GitLab

Lara Ianov, Ph.D.
Neurodevelopmental Bioinformatics Initiative (NBI)
Civitan International Research Center
University of Alabama at Birmingham

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Git

- Version control software
  - Tracks changes among all members
  - Maintains a history of all changes in an organized way and allows one to revert changes
  - A higher order method over the standard ”copy and change name method”: copy a file with changes to it and name it differently or place it in time-stamped directories - usually these scripts are filled with unnecessary comments documenting the changes
  - A git repository contains the full history of the project. Each clone will always mirror the full repository. Thus, git is a Distributed Version Control System

GitLab, GitHub, Bitbucket etc.

- Web-based services which can be used to host your git repositories in a streamlined manner. Here are some differences among them:

Free Plans	Public Repos	Private Repos	Collaborators	Storage Space	Hosting	Support
GitHub Public	Unlimited	* 0	Unlimited	N / A	Cloud	Email / Forum
Bitbucket Small teams	Unlimited	Unlimited (1Gb /project)	5	N / A	Cloud	Email / Forum
GitLab Cloud Hosted	Unlimited	Unlimited (10Gb / Project)	Unlimited	Unlimited	Cloud	Forum
GitLab Community Edition	Unlimited	Unlimited	Unlimited	N / A	Self-hosted	Forum

UAB RC hosts

* As a student (with .edu account), you can have private repos for free with access to "student developer plan". Details at: https://help.github.com/articles/applying-for-a-student-developer-pack/

Table source:
https://medium.com/flow-ci/github-vs-bitbucket-vs-gitlab-vs-coding-7cf2b43888a1

GitLab

- Sign-in with Blazer ID and password: https://gitlab.rc.uab.edu/users/sign_in
- Learning sources:
  - Git for beginners from UAB RC: https://docs.uabgrid.uab.edu/wiki/Git_For_Beginners
  - GitLab tutorial: https://www.tutorialspoint.com/gitlab/index.htm
  - GitLab docs: https://docs.gitlab.com/
  - Atlassian's tutorial: https://www.atlassian.com/git/tutorials/what-is-version-control
  - Google ☺
- **Today's focus**: GitLab's graphical interface (with some emphasis on important commands)
- Basic git terminology:
  - `Clone`: copy a repository (repo)
  - `Commit`: record changes to the repo
  - `Push`: updates remote git repo with committed changes (if working outside of GitLab environment)
  - `Branch`: independent area of development from the primary set/branch
  - … and more

