Introduction to Git and GitHub

Managing your code: quietly introducing *Git* - a friend for life

Thanks to all contributors:

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Contents

- What is version control?
- What are Git & GitHub?
- Nice features of GitHub
- Basic workflow

Foreword

Git is easy to use but will take a bit of practice to get comfortable with. With that in mind:

- We will encourage you to commit your work at then end of every exercise.
- The basics will be enough for most use-cases
- We will provide you with a cheatsheet
- The internet is full of answers
- Give it a go. **You don’t need to “get it” to “git it”.**
- **The exercise following this presentation will make sure you are setup with Git/GitGub**

What is a version control system (VCS)?

- Version control software keeps track of your changes
- Allows you to revert back to a previous point
- Manages contributions from multiple people
- Creates freeze points which won’t change
- Stores the full history of the things under version control including who did what, when?

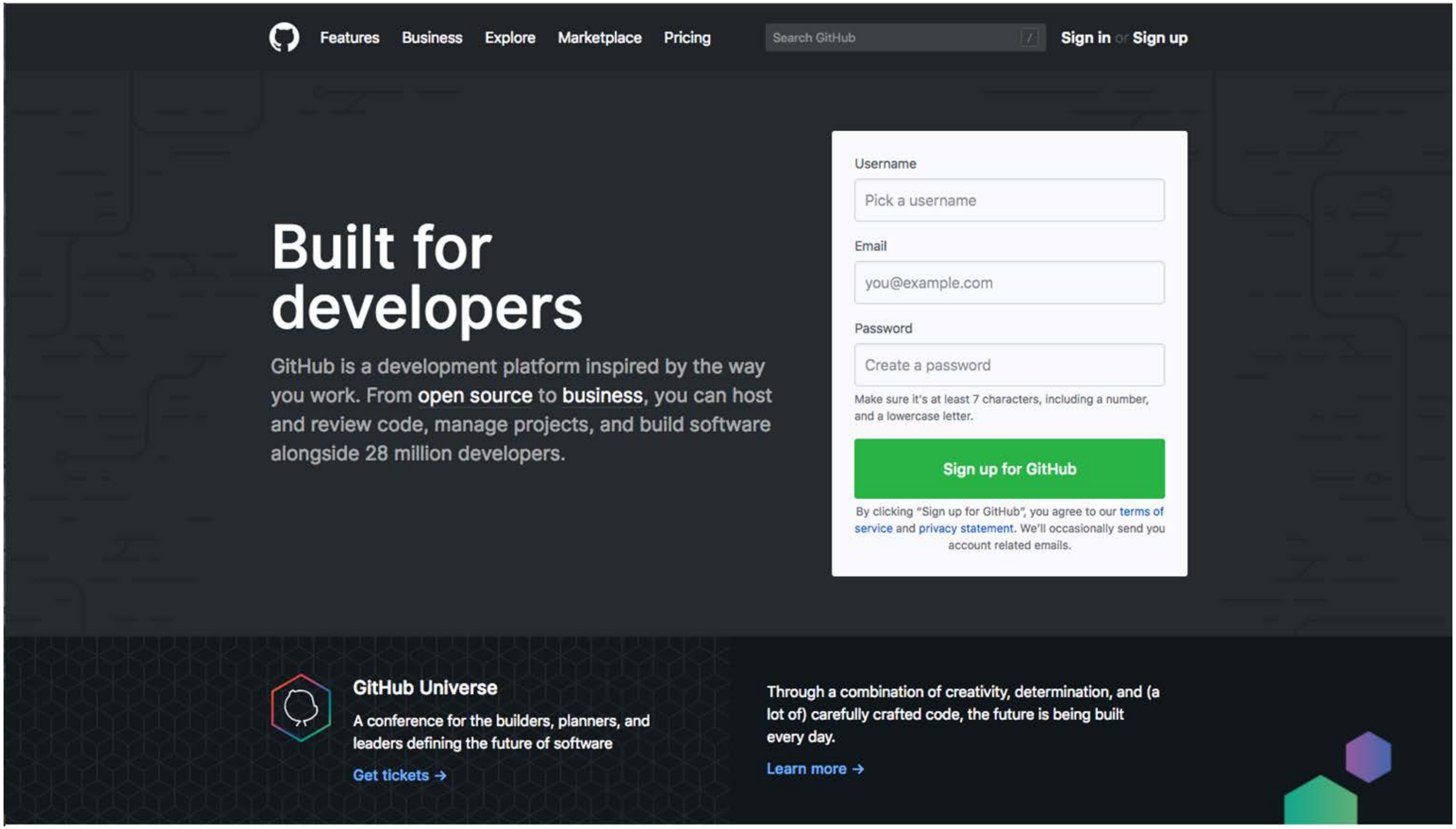
Why might you need VCS?

- Scientists are typically **required to publish data and code** (by their funders/institutions).
- Collaboration between scientists requires data-sharing; this implicitly relies upon **code-sharing**.
- There are **tools that make it easy** to record our changes, document our workflow and "fix" releases of our code at important steps along the way.
- Reduce errors and admin burden ("latest", "new2"…)
- Allows you test ideas with confidence, you can always go back.

So, working on the premise that we accept that we need to know about, and use, version control…

We will use Git and GitHub

Introducing GitHub



Built for developers

GitHub is a development platform inspired by the way you work. From **open source** to **business**, you can host and review code, manage projects, and build software alongside 28 million developers.

Username: Pick a username

Email: you@example.com

Password: Create a password

Make sure it's at least 7 characters, including a number, and a lowercase letter.

By clicking "Sign up for GitHub", you agree to our terms of service and privacy statement. We'll occasionally send you account related emails.

GitHub Universe

A conference for the builders, planners, and leaders defining the future of software

Through a combination of creativity, determination, and (a lot of) carefully crafted code, the future is being built every day.

https://github.com/

What is GitHub?

“A **web-based** Git repository **hosting service**”

GitHub allows you to:

- Share your repositories with others
- Access other user’s repositories
- Store remote copies as a backup of your local repositories
- Add bug tracking, feature requests, wikis, ...

