Introduction to Git

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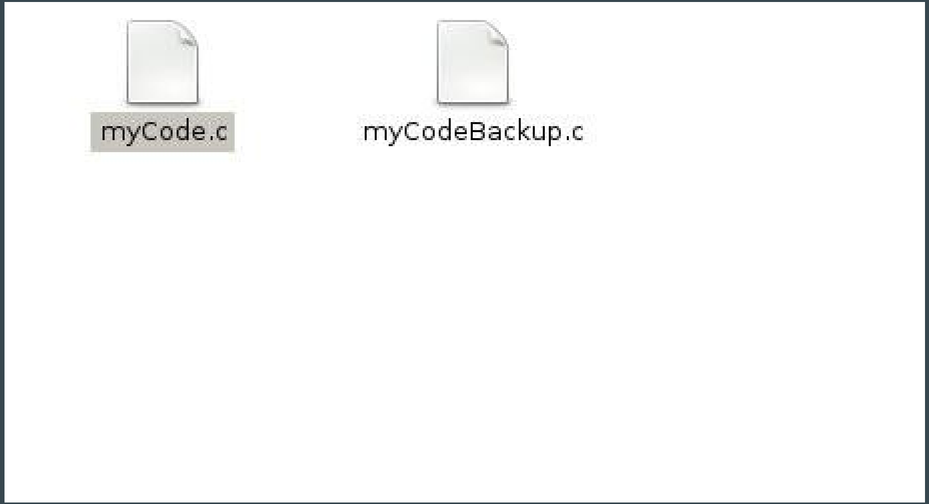
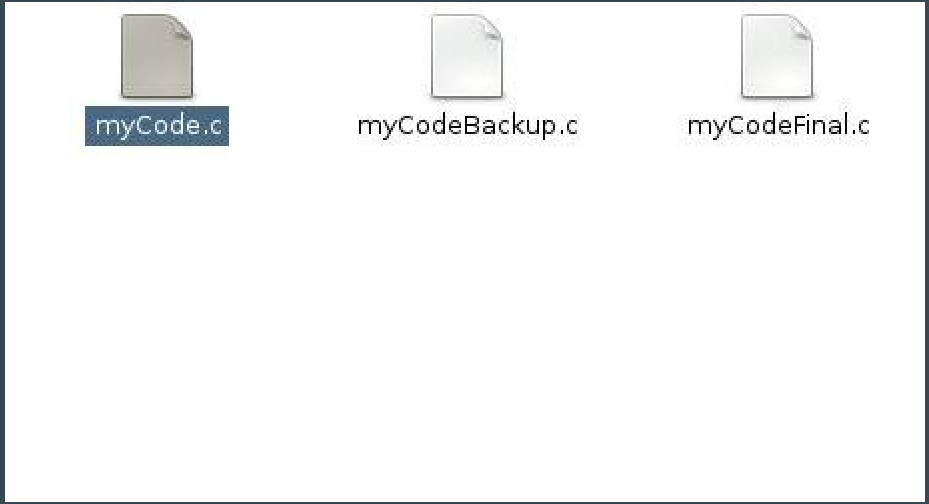
Why do we need git

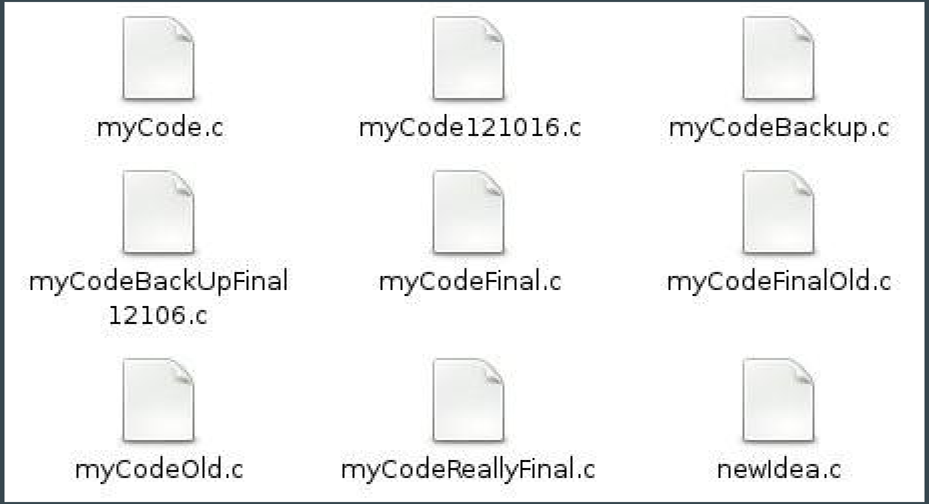
Why do we need git



Why do we need git



Why do we need git



Why do we need git

Why do you need git

- Your future employer probably works with git
- Most common tool for open source development
- To manage your own projects/assignments
- Usage will be mandatory in future modules

