Introduction to Git and GitHub

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

Thanks to all contributors:

Alison Pamment, Sam Pepler, Ag Stephens, Stephen Pascoe, Kevin Marsh, Anabelle Guillory, Graham Parton, Esther Conway, Eduardo Damasio Da Costa, Wendy Garland, Alan Iwi, Matt Pritchard and Tommy Godfrey.

Contents

Foreword

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

- You only need to understand the basics
- Use the Cheatsheet: https://education.github.com/git-cheat-sheet-education.pdf
- The exercise following this presentation will get you set up to use Git and GitHub
- (We will encourage you to commit your work at then end of every exercise)
- Give it a try – you'll learn by *doing*

What is a version control system (VCS)?

- Version control software keeps track of your changes
- Allows you to revert back to previous points in history
- Uses freeze points which won’t change
- Can manage contributions from multiple people
- 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 create “fixed” 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.

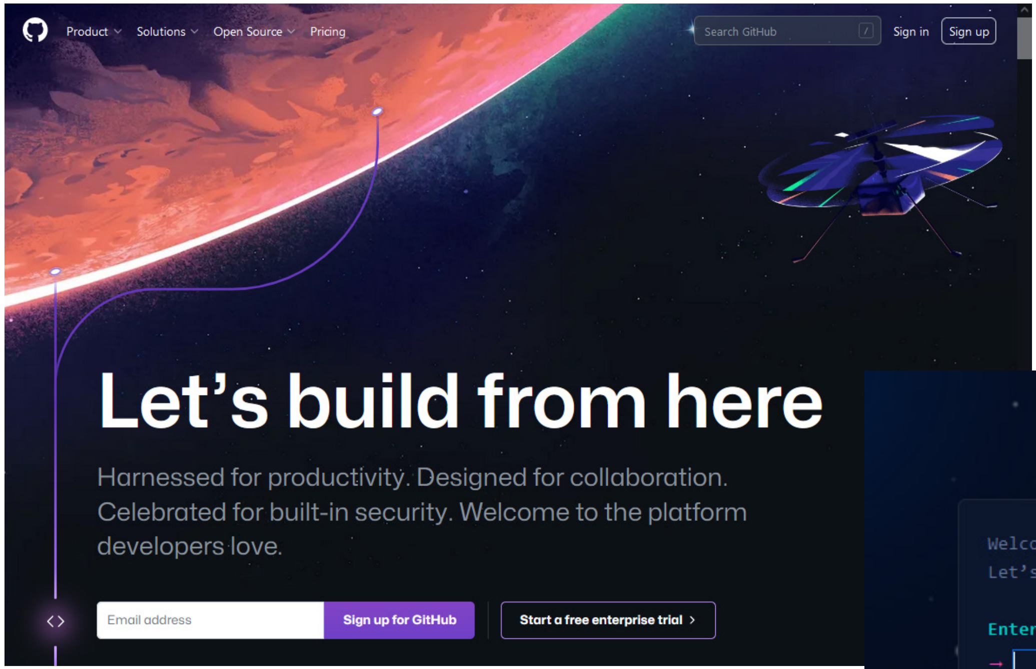
Why use Git and GitHub?

- There are a number of tools and web services that can do some, or all, of the tasks managed by Git/GitHub.
- We think that Git and GitHub are as good, if not better, than alternatives.
- In your daily life as a scientist, we think that you will encounter these two tools most frequently.
- If you learn how to use them, then the principles will be transferrable to other tools (if needed).

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

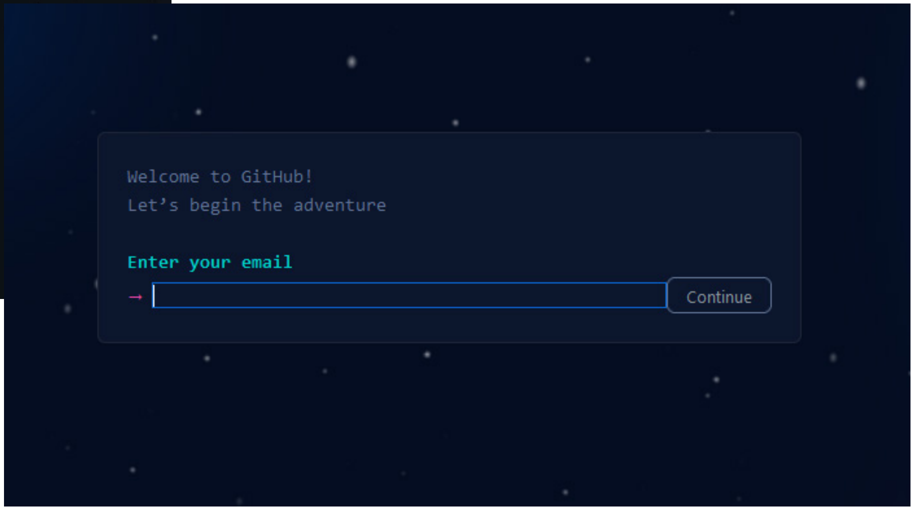
We will use Git and GitHub

Introducing GitHub



Let’s build from here

Harnessed for productivity. Designed for collaboration. Celebrated for built-in security. Welcome to the platform developers love.



Welcome to GitHub!
Let’s begin the adventure

Enter your email

https://github.com/

What is GitHub?