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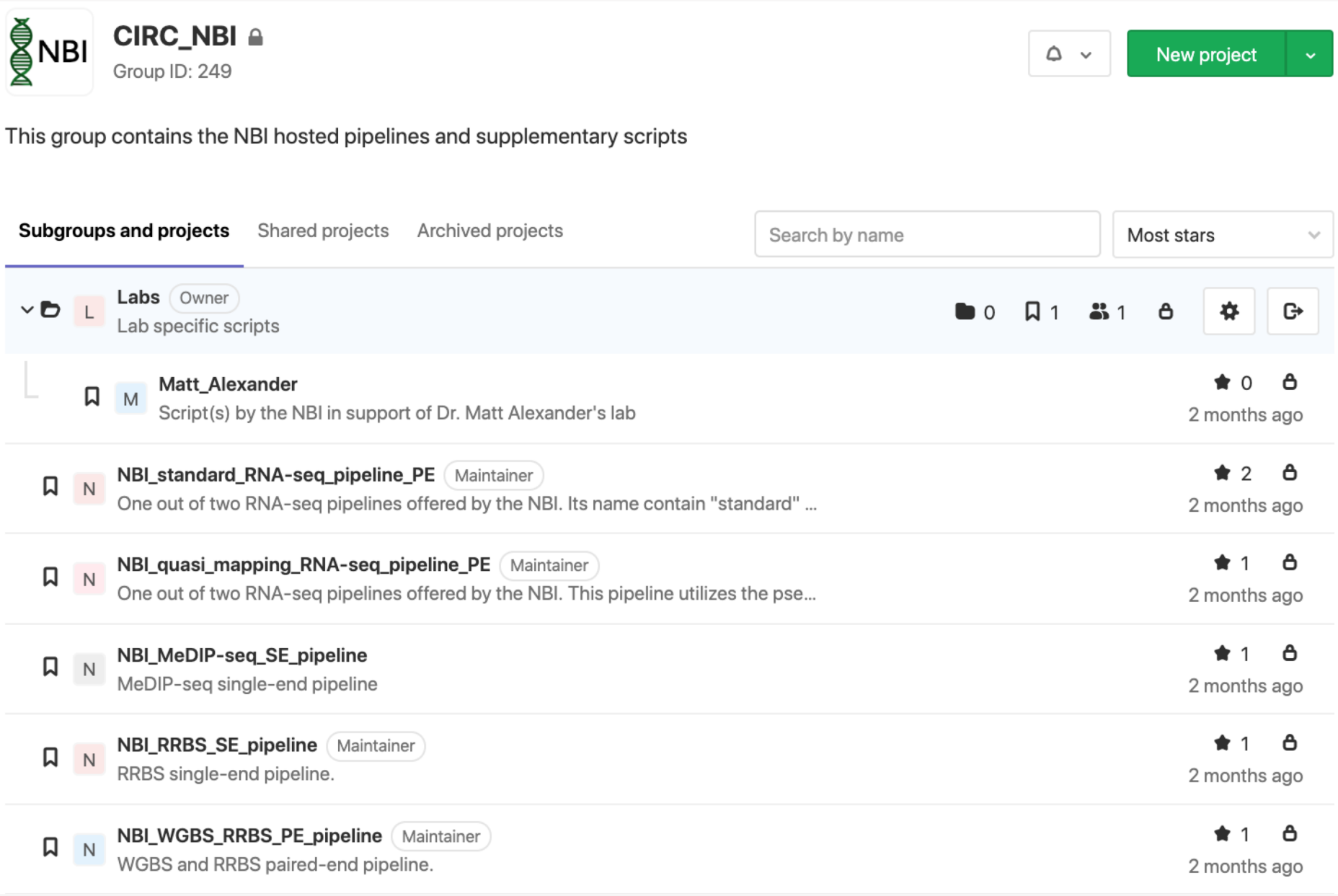
