

Version Control

Simple Intro

Part 2



```
1 // If it IE 9] ><script src="<?php echo
2 // wp_head(); ?>
3 // <head>
4 // body <?php body_class(); ?>
5 // <div id="page-header" class="hfeed site">
6 // $theme_options = fruitful_get_theme_options();
7 // $logo_pos = $menu_pos = '';
8 // if (isset($theme_options['logo_pos'])) {
9 //   $logo_pos = esc_attr($theme_options['logo_pos']);
10 //   if (isset($theme_options['menu_pos'])) {
11 //     $menu_pos = esc_attr($theme_options['menu_pos']);
12 //     $1000_pos_class = $menu_pos . 'pos-class';
13 //     $pos_class = $1000_pos_class . 'pos-class';
14 //   }
15 // }
16 // <header>
17 // <div>
18 // <div>
19 // <div>
20 // <div>
21 // <div>
22 // <div>
23 // <div>
24 // <div>
25 // <div>
26 // <div>
27 // <div>
28 // <div>
29 // <div>
30 // <div>
31 // <div>
32 // <div>
33 // <div>
```

Why version control?

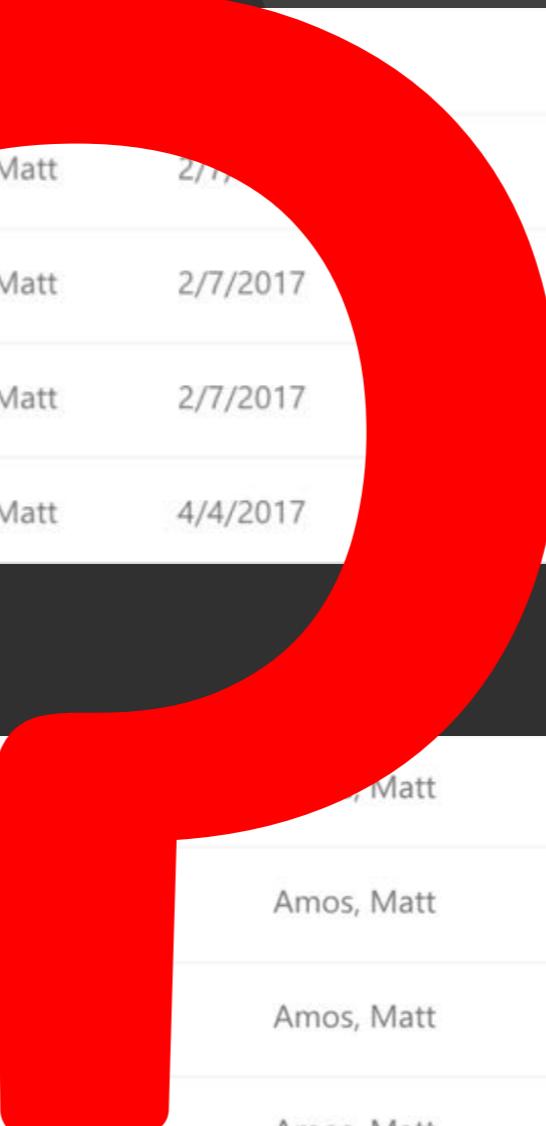
 SupremePlotLow.m	Amos, Matt	2/7/2017	2.47 KB
 SupremePlotLow.m	Amos, Matt	2/7/2017	2.45 KB
 SupremePlotLow.m	Amos, Matt	2/7/2017	2.49 KB
 SupremePlot.m	Amos, Matt	2/7/2017	2.43 KB
 SupremePlot.m	Amos, Matt	4/4/2017	3.23 KB

 FirstWaveRegister.m	Amos, Matt	1/30/2017	508 bytes
 FirstWaveRegister.m	Amos, Matt	3/8/2017	542 bytes
 FirstWaveRegister.m	Amos, Matt	3/8/2017	552 bytes
 FirstWaveRegister.m	Amos, Matt	3/8/2017	543 bytes

Why version control?



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Why version control?



- Collaboration
 - Each member of a team can edit independently
- History of changes
- Create changes in parallel
- Not limited to code - great for notes, .tex ...

```
commit e7e1dcc84a2d1d20e2beef7b6e134df7655beaf0
Author: Matt Amos <matty_a1@hotmail.co.uk>
Date: Mon Mar 19 18:50:21 2018 +0000
```

new funcs added to util

```
commit 53d66732acd323cf653d042d10a7c164a1af03a8
Author: Matt Amos <matty_a1@hotmail.co.uk>
Date: Mon Mar 19 14:04:30 2018 +0000
```

updating for gnasher

```
commit a573dfad5289f917dbb9ef26dbd74ed11b0cf96e
Author: Matt Amos <matty_a1@hotmail.co.uk>
Date: Fri Mar 16 22:37:51 2018 +0000
```

First Commit of Util

```
@@ -371,17 +377,117 @@ def plot_multi_model_mean(cubes_list, mov_ave=None):  
     # For mean and standard deviation  
     time = std_cube.coord('time_month')  
-    fixed_dates = iris.plot._fixup_dates(time_coord, time_coord.points)  
+    fixed_dates = iris.plot._fixup_dates(time, time.points)  
  
     std_data = std_cube.data  
     mean_data = mean_cube.data  
-  
+  
     plt.plot(fixed_dates, mean_data, label='Model average')  
-     plt.fill_between(fixed_dates, mean_data-std_data, mean_data+std_data, facecolor='grey', alpha=0.4)  
+     if std_dev:  
+         plt.fill_between(fixed_dates, mean_data-std_data, mean_data+std_data, facecolor='grey',  
+                         alpha=0.4)
```

