

# Git Tutorial

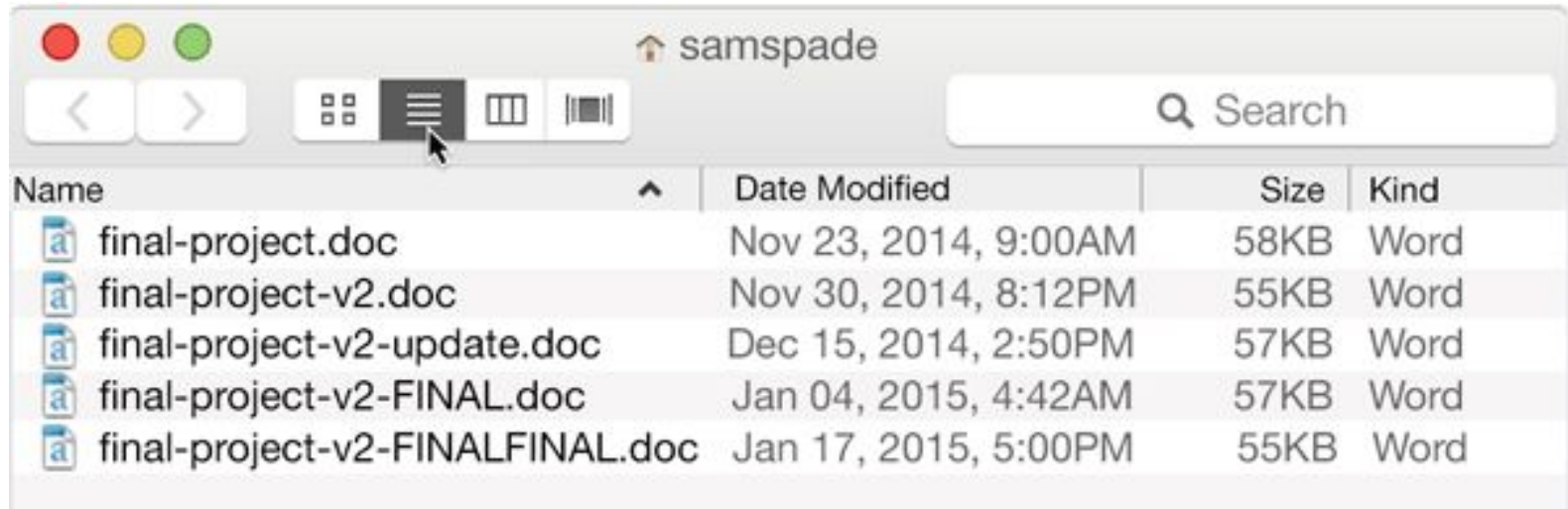
TA: 睿德

# What is Git

- A version control system
  - free and open source
  - small and fast
  - distributed

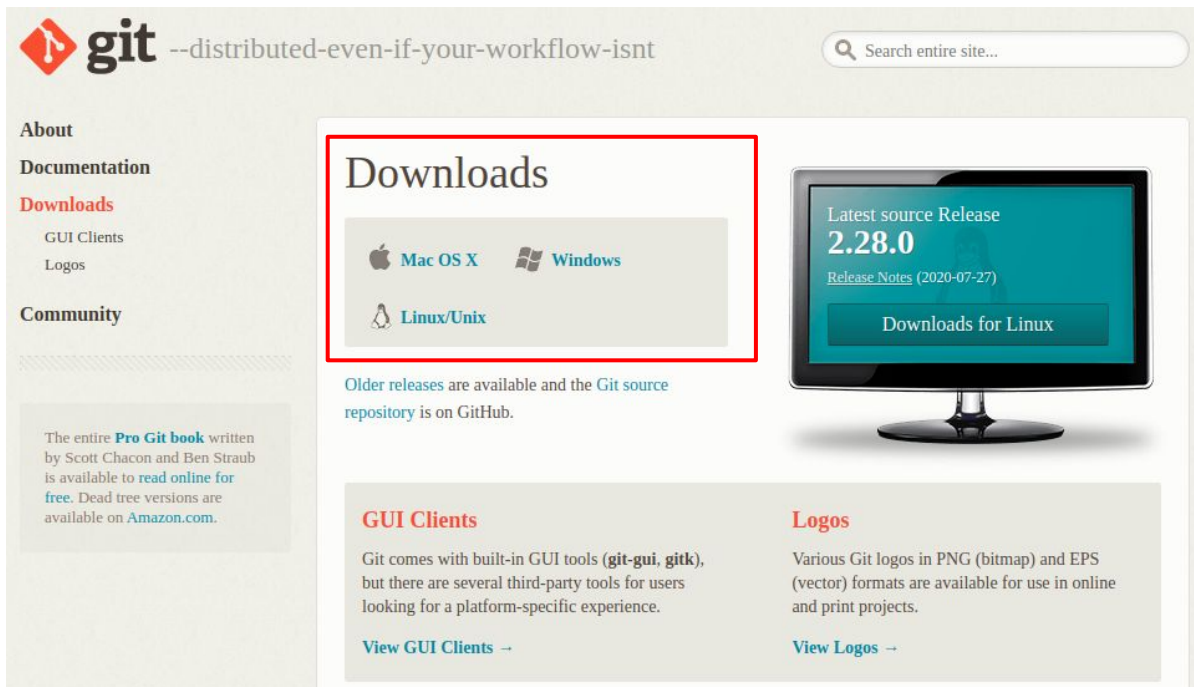


# Without Version Control



# Git Installation

- [Download link](#)



