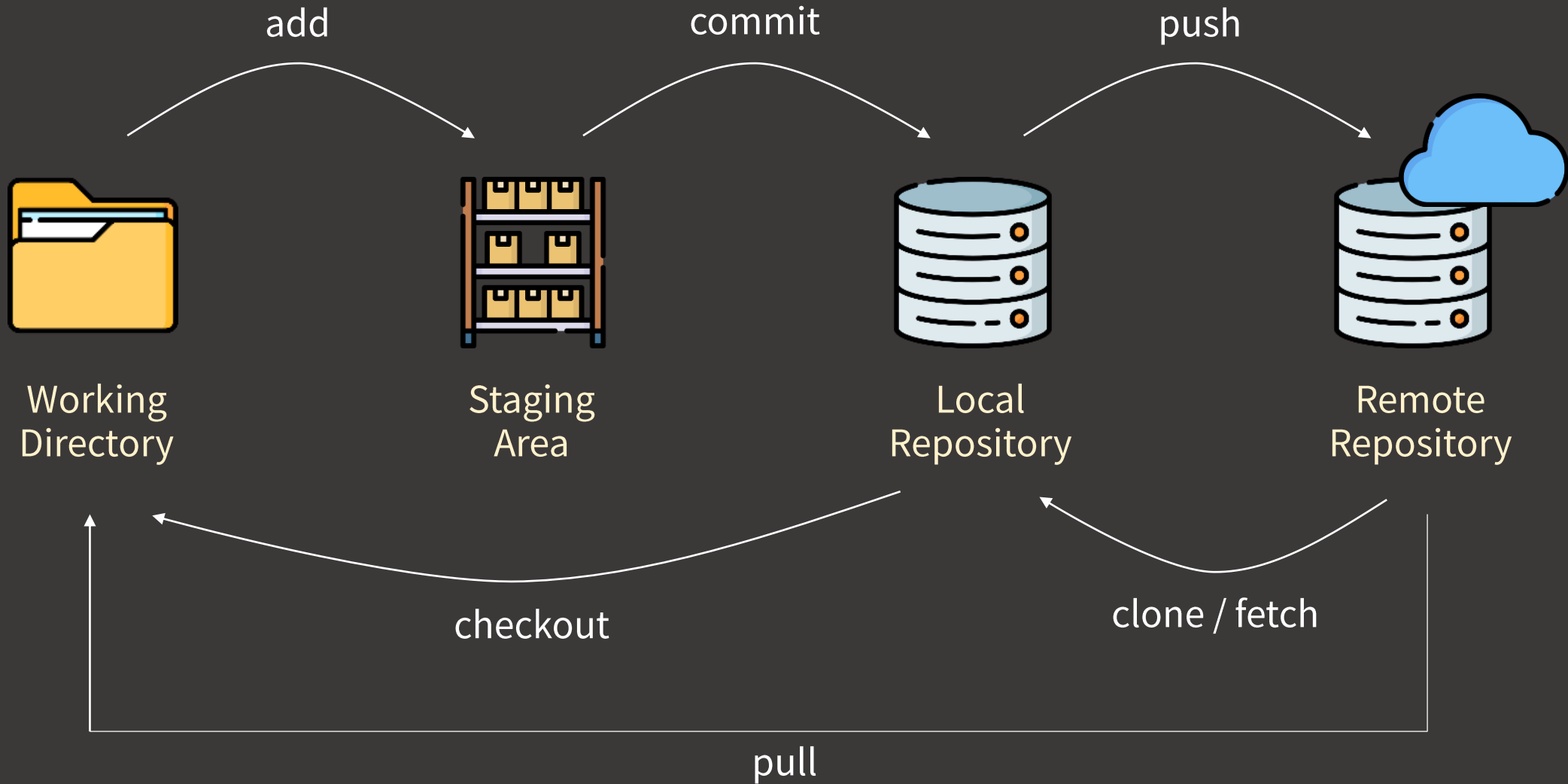


Introduction to Data Science

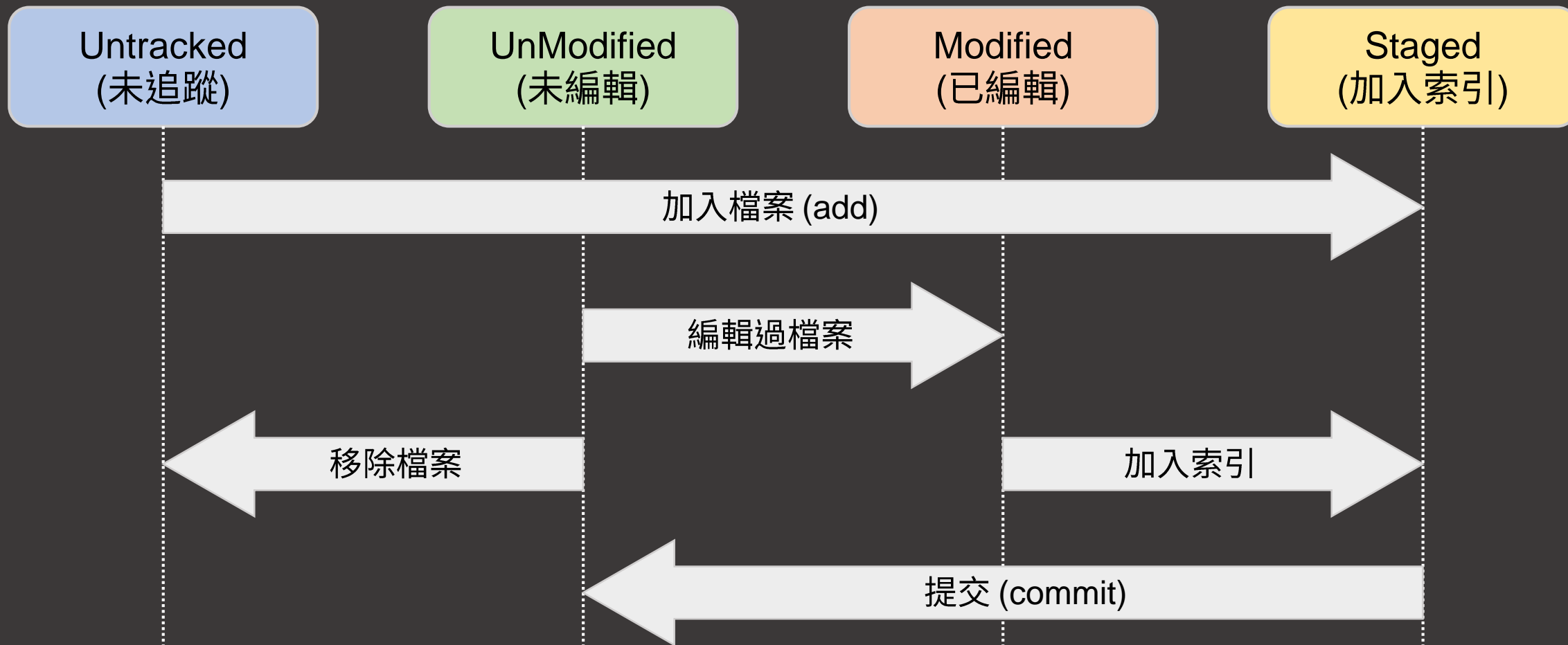
Git & GitHub

TA: 李佩徵

Git -- review



Git -- review



Git -- review

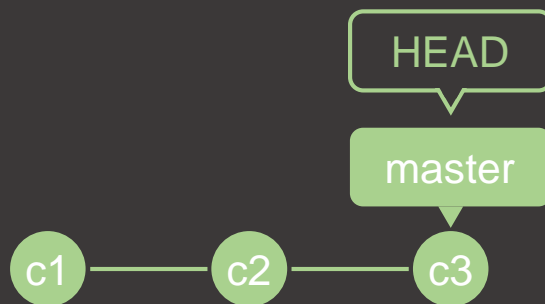
- Git 指令回顧

git init	建立本地端數據庫
git add <file>	單一檔案加入索引
git add .	所有檔案加入索引
git commit -m '<information>'	提交版本
git. status	觀看當前狀態
git log	瀏覽歷史紀錄
git remote add <數據庫簡稱> <url>	加入遠端數據庫
git remote	查看遠端數據庫列表
git remote -v	查看遠端數據庫列表 (包含url)
git push <數據庫簡稱> <分支名稱>	推送資料到遠端數據庫

