

Computer Programming II Lab

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Outline

- 版本控制系統 - Git
 - 單人多裝置（單分支）
 - 單人多分支
 - 多人多分支
- Online Judge
- LeetCode

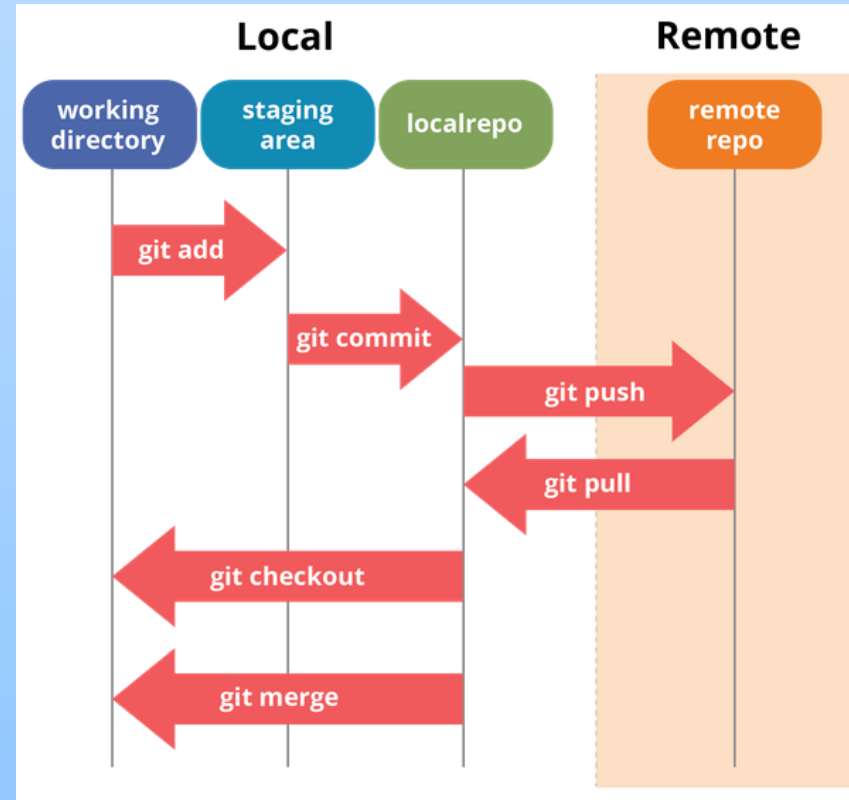
版本控制系統 - Git



Git

- Git 可以把檔案的狀態作為更新歷史記錄保存起來。因此可以把編輯過的檔案復原到以前的狀態，也可以顯示編輯過內容的差異。
- 當有人想將編輯過的舊檔案上傳到伺服器、覆蓋其他人的最新檔案時，系統會發出警告，因此可以避免在無意中覆蓋他人的編輯內容。

Git



基本操作

- 在自己的 GitHub 上面創建一個資料夾

Create a new repository

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

Owner * / Repository name *

chang861224 / 1102cp2 ✓

Great repository names are short, lowercase, and contain only numbers, lowercase letters, hyphens, and underscores. 1102cp2 is available. Need inspiration? How about [silver-rotary-phone?](#)

Description (optional)

☒ **Public**
Anyone on the internet can see this repository. You choose who can commit.

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

Initialize this repository with:
Skip this step if you're importing an existing repository.

☒ **Add a README file**
This is where you can write a long description for your project. [Learn more.](#)

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

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

This will set `main` as the default branch. Change the default name in your [settings](#).

基本操作

- 將 GitHub 上面的資料夾下載到自己的電腦 Local 端

```
git clone <repository_url>
```

```
(^o^) [cch] [~/Documents] $ git clone git@github.com:chang861224/1102cp2.git
Cloning into '1102cp2'...
remote: Enumerating objects: 3, done.
remote: Counting objects: 100% (3/3), done.
remote: Total 3 (delta 0), reused 0 (delta 0), pack-reused 0
Receiving objects: 100% (3/3), done.
(^o^) [cch] [~/Documents] $ ls -l
drwxrwxr-x  3 cch cch  4096 Feb 16 21:45 1102cp2
drwxrwxr-x  5 cch cch  4096 Feb 16 16:27 1102cp2_lab
(^o^) [cch] [~/Documents] $
```

