

# Git Tutorial

git with it!

## Check to see what folder you are working in

```
In [2]: !pwd  
/Users/pagrawal/repos/notebooks/uptake
```

## Git Setup

### Initialize git repository in your repo folder

```
In [3]: !git init  
Reinitialized existing Git repository in /Users/pagrawal/repos/notebooks/uptake/.git/
```

### Check what is the current git status of your repo

```
In [5]: !git status  
On branch master  
  
Initial commit  
  
Untracked files:  
  (use "git add <file>..." to include in what will be committed)  
  
    .ipynb_checkpoints/  
    git-tutorial.ipynb  
  
nothing added to commit but untracked files present (use "git add" to track)
```

## Staging and Committing

Add single files by using the git add command, you can include multiple files on the same line with just a space separating them.

To include all files that show up in git status as untracked, just do a git add -A

```
In [6]: !git add git-tutorial.ipynb
```

**Till now we have just staged files for commit, but not yet committed anything to the repo.**

Commit your staged files with a message using the -m "" It is a good idea to begin your commit message with the JIRA number and then a very very brief description of what the commit is about. Remember to not bunch unrelated changes in a single commit.

```
In [7]: !git commit -m "DSC-1234 first commit"

[master (root-commit) 14f6fd7] DSC-1234 first commit
1 file changed, 92 insertions(+)
create mode 100644 git-tutorial.ipynb
```

**It's always a good idea to keep checking the status of your repo**

```
In [8]: !git status

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

    .ipynb_checkpoints/

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

**Since we are using iPython Notebook, the file has been changing constantly, so now if you issue a git status command then you should see a different status than the output from the block above**

```
In [10]: !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 director
y)
```

```
        modified:   git-tutorial.ipynb
```

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

        .ipynb_checkpoints/
```

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

**Use git add to add any files that have been modified. You could add them individually or add all modified files with one git add command**

```
In [15]: !git add git-tutorial.ipynb
```

**Checking status again!**

```
In [16]: !git status
```

```
On branch master
Changes to be committed:
  (use "git reset HEAD <file>..." to unstage)
```

```
        modified:   git-tutorial.ipynb
```

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

        .ipynb_checkpoints/
```

**Commit the second set of changes**

```
In [17]: !git commit -m "DSC-1234 second commit"
```

```
[master dadce14] DSC-1234 second commit
1 file changed, 205 insertions(+), 3 deletions(-)
```

**History of everything!**

## To view the history of your commits- issue a "git log" command

In [18]: `!git log`

```
commit dadce14e5c932d0f989fbb517717bad0eed1c764
Author: pratikagrawal <pratik.agrawal@uptake.io>
Date:   Mon Mar 16 10:29:08 2015 -0500
```

DSC-1234 second commit

```
commit 8bb1140f5ab5313cb003126754b5c0e4318135da
Author: pratikagrawal <pratik.agrawal@uptake.io>
Date:   Mon Mar 16 10:28:35 2015 -0500
```

DSC-1234 second commit

```
commit 14f6fd70a85cfc2a666fbf71ada7b7a3c2dce67a
Author: pratikagrawal <pratik.agrawal@uptake.io>
Date:   Mon Mar 16 09:53:13 2015 -0500
```

DSC-1234 first commit

**The above history seems littered with a lot of information, which you may not care about. In that case, use the following to view a brief log of commit history**

In [19]: `!git log --pretty=oneline`

```
dadce14e5c932d0f989fbb517717bad0eed1c764 DSC-1234 second commit
8bb1140f5ab5313cb003126754b5c0e4318135da DSC-1234 second commit
14f6fd70a85cfc2a666fbf71ada7b7a3c2dce67a DSC-1234 first commit
```

## Many different options can be used with the git history-

`git log --pretty=oneline --max-count=2`

`git log --pretty=oneline --since='5 minutes ago'`

`git log --pretty=oneline --until='5 minutes ago'`

`git log --pretty=oneline --author=pratikagrawal`

`git log --pretty=oneline --all`

## Aliases

**It would be a good idea to create aliases for the most commonly used commands in git.**

Add the following to your ~/.bash\_profile file (for macs only)