Example time

- Initialise git repo

```
[Matts-MacBook-Pro:maths amosm1$ git init
Initialized empty Git repository in /Users/amosm1/math.../.
```

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- Add to the staging area

```
Matts-MacBook-Pro:maths amosm1$ git add square.py
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- Add to the staging area

```
Matts-MacBook-Pro:maths amosm1$ git add square.py
```

- Save the changes locally

```
[Matts-MacBook-Pro:maths amosm1$ git commit -m 'New Function'
[master (root-commit) e758915] New Function
 1 file changed, 1 insertion(+)
 create mode 100644 square.py
```

- Initialise git repo

```
[Matts-MacBook-Pro:maths amosm1$ git init
Initialized empty Git repository in /Users/amosm1/math.../
```

- Add to the staging area

```
Matts-MacBook-Pro:maths amosm1$ git add square.py
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- Save the changes locally

```
[Matts-MacBook-Pro:maths amosm1$ git commit -m 'New Function'
[master (root-commit) e758915] New Function
 1 file changed, 1 insertion(+)
 create mode 100644 square.py
```

- Check we're up to date

```
[Matts-MacBook-Pro:maths amosm1$ git status
On branch master
nothing to commit, working tree clean
```

```
1123
1124 def load_and_make_seasonal_1d(in_dir, lat, ndim=4):
1125
1126     # Load all CCMI data
1127     if isinstance(lat, list):
1128         lat_0 = lat[0]
1129         lat_1 = lat[1]
1130     else:
1131         raise ValueError('Latitude must be specified as a list')
1132
1133     # Load files and group separate time files into lists
1134     files = [os.path.join(in_dir, file)
1135             for file in os.listdir(in_dir) if file[:2] != '._']
1136     con = iris.Constraint(latitude=lambda cell: lat_0 < cell < lat_1)
1137     in_cubes = iris.cube.CubeList(
1138         [cube for cube in iris.load(files, con) if cube.ndim >= ndim])
1139     cubes_list = group_models(in_cubes)
1140
1141     # Concatenate and collapse (area-weighting)
1142     fin_cubes = []
1143     for cubes in cubes_list:
1144         rem_and_eq(cubes)
1145         if len(cubes) != 1:
1146
1147             try:
1148                 out_cube = iris.cube.CubeList(cubes).concatenate_cube()
1149             except iris.exceptions.ConcatenateError:
```

```
amosm1$ git log -p -- util.py
  - - - - - asonal_1d(in_dir, lat, ndim=4):
1125
1126     # Load all CCM4 data
1127     if isinstance(lat, list):
-def load_and_make_seasonal_1d(in_dir, lat):
+def load_and_make_seasonal_1d(in_dir, lat, ndim=4):
    # Load all CCM4 data
    if isinstance(lat, list):
@@ -1034,7 +1121,7 @@ def load_and_make_seasonal_1d(in_dir, lat):
        # Load files and group separate time files into lists
        files = [os.path.join(in_dir, file) for file in os.listdir(in_dir) if file[:2]!='..']
        con = iris.Constraint(latitude=lambda cell: lat_0 < cell < lat_1 )
-        in_cubes = iris.cube.CubeList([cube for cube in iris.load(files, con) if cube.ndim >= 3])
+        in_cubes = iris.cube.CubeList([cube for cube in iris.load(files, con) if cube.ndim >= ndim
    ])
        cubes_list = group_models(in_cubes)

        # Concatenate and collapse (area-weighting)
@@ -1078,8 +1165,14 @@ def load_and_make_seasonal_1d(in_dir, lat):
        return s_model_cubes
    if len(cubes) == 1:
1146
1147     try:
1148         out_cube = iris.cube.CubeList(cubes).concatenate_cube()
1149     except iris.exceptions.ConcatenateError:
```

```
Matts-MacBook-Pro:analysis amosm1$ git log -p -- util.py dim=4):  
1125  
1126     # Load all CCM4 data  
1127     if isinstance(lat, list):  
-def load_and_make_seasonal_1d(in_dir, lat):  
+def load_and_make_seasonal_1d(in_dir, lat, ndim=4):  
  
    # Load all CCM4 data  
    if isinstance(lat, list):  
@@ -1034,7 +1121,7 @@ def load_and_make_seasonal_1d(in_dir, lat):  
        # Load files and group separate time files into lists  
        files = [os.path.join(in_dir, file) for file in os.listdir(in_dir) if file[:2]!='..']  
        con = iris.Constraint()  
-        in_cubes = iris.cube.CubeList([cube for cube in iris.load(files, con) if cube.ndim >= 3])  
+        in_cubes = iris.cube.CubeList([cube for cube in iris.load(files, con) if cube.ndim >= ndim])  
    )  
    cubes_list = group_models(in_cubes)  
  
    # Concatenate and collapse (area-weighting)  
@@ -1078,8 +1165,14 @@ def load_and_make_seasonal_1d(in_dir, lat):  
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1146  
1147         try:  
1148             out_cube = iris.cube.CubeList(cubes).concatenate_cube()  
1149         except iris.exceptions.ConcatenateError:
```





GitHub



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mattramos / shared-atmos-scripts

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Wiki

Insights

Settings

Branch: master ▾

shared-atmos-scripts / CCMI-Download /

Create new file

Upload files

Find file

History

 mattramos Update README.md

Latest commit 0598e30 an hour ago

..