GitHub is **free** for most use cases

Git vs GitHub

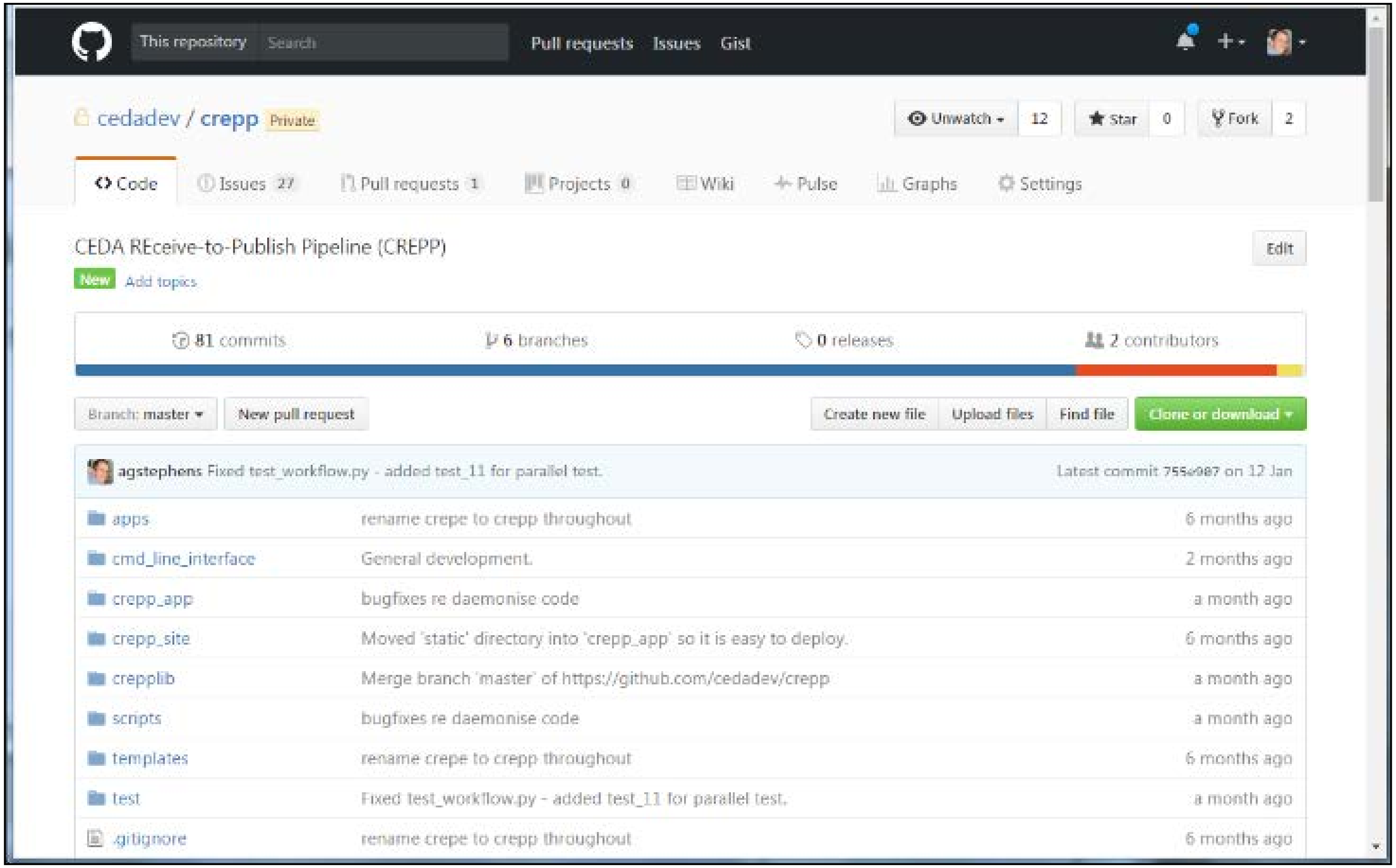
Git is a *revision control system*, a tool to manage your source code history.

GitHub is a *hosting service for Git repositories*.

They are not the same thing. **Git** is the **tool**, **GitHub** is a **web service**.

You **do not** need GitHub to use Git, but GitHub adds useful functionality.

GitHub: repositories (public *or* **private**)



