

# Intro to version control with Git

Roy van de Water

version  
Control?



Why Use  
Version  
Control?

Developer A

Developer B

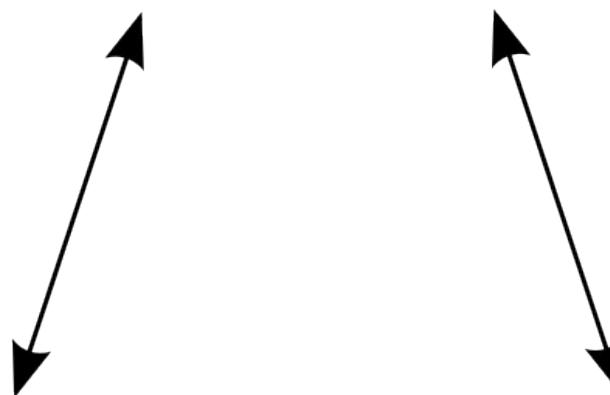
Project

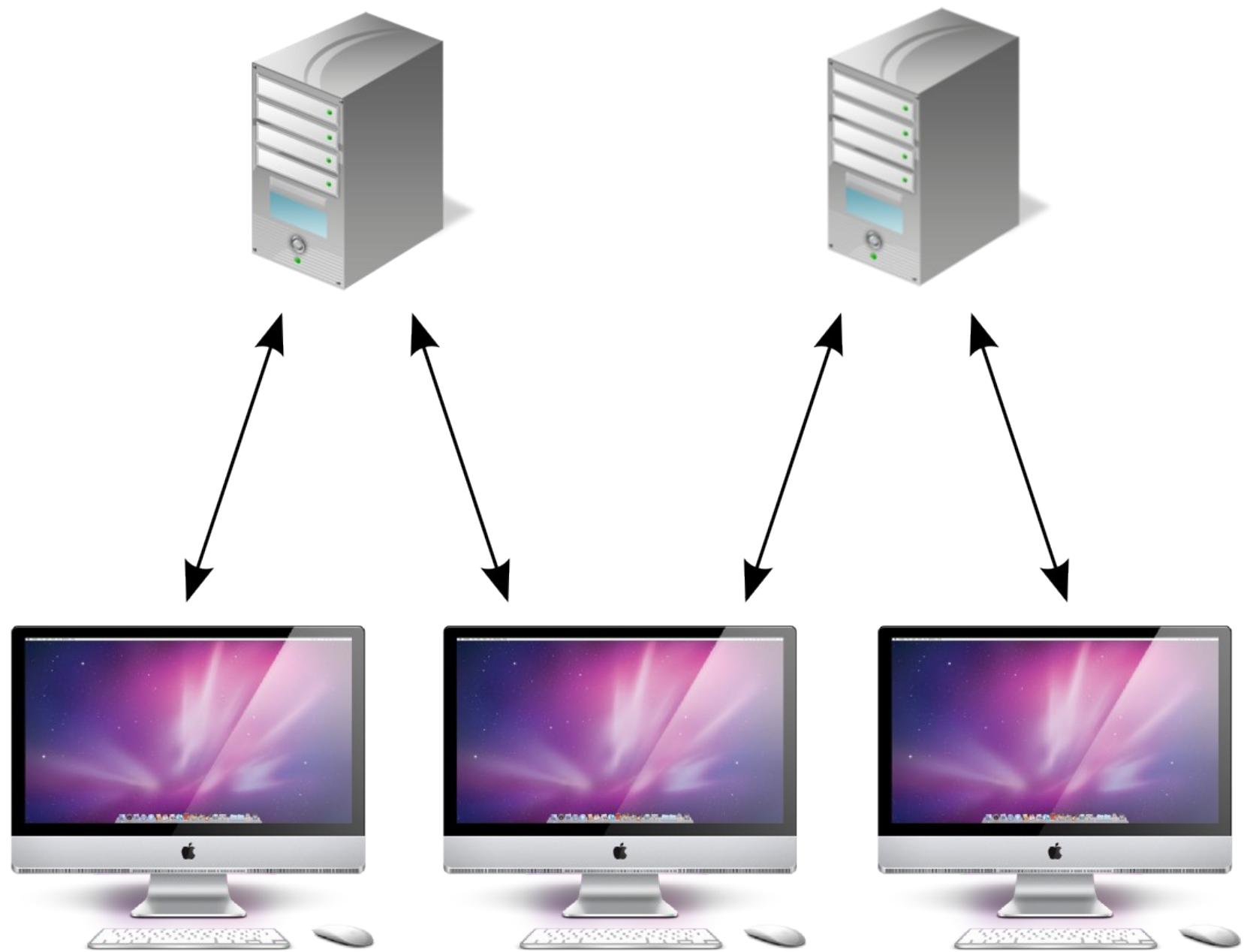


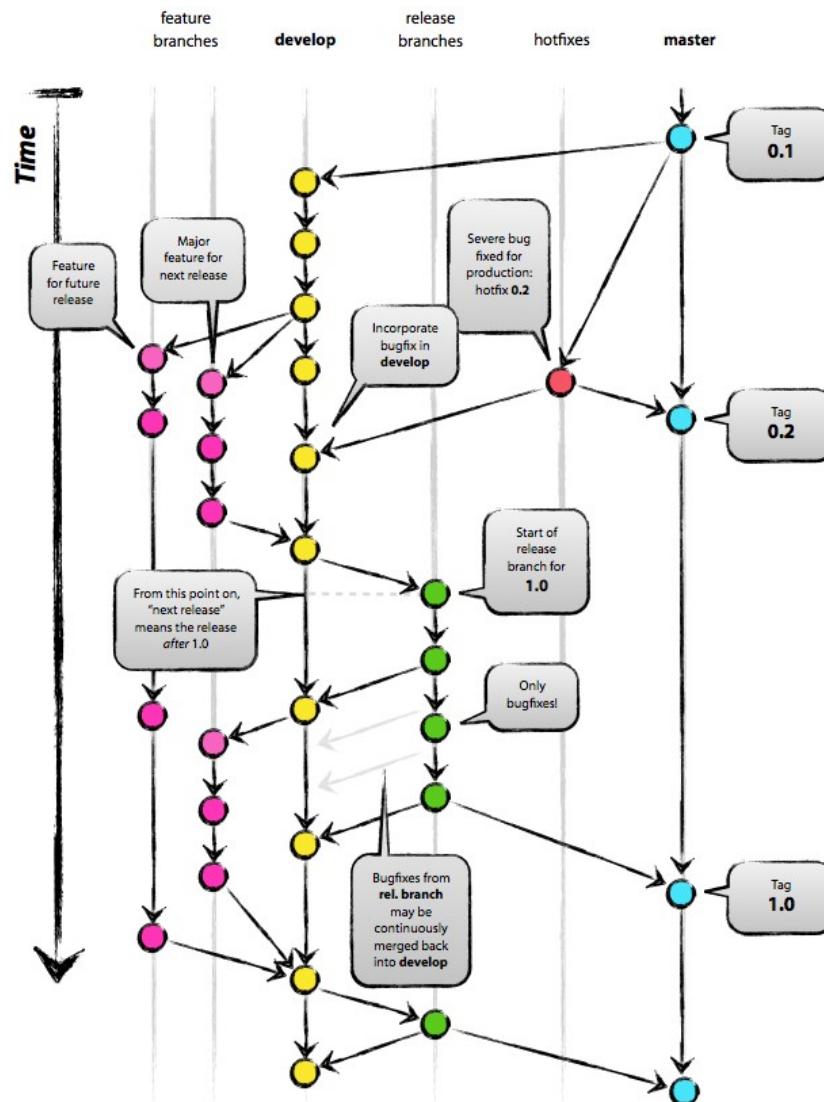
```
while(true){  
    breakEverything();  
}
```



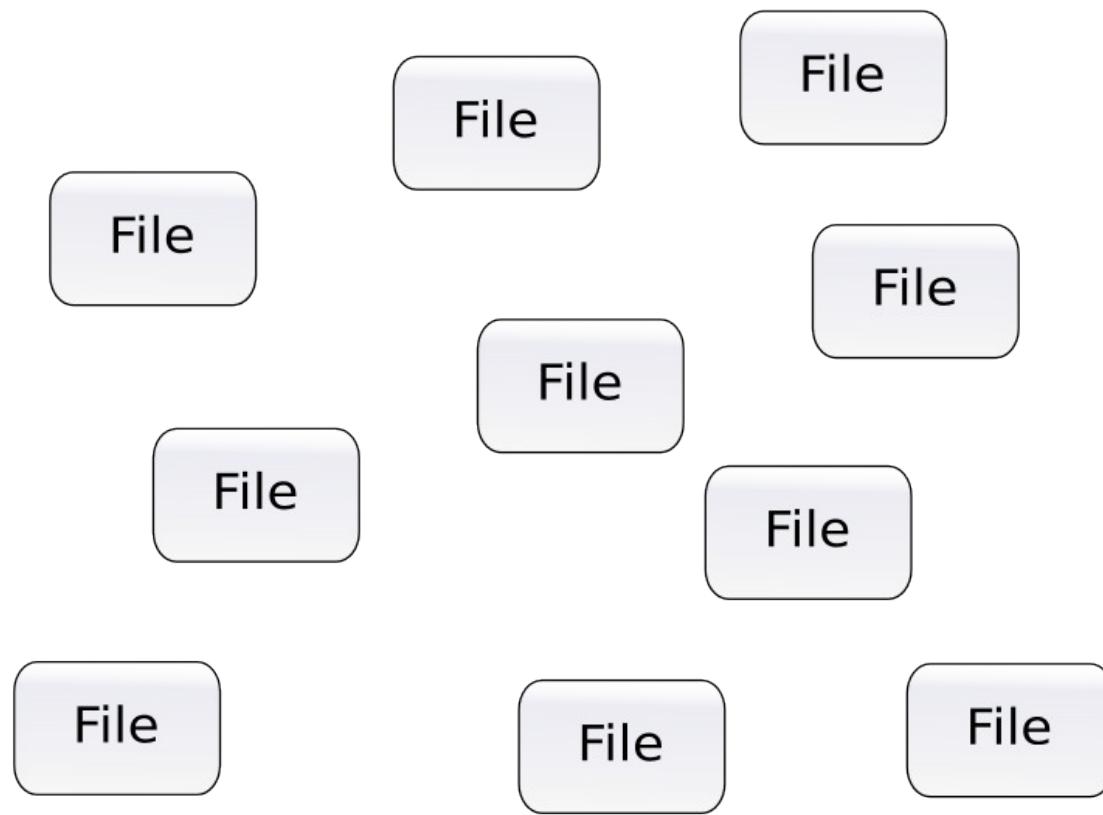
# why Git?



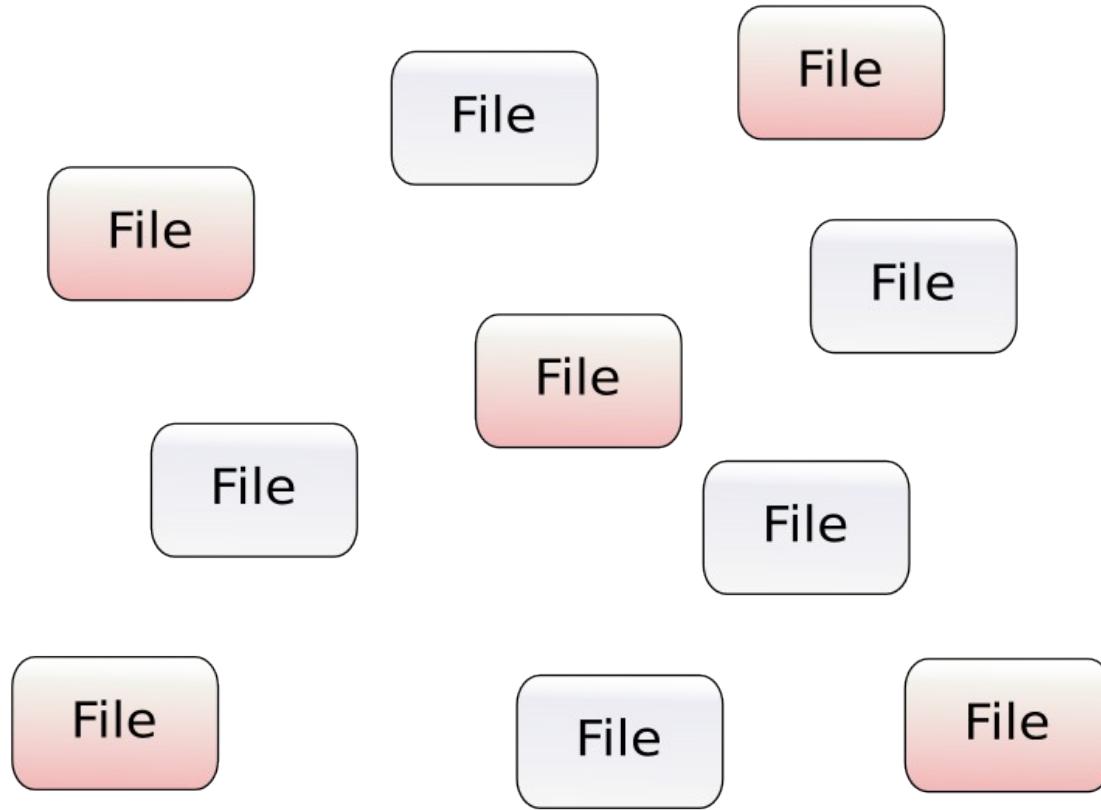




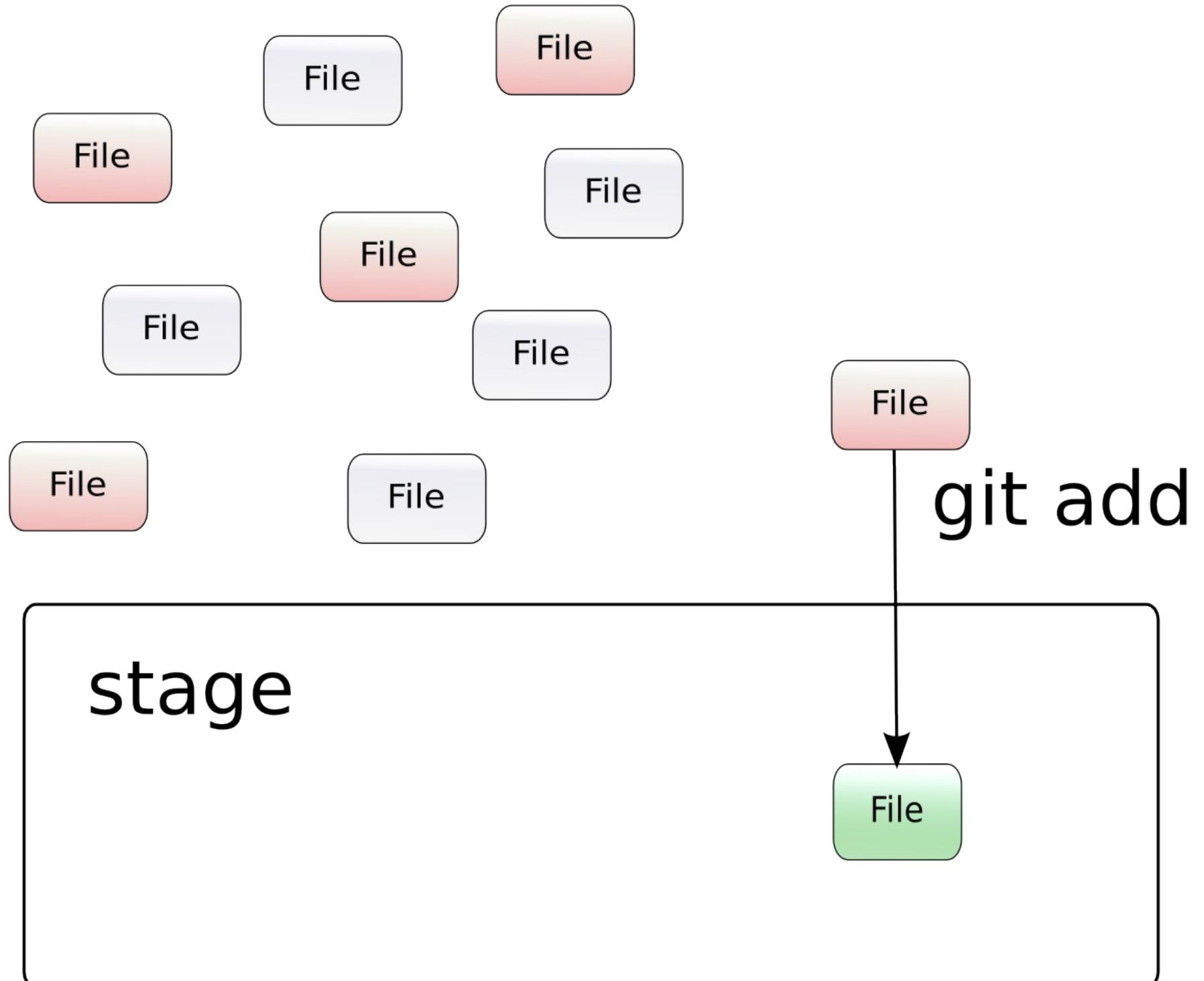
git commit

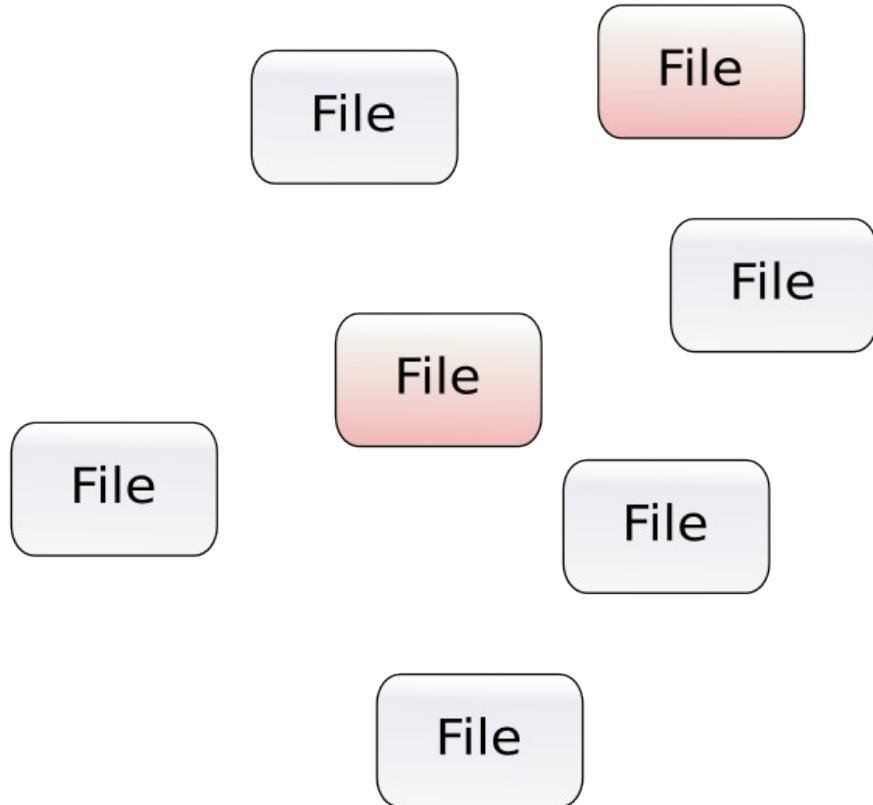


stage

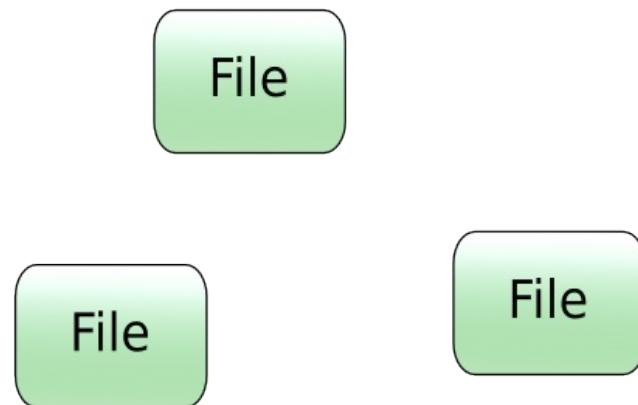


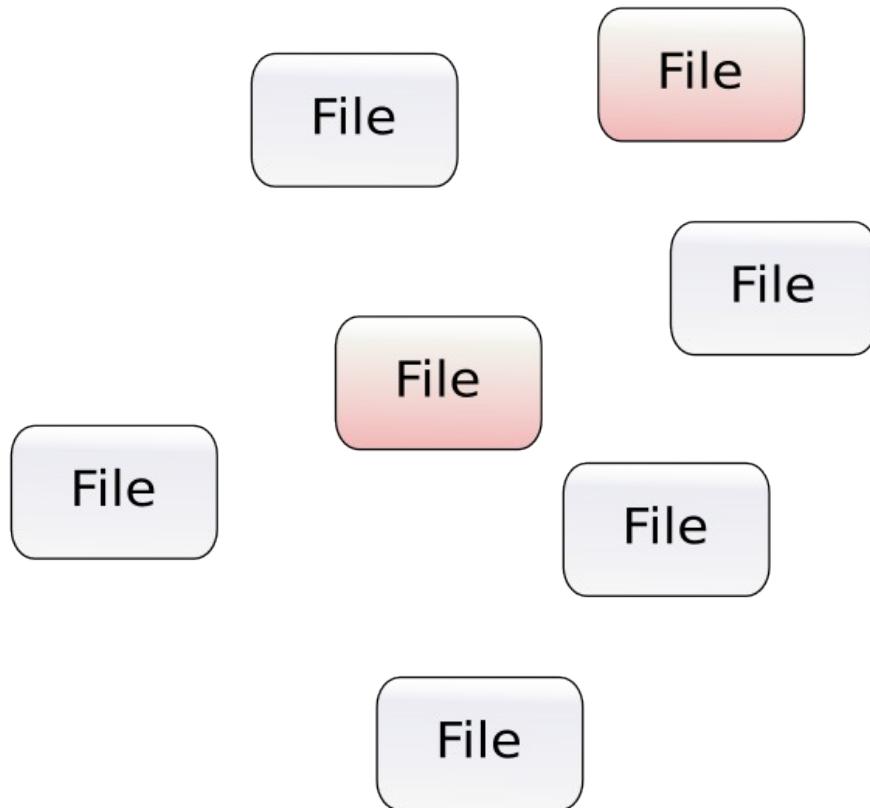
stage





Stage

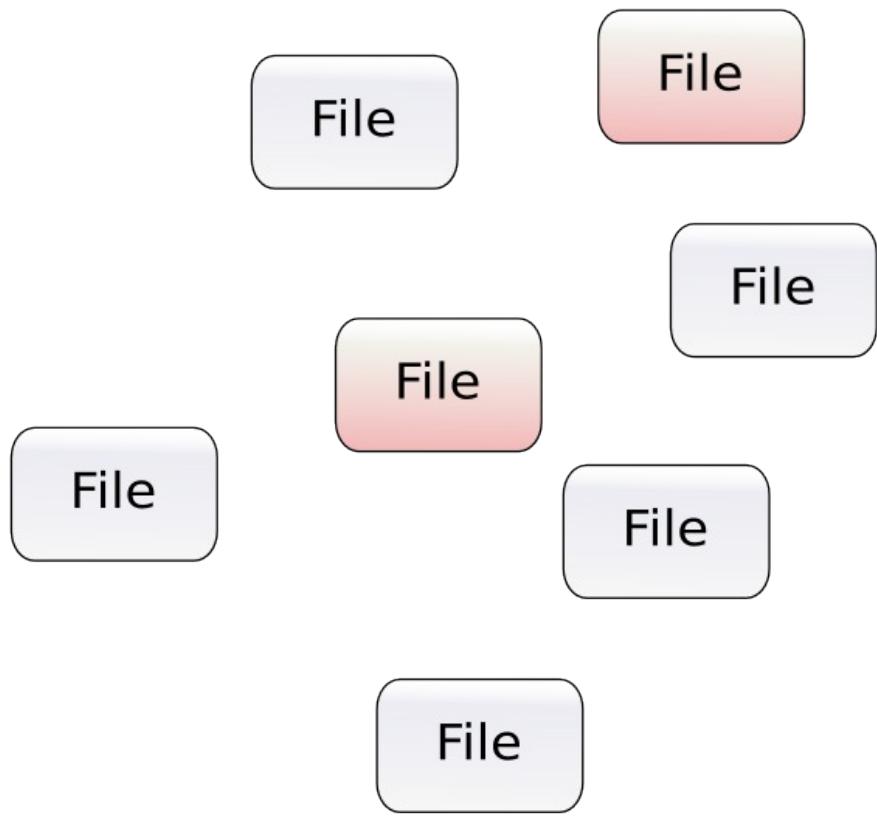




stage

git commit





stage



```
| roy@roy-media: ~/Projects/roy/git-tutorial 80x20
| roy@roy-media:~/Projects/roy/git-tutorial$ git status
| # On branch master
| nothing to commit (working directory clean)
| roy@roy-media:~/Projects/roy/git-tutorial$
```

```
1 #!/usr/bin/env ruby
2
3 if true
4   puts "Hello World"
5 end
```

```
| roy@roy-media: ~/Projects/roy/git-tutorial 81x22
roy@roy-media:~/Projects/roy/git-tutorial$ git status
# On branch master
# Changed but not updated:
#   (use "git add <file>..." to update what will be committed)
#   (use "git checkout -- <file>..." to discard changes in working directory)
#
#       modified:   README
#       modified:   program.rb
#
no changes added to commit (use "git add" and/or "git commit -a")
roy@roy-media:~/Projects/roy/git-tutorial$
```

```
roy@roy-media: ~/Projects/roy/git-tutorial 81x22
roy@roy-media:~/Projects/roy/git-tutorial$ git add program.rb
roy@roy-media:~/Projects/roy/git-tutorial$ git status
# On branch master
# Changes to be committed:
#   (use "git reset HEAD <file>..." to unstage)
#
#       modified:   program.rb
#
# Changed but not updated:
#   (use "git add <file>..." to update what will be committed)
#   (use "git checkout -- <file>..." to discard changes in working directory)
#
#       modified:   README
#
roy@roy-media:~/Projects/roy/git-tutorial$
```

```
roy@roy-media: ~/Projects/roy/git-tutorial 81x22
roy@roy-media:~/Projects/roy/git-tutorial$ git commit -m "Summary of changes"
[master a49cb35] Summary of changes
 1 files changed, 1 insertions(+), 1 deletions(-)
roy@roy-media:~/Projects/roy/git-tutorial$ git status
# On branch master
# Your branch is ahead of 'origin/master' by 1 commit.
#
# Changed but not updated:
#   (use "git add <file>..." to update what will be committed)
#     (use "git checkout -- <file>..." to discard changes in working directory)
#
#       modified:   README
#
no changes added to commit (use "git add" and/or "git commit -a")
roy@roy-media:~/Projects/roy/git-tutorial$
```

roy@roy-media: ~/Projects/roy/git-tutorial 81x21

```
commit a49cb35843df3cbab038a4c64c43fcdbbadbbdac
Author: Roy van de Water <roy@integrumtech.com>
Date:   Sat Apr 2 04:38:31 2011 -0700
```

### Summary of changes

```
commit 8979723da563d63e5eb5652492e486044c0c9767
Author: Roy van de Water <roy.v.water@gmail.com>
Date:   Sun Feb 20 18:40:06 2011 -0700
```

### Updated the README

```
commit 65b8ab91f6012113daa270c2b64538b6dfd76217
Author: Roy van de Water <roy.v.water@gmail.com>
Date:   Sun Feb 20 18:39:36 2011 -0700
```

### Made a mistake

```
commit 1b0d64c4219560941ed181134bb1305bac7631a4
Author: Roy van de Water <roy.v.water@gmail.com>
:
```

```
roy@roy-media: ~/Projects/roy/git-tutorial 81x21
```

```
commit a49cb35843df3cbab038a4c64c43fcdbbadbbaac  
tree 441b6222615918eb24a3d72cecd40b4c570c2a4f  
parent 8979723da563d63e5eb5652492e486044c0c9767  
author Roy van de Water <roy@integrumtech.com> 1301744311 -0700  
committer Roy van de Water <roy@integrumtech.com> 1301744311 -0700
```

## Summary of changes

```
diff --git a/program.rb b/program.rb  
index 753b482..b8362b2 100755  
--- a/program.rb  
+++ b/program.rb  
@@ -1,5 +1,5 @@  
 #!/usr/bin/env ruby
```

```
-if false  
+if true  
  puts "Hello World"  
end
```

```
:
```

Commit  
a49c...bdac

parent  
8979...c9767

Tree  
441b...2a4f

program.rb  
b836...3872

README  
10e3...5a4d

git branch

A

B

C

D

E

F

G

production

development

master

A

B

C

development

D

E

# master

A

B

C

F

# development

D

E

master

A

B

C

F

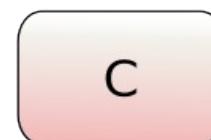
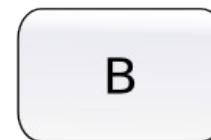
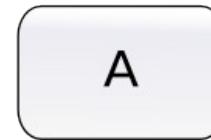
development

D

E

F

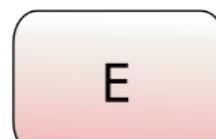
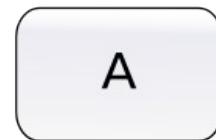
# master



# development



# master



```
roy@roy-media: ~/Projects/roy/git-tutorial 81x21
```

```
roy@roy-media:~/Projects/roy/git-tutorial$ git checkout -b new_feature
Switched to a new branch 'new_feature'
roy@roy-media:~/Projects/roy/git-tutorial$ git status
# On branch new_feature
nothing to commit (working directory clean)
roy@roy-media:~/Projects/roy/git-tutorial$
```

```
roy@roy-media:~/Projects/roy/git-tutorial 81x21
roy@roy-media:~/Projects/roy/git-tutorial$ git status
# On branch new_feature
# Changes to be committed:
#   (use "git reset HEAD <file>..." to unstage)
#
#       modified:   program.rb
#
roy@roy-media:~/Projects/roy/git-tutorial$ git diff --cached
diff --git a/program.rb b/program.rb
index b8362b2..753b482 100755
--- a/program.rb
+++ b/program.rb
@@ -1,5 +1,5 @@
 #!/usr/bin/env ruby

-if true
+if false
  puts "Hello World"
end
roy@roy-media:~/Projects/roy/git-tutorial$ git commit -m "Changed if to true"
```

```
| roy@roy-media: ~/Projects/roy/git-tutorial 81x21
| roy@roy-media:~/Projects/roy/git-tutorial$ git checkout master
| Switched to branch 'master'
| roy@roy-media:~/Projects/roy/git-tutorial$
```

```
roy@roy-media:~/Projects/roy/git-tutorial 81x21
roy@roy-media:~/Projects/roy/git-tutorial$ git status
# On branch master
# Changes to be committed:
#   (use "git reset HEAD <file>..." to unstage)
#
#       modified:   program.rb
#
roy@roy-media:~/Projects/roy/git-tutorial$ git diff --cached
diff --git a/program.rb b/program.rb
index b8362b2..75d301c 100755
--- a/program.rb
+++ b/program.rb
@@ -1,4 +1,5 @@
 #!/usr/bin/env ruby
+# Used to demonstrate git techniques

if true
  puts "Hello World"
roy@roy-media:~/Projects/roy/git-tutorial$ git commit -m "Added file description"
```

```
| roy@roy-media: ~/Projects/roy/git-tutorial 81x21
| roy@roy-media:~/Projects/roy/git-tutorial$ git diff new_feature
| diff --git a/program.rb b/program.rb
| index 753b482..75d301c 100755
| --- a/program.rb
| +++ b/program.rb
| @@ -1,5 +1,6 @@
|   #!/usr/bin/env ruby
| +# Used to demonstrate git techniques
|
| -if false
| +if true
|     puts "Hello World"
| end
roy@roy-media:~/Projects/roy/git-tutorial$
```



roy@roy-media: ~/Projects/roy/git-tutorial 81x21

```
roy@roy-media:~/Projects/roy/git-tutorial$ git merge master
Auto-merging program.rb
Merge made by recursive.
 program.rb |    1 +
 1 files changed, 1 insertions(+), 0 deletions(-)
roy@roy-media:~/Projects/roy/git-tutorial$ git status
# On branch new_feature
nothing to commit (working directory clean)
roy@roy-media:~/Projects/roy/git-tutorial$
```

roy@roy-media: ~/Projects/roy/git-tutorial 81x21

```
commit 8a1f43772c0ceb976672469c22323eb8c013022c
Merge: 261c429 6cb853a
Author: Roy van de Water <roy@integrumtech.com>
Date:   Sat Apr 2 05:20:18 2011 -0700
```

Merge branch 'master' into new\_feature

```
commit 6cb853ae45d45fcfb0f4ace708603b6d4564d4f9
Author: Roy van de Water <roy@integrumtech.com>
Date:   Sat Apr 2 05:19:37 2011 -0700
```