 README.md

Update README.md

an hour ago

 ccmi_data_retrieve.py

First Commit

7 days ago

 ccmi_download.sh

First Commit

7 days ago

 ccmi_filelist_retrieve.sh

First Commit

7 days ago

 @@ -80,4 +78,4 @@ Points to note

80	- The first time you run, you will need to run with 'refresh' as the last argument this	78	- The first time you run, you will need to run with 'refresh' as the last argument this
81	may take a few minutes whilst the file structure is collected. It is stored so	79	may take a few minutes whilst the file structure is collected. It is stored so
82	this process need only be repeated infrequently	80	this process need only be repeated infrequently
83	- CESM models are not on BADC	81	+ CESM models are not on BADC



git ≠



LOCAL

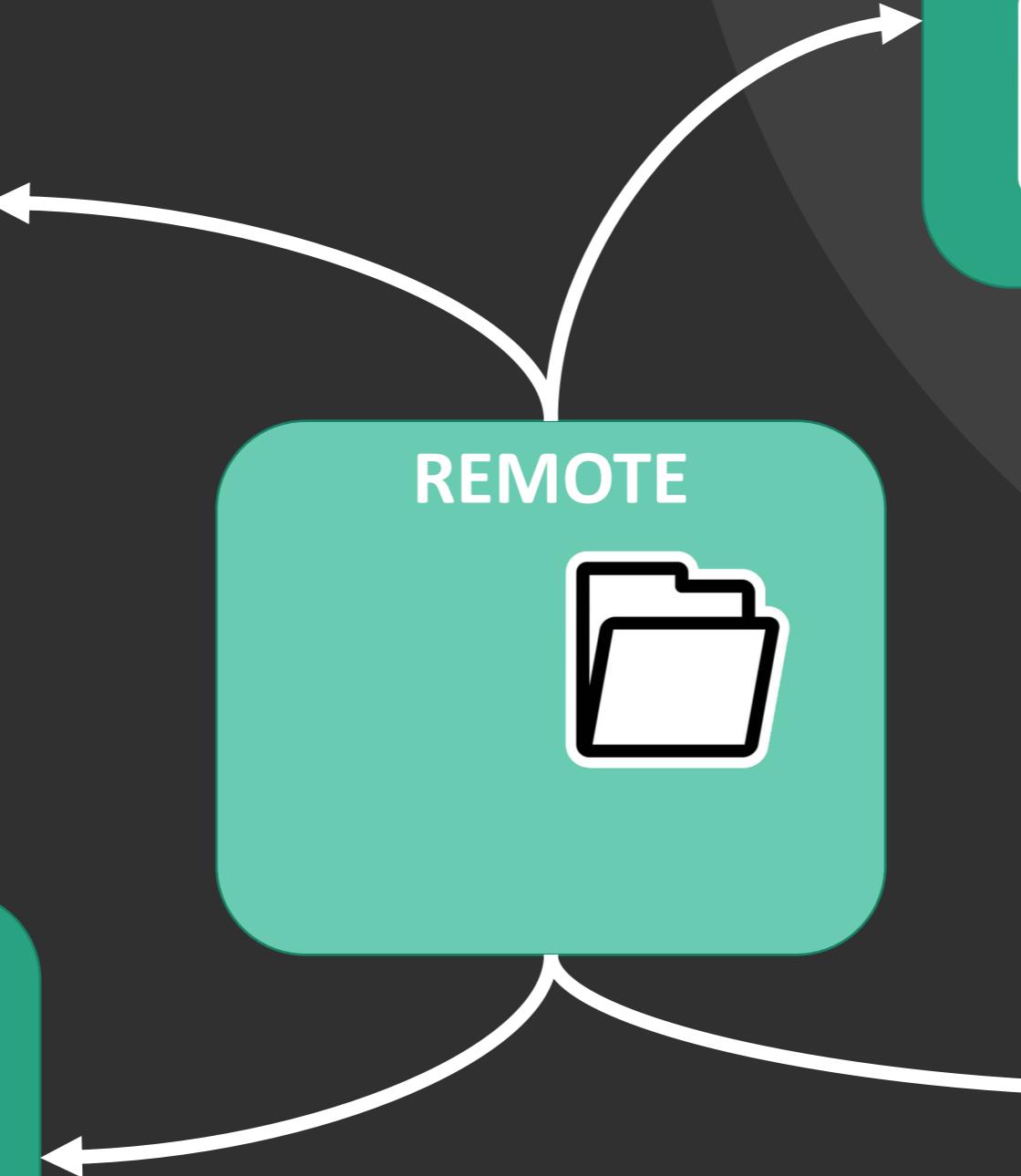
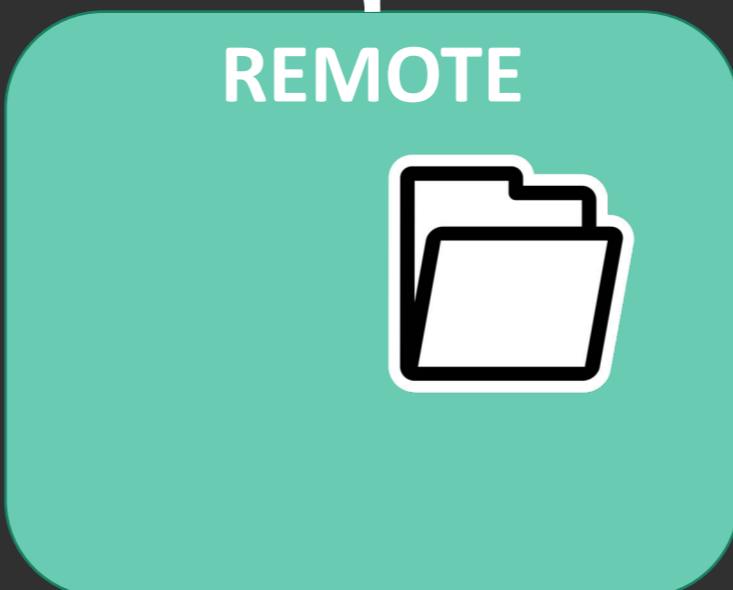
REMOTE