cedadev / crepp Private

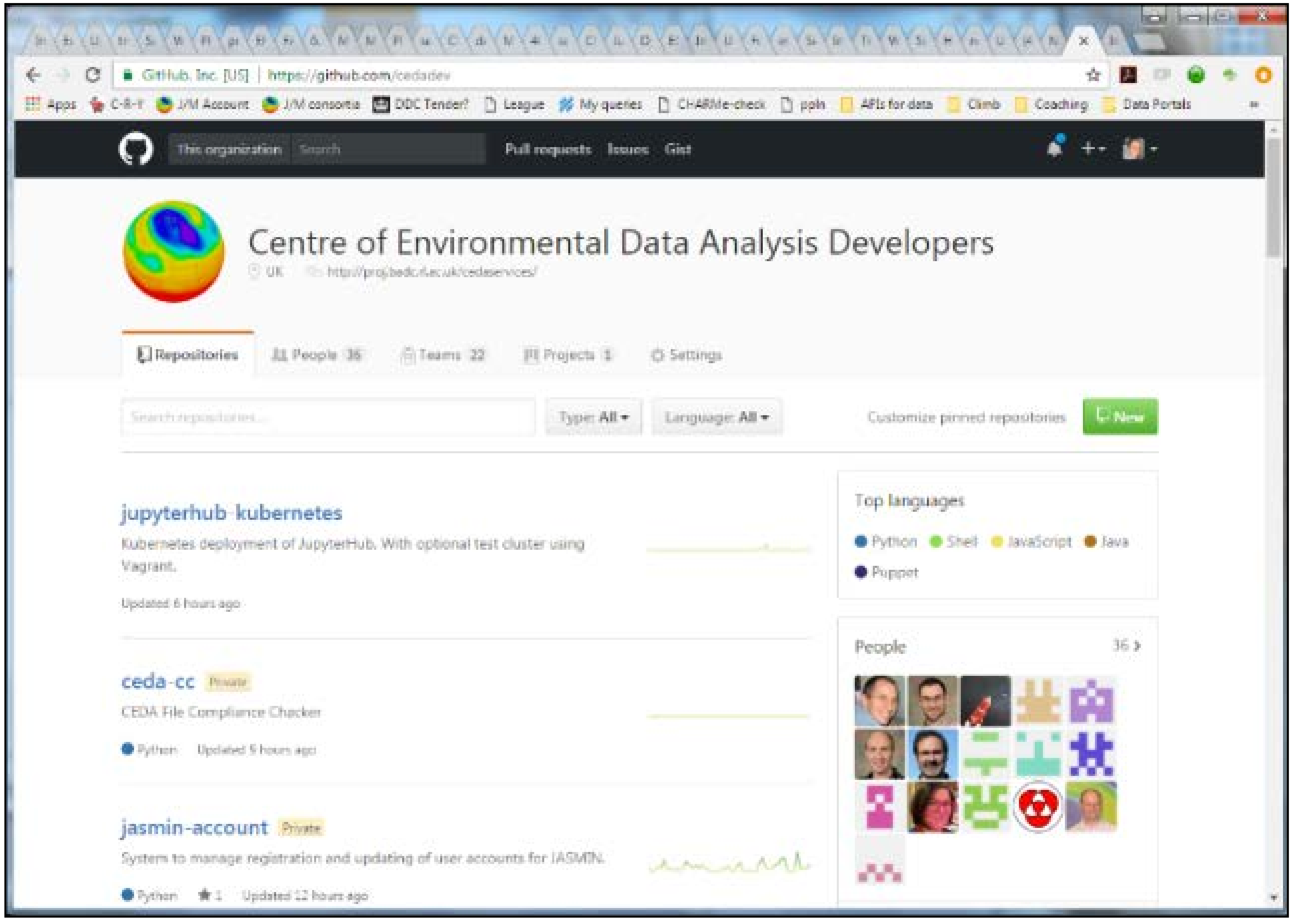
CEDA REceive-to-Publish Pipeline (CREPP)

81 commits · 6 branches · 0 releases · 2 contributors

agstephens Fixed test_workflow.py - added test_11 for parallel test. Latest commit 755e987 on 12 Jan

apps	rename crepe to crepp throughout	6 months ago
cmd_line_interface	General development.	2 months ago
crepp_app	bugfixes re daemonise code	a month ago
crepp_site	Moved 'static' directory into 'crepp_app' so it is easy to deploy.	6 months ago
crepplib	Merge branch 'master' of https://github.com/cedadev/crepp	a month ago
scripts	bugfixes re daemonise code	a month ago
templates	rename crepe to crepp throughout	6 months ago
test	Fixed test_workflow.py - added test_11 for parallel test.	a month ago
.gitignore	rename crepe to crepp throughout	6 months ago

GitHub: organisations



Centre of Environmental Data Analysis Developers

UK http://proj.badc.rl.ac.uk/cedaservices/

jupyterhub-kubernetes

Kubernetes deployment of JupyterHub. With optional test cluster using Vagrant.

Updated 6 hours ago

ceda-cc Private

CEDA File Compliance Checker

● Python Updated 5 hours ago

jasmin-account Private

System to manage registration and updating of user accounts for JASMIN.