Git -- HEAD

- 目前指向的版本狀態

1. 分支 (branch)
2. commit 版本



- 切換到不同 commit 版本

1. 執行 `git log` 查詢 commit 的 SHA-1 編號
2. 取前幾碼準備切換
3. 執行 `git checkout <SHA-1>`

ps. 若想回到最新 commit 的版本！

可直接執行 `git checkout master`

```
MINGW64/d/GitHub/TA
user@LAPTOP-S6CFJCTA MINGW64 /d/GitHub/TA (master)
$ git log
commit 0a432e56f86942527c854854a0671822837d8b44 (HEAD -> master, origin/master)
Author: patty5916 <patty101257@gmail.com>
Date: Sun Nov 14 03:07:57 2021 +0800
    add images of TA04_HTML.html

commit 4577e7c082590c4f5bbcac1882fbf4dc9108f6c2
Author: patty5916 <patty101257@gmail.com>
Date: Sat Nov 13 14:11:19 2021 +0800
    add content in test.txt and new TA04_HTML.html and TA04_CSS.css

commit b10d1a7385efad4c90d13db8015dcdcbf322e08b
Author: patty5916 <patty101257@gmail.com>
Date: Sat Nov 13 13:53:16 2021 +0800
    new

user@LAPTOP-S6CFJCTA MINGW64 /d/GitHub/TA (master)
$ git checkout b10d1a7385
Note: checking out 'b10d1a7385'.

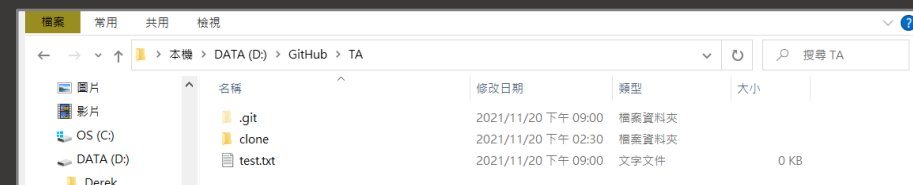
You are in 'detached HEAD' state. You can look around, make experimental
changes and commit them, and you can discard any commits you make in this
state without impacting any branches by performing another checkout.

If you want to create a new branch to retain commits you create, you may
do so (now or later) by using -b with the checkout command again. Example:

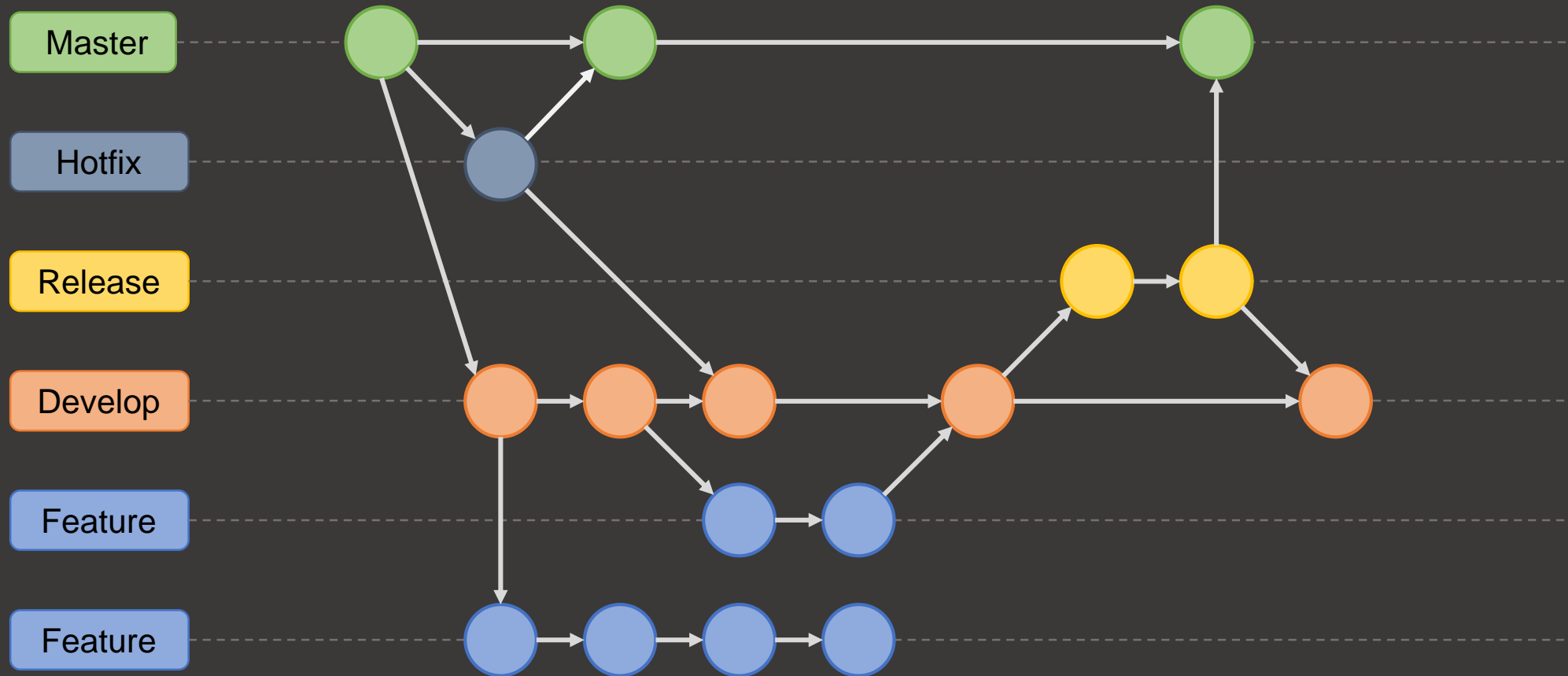
    git checkout -b <new-branch-name>

HEAD is now at b10d1a7 new

user@LAPTOP-S6CFJCTA MINGW64 /d/GitHub/TA ((b10d1a7...))
$
```