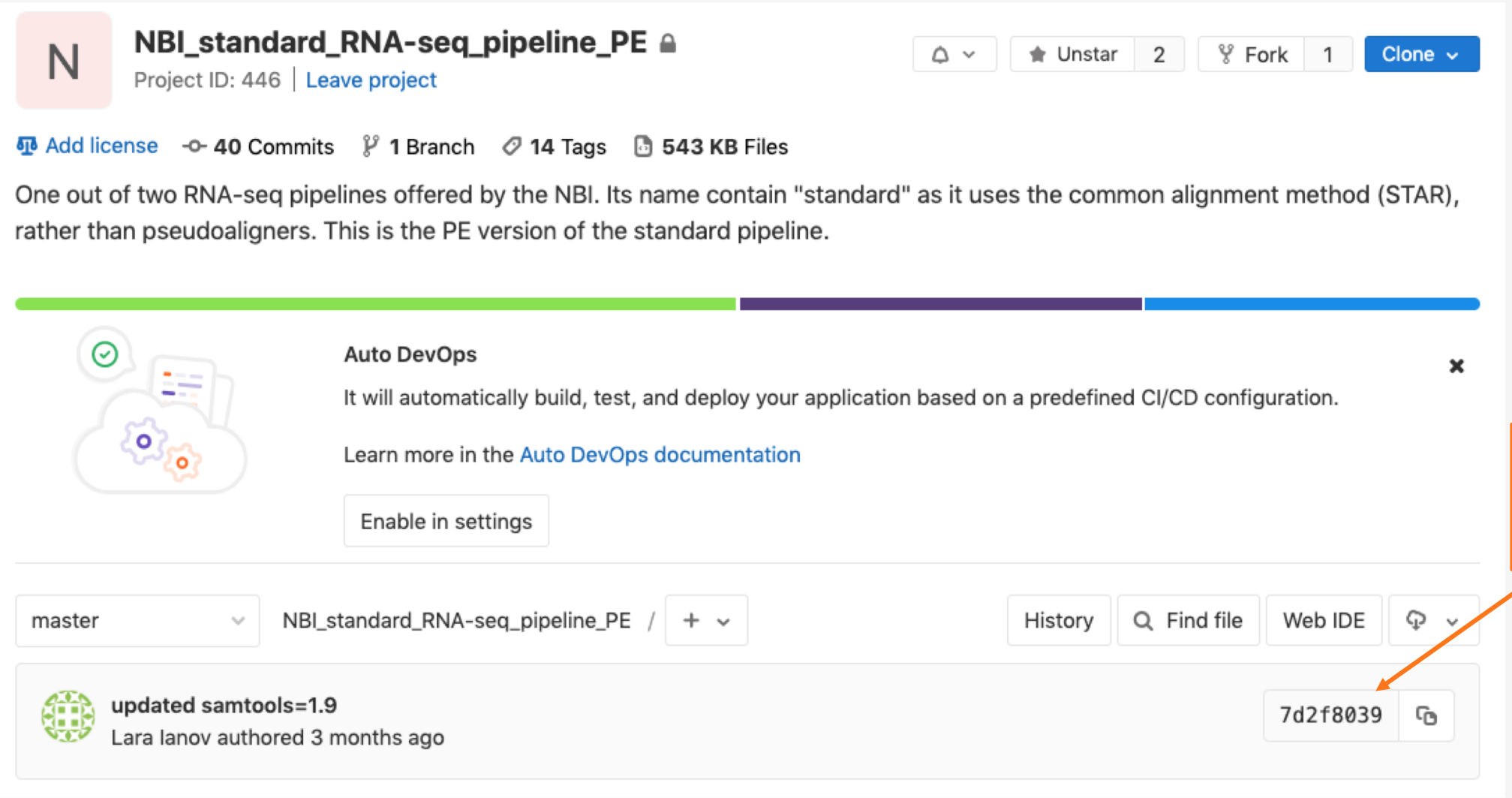
GitLab groups



