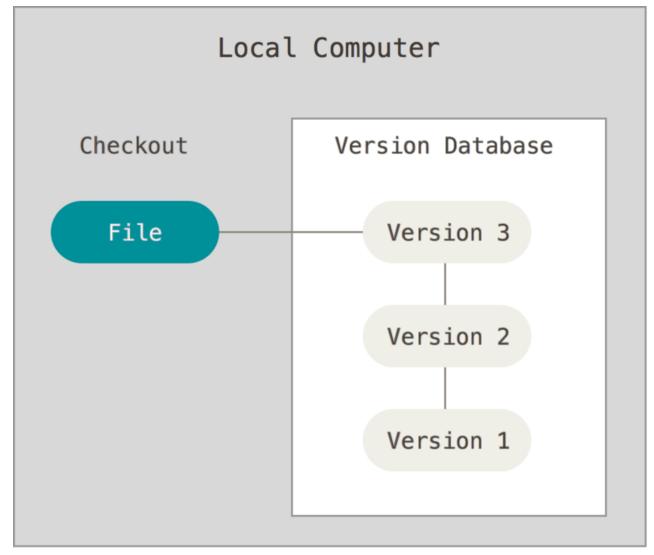




王裕續 yubin@ispan.com.tw 資展國際股份有限公司



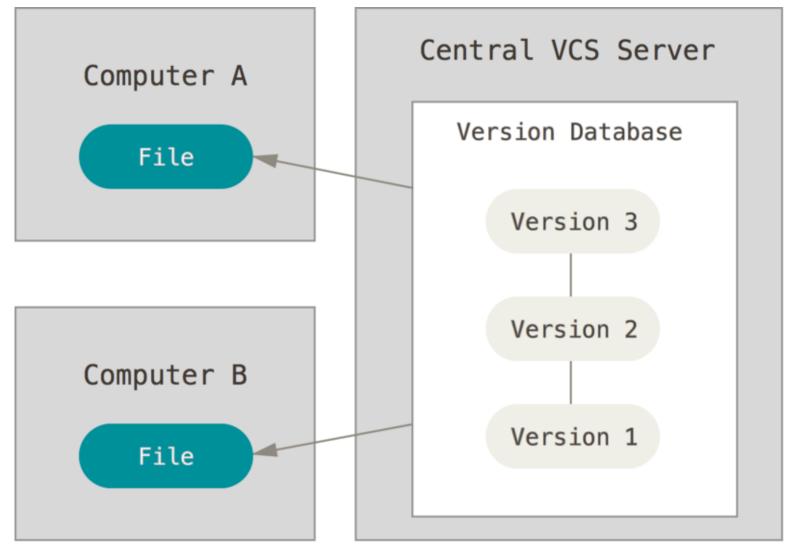
本地端版本控制



圖片來自: https://git-scm.com/book/en/v2/Getting-Started-About-Version-Control



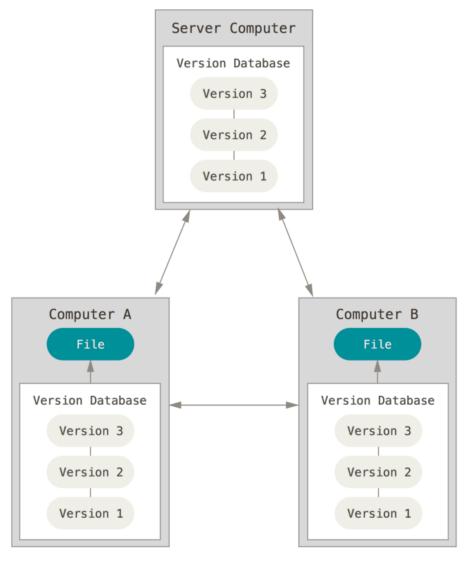
集中化的版本控制系統



圖片來自: https://git-scm.com/book/en/v2/Getting-Started-About-Version-Control



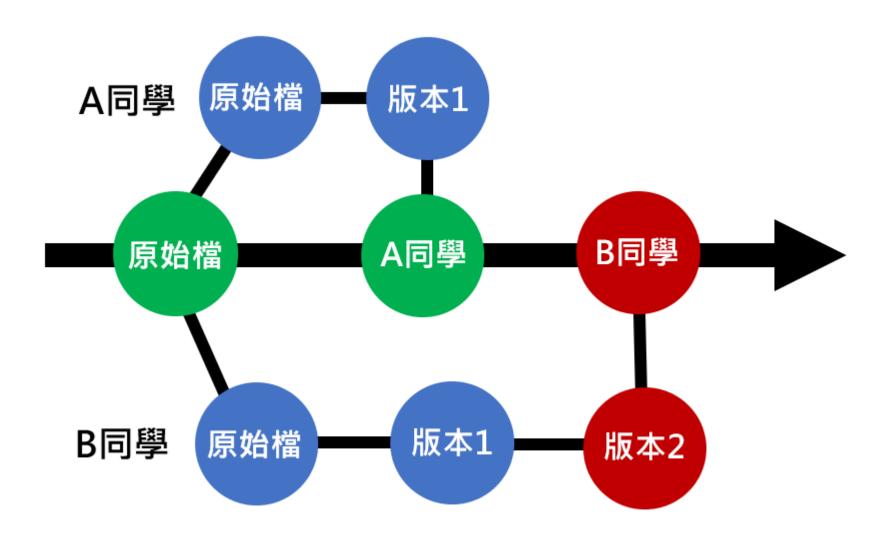
分散式版本控制系統



圖片來自: https://git-scm.com/book/en/v2/Getting-Started-About-Version-Control

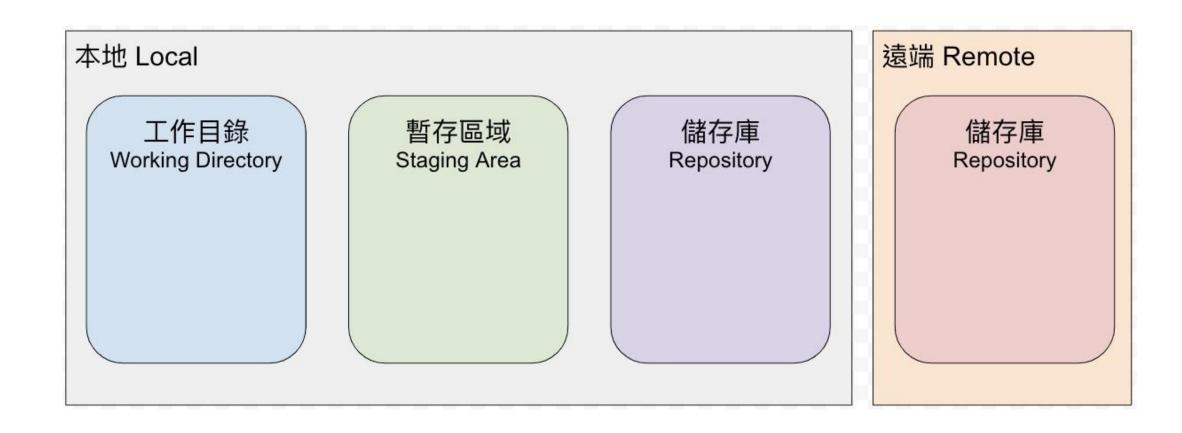


分散式版本控制系統





Git分散式版本控制



圖片來自: https://i.imgur.com/7WTvjCN.png



安裝 Git

● 下載 https://git-scm.com/downloads 及安裝



● 開啟命令提示字元(終端機),輸入 git --version查詢安裝的版本



使用者設定

● 開啟終端機設定使用者資訊

```
git config --global user.name "yubin" git config --global user.email "yubin@ispan.com.tw"
```

• 檢視目前的設定