Before we start

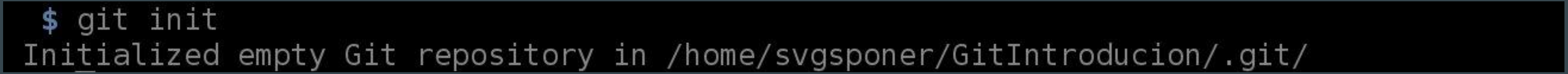
Model	File
Sketch	Working directory
Scene	Staging Area
Photo album	Repository

git init - Setup everything

Setup for the capturing:

- Create empty sketch
- Point camera at empty scene
- Buy new empty photo album

In git this is done by *git init*

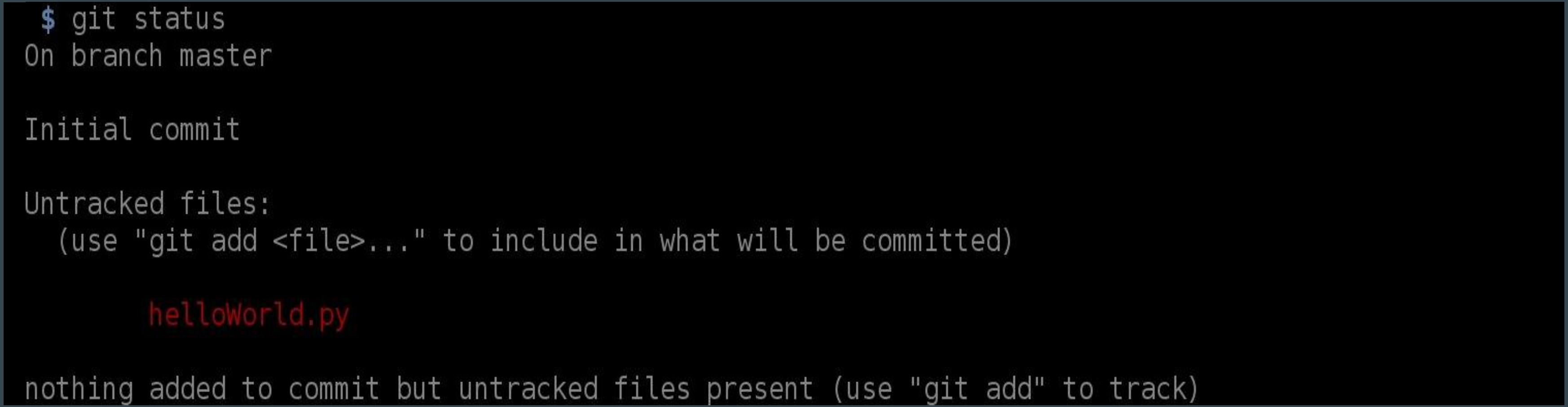


```
  $ git init
Initialized empty Git repository in /home/svgsponer/GitIntrodución/.git/
```

git status - Get an Overview

Check who is on the drawing and who is standing in the scene.

git status gives you an overview of the current situation

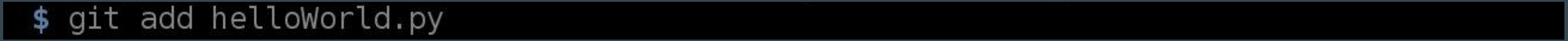


```
 $ git status
On branch master

Initial commit

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

        helloWorld.py

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

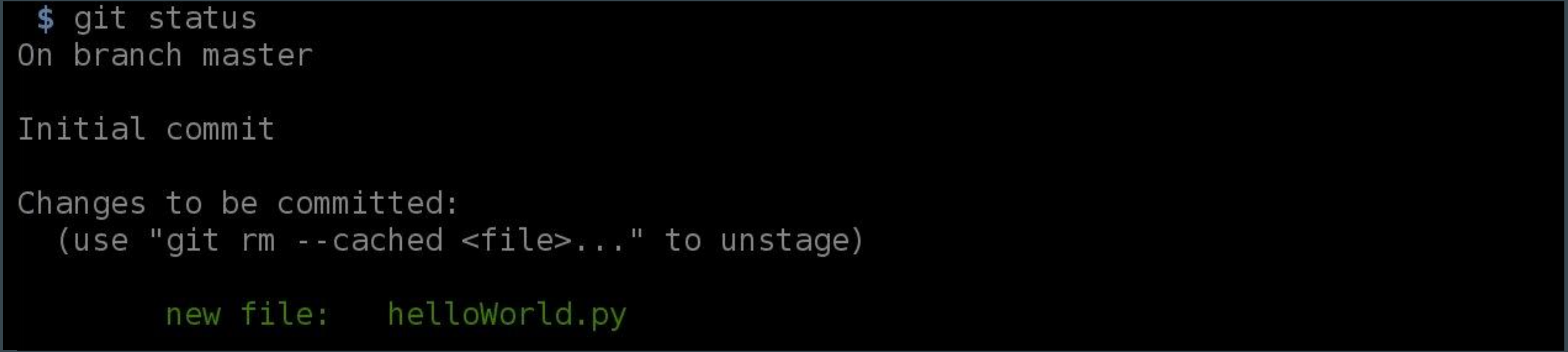
git add - Adjust the Scene

Tell models you like on the sketch to go to the scene

git add <filename> adds file to the staging area