GitLab "groups" are ideal for individual labs/cores

- Unlimited number of projects (there is a limit in your own profile)
- Easy to collaborate/share



SHA-1 hash is essential to git's method of version control

Access can be given to:

1. Specific user(s)
2. Everyone at UAB
3. Globally

They may also open "issues" with requests to add specific features etc.

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Project members

You can invite a new member to **NBI_standard_RNA-seq_pipeline_PE** or invite another group.

Invite member | Invite group

Select members to invite

Search for members to update or invite

Choose a role permission

Guest

Read more about role permissions

Access expiration date

Expiration date

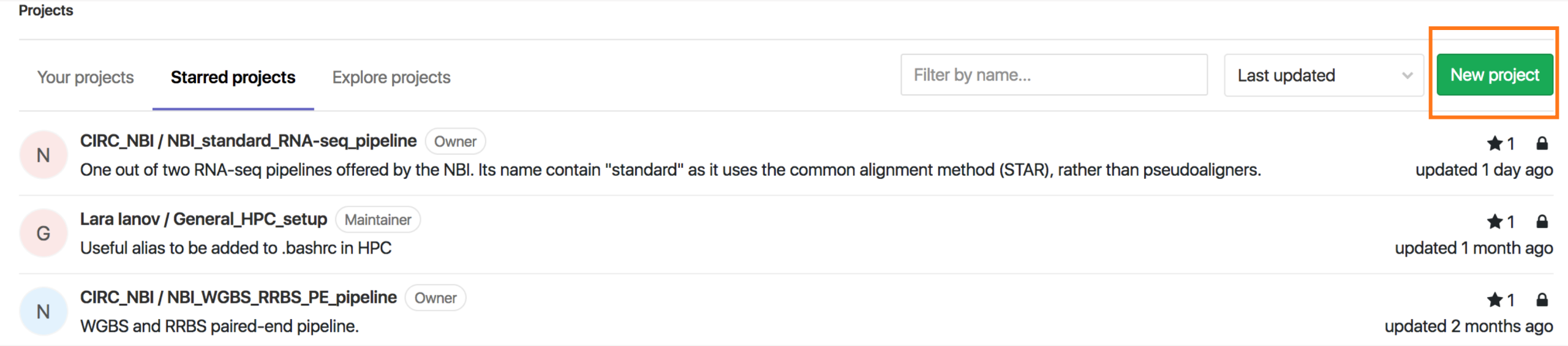
Add to project | Import

See more member permissions at: https://docs.gitlab.com/ee/user/permissions.html

Action	Guest	Reporter	Developer	Maintainer	Owner
Create new issue	✓ [1]	✓	✓	✓	✓
Create confidential issue	✓ [1]	✓	✓	✓	✓
View confidential issues	(✓) [2]	✓	✓	✓	✓
Leave comments	✓ [1]	✓	✓	✓	✓
See related issues	✓	✓	✓	✓	✓
See a list of jobs	✓ [3]	✓	✓	✓	✓
See a job log	✓ [3]	✓	✓	✓	✓
Download and browse job artifacts	✓ [3]	✓	✓	✓	✓
View wiki pages	✓ [1]	✓	✓	✓	✓
View license management reports	✓ [1]	✓	✓	✓	✓
View Security reports	✓ [1]	✓	✓	✓	✓
Pull project code	[1]	✓	✓	✓	✓
Download project	[1]	✓	✓	✓	✓
Assign issues		✓	✓	✓	✓
Assign merge requests			✓	✓	✓
Label issues		✓	✓	✓	✓
Label merge requests			✓	✓	✓
Create code snippets		✓	✓	✓	✓
Manage issue tracker		✓	✓	✓	✓
Manage labels		✓	✓	✓	✓

GitLab – Starting a repository

- From GitLab:



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Blank project | Create from template | Import project

Project name

My awesome project

Project URL

https://gitlab.rc.uab.edu/ lianov

Project slug

my-awesome-project

Want to house several dependent projects under the same namespace? Create a group.

Project description (optional)

Description format

Path may be user profile or specific groups (e.g.: “CIRC_NBI”)

Visibility Level

- Private
  Project access must be granted explicitly to each user.
- Internal
  The project can be accessed by any logged in user.
- Public
  The project can be accessed without any authentication.

Initialize repository with a README

Allows you to immediately clone this project’s repository. Skip this if you plan to push up an existing repository.

Create project

Cancel

- From the command line:
  - Very nice when uploading a directory of existing files

Command line instructions

Git global setup

```
git config --global user.name "Lara Ianov"
git config --global user.email "lianov@uab.edu"
```

Create a new repository

```
git clone git@gitlab.rc.uab.edu:lianov/gitlab_demo.git
cd gitlab_demo
touch README.md
git add README.md
git commit -m "add README"
git push -u origin master
```

Or type a one-liner to stage and commit all **tracked** files:

```
git commit -a -m "message goes here"
```

Existing folder

```
cd existing_folder
git init
git remote add origin git@gitlab.rc.uab.edu:lianov/gitlab_demo.git
git add .
git commit -m "Initial commit"
git push -u origin master
```

Commands to upload files when initial project (in this case named "gitlab_demo") was created in GitLab

Existing Git repository

```
cd existing_repo
git remote rename origin old-origin
git remote add origin git@gitlab.rc.uab.edu:lianov/gitlab_demo.git
git push -u origin --all
git push -u origin --tags
```

