



Introduction to Linux Systems

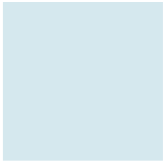
Version Control System: Git

Lab2: Create your Git account and first project

Chia-Heng Tu

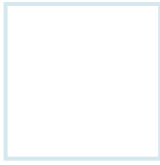
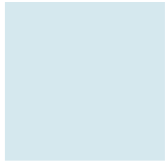
Dept. of Computer Science and Information
Engineering

National Cheng Kung University
Fall 2022



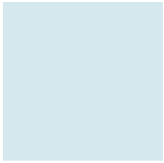
Lab

- Register the GitHub account
- Fork a repository and clone it to the local
- Practice the GitHub flow



Install git on Linux

```
$ sudo apt install git
```



Register an account on GitHub [\(https://github.com/\)](https://github.com/)



Why GitHub? ▾ Enterprise Explore ▾ Marketplace Pricing ▾

Search GitHub



Sign in

Sign up

Built for developers

GitHub is a development platform inspired by the way you work. From **open source** to **business**, you can host and review code, manage projects, and build software alongside 40 million developers.

Username



Email



Password

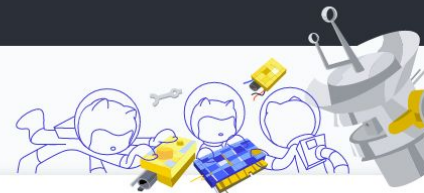
including a number and a lowercase letter. [Learn more.](#)

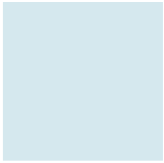
Sign up for GitHub

By clicking "Sign up for GitHub", you agree to our [Terms of Service](#) and [Privacy Statement](#). We'll occasionally send you account related emails.

We suggest **NOT** using your student ID as the username

Get started with





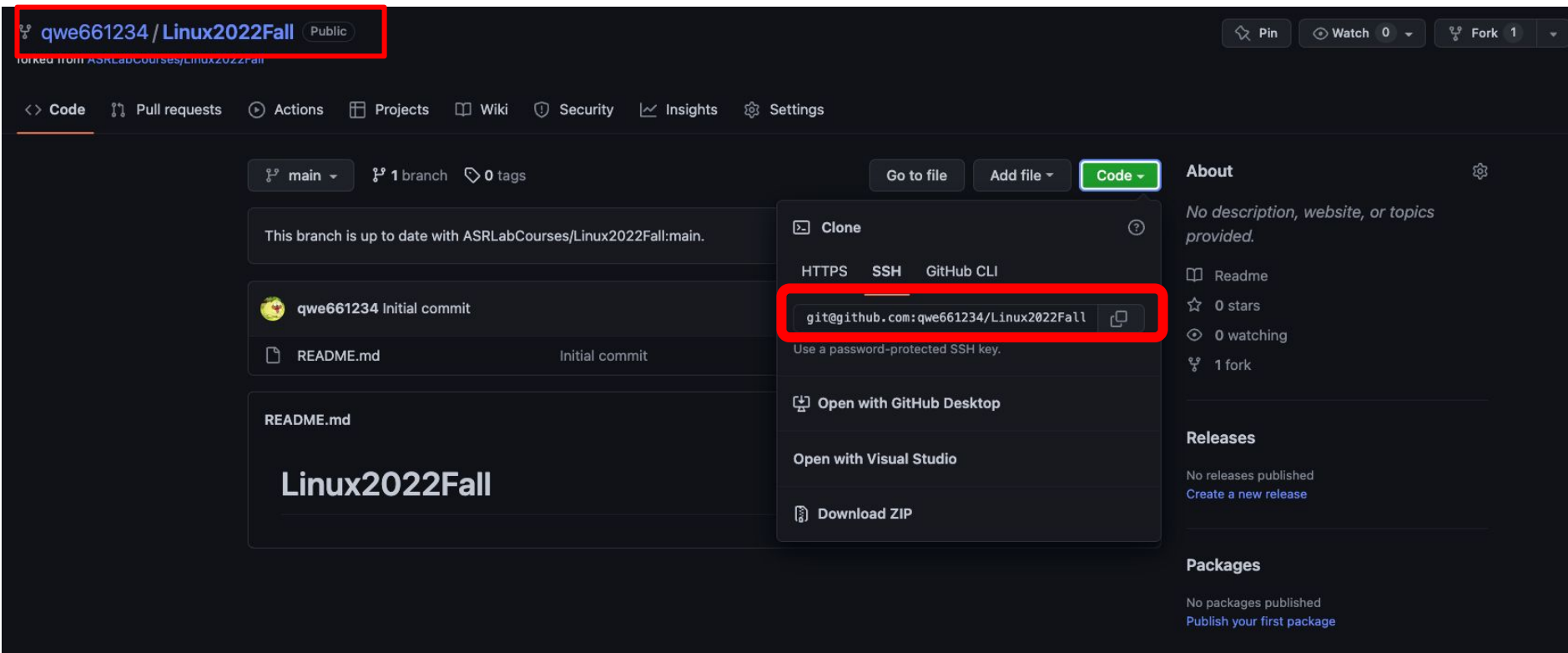
Fork a repository from “<https://github.com/ASRLabCourses/Linux2022Fall>”