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

GitHub allows you to:

- Share your repositories with others
- Access other users’ 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

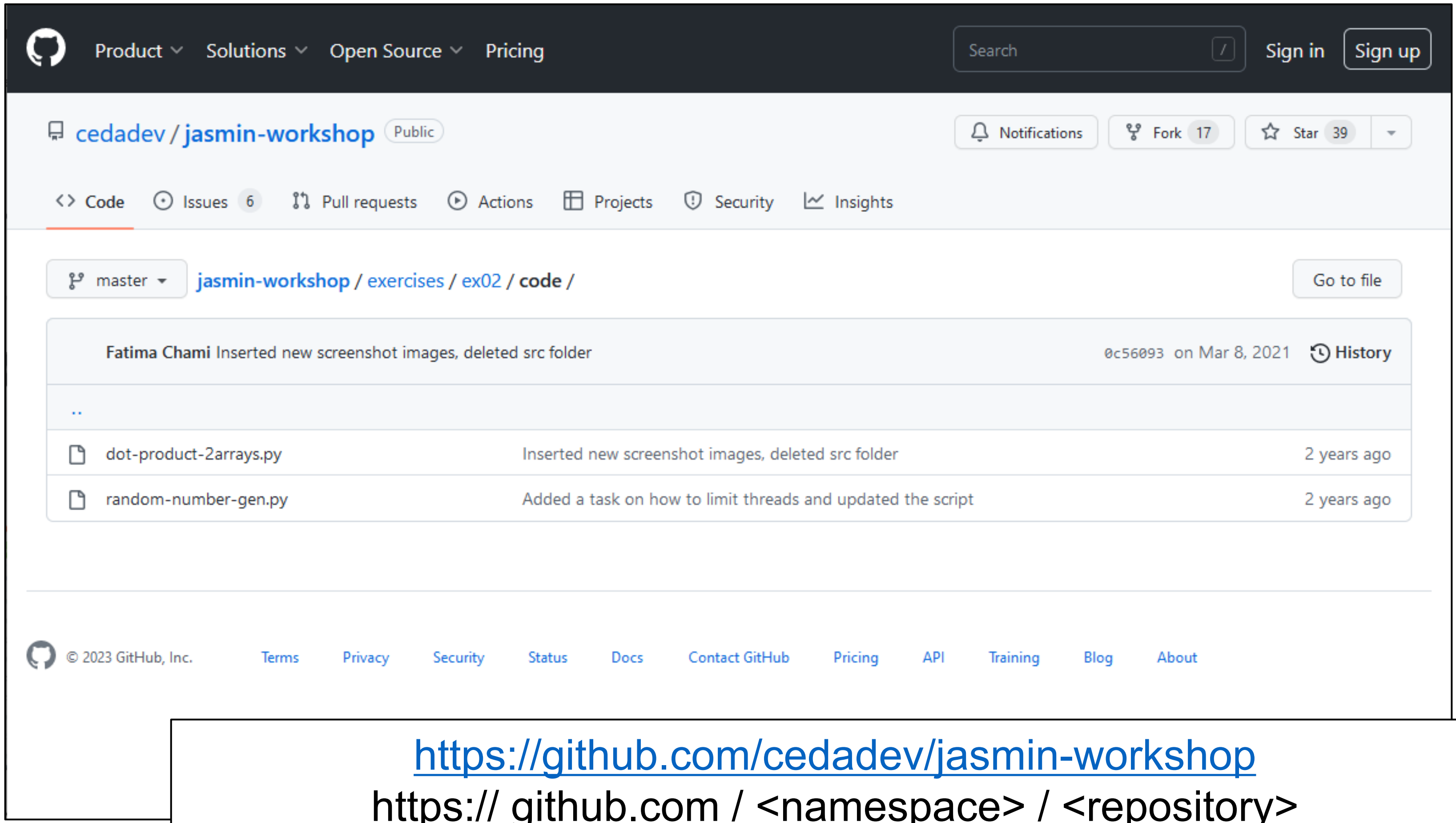
Git is a *version control system*, a tool to manage your source code history.

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**)



jasmin-workshop / exercises / ex02 / code /

Fatima Chami Inserted new screenshot images, deleted src folder 0c56093 on Mar 8, 2021

..

dot-product-2arrays.py	Inserted new screenshot images, deleted src folder	2 years ago
random-number-gen.py	Added a task on how to limit threads and updated the script	2 years ago