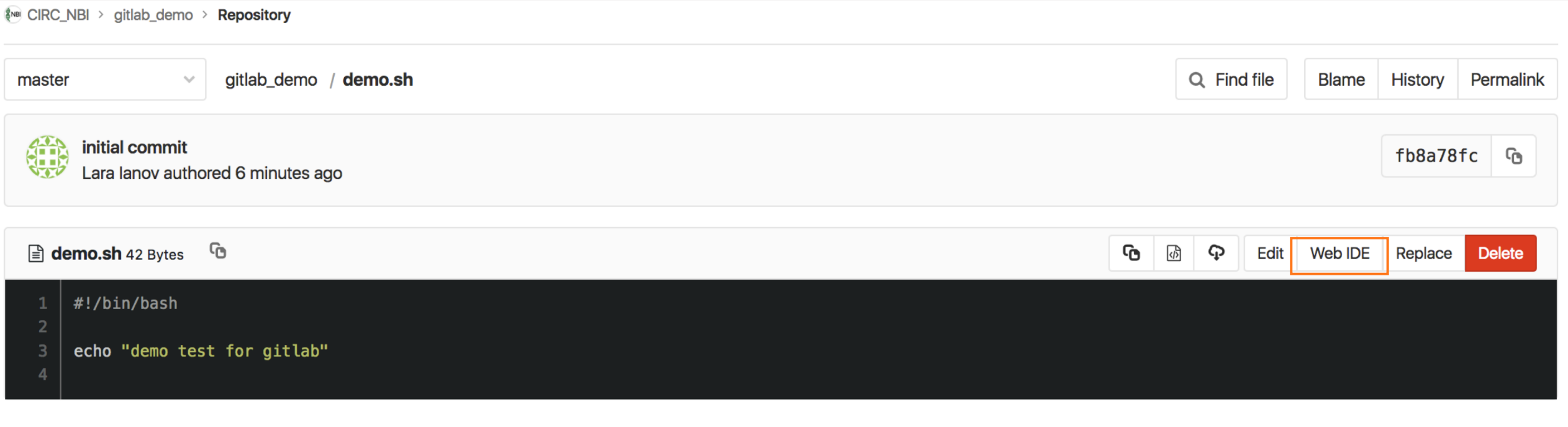
- From the command line:
  - Or create the project directly from the command line and push all files to the project

```
cd existing_folder
git init
git add .
git commit –m “initial commit message”

# With SSH
git push -u git@gitlab.rc.uab.edu:<namespace>/<project_name>.git master
git remote add origin git@gitlab.rc.uab.edu:<namespace>/<project_name>.git

# OR with HTTPS
git push -u https://gitlab.rc.uab.edu/<namespace>/<project_name>.git master
git remote add origin https://gitlab.rc.uab.edu/<namespace>/<project_name>.git
```

FYI on setting up SSH for GitLab: https://docs.gitlab.com/ee/ssh/README.html

GitLab – Edit and commit

- GitLab contains an integrated development environment (IDE) – OK for small edits, but I do not use it for large projects/changes.



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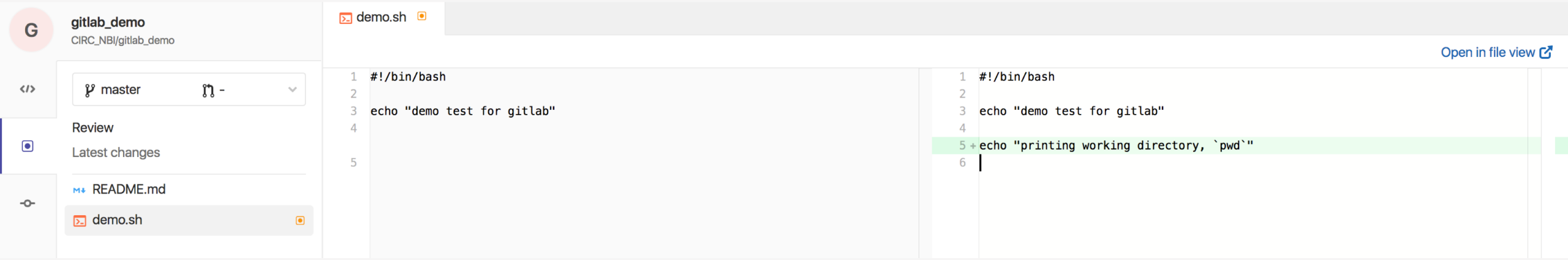
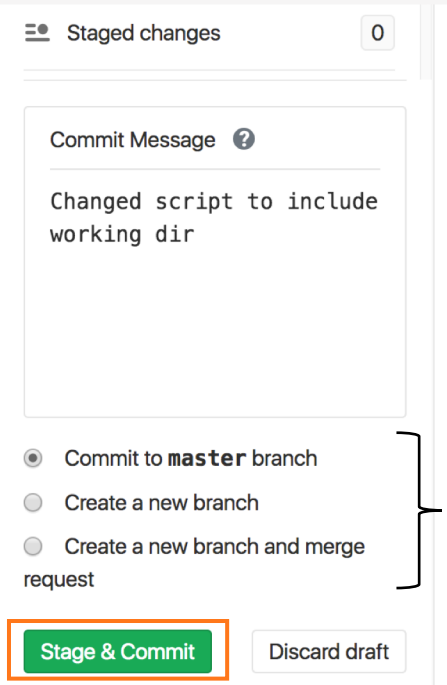
GitLab's IDE