```
 $ git add helloWorld.py
```

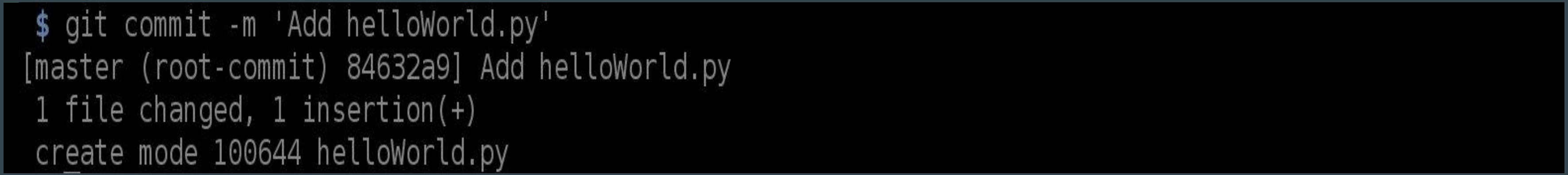


```
 $ git status
On branch master

Initial commit

Changes to be committed:
  (use "git rm --cached <file>..." to unstage)

        new file:   helloWorld.py
```

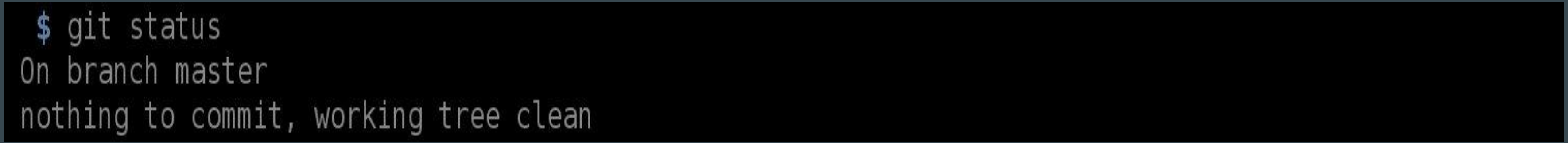
git commit - Take the Photo

Take the photo and glue it in our album together with a description.

git commit saves files in the repository



```
 $ git commit -m 'Add helloWorld.py'
[master (root-commit) 84632a9] Add helloWorld.py
 1 file changed, 1 insertion(+)
 create mode 100644 helloWorld.py
```

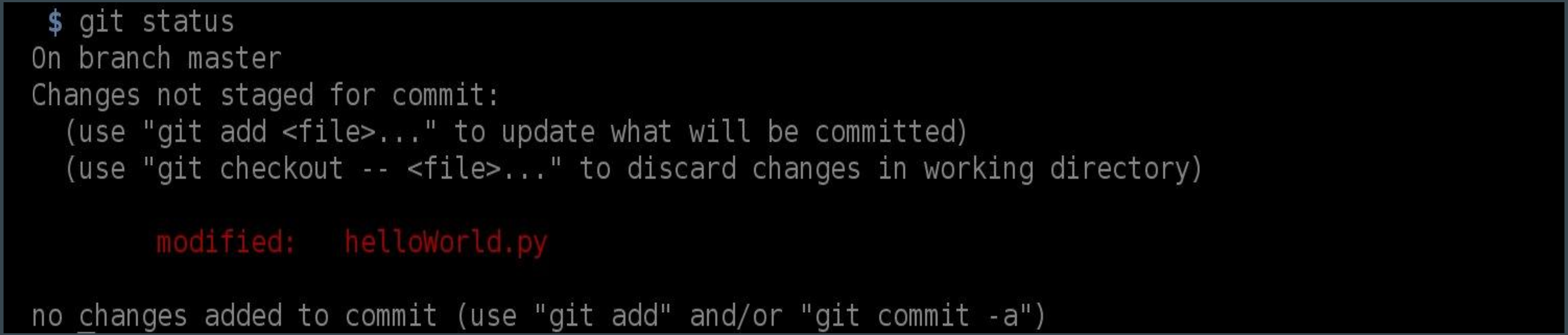