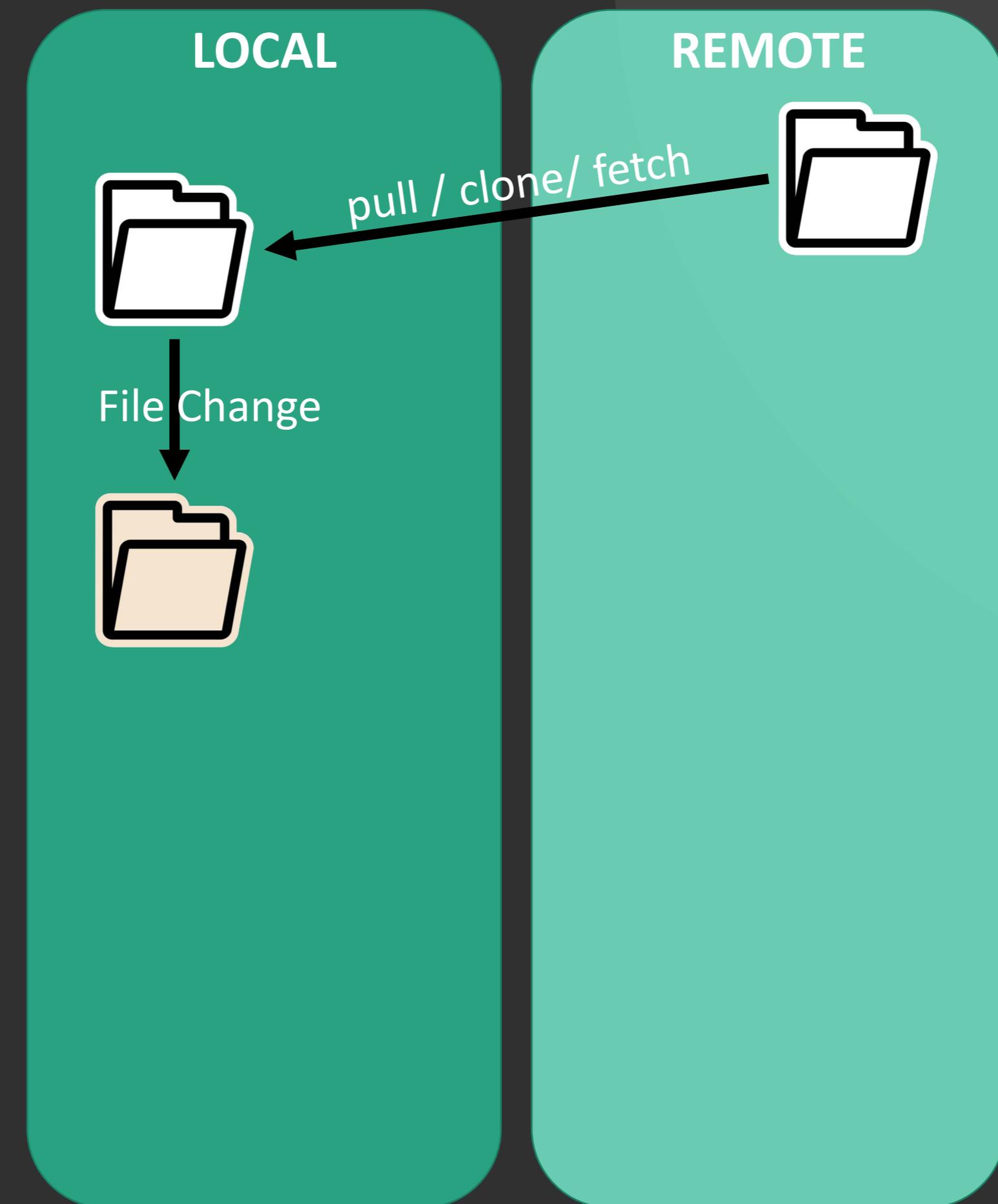


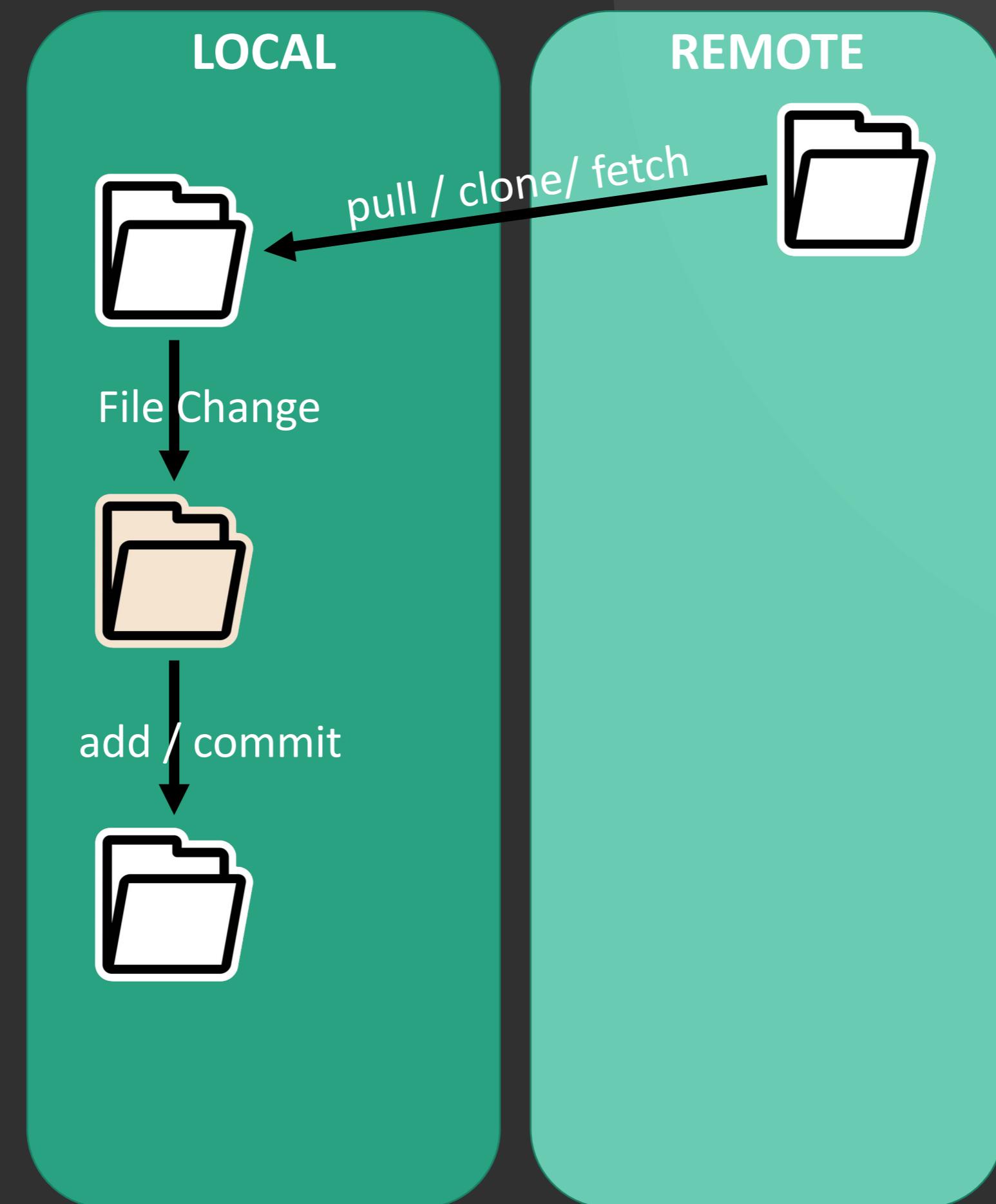
pull / clone/ fetch

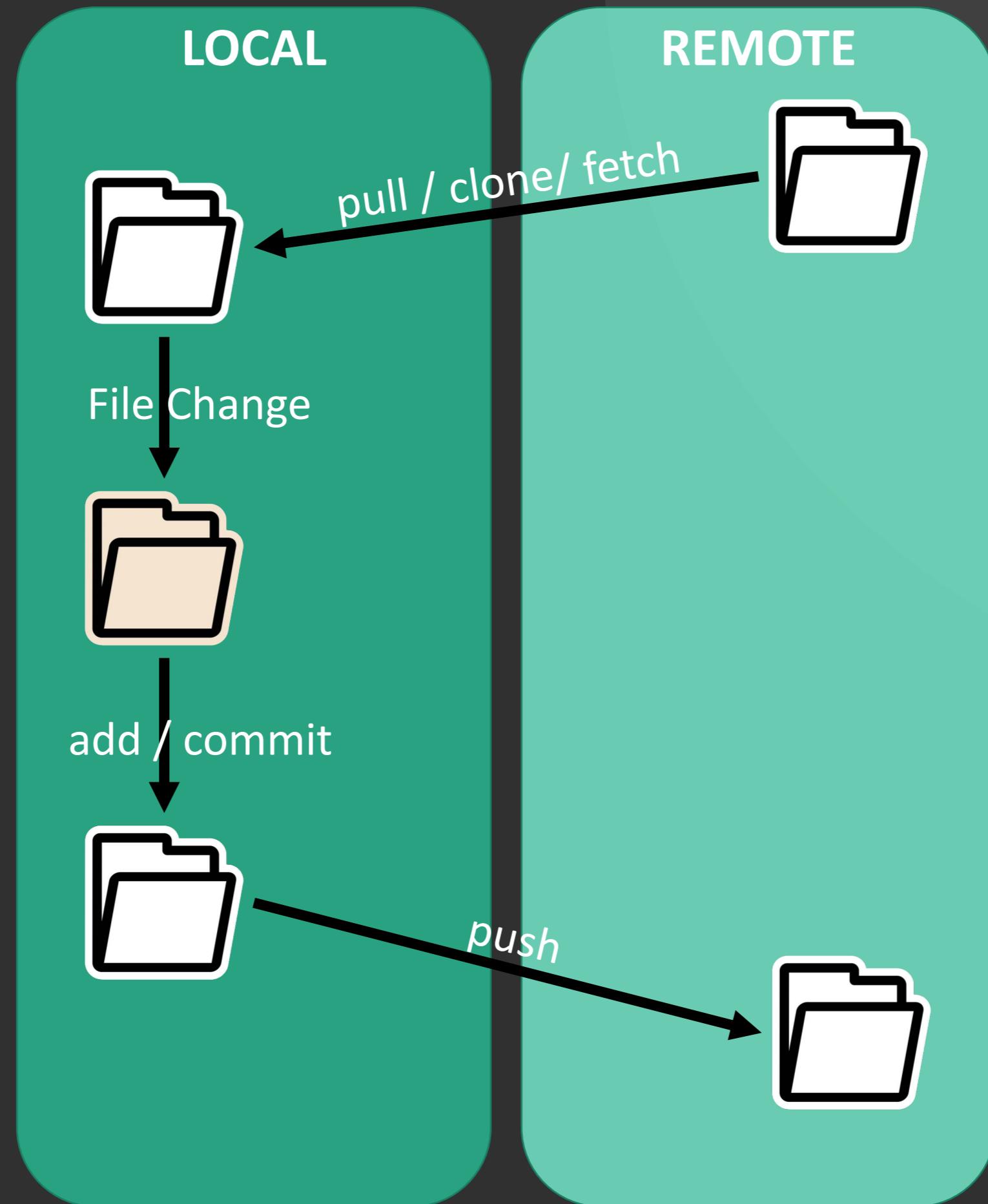


Pull









That's pretty much it

1. Get github account download git
2. Create repo on github
3. `git config --global user.name "First Last"`
4. `git config --global user.email "user@domain"`
5. `git init`
6. `git add (staging area)`
7. `git commit`
8. `git remote add origin https://github.com/user/repo.git`
9. `git push -u origin master`

More?

- Find the difference between versions
 - `git diff`