git config -- list

● 檢視單一設定

git config user.name

- 設定的資料儲存在
 - ✓ C:\Users\<使用者帳號>\.gitconfig



開始使用 – 建立 Git儲存庫(Repository)

git init

E:\myapp>git init Initialized empty Git repository in E:/myapp/.git/

- 這個動作會建立一個叫.git隱藏目錄
 - .git目錄中紀錄了儲存庫中的所有更動的紀錄
- 查看儲存庫的狀態

git status

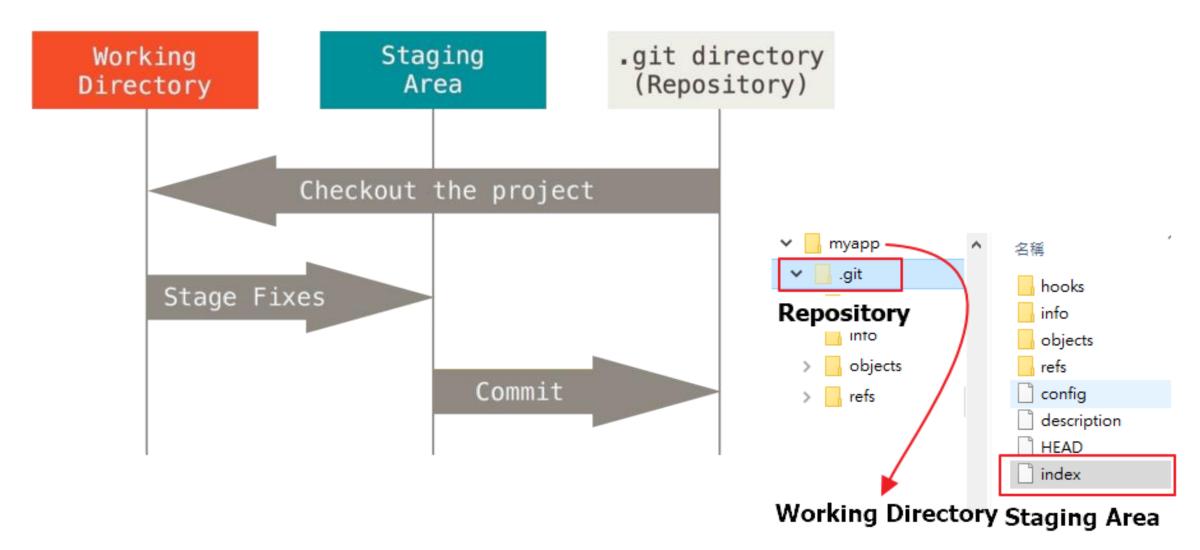
E:\myapp>git status
On branch master

No commits yet

nothing to commit (create/copy files and use "git add" to track) pan International Inc.



Working Directory工作目錄(區)



圖片來自: https://git-scm.com/book/en/v2/Getting-Started-Git-Basics

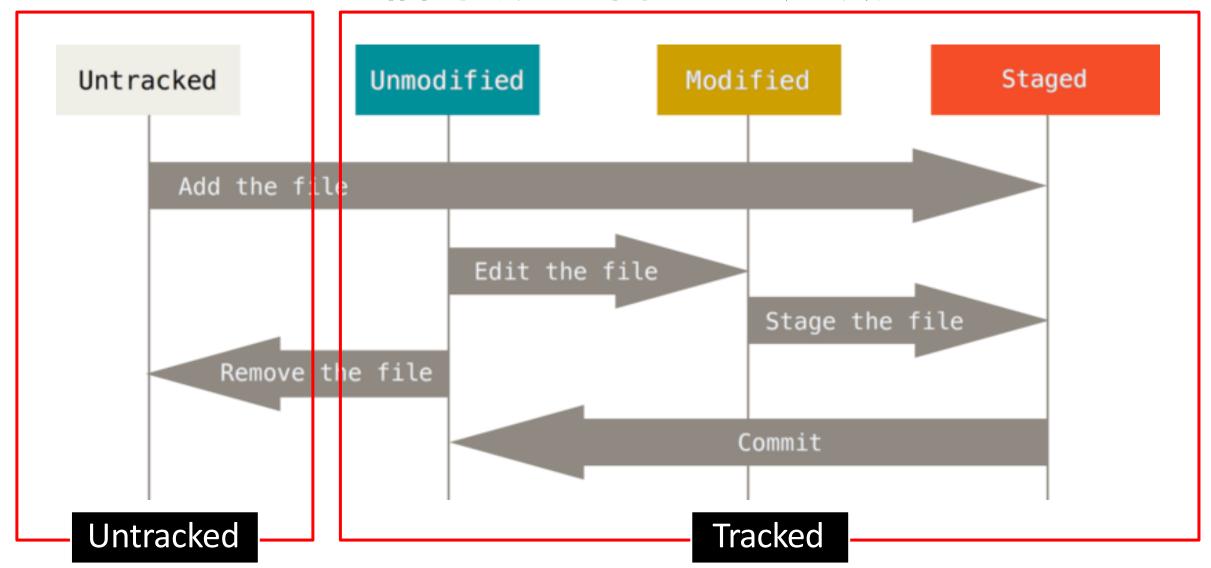


工作目錄(Working Directory)中的檔案

- 兩種基本狀態
 - tracked: 已經記錄在git repository中的檔案,其中又可以 分成三種紀錄狀態
 - Unmodified: commit之後,還沒修改過的檔案
 - modified:commit之後,又修改過的檔案
 - staged:加到staging area的檔案
 - untracked:還沒有納入git控管的檔案