單人多裝置（單分支）

情劇：當你會在不同裝置上（ex. 筆電、桌機公司電腦....etc）開發同一個專案

- 更新專案到最新版本
 - 如果 local 端沒有專案資料夾：把 GitHub 上的資料夾 clone 下來
 - 如果 local 端已有專案資料夾：更新到最新版本

```
git pull
```

- 編輯檔案（coding time....）
- 提交更新版本
- 上傳到 GitHub

單人多裝置 (單分支)

如果你沒有更新的話....

```
(^o^) [cch] [~/Downloads/1102cp2] $ vim doc.txt
(^o^) [cch] [~/Downloads/1102cp2] $ git add doc.txt
(^o^) [cch] [~/Downloads/1102cp2] $ git commit -m "Download folder modify"
[main 760bee6] Download folder modify
1 file changed, 1 insertion(+)
create mode 100644 doc.txt
(^o^) [cch] [~/Downloads/1102cp2] $ git push origin main
Enumerating objects: 4, done.
Counting objects: 100% (4/4), done.
Delta compression using up to 4 threads
Compressing objects: 100% (2/2), done.
Writing objects: 100% (3/3), 366 bytes | 122.00 KiB/s, done.
Total 3 (delta 0), reused 0 (delta 0), pack-reused 0
To https://github.com/chang861224/1102cp2.git
a858527..760bee6  main -> main
```

單人多裝置 (單分支)

上傳的時候就會噴錯誤訊息

```
(^o^) [cch] [~/Documents/1102cp2] $ vim doc1.txt
(^o^) [cch] [~/Documents/1102cp2] $ git add doc1.txt
(^o^) [cch] [~/Documents/1102cp2] $ git commit -m "Document folder modify"
[main f080779] Document folder modify
 1 file changed, 1 insertion(+)
 create mode 100644 doc1.txt
(^o^) [cch] [~/Documents/1102cp2] $ git push origin main
To https://github.com/chang861224/1102cp2.git
 ! [rejected]          main -> main (fetch first)
error: failed to push some refs to 'https://github.com/chang861224/1102cp2.git'
hint: Updates were rejected because the remote contains work that you do
hint: not have locally. This is usually caused by another repository pushing
hint: to the same ref. You may want to first integrate the remote changes
hint: (e.g., 'git pull ...') before pushing again.
hint: See the 'Note about fast-forwards' in 'git push --help' for details.
```

單人多分支

情境：當你在相同/不同裝置上開發同一個專案，且會出現多種差異版本

- 更新專案到最新版本
- 確認分支

```
git branch          # 查看所處分支
git branch <branch_name> # 新增分支
git checkout <branch_name> # 切換分支
git merge <branch_name> # 合併分支
```

- 編輯檔案 (coding time....)
- 提交更新版本
- 上傳到 GitHub

```
git push origin <branch_name>
```

單人多分支

```
Chi-Hung Chang@cch20-pc MINGW64 ~/Documents/1102cp2 (main)
$ git branch
* main
```

```
Chi-Hung Chang@cch20-pc MINGW64 ~/Documents/1102cp2 (main)
$ git branch new_branch
```

```
Chi-Hung Chang@cch20-pc MINGW64 ~/Documents/1102cp2 (main)
$ git branch
* main
  new_branch
```

```
Chi-Hung Chang@cch20-pc MINGW64 ~/Documents/1102cp2 (main)
$ git checkout new_branch
Switched to branch 'new_branch'
```

```
Chi-Hung Chang@cch20-pc MINGW64 ~/Documents/1102cp2 (new_branch)
$ git branch
  main
* new_branch
```

單人多分支

```
Chi-Hung Chang@cch20-pc MINGW64 ~/Documents/1102cp2 (new_branch)
$ vim new.txt
```

```
Chi-Hung Chang@cch20-pc MINGW64 ~/Documents/1102cp2 (new_branch)
$ git add new.txt
```

```
Chi-Hung Chang@cch20-pc MINGW64 ~/Documents/1102cp2 (new_branch)
$ git commit -m "add new"
[new_branch cd4c010] add new
1 file changed, 1 insertion(+)
create mode 100644 new.txt
```

```
Chi-Hung Chang@cch20-pc MINGW64 ~/Documents/1102cp2 (new_branch)
$ git push origin new_branch
Enumerating objects: 4, done.
Counting objects: 100% (4/4), done.
Delta compression using up to 4 threads
Compressing objects: 100% (2/2), done.
Writing objects: 100% (3/3), 313 bytes | 313.00 KiB/s, done.
Total 3 (delta 0), reused 0 (delta 0), pack-reused 0
remote:
remote: Create a pull request for 'new_branch' on GitHub by visiting:
remote:   https://github.com/chang861224/1102cp2/pull/new/new_branch
remote:
To https://github.com/chang861224/1102cp2.git
 * [new branch]      new_branch -> new_branch
```