- Restore to specific version
 - `git checkout 660213b file.py`
- Add branches for collaboration

Personally

- Saved me a lot of time
- Avoided that ‘OH NO!’ moment
- Sharing files
- Learnt by making it habit to use git every day

Questions??

- LEC repository for sharing code
- <https://github.com/mattramos/shared-atmos-scripts/>
 - Where I put scripts and functions to share
 - CCM4 downloads
 - IRIS wrappers and functions

Quick Tutorial

I thought I'd share these slides on github of course and it seems like the perfect time to make a mini tutorial of the process.

Once the repo is set up these processes become a lot quicker

0. Get git and git hub

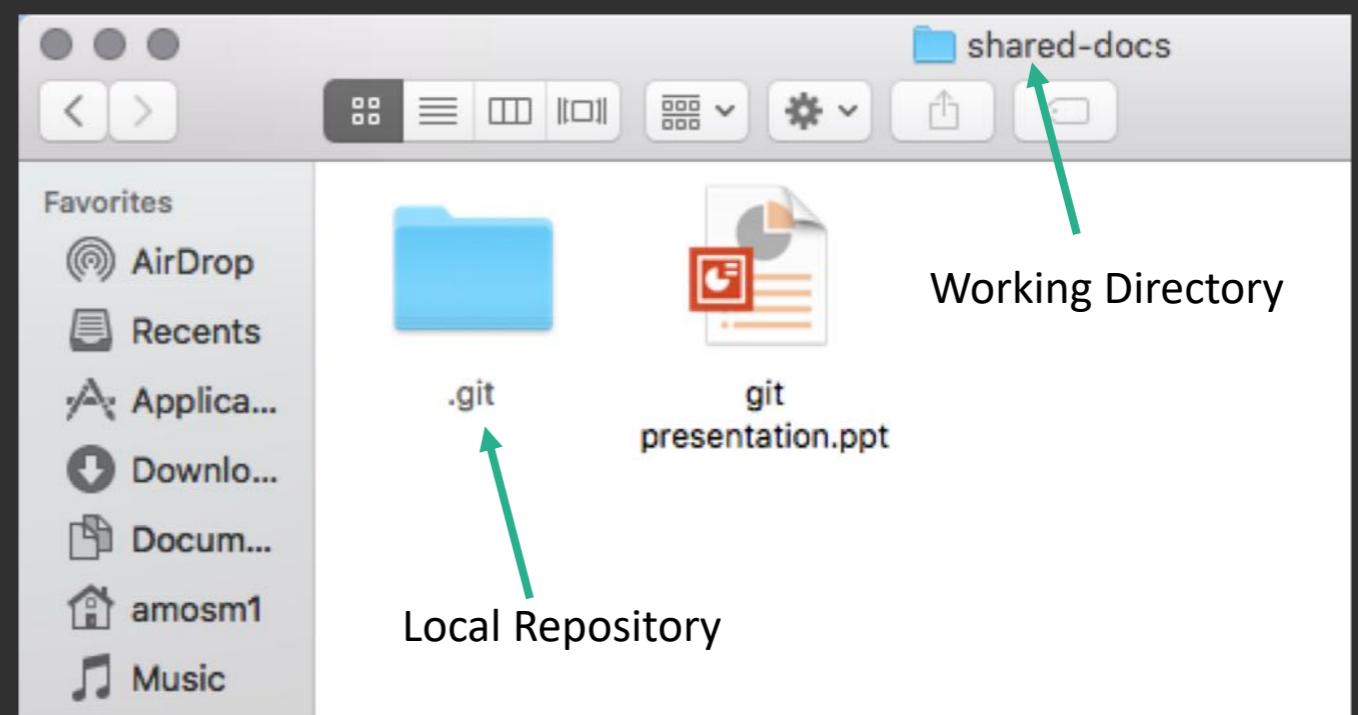
- Download git (conda install -c anaconda git, or <https://git-scm.com/downloads>)
- Get a github academic account <https://help.github.com/articles/applying-for-an-academic-research-discount/>
- Set up git
 - git config --global user.name "First Last"
 - git config --global user.email "user@domain"
 - Can also set up ssh keys <https://help.github.com/articles/generating-a-new-ssh-key-and-adding-it-to-the-ssh-agent/>