The screenshot shows the GitHub repository page for `ASRLabCourses/Linux2022Fall`. The repository is public and has 1 fork. The `Fork` button is highlighted with a red box. The repository has 1 branch (`main`) and 0 tags. The commit history shows an initial commit by `qwe661234` 7 hours ago. The README file is also shown, with the title `Linux2022Fall`. The right sidebar shows the repository's statistics: 0 stars, 1 watching, and 1 fork. The `Releases` and `Packages` sections are also visible.



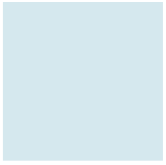
Copy the URL of forked repo

fork 後的 repo 會是 username / Linux2022Fall



The screenshot shows a GitHub repository page for 'qwe661234 / Linux2022Fall'. The repository is a fork of 'ASRLabCourses/Linux2022Fall'. The 'Code' button is highlighted in green. A dropdown menu is open, showing the 'Clone' option with the HTTPS URL 'git@github.com:qwe661234/Linux2022Fall' highlighted in red. The repository has 0 stars, 0 watching, and 1 fork. The README file is visible, titled 'Linux2022Fall'.

注意！是要複製剛剛 fork 的 repo., 而非 <https://github.com/ASRLabCourses/Linux2022Fall.git>



Clone forked repo to the local

```
$ git clone https://github.com/<Your username>/Linux2022Fall.git
```

```
$ cd Linux2022Fall/
```



Configure personal information

```
$ git config --global user.name "your_github_username"  
$ git config --global user.email "your_github_email"  
$ git config -l
```