```
 $ git status
On branch master
nothing to commit, working tree clean
```

Make some changes

After some drawing get an overview by looking at scene and drawing

git status shows us that helloWorld.py changed

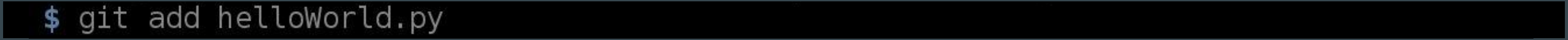


```
 $ git status
On branch master
Changes not staged for commit:
  (use "git add <file>..." to update what will be committed)
  (use "git checkout -- <file>..." to discard changes in working directory)

        modified:   helloWorld.py

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

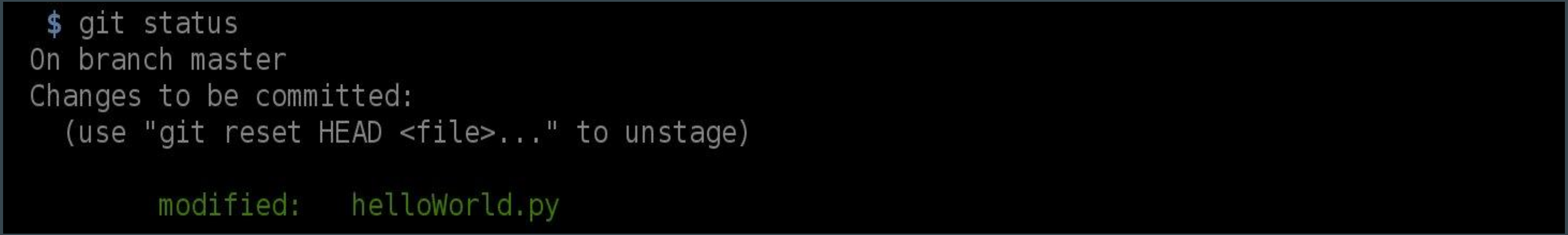
git add - Adjust scene

Choose which changes of the sketch we want in the scene

Add the changes to the staging area



```
 $ git add helloWorld.py
```

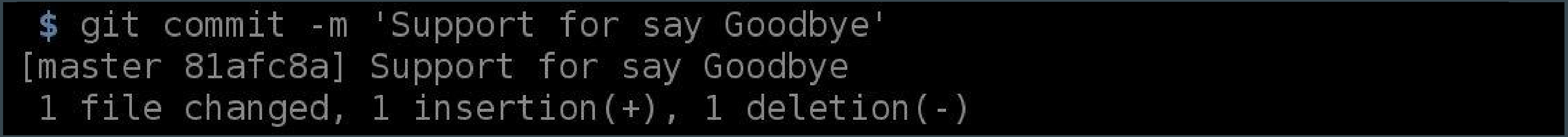


```
 $ git status
On branch master
Changes to be committed:
  (use "git reset HEAD <file>..." to unstage)

        modified:   helloWorld.py
```

commit - Smile! Click, click

Take a new photo and put it in our album with a description.