檔案狀態的生命週期



圖片來自: https://git-scm.com/book/en/v2/Git-Basics-Recording-Changes-to-the-Repository



顯示檔案狀態

● 加入一個檔案(page1.txt)到工作目錄中,然後顯示工作目錄中檔案的狀態

git status

```
$ git status
On branch main

No commits yet

Untracked files:

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

page1.txt

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



將檔案交給Git管理,進入到暫存區 (Staging Area)

- untracked的檔案,可以透過git add指令,將檔案加到 staging area,讓Git來管理
- 單一檔案

git add page1.txt

● 副檔名是.txt的所有檔案

git add *.txt

所有檔案

git add –all git add.



git add

```
git status
On branch main
No commits yet
Untracked files:
  (use "git add <file>..." to include in what will be committed)
        page1.txt
nothing added to commit but untracked files present (use "git add" to track)
wang0804@980517-NB3-DEI MINGW64 ~/Documents/workspace/temp (main)
$ git add page1.txt
wang0804@980517-NB3-DEI MINGW64 ~/Documents/workspace/temp (main)
$ git status
On branch main
No commits yet
Changes to be committed:
  (use "git rm --cached <file>..." to unstage)
        new file:
                    page1.txt
```



從暫存區(Staging Area)進入到備份區 (Repository)

staging area中的檔案,可以透過commit指令,將檔案確認存到透過Repository

git commit -m "init commit"

```
$ git commit -m "init commit"
[main (root-commit) 137750e] init commit
1 file changed, 0 insertions(+), 0 deletions(-)
create mode 100644 page1.txt

wang0804@980517-NB3-DEI MINGW64 ~/Documents/workspace/temp (main)
$ git status
On branch main
nothing to commit, working tree clean
```



修改檔案

● 將剛剛備份完成的檔案拿來修改,再透過git status查詢檔案的狀態

- 將修改的檔案備份,就重新再做一次 git add、git commit,這兩個動作可以合併成一次
 - git commit -am "update content"



將修改追加到最近一次commit

● 修改最近一次commit的message

git commit --amend -m "修改的message"

● 將要備份的檔案加到最近一次的commit

git commit --amend --no-edit

```
$ git commit --amend --no-edit
[main 0432ca1] add some text
Date: Tue Mar 15 23:02:08 2022 +0800
1 file changed, 3 insertions(+), 1 deletion(-)
```



檢視commit紀錄

● 使用log指令,會由新到舊的顯示,是誰、什麼時候做 了什麼事

git log git log --oneline [--graph]

```
$ git log
commit 96916b70ac7fcf342aaa4db52f7f142c3a96e364 (HEAD -> main)
Author: hhwang <wang@ispan.com.tw>
Date: Thu Feb 17 14:49:11 2022 +0800

add aaaaaaa

commit 137750e86bf6c0087681b465bbc55499b1976d98
Author: hhwang <wang@ispan.com.tw>
Date: Wed Feb 16 23:11:14 2022 +0800

init commit
```

\$ git log --oneline
96916b7 (HEAD -> main) add aaaaaaa
137750e init commit

退出 log 狀態,輸入:q



git restore 還原修改 -1

檔案修改後,還沒有新增到暫存區(Staging Area),要
 復原檔案中的修改

git restore <file>

```
$ git status
On branch main
Changes not staged for commit:
  (use "git add <file>..." to update what will be committed)
  (use "git restore <file>..." to discard changes in working directory)
       modified: page1.txt
no changes added to commit (use "git add" and/or "git commit -a")
wang0804@980517-NB3-DEI MINGW64 ~/Documents/workspace/temp (main)
$ git restore page1.txt
wang0804@980517-NB3-DEI MINGW64 ~/Documents/workspace/temp (main)
$ git status
On branch main
nothing to commit, working tree clean
```



git restore還原修改 -2

檔案修改後,已經新增到暫存區(Staging Area),要退回到工作目錄(Working Directory)

git restore --staged <file>

```
$ git status
On branch main
Changes to be committed:
  (use "git restore --staged <file>..." to unstage)
        modified: page1.txt
wang0804@980517-NB3-DEI MINGW64 ~/Documents/workspace/temp (main)
$ git restore --staged page1.txt
wang0804@980517-NB3-DEI MINGW64 ~/Documents/workspace/temp (main)
$ git status
On branch main
Changes not staged for commit:
  (use "git add <file>..." to update what will be committed)
  (use "git restore <file>..." to discard changes in working directory)
no changes added to commit (use "git add" and/or "git commit -a")
```



把檔案設定不被git控管

git rm --cached page1.txt

```
Changes to be committed:
  (use "git rm --cached <file>..." to unstage)
        new file: page1.txt
wang0804@980517-NB3-DEI MING<u>w64 ~/D</u>ocuments/workspace/temp (main)
$ git rm --cached page1.txt
rm 'page1.txt'
wang0804@980517-NB3-DEI MINGW64 ~/Documents/workspace/temp (main)
$ git status
On branch main
No commits yet
Untracked files:
  (use "git add <file>..." to include in what will be committed)
        page1.txt
nothing added to commit but untracked files present (use "git add" to track)
```



檔案差異比較 git diff – 情境1

● 比對工作目錄(Working Directory) 修改檔案之間的差 異

git diff

將比較的結果 匯出

git diff > page.diff

```
git diff
diff --git a/page2.txt b/page2.txt
index 0362c55..682f232 100644
                             --- 表示舊的檔案
   a/page2.txt
                             +++表示新的檔案
+++ b/page2.txt
                             -1,3表示舊的檔案中內容的1-3行
@@ -1,3 +1,4 @@
                             +1,`表示新的檔案中內容的1-4行
abcdefg
                             空白字元開頭表示這行兩個檔案
 ZZZZZZZ
 No newline at end of file
-aaaaaaa
                             - 字元表示內容只有在舊檔案中
 ZZZZZZZ
                             +字元表示内容只有在新檔案中
-cccccc
 No newline at end of file
```



檔案差異比較 git diff – 情境2

比對暫存區(staging area)與儲存區(Repository)檔案之間的差異

git diff --staged



檔案差異比較 git diff – 情境3

● 儲存區(Repository)中任意兩個版本檔案之間的差異

git diff commit1 commit2

```
$ git diff 96916b7 58b9995
diff --git a/page1.txt b/page1.txt
index 2bd8960..633a71a 100644
    a/page1.txt
+++ b/page1.txt
00 -1 +1,3 00
  No newline at end of file
 -aaaaaaaaaaaaaaaaaaaaaa
 +bbbbbbbbbbb
  cccccccccccccc
  No newline at end of file
diff --git a/page2.txt b/page2.txt
new file mode 100644
index 0000000..682f232
     /dev/null
+++ b/page2.txt
@@ -0.0 +1.4 @@
+abcdefq
 ∔aaaaaaaa
 +ZZZZZZZ
 +CCCCCCC
  No newline at end of file
```



git reset 切換版本 - 1

- 保留工作目錄(Working Directory)中的內容,暫存區 (Staging Area)以及儲存庫(Repository)的內容回到指 定的版本
- 指定版本的幾種寫法

git reset HEAD~~~~

git reset HEAD~5

git reset HEAD^^

git reset <commit>



切換到之前的版本 - 情境2

保留工作目錄(Working Directory)及暫存區(Staging Area)的內容,儲存庫(Repository)的內容回到指定的版本

git reset --soft HEAD~~



切換到之前的版本 - 情境3

 工作目錄(Working Directory)、暫存區(Staging Area)、 儲存庫(Repository)的內容都回到指定的版本

git reset --hard HEAD~~



Reset 後的還原

● 列出所有的歷史紀錄

git reflog

```
6179f5f HEAD@{15}: reset: moving to HEAD~
4509c3e (HEAD, main) HEAD@{16}: reset: moving to 4509c3e
6179f5f HEAD@{17}: reset: moving to HEAD~
4509c3e (HEAD, main) HEAD@{18}: commit: add bbbbb
6179f5f HEAD@{19}: commit: add Page4.txt
ab1602c HEAD@{20}: commit: add some content
2c37cfb (origin/main, feature-login) HEAD@{21}: checkout:
```

● 回歸原始版本

git reset --hard HEAD@{8}



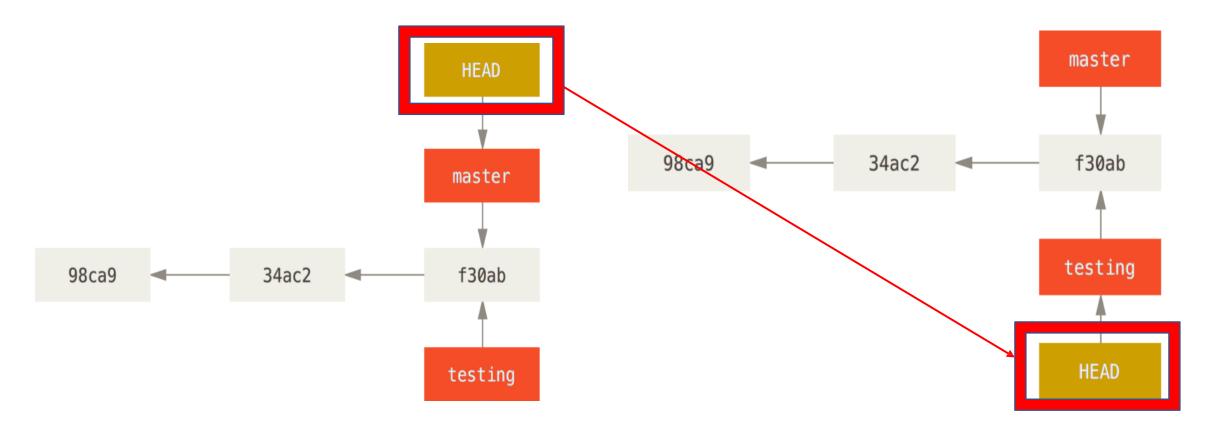
branch 分支

- 將程式開發從開發主線上分離開來
 - 不同的版本就使用不同的分支,ex:1.0、1.0.1、1.1、2.0、....
 - 不同的軟體版本週期使用不同的分支,ex:Alpha、Beta、 RC、RTM、.....
 - 單一功能的開發使用不同的分支
 - 不同的開發人員使用不同的分支
 - 為了修復問題也可以使用不同的分支
- 預設的分支名稱叫做?以前是master,現在是main
- 透過HEAD指標,指定目前使用中的branch



指標 HEAD

● 被 HEAD 指向的分支是目前分支





新增分支

• 查詢目前專案有哪些分支 git branch

● 新增分支

git branch

branch分支名稱>

• 切換分支

git checkout

branch分支名稱>

● 同時建立及切換分支

git checkout -b

branch分支名稱>

```
git branch
 main
wang0804@980517-NB3-DEI MINGW64 ~/Doc
 git branch
 main
wang0804@980517-NB3-DEI MINGW64 ~/Docu
$ git branch dev
wang0804@980517-NB3-DEI MINGW64 ~/Doc
$ git branch
 dev
 main
wang0804@980517-NB3-DEI MINGW64 ~/Doci
$ git checkout dev
Switched to branch 'dev'
vang0804@980517-NB3-DEI MINGW64 ~/Doci
 git branch
 main
```



切換分支的另一種寫法(新)

● 切換分支

git switch <branch分支名稱>

```
wang0804@980517-NB3-DEI MINGW64 ~/documents/workspace/gitwork (relase)
$ git switch main
Switched to branch 'main'
Your branch is ahead of 'origin/main' by 1 commit.
  (use "git push" to publish your local commits)
```

●同時建立及切換分支

git switch -c

 branch分支名稱>

```
wang0804@980517-NB3-DEI MINGW64 ~/documents/workspace/gitwork (main)
$ git switch -c feature1
Switched to a new branch 'feature1'
```



修改分支名稱

git branch -m <舊的分支名稱> <新的分支名稱>

```
git branch
 dev
  main
wang0804@980517-NB3-DEI MINGW64
$ git branch -m dev develop
wang0804@980517-NB3-DEI MINGW64
 git branch
* develop
 main
```



刪除分支

● 不能刪除現在使用的分支,因此要先切換到別的分支

git branch -d(-D) <分支名稱>

```
$ git branch
  develop
  main
wang0804@980517-NB3-DEI MINGW64 ~/Docume
$ git branch -d develop
Deleted branch develop (was a6a3b72).
wang0804@980517-NB3-DEI MINGW64 ~/Docume
 git branch
  main
```



合併分支

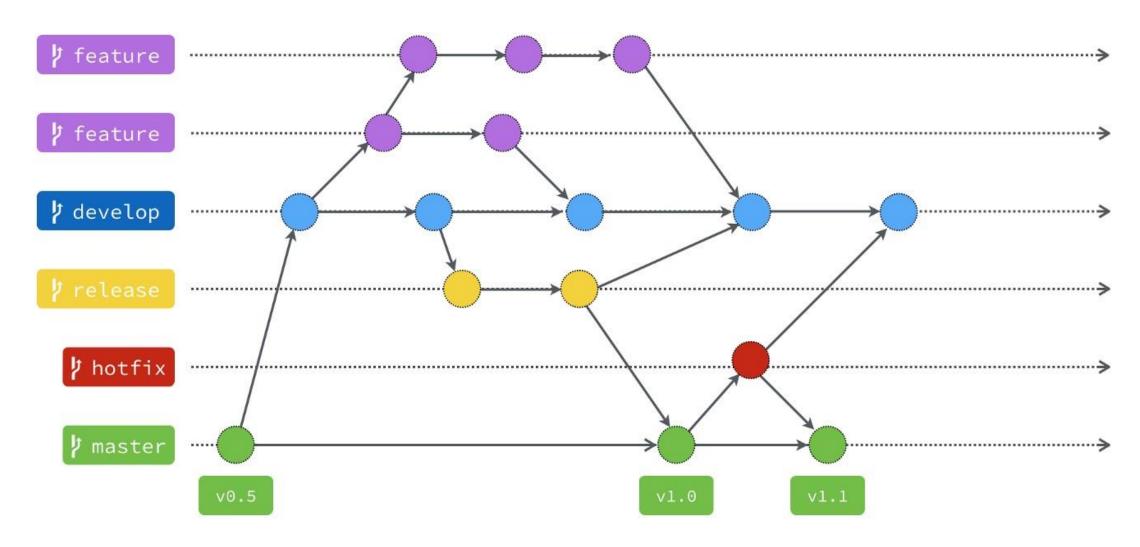
如果要用main分支合併其它分支,就要先切換到main分支

git merge <分支名稱> -m "message"

```
$ git merge feature -m "daily merge"
Merge made by the 'ort' strategy.
feature2.txt | 2 ++
1 file changed, 2 insertions(+)
```



Git Flow





Git remote repository



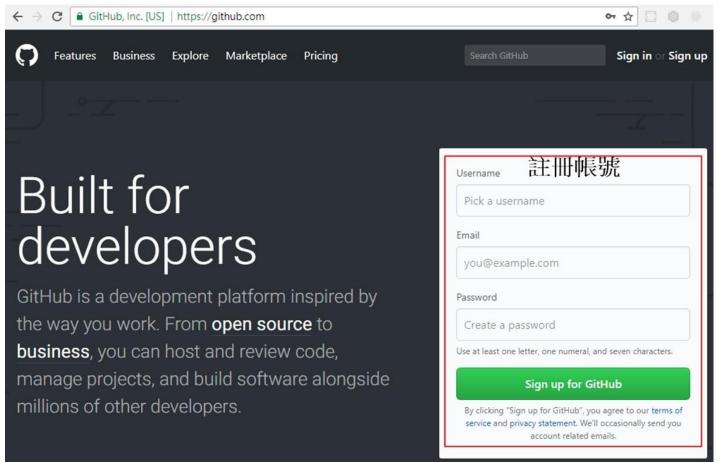
Git Remote Repository

- Git Repository
 - Local Repository: 之前的用法就是local repository
 - Remote Repository:讓開發團隊成員分享各自的local repository資料而建立
- 我們可以自行建置 Git Server或使用坊間的Git Repository託管服務
 - GitHub \ GitLab \ Bitbucket \ Gitorious



GitHub

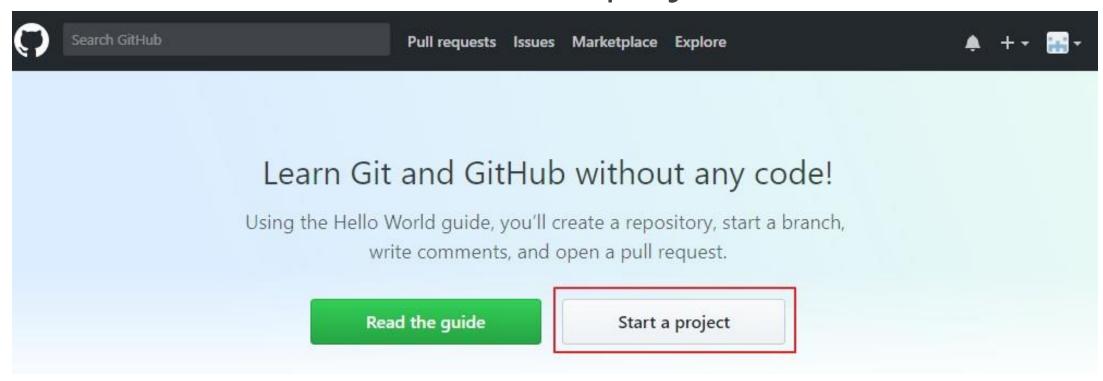
● 申請GitHub帳號 https://github.com/





註冊完後

按下Start a project後,還會有一個驗證email的步驟,接下來才能建立專案[Start a project]

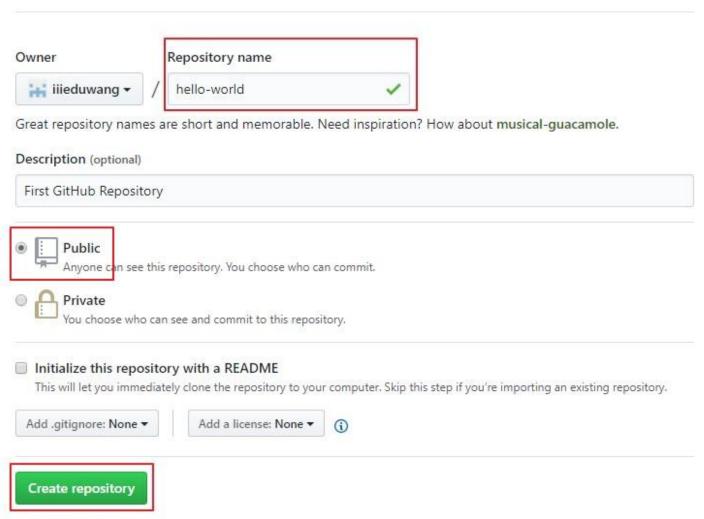




建立新專案

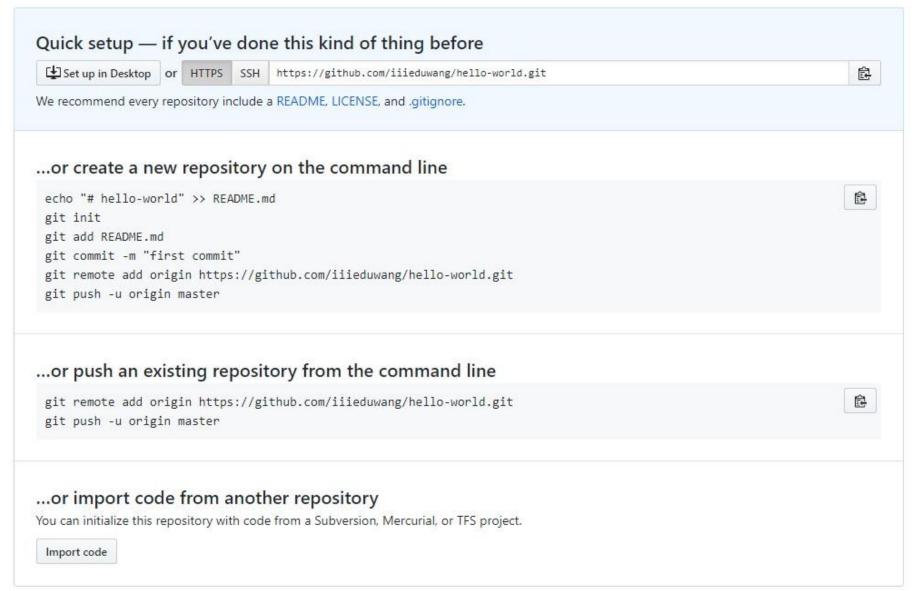
Create a new repository

A repository contains all the files for your project, including the revision history.





完整的使用方式說明





從local連到remote 1

在Git環境加入remote repository的設定

git remote add <自取的名稱> <remote repository 的URL>

- remote repository url 格式
 - https://github.com/<GitHub帳號>/<GitHub上的 Repository名稱>.git
 - 檢視所有remote repository的設定

git remote -v

檢視某個remote repository的設定

git remote show <名稱>



範例參考

```
E:\myapp>git remote add origin https://github.com/iiieduwang/hello-world.git
E:\myapp>git remote -v
origin https://github.com/iiieduwang/hello-world.git (fetch)
origin https://github.com/iiieduwang/hello-world.git (push)
E:\myapp>git remote show origin
 remote origin
  Fetch URL: https://github.com/iiieduwang/hello-world.git
  Push URL: https://github.com/iiieduwang/hello-world.git
  HEAD branch: master
  Remote branch:
    master new (next fetch will store in remotes/origin)
  Local ref configured for 'git push':
    master pushes to master (local out of date)
```



從local連到remote 2

- 改變remote repository設定的名稱
- 檢視所有remote repository的設定

git remote rename <舊的名稱> <新的名稱>

● 刪除remote repository的設定

git remote remove <設定的名稱>



上傳下載資料

● local repository的資料上傳到remote repository

```
git push <設定的名稱> <br/> <br/> git push --all origin
```

Remote repository的資料下載到local repository

git pull <設定的名稱> <branch的名稱>



git push 範例參考

```
E:\fromgit\git remote add origin https://github.com/iiieduwang/fromlocal.git
E:\fromgit\git push origin master
Fatal: HttpRequestException encountered.
Username for 'https://github.com': iiieduwang
Password for 'https://iiieduwang@github.com':
Counting objects: 14, done.
Delta compression using up to 8 threads.
Compressing objects: 100% (10/10), done.
Writing objects: 100% (14/14), 1.21 KiB | 0 bytes/s, done.
Total 14 (delta 1), reused 0 (delta 0)
remote: Resolving deltas: 100% (1/1), done.
To https://github.com/iiieduwang/fromlocal.git
 * [new branch] master -> master
```



git pull 範例參考

```
E:\fromgit\git remote add origin https://github.com/iiieduwang/hello-world.git
E:\fromgit>git remote -v
origin https://github.com/iiieduwang/hello-world.git (fetch)
origin https://github.com/iiieduwang/hello-world.git (push)
E:\fromgit\git pull origin master
remote: Counting objects: 14, done.
remote: Compressing objects: 100% (9/9), done.
remote: Total 14 (delta 1), reused 14 (delta 1), pack-reused 0
Unpacking objects: 100% (14/14), done.
From https://github.com/iiieduwang/hello-world
 * branch
           master -> FETCH_HEAD
 * [new branch] master -> origin/master
```



透過 README.md 說明Repo的內容





ignore file

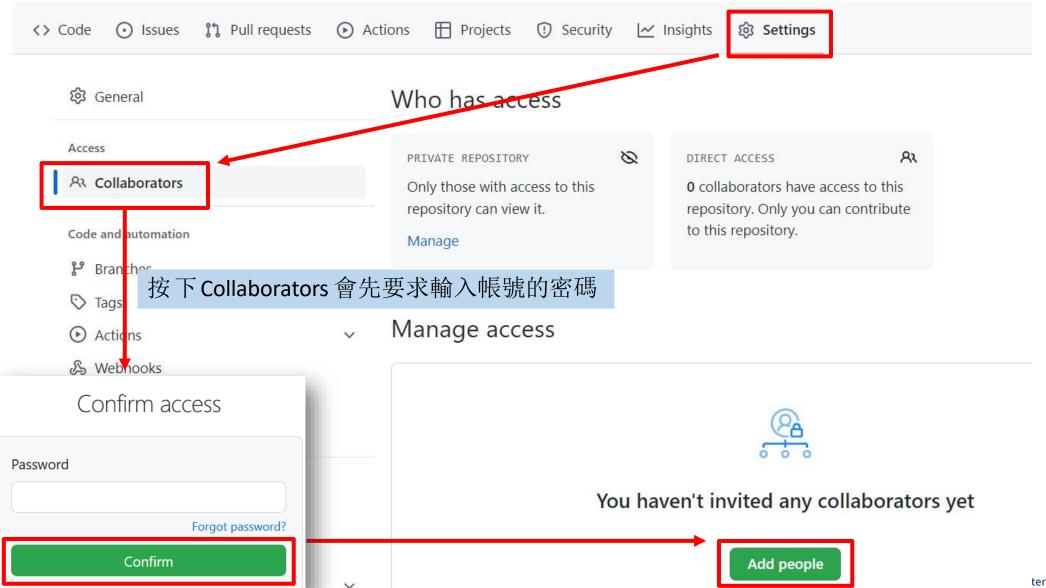
- 紀錄不想被Git管理的檔案
- 在工作目錄中放一個.gitignore檔案

```
    ◆ .gitignore ×
    1 #忽略log目錄下的所有檔案
    2 log/
    3 #忽略config.json檔案
    5 config.json
    6
    7 #忽略所有附檔名是.tmp的檔案
    8 *.tmp
```

- Github提供了.gitignore檔案的範例
 - https://github.com/github/gitignore
 - https://www.toptal.com/developers/gitignore

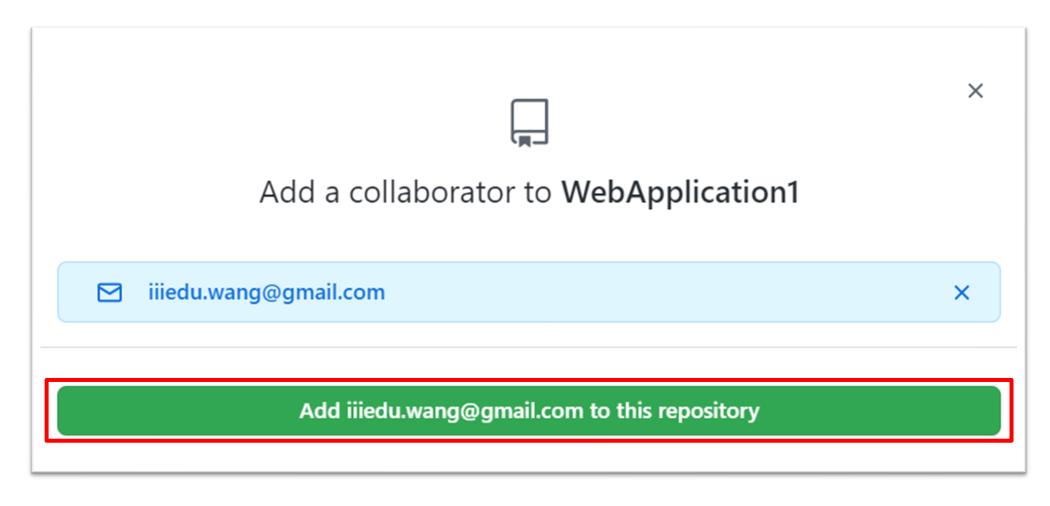


新增團隊成員





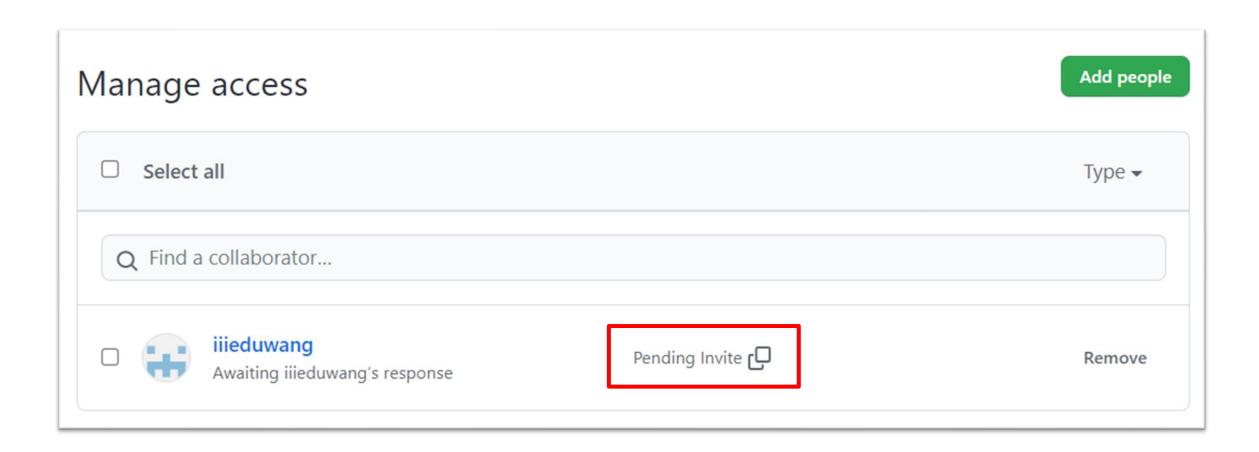
透過帳號或電子郵件找到團隊成員



按下按鈕後會發一封請團隊成員確認的電子郵件



等候團隊成員的同意





團隊成員收到邀請的電子郵件



@HsiaoHungWang has invited you to collaborate on the

HsiaoHungWang/WebApplication1 repository

You can accept or decline this invitation. You can also head over to https://github.com/ HsiaoHungWang/WebApplication1 to check out the repository or visit @HsiaoHungWang to learn a bit more about them.

This invitation will expire in 7 days.

7天内要接受邀請