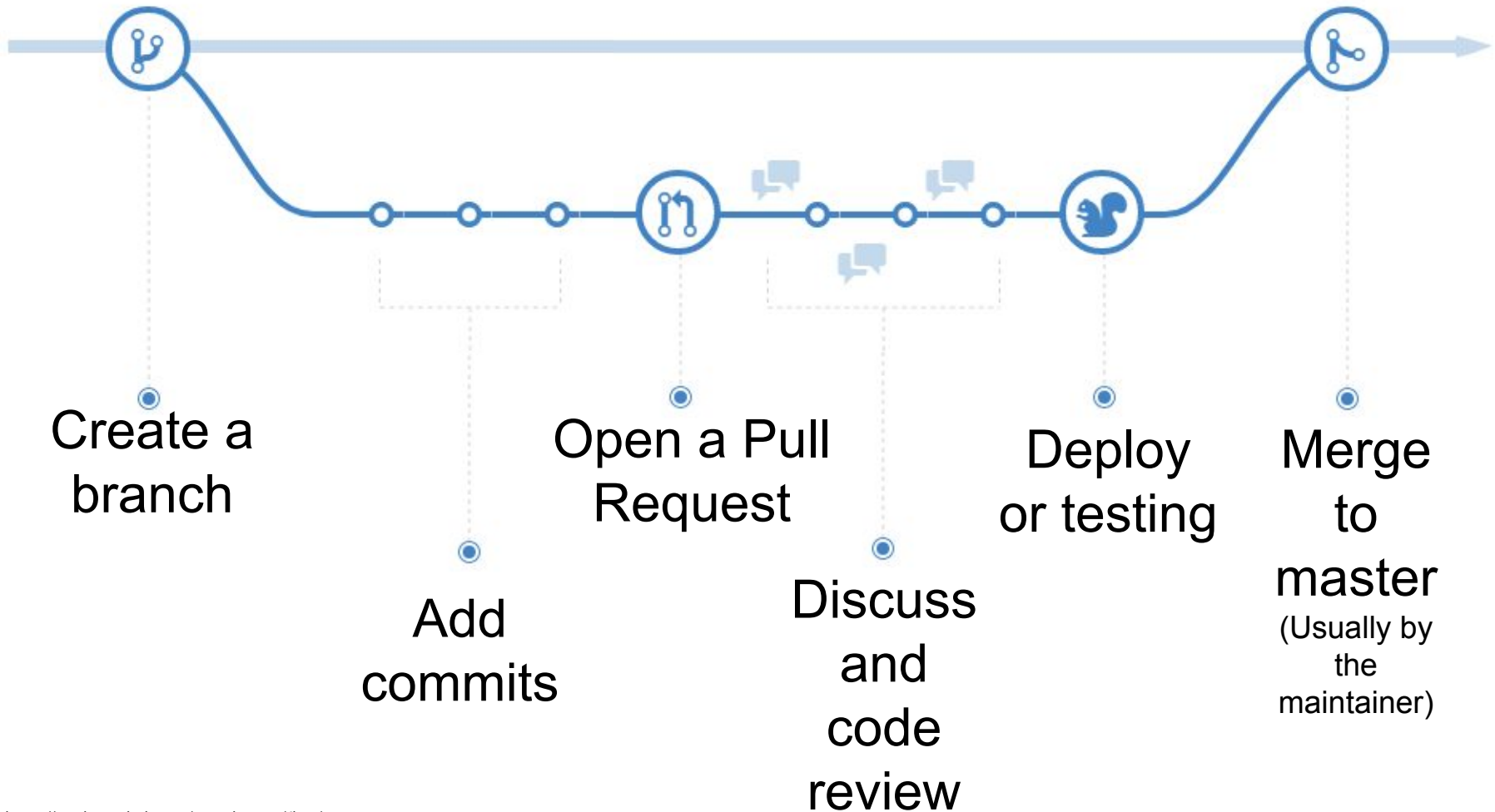
git config -l command 預期輸出

user.email=your_github_email

user.name=your_github_username



GitHub Flow

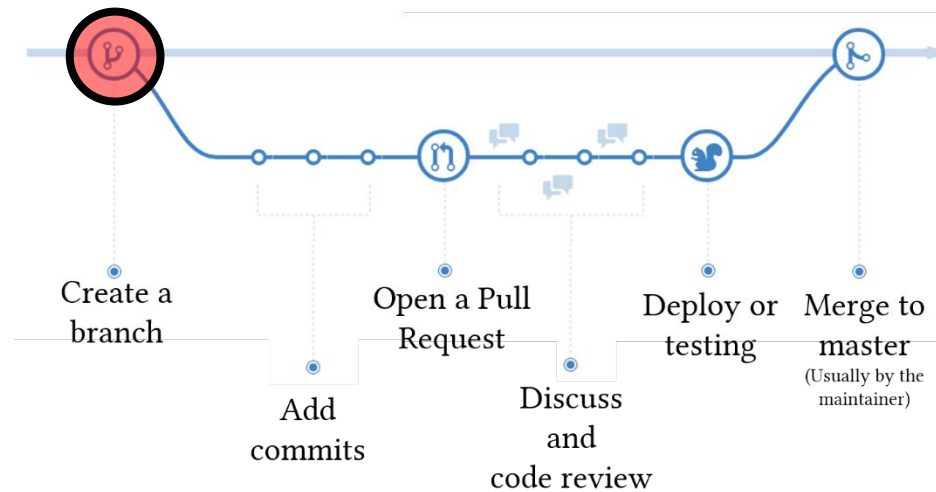


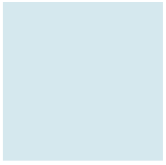


Create a new branch

\$ git checkout -b lab-2-git

可用 \$ git branch 檢查有沒有成功
創建新的 branch





Create a new file with content

```
$ mkdir -p f12345678/lab_2_git
```

```
$ cd f12345678/lab_2_git
```

```
$ echo "first text" > first.txt
```