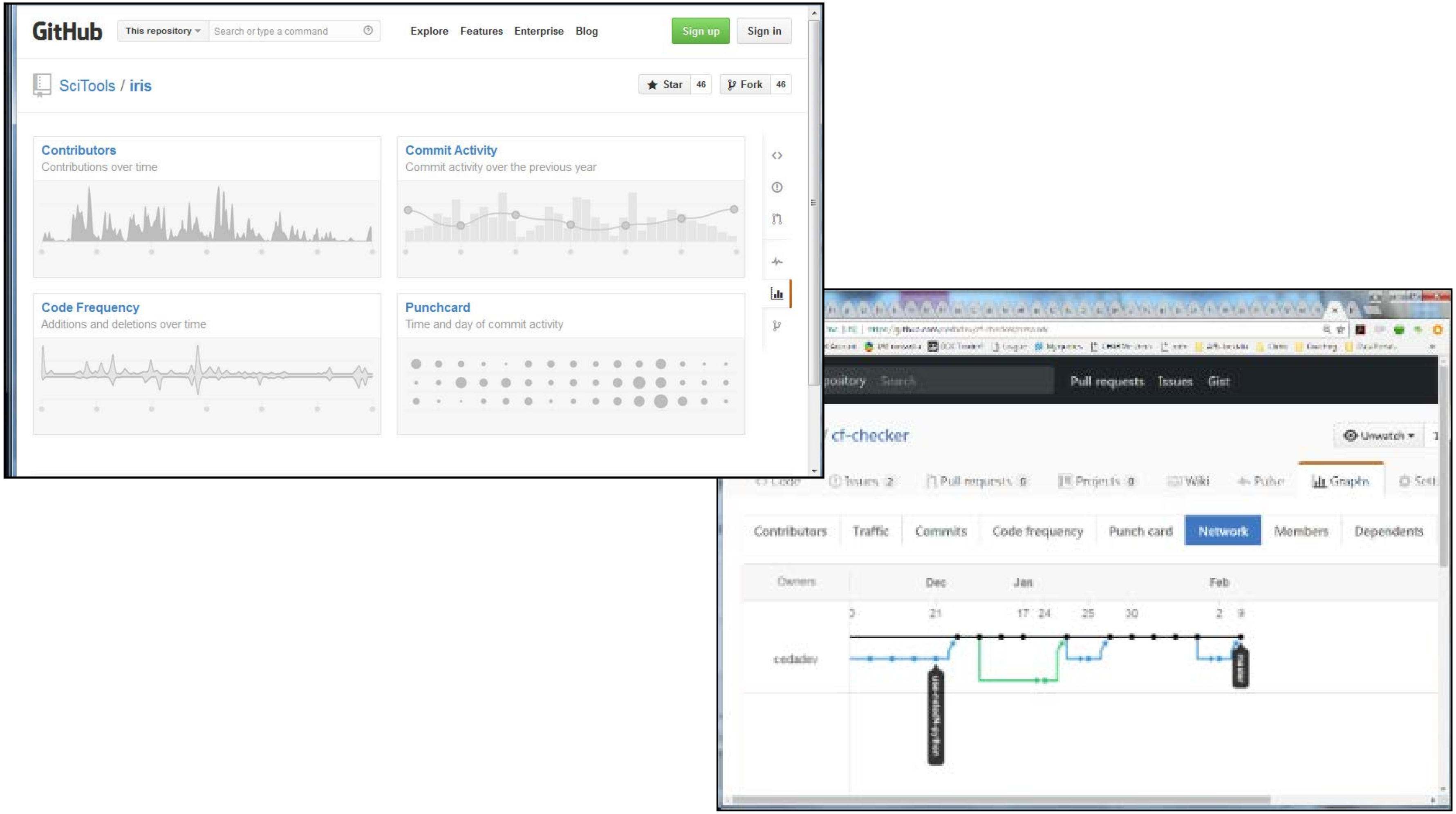
● Python ★ 1 Updated 12 hours ago

Top languages

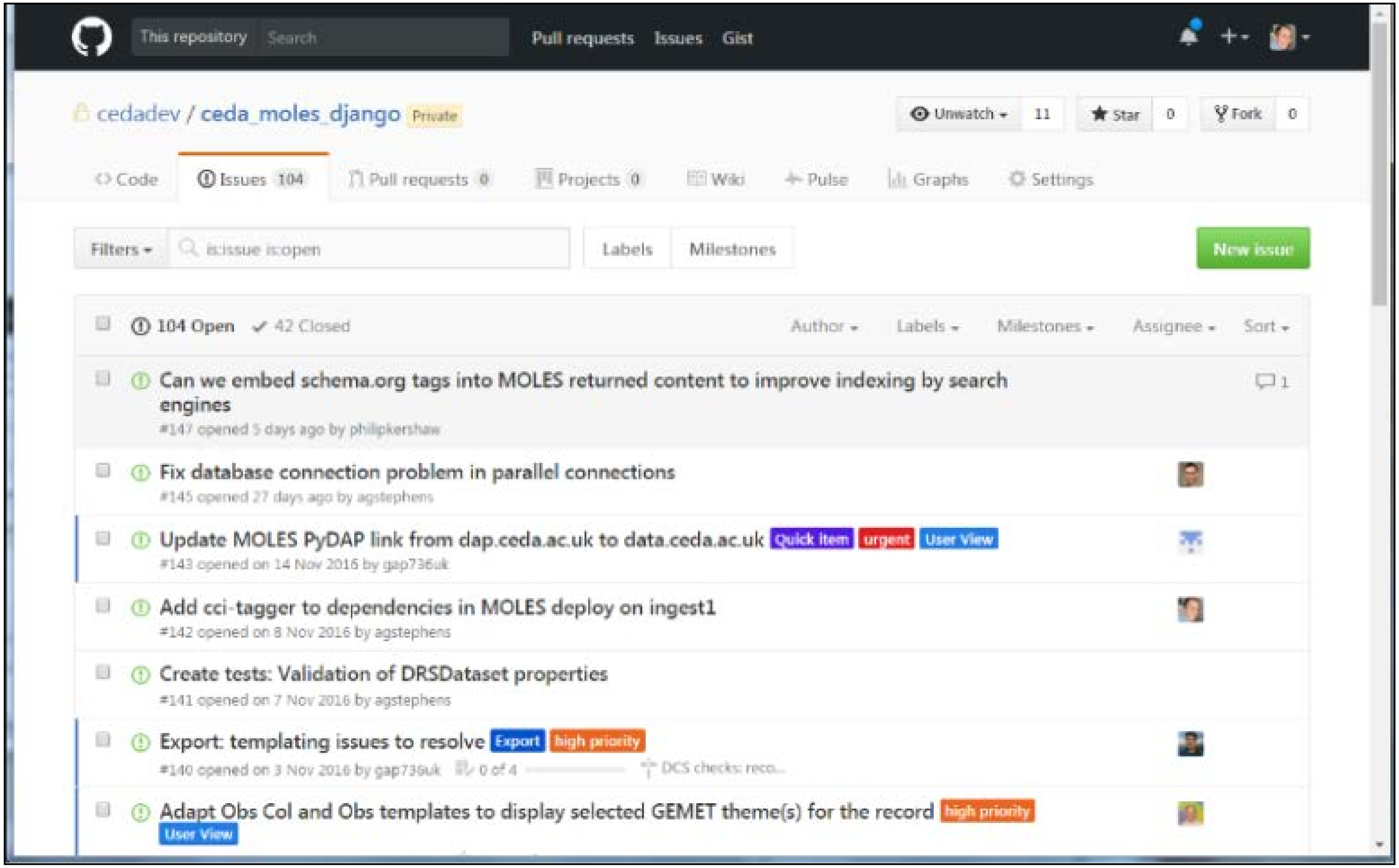
● Python ● Shell ● JavaScript ● Java ● Puppet

People 36 ›

GitHub: collaboration (branch/fork)



GitHub: Issue tracking



□ ⓘ 104 Open ✓ 42 Closed

□ ⓘ Can we embed schema.org tags into MOLES returned content to improve indexing by search engines 💬 1
#147 opened 5 days ago by philipkershaw

□ ⓘ Fix database connection problem in parallel connections
#145 opened 27 days ago by agstephens

□ ⓘ Update MOLES PyDAP link from dap.ceda.ac.uk to data.ceda.ac.uk Quick item urgent User View
#143 opened on 14 Nov 2016 by gap736uk