Hit "Stage and Commit" and include a message. Same as `git add . && git commit -m "message"`

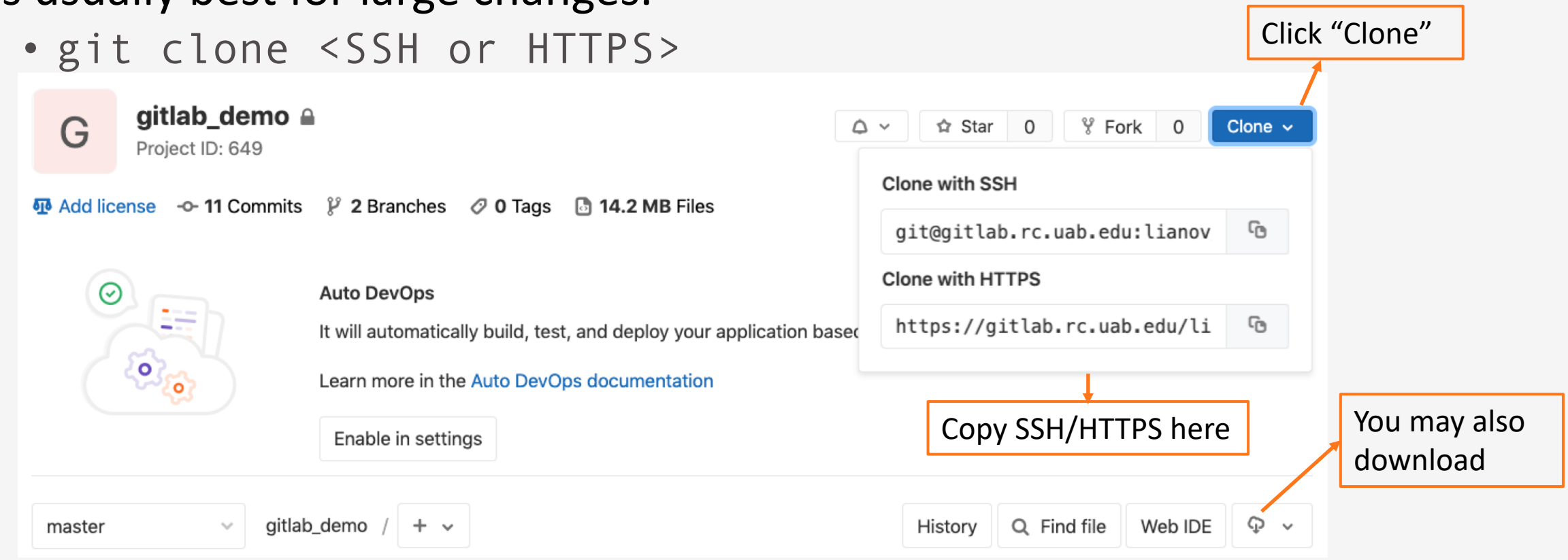
No need to `push` as this is being done directly in GitLab.



Note, the option of committing into the master branch or a new branch. A new branch would be wise if you are still testing the code or to work among collaborators where you would send ("create a merge request") the reviewed code to the project's maintainer.

GitLab – Edit and commit

- ✓GitLab contains an integrated development environment (IDE) – OK for small edits, but I do not use it for large projects/changes.
- Cloning the repo to your local computer and using your favorite editor is usually best for large changes.
  - `git clone <SSH or HTTPS>`



GitLab – Edit and commit

- ✓GitLab contains an integrated development environment (IDE) – OK for small edits, but I do not use it for large projects/changes.
- Cloning the repo to your local computer and using your favorite editor is usually best for large changes.
  - `git clone <SSH or HTTPS>`

demo.sh

```
1  #!/bin/bash
2
3  echo "demo test for gitlab"
4
5  echo "printing working directory, `pwd`"
6
7  echo "line added locally after cloning, and then committed and pushed to GitLab"
8
```