Change f12345678 to
your student ID



Track the modification

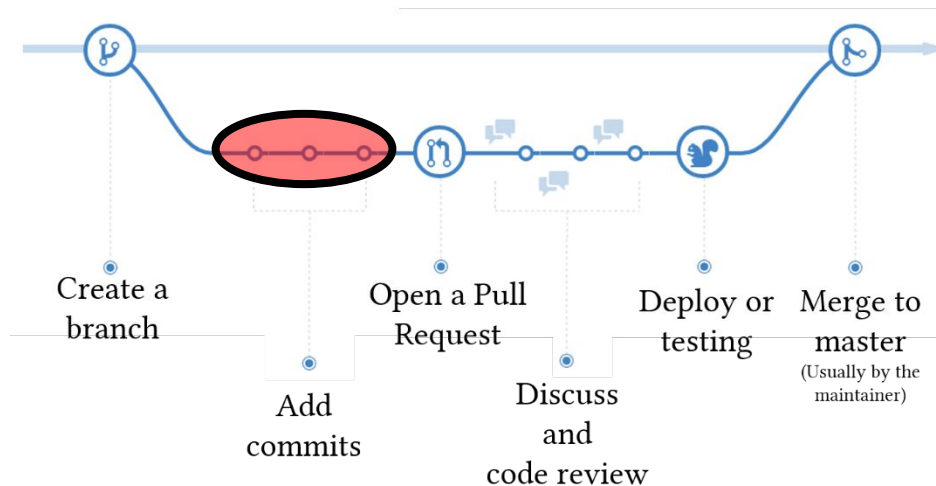
```
$ git add first.txt
```

```
$ git status
```

```
$ git commit -m "Add F12345678"
```

Check new file tracked

Set the **name** and **email** of the user first by git config before commit command.





Authentication

1. Personal Access Token
2. SSH Key
 - Generate ssh key
 - Add ssh key to Github

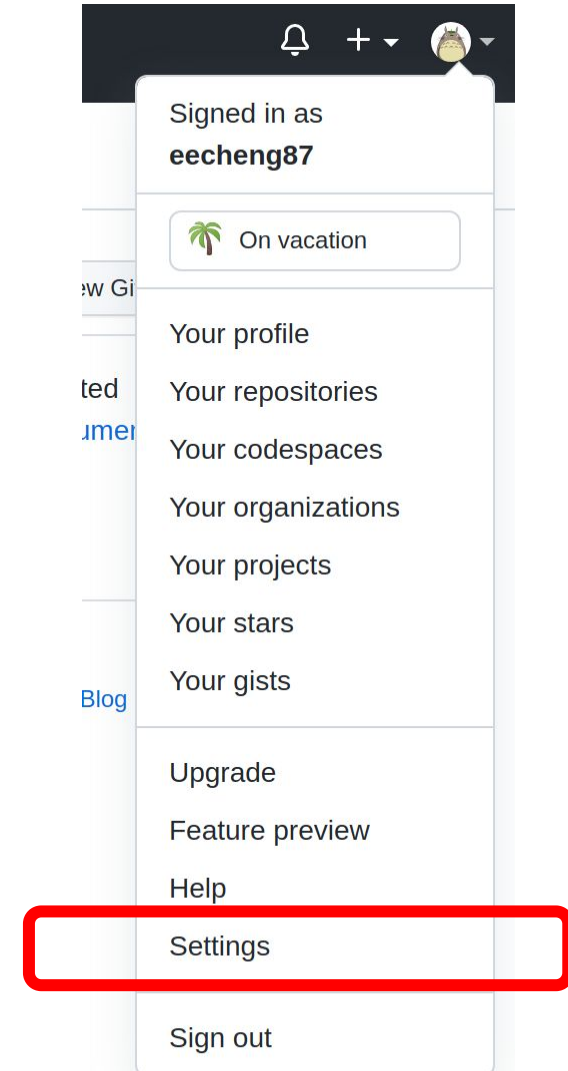


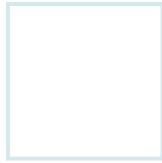
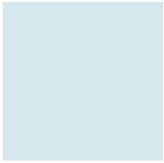
Personal access token

Settings -> Developer Settings

-> Personal Access Token

-> Generate new token





Personal access token (cont.)

New personal access token

Personal access tokens function like ordinary OAuth access tokens. They can be used instead of a password for Git over HTTPS, or can be used to [authenticate to the API over Basic Authentication](#).

Note

What's this token for?

Expiration *

30 days

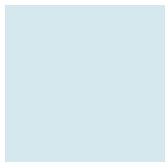


The token will expire on Mon, Oct 25 2021

Select scopes

Scopes define the access for personal tokens. [Read more about OAuth scopes](#).

- | | |
|---|--|
| <input checked="" type="checkbox"/> repo | Full control of private repositories |
| <input type="checkbox"/> repo:status | Access commit status |
| <input type="checkbox"/> repo_deployment | Access deployment status |
| <input type="checkbox"/> public_repo | Access public repositories |
| <input type="checkbox"/> repo:invite | Access repository invitations |
| <input type="checkbox"/> security_events | Read and write security events |
| <input type="checkbox"/> workflow | Update GitHub Action workflows |
| <input type="checkbox"/> write:packages | Upload packages to GitHub Package Registry |
| <input type="checkbox"/> read:packages | Download packages from GitHub Package Registry |



Personal access token (cont.)