```
alias gs='git status '
```

```
alias ga='git add '
```

```
alias gb='git branch '
```

```
alias gc='git commit'
```

```
alias gd='git diff'
```

```
alias go='git checkout '
```

```
alias gk='gitk --all&'
```

```
alias gx='gitx --all'
```

```
alias gl='git log'
```

```
alias gl1l='git log --pretty=online'
```

**Also add the following to your .gitconfig file**

```
[alias]
```

```
co = checkout
```

```
ci = commit
```

```
st = status
```

```
br = branch
```

```
hist = log --pretty=format:'%h %ad | %s%d [%an]' --graph --date=short
```

```
type = cat-file -t
```

```
dump = cat-file -p
```

## Reverting Changes

**Creating a text file in our repo**

```
In [25]: !ls ../../ds-locomotive-models/scripts/>directory-listing.txt
```

**Checking the git status for the nth time!**

```
In [26]: !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:   git-tutorial.ipynb
```

```
Untracked files:
```

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

```
        .ipynb_checkpoints/
        directory-listing.txt
```

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

## Staging and committing the new file

```
In [27]: !git add directory-listing.txt
```

```
In [28]: !git commit -m "DSC-1234 adding directory listing"
```

```
[master 1591976] DSC-1234 adding directory listing
```

```
1 file changed, 8 insertions(+)
```

```
create mode 100644 directory-listing.txt
```

```
In [29]: !git log --pretty=oneline
```

```
159197673977b5d62e2dc6a5038ff2236a2c9d44 DSC-1234 adding directory listing
```

```
dadce14e5c932d0f989fbb517717bad0eed1c764 DSC-1234 second commit
```

```
8bb1140f5ab5313cb003126754b5c0e4318135da DSC-1234 second commit
```

```
14f6fd70a85cfc2a666fbf71ada7b7a3c2dce67a DSC-1234 first commit
```

## Changing the text file

```
In [30]: !ls ../../ds-locomotive-models/src/>directory-listing.txt
```

```
In [31]: !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 director
y)

        modified:   directory-listing.txt

        modified:   git-tutorial.ipynb

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

        .ipynb_checkpoints/

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

**Check to see what are the difference between the master and working file for directory-listing.txt**

```
In [33]: !git diff directory-listing.txt
```

```
diff --git a/directory-listing.txt b/directory-listing.txt
index 05ba8ab..42af1bc 100644
--- a/directory-listing.txt
+++ b/directory-listing.txt
@@ -1,8 +1,3 @@
-Faultgroup_linmixed.R
-Faultgroup_logreg_train_effects.R
-Faultgroup_logreglasso.R
-Logreg_lasso_selection.R
-healthscore and_fitted_value_daily_averages
-rf_chronosplit_trainint.R
-rf_tweak.R
-starterScript.R
+actions_recommendation_engine.R
+fault_risk_model.R
+health_score_model.R
```

**Revert to previous version of the directory-listing.txt file**

```
In [34]: !git checkout directory-listing.txt
```

```
In [35]: !git diff directory-listing.txt
```

```
In [36]: !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: git-tutorial.ipynb

Untracked files:

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

.ipynb\_checkpoints/

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

```
In [46]: !ls ../../ds-locomotive-models/src/>directory-listing.txt
```

^C

```
In []: !git add directory-listing.txt
```

```
In []: !git commit -m "DSC-1234 changed directory listing"
```

```
In []: !git revert HEAD --no-edit
```

[master b2531b0] Revert "DSC-1234 changed directory listing"

1 file changed, 8 insertions(+), 3 deletions(-)

```
In [1]: !git log --pretty=oneline
```

```
b2531b0b8fe852c2d26ace04b780cb48d2ee91b0 Revert "DSC-1234 changed directory listing"
c9f6bcd18ee73e3353675759bfc5b3dd9a841c65 DSC-1234 changed directory listing
159197673977b5d62e2dc6a5038ff2236a2c9d44 DSC-1234 adding directory listing
dadce14e5c932d0f989fbb517717bad0eed1c764 DSC-1234 second commit
8bb1140f5ab5313cb003126754b5c0e4318135da DSC-1234 second commit
14f6fd70a85cfc2a666fbf71ada7b7a3c2dce67a DSC-1234 first commit
```

## Adding to remote repo

### Clone your repo