Added file description

```
commit 261c4290fd306a5596e63df085f8bd6dd5cda30b
Author: Roy van de Water <roy@integrumtech.com>
Date:   Sat Apr 2 05:12:48 2011 -0700
```

Changed if to true

```
commit a49cb35843df3cbab038a4c64c43fcdbbadbbaac
:
```

roy@roy-media: ~/Projects/roy/git-tutorial 81x21

```
commit 8a1f43772c0ceb976672469c22323eb8c013022c
tree d11a22b56aa0d48f26604c72cae6d41d6dd527e4
parent 261c4290fd306a5596e63df085f8bd6dd5cda30b
parent 6cb853ae45d45fcf0f4ace708603b6d4564d4f9
author Roy van de Water <roy@integrumtech.com> 1301746818 -0700
committer Roy van de Water <roy@integrumtech.com> 1301746818 -0700
```

Merge branch 'master' into new\_feature

```
commit 6cb853ae45d45fcf0f4ace708603b6d4564d4f9
tree a0d7b38153bf496cbbd5a1f52be49fe0b92caae6
parent a49cb35843df3cbab038a4c64c43fcdbbadbba
parent 261c4290fd306a5596e63df085f8bd6dd5cda30b
author Roy van de Water <roy@integrumtech.com> 1301746777 -0700
committer Roy van de Water <roy@integrumtech.com> 1301746777 -0700
```

Added file description

```
commit 261c4290fd306a5596e63df085f8bd6dd5cda30b
tree 4cdb175d763cfa9bc7e76b20d7ec3f979f515462
parent a49cb35843df3cbab038a4c64c43fcdbbadbba
: 100000 file_description 0
```

```
| roy@roy-media: ~/Projects/roy/git-tutorial 81x21
| roy@roy-media:~/Projects/roy/git-tutorial$ git checkout master
| Switched to branch 'master'
| Your branch is ahead of 'origin/master' by 1 commit.
| roy@roy-media:~/Projects/roy/git-tutorial$ git merge new_feature
| Updating 6cb853a..8a1f437
| Fast-forward
|   program.rb |    2 +-+
|   1 files changed, 1 insertions(+), 1 deletions(-)
| roy@roy-media:~/Projects/roy/git-tutorial$
```

```
roy@roy-media: ~/Projects/roy/git-tutorial 81x21
```

```
* commit 8a1f43772c0ceb976672469c22323eb8c013022c
|\ Merge: 261c429 6cb853a
| | Author: Roy van de Water <roy@integrumtech.com>
| | Date: Sat Apr 2 05:20:18 2011 -0700
| |
| |     Merge branch 'master' into new_feature
| |
* commit 6cb853ae45d45fcfb0f4ace708603b6d4564d4f9
| | Author: Roy van de Water <roy@integrumtech.com>
| | Date: Sat Apr 2 05:19:37 2011 -0700
| |
| |     Added file description
| |
* commit 261c4290fd306a5596e63df085f8bd6dd5cda30b
| | Author: Roy van de Water <roy@integrumtech.com>
| | Date: Sat Apr 2 05:12:48 2011 -0700
| |
| |     Changed if to true
| |
* commit a49cb35843df3cbab038a4c64c43fcdbbadbbdac
:
```

```
| roy@roy-media: ~/Projects/roy/git-tutorial 81x21
| roy@roy-media:~/Projects/roy/git-tutorial$ git branch -d new_feature
| Deleted branch new_feature (was 8a1f437).
| roy@roy-media:~/Projects/roy/git-tutorial$
```

When  
merging  
fails

```
| roy@roy-media: ~/Projects/roy/git-tutorial 81x24
roy@roy-media:~/Projects/roy/git-tutorial$ git checkout -b text_change
Switched to a new branch 'text_change'
roy@roy-media:~/Projects/roy/git-tutorial$ vim program.rb
roy@roy-media:~/Projects/roy/git-tutorial$ git add program.rb
roy@roy-media:~/Projects/roy/git-tutorial$ git status
# On branch text_change
# Changes to be committed:
#   (use "git reset HEAD <file>..." to unstage)
#
#       modified:   program.rb
#
roy@roy-media:~/Projects/roy/git-tutorial$ git diff --cached
diff --git a/program.rb b/program.rb
index 07786e3..99da1ce 100755
--- a/program.rb
+++ b/program.rb
@@ -2,5 +2,5 @@
 # Used to demonstrate git techniques

 if false
- puts "Hello World"
+ puts "My new text"
end
roy@roy-media:~/Projects/roy/git-tutorial$ git commit -m "Changed to new text"
```

```
| roy@roy-media: ~/Projects/roy/git-tutorial 81x24
```

```
roy@roy-media:~/Projects/roy/git-tutorial$ git checkout master
Switched to branch 'master'
roy@roy-media:~/Projects/roy/git-tutorial$ vim program.rb
roy@roy-media:~/Projects/roy/git-tutorial$ git add program.rb
roy@roy-media:~/Projects/roy/git-tutorial$ git diff --cached
diff --git a/program.rb b/program.rb
index 07786e3..48a2cc9 100755
--- a/program.rb
+++ b/program.rb
@@ -2,5 +2,5 @@
 # Used to demonstrate git techniques

 if false
- puts "Hello World"
+ puts "Other developer's contribution"
end
roy@roy-media:~/Projects/roy/git-tutorial$ git commit -m "Bob's text change"
[master faae086] Bob's text change
 1 files changed, 1 insertions(+), 1 deletions(-)
roy@roy-media:~/Projects/roy/git-tutorial$
```