<input type="checkbox"/> read:user	Read ALL user profile data
<input type="checkbox"/> user:email	Access user email addresses (read-only)
<input type="checkbox"/> user:follow	Follow and unfollow users
<input type="checkbox"/> delete_repo	Delete repositories
<input type="checkbox"/> write:discussion	Read and write team discussions
<input type="checkbox"/> read:discussion	Read team discussions
<input type="checkbox"/> admin:enterprise	Full control of enterprises
<input type="checkbox"/> manage_billing:enterprise	Read and write enterprise billing data
<input type="checkbox"/> read:enterprise	Read enterprise profile data
<input type="checkbox"/> admin:gpg_key	Full control of public user GPG keys (Developer Preview)
<input type="checkbox"/> write:gpg_key	Write public user GPG keys
<input type="checkbox"/> read:gpg_key	Read public user GPG keys

Generate token

Cancel

接著畫面會跳轉，會出現類似一串

ghp_sFhFsSHhTzMDreGRLjmks4Tzuzgthdvfsrta

的 token，記得保存好，因為它只會出現一次



Push the branch to GitHub (Personal Access Token)

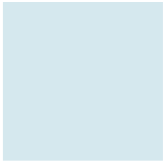
\$ git push origin lab-2-git

remote

branch

分別輸入你的帳號和剛得到的 token

```
qwe661234@qwe661234-linux-2022:~/Linux2022Fall/f12345678/lab_2_git$ git push origin lab-2-git
[Username for 'https://github.com': qwe661234
[Password for 'https://qwe661234@github.com':
Enumerating objects: 6, done.
Counting objects: 100% (6/6), done.
Delta compression using up to 64 threads
Compressing objects: 100% (2/2), done.
Writing objects: 100% (5/5), 380 bytes | 380.00 KiB/s, done.
Total 5 (delta 0), reused 0 (delta 0)
remote:
remote: Create a pull request for 'lab-2-git' on GitHub by visiting:
remote:   https://github.com/qwe661234/Linux2022Fall/pull/new/lab-2-git
remote:
To https://github.com/qwe661234/Linux2022Fall.git
 * [new branch]      lab-2-git -> lab-2-git
```



SSH Key - Generate ssh key

```
$ ssh-keygen
```

```
$ cat ~/.ssh/id_rsa.pub
```

預期會得到 ssh-rsa XXXXXXXX (一串token), 接著請複製這串 token (ssh-rsa XXXXXXXX)



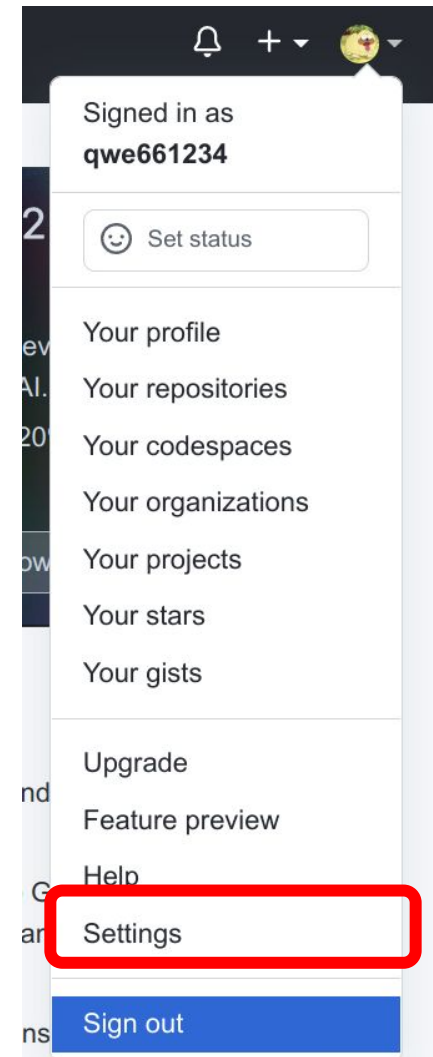
SSH Key - Add ssh key to Github

Settings -> SSH and GPG keys
-> New SSH key

SSH keys

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

New SSH key





SSH Key - Add ssh key to Github

SSH keys / Add new

Title

自定義 ssh key 的 title

Key type

Authentication Key ▾

貼上剛剛複製的那串 ssh token

Key

Begins with 'ssh-rsa', 'ecdsa-sha2-nistp256', 'ecdsa-sha2-nistp384', 'ecdsa-sha2-nistp521', 'ssh-ed25519', 'sk-ecdsa-sha2-nistp256@openssh.com', or 'sk-ssh-ed25519@openssh.com'