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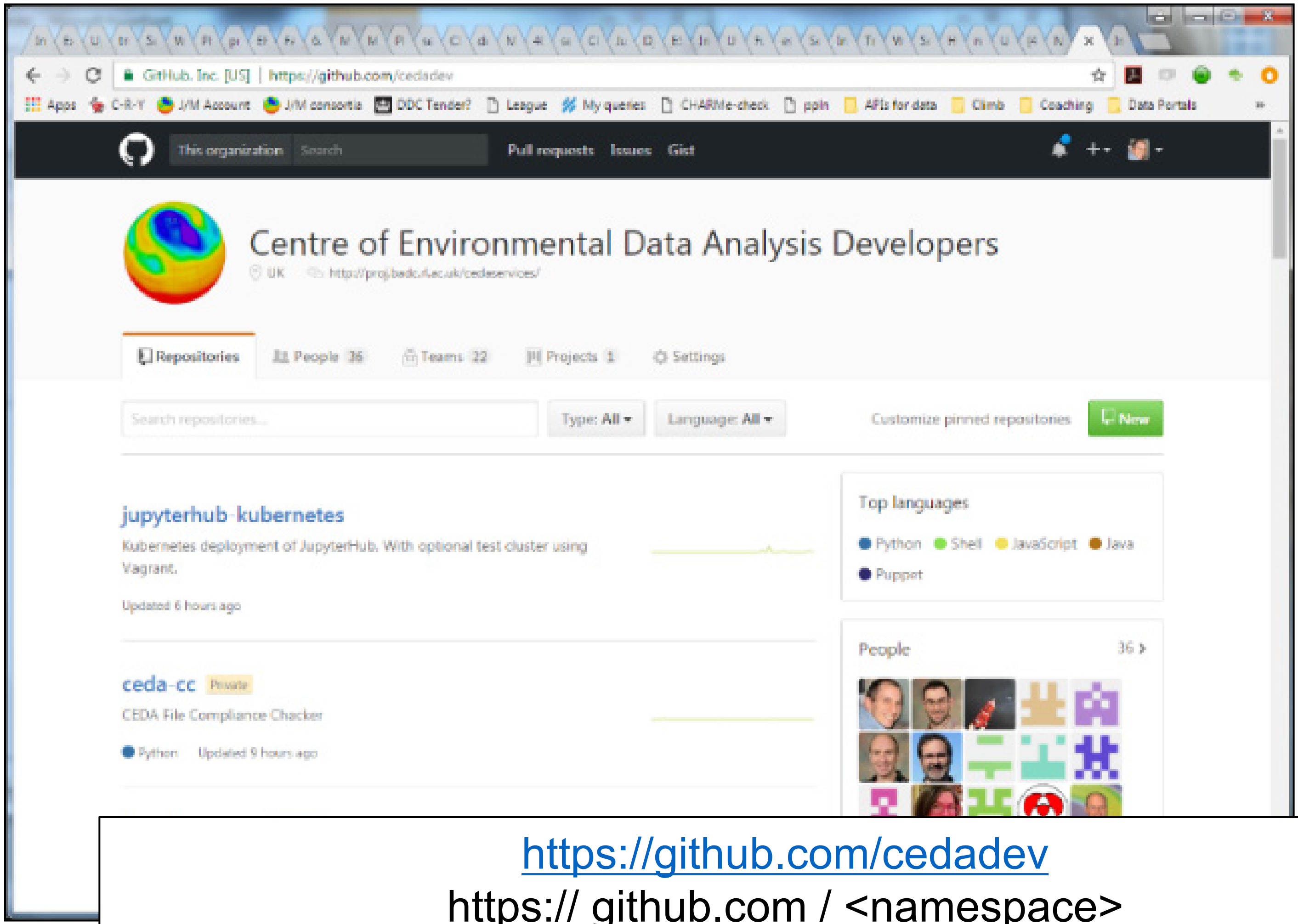
https://github.com/cedadev/jasmin-workshop

https:// github.com / <namespace> / <repository>

GitHub: organisations



https://github.com/cedadev

Centre of Environmental Data Analysis Developers

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

Repositories | People 36 | Teams 22 | Projects 1 | Settings

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 9 hours ago

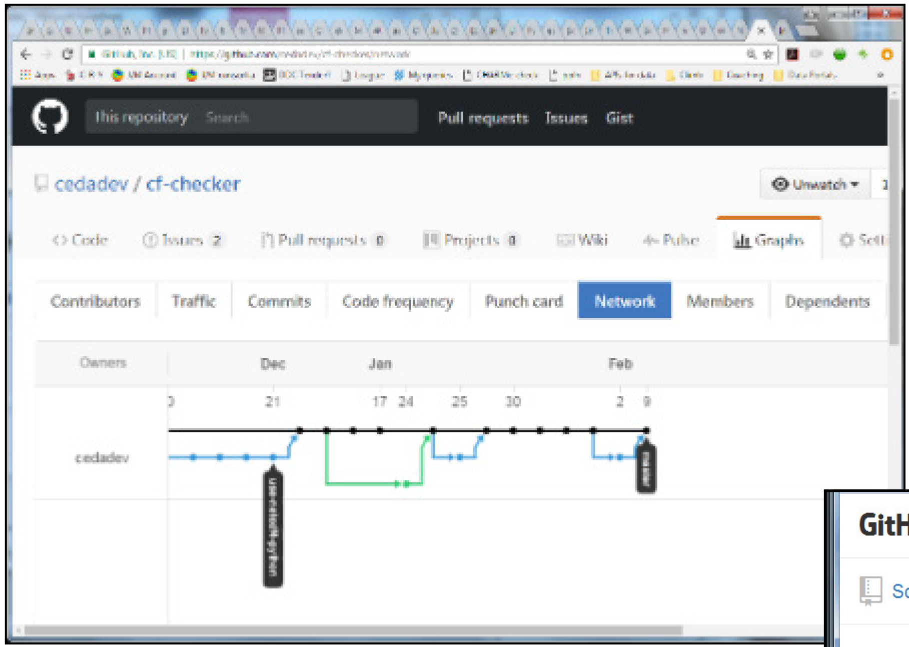
Top languages

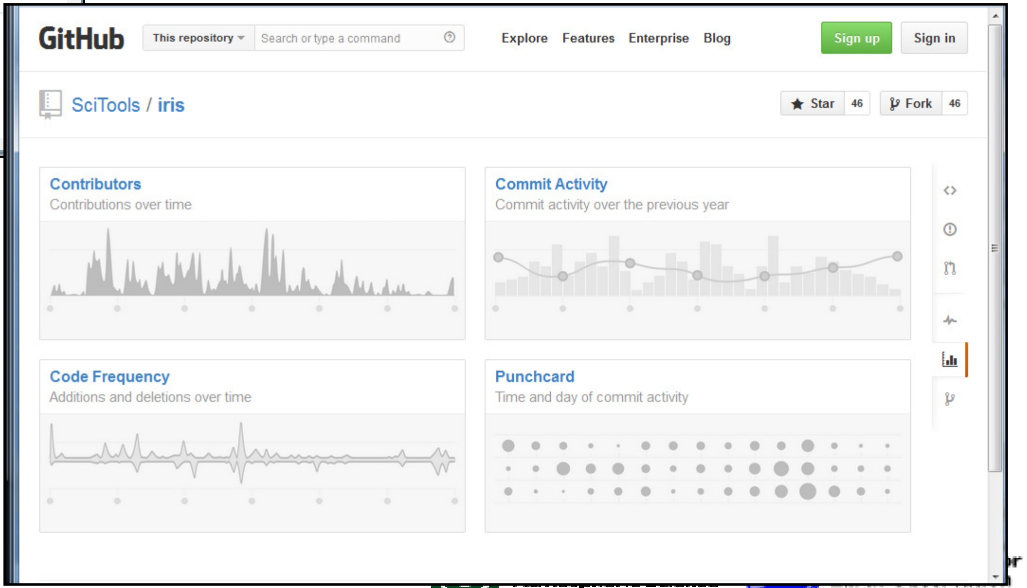
● Python ● Shell ● JavaScript ● Java ● Puppet