Git Flow



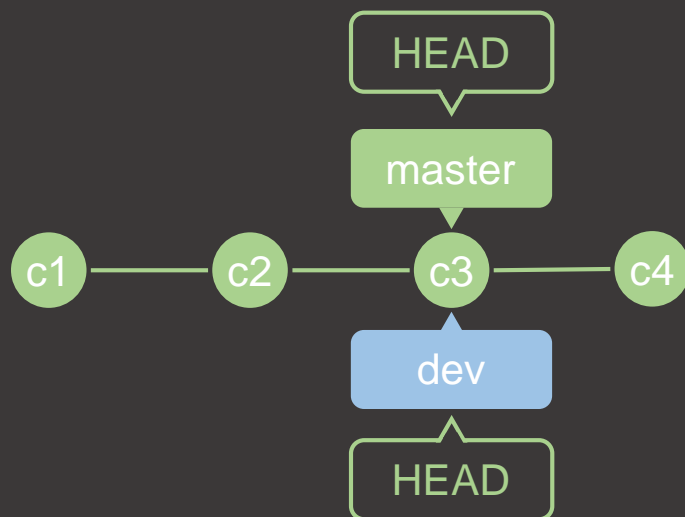
Git -- branch

- 分支的基本操作

1. 執行 `git branch <分支名稱>` 新增一個分支
2. 執行 `git checkout <分支名稱>` 切換到該分支

```
MINGW64/d/GitHub/TA
user@LAPTOP-S6CFJCTA MINGW64 /d/GitHub/TA (master)
$ git branch dev

user@LAPTOP-S6CFJCTA MINGW64 /d/GitHub/TA (master)
$ git checkout dev
Switched to branch 'dev'
```



```
MINGW64/d/GitHub/TA
user@LAPTOP-S6CFJCTA MINGW64 /d/GitHub/TA (dev)
$ git status
On branch dev
Changes not staged for commit:
  (use "git add <file>..." to update what will be committed)
  (use "git checkout -- <file>..." to discard changes in working directory)

        modified:   test.txt

Untracked files:
  (use "git add <file>..." to include in what will be committed)

        clone/

no changes added to commit (use "git add" and/or "git commit -a")

user@LAPTOP-S6CFJCTA MINGW64 /d/GitHub/TA (dev)
$ git add test.txt

user@LAPTOP-S6CFJCTA MINGW64 /d/GitHub/TA (dev)
$ git commit -m 'modify the content of test.txt'
[dev 3f3ec9b] modify the content of test.txt
1 file changed, 1 insertion(+), 1 deletion(-)

user@LAPTOP-S6CFJCTA MINGW64 /d/GitHub/TA (dev)
$ git log
commit 3f3ec9b6045ac08c93df6e2d82f5ceed48178290 (HEAD -> dev)
Author: patty5916 <patty101257@gmail.com>
Date:   Sun Nov 21 00:12:30 2021 +0800

    modify the content of test.txt

commit 0a432e56f86942527c854854a0671822837d8b44 (origin/master, master)
Author: patty5916 <patty101257@gmail.com>
Date:   Sun Nov 14 03:07:57 2021 +0800

    add images of TA04_HTML.html

commit 4577e7c082590c4f5bbcac1882fbf4dc9108f6c2
Author: patty5916 <patty101257@gmail.com>
Date:   Sat Nov 13 14:11:19 2021 +0800

    add content in test.txt and new TA04_HTML.html and TA04_CSS.css

commit b10d1a7385efad4c90d13db8015dcdcbf322e08b
Author: patty5916 <patty101257@gmail.com>
Date:   Sat Nov 13 13:53:16 2021 +0800

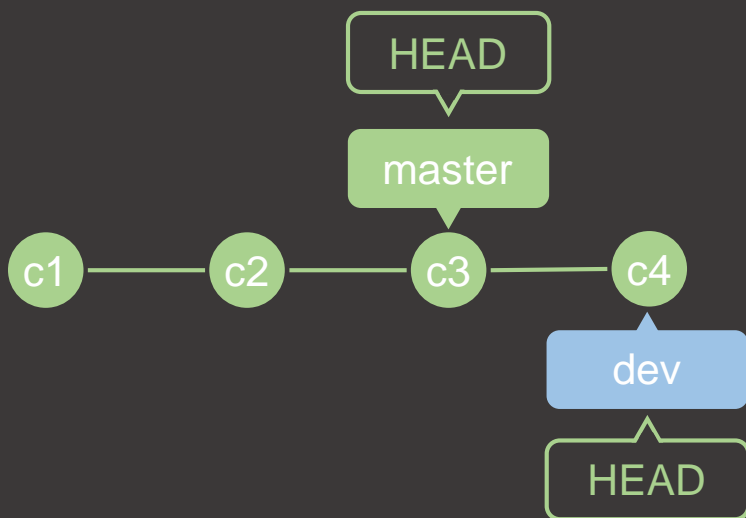
    new

user@LAPTOP-S6CFJCTA MINGW64 /d/GitHub/TA (dev)
$
```