1. Initialise git

- Find a directory you want to add to git/github

```
[dyn-10-32-100-59:~ amosm1$ cd Documents/  
[dyn-10-32-100-59:Documents amosm1$ mkdir shared-docs  
[dyn-10-32-100-59:Documents amosm1$ cd shared-docs  
[dyn-10-32-100-59:shared-docs amosm1$ git init  
Initialized empty Git repository in /Users/amosm1/Documents/shared-docs/.git/
```

- Made a new working directory and initialise a git repository (.git folder)



2. Adding to local repo

- Add the file to the staging area (git add filename)

```
[dyn-10-32-100-59:shared-docs amosm1$ git add git\ presentation.ppt
```

- git status shows us about the files git is watching

```
[dyn-10-32-100-59:shared-docs amosm1$ git status
On branch master
  ← We have the master version
    (not a branch)
No commits yet

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

    new file:  git presentation.ppt
  ← git is watching this file but it
    isn't yet saved to the local repo

dyn-10-32-100-59:shared-docs amosm1$
```

3. Saving to the local repo

- We commit (save) the file to the local repo.

```
[dyn-10-32-100-59:shared-docs amosm1$ git commit -m 'added the presentation about git'  
[master (root-commit) 87ba3ff] added the presentation about git  
 1 file changed, 0 insertions(+), 0 deletions(-)  
 create mode 100644 git presentation.ppt
```

History id

Useful message about changes

- git now shows that we are up to date locally

```
[dyn-10-32-100-59:shared-docs amosm1$ git status  
On branch master  
nothing to commit, working tree clean
```

4. Create remote repo on github

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Create a new repository

A repository contains all the files for your project, including the revision history.

Get to the 'create repo' page here

Owner: mattramos / Repository name: shared-docs

Need the same name as the local repo

Great repository names are short and memorable. Need inspiration? How about `effective-octo-happiness`.

Description (optional): A selection of useful documents and presentations about using programs

Public
Anyone can see this repository. You choose who can commit.

Private
You choose who can see and commit to this repository.

Initialize this repository with a README
This will let you immediately clone the repository to your computer. Skip this step if you're importing an existing repository.

Add .gitignore: None | Add a license: None | ⓘ

Create repository

5. Push to github remote repo

- Create a new remote, called origin. Essentially shows git where the remote repo is

```
amosm1$ git remote add origin https://github.com/mattramos/shared-docs.git
```

- Push to the remote repo (only need the options once)

```
[dyn-10-32-100-59:shared-docs amosm1$ git push -u origin master
Counting objects: 3, done.
Delta compression using up to 4 threads.
Compressing objects: 100% (2/2), done.
Writing objects: 100% (3/3), 2.77 MiB | 2.25 MiB/s, done.
Total 3 (delta 0), reused 0 (delta 0)
To https://github.com/mattramos/shared-docs.git
 * [new branch]      master -> master
Branch master set up to track remote branch master from origin.
```

6. Say we change the file

- I added a these extra slides to the presentation so we see that we're no longer up to date with the local repo

```
[dyn-10-32-100-59:shared-docs amosm1$ git status
On branch master
Your branch is up-to-date with 'origin/master'.
  ▶ image Sampling
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)
    Custom Reduce
    ▼ Reduce File Size Copy
      modified:   git presentation.pdf
no changes added to commit (use "git add" and/or "git commit -a")
```

- Git shows us what files have changed

7. We can the update this

- git commit –a is the same as git add AND git commit for all modified files. This will not add untracked files

```
[dyn-10-32-100-59:shared-docs amosm1$ git commit -a -m 'Added tutorial slides'  
[master 041df2b] Added tutorial slides  
 1 file changed, 0 insertions(+), 0 deletions(-)
```

```
[dyn-10-32-100-59:shared-docs amosm1$ git status  
On branch master  
Your branch is ahead of 'origin/master' by 1 commit.  
(use "git push" to publish your local commits)  
nothing to commit, working tree clean
```

- We're now up to date locally, but we are behind the remote repo by one commit.