# First-Time Setup

- Set your identity

```
$ git config --global user.name "Your Name"  
$ git config --global user.email "Your Email Address"
```

- View your setting

```
$ git config --list
```

# Git Basic - git init

- Start version-controlling the current directory with git
- Create subdirectory **.git/** containing all necessary repository files

```
$ cd /tmp/git_demo  
$ git init  
Initialized empty Git repository in /tmp/git_demo/.git/
```

# Git Basic - git status

- Check the status of files

```
$ touch file1
$ git status
On branch master

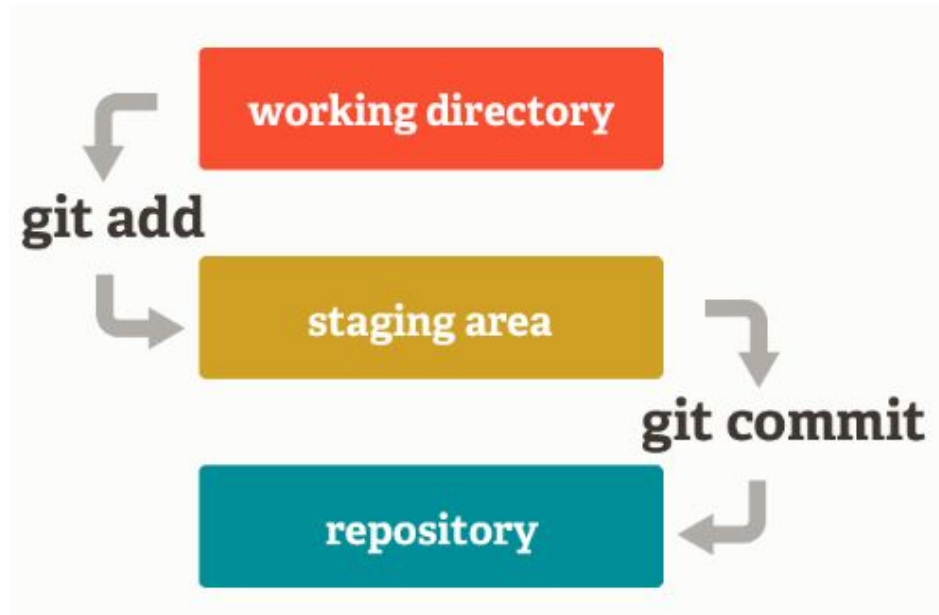
No commits yet

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

    file1

nothing added to commit but untracked files present (use "git add" to track)
```

# Three Sections in Git





# Git Basic - git add

1. Begin tracking new files
2. Stage modified files

```
$ git add file1
$ git status
On branch master

No commits yet

Changes to be committed:
  (use "git rm --cached <file>..." to unstage)

        new file:   file1
```

# Git Basic - git commit

- Create a commit
- Write meaningful commit message to describe the changes

```
$ git commit -m "First commit"  
[master (root-commit) 1d8ebb7] First commit  
1 file changed, 0 insertions(+), 0 deletions(-)  
create mode 100644 file1
```

# Git Basic - git log

- View the commit history

```
$ git log
commit 935ecda6814c1e0ea8e7751bd332abffe5e29b6f (HEAD -> master)
Author: Chih-Yu Kao <lcd010308@gmail.com>
Date: Tue Oct 6 05:48:08 2020 +0800

    Add file2

commit 1d8ebb72811c20605b5b31ca76737eda6c2cec29 commit id
Author: Chih-Yu Kao <lcd010308@gmail.com>
Date: Tue Oct 6 05:34:34 2020 +0800

    First commit
```

# Git Basic - git diff

- Compare the difference between current working directory and the last commit

```
$ echo "hello" >> file2
$ git diff
diff --git a/file2 b/file2
index e69de29..ce01362 100644
--- a/file2
+++ b/file2
@@ -0,0 +1 @@
+hello
```

# Git Basic - git diff

- Compare the difference between two versions

```
$ git diff 25edabd 7b4b8dc
diff --git a/file2 b/file2
index ce01362..4617d4e 100644
--- a/file2
+++ b/file2
@@ -1,2 @@
-hello
+test 1
+test 2
```

# Git Basic - git checkout

- Go back to the past commit

```
$ git checkout 1d8ebb7
```

```
Note: checking out '1d8ebb7'.
```

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 1d8ebb7 First commit
```

# Git Basic - git checkout

- Return to the latest commit (in master branch)