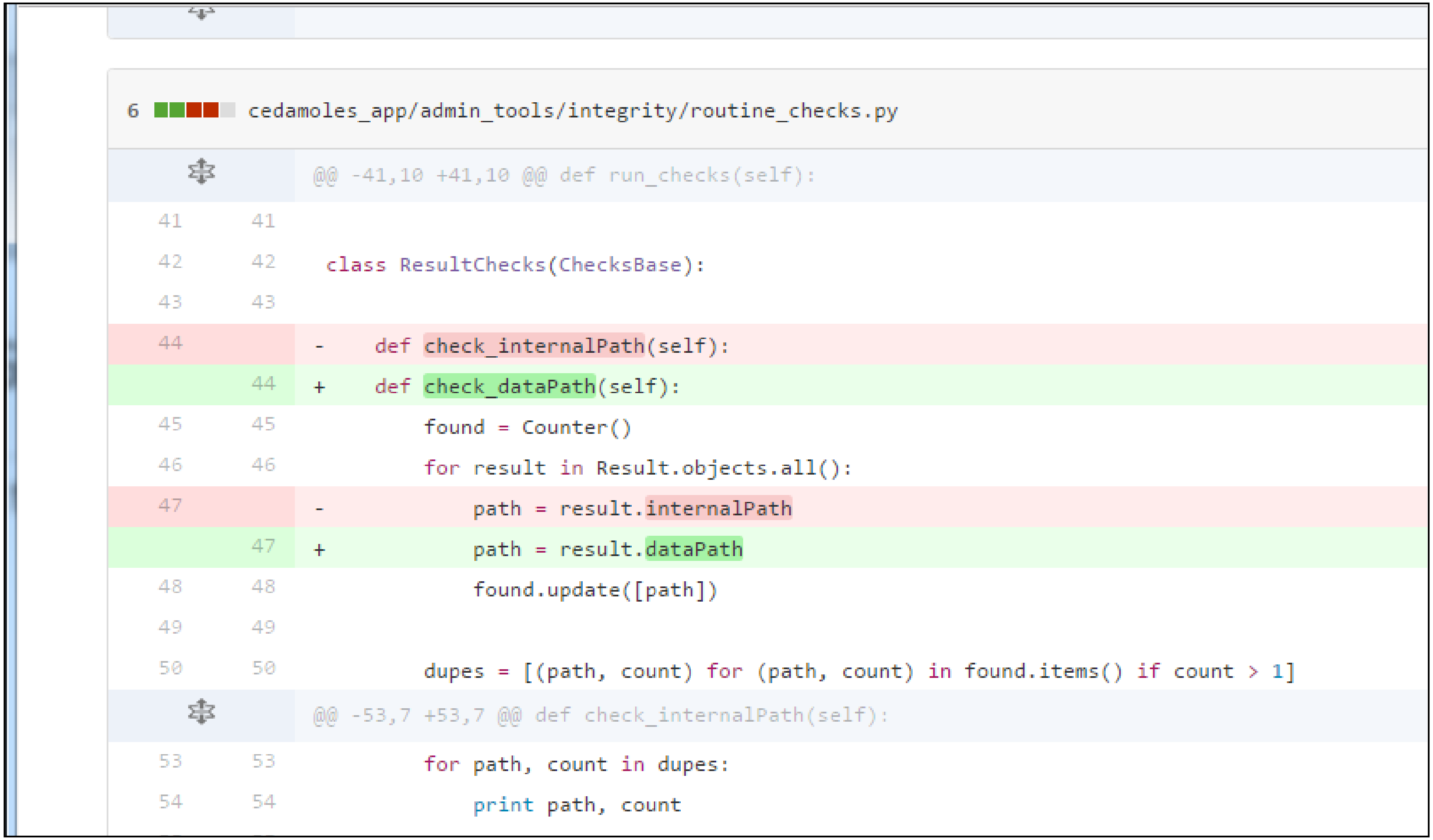
□ ⓘ Add cci-tagger to dependencies in MOLES deploy on ingest1
#142 opened on 8 Nov 2016 by agstephens

□ ⓘ Create tests: Validation of DRSDataset properties
#141 opened on 7 Nov 2016 by agstephens

□ ⓘ Export: templating issues to resolve Export high priority
#140 opened on 3 Nov 2016 by gap736uk 0 of 4 DCS checks: reco...

□ ⓘ Adapt Obs Col and Obs templates to display selected GEMET theme(s) for the record high priority User View