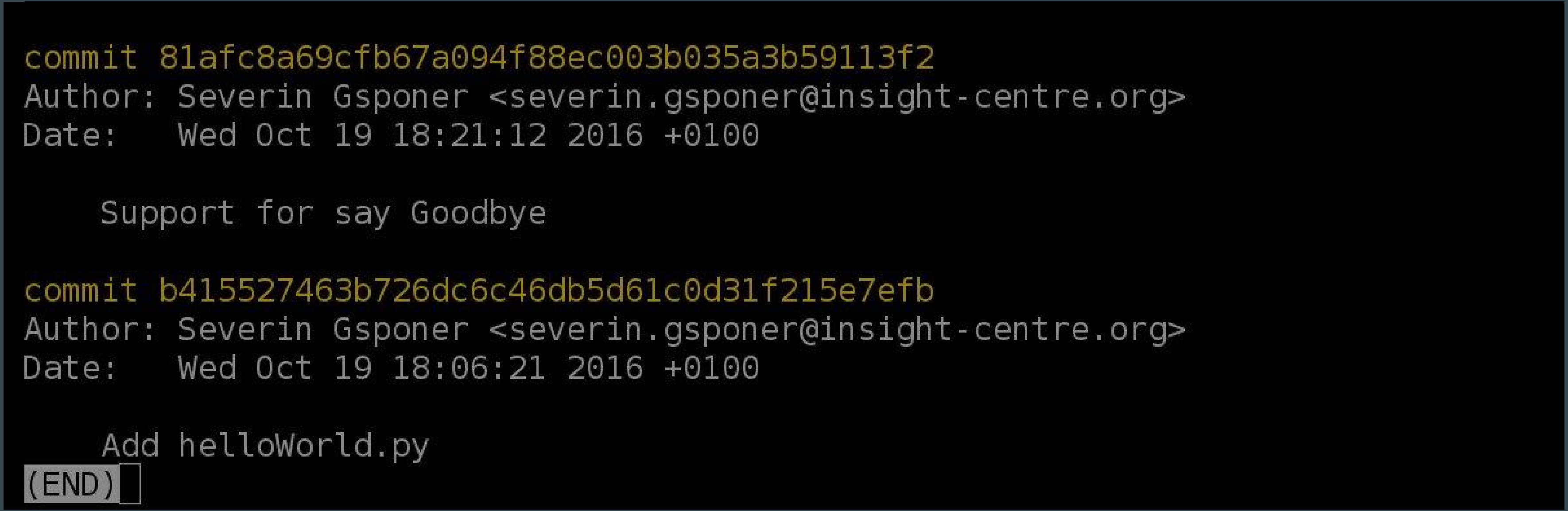
git commit saves staged files in the repository



```
 $ git commit -m 'Support for say Goodbye'
[master 81afc8a] Support for say Goodbye
 1 file changed, 1 insertion(+), 1 deletion(-)
```

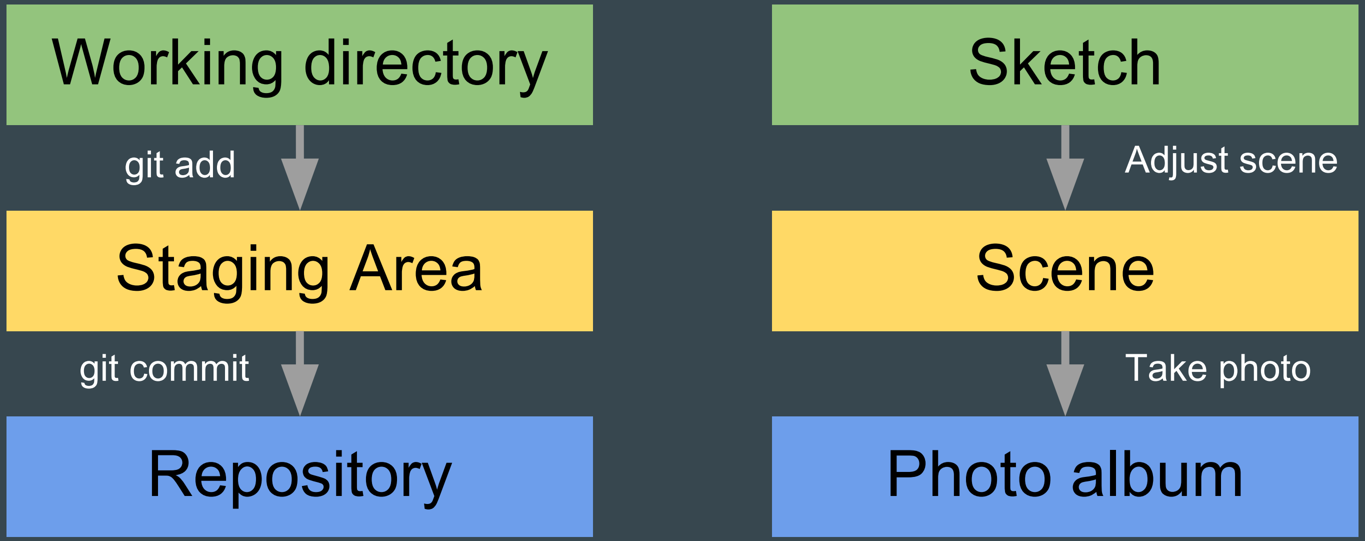
git log - Look through the Album

Shows the history of commits



```
commit 81afc8a69cfb67a094f88ec003b035a3b59113f2
Author: Severin Gsponer <severin.gsponer@insight-centre.org>
Date:   Wed Oct 19 18:21:12 2016 +0100

    Support for say Goodbye

commit b415527463b726dc6c46db5d61c0d31f215e7efb
Author: Severin Gsponer <severin.gsponer@insight-centre.org>
Date:   Wed Oct 19 18:06:21 2016 +0100

    Add helloWorld.py
(END)
```

