

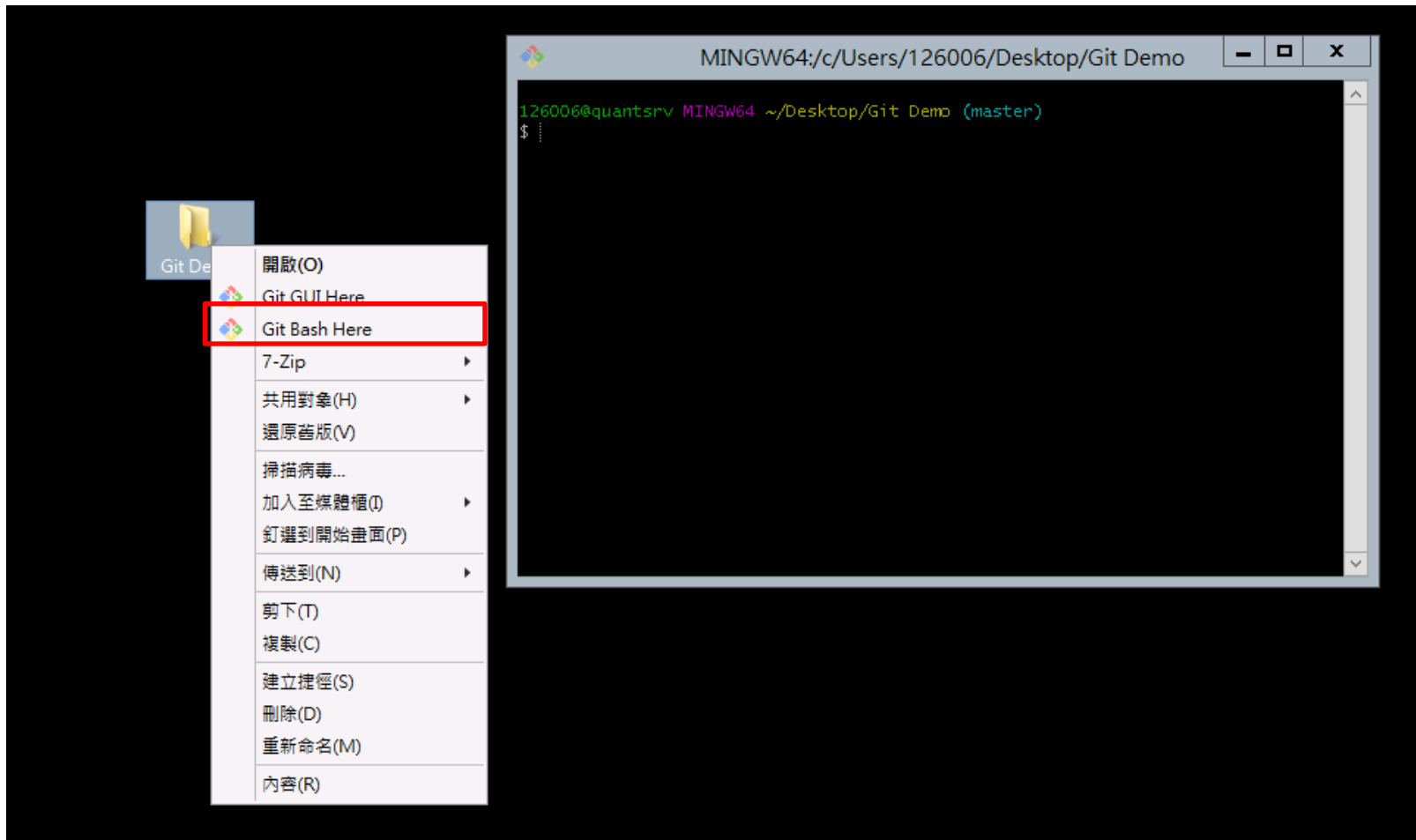
Git操作介紹

以RND_Calibration上版為例

Hank

2018/05/18

Create a Git repository



Create an Empty Git repository

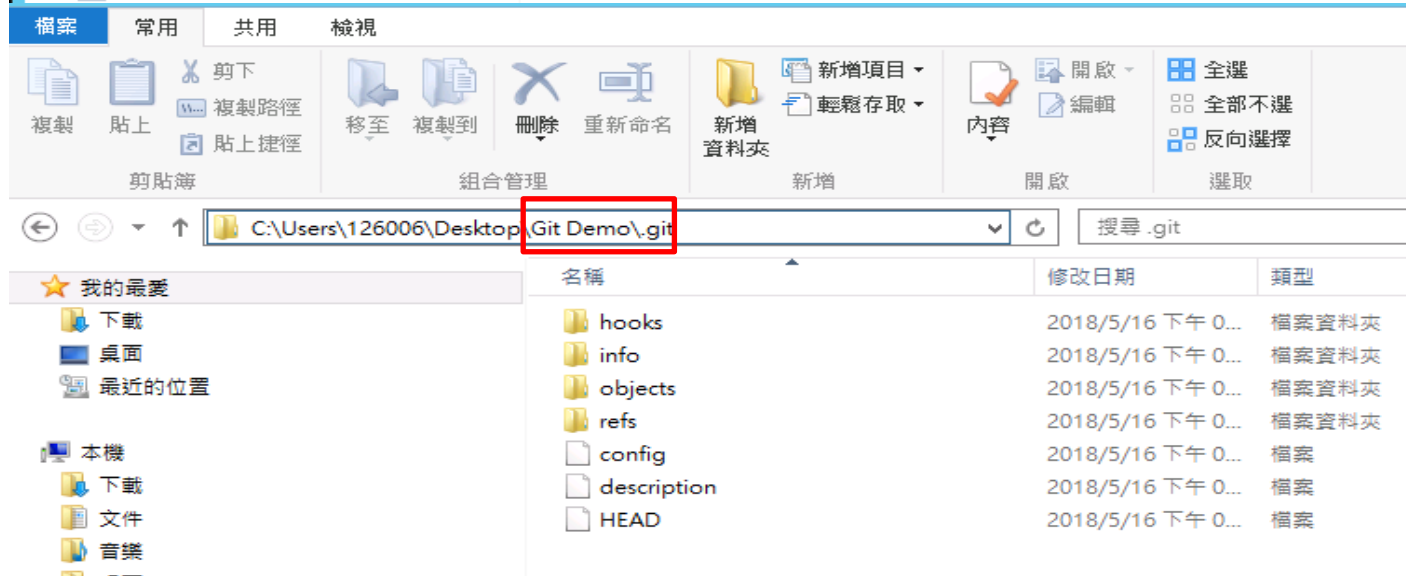
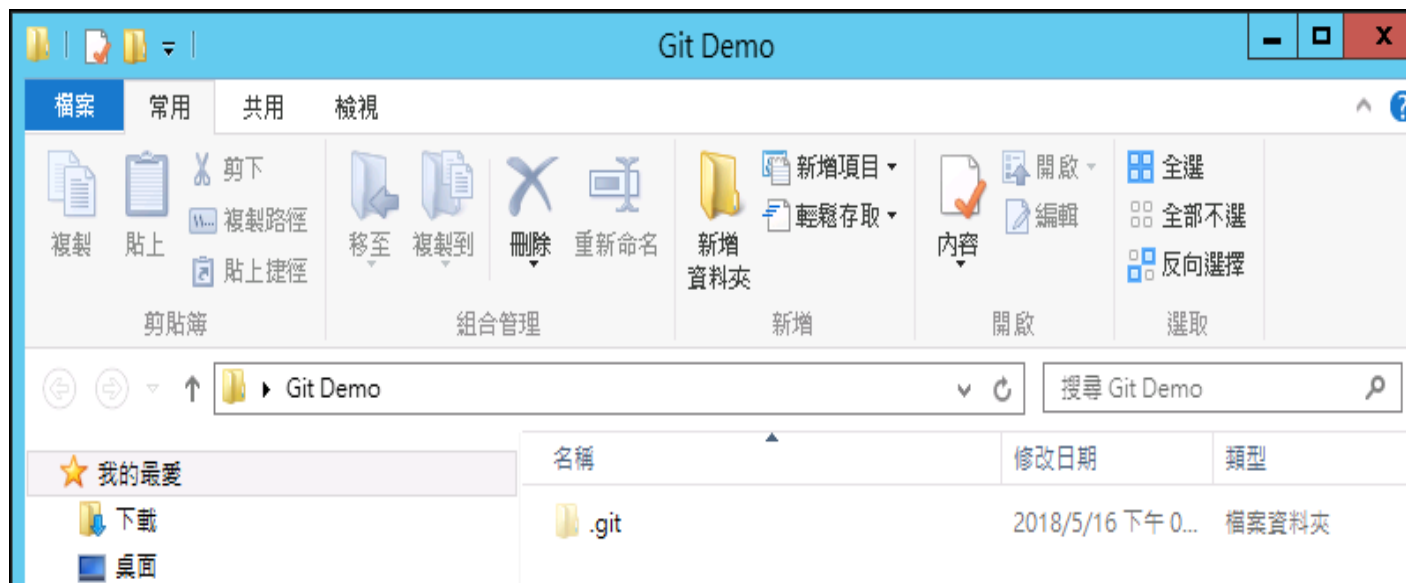


```
MINGW64:/c/Users/126006/Desktop/Git Demo

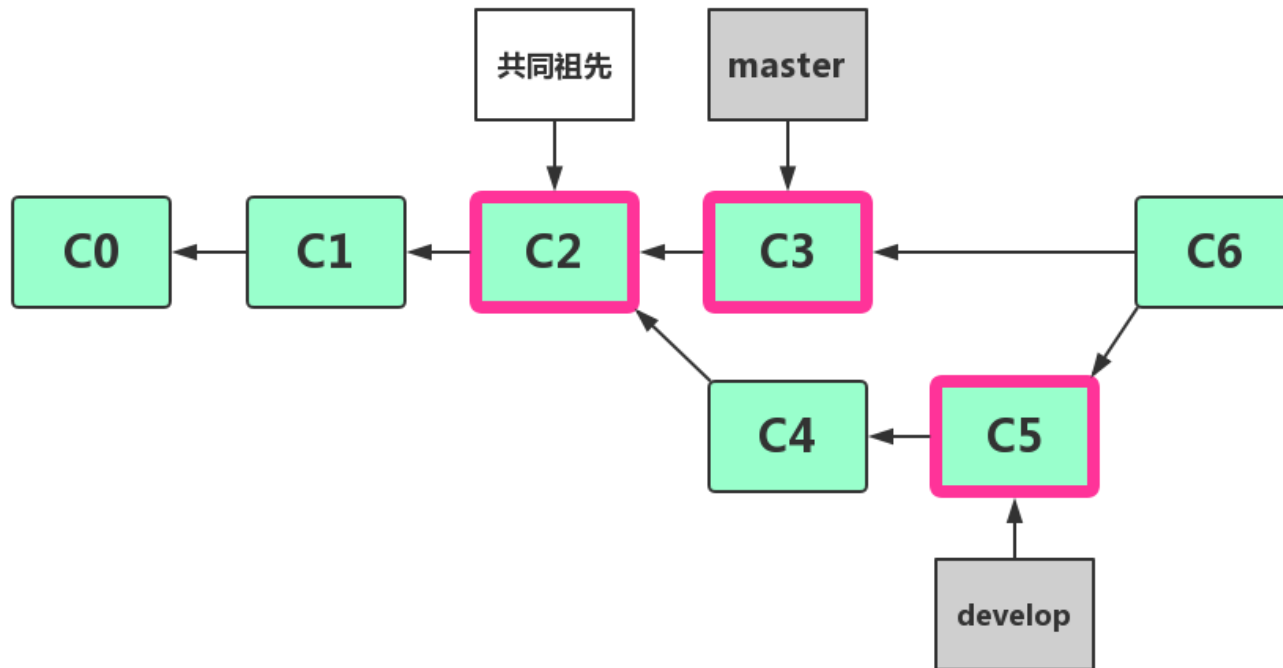
126006@quantsrv MINGW64 ~/Desktop/Git Demo (master)
$ git init
Initialized empty Git repository in C:/Users/126006/Desktop/Git Demo/.git/

126006@quantsrv MINGW64 ~/Desktop/Git Demo (master)
$ |
```

The image shows a terminal window with a blue title bar that reads "MINGW64:/c/Users/126006/Desktop/Git Demo". The terminal content shows a user named "126006@quantsrv" in a "MINGW64" environment at the directory "~/Desktop/Git Demo" on the "master" branch. They execute the command `$ git init`, which results in the message "Initialized empty Git repository in C:/Users/126006/Desktop/Git Demo/.git/". The prompt then returns to `$ |`.