Add SSH key

新增成功後 SSH keys 會新增剛剛輸入的 Title 的 Authentication Keys

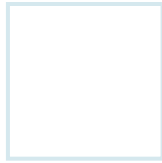
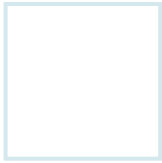
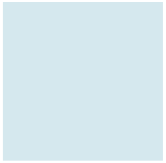


SSH Key - clone repo.

如果選擇使用 ssh key, clone repo. 要選擇 ssh 而非 http

```
$ git clone git@github.com:<Your username>/Linux2022Fall.git
```

The screenshot shows a GitHub repository page for 'qwe661234 / Linux2022Fall'. The repository is public and forked from 'ASRLabCourses/Linux2022Fall'. The main branch is 'main'. The repository contains a single commit by 'qwe661234' with the message 'Initial commit'. The commit includes a file named 'README.md'. The repository name 'Linux2022Fall' is displayed prominently. On the right side, there is a 'Code' dropdown menu that is open, showing options for cloning the repository: 'Clone', 'Open with GitHub Desktop', 'Open with Visual Studio', and 'Download ZIP'. The 'Clone' option is selected, and the 'SSH' tab is active, displaying the SSH URL 'git@github.com:qwe661234/Linux2022Fall' which is highlighted with a red box. The right sidebar shows the repository's statistics: 0 stars, 0 watching, and 1 fork. There are also sections for 'About', 'Releases', and 'Packages'.



Push the branch to GitHub (SSH Key)

```
$ git push origin lab-2-git
```

remote

branch

```
[qwe661234@qwe661234-linux-2022:~/Linux2022Fall/f12345678]$ git push origin lab-2-git
```

```
Enumerating objects: 5, done.
```

```
[Counting objects: 100% (5/5), done.
```

```
Delta compression using up to 64 threads
```

```
Compressing objects: 100% (2/2), done.
```

```
Writing objects: 100% (4/4), 333 bytes | 333.00 KiB/s, done.
```

```
Total 4 (delta 0), reused 0 (delta 0)
```

```
remote:
```

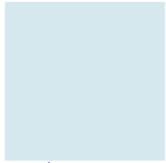
```
remote: Create a pull request for 'lab-2-git' on GitHub by visiting:
```

```
remote:      https://github.com/qwe661234/Linux2022Fall/pull/new/lab-2-git
```

```
remote:
```

```
To github.com:qwe661234/Linux2022Fall.git
```

```
* [new branch]      lab-2-git -> lab-2-git
```