Line added in my editor of choice in my computer and then:

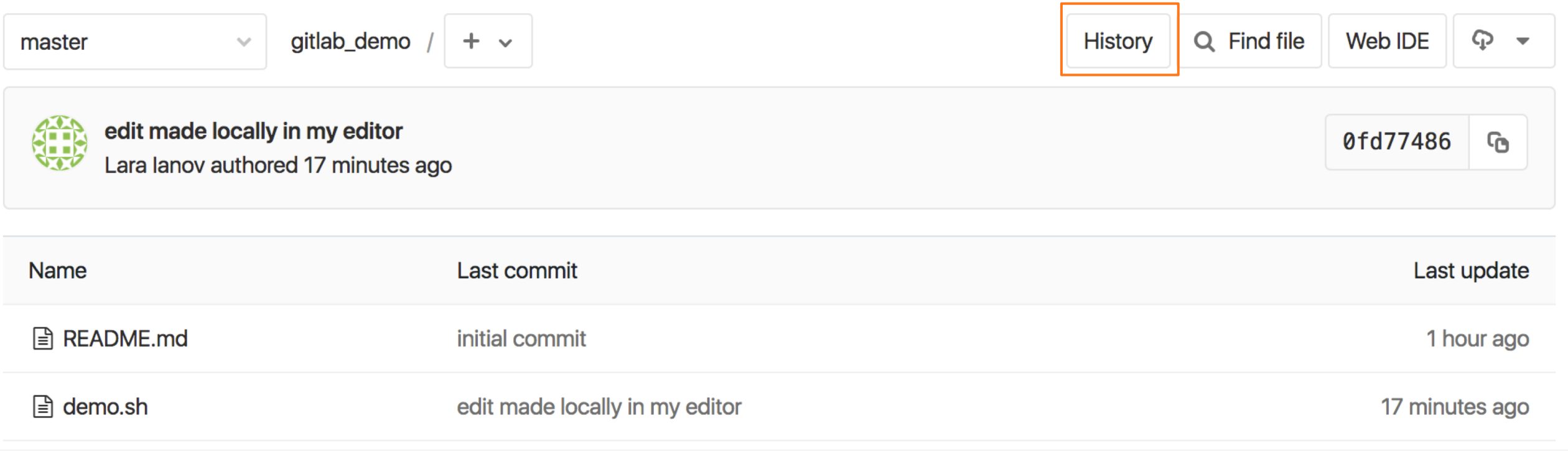
```
git add .
git commit -m “edit made locally in my editor”
git push -u origin master
```

GitLab – Atom integration

- Atom is a great editor for both GitHub and GitLab as it integrates the git commands, allowing you to perform tasks such as `commit` and `push` directly from the editor. Explore Atom's packages such as this to learn more

GitLab – History

- Regardless of where changes were made (in GitLab IDE or locally and then pushed), all changes are easily tracked in GitLab:



FYI command line version: `git log`

master | gitlab_demo | Filter by commit message

28 Nov, 2018 3 commits

edit made locally in my editor
Lara Ianov authored 25 minutes ago — `0fd77486`

Changed script to include working dir
Lara Ianov authored 1 hour ago — `0917c098`

initial commit
Lara Ianov authored 2 hours ago — `fb8a78fc`

Note the changes in SHA-1

edit made locally in my editor

FYI command line version: `git show <SHA-1>`

parent `0917c098` `master`

No related merge requests found

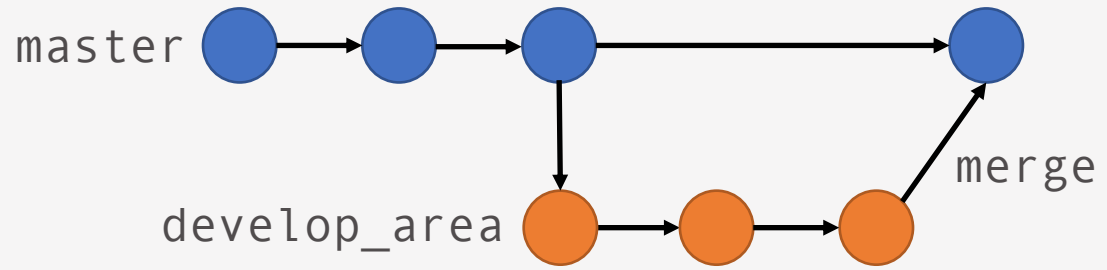
Showing 1 changed file with 2 additions and 0 deletions | Hide whitespace changes | Inline | Side-by-side