GitHub: history and change



6 🟩🟩🟥🟥⬜ cedamoles_app/admin_tools/integrity/routine_checks.py

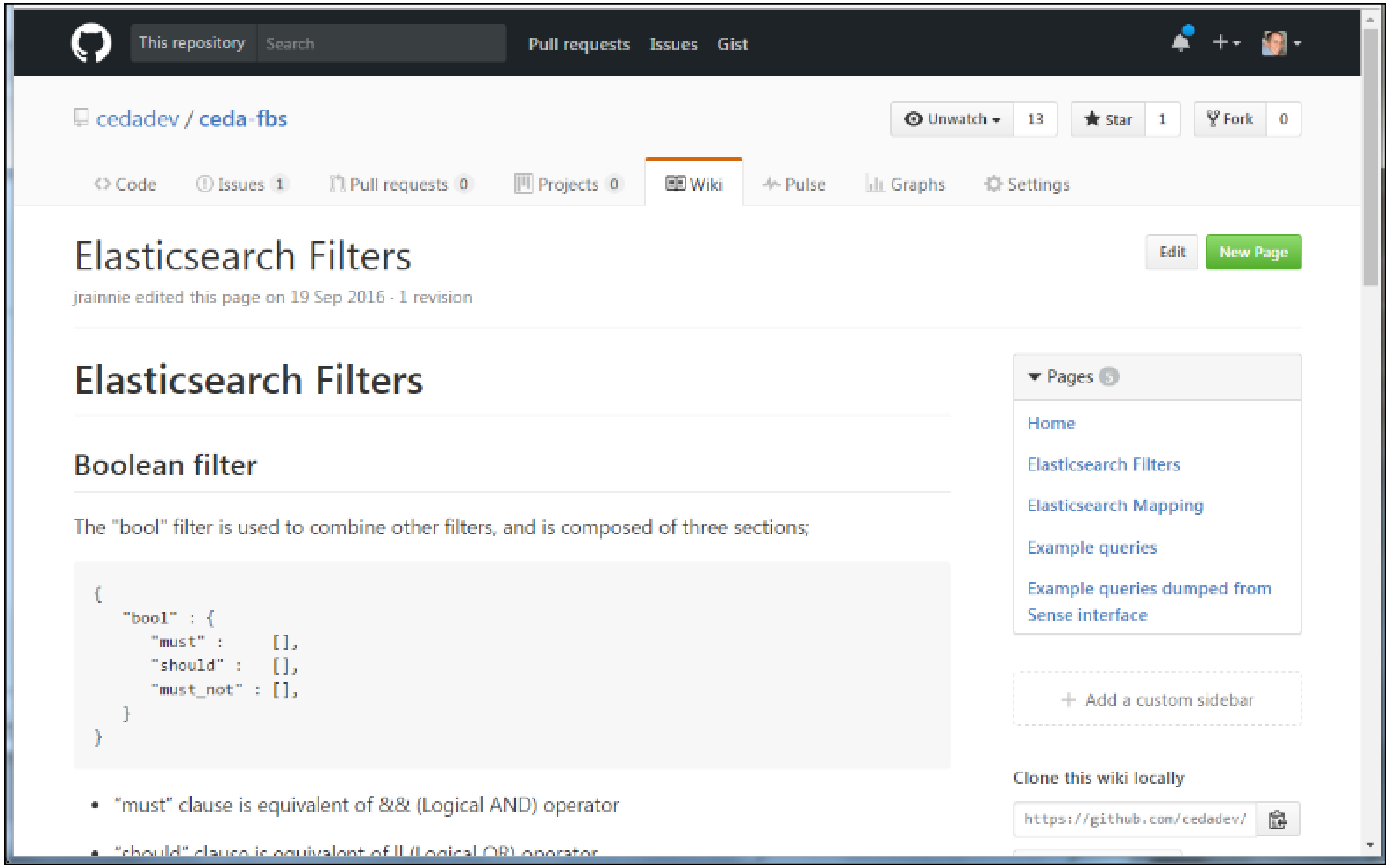
```
@@ -41,10 +41,10 @@ def run_checks(self):

  class ResultChecks(ChecksBase):

-     def check_internalPath(self):
+     def check_dataPath(self):
          found = Counter()
          for result in Result.objects.all():
-             path = result.internalPath
+             path = result.dataPath
              found.update([path])

          dupes = [(path, count) for (path, count) in found.items() if count > 1]
@@ -53,7 +53,7 @@ def check_internalPath(self):
          for path, count in dupes:
              print path, count
```

GitHub: wikis



Elasticsearch Filters

jrainnie edited this page on 19 Sep 2016 · 1 revision

Elasticsearch Filters

Boolean filter

The "bool" filter is used to combine other filters, and is composed of three sections;

```
{
   "bool" : {
      "must" :     [],
      "should" :   [],
      "must_not" : [],
   }
}
```

- “must” clause is equivalent of && (Logical AND) operator
- “should” clause is equivalent of || (Logical OR) operator

GitHub does lots of funky things, but…

- On this course we are only using it as a remote repository.
- We are going to concentrate on simply using Git.

Where to start?

There are three different start points when using Git:

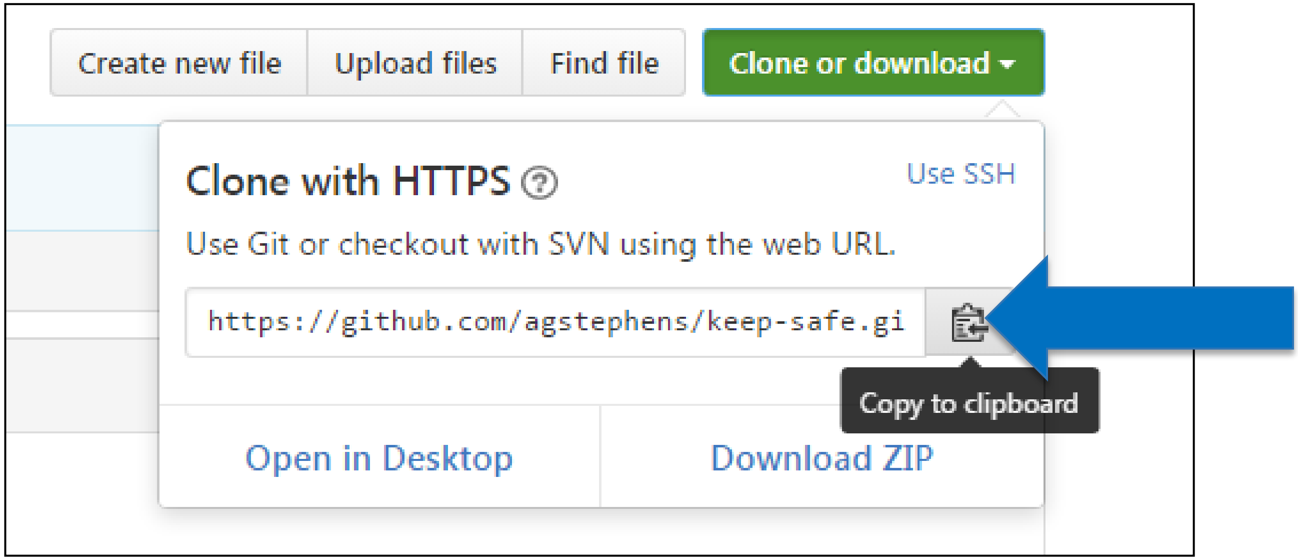
- Clone an existing repository **from GitHub**

- Create a new, empty repo and clone it **from GitHub**

- Turn an existing **local directory** into a Git repo; it can contain files or be empty

Where to start 1: Clone Existing Repo

This makes a copy of a repository locally.