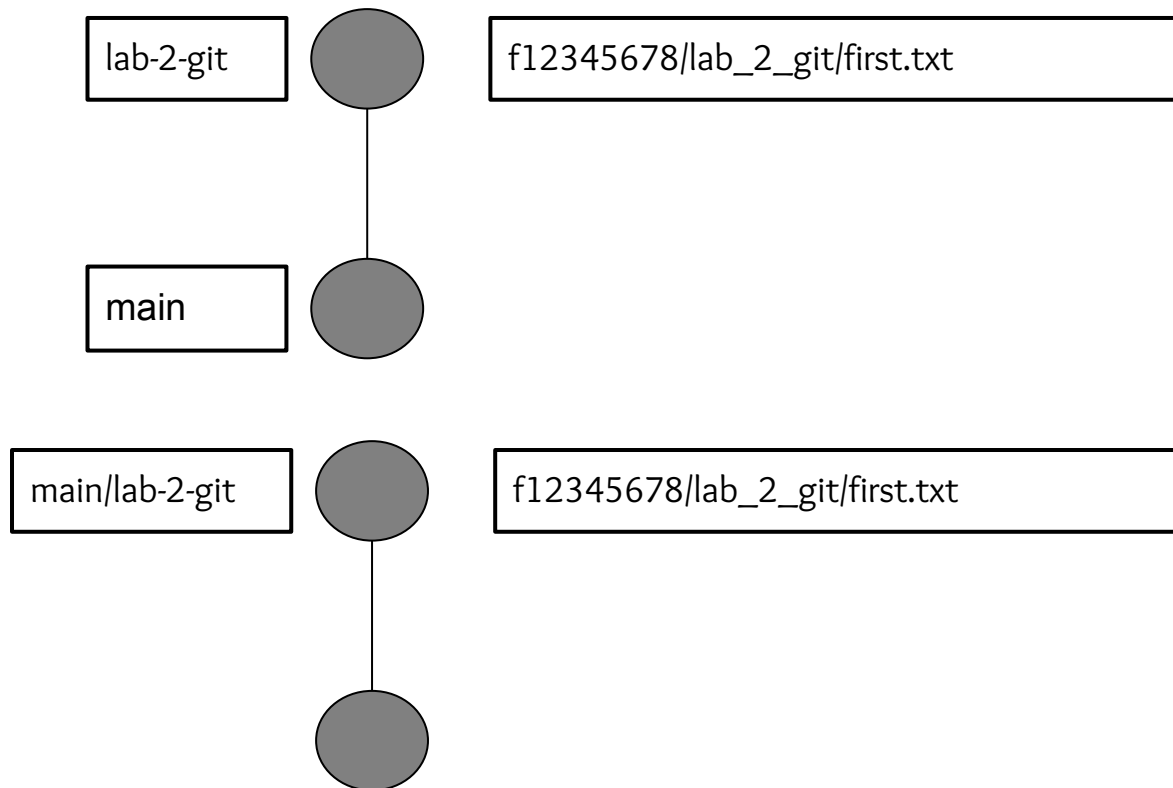


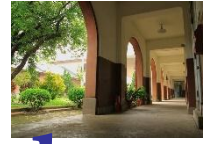
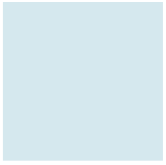
Create pull-request on the web UI (optional)

The screenshot shows a GitHub repository interface for 'lab-2-git'. At the top, a notification bar states 'lab-2-git had recent pushes less than a minute ago'. To the right of this bar, a green button labeled 'Compare & pull request' is highlighted with a red rectangular border. Below the notification bar, the repository's main branch is 'main', with '1 branch' and '0 tags' indicated. To the right of this information are buttons for 'Go to file', 'Add file', and 'Code'. A status bar below indicates 'This branch is up to date with ASRLabCourses/Linux2022Fall:main.' and includes links for 'Contribute' and 'Sync fork'. The commit history shows a single commit by 'qwe661234' titled 'Initial commit', dated '6 hours ago', with a commit hash of '5e16546'. Below the commit list, a file named 'README.md' is shown as part of the 'Initial commit' from '6 hours ago'. The content of the README.md file is displayed below, showing the text 'Linux2022Fall'.



Merge your branch in local and push to remote





Merge your branch in local and push to remote

```
$ cd ../../
```

```
$ git checkout main
```

```
$ git branch
```

```
lab-2-git  
* main
```

```
$ git merge lab-2-git
```


```
$ git push
```



Open





https://github.com/<Your username>/Linux2022Fall/tree/main/<Your student ID>/lab_2_git


 **qwe661234 / Linux2022Fall** Public

forked from ASRLabCourses/Linux2022Fall

[Code](#) [Pull requests](#) [Actions](#) [Projects](#) [Wiki](#) [Security](#) [Insights](#) [Settings](#)

 **main**

 **2 branches**

 **0 tags**



[Go to file](#)


[Add file](#)


[Code](#)

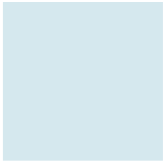
This branch is **1 commit ahead** of ASRLabCourses:main.

[Contribute](#) [Sync fork](#)

 **qwe661234** Add F12345678 e78304b 21 minutes ago  **2 commits**

 **f12345678/lab_2_git** Add F12345678 21 minutes ago

 **README.md** Initial commit 6 hours ago



Demo

```
qwe661234@qwe661234-linux-2022:~/Linux2022Fall$ git merge lab-2-git
Updating 5e16546..e78304b
Fast-forward
 f12345678/lab_2_git/first.txt | 1 +
 1 file changed, 1 insertion(+)
 create mode 100644 f12345678/lab_2_git/first.txt
```

截圖檢查項目 共四項

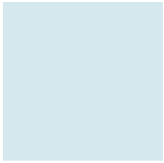
1. git merge
2. git log --graph
3. 為 fork 的 repo.
4. 為 main 分支且 repo. 內有檔案

```
qwe661234@qwe661234-linux-2022:~/Linux2022Fall$ git log --graph
* commit e78304ba2a55837f7531e9144070e9a77816f210 (HEAD -> main, origin/main, origin/lab-2-git, origin/HEAD, lab-2-git)
   Author: qwe661234 <qwe661234@gmail.com>
   Date:   Mon Sep 19 21:20:29 2022 +0800

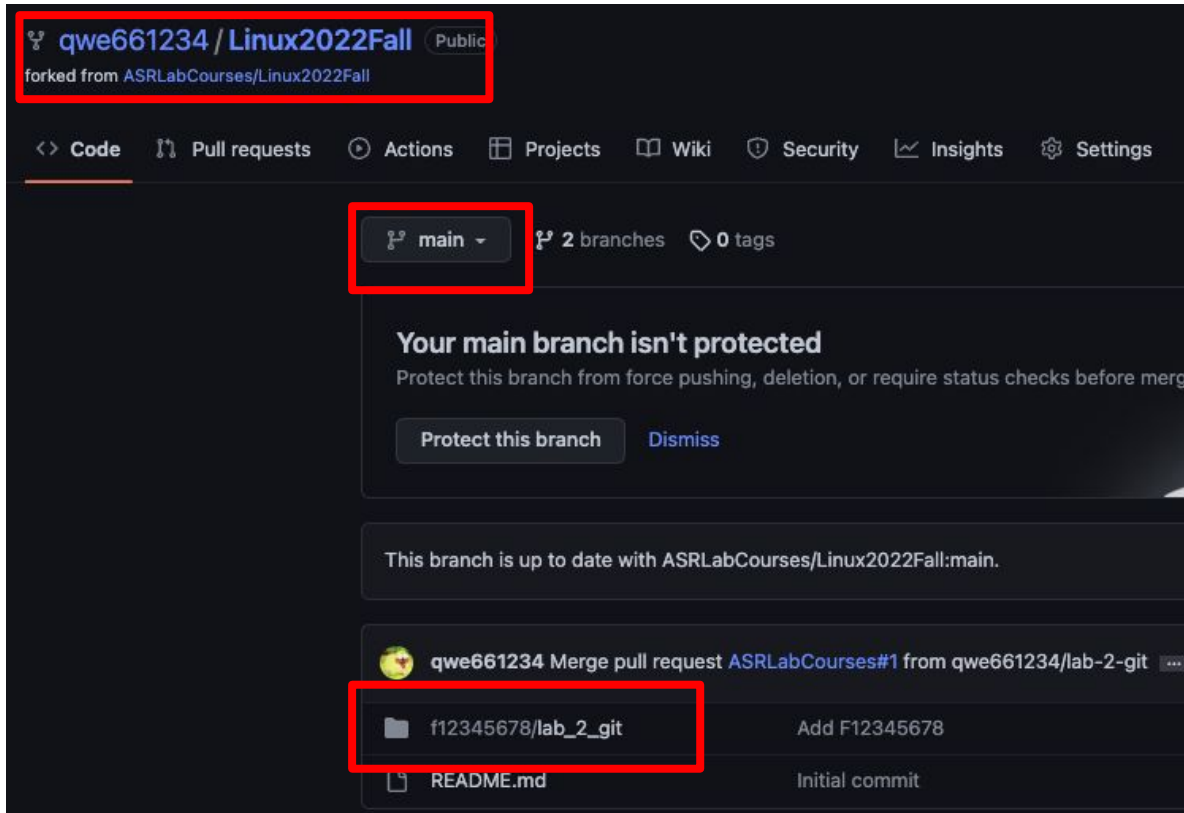
       Add F12345678

* commit 5e16546d91784e4b52e36d38839b7f3884dba46b
   Author: waysimdrop <48278026+qwe661234@users.noreply.github.com>
   Date:   Mon Sep 19 15:44:16 2022 +0800

       Initial commit
```



Demo

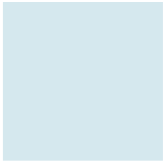


截圖檢查項目 **共四項**

1. git merge
2. git log --graph
3. 為 fork 的 repo.
4. 為 main 分支且 repo. 內有檔案

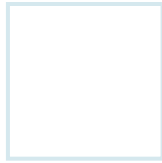
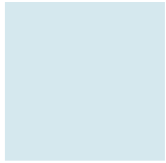
繳交方式: 截圖上傳至 moodle, 須包含以上 **四項** 檢查項目

僅供參考



Ref.

- Reusing a merged branch, good practice?
- Why Delete Old Git Branches?
- How can I save username and password in Git?
- SSH key tutorial: <https://ithelp.ithome.com.tw/articles/10205988>
- Step by step:
<https://aben20807.github.io/posts/20190421-github-flow-2/>



QUESTIONS