```
In [2]: !git remote add origin https://github.com/UptakeTech/ds-notebooks.git
```

```
In [3]: !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 director
y)

        modified:   git-tutorial.ipynb

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

        .ipynb_checkpoints/

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

### Try pushing changes to the remote repo

```
In [4]: !git push origin master
```

```
To https://github.com/UptakeTech/ds-notebooks.git
! [rejected]        master -> master (fetch first)
error: failed to push some refs to 'https://github.com/UptakeTech/ds-note
books.git'
hint: Updates were rejected because the remote contains work that you do
hint: not have locally. This is usually caused by another repository push
ing
hint: to the same ref. You may want to first integrate the remote changes
hint: (e.g., 'git pull ...') before pushing again.
hint: See the 'Note about fast-forwards' in 'git push --help' for detail
s.
```

**This tells us that we need to pull first from the remote repo, as that has changes which our local repo does not have as yet**

```
git pull origin master
```

```
From https://github.com/UptakeTech/ds-notebooks
```

- branch master -> FETCH\_HEAD

```
Already up-to-date.
```

**Now we need to push our changes to the remote repo**

git push origin master

Counting objects: 20, done.

Delta compression using up to 8 threads.

Compressing objects: 100% (16/16), done.

Writing objects: 100% (19/19), 6.62 KiB | 0 bytes/s, done.

Total 19 (delta 5), reused 0 (delta 0)

To https://github.com/UptakeTech/ds-notebooks.git

301e97b..92200ca master -> master

In [1]: !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: git-tutorial.ipynb

Untracked files:

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

.ipynb\_checkpoints/

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

## Working with Branches!

### Creating a branch

Always give your branch a name which symbolized either a feature or a bigger JIRA story you are working on

In [3]: !git checkout -b DSC-4321

M git-tutorial.ipynb

Switched to a new branch 'DSC-4321'

**Push your shiny new branch to the remote repo!**

```
In [4]: !git push origin DSC-4321
```

```
Total 0 (delta 0), reused 0 (delta 0)  
To https://github.com/UptakeTech/ds-notebooks.git  
* [new branch]      DSC-4321 -> DSC-4321
```

### Modify the text file, and add a new text file to this branch

```
In [6]: !ls ../../ds-locomotive-models/>directory-listing.txt
```

```
In [7]: !git diff directory-listing.txt
```

```
diff --git a/directory-listing.txt b/directory-listing.txt  
index 05ba8ab..2f3f235 100644  
--- a/directory-listing.txt  
+++ b/directory-listing.txt  
@@ -1,8 +1,5 @@  
-Faultgroup_linmixed.R  
-Faultgroup_logreg_train_effects.R  
-Faultgroup_logreglasso.R  
-Logreg_lasso_selection.R  
-healthscore and_fitted_value_daily_averages  
-rf_chronosplit_trainint.R  
-rf_tweak.R  
-starterScript.R  
+README.md  
+data  
+output  
+scripts  
+src
```

```
In [8]: !ls ../../ds-locomotive-models/src/>locomotive-models-directory-listin  
g.txt
```

```
In [9]: !git status
```

On branch DSC-4321

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: directory-listing.txt

modified: git-tutorial.ipynb

Untracked files:

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

.ipynb\_checkpoints/

locomotive-models-directory-listing.txt

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

```
In [10]: !git add directory-listing.txt locomotive-models-directory-listing.txt
```

```
In [12]: !git commit -m "DSC-4321 modifying dir-list.txt adding new file"
```

[DSC-4321 1650497] DSC-4321 modifying dir-list.txt adding new file

2 files changed, 8 insertions(+), 8 deletions(-)

create mode 100644 locomotive-models-directory-listing.txt

## Push changes to remote branch

```
In [13]: !git push origin DSC-4321
```

Counting objects: 6, done.

Delta compression using up to 8 threads.

Compressing objects: 100% (3/3), done.

Writing objects: 100% (4/4), 460 bytes | 0 bytes/s, done.

Total 4 (delta 1), reused 0 (delta 0)

To https://github.com/UptakeTech/ds-notebooks.git

92200ca..1650497 DSC-4321 -> DSC-4321

ERROR:py4j.java\_gateway:Error while sending or receiving.

