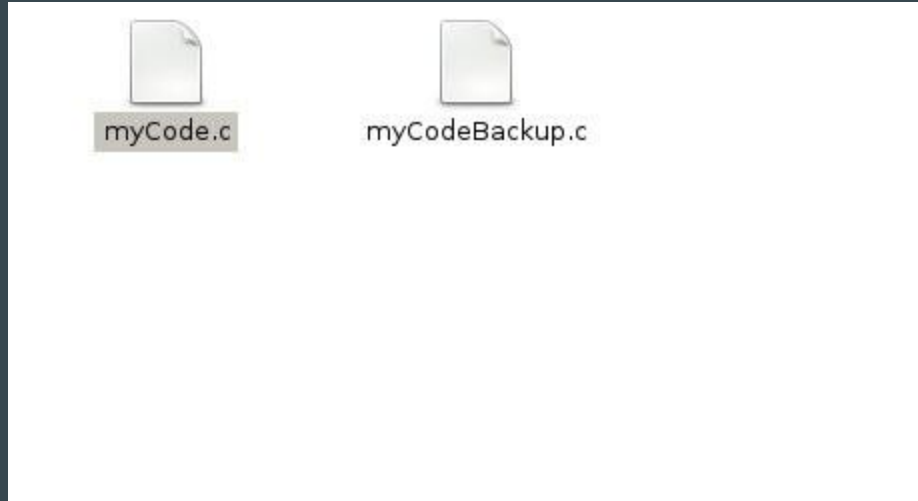# Introduction to Git

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20. 10. 2016

Why do we need git
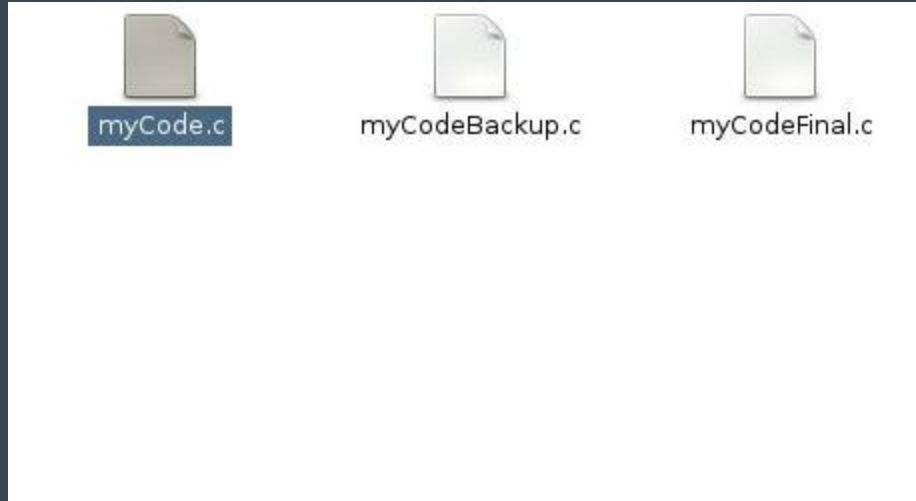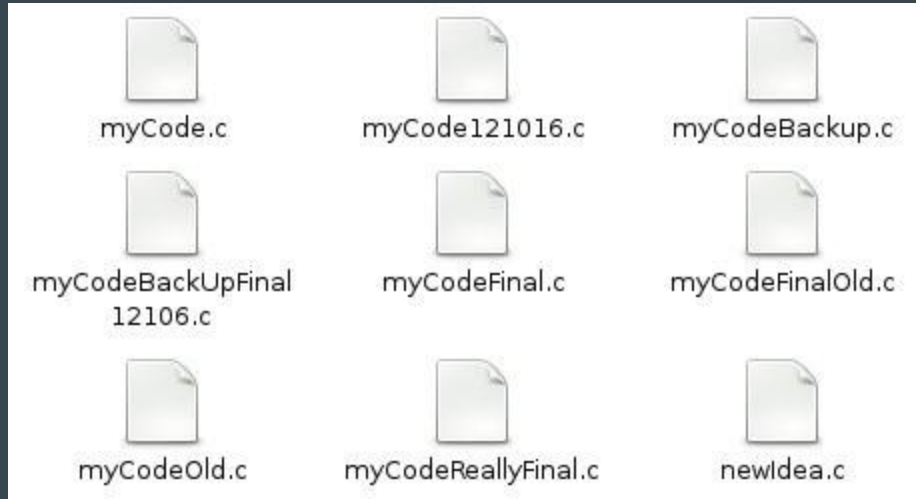