People 36

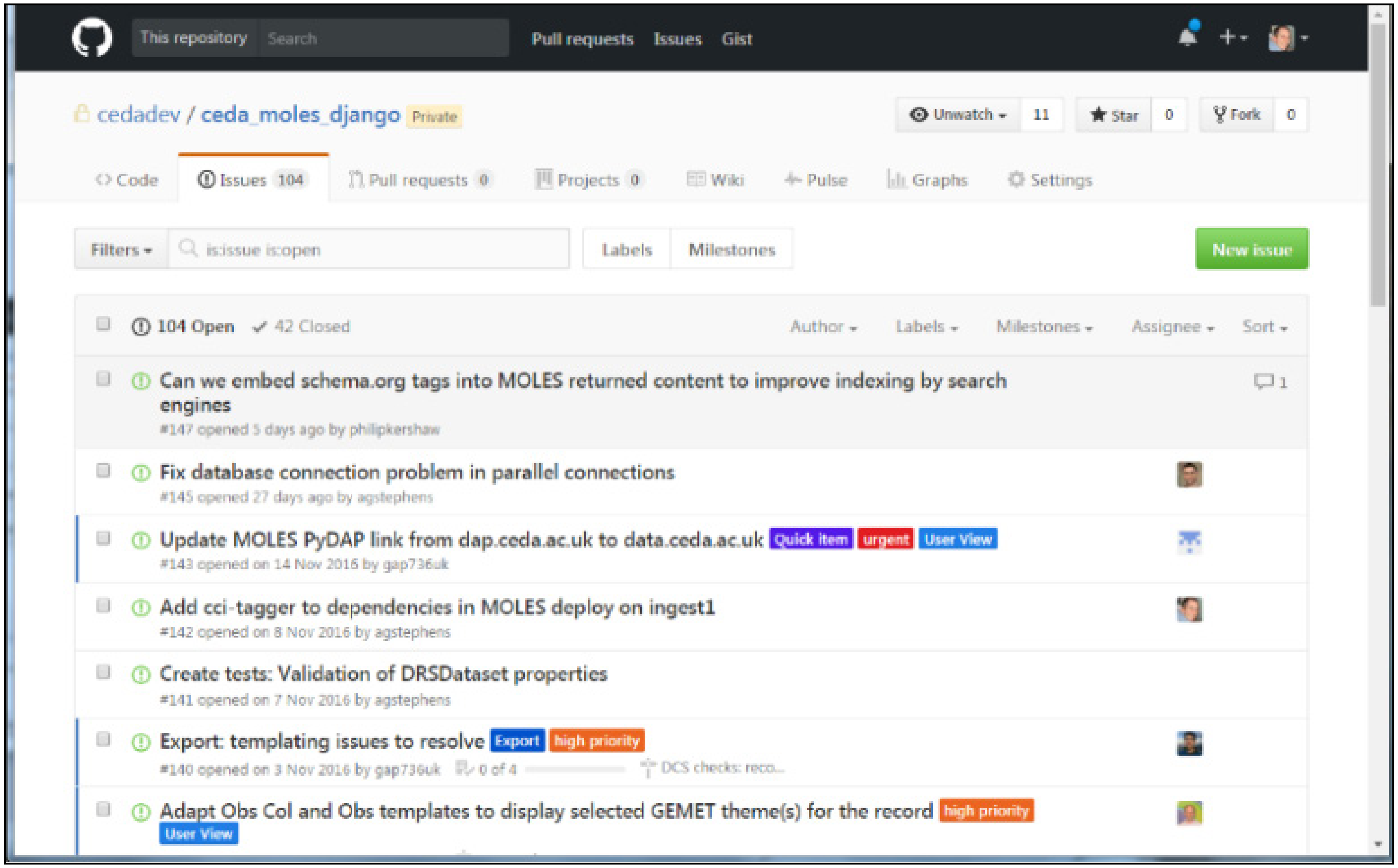
https://github.com/cedadev
https:// github.com / <namespace>

GitHub: collaboration (branch/fork)