Recap



Working directory

git add

Staging Area

git commit

Repository

Sketch

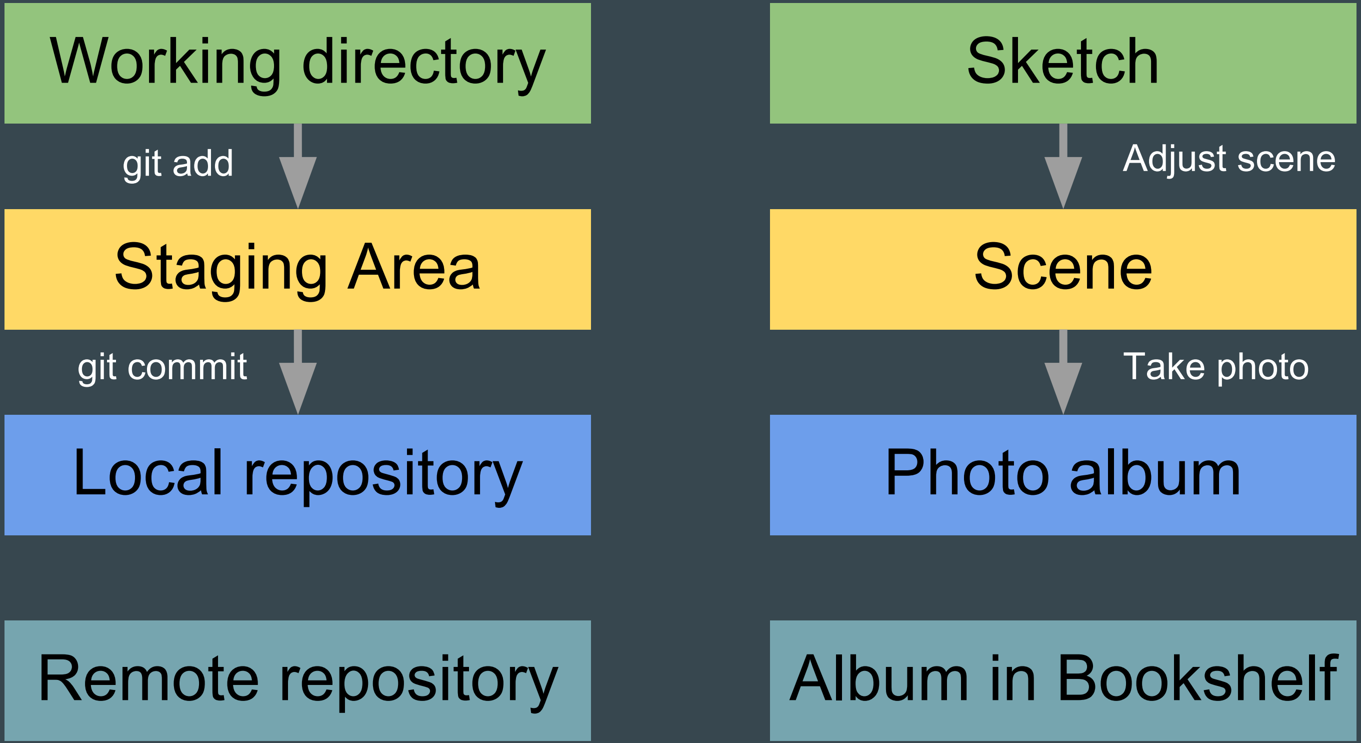
Adjust scene

Scene

Take photo

Photo album

Add Next Level



Working directory

git add

Staging Area

git commit

Local repository

Remote repository

Sketch

Adjust scene

Scene

Take photo

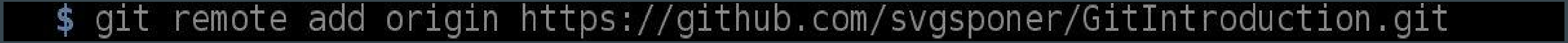
Photo album

Album in Bookshelf

git remote - Define the Bookshelf

We first define which bookshelf to use and give it a name

git remote add origin <url> does this



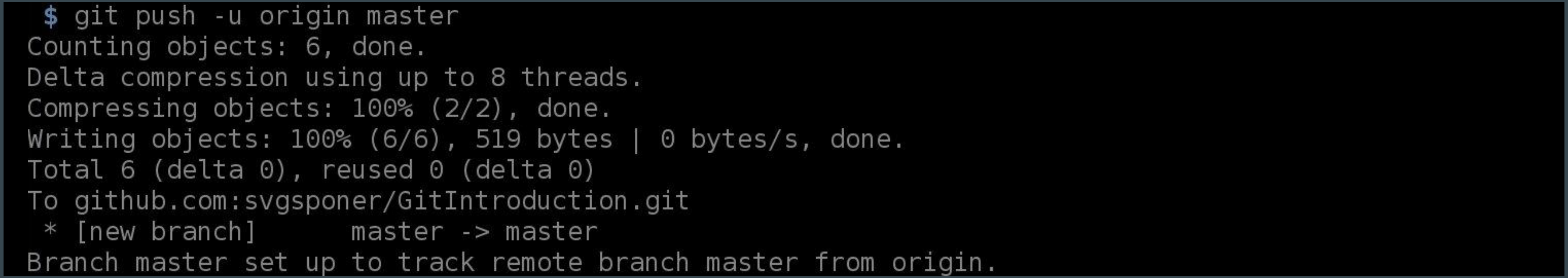
```
$ git remote add origin https://github.com/svgsponer/GitIntroduction.git