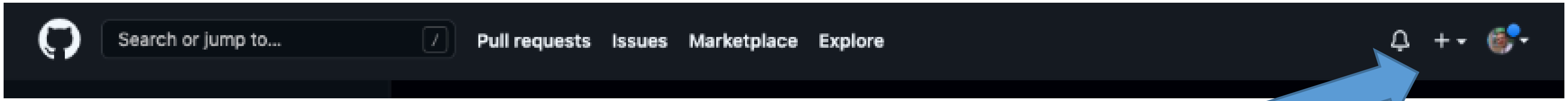
Clone with HTTPS

Use Git or checkout with SVN using the web URL.

```
https://github.com/agstephens/keep-safe.gi
```

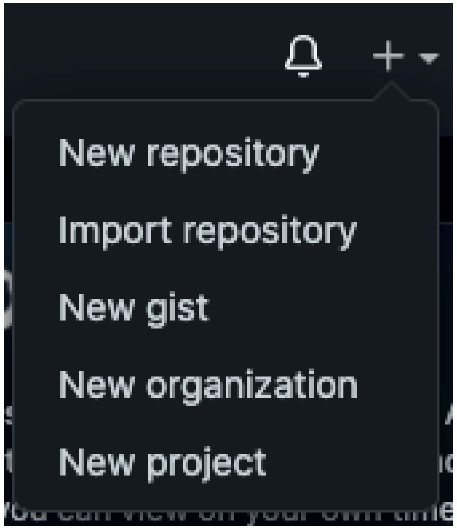
```
$ git clone
  https://github.com/agstephens/keep-safe
```

Where to start 2: Create a repository on GitHub



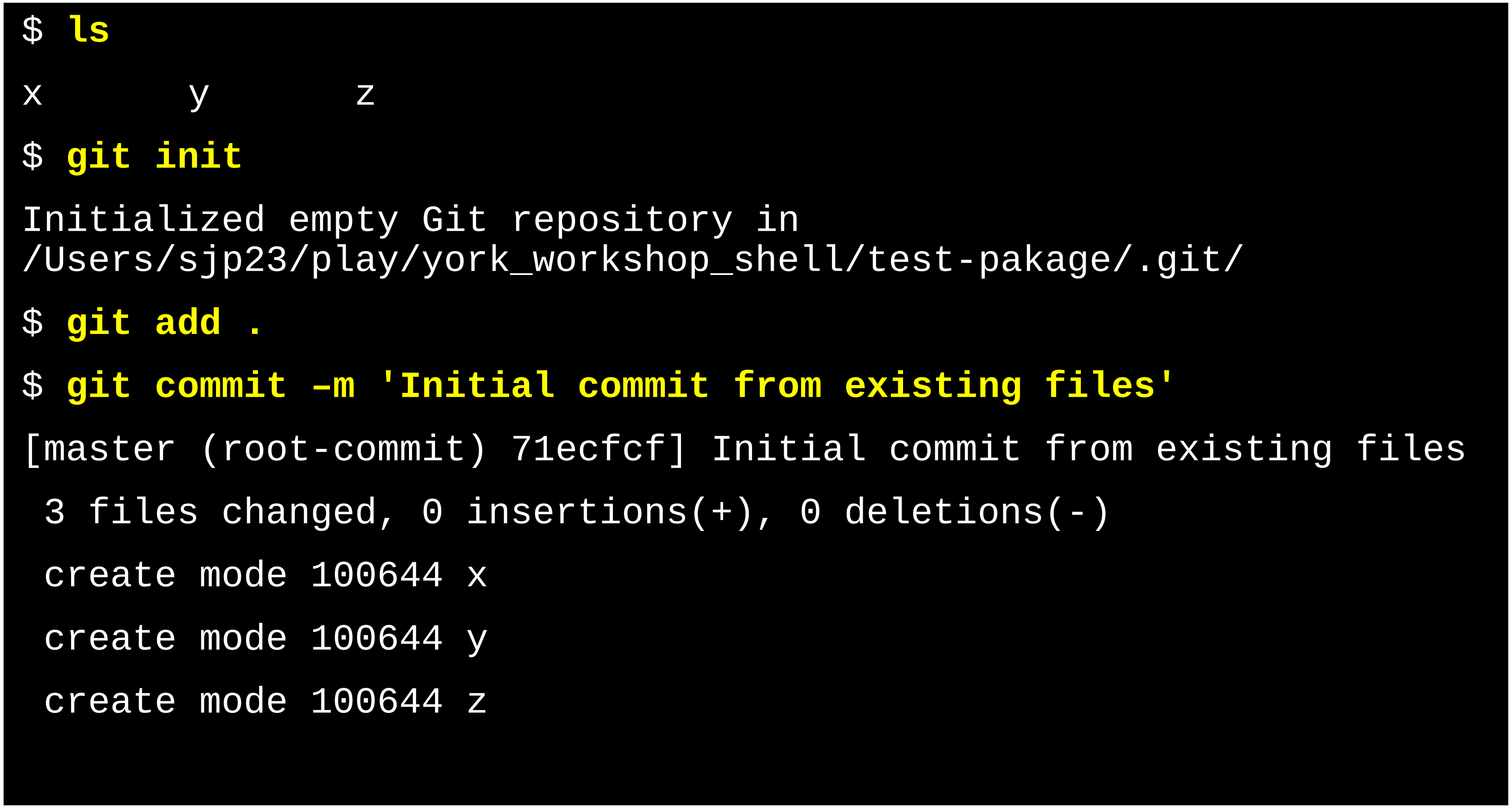
Click "+" in top right

Click "New repository"



You can then clone in the same way as "Where to start 1"

Where to start 3: start a new repository from an existing local directory



```
$ ls
x       y       z
$ git init
Initialized empty Git repository in
/Users/sjp23/play/york_workshop_shell/test-pakage/.git/
$ git add .
$ git commit –m 'Initial commit from existing files'
[master (root-commit) 71ecfcf] Initial commit from existing files
 3 files changed, 0 insertions(+), 0 deletions(-)
 create mode 100644 x
 create mode 100644 y
 create mode 100644 z
```