Git -- merge

- 分支合併

1. 執行 `git checkout master` 回到master
2. 執行 `git merge <分支名稱>` 合併該分支



```
MINGW64:/d/GitHub/TA

user@LAPTOP-S6CFJCTA MINGW64 /d/GitHub/TA (dev)
$ git checkout master
Switched to branch 'master'

user@LAPTOP-S6CFJCTA MINGW64 /d/GitHub/TA (master)
$ git merge dev
Updating 0a432e5..3f3ec9b
Fast-forward
 test.txt | 2 +-
 1 file changed, 1 insertion(+), 1 deletion(-)

user@LAPTOP-S6CFJCTA MINGW64 /d/GitHub/TA (master)
$ git log
commit 3f3ec9b6045ac08c93df6e2d82f5ceed48178290 (HEAD -> master, dev)
Author: patty5916 <patty101257@gmail.com>
Date: Sun Nov 21 00:12:30 2021 +0800

    modify the content of test.txt

commit 0a432e56f86942527c854854a0671822837d8b44 (origin/master)
Author: patty5916 <patty101257@gmail.com>
Date: Sun Nov 14 03:07:57 2021 +0800

    add images of TA04_HTML.html

commit 4577e7c082590c4f5bbcac1882fbf4dc9108f6c2
Author: patty5916 <patty101257@gmail.com>
Date: Sat Nov 13 14:11:19 2021 +0800

    add content in test.txt and new TA04_HTML.html and TA04_CSS.css

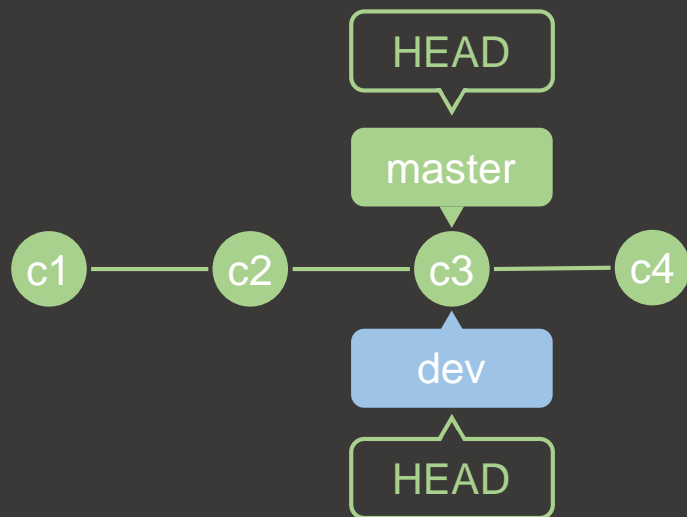
commit b10d1a7385efad4c90d13db8015dcdcbf322e08b
Author: patty5916 <patty101257@gmail.com>
Date: Sat Nov 13 13:53:16 2021 +0800

    new

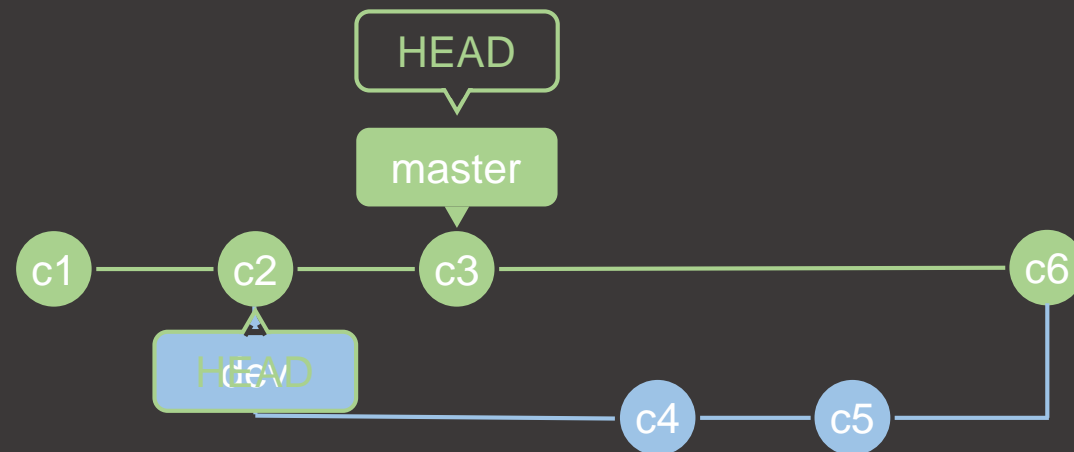
user@LAPTOP-S6CFJCTA MINGW64 /d/GitHub/TA (master)
$
```