Traceback (most recent call last):

File "/Users/pagrawal/programs/spark-1.2.0/python/lib/py4j-0.8.2.1-src.zip/py4j/java\_gateway.py", line 473, in send\_command

answer = smart\_decode(self.stream.readline()[:-1])

File "/Users/pagrawal/anaconda/lib/python2.7/socket.py", line 430, in readline

data = recv(1)

error: [Errno 54] Connection reset by peer

ERROR:py4j.java\_gateway:An error occurred while trying to connect to the Java server

Traceback (most recent call last):

```

File "/Users/pagrawal/programs/spark-1.2.0/python/lib/py4j-0.8.2.1-src.zip/py4j/java_gateway.py", line 425, in start
    self.socket.connect((self.address, self.port))
File "/Users/pagrawal/anaconda/lib/python2.7/socket.py", line 224, in meth
    return getattr(self._sock,name)(*args)
error: [Errno 61] Connection refused
ERROR:py4j.java_gateway:An error occurred while trying to connect to the Java server
Traceback (most recent call last):
  File "/Users/pagrawal/programs/spark-1.2.0/python/lib/py4j-0.8.2.1-src.zip/py4j/java_gateway.py", line 425, in start
    self.socket.connect((self.address, self.port))
  File "/Users/pagrawal/anaconda/lib/python2.7/socket.py", line 224, in meth
    return getattr(self._sock,name)(*args)
error: [Errno 61] Connection refused
ERROR:py4j.java_gateway:An error occurred while trying to connect to the Java server
Traceback (most recent call last):
  File "/Users/pagrawal/programs/spark-1.2.0/python/lib/py4j-0.8.2.1-src.zip/py4j/java_gateway.py", line 425, in start
    self.socket.connect((self.address, self.port))
  File "/Users/pagrawal/anaconda/lib/python2.7/socket.py", line 224, in meth
    return getattr(self._sock,name)(*args)
error: [Errno 61] Connection refused
ERROR:py4j.java_gateway:An error occurred while trying to connect to the Java server
Traceback (most recent call last):
  File "/Users/pagrawal/programs/spark-1.2.0/python/lib/py4j-0.8.2.1-src.zip/py4j/java_gateway.py", line 425, in start
    self.socket.connect((self.address, self.port))
  File "/Users/pagrawal/anaconda/lib/python2.7/socket.py", line 224, in meth
    return getattr(self._sock,name)(*args)
error: [Errno 61] Connection refused
ERROR:py4j.java_gateway:An error occurred while trying to connect to the Java server
Traceback (most recent call last):
  File "/Users/pagrawal/programs/spark-1.2.0/python/lib/py4j-0.8.2.1-src.zip/py4j/java_gateway.py", line 425, in start
    self.socket.connect((self.address, self.port))
  File "/Users/pagrawal/anaconda/lib/python2.7/socket.py", line 224, in meth
    return getattr(self._sock,name)(*args)
error: [Errno 61] Connection refused
ERROR:py4j.java_gateway:An error occurred while trying to connect to the Java server
Traceback (most recent call last):
  File "/Users/pagrawal/programs/spark-1.2.0/python/lib/py4j-0.8.2.1-src.zip/py4j/java_gateway.py", line 425, in start
    self.socket.connect((self.address, self.port))
  File "/Users/pagrawal/anaconda/lib/python2.7/socket.py", line 224, in meth
    return getattr(self._sock,name)(*args)
error: [Errno 61] Connection refused

```

**Updating your branch with changes in master**

```
git checkout DSC-4321
```

```
git merge master
```

**Another way to update your branch with changes from master is to use Rebase. Although take care to not rebase branches which are public or have other people working on them, as rebasing will rewrite the commit history of the branch.**

```
git checkout DSC-4321
```

```
git rebase master
```

### **Resetting your branch**

```
git reset --hard (hash)
```

where hash looks like- 159197673977b5d62e2dc6a5038ff2236a2c9d44

### **Check to see what branches already exist**

```
In [16]: !git branch -a
```

```
* DSC-4321
  master
  remotes/origin/DSC-4321
  remotes/origin/master
```

```
In []:
```