The basic workflow: Adding a file

1. Enter the repository directory:

```
$ cd ncas-isc
```

2. Create a new file:

```
$ echo "hello world" > hello.txt
```

3. Tell Git about the file:

```
$ git add hello.txt
```

4. Commit the file to the **local** Git repository:

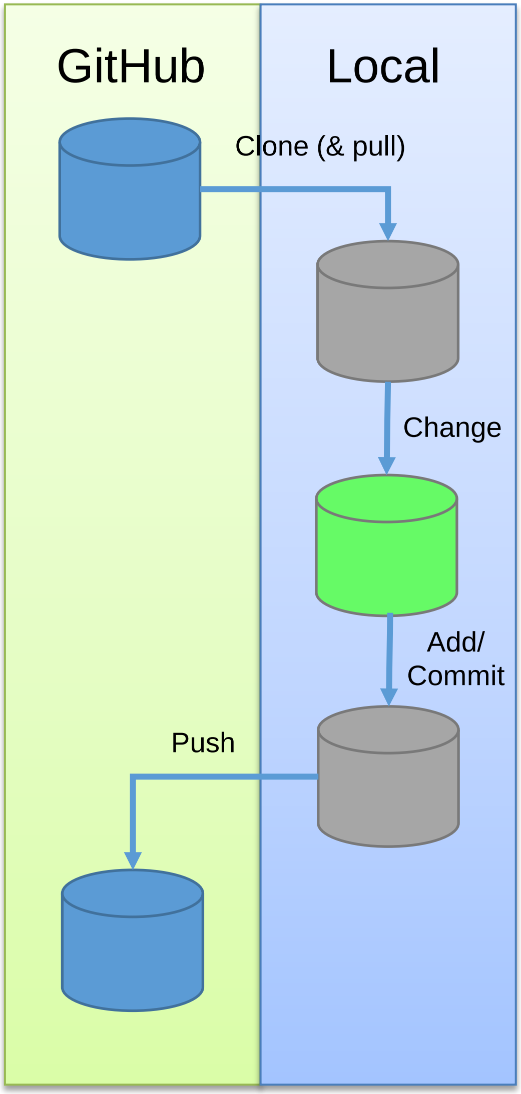
```
$ git commit -m "added hello"
```

5. Push any updates to the **remote** GitHub repo:

```
$ git push
```

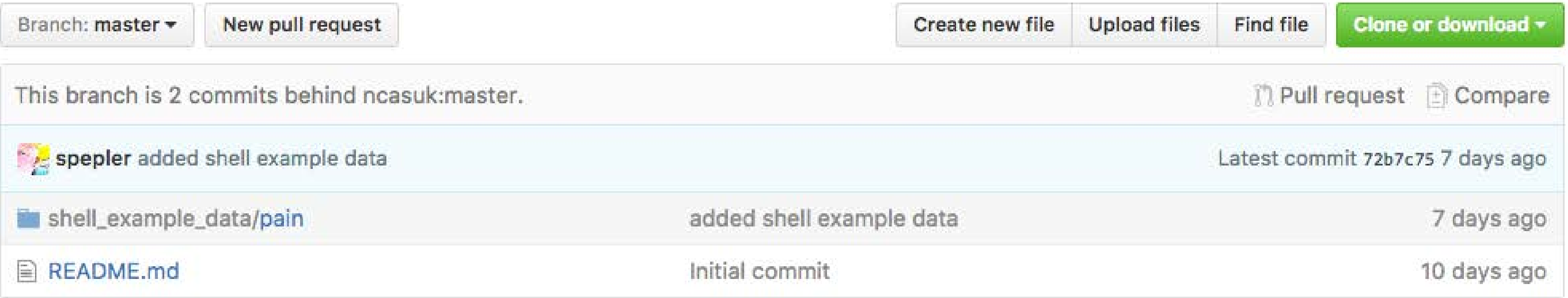
So, what just happened?

- We *cloned* the remote repository to our file system.
  - Now there are two identical copies of one repo.
- We *created* a new text file.
- We *added* and *committed* that new file to the local version of the repo.
- We used *push* to update the remote repo.



Let's look on GitHub

Before...

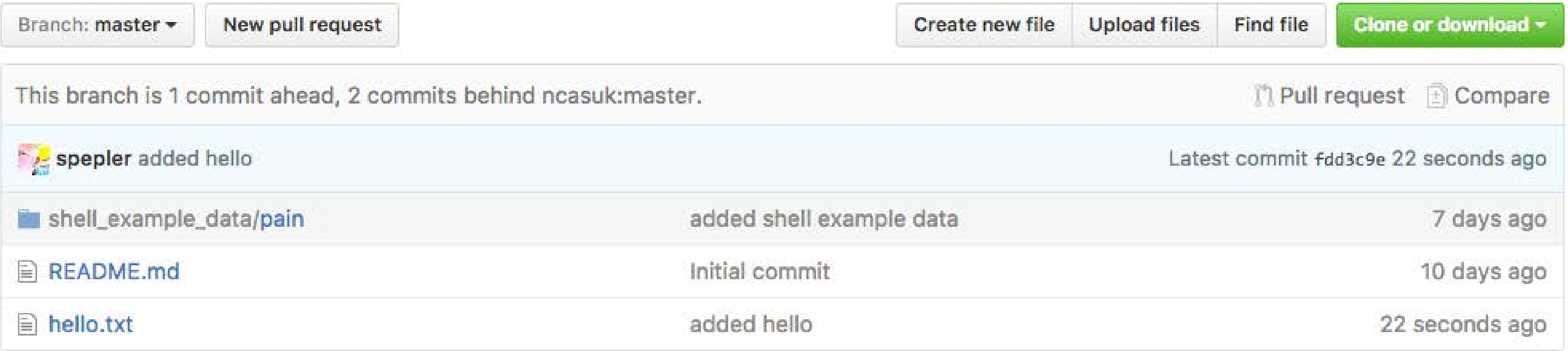


This branch is 2 commits behind ncasuk:master.

spepler added shell example data — Latest commit 72b7c75 7 days ago

shell_example_data/pain	added shell example data	7 days ago
README.md	Initial commit	10 days ago

After...



This branch is 1 commit ahead, 2 commits behind ncasuk:master.

spepler added hello — Latest commit fdd3c9e 22 seconds ago

shell_example_data/pain	added shell example data	7 days ago
README.md	Initial commit	10 days ago
hello.txt	added hello	22 seconds ago

The Plan: Use git / GitHub all week

- This stuff is hard to learn - we know that from experience.
- A presentation is quickly forgotten.
- So, we propose that you use Git/GitHub for every exercise.
- We encourage you to create and update your own GitHub repository with files from exercises throughout the course.