Git -- merge

- 快轉模式



- 非快轉模式



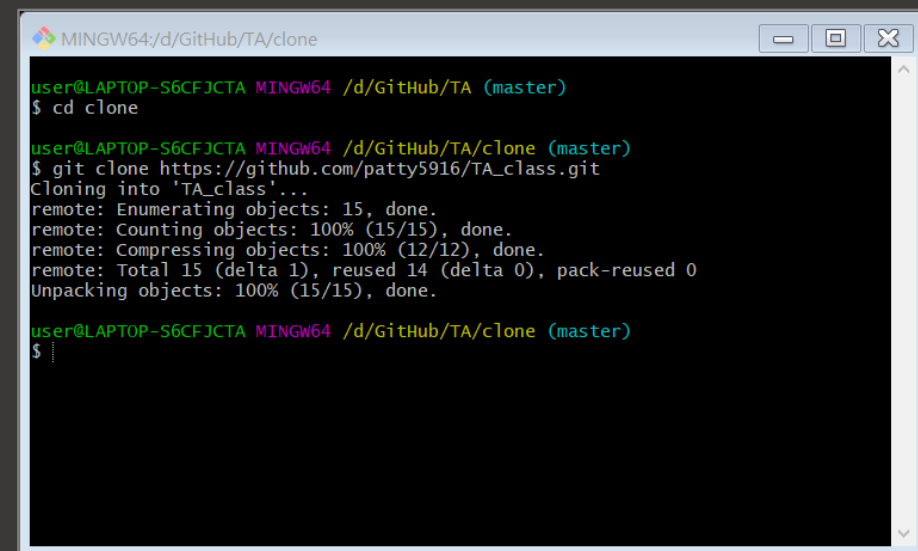
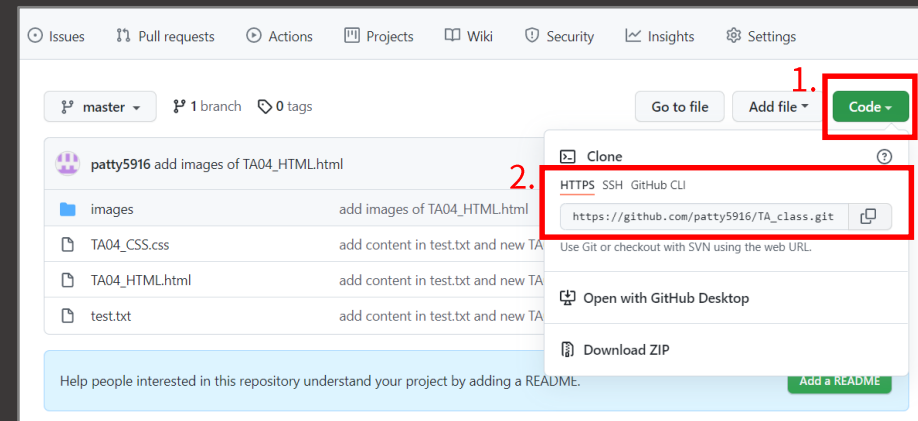
Git -- clone