GitHub: Issue tracking



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

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

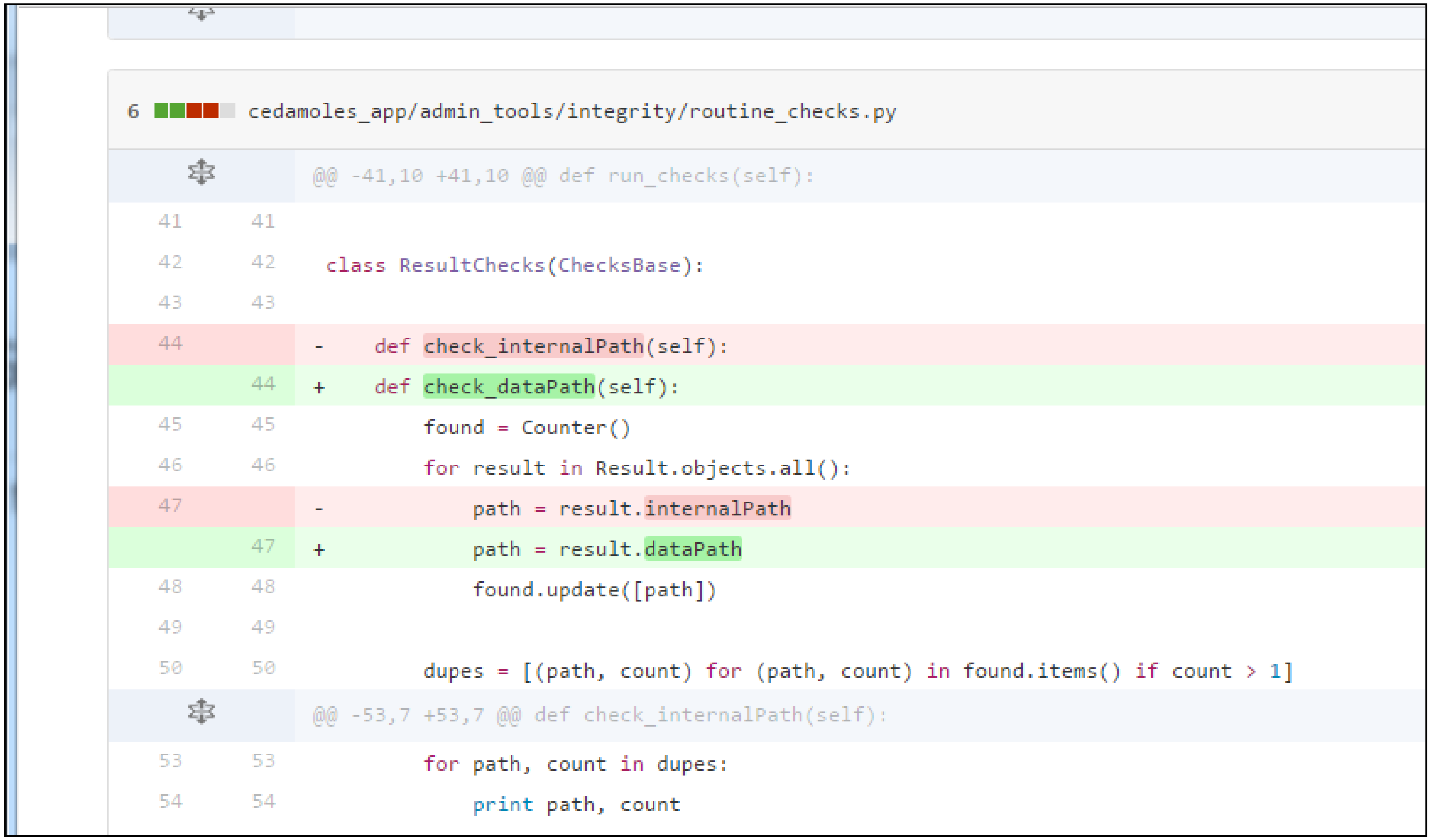
Add cci-tagger to dependencies in MOLES deploy on ingest1
#142 opened on 8 Nov 2016 by agstephens

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...

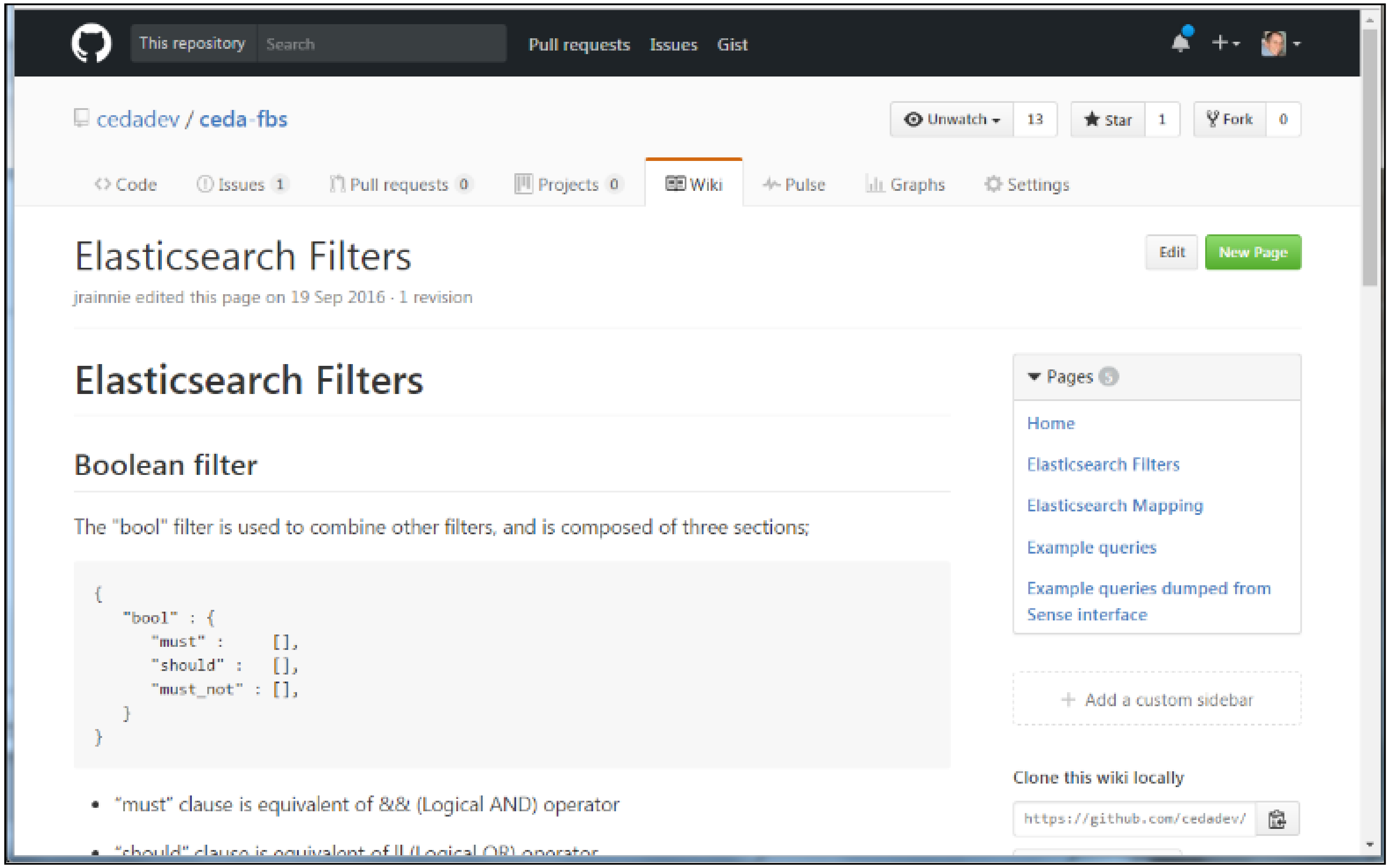
Adapt Obs Col and Obs templates to display selected GEMET theme(s) for the record high priority User View