demo.sh 100644 → 100755 | View file @ `0fd77486`

```
...  @@ -3,3 +3,5 @@
3    echo "demo test for gitlab"
4
5    echo "printing working directory, `pwd`"
```

```
...  @@ -3,3 +3,5 @@
3    echo "demo test for gitlab"
4
5    echo "printing working directory, `pwd`"
6  +
7  + echo "line added locally after cloning, and then committed and pushed to GitLab"
```

GitLab - Branch



- By default, all projects start with one branch, called `master`. All commits I have done in this demo so far have been made to `master`.
- But what if you would like to work on the repo without committing to the main branch? Maybe testing code without overwriting the `master` branch?
  - This is where `branching` is very useful, especially when more than one person is working on the same code.
  - In the case of more than one person, a collaborator can branch, edit independently at the isolated branch and when finalized, send a `merge` request to the maintainer who can approve to merge all changes into the `master` branch.

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G

gitlab_demo

Project ID: 936

Star 0 | Fork 0 | Clone

Add license | 1 Commit | 1 Branch | 0 Tags | 2.1 MB Files

Lara Ianov > gitlab_demo > Branches

Overview | Active | Stale | All

Filter by branch name | Delete merged branches | New branch

Protected branches can be managed in project settings.

Active branches

master default protected

25e27b03 · Changes made in Atom and committed etc. directly · 23 hours ago

Lara Ianov > gitlab_demo > **New Branch**

New Branch

Branch name: develop_area

Create from: master

Existing branch name, tag, or commit SHA

Create branch

Cancel

Lara Ianov > gitlab_demo > **Details**

G

gitlab_demo

Project ID: 649

Star 0 Fork 0 Clone

Add license | **11** Commits | **2** Branches | **0** Tags | **14.2 MB** Files

You can now edit the code of the second branch and click on “branches” to compare and add a merge request

Lara Ianov > gitlab_demo > **Branches**

Overview Active Stale All

Filter by branch name | Delete merged branches | New branch

Protected branches can be managed in project settings.

Active branches

develop_area
caeed48f · Update demo.sh · 2 minutes ago
0 1 | Merge request | Compare

master default protected
25e27b03 · Changes made in Atom and committed etc. directly · 23 hours ago

Lara Ianov > gitlab_demo > Compare Revisions > **master...develop_area**

Source `develop_area` ... Target `master` Compare | Create merge request

Commits (1)

Update demo.sh
Lara Ianov authored 3 minutes ago

caeed48f

Showing 1 changed file with 3 additions and 0 deletions

Hide whitespace changes | Inline | Side-by-side

demo.sh

View file @ caeed48f

```
...  @@ -10,3 +10,5 @@ echo "line added locally after cloning, and then committed and pushed to GitLab"
10   # changes below were made in Atom, staged, committed and pushed direct ly from Atom
11   echo "printing current date and time"
12   date
```

```
...  @@ -10,3 +10,5 @@ echo "line added locally after cloning, and then committed and pushed to GitLab"
10   # changes below were made in Atom, staged, committed and pushed direct ly from Atom
11   echo "printing current date and time"
12   date
13  +
14  + #----- This represents finalized code ready to be merged --------
     \ No newline at end of file
```

GitLab - Branch

- Again, using GitLab's IDE may be OK for small changes but I prefer local for larger changes:

```
git clone <SSH or HTTPS> # or git pull
cd <cloned_dir> # only needed if cloned
git branch -a
git checkout <branch_name> (switches the branch)
### modify code ###
git commit -am "message goes here" (adding in one-liner)
git push -u origin <branch_name>
```

- Atom's packages offer good features to do this as well

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Thanks!

A big thank you to UAB Research Computing for hosting GitLab and for taking the time to provide additional documentation and training

My contact info:

lianov@uab.edu

CIRC 252C | P: 205-996-5871

NBI

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