- 使用時機

1. 本地端數據庫的資料不見
2. 想要開發其他開發者推送到 GitHub 上的作品

- 將遠端數據庫複製到本地端數據庫

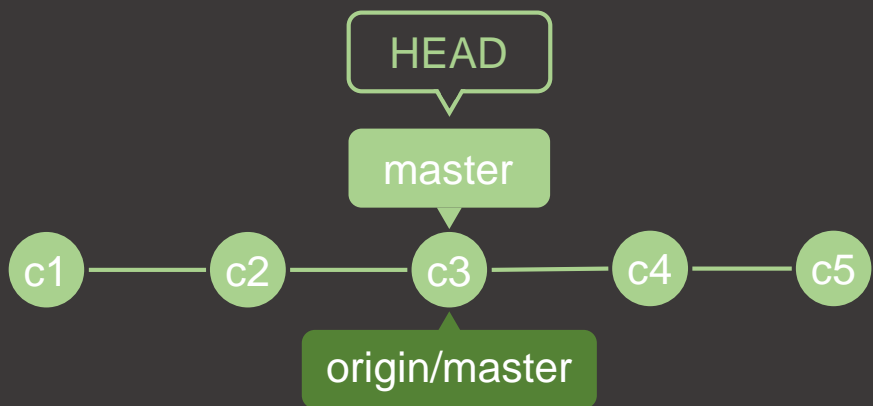
1. 複製網址 (使用https的方式)
2. `cd` 移動到想要存放的資料夾位置
3. 執行 `git clone <複製的網址>`



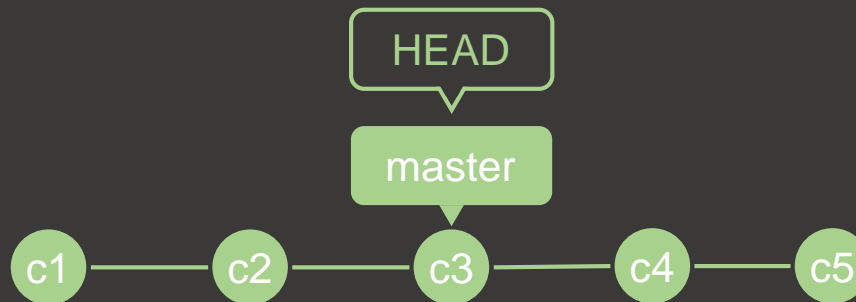
Git -- fetch

- 執行 `git fetch` 抓取遠端資料庫檔案

➤ Local Repository



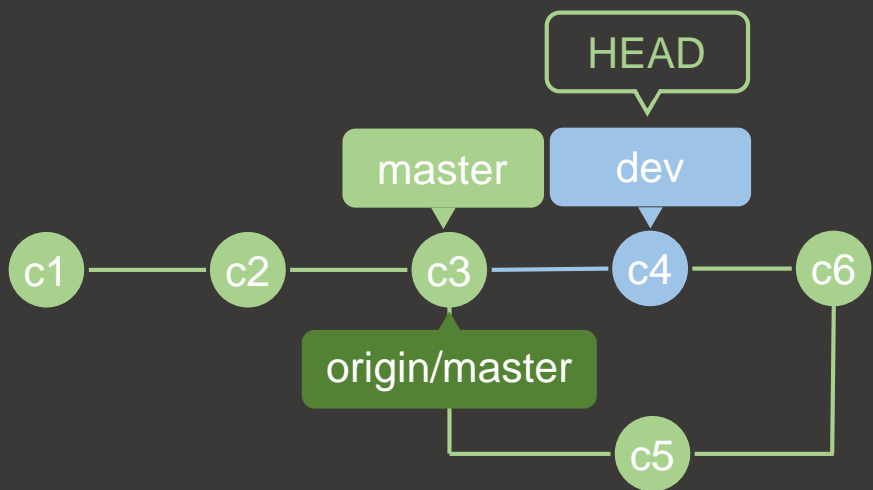
➤ Remote Repository (origin)