Git branch



Git 新增檔案

```
MINGW64:/c/Users/126006/Desktop/

126006@quantsrv MINGW64 ~/Desktop/Git Demo (master)
$ git init
Initialized empty Git repository in C:/Users/126006/Desktop/Git Demo/.git/

126006@quantsrv MINGW64 ~/Desktop/Git Demo (master)
$ echo > a.txt

126006@quantsrv MINGW64 ~/Desktop/Git Demo (master)
$ git add .
warning: LF will be replaced by CRLF in a.txt.
The file will have its original line endings in your working directory.

126006@quantsrv MINGW64 ~/Desktop/Git Demo (master)
$ git commit -m "Initial commit"
[master (root-commit) 959ca9f] Initial commit
Committer: 謝明翰 <126006@kgibank.com>
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. Run the
following command and follow the instructions in your editor to edit
your configuration file:

    git config --global --edit

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

    git commit --amend --reset-author

1 file changed, 1 insertion(+)
create mode 100644 a.txt

126006@quantsrv MINGW64 ~/Desktop/Git Demo (master)
$
```

新增一個txt檔

告訴Git server提交
這次修改

Git 新增branch

在feature branch
的資料夾，現在
有a, b兩個檔案

```
126006@quantsrv MINGW64 ~/Desktop/Git Demo (master)
```

```
$ git branch
```

```
* master    修改日期    類型
```

```
126006@quantsrv MINGW64 ~/Desktop/Git Demo (master)
```

```
$ git checkout -b feature
```

```
Switched to a new branch 'feature'
```

```
126006@quantsrv MINGW64 ~/Desktop/Git Demo (feature)
```

```
$ git branch
```

```
* feature  
master
```

```
126006@quantsrv MINGW64 ~/Desktop/Git Demo (feature)
```

```
$ echo 2 > b.txt
```

```
126006@quantsrv MINGW64 ~/Desktop/Git Demo (feature)
```

```
$ git add .
```

```
warning: LF will be replaced by CRLF in b.txt.
```

```
The file will have its original line endings in your working directory.
```

```
126006@quantsrv MINGW64 ~/Desktop/Git Demo (feature)
```

```
$ git commit -m "Add b.txt"
```

```
[feature 861a2ad] Add b.txt
```

```
Committer: 謝明翰 <126006@kgibank.com>
```

```
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. Run the  
following command and follow the instructions in your editor to edit  
your configuration file:
```

```
git config --global --edit
```

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

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

```
1 file changed, 1 insertion(+)  
create mode 100644 b.txt
```

```
126006@quantsrv MINGW64 ~/Desktop/Git Demo (feature)
```

```
$ |
```

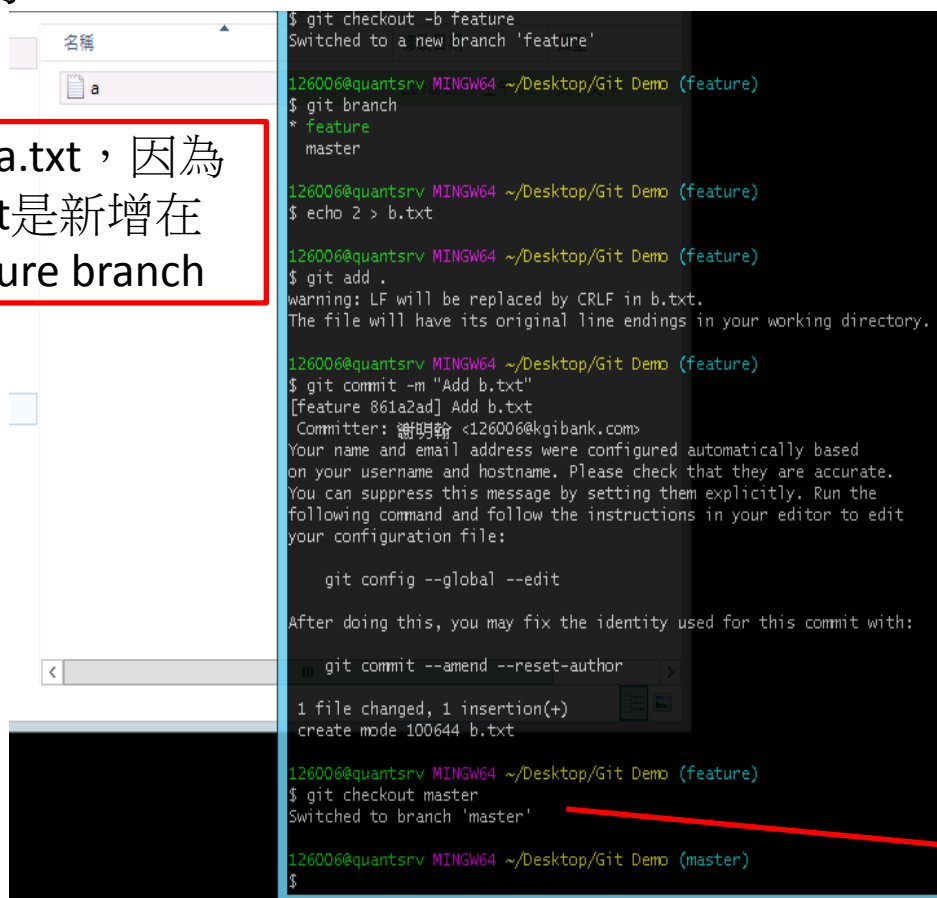
原先只有master
branch

新增feature branch

在feature branch新
增一個b.txt

- 在此同時的master branch

只有a.txt，因為
b.txt是新增在
feature branch



```
$ git checkout -b feature
Switched to a new branch 'feature'

126006@quantsrv MINGW64 ~/Desktop/Git Demo (feature)
$ git branch
* feature
  master

126006@quantsrv MINGW64 ~/Desktop/Git Demo (feature)
$ echo 2 > b.txt

126006@quantsrv MINGW64 ~/Desktop/Git Demo (feature)
$ git add .
warning: LF will be replaced by CRLF in b.txt.
The file will have its original line endings in your working directory.

126006@quantsrv MINGW64 ~/Desktop/Git Demo (feature)
$ git commit -m "Add b.txt"
[feature 861a2ad] Add b.txt
Committer: 謝明翰 <126006@kgibank.com>
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. Run the
following command and follow the instructions in your editor to edit
your configuration file:

    git config --global --edit

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

    git commit --amend --reset-author

1 file changed, 1 insertion(+)
create mode 100644 b.txt

126006@quantsrv MINGW64 ~/Desktop/Git Demo (feature)
$ git checkout master
Switched to branch 'master'

126006@quantsrv MINGW64 ~/Desktop/Git Demo (master)
$
```