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

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GitHub does lots of funky things, but…

- To start with, we want to learn how to use 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:

1. Clone an existing repository **from GitHub**

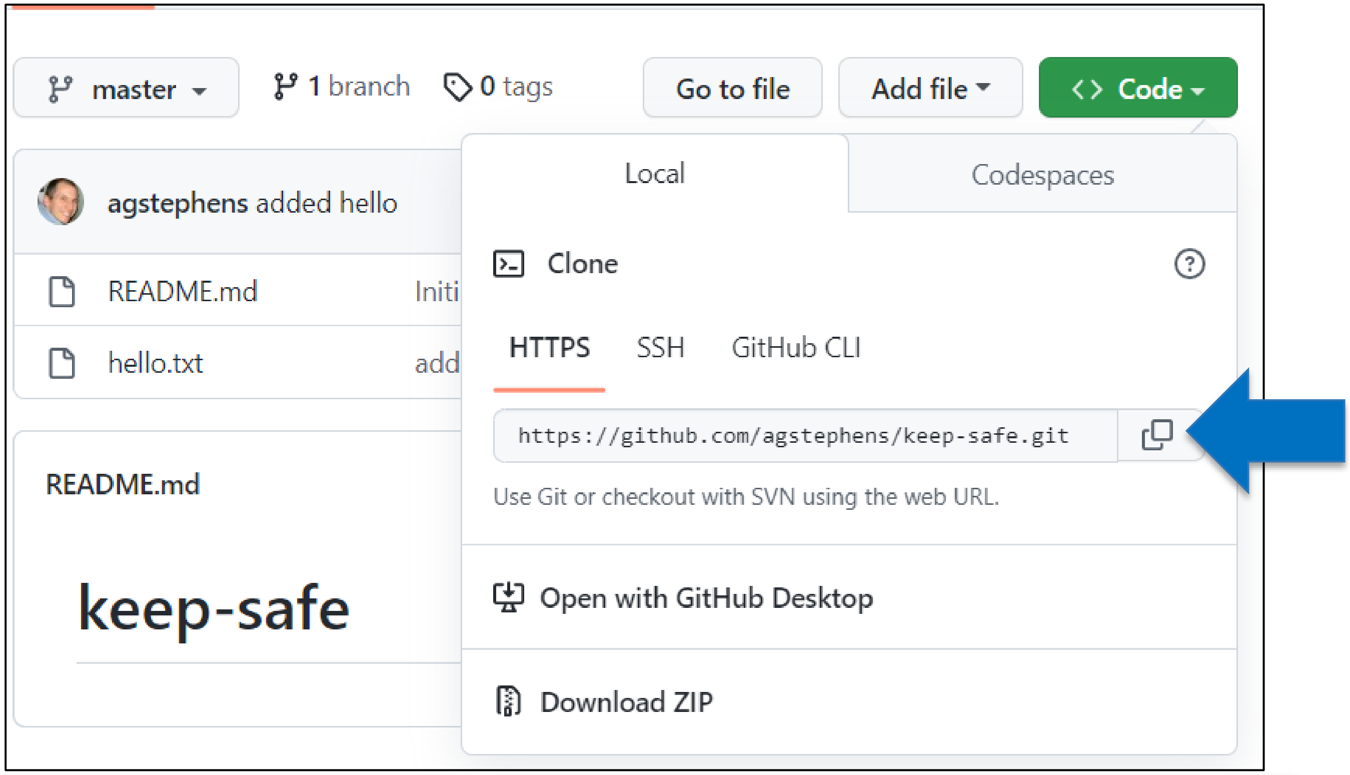
2. Create a new, empty repo and clone it **from GitHub**

Most common

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

Option 1: Clone Existing Repo

This makes a copy of a repository locally.