```
$ git checkout master  
Previous HEAD position was 1d8ebb7 First commit  
Switched to branch 'master'
```

# Enter Workspace in Bitbucket

- We will invite you to our Bitbucket workspace (check your email)



**yoway** invited you to join **nycu\_np\_2022** on Bitbucket.

Accept my invitation

This message was sent to you by Atlassian Cloud





# Enter Workspace in Bitbucket

- You should accept invitation first

## ACCOUNT



秦睿德

pikachin.cs10@nycu.edu.tw

Switch account

Manage account



## RECENT WORKSPACES



秦睿德

All workspaces

## SETTINGS

Personal settings

Labs

Log out

## Workspaces

### Workspace

### Members



nycu\_np\_2022

2 members



秦睿德

1 member



nycu\_np\_2021

114 members

# Create Remote Repository

nycu\_np\_2022

## Repositories

Create repository

### Create a new repository

[Import repository](#)

Workspace  nycu\_np\_2022 ▼

Project\*  np\_project1  ▼

Repository name\* 310553034\_np\_project1

Access level ☒ Private repository

Uncheck to make this repository public. Public repositories typically contain open-source code and can be viewed by anyone.

Include a README? No ▼

Default branch name e.g., 'main'

Include .gitignore? No ▼

[> Advanced settings](#)

Create repository

Cancel

# Create Remote Repository

The diagram illustrates the steps to create a remote repository in VS Code:

- Step 1:** The VS Code interface shows the sidebar with the **+** icon circled in red, indicating the starting point for creating a new repository.
- Step 2:** The **CREATE** menu is shown, with the **Repository** option highlighted by a red box.
- Step 3:** The **Create a new repository** dialog is shown, with the **Workspace**, **Project**, and **Repository name** fields highlighted by a red box. The **Repository name** field contains the text `309551078_np_project1`.

The **Create a new repository** dialog includes the following options:

- Workspace:** `nycu_np_2021`
- Project:** `np_project1`
- Repository name:** `309551078_np_project1`
- Access level:** ☒ Private repository (Uncheck to make this repository public. Public repositories typically contain open-source code and can be viewed by anyone.)
- Include a README?:** No
- Default branch name:** e.g., 'main'
- Include .gitignore?:** No

[Advanced settings](#)

**Create repository** **Cancel**

# Upload to Remote Repository

## Let's put some bits in your bucket

SSH



```
git clone git@bitbucket.org:nycu-np-2022/310553034_np_project1.git
```



## Get started quickly

Creating a README or a .gitignore is a quick and easy way to get something into your repository.

Create a README

Create a .gitignore

## Get your local Git repository on Bitbucket

Step 1: Switch to your repository's directory

```
1 cd /path/to/your/repo
```

Step 2: Connect your existing repository to Bitbucket

```
1 git remote add origin git@bitbucket.org:nycu-np-2022/310553034_np_project1.git
2 git push -u origin master
```

Need more information? [Learn more](#)

# Upload to Remote Repository

Let's put some bits in your bucket

HTTPS



git clone https://lcd010308@bitbucket.org/nycu-np-2021/309551078\_np\_



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```

```
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```

Need more information? [Learn more](#)

# Clone Repository to Local

**Let's put some bits in your bucket**

SSH ▾

git clone git@bitbucket.org:nycu-np-2022/310553034\_np\_project1.git



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[Create a README](#)[Create a .gitignore](#)

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Need more information? [Learn more](#)

# Add SSH key

- You should generate your key first


```
🍏 ~/.ssh  
> ssh-keygen  
Generating public/private rsa key pair.  
Enter file in which to save the key (/Users/pikachin/.ssh/id_rsa):  
Enter passphrase (empty for no passphrase):  
Enter same passphrase again:  
Your identification has been saved in /Users/pikachin/.ssh/id_rsa  
Your public key has been saved in /Users/pikachin/.ssh/id_rsa.pub  
The key fingerprint is:  
SHA256:NM8+V0QrA+MwL3a9jqGDwK04sXjZLV3VUU0YemQD0qs pikachin@qinruidedeMacBook-Air.local
```

```
🍏 ~/.ssh  
> ls  
config          id_rsa.pub  
id_rsa          known_hosts
```




# Add SSH key


**ACCOUNT**

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## GENERAL

Account settings

Email aliases

Notifications

## ACCESS MANAGEMENT

App authorizations

App passwords

## SECURITY

SSH keys

Two-step verification

Sessions

Audit log

## FEATURES

Labs

## Add SSH key

Label

MyMac

Key\*

Paste your key here...

Paste public key here

### Don't have a key?

Learn how to [generate an SSH key](#).

### Already have a key?

Copy and paste your key here with `cat ~/.ssh/id_rsa.pub | pbcopy`.

### Problems adding a key?

Read our [troubleshooting page](#) for common issues.

Add key

Cancel

# Reference

- <https://git-scm.com/doc>
- <https://gitbook.tw/>
- <https://backlog.com/git-tutorial/tw/>