```

Remote repository has to exist on github.

git push - Put Photo Album into the Shelf

Copy photos from my personal album to the shelfs album.

git push send local repository to remote repository



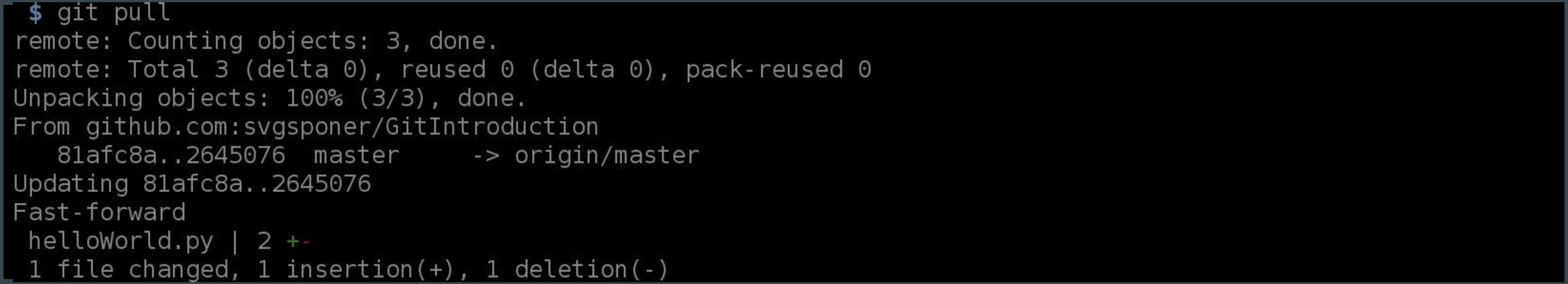
```
 $ git push -u origin master
Counting objects: 6, done.
Delta compression using up to 8 threads.
Compressing objects: 100% (2/2), done.
Writing objects: 100% (6/6), 519 bytes | 0 bytes/s, done.
Total 6 (delta 0), reused 0 (delta 0)
To github.com:svgsponer/GitIntroduction.git
 * [new branch]      master -> master
Branch master set up to track remote branch master from origin.
```

