

Git Command 101

把Git當成RCS使用的指令備忘（沒有pull, push...）

create initial repository

進入想要建立git repository的目錄之後，使用git init就可以將那個目錄轉換成git repository。

```
terence-mba:Site tzuyichao$ git init
Initialized empty Git repository in /Users/tzuyichao/lab/git/Site/.git/
terence-mba:Site tzuyichao$ ls -al
total 0
drwxr-xr-x  3 tzuyichao  staff  102  4 11 20:46 .
drwxr-xr-x  3 tzuyichao  staff  102  4 11 20:46 ..
drwxr-xr-x 10 tzuyichao  staff  340  4 11 20:46 .git
```

clone git repository

不管是clone自己的git repository或者從網路上clone open source git repository，clone之後就是在自己環境的一份git repository。

下面的例子就是clone jquery下來到我的機器上。

```
terence-mba:tmp tzuyichao$ git clone git://github.com/jquery/jquery.git
Cloning into jquery...
remote: Counting objects: 21783, done.
remote: Compressing objects: 100% (5643/5643), done.
remote: Total 21783 (delta 15762), reused 21473 (delta 15565)
Receiving objects: 100% (21783/21783), 13.15 MiB | 351 KiB/s, done.
Resolving deltas: 100% (15762/15762), done.
```

basic operations

add file to git repository

使用git add將檔案加入，然後再用git commit把檔案check in。

```
terence-mba:Site tzuyichao$ ls
index.html
terence-mba:Site tzuyichao$ git add index.html
terence-mba:Site tzuyichao$ echo "second file" > second.html
terence-mba:Site tzuyichao$ ls
index.html  second.html
terence-mba:Site tzuyichao$ git commit -m "Initial content" \> --
author="Terence Chao <tzuyichao@mail2000.com.tw>"
[master (root-commit) 4eaff7f] Initial content
Author: Terence Chao <tzuyichao@mail2000.com.tw>
Committer: Chao TzuYi <tzuyichao@61-64-140-104-adsl-tpe.dynamic.so-net.net.tw>
Your name and email address were configured automatically based
on your username and hostname. Please check that they are accurate.
You can suppress this message by setting them explicitly:
```

```
git config --global user.name "Your Name"
git config --global user.email you@example.com
```

After doing this, you may fix the identity used for this commit with:

```
git commit --amend --reset-author
```

```
1 files changed, 9 insertions(+), 0 deletions(-)
create mode 100644 index.html
```

如果要同時放多個檔案的例子

```

terence-mba:Site tzuyichao$ git add first.html
terence-mba:Site tzuyichao$ git add second.html
terence-mba:Site tzuyichao$ git status
# On branch master
# Changes to be committed:
#   (use "git reset HEAD <file>..." to unstage)
#
#       new file:   first.html
#       new file:   second.html
#
terence-mba:Site tzuyichao$ git commit -m "first.html and second.html add repository" \
> --author="Terence Chao <tzuyichao@mail2000.com.tw>"
[master af2ac67] first.html and second.html add repository
Author: Terence Chao <tzuyichao@mail2000.com.tw>
Committer: Chao TzuYi <tzuyichao@61-64-140-104-adsl-tpe.dynamic.so-net.net.tw>
Your name and email address were configured automatically based
on your username and hostname. Please check that they are accurate.
You can suppress this message by setting them explicitly:

    git config --global user.name "Your Name"
    git config --global user.email you@example.com

```

After doing this, you may fix the identity used for this commit with:

```

git commit --amend --reset-author

2 files changed, 2 insertions(+), 0 deletions(-)
create mode 100644 first.html
create mode 100644 second.html

```

一般來說，我們程式碼不會全部都在同一個目錄，有可能會忘記哪些檔案已經要加入git repository，可以透過git status指令來看看狀況。

check commit log

```

terence-mba:Site tzuyichao$ git log
commit af2ac67eea4b5d2aedc08ee8d2ccfe38f2a4436c
Author: Terence Chao <tzuyichao@mail2000.com.tw>
Date:   Wed Apr 11 21:02:54 2012 +0800

    first.html and second.html add repository

commit 4eaff7f082f4079cfde7ed2d154fb8045188a169
Author: Terence Chao <tzuyichao@mail2000.com.tw>
Date:   Wed Apr 11 20:58:49 2012 +0800

    Initial content

```

可以看到有兩次commit的紀錄，但是沒有跟我們說，這兩次異動了哪些東西。如果我們想看每次commit的內容就要透過git show指令，如果沒有給任何參數則會取得最近一次commit的內容。如果加上識別碼，就可以看到那次commit的內容。

```

terence-mba:Site tzuyichao$ git show
commit af2ac67eea4b5d2aedc08ee8d2ccfe38f2a4436c
Author: Terence Chao <tzuyichao@mail2000.com.tw>
Date:   Wed Apr 11 21:02:54 2012 +0800

    first.html and second.html add repository

diff --git a/first.html b/first.html
new file mode 100644
index 0000000..303ff98
--- /dev/null
+++ b/first.html

```

```
@@ -0,0 +1 @@
+first file
diff --git a/second.html b/second.html
new file mode 100644
index 0000000..1c59427
--- /dev/null
+++ b/second.html
@@ -0,0 +1 @@
+second file
```

跟下面這個比較一下就知道

```
terence-mba:Site tzuyichao$ git show af2ac67eea4b5d2aedc08ee8d2ccfe38f2a4436c
commit af2ac67eea4b5d2aedc08ee8d2ccfe38f2a4436c
Author: Terence Chao <tzuyichao@mail2000.com.tw>
Date:   Wed Apr 11 21:02:54 2012 +0800
```

first.html and second.html add repository

```
diff --git a/first.html b/first.html
new file mode 100644
index 0000000..303ff98
--- /dev/null
+++ b/first.html
@@ -0,0 +1 @@
+first file
diff --git a/second.html b/second.html
new file mode 100644
index 0000000..1c59427
--- /dev/null
+++ b/second.html
@@ -0,0 +1 @@
+second file
```

remove file from git repository

要從git repository刪除檔案就用git rm

```
terence-mba:Site tzuyichao$ git rm second.html
rm 'second.html'
terence-mba:Site tzuyichao$ git commit -m "remove second.html"
[master ed9d190] remove second.html
Committer: Chao TzuYi <tzuyichao@61-64-140-104-adsl-tpe.dynamic.so-net.net.tw>
Your name and email address were configured automatically based
on your username and hostname. Please check that they are accurate.
You can suppress this message by setting them explicitly:
```

```
git config --global user.name "Your Name"
git config --global user.email you@example.com
```

After doing this, you may fix the identity used for this commit with:

```
git commit --amend --reset-author
```

```
1 files changed, 0 insertions(+), 1 deletions(-)
delete mode 100644 second.html
```

rename file

做法是先mv將檔案改名，然後使用git rm由git repository刪除原本檔案。

```
terence-mba:Site tzuyichao$ mv first.html uno.html
terence-mba:Site tzuyichao$ git rm first.html
rm 'first.html'
terence-mba:Site tzuyichao$ git add uno.html
```

```
terence-mba:Site tzuyichao$ git commit -m "rename first to uno"
[master 5db1317] rename first to uno
Committer: Chao TzuYi <tzuyichao@61-64-140-104-adsl-tpe.dynamic.so-net.net.tw>
Your name and email address were configured automatically based
on your username and hostname. Please check that they are accurate.
You can suppress this message by setting them explicitly:
```

```
git config --global user.name "Your Name"
git config --global user.email you@example.com
```

After doing this, you may fix the identity used for this commit with:

```
git commit --amend --reset-author
```

```
1 files changed, 0 insertions(+), 0 deletions(-)
rename first.html => uno.html (100%)
```

diff two commit

先修改index.html改一下title內容，然後commit一個版本進去。

```
terence-mba:Site tzuyichao$ git add index.html
terence-mba:Site tzuyichao$ git commit -m "change title"
[master 445146e] change title
Committer: Chao TzuYi <tzuyichao@61-64-140-104-adsl-tpe.dynamic.so-net.net.tw>
Your name and email address were configured automatically based
on your username and hostname. Please check that they are accurate.
You can suppress this message by setting them explicitly:
```

```
git config --global user.name "Your Name"
git config --global user.email you@example.com
```

After doing this, you may fix the identity used for this commit with:

```
git commit --amend --reset-author
```

```
1 files changed, 1 insertions(+), 1 deletions(-)
```

接著透過git log找到兩個要比較的commit識別碼，之後使用git diff就可以比較兩次commit內容的差異。

```
terence-mba:Site tzuyichao$ git log
commit 445146e79a61f19c68df8dcdf78d04f38a23f3b2
Author: Chao TzuYi <tzuyichao@61-64-140-104-adsl-tpe.dynamic.so-net.net.tw>
Date: Wed Apr 11 21:39:35 2012 +0800
```

```
change title
```

```
commit 5db131745a4dbae073b8559a09931909e49d9867
Author: Chao TzuYi <tzuyichao@61-64-140-104-adsl-tpe.dynamic.so-net.net.tw>
Date: Wed Apr 11 21:32:10 2012 +0800
```

```
rename first to uno
```

```
commit ed9d1902dca91333bac26b4213dc2683b7850a19
Author: Chao TzuYi <tzuyichao@61-64-140-104-adsl-tpe.dynamic.so-net.net.tw>
Date: Wed Apr 11 21:25:33 2012 +0800
```

```
remove second.html
```

```
commit af2ac67eea4b5d2aedc08ee8d2ccfe38f2a4436c
Author: Terence Chao <tzuyichao@mail2000.com.tw>
Date: Wed Apr 11 21:02:54 2012 +0800
```

first.html and second.html add repository

```
commit 4eaff7f082f4079cfde7ed2d154fb8045188a169
Author: Terence Chao <tzuyichao@mail2000.com.tw>
Date:   Wed Apr 11 20:58:49 2012 +0800
```

Initial content

```
terence-mba:Site tzuyichao$ git diff 445146e79a61f19c68df8dcaf78d04f38a23f3b2
4eaff7f082f4079cfde7ed2d154fb8045188a169
diff --git a/index.html b/index.html
index f0c97b4..24a5c93 100644
--- a/index.html
+++ b/index.html
@@ -1,7 +1,7 @@
<!DOCTYPE html>
<html>
<head>
-   <title>git example</title>
+   <title>Hello, World</title>
</head>
<body>
  <h1>It's Works!!</h1>
diff --git a/uno.html b/uno.html
deleted file mode 100644
index 303ff98..0000000
--- a/uno.html
+++ /dev/null
@@ -1 +0,0 @@
-first file
```

config

有沒有發現後來偷懶沒打--author的後果，少了Author只有Committer。另外有沒有注意到下git commit的時候的訊息？

You can suppress this message by setting them explicitly:

```
git config --global user.name "Your Name"
git config --global user.email you@example.com
```

After doing this, you may fix the identity used for this commit with:

```
git commit --amend --reset-author
```

Git有三個level的config file

- *.git/config* 這個是該*git repository*本身的設定（使用--file）
- *~/.gitconfig* 這個是使用者*level*的設定（使用--global）
- */etc/gitconfig* 這個是整個系統的設定（如果有權限，使用--system）

```
terence-mba:Site tzuyichao$ cat ~/.gitconfig
cat: /Users/tzuyichao/.gitconfig: No such file or directory
terence-mba:Site tzuyichao$ git config --global user.name "Terence Chao"
terence-mba:Site tzuyichao$ cat ~/.gitconfig
[user]
  name = Terence Chao
terence-mba:Site tzuyichao$ git config --global user.email
"tzuyichao@mail2000.com.tw"
terence-mba:Site tzuyichao$ cat ~/.gitconfig
[user]
  name = Terence Chao
  email = tzuyichao@mail2000.com.tw
```

簡單的例子，在沒有設定任何configuration到user level的時候，在user home沒有.gitconfig。當我使用git config --global開始設定的時候就可以看到git做出這個設定檔。我們可以直接用cat看或者用vi來修改這個檔案內容。

branch

列出分支名稱和目前使用的分支

```
terence-mba:Site tzuyichao$ git branch
* master
```

下面這個例子就是建立了一個分支，但是還沒開始使用新建立的分支來進行開發。因為在這個例子中，可以看到使用git branch project建立分支之後，再執行git branch看到星號標示master。

```
terence-mba:Site tzuyichao$ git branch
* master
terence-mba:Site tzuyichao$ git branch project
terence-mba:Site tzuyichao$ git branch
* master
  project
```

此時如果要切換到project branch則要透過git checkout取出想要的分支

```
terence-mba:Site tzuyichao$ git checkout project
Switched to branch 'project'
terence-mba:Site tzuyichao$ git branch
  master
* project
```

先來看看刪除分支，加上-d就可以刪除分支，下面這個例子可以知道，不能刪除正在使用的分支，因此必須使用git checkout取得master之後，才能刪除project這個分支。

```
terence-mba:Site tzuyichao$ git branch -d project
error: Cannot delete the branch 'project' which you are currently on.
terence-mba:Site tzuyichao$ git checkout master
Switched to branch 'master'
terence-mba:Site tzuyichao$ git branch -d project
Deleted branch project (was 7f799a7).
terence-mba:Site tzuyichao$ git branch
* master
```

下面的例子，建立一個branch prj/clojure，然後checkout prj/clojure，然後修改一下index.html加上include general.js。之後在commit git repository，可以看到這個異動是在prj/clojure這個branch。

```
terence-mba:Site tzuyichao$ git branch prj/clojure
terence-mba:Site tzuyichao$ git branch
* master
  prj/clojure
terence-mba:Site tzuyichao$ git checkout prj/clojure
Switched to branch 'prj/clojure'
terence-mba:Site tzuyichao$ ll
total 16
drwxr-xr-x  6 tzuyichao  staff  204  4 16 20:59 .
drwxr-xr-x  3 tzuyichao  staff  102  4 11 20:46 ..
drwxr-xr-x 14 tzuyichao  staff  476  4 17 07:39 .git
-rw-r--r--  1 tzuyichao  staff  118  4 11 21:37 index.html
drwxr-xr-x  3 tzuyichao  staff  102  4 16 21:00 js
```

```
-rw-r--r--  1 tzuyichao  staff   11  4 11 21:01 uno.html
terence-mba:Site tzuyichao$ vi index.html
terence-mba:Site tzuyichao$ git add index.html
terence-mba:Site tzuyichao$ git commit -m "include general.js"
[prj/clojure 2c9612e] include general.js
1 files changed, 1 insertions(+), 0 deletions(-)
```

接著來驗證一下

```
terence-mba:Site tzuyichao$ git show
commit 2c9612e5aa3850442d24cdf2c4aeff78f51fde94
Author: Terence Chao <tzuyichao@mail2000.com.tw>
Date:   Tue Apr 17 08:32:11 2012 +0800
```

```
    include general.js
```

```
diff --git a/index.html b/index.html
index f0c97b4..c3d02bd 100644
--- a/index.html
+++ b/index.html
@@ -2,6 +2,7 @@
<html>
<head>
  <title>git example</title>
+  <script src="js/general.js"></script>
</head>
<body>
  <h1>It's Works!!</h1>
```

```
terence-mba:Site tzuyichao$ git checkout master
Switched to branch 'master'
terence-mba:Site tzuyichao$ git show
commit 7f799a763c49889986bf3e231fa13267b3d40823
Author: Terence Chao <tzuyichao@mail2000.com.tw>
Date:   Mon Apr 16 21:01:00 2012 +0800
```

```
    js function
```

```
diff --git a/js/general.js b/js/general.js
new file mode 100644
index 0000000..0d9fcc7
--- /dev/null
+++ b/js/general.js
@@ -0,0 +1,3 @@
+window.onload = function() {
+  console.log( "window.onload" );
+};
```

在prj/clojure branch使用git show看一下最近那一次異動，然後checkout master branch，一樣使用git show看最近一筆異動。是把general.js加到git repository。不放心還可以cat index.html看一下。

接著，就把prj/clojure的異動merge到master，如果沒有衝突就會直接commit。也就是說如果有衝突產生就要解除之後自己commit。

```
terence-mba:Site tzuyichao$ cat index.html
<!DOCTYPE html>
<html>
<head>
  <title>git example</title>
  <script src="js/general.js"></script>
</head>
<body>
```

```

    <h1>It's Works!!</h1>
</body>
</html>
terence-mba:Site tzuyichao$ git checkout master
Switched to branch 'master'
terence-mba:Site tzuyichao$ cat index.html
<!DOCTYPE html>
<html>
<head>
  <title>git example</title>
</head>
<body>
  <h1>It's Works!!</h1>
</body>
</html>
terence-mba:Site tzuyichao$ git merge prj/clojure
Updating 7f799a7..2c9612e
Fast-forward
 index.html |      1 +
 1 files changed, 1 insertions(+), 0 deletions(-)
terence-mba:Site tzuyichao$ cat index.html
<!DOCTYPE html>
<html>
<head>
  <title>git example</title>
  <script src="js/general.js"></script>
</head>
<body>
  <h1>It's Works!!</h1>
</body>
</html>

```

還有一個指令可以看更詳細branch的資訊

```

terence-mba:Site tzuyichao$ git show-branch
* [master] include general.js
! [prj/clojure] include general.js
--
*+ [master] include general.js

```

tag

```

terence-mba:Site tzuyichao$ git tag -m "first release" v1.0
terence-mba:Site tzuyichao$ git rev-parse v1.0
22efa4760e092bc1260a4b7b3d3338d985f2bc81
terence-mba:Site tzuyichao$ git cat-file -p
22efa4760e092bc1260a4b7b3d3338d985f2bc81
object 7f799a763c49889986bf3e231fa13267b3d40823
type commit
tag v1.0
tagger Terence Chao <tzuyichao@mail2000.com.tw> Mon Apr 16 21:05:26 2012 +0800

first release
terence-mba:Site tzuyichao$ git tag -l
v1.0

```

送出去的是v1.0這個標記物件，指向一個樹狀結構


```

terence-mba:Site tzuyichao$ git cat-file -p
7f799a763c49889986bf3e231fa13267b3d40823
tree 937b570be0cf2e4437055a01ffdd62e91bdc746d
parent 445146e79a61f19c68df8dc78d04f38a23f3b2
author Terence Chao <tzuyichao@mail2000.com.tw> 1334581260 +0800
committer Terence Chao <tzuyichao@mail2000.com.tw> 1334581260 +0800

js function
terence-mba:Site tzuyichao$ git cat-file -p
937b570be0cf2e4437055a01ffdd62e91bdc746d
100644 blob f0c97b4cd9a79f498ceb8f79d3ecabe21f201fea index.html
040000 tree 5248c1ca913f4378438716b938c78ad33531f2be js
100644 blob 303ff981c488b812b6215f7db7920dedb3b59d9a uno.html
terence-mba:Site tzuyichao$ git cat-file -p
5248c1ca913f4378438716b938c78ad33531f2be
100644 blob 0d9fcc718a331968483043c2d6bafb60ff663d54 general.js

```

Tag vs Branch

自己的感想

貼release版號的時候用tag，branch則是用在開發專案或bug fix不影響main開發流程的東西。

revert

git reset可以讓我們重置到某個階段，可以有幾個狀況可以選擇

1. 消除commit資訊，檔案內容保留 (git reset --soft)

在index.html加一行<p>test reset</p>，commit到git repository之後，反悔但是希望檔案的異動還是留著。就可以用這個做法。

reset要填的是前一個commit的SHA value。

```

terence-mba:Site tzuyichao$ vi index.html
terence-mba:Site tzuyichao$ git add index.html
terence-mba:Site tzuyichao$ git commit -m "test reset commit"
[master a219562] test reset commit
1 files changed, 1 insertions(+), 0 deletions(-)
terence-mba:Site tzuyichao$ git log
commit a219562e3a405c6726f9d1097d6721c325c9a29b
Author: Terence Chao <tzuyichao@mail2000.com.tw>
Date: Tue Apr 17 11:41:43 2012 +0800

    test reset commit

commit 6d2c5fdfea8198736fa23aecc3d24bb0eb3dc83b
Author: Terence Chao <tzuyichao@mail2000.com.tw>
Date: Tue Apr 17 11:13:55 2012 +0800

    Revert "Revert "js function""

    This reverts commit c954937bf7628e631e5da59619343d5baeaca234.

...省略

terence-mba:Site tzuyichao$ cat index.html
<!DOCTYPE html>
<html>
<head>
    <title>git example</title>
    <script src="js/general.js"></script>
</head>

```

```
<body>
  <h1>It's Works!!</h1>
  <p>test reset</p>
</body>
</html>
```

```
terence-mba:Site tzuyichao$ git reset 6d2c5fdfea8198736fa23aecc3d24bb0eb3dc83b
Unstaged changes after reset:
```

```
M    index.html
```

```
terence-mba:Site tzuyichao$ git log
commit 6d2c5fdfea8198736fa23aecc3d24bb0eb3dc83b
Author: Terence Chao <tzuyichao@mail2000.com.tw>
Date:   Tue Apr 17 11:13:55 2012 +0800
```

```
    Revert "Revert "js function""
```

```
    This reverts commit c954937bf7628e631e5da59619343d5baeaca234.
```

...省略

```
terence-mba:Site tzuyichao$ cat index.html
<!DOCTYPE html>
<html>
<head>
  <title>git example</title>
  <script src="js/general.js"></script>
</head>
<body>
  <h1>It's Works!!</h1>
  <p>test reset</p>
</body>
</html>
```

2. 消除commit資訊和異動的檔案內容 (git reset --hard)

使用git reset --hard 前一個SHA value這樣就可以讓檔案和commit資訊都回到前一個版本。

```
terence-mba:Site tzuyichao$ cat index.html
<!DOCTYPE html>
<html>
<head>
  <title>git example</title>
  <script src="js/general.js"></script>
</head>
<body>
  <h1>It's Works!!</h1>
  <p>test reset</p>
</body>
</html>
terence-mba:Site tzuyichao$ git add index.html
terence-mba:Site tzuyichao$ git commit -m "add for test"
[master e312836] add for test
 1 files changed, 1 insertions(+), 0 deletions(-)
terence-mba:Site tzuyichao$ git log
commit e312836b109fadf8757e03960b64385d32852834
Author: Terence Chao <tzuyichao@mail2000.com.tw>
Date:   Tue Apr 17 14:55:23 2012 +0800

    add for test

commit 6d2c5fdfea8198736fa23aecc3d24bb0eb3dc83b
Author: Terence Chao <tzuyichao@mail2000.com.tw>
Date:   Tue Apr 17 11:13:55 2012 +0800
```

```
Revert "Revert "js function""
```

```
This reverts commit c954937bf7628e631e5da59619343d5baeaca234.
```

...省略

```
terence-mba:Site tzuyichao$ git reset --hard
6d2c5fdfea8198736fa23aecc3d24bb0eb3dc83b
HEAD is now at 6d2c5fd Revert "Revert "js function""
terence-mba:Site tzuyichao$ cat index.html
<!DOCTYPE html>
<html>
<head>
  <title>git example</title>
  <script src="js/general.js"></script>
</head>
<body>
  <h1>It's Works!!</h1>
</body>
</html>
```

3. 消除git add的動作 (`git reset --mixed`) (default)

```
terence-mba:Site tzuyichao$ vi index.html
terence-mba:Site tzuyichao$ git add index.html
terence-mba:Site tzuyichao$ git status
# On branch master
# Changes to be committed:
#   (use "git reset HEAD <file>..." to unstage)
#
#       modified:   index.html
#
terence-mba:Site tzuyichao$ git reset -- index.html
Unstaged changes after reset:
M   index.html
terence-mba:Site tzuyichao$ git status
# On branch master
# 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:   index.html
#
no changes added to commit (use "git add" and/or "git commit -a")
```

git revert不會改變commit記錄，會再產生一個commit記錄
git revert [SHA]然後用git log就可以看到多一筆記錄

misc version

```
terence-mba:Site tzuyichao$ git --version
git version 1.7.5.4
```

grep

```
terence-mba:Site tzuyichao$ git grep html
index.html:<!DOCTYPE html>
index.html:<html>
```

index.html:</html>