master · 1 branch · 0 tags · Go to file · Add file · Code

agstephens added hello

README.md Initi

hello.txt add

README.md

keep-safe

Local · Codespaces

Clone

HTTPS · SSH · GitHub CLI

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

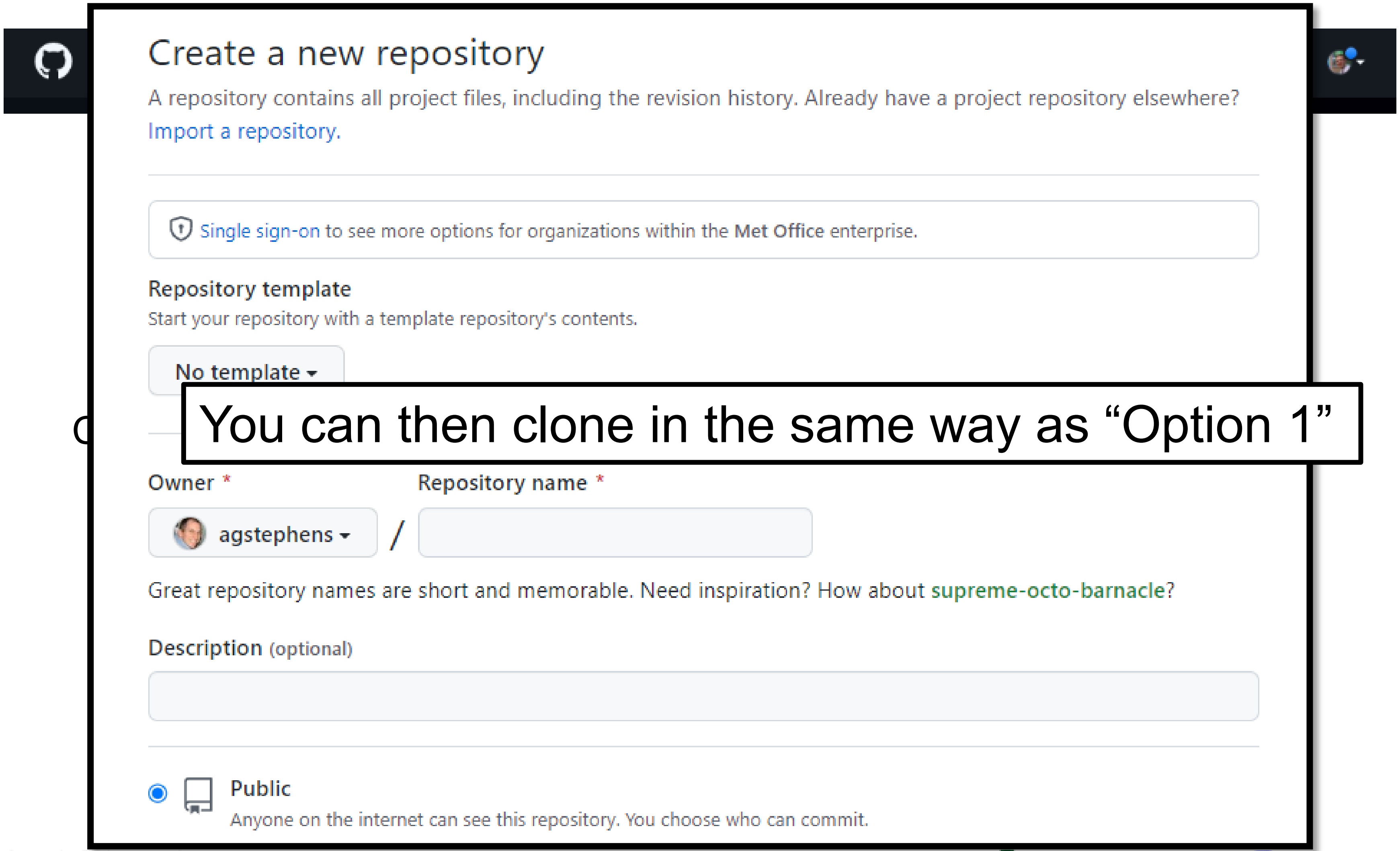
Use Git or checkout with SVN using the web URL.

Open with GitHub Desktop

Download ZIP

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

Option 2: Create a repository on GitHub



Create a new repository

A repository contains all project files, including the revision history. Already have a project repository elsewhere? Import a repository.

Single sign-on to see more options for organizations within the **Met Office** enterprise.

Repository template

Start your repository with a template repository's contents.

No template ▾

Owner * Repository name *

agstephens ▾ /

Great repository names are short and memorable. Need inspiration? How about supreme-octo-barnacle?

Description (optional)

● Public

Anyone on the internet can see this repository. You choose who can commit.

You can then clone in the same way as "Option 1"

Option 3: repository from an existing local directory

```
$ ls
x       y       z
$ git init
Initialized empty Git repository in:
 /users/someone/test-package/.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 keep-safe/
```

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"
```

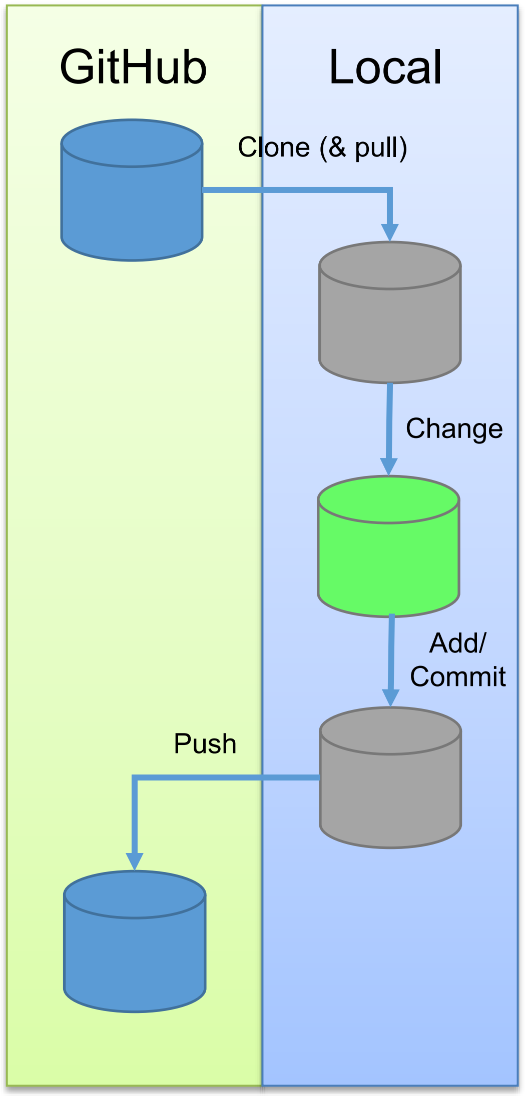
5. Push any updates to the **remote** GitHub repo:

```
$ git push
```

ADD
COMMIT
PUSH

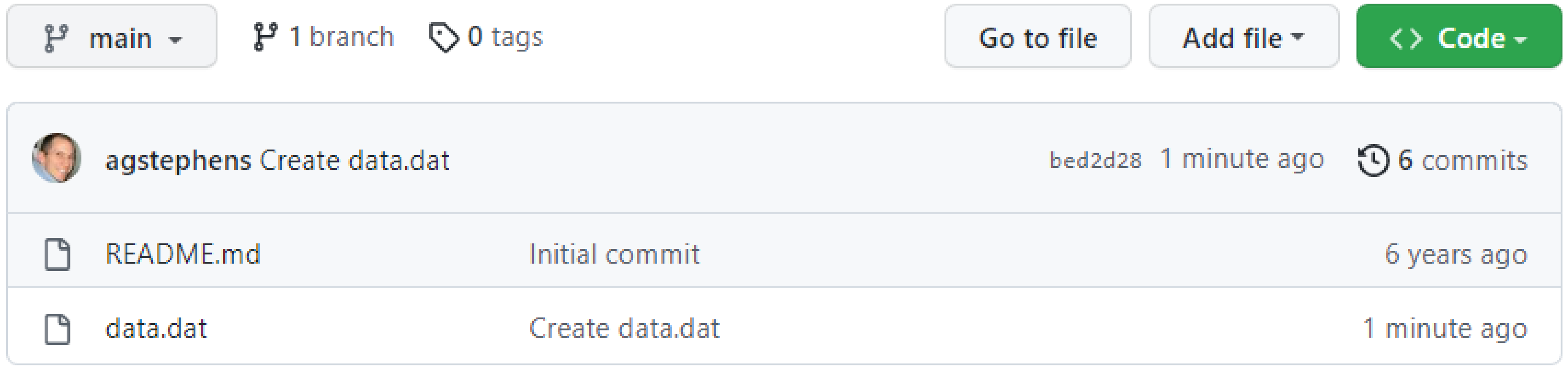
So, what just happened?

- We *cloned* the remote repository to our file system (using Option 1).
  - 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…

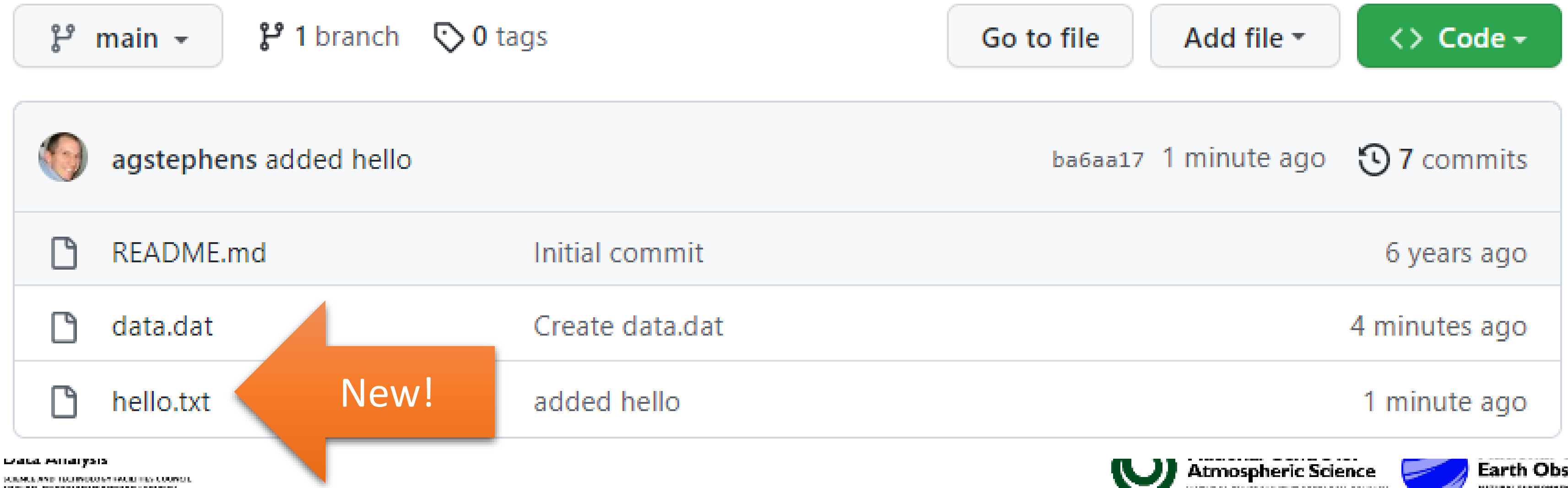


main · 1 branch · 0 tags · Go to file · Add file · Code

agstephens Create data.dat · bed2d28 · 1 minute ago · 6 commits

README.md	Initial commit	6 years ago
data.dat	Create data.dat	1 minute ago

After…



main · 1 branch · 0 tags · Go to file · Add file · Code

agstephens added hello · ba6aa17 · 1 minute ago · 7 commits

README.md	Initial commit	6 years ago
data.dat	Create data.dat	4 minutes ago
hello.txt	added hello	1 minute ago

Learn by doing

- This stuff is hard to learn - we know that from experience.
- A presentation is quickly forgotten.
- So, we propose that you use Git/GitHub every day.
- We encourage you to create and update your own GitHub repository with files from exercises throughout our courses, and in your daily work!