myCode.c

Why do we need git

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myCode.c

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/GitIntroducion/.git/
```

git status - Get an Overview

Check who is in 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 in 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 into 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 drawing get an overview by looking at the 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 to 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)
```
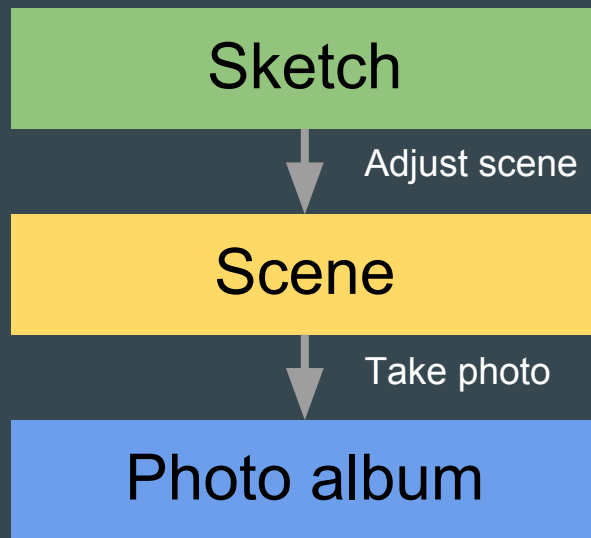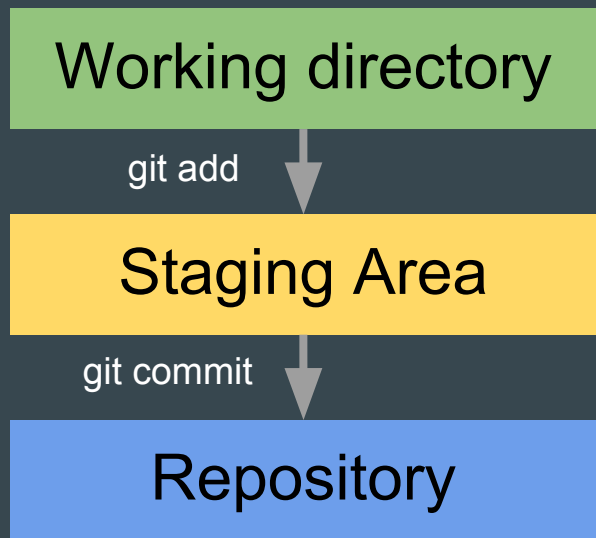
Recap

Add Next Level

Working directory	Sketch
↓ git add	↓ Adjust scene
Staging Area	Scene
↓ git commit	↓ Take photo
Local repository	Photo album
Remote repository	Album in Bookshelf
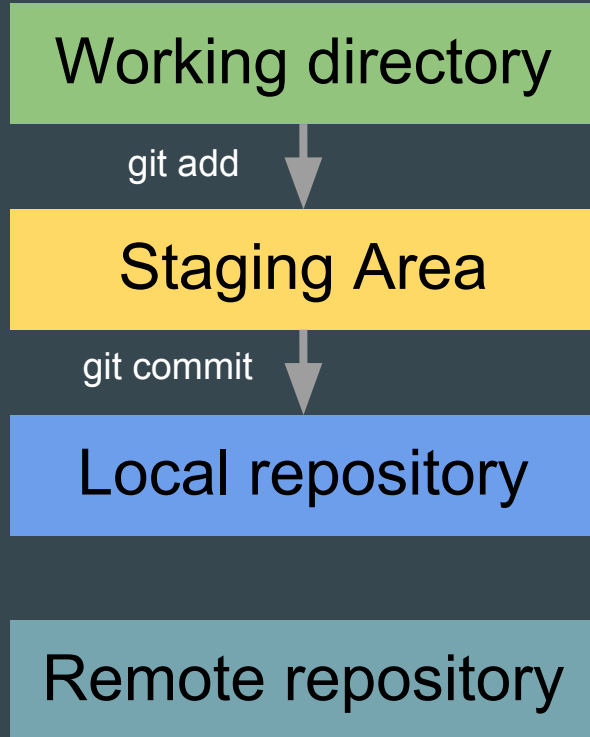
git remote - Define the Bookshelf

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 album on the shelf.

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
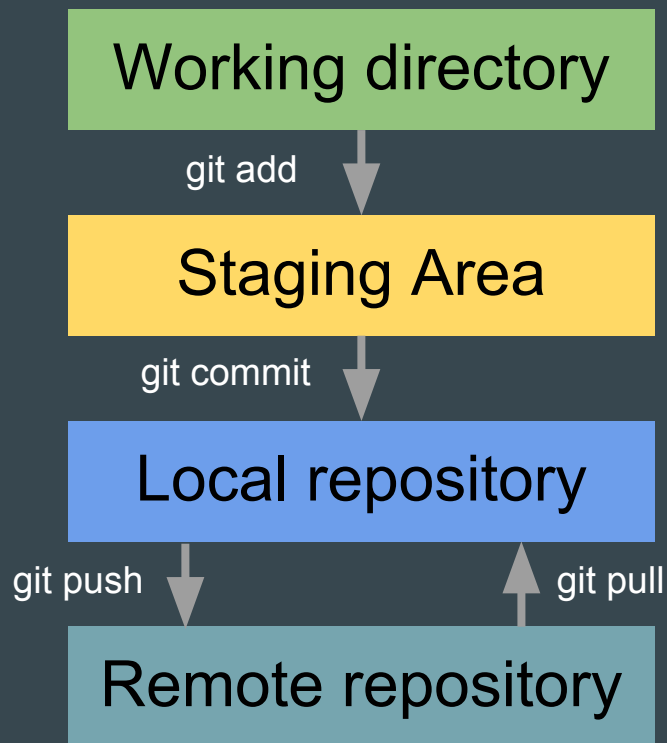
Further topics

- 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: svgsponer.github.io