查看master
branch

(新增一枝branch時，新branch會將master branch內容全部繼承)

Git merge branch

此時的master
branch中有兩個檔
案，a.txt和b.txt

```
$ cat a.txt
1
NEW LINE
2018/5/17 上午 0... 文字文件
126006@quantsrv MINGW64 ~/Desktop/Git Demo (master)
$ git add .
warning: LF will be replaced by CRLF in a.txt.
The file will have its original line endings in your working directory.
126006@quantsrv MINGW64 ~/Desktop/Git Demo (master)
$ git commit -m "Update a.txt: append NEW LINE"
[master 41b61a5] Update a.txt: append NEW LINE
Committer: 謝明翰 <126006@kgibank.com>
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. Run the
following command and follow the instructions in your editor to edit
your configuration file:

    git config --global --edit

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

    git commit --amend --reset-author

1 file changed, 1 insertion(+)
126006@quantsrv MINGW64 ~/Desktop/Git Demo (master)
$ git status
On branch master
nothing to commit, working tree clean
126006@quantsrv MINGW64 ~/Desktop/Git Demo (master)
$ git merge feature
Merge made by the 'recursive' strategy.
b.txt | 1 +
1 file changed, 1 insertion(+)
create mode 100644 b.txt
126006@quantsrv MINGW64 ~/Desktop/Git Demo (master)
$
```

在merge之前，先確保
在不同branch上

相較之前的master
branch，現在的master
branch多了b.txt檔案

Git檔案修改

```
126006@quantsrv MINGW64 ~/Desktop/Git Demo (master)
$ echo hello word > a.txt

126006@quantsrv MINGW64 ~/Desktop/Git Demo (master)
$ git status
git: 'status' is not a git command. See 'git --help'.

The most similar command is
    status

126006@quantsrv MINGW64 ~/Desktop/Git Demo (master)
$ 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:   a.txt

no changes added to commit (use "git add" and/or "git commit -a")

126006@quantsrv MINGW64 ~/Desktop/Git Demo (master)
$ git diff
warning: LF will be replaced by CRLF in a.txt.
The file will have its original line endings in your working directory.
diff --git a/a.txt b/a.txt
index 58fc33f..7fd5222 100644
--- a/a.txt
+++ b/a.txt
@@ -1,2 +1 @@
-1
-NEW LINE
+hello word

126006@quantsrv MINGW64 ~/Desktop/Git Demo (master)
```

將a.txt內容修改
為hello word

查看檔案前後差異

跟原先相比，刪了
一行、新增一行

Git告訴我們，少了1、NEW
LINE，多了hello word

Git檔案還原I(after commit)

檔案(F) 編輯(E) 格式(O) 檢視(V) 說明(H)

hello word

名稱

a

```
126006@quantsrv MINGW64 ~/Desktop/Git Demo (master)
$ git status
On branch master
nothing to commit, working tree clean

126006@quantsrv MINGW64 ~/Desktop/Git Demo (master)
$ git reset

126006@quantsrv MINGW64 ~/Desktop/Git Demo (master)
$ git reflog
53bdf40 (HEAD -> master) HEAD@{0}: reset: moving to HEAD
53bdf40 (HEAD -> master) HEAD@{1}: commit: modify a.txt
cb63e4b HEAD@{2}: merge feature: Merge made by the 'recursive' strategy.
41b61a5 HEAD@{3}: commit: Update a.txt: append NEW LINE
74a35e0 HEAD@{4}: checkout: moving from feature to master
861a2ad (feature) HEAD@{5}: checkout: moving from master to feature
74a35e0 HEAD@{6}: checkout: moving from feature to master
861a2ad (feature) HEAD@{7}: commit: Add b.txt
74a35e0 HEAD@{8}: checkout: moving from master to feature
74a35e0 HEAD@{9}: commit: Update a.txt
9f66006 HEAD@{10}: commit (initial): Initial commit(a.txt created)

126006@quantsrv MINGW64 ~/Desktop/Git Demo (master)
$ get reset --hard HEAD~2
bash: get: command not found

126006@quantsrv MINGW64 ~/Desktop/Git Demo (master)
$ git reset --hard HEAD~2
HEAD is now at 41b61a5 Update a.txt: append NEW LINE
```

查看過去修改紀錄

決定將檔案還元到合併之前

```

126006@quantsrv MINGW64 ~/Desktop/Git Demo (master)
$ git reset

126006@quantsrv MINGW64 ~/Desktop/Git Demo (master)
$ git reflog
53bdf40 (HEAD -> master) HEAD@{0}: reset: moving to HEAD
53bdf40 (HEAD -> master) HEAD@{1}: commit: modify a.txt
cb63e4b HEAD@{2}: merge feature: Merge made by the 'recursive' strategy.
41b61a5 HEAD@{3}: commit: Update a.txt: append NEW LINE
74a35e0 HEAD@{4}: checkout: moving from feature to master
861a2ad (feature) HEAD@{5}: checkout: moving from master to feature
74a35e0 HEAD@{6}: checkout: moving from feature to master
861a2ad (feature) HEAD@{7}: commit: Add b.txt
74a35e0 HEAD@{8}: checkout: moving from master to feature
74a35e0 HEAD@{9}: commit: Update a.txt
9f66006 HEAD@{10}: commit (initial): Initial commit(a.txt created)

126006@quantsrv MINGW64 ~/Desktop/Git Demo (master)
$ get reset --hard HEAD~2
bash: get: command not found

126006@quantsrv MINGW64 ~/Desktop/Git Demo (master)
$ git reset --hard HEAD~2
HEAD is now at 41b61a5 Update a.txt: append NEW LINE

126006@quantsrv MINGW64 ~/Desktop/Git Demo (master)
$ git status
On branch master
nothing to commit, working tree clean

126006@quantsrv MINGW64 ~/Desktop/Git Demo (master)
$ git reflog
41b61a5 (HEAD -> master) HEAD@{0}: reset: moving to HEAD~2
53bdf40 HEAD@{1}: reset: moving to HEAD
53bdf40 HEAD@{2}: commit: modify a.txt
cb63e4b HEAD@{3}: merge feature: Merge made by the 'recursive' strategy.
41b61a5 (HEAD -> master) HEAD@{4}: commit: Update a.txt: append NEW LINE
74a35e0 HEAD@{5}: checkout: moving from feature to master
861a2ad (feature) HEAD@{6}: checkout: moving from master to feature
74a35e0 HEAD@{7}: checkout: moving from feature to master
861a2ad (feature) HEAD@{8}: commit: Add b.txt
74a35e0 HEAD@{9}: checkout: moving from master to feature
74a35e0 HEAD@{10}: commit: Update a.txt
9f66006 HEAD@{11}: commit (initial): Initial commit(a.txt created)

126006@quantsrv MINGW64 ~/Desktop/Git Demo (master)
$