roy@roy-media: ~/Projects/roy/git-tutorial 81x24

```
roy@roy-media:~/Projects/roy/git-tutorial$ git checkout text_change
Switched to branch 'text_change'
roy@roy-media:~/Projects/roy/git-tutorial$ git diff master
diff --git a/program.rb b/program.rb
index 48a2cc9..99da1ce 100755
--- a/program.rb
+++ b/program.rb
@@ -2,5 +2,5 @@
 # Used to demonstrate git techniques

 if false
- puts "Other developer's contribution"
+ puts "My new text"
end
roy@roy-media:~/Projects/roy/git-tutorial$
```

```
| roy@roy-media: ~/Projects/roy/git-tutorial 81x24
```

```
roy@roy-media:~/Projects/roy/git-tutorial$ git merge master
Auto-merging program.rb
CONFLICT (content): Merge conflict in program.rb
Automatic merge failed; fix conflicts and then commit the result.
roy@roy-media:~/Projects/roy/git-tutorial$ git status
# On branch text_change
# Unmerged paths:
#   (use "git add/rm <file>..." as appropriate to mark resolution)
#
#       both modified:    program.rb
#
no changes added to commit (use "git add" and/or "git commit -a")
roy@roy-media:~/Projects/roy/git-tutorial$ git mergetool
```

```
1 #!/usr/bin/env ruby
2 # Used to demonstrate git t
3
4 if false
5   puts "My new text"
6 end
```

```
1 #!/usr/bin/env ruby
2 # Used to demonstrate git te
3
4 if false
5 <<<<< HEAD
6   puts "My new text"
7 =====
8   puts "Other developer's co
9 >>>>> master
10 end
```

```
1 #!/usr/bin/env ruby
2 # Used to demonstrate git t
3
4 if false
5   puts "Other developer's c
6 end
```

```
1 #!/usr/bin/env ruby
2 # Used to demonstrate git t
3
4 if false
5   puts "My new text"
6 end
```

```
1 #!/usr/bin/env ruby
2 # Used to demonstrate git te
3
4 if false
5   puts "My new text"
6 end
```

```
1 #!/usr/bin/env ruby
2 # Used to demonstrate git t
3
4 if false
5   puts "Other developer's c
6 end
```

<.LOCAL.15094.rb 1,1  
All 3 fewer lines

All program.rb [+] 1,1

All <REMOTE.15094.rb 1,1

All

```
| roy@roy-media: ~/Projects/roy/git-tutorial 81x24
roy@roy-media:~/Projects/roy/git-tutorial$ git status
# On branch text_change
# Untracked files:
#   (use "git add <file>..." to include in what will be committed)
#
#       program.rb.orig
nothing added to commit but untracked files present (use "git add" to track)
roy@roy-media:~/Projects/roy/git-tutorial$ cat program.rb.orig
#!/usr/bin/env ruby
# Used to demonstrate git techniques

if false
<<<<< HEAD
  puts "My new text"
=====
  puts "Other developer's contribution"
>>>>> master
end
roy@roy-media:~/Projects/roy/git-tutorial$
```

```
| roy@roy-media: ~/Projects/roy/git-tutorial 81x24
roy@roy-media:~/Projects/roy/git-tutorial$ ls
program.rb README
roy@roy-media:~/Projects/roy/git-tutorial$ git commit -m "Merged with master"
[text_change 244b0a2] Merged with master
roy@roy-media:~/Projects/roy/git-tutorial$ git checkout master
Switched to branch 'master'
Your branch is ahead of 'origin/master' by 1 commit.
roy@roy-media:~/Projects/roy/git-tutorial$ git merge text_change
Updating faae086..244b0a2
Fast-forward
 program.rb |    2 +-
 1 files changed, 1 insertions(+), 1 deletions(-)
roy@roy-media:~/Projects/roy/git-tutorial$
```

git stash

roy@roy-media: ~/Projects/roy/git-tutorial 81x24

```
roy@roy-media:~/Projects/roy/git-tutorial$ vim program.rb
roy@roy-media:~/Projects/roy/git-tutorial$ git status
# On branch master
# Changed but not updated:
#   (use "git add <file>..." to update what will be committed)
#   (use "git checkout -- <file>..." to discard changes in working directory)
#
#       modified:   program.rb
#
no changes added to commit (use "git add" and/or "git commit -a")
roy@roy-media:~/Projects/roy/git-tutorial$
```

roy@roy-media: ~/Projects/roy/git-tutorial 81x24

```
roy@roy-media:~/Projects/roy/git-tutorial$ git stash
Saved working directory and index state WIP on master: 244b0a2 Merged with master
HEAD is now at 244b0a2 Merged with master
roy@roy-media:~/Projects/roy/git-tutorial$ git status
# On branch master
nothing to commit (working directory clean)
roy@roy-media:~/Projects/roy/git-tutorial$
```

roy@roy-media: ~/Projects/roy/git-tutorial 81x24

```
roy@roy-media:~/Projects/roy/git-tutorial$ git stash list
stash@{0}: WIP on master: 244b0a2 Merged with master
roy@roy-media:~/Projects/roy/git-tutorial$
```

roy@roy-media: ~/Projects/roy/git-tutorial 81x24

```
roy@roy-media:~/Projects/roy/git-tutorial$ git stash pop
# On branch master
# Changed but not updated:
#   (use "git add <file>..." to update what will be committed)
#   (use "git checkout -- <file>..." to discard changes in working directory)
#
#       modified:   program.rb
#
no changes added to commit (use "git add" and/or "git commit -a")
Dropped refs/stash@{0} (7d60d5b14f6ecfbfd3882922a046aa05bd7337e9)
roy@roy-media:~/Projects/roy/git-tutorial$
```

git tag v0.1

refspec

git checkout master

git checkout v0.1

git checkout HEAD^

git checkout HEAD~5

Roy van de Water  
@royvandewater

<http://bit.ly/git-101>