單人多分支

The screenshot shows the GitHub interface for a repository named '1102cp2' by user 'chang861224'. The repository is private. The top navigation bar includes links for Pull requests, Issues, Marketplace, and Explore. The repository header shows 'Unwatch 1', 'Fork 0', and 'Star 0'. The main navigation bar includes links for Code, Issues, Pull requests (1), Actions, Projects, Security, Insights, and Settings. The repository content area shows a file tree with 'Initial commit' and 'add hellow world'. A modal for switching branches/tags is open, showing a search bar 'Find or create a branch...' and a list of branches: 'main' (selected, default) and 'new_branch'. The repository name '1102cp2' is displayed prominently. The right sidebar contains sections for 'About' (No description, website, or topics provided), 'Releases' (No releases published, Create a new release), and 'Packages'.

Search or jump to... / Pull requests Issues Marketplace Explore

chang861224 / 1102cp2 Private

Unwatch 1 Fork 0 Star 0

<> Code Issues Pull requests 1 Actions Projects Security Insights Settings

main 2 branches 0 tags

Go to file Add file Code

Switch branches/tags

Find or create a branch...

Branches Tags

✓ main default

new_branch

View all branches

cc1632b 20 days ago 2 commits

Initial commit 20 days ago

add hellow world 20 days ago

1102cp2

https://github.com/chang861224/1102cp2/tree/new_branch

About

No description, website, or topics provided.

Readme

0 stars

1 watching

0 forks

Releases

No releases published

Create a new release

Packages

多人多分支

情境：當有多個人在相同/不同裝置上開發同一個專案 \Rightarrow 會出現多種版本差異

- 將 GitHub 上的專案 fork 到自己的資料夾下
- 更新專案到最新版本
 - 如果 local 端沒有專案資料夾：把 GitHub 上的資料夾 clone 下來
 - 如果 local 端已有專案資料夾：**更新到最新版本**

```
git pull <remote_name>
```

- 確認遠端

```
git remote          # 顯示你的遠端名稱  
git remote -v       # 顯示你的遠端名稱及所用的網址  
git remote add <remote_name> <URL>      # 新增遠端版本庫
```

多人多分支

情境：當有多個人在相同/不同裝置上開發同一個專案 \Rightarrow 會出現多種版本差異

- 確認分支

```
git branch          # 查看所處分支
git branch <branch_name>      # 新增分支
git checkout <branch_name>    # 切換分支
git merge <branch_name>       # 合併分支
```

- 編輯專案 (coding time....)
- 提交更新版本
- 上傳到 GitHub

```
git push <remote_name> <branch_name>
```

- 在 GitHub 上面發 PR (Pull Request) 給原始資料夾擁有者

多人多分支

fork 在右上角的右邊第二個

The screenshot shows a GitHub repository page for 'chang861224/information_visualization'. The repository is public and was forked from 'gokudera17/information_visualization'. The page includes a navigation bar with links to Pull requests, Issues, Marketplace, and Explore. Below the repository name, there are buttons for Pin, Watch (0), Fork (4), and Star (0). The main content area shows the 'main' branch selected, with 1 branch and 0 tags. A message indicates the branch is up to date with the upstream. Below this, a table lists the commit history, showing a commit by 'Graham' on 16 Jun 2021 with 88 commits. The table lists files: css, data, html, js, and pic, each with a commit message and a timestamp of 9 months ago. On the right side, the 'About' section states 'No description, website, or topics provided.' and the 'Releases' section states 'No releases published' with a link to 'Create a new release'.

Search or jump to... Pull requests Issues Marketplace Explore

chang861224 / information_visualization Public

forked from gokudera17/information_visualization

<> Code Pull requests Actions Projects Wiki Security Insights Settings

main 1 branch 0 tags

Go to file Add file Code

About

No description, website, or topics provided.