8. Pushing the changes

- Now we need to push the local commits to the remote repo. All we have to do is ‘git push’

```
[dyn-10-32-100-59:shared-docs amosm1$ git push
Counting objects: 3, done.
Delta compression using up to 4 threads.
Compressing objects: 100% (2/2), done.
Writing objects: 100% (3/3), 7.43 MiB | 3.49 MiB/s, done.
Total 3 (delta 0), reused 0 (delta 0)
To https://github.com/mattramos/shared-docs.git
 4754924..041df2b  master -> master
```

- Now we’re up to date both locally and remotely

```
[dyn-10-32-100-59:shared-docs amosm1$ git status
On branch master
Your branch is up-to-date with 'origin/master'.
nothing to commit, working tree clean
```

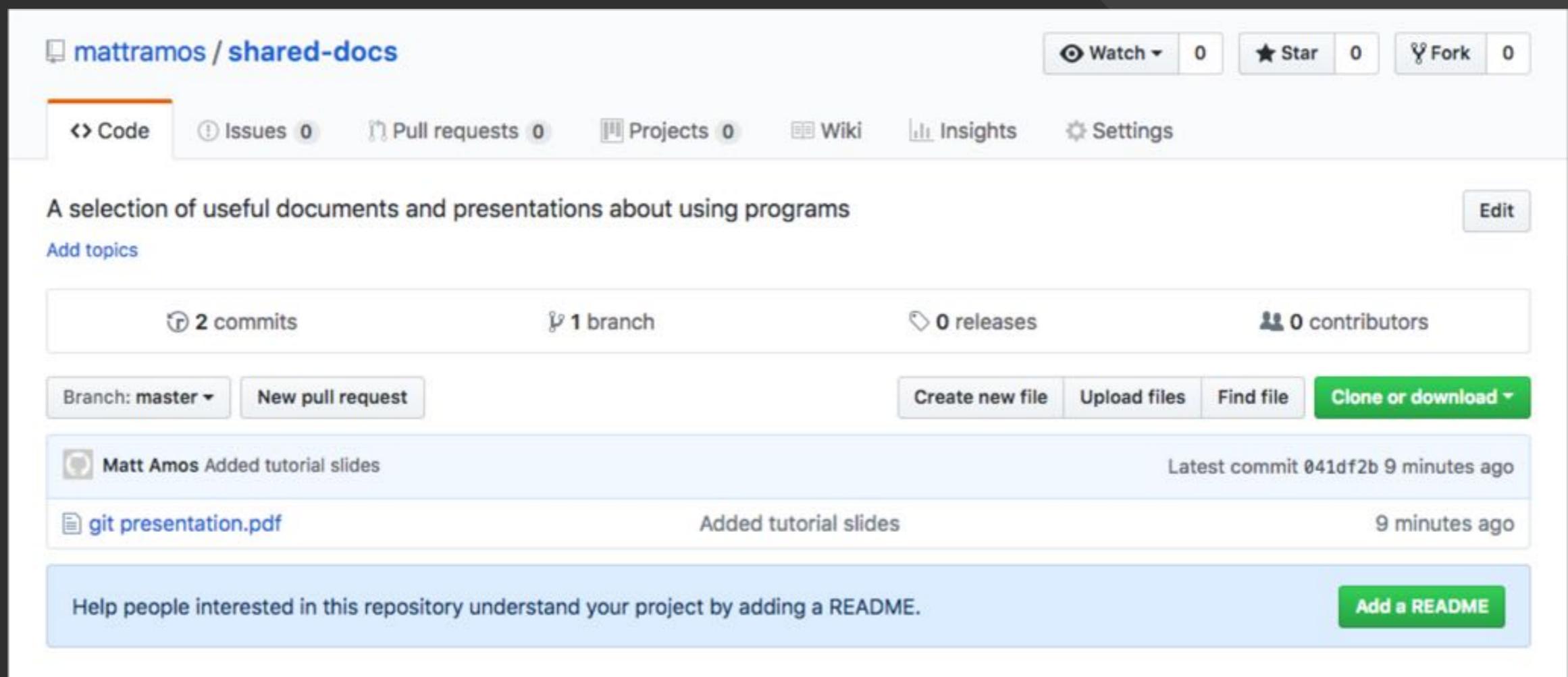
9. Pull

- If we had changes on the remote repo that we wanted locally, all we need do is pull

```
[dyn-10-32-100-59:shared-docs amosm1]$ git pull  
Already up-to-date.
```

10. Check github – job done

- We can see on github the files, and the two commits we made to put it there



The screenshot shows a GitHub repository page for the repository `mattramos/shared-docs`. The page includes the following elements:

- Repository Header:** Shows the repository name `mattramos/shared-docs`, and buttons for `Watch` (0), `Star` (0), and `Fork` (0).
- Navigation Bar:** Includes links for `Code`, `Issues 0`, `Pull requests 0`, `Projects 0`, `Wiki`, `Insights`, and `Settings`.
- Repository Description:** A selection of useful documents and presentations about using programs. Includes an `Edit` button.
- Statistics:** 2 commits, 1 branch, 0 releases, 0 contributors.
- Branch Selection:** Branch: `master` (dropdown), `New pull request`.
- Commit List:** Shows a single commit by `Matt Amos` titled `Added tutorial slides`, uploaded 9 minutes ago. The commit hash is `041df2b`.
- File List:** Shows the file `git presentation.pdf` with the commit message `Added tutorial slides` and timestamp `9 minutes ago`.
- README Placeholder:** A box prompting to `Add a README`.