```

實際上，這種方式只是將指標在指回去而已，過往的操作紀錄依舊存留在Git的log中

Git檔案還原 II(before add)

```
MINGW64:/c/Users/126006/Desktop/Git Demo
126006@quantsrv MINGW64 ~/Desktop/Git Demo (master)
$ git status
On branch master
nothing to commit, working tree clean

126006@quantsrv MINGW64 ~/Desktop/Git Demo (master)
$ echo delete line >> a.txt

126006@quantsrv MINGW64 ~/Desktop/Git Demo (master)
$ git checkout a.txt

126006@quantsrv MINGW64 ~/Desktop/Git Demo (master)
$ git commit -m "new line"
On branch master
nothing to commit, working tree clean

126006@quantsrv MINGW64 ~/Desktop/Git Demo (master)
1 cat a.txt
NEW LINE

126006@quantsrv MINGW64 ~/Desktop/Git Demo (master)
$ echo NEW LINE >> a.txt

126006@quantsrv MINGW64 ~/Desktop/Git Demo (master)
$ git checkout a.txt

126006@quantsrv MINGW64 ~/Desktop/Git Demo (master)
$ echo delete line >> a.txt

126006@quantsrv MINGW64 ~/Desktop/Git Demo (master)
$ 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:   a.txt

no changes added to commit (use "git add" and/or "git commit -a")

126006@quantsrv MINGW64 ~/Desktop/Git Demo (master)
$ git checkout a.txt

126006@quantsrv MINGW64 ~/Desktop/Git Demo (master)
$
```

```
檔案(F) 編輯(E) 格式(O) 檢視(V) 說明(H)
|1
NEW LINE
delete line
```

沒有add也沒有
commit

```
檔案(F) 編輯(E) 格式(O) 檢視(V) 說明(H)
|1
NEW LINE
```

Git檔案還原 III(before commit)

```
MINGW64/c/Users/126006/Desktop/Git Demo
$ echo delete line >> a.txt

126006@quantsrv MINGW64 ~/Desktop/Git Demo (master)
$ 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:   a.txt

no changes added to commit (use "git add" and/or "git commit -a")

126006@quantsrv MINGW64 ~/Desktop/Git Demo (master)
$ git checkout a.txt

126006@quantsrv MINGW64 ~/Desktop/Git Demo (master)
$ echo delete line >> a.txt

126006@quantsrv MINGW64 ~/Desktop/Git Demo (master)
$ git checkout a.txt

126006@quantsrv MINGW64 ~/Desktop/Git Demo (master)
$ echo delete line >> a.txt

126006@quantsrv MINGW64 ~/Desktop/Git Demo (master)
$ git add .
warning: LF will be replaced by CRLF in a.txt.
The file will have its original line endings in your working directory.

126006@quantsrv MINGW64 ~/Desktop/Git Demo (master)
$ git status
On branch master
Changes to be committed:
  (use "git reset HEAD <file>..." to unstage)

    modified:   a.txt

126006@quantsrv MINGW64 ~/Desktop/Git Demo (master)
$ git reset --hard
HEAD is now at 475abd4 new line

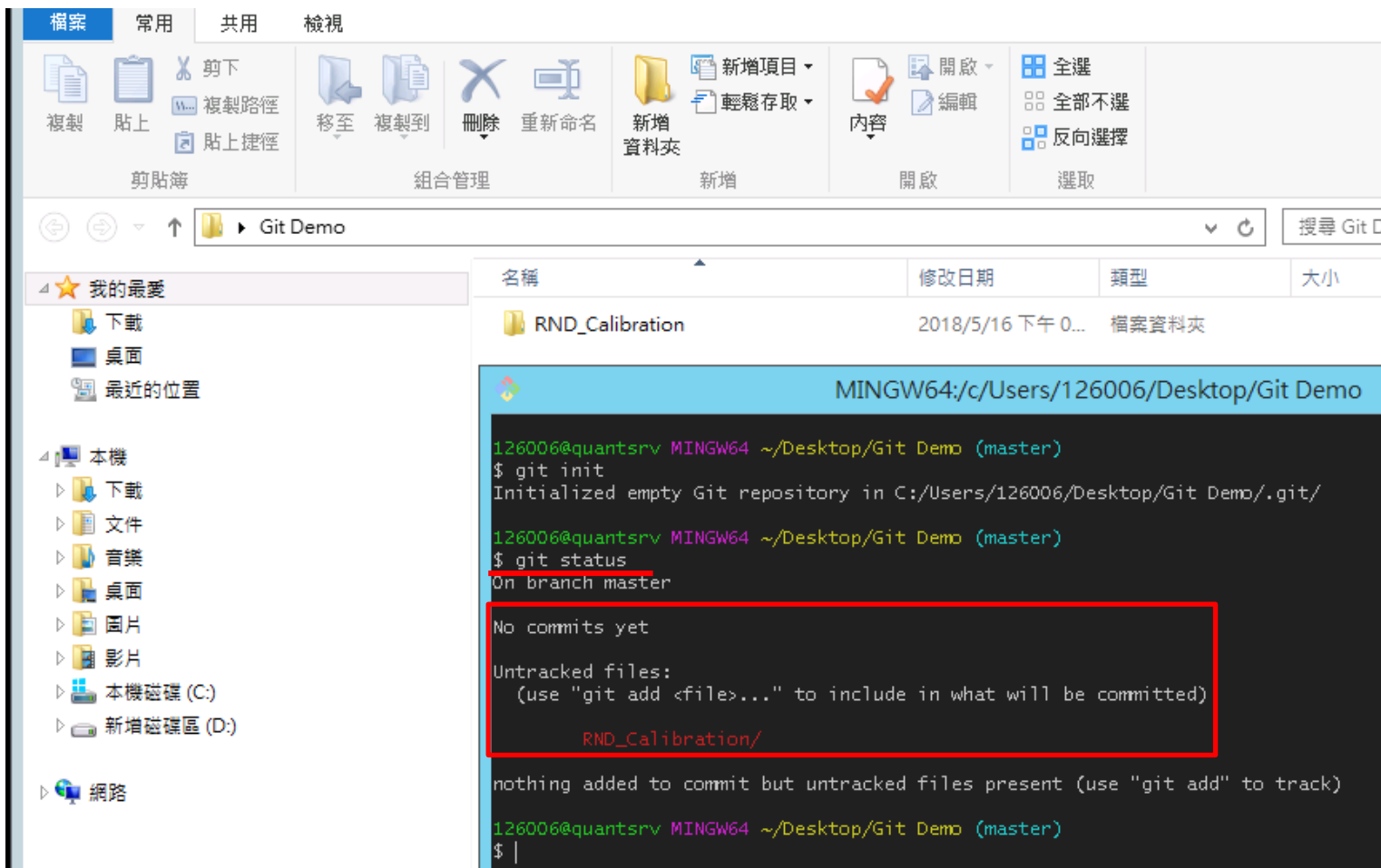
126006@quantsrv MINGW64 ~/Desktop/Git Demo (master)
$
```

```
1
NEW LINE
delete line
```

利用reset --hard指令還原

```
1
NEW LINE
```

RND_Calibration上版



126006@quantsrv MINGW64 ~/Desktop/Git Demo/RND_Calibration (master)

\$ git add .

126006@quantsrv MINGW64 ~/Desktop/Git Demo/RND_Calibration (master)

\$ git status

On branch master

No commits yet

Changes to be committed:

(use "git rm --cached <file>..." to unstage)

```
new file: Cmdty_RND/App.config
new file: Cmdty_RND/Cmdty_RND.csproj
new file: Cmdty_RND/Cmdty_RND.csproj.user
new file: Cmdty_RND/Data_Cleansing.cs
new file: Cmdty_RND/Discount_Factor.cs
new file: Cmdty_RND/FinToolLib.dll
new file: Cmdty_RND/Form1.Designer.cs
new file: Cmdty_RND/Form1.cs
new file: Cmdty_RND/Form1.resx
new file: Cmdty_RND/GetDay.cs
new file: Cmdty_RND/MathNet.Numerics.dll
new file: Cmdty_RND/Moment.cs
new file: Cmdty_RND/NumericalRecipes.dll
new file: Cmdty_RND/Option_Pricing.cs
new file: Cmdty_RND/Piecewiseconstant.cs
new file: Cmdty_RND/Price_transfer.cs
new file: Cmdty_RND/Program.cs
new file: Cmdty_RND/Properties/AssemblyInfo.cs
new file: Cmdty_RND/Properties/Resources.Designer.cs
new file: Cmdty_RND/Properties/Resources.resx
new file: Cmdty_RND/Properties/Settings.Designer.cs
new file: Cmdty_RND/Properties/Settings.settings
new file: Cmdty_RND/QR_Solver.cs
new file: Cmdty_RND/RND.cs
new file: Cmdty_RND/RND_conti_Cmdty.cs
new file: Cmdty_RND/SQL_function.cs
new file: Cmdty_RND/bin/Debug/Cmdty_RND.exe
new file: Cmdty_RND/bin/Debug/Cmdty_RND.exe.config
new file: Cmdty_RND/bin/Debug/Cmdty_RND.pdb
new file: Cmdty_RND/bin/Debug/Cmdty_RND.vshost.exe
new file: Cmdty_RND/bin/Debug/Cmdty_RND.vshost.exe.config
new file: Cmdty_RND/bin/Debug/Cmdty_RND.vshost.exe.manifest
new file: Cmdty_RND/bin/Debug/FinToolLib.dll
new file: Cmdty_RND/bin/Debug/MathNet.Numerics.dll
new file: Cmdty_RND/bin/Debug/NumericalRecipes.dll
new file: Cmdty_RND/bin/Debug/test_output.exe
new file: Cmdty_RND/bin/Debug/test_output.exe.config
```

126006@quantsrv MINGW64 ~/Desktop/Git Demo/RND_Calibration (master)

\$ git commit -m "Add RND_Calibration"

[master (root-commit) 37accdd] Add RND_Calibration

Committer: 謝明翰 <126006@kgibank.com>

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. Run the following command and follow the instructions in your editor to edit your configuration file:

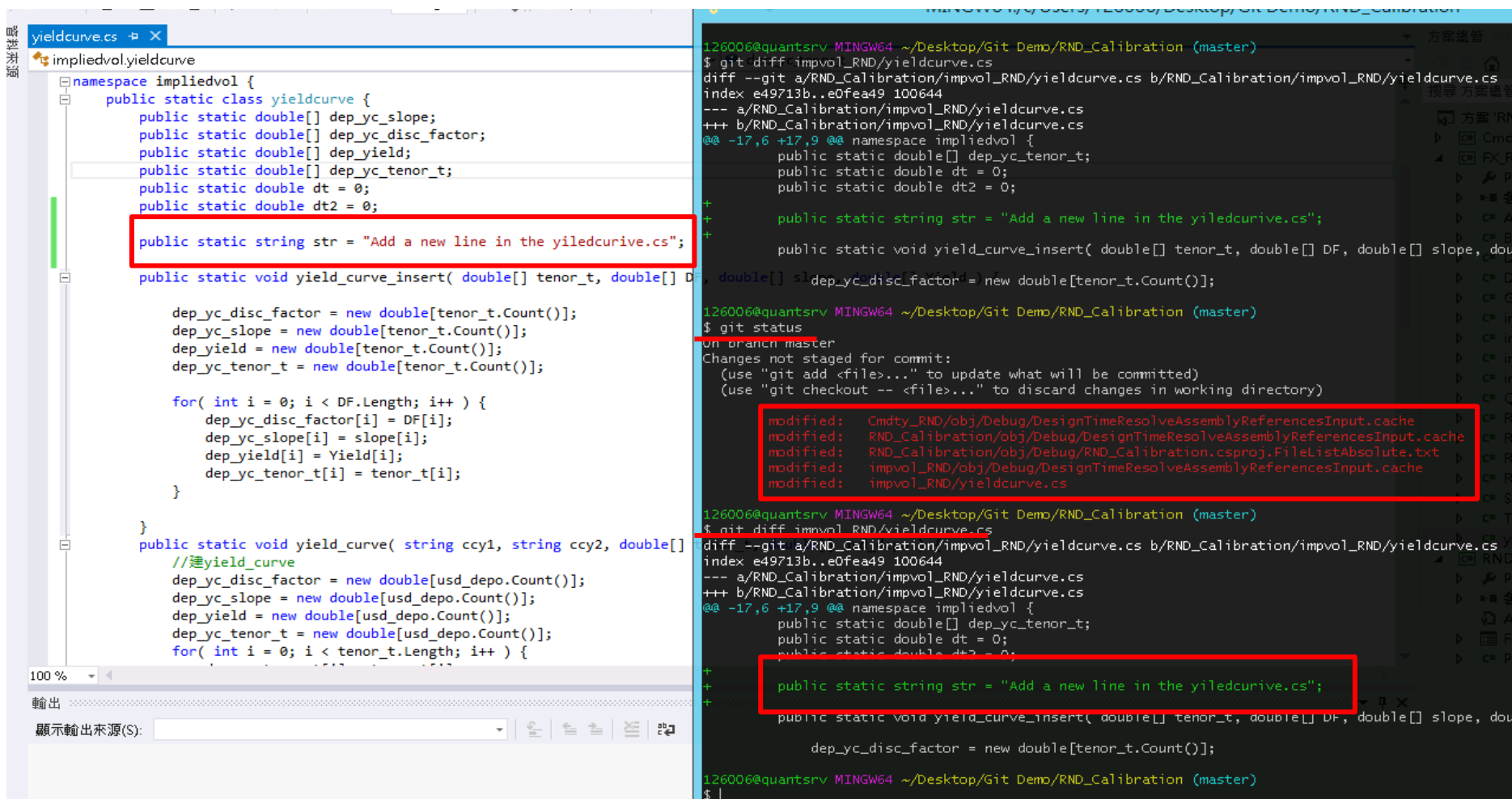
git config --global --edit

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

git commit --amend --reset-author

```
211 files changed, 13711 insertions(+)
create mode 100644 RND_Calibration/Cmdty_RND/App.config
create mode 100644 RND_Calibration/Cmdty_RND/Cmdty_RND.csproj
create mode 100644 RND_Calibration/Cmdty_RND/Cmdty_RND.csproj.user
create mode 100644 RND_Calibration/Cmdty_RND/Data_Cleansing.cs
create mode 100644 RND_Calibration/Cmdty_RND/Discount_Factor.cs
create mode 100644 RND_Calibration/Cmdty_RND/FinToolLib.dll
create mode 100644 RND_Calibration/Cmdty_RND/Form1.Designer.cs
create mode 100644 RND_Calibration/Cmdty_RND/Form1.cs
create mode 100644 RND_Calibration/Cmdty_RND/Form1.resx
create mode 100644 RND_Calibration/Cmdty_RND/GetDay.cs
create mode 100644 RND_Calibration/Cmdty_RND/MathNet.Numerics.dll
create mode 100644 RND_Calibration/Cmdty_RND/Moment.cs
create mode 100644 RND_Calibration/Cmdty_RND/NumericalRecipes.dll
create mode 100644 RND_Calibration/Cmdty_RND/Option_Pricing.cs
create mode 100644 RND_Calibration/Cmdty_RND/Piecewiseconstant.cs
create mode 100644 RND_Calibration/Cmdty_RND/Price_transfer.cs
create mode 100644 RND_Calibration/Cmdty_RND/Program.cs
create mode 100644 RND_Calibration/Cmdty_RND/Properties/AssemblyInfo.cs
create mode 100644 RND_Calibration/Cmdty_RND/Properties/Resources.Designer.cs
create mode 100644 RND_Calibration/Cmdty_RND/Properties/Resources.resx
create mode 100644 RND_Calibration/Cmdty_RND/Properties/Settings.Designer.cs
create mode 100644 RND_Calibration/Cmdty_RND/Properties/Settings.settings
create mode 100644 RND_Calibration/Cmdty_RND/QR_Solver.cs
create mode 100644 RND_Calibration/Cmdty_RND/RND.cs
create mode 100644 RND_Calibration/Cmdty_RND/RND_conti_Cmdty.cs
create mode 100644 RND_Calibration/Cmdty_RND/SQL_function.cs
create mode 100644 RND_Calibration/Cmdty_RND/bin/Debug/Cmdty_RND.exe
create mode 100644 RND_Calibration/Cmdty_RND/bin/Debug/Cmdty_RND.exe.config
create mode 100644 RND_Calibration/Cmdty_RND/bin/Debug/Cmdty_RND.pdb
create mode 100644 RND_Calibration/Cmdty_RND/bin/Debug/Cmdty_RND.vshost.exe
create mode 100644 RND_Calibration/Cmdty_RND/bin/Debug/Cmdty_RND.vshost.exe.config
create mode 100644 RND_Calibration/Cmdty_RND/bin/Debug/Cmdty_RND.vshost.exe.manifest
```


可以從Git中發現被修改的檔案以及修改內容



The image shows a code editor on the left and a terminal window on the right. The code editor displays the file `yieldcurve.cs` with the following content:

```
namespace impliedvol {  
    public static class yieldcurve {  
        public static double[] dep_yc_slope;  
        public static double[] dep_yc_disc_factor;  
        public static double[] dep_yield;  
        public static double[] dep_yc_tenor_t;  
        public static double dt = 0;  
        public static double dt2 = 0;  
  
        public static string str = "Add a new line in the yiledcurve.cs";  
  
        public static void yield_curve_insert( double[] tenor_t, double[] DF, double[] slope, double[] dep_yc_disc_factor) {  
            dep_yc_disc_factor = new double[tenor_t.Count()];  
            dep_yc_slope = new double[tenor_t.Count()];  
            dep_yield = new double[tenor_t.Count()];  
            dep_yc_tenor_t = new double[tenor_t.Count()];  
  
            for( int i = 0; i < DF.Length; i++ ) {  
                dep_yc_disc_factor[i] = DF[i];  
                dep_yc_slope[i] = slope[i];  
                dep_yield[i] = Yield[i];  
                dep_yc_tenor_t[i] = tenor_t[i];  
            }  
        }  
  
        public static void yield_curve( string ccy1, string ccy2, double[] USD_depo, double[] USD_yield, double[] USD_tenor_t, double[] USD_DF, double[] USD_slope, double[] USD_yield_curve) {  
            //建yield_curve  
            dep_yc_disc_factor = new double[USD_depo.Count()];  
            dep_yc_slope = new double[USD_depo.Count()];  
            dep_yield = new double[USD_depo.Count()];  
            dep_yc_tenor_t = new double[USD_depo.Count()];  
            for( int i = 0; i < USD_tenor_t.Length; i++ ) {  
                dep_yc_disc_factor[i] = USD_DF[i];  
                dep_yc_slope[i] = USD_slope[i];  
                dep_yield[i] = USD_yield[i];  
                dep_yc_tenor_t[i] = USD_tenor_t[i];  
            }  
        }  
    }  
}
```