Readme

0 stars

0 watching

4 forks

Releases

No releases published

Create a new release

Graham commit		0216121 on 16 Jun 2021	88 commits
css	feat: Add network graph to index.html	9 months ago	
data	feat: Add network graph to index.html	9 months ago	
html	commit	9 months ago	
js	commit	9 months ago	
pic	add main page	9 months ago	

多人多分支

確認遠端

```
(^o^) [cch] [~/Documents/CPLab] $ git remote -v
origin  https://github.com/josix/CPLab.git (fetch)
origin  https://github.com/josix/CPLab.git (push)
(^o^) [cch] [~/Documents/CPLab] $ git remote add upstream https://github.com/chang861224/CPLab.git
(^o^) [cch] [~/Documents/CPLab] $ git remote -v
origin  https://github.com/josix/CPLab.git (fetch)
origin  https://github.com/josix/CPLab.git (push)
upstream      https://github.com/chang861224/CPLab.git (fetch)
upstream      https://github.com/chang861224/CPLab.git (push)
(^o^) [cch] [~/Documents/CPLab] $
```

多人多分支

發 PR 向原資料夾作者要求合併

The screenshot shows the GitHub interface for a repository named '1102cp2' by user 'chang861224'. The repository is marked as 'Private'. The top navigation bar includes links for 'Pull requests', 'Issues', 'Marketplace', and 'Explore'. Below the repository name, there are buttons for 'Unwatch', 'Fork', and 'Star'. The main navigation bar includes 'Code', 'Issues', 'Pull requests', 'Actions', 'Projects', 'Security', 'Insights', and 'Settings'. A yellow banner indicates that 'new_branch' had recent pushes 2 minutes ago, with a 'Compare & pull request' button. Below this, there are buttons for 'main', '2 branches', and '0 tags', along with 'Go to file', 'Add file', and 'Code' buttons. The commit history shows two commits: 'Initial commit' for 'README.md' and 'add hellow world' for 'test.c', both 20 days ago. The 'README.md' file content is displayed below, showing the repository name '1102cp2'. On the right side, the 'About' section states 'No description, website, or topics provided.' and lists '0 stars', '1 watching', and '0 forks'. The 'Releases' section states 'No releases published' and provides a link to 'Create a new release'. The 'Packages' section is also visible at the bottom.

Search or jump to... Pull requests Issues Marketplace Explore

chang861224 / 1102cp2 Private

Unwatch 1 Fork 0 Star 0

<> Code Issues Pull requests Actions Projects Security Insights Settings

new_branch had recent pushes 2 minutes ago Compare & pull request

main 2 branches 0 tags Go to file Add file Code

chang861224 add hellow world cc1632b 20 days ago 2 commits

README.md	Initial commit	20 days ago
test.c	add hellow world	20 days ago

README.md

1102cp2

About

No description, website, or topics provided.

Readme

0 stars

1 watching

0 forks

Releases

No releases published

Create a new release

Packages

Bonus Time

這些動作要在今天 23:59 前完成，才會有 bonus 喔！

1. 在 GitHub 上面找到 **chang861224/1102CP2_Lab0317** 這個資料夾
2. 將這個資料夾 fork 到你自己的 GitHub 上
3. 將你 fork 來的這個資料夾 clone 到你的電腦 local 端
4. 創建一個 branch，名稱是「**NCCU_<你的學號>**」
5. 在這個 branch 裡面新增一個檔案，檔名是「**Lab0317_<你的學號>.txt**」，檔案內容則是找一首歌，把歌名和歌詞貼過來
6. 在 commit 打「**<你的學號>: <歌名>**」
7. 將更新後的這個分支 push 到你自己的 GitHub 上，然後發一個 PR 給我

註：要在「**你新增的 branch 上傳然後發 PR**」，而不是直接在你的 main 分支上傳！

Reference

- 遠端多人合作開發－單分支
- 連猴子都能懂的Git入門指南
- 30 天精通 Git 版本控管
- Git Tutorial

Online Judge

大家來搬積木

- move a onto b

在將 a 搬到 b 上之前，先將 a 和 b 上的積木放回原來的位置（例如：1 就放回 1 的最開始位置）

- move a over b

在將 a 搬到 b 所在的那堆積木之上之前，先將 a 上的積木放回原來的位置（b 所在的那堆積木不動）

- pile a onto b

將 a 本身和其上的積木一起放到 b 上，在搬之前 b 上方的積木放回原位

- pile a over b

將 a 本身和其上的積木一起搬到到 b 所在的那堆積木之上

- quit

動作結束

LeetCode

<https://leetcode.com/problems/add-two-numbers>

Any Question?