View invitation

按下[Accept Invitation] 按鈕,接收邀請



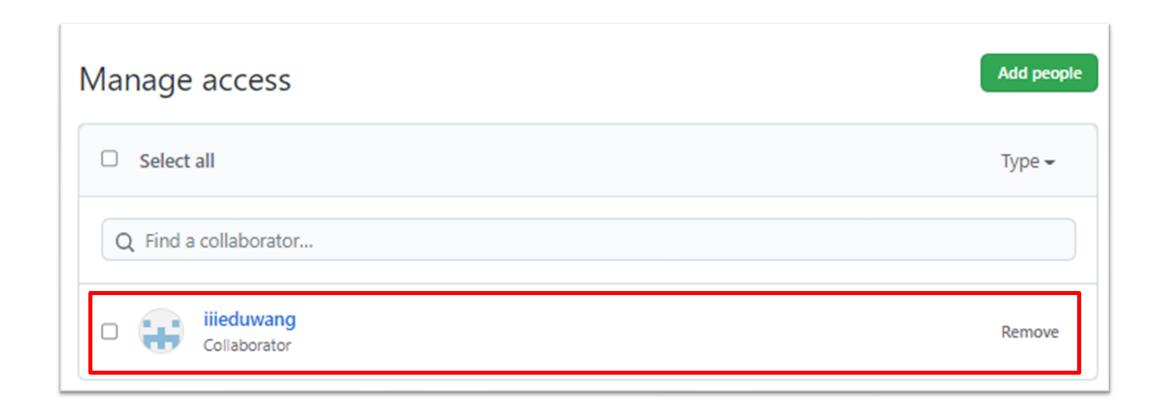
HsiaoHungWang invited you to collaborate

Accept invitation Decline

- Owners of WebApplication1 will be able to see:
- Your public profile information
- Certain activity within this repository
- Country of request origin
- · Your access level for this repository



完成邀請團隊成員的流程





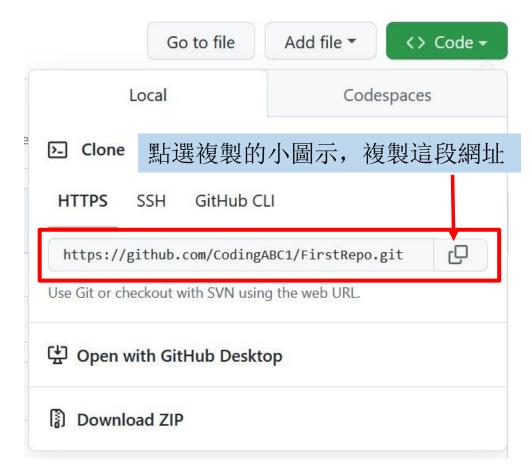
團隊成員下載 Github上的Repo

git clone https://github.com/CodingABC1/.....

將複製的網址貼到clone 的指令之後

之後團隊成員修改檔案要做版本控管就是:

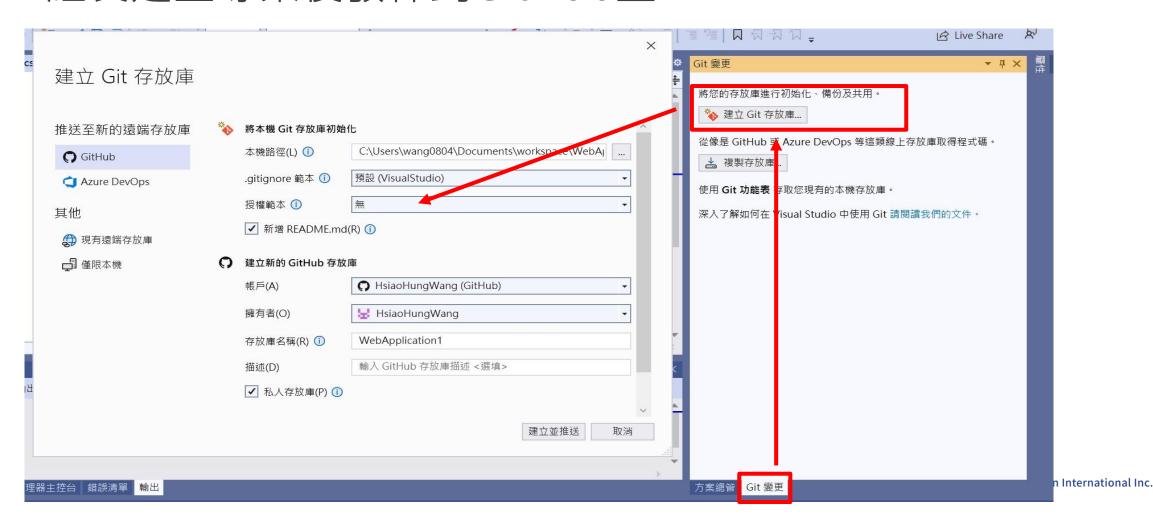
- 在本機上使用
 - git add <file>
 - git commit –m '....'
- 將本機上的版本推到Github
 - git push





在 Visual Studio 使用 Git

● 組長建立專案後發佈到GitHub上



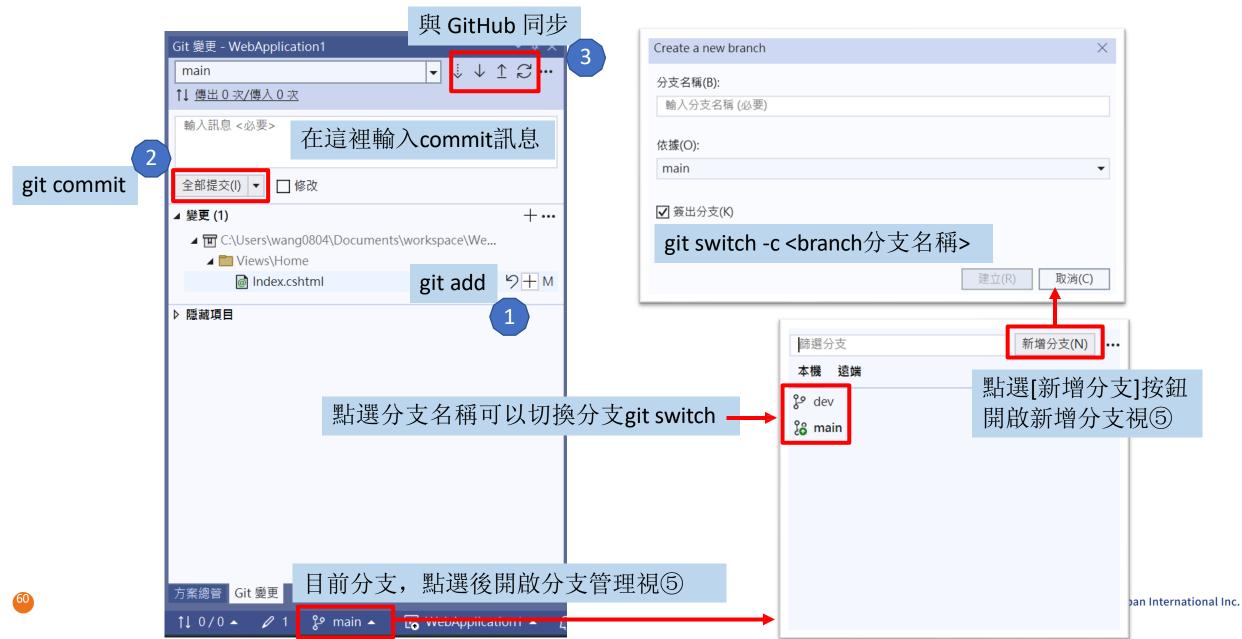


組員從 GitHub 複製儲存庫





程式修改後Git的處理





Thank you