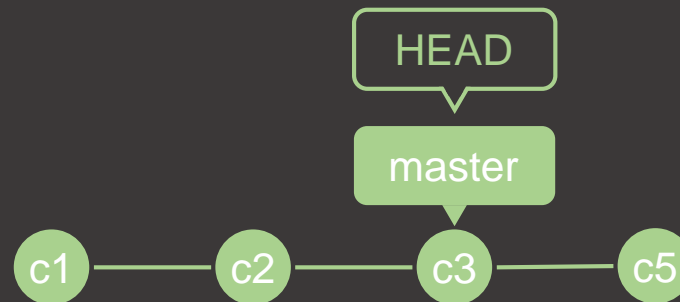
Git -- pull

- 執行 `git pull` 抓取遠端資料庫檔案並同步更新 (`git pull = git fetch + git merge`)

➤ Local Repository

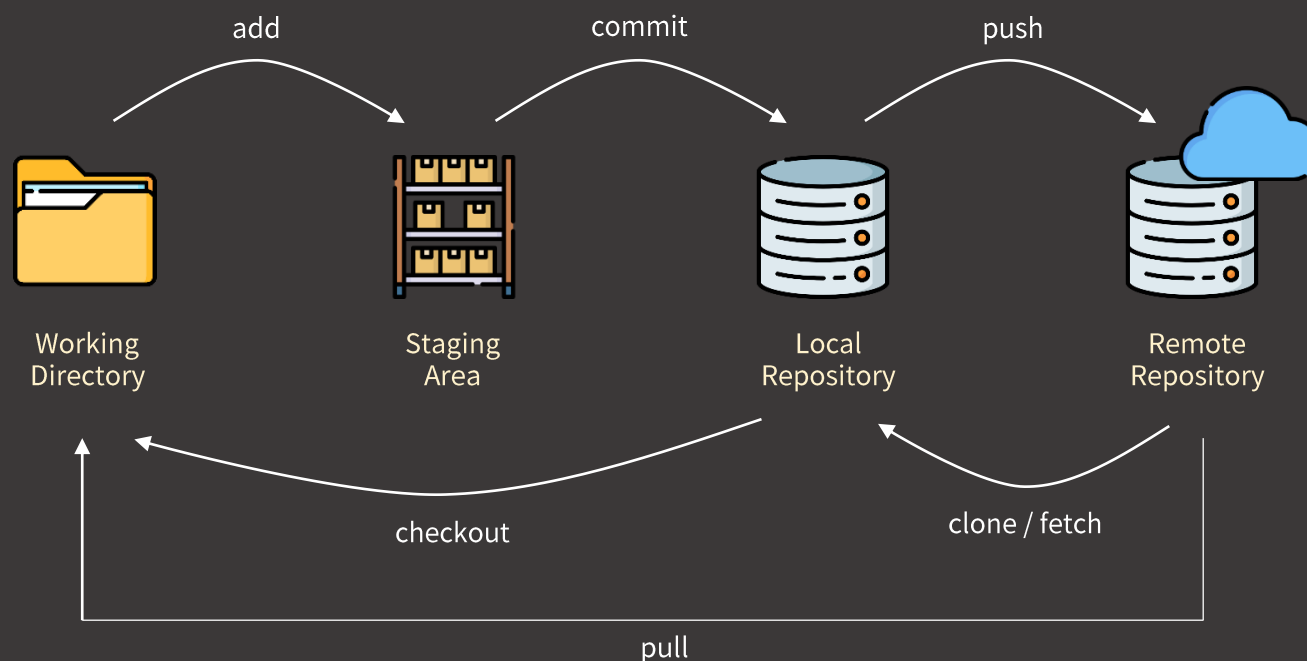


➤ Remote Repository (origin)



Git -- clone vs. fetch vs. pull

- clone: 第一次看到這個專案，想要下載到自己的電腦裡 (通常只會使用第一次)
- fetch: 抓取遠端資料庫檔案
- pull: 抓取遠端資料庫檔案並同步更新本地端資料庫
- <https://learngitbranching.js.org/>



Git -- clean & checkout & reset

- 檔案還沒加入追蹤，想清空工作目錄

- 顯示要被清除的檔案：`git clean -n`
- 強制清除檔案：`git clean -f`

- 檔案已加入追蹤，想還原工作目錄

- 單一檔案指令：`git checkout -- <file>`
- 全部檔案指令：`git checkout .`

- 檔案加入到索引，想退到工作目錄

- `git reset HEAD`

(搭配 ^ 或 ~ <數字>，代表往後退幾次)

- `git reset HEAD^^`
- `git reset HEAD~~`
- `git reset HEAD^2`
- `git reset HEAD~2`



End

Git 與 GitHub 是資料科學領域不可或缺的工具！！！！

第一次聽不太懂沒有關係，不要灰心，多接觸幾次就會了解囉！