The terminal window shows the following commands and output:

```
126006@quantsrv MINGW64 ~/Desktop/Git Demo/RND_Calibration (master)  
$ git diff impliedvol_RND/yieldcurve.cs  
diff --git a/RND_Calibration/impliedvol_RND/yieldcurve.cs b/RND_Calibration/impliedvol_RND/yieldcurve.cs  
index e49713b..e0fea49 100644  
--- a/RND_Calibration/impliedvol_RND/yieldcurve.cs  
+++ b/RND_Calibration/impliedvol_RND/yieldcurve.cs  
@@ -17,6 +17,9 @@ namespace impliedvol {  
     public static double[] dep_yc_tenor_t;  
     public static double dt = 0;  
     public static double dt2 = 0;  
  
+     public static string str = "Add a new line in the yiledcurve.cs";  
+  
     public static void yield_curve_insert( double[] tenor_t, double[] DF, double[] slope, double[] dep_yc_disc_factor) {  
         dep_yc_disc_factor = new double[tenor_t.Count()];  
         dep_yc_slope = new double[tenor_t.Count()];  
         dep_yield = new double[tenor_t.Count()];  
         dep_yc_tenor_t = new double[tenor_t.Count()];  
  
         for( int i = 0; i < DF.Length; i++ ) {  
             dep_yc_disc_factor[i] = DF[i];  
             dep_yc_slope[i] = slope[i];  
             dep_yield[i] = Yield[i];  
             dep_yc_tenor_t[i] = tenor_t[i];  
         }  
     }  
  
     public static void yield_curve( string ccy1, string ccy2, double[] USD_depo, double[] USD_yield, double[] USD_tenor_t, double[] USD_DF, double[] USD_slope, double[] USD_yield_curve) {  
         //建yield_curve  
         dep_yc_disc_factor = new double[USD_depo.Count()];  
         dep_yc_slope = new double[USD_depo.Count()];  
         dep_yield = new double[USD_depo.Count()];  
         dep_yc_tenor_t = new double[USD_depo.Count()];  
         for( int i = 0; i < USD_tenor_t.Length; i++ ) {  
             dep_yc_disc_factor[i] = USD_DF[i];  
             dep_yc_slope[i] = USD_slope[i];  
             dep_yield[i] = USD_yield[i];  
             dep_yc_tenor_t[i] = USD_tenor_t[i];  
         }  
     }  
 }  
}
```

The terminal window also shows the output of `git status` and `git diff` commands, indicating that the file `yieldcurve.cs` has been modified and is ready to be committed.

```
yieldcurve.cs 141 142 143
impliedvol.yieldcurve yield_

namespace impliedvol {
    public static class yieldcurve {
        public static double[] dep_yc_slope;
        public static double[] dep_yc_disc_factor;
        public static double[] dep_yield;
        public static double[] dep_yc_tenor_t;
        public static double dt = 0;
        public static double dt2 = 0;

        //public static string str = "Add a new line in the yiledcurive.cs";
        public static string str = "In the RNDbranch branch, I add another new line";

        $ git branch
        * master_disc_factor = new double[tenor_t.Count()];
        dep_yc_slope = new double[tenor_t.Count()];
        dep_yc_disc_factor = new double[tenor_t.Count()];
        $ git checkout -b RNDbranch
        Switched to a new branch "RNDbranch"

        126006@quantsrv MINGW64 ~/Desktop/Git Demo/RND_Calibration (RNDbranch)
        $ git branch
        * RNDbranch
        * master
        $ git status
        On branch RNDbranch
        nothing to commit, working tree clean
        public static void yield_curve( string ccy1, string ccy2, double[] tenor_t, double[] disc_factor, double[] yield, double[] slope, double[] tenor_t2, double[] disc_factor2, double[] yield2, double[] slope2)
        {
            126006@quantsrv MINGW64 ~/Desktop/Git Demo/RND_Calibration (RNDbranch)
            $ git status
            On branch RNDbranch
            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:   impliedvol_RND/yieldcurve.cs

            no changes added to commit (use "git add" and/or "git commit -a")
            126006@quantsrv MINGW64 ~/Desktop/Git Demo/RND_Calibration (RNDbranch)
            $
```

這邊，我新增了另一個新分支 RNDbranch，在RNDbranch中在 yieldcurve.cs檔案中在做新的修改

```
yieldcurve.cs  x
impliedvol.yieldcurve  dep_yc_slope

namespace impliedvol {
    public static class yieldcurve {
        public static double[] dep_yc_slope;
        public static double[] dep_yc_disc_factor;
        public static double[] dep_yield;
        public static double[] dep_yc_tenor_t;
        public static double dt = 0;
        public static double dt2 = 0;

        //public static string str = "Add a new line in the yiledcurive.cs";
        public static string str = "In the RNDbranch branch, I add another new line";
    }
}

MINGW64/c/Users/126006/Desktop/Git Demo/RND_Calibrati...

126006@quantser: MINGW64 ~/Desktop/Git Demo/RND_Calibration (master)
$ git branch
  RNDbranch
* master
dep_yc_tenor_t = new double[tenor_t.Count()];
126006@quantser: MINGW64 ~/Desktop/Git Demo/RND_Calibration (master)
$ git merge RNDbranch DF.Length; i++) {
Updating f36f56f..392f2eb: 1 file changed, 1 insertion(+)
Fast-forward slope[i] = slope[i];
RND_Calibration/impvol_RND/yieldcurve.cs | 1 +
1 file changed, 1 insertion(+)
126006@quantser: MINGW64 ~/Desktop/Git Demo/RND_Calibration (master)
$ 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:   RND_Calibration.v11.suo

no changes added to commit (use "git add" and/or "git commit -a")
126006@quantser: MINGW64 ~/Desktop/Git Demo/RND_Calibration (master)
$ git branch -d RNDbranch
Deleted branch RNDbranch (was 392f2eb).
126006@quantser: MINGW64 ~/Desktop/Git Demo/RND_Calibration (master)
$ git branch
* master
```

回到master branch後，將兩支branch做合併，會發現在RNDbranch所做的修改會同步到master branch中，最後再把RNDbranch刪除

- 多人共同開發同一專案時，切記要先new branch以確保開發過程中不互相衝突
- 新的branch和舊branch合併後，若不再需要，要將branch刪除，以免保留太多分支
- Git log檔最多保留90天，若想回復90天前資料，Git無法達成
- 每次對程式做完修改後，記得要在Git上依序下add、commit指令
- commit指令一定要加解釋，方便日後管理