After pushed once the command *git push* is enough

git pull - Take Photo Album from the Shell

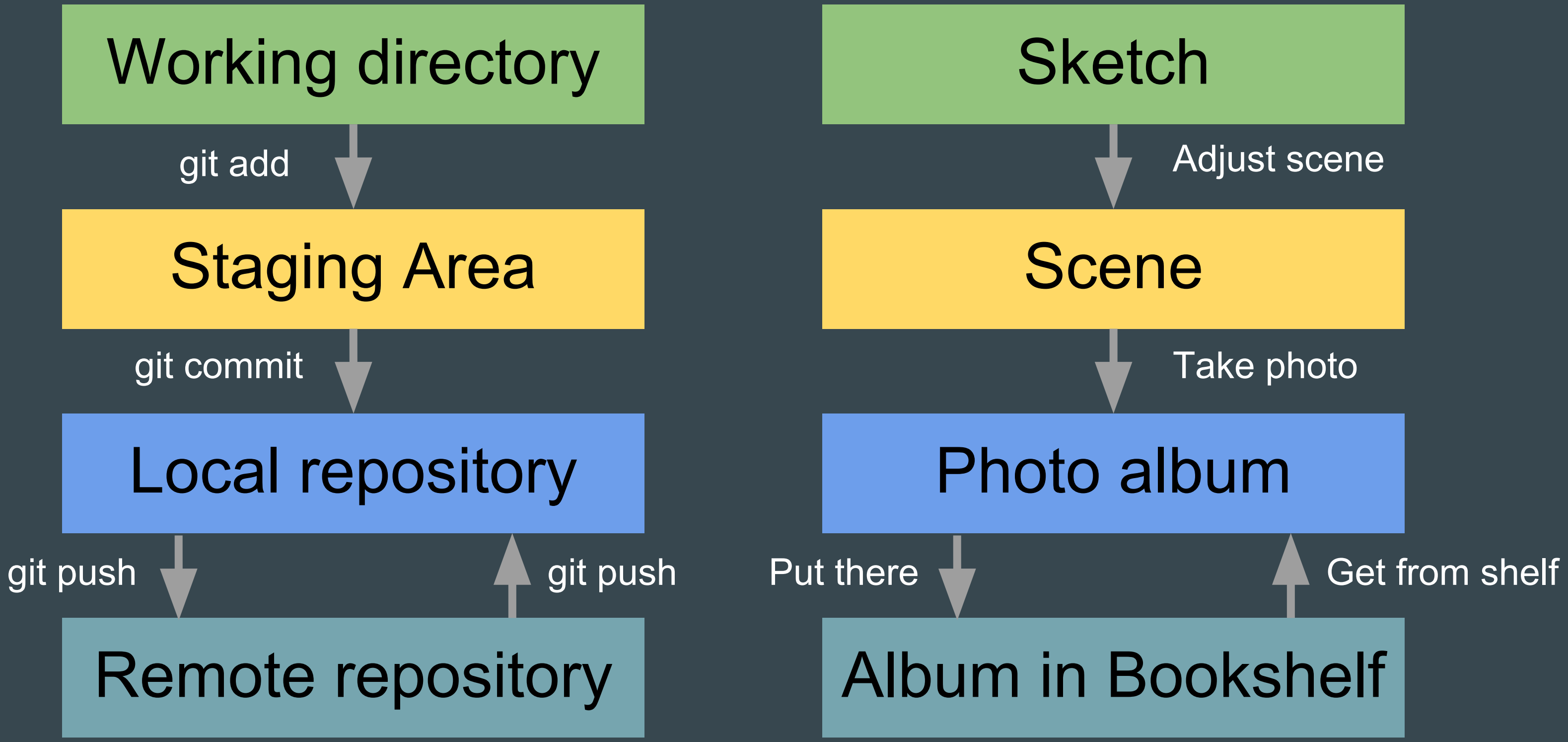
Gets album from the shelf and adds missing photos in personal Photo album

git pull gets remote repository and adds changes to local repository



```
 $ git pull
remote: Counting objects: 3, done.
remote: Total 3 (delta 0), reused 0 (delta 0), pack-reused 0
Unpacking objects: 100% (3/3), done.
From github.com:svgsponer/GitIntroduction
   81afc8a..2645076  master     -> origin/master
Updating 81afc8a..2645076
Fast-forward
 helloWorld.py | 2 +-
 1 file changed, 1 insertion(+), 1 deletion(-)
```

Add Next Level



Working directory

git add

Staging Area

git commit

Local repository

git push

git push

Remote repository

Sketch

Adjust scene

Scene

Take photo

Photo album

Put there

Get from shelf

Album in Bookshelf

Further topics

- Cloning
- Rollback (checkout, reset and revert)
- Branching
- Merging
- Graphical tools (Eclipse, Emacs, Github app, ...)

More material

- https://try.github.io (interactive tutorial)
- https://git-scm.com (official documentation)
- https://www.atlassian.com/git/tutorials/what-is-version-control (tutorial)
- http://git.io/git-tips (collection of useful command)
- https://guides.github.com/activities/hello-world/ (tutorial)
- http://ndpsoftware.com/git-cheatsheet.html (interactive cheatsheet)
- http://justinhileman.info/article/git-pretty/git-pretty.png (panic graph)
- https://www.youtube.com/watch?v=ZDR433b0HJY (more technical introduction)
- https://www.youtube.com/watch?v=MYP56QJpDr4 (advanced git and internals)

Exercise

1. Install git (https://www.atlassian.com/git/tutorials/install-git/linux)
2. Create new folder with a file in it
3. Initialize git (git init)
4. Add a file to the stage (git add)
5. Commit (git commit -m’<message>’)
6. Change file and commit changes (git add & git commit)
7. Create remote repository on Github (www.github.com)
8. Add remote to local repository (git remote add)
9. Push to remote repository

Slides available at: