

GitLab as a Collaborative Working Environment - part 3

Introductory Course

Mihai Lefter

Department of Human Genetics



Outline

Time	Activity	Contents
09:00	Lecture 1	Introduction, version control.
09:30	Practical 1	GitLab: groups, projects, and file handling.
09:50	Break	
10:00	Lecture 2	GitLab: issues, labels, milestones,
10:20	Practical 2	and the issue board.
10:40	Break	
10:50	Lecture 3	GitLab: wiki, markdown, extras.
11:20	Practical 3	
11:50	Final questions	
12:00	Closing	

Wiki

Keep your project documentation using the built-in wiki system.

- Enabled by default on all new projects.
- Every Wiki is a separate Git repository.
- Available formats:
 - Markdown.
 - RDoc.
 - AsciiDoc.

Note: *Guest* permission level is needed to view a Wiki and *Developer* is needed to create and edit Wiki pages.

You can find more information on the GitLab [documentation](#).

Example: wiki main page creation

GitLab

https://git.lumc.nl/CR/project-75-RNAseqHumanBrain/wikis/home

Wiki

Home · Create Page

New Page

More Pages

Format: Markdown

Content: Write Preview

Welcome to the project wiki.

Styling with Markdown is supported

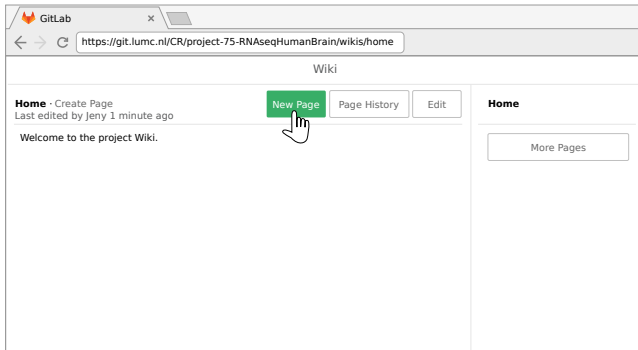
Commit message: First wiki page.

Create page Cancel



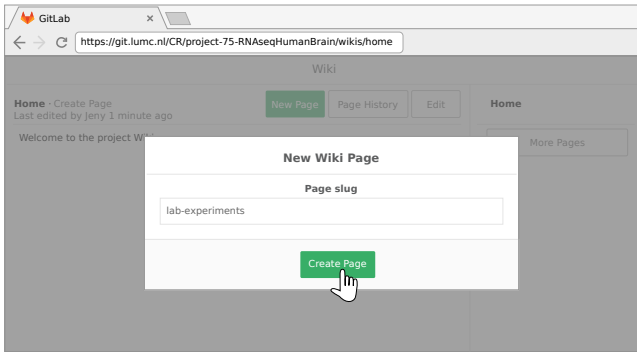
Creates wiki main page.

Example: wiki page creation



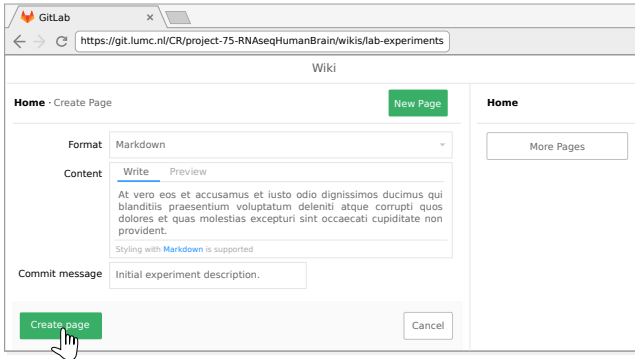
Starts creating the lab experiments page.

Example: wiki page creation



Inserts the name.

Example: wiki page creation

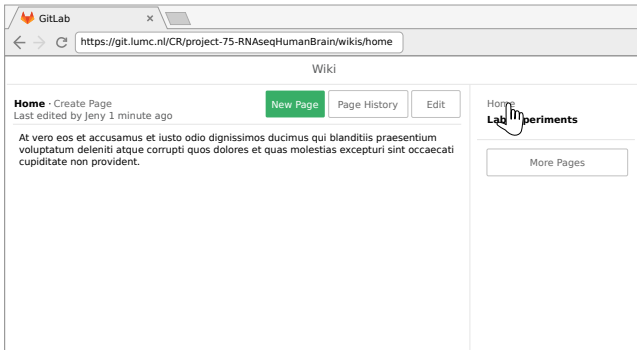


The screenshot shows the GitLab Wiki page creation interface. The browser address bar displays the URL: `https://git.lumc.nl/CR/project-75-RNAseqHumanBrain/wikis/lab-experiments`. The page title is "Wiki". The main content area is titled "Home · Create Page" and includes a "New Page" button. The "Format" dropdown is set to "Markdown". The "Content" section has tabs for "Write" and "Preview". The "Write" tab is active, showing a text area with the placeholder text: "At vero eos et accusamus et iusto odio dignissimos ducimus qui blanditiis praesentium voluptatum deleniti atque corrupti quos dolores et quas molestias excepturi sint occaecati cupiditate non provident." Below the text area, a note states "Styling with Markdown is supported". The "Commit message" field contains the text "Initial experiment description." At the bottom left, there is a green "Create page" button with a hand cursor icon pointing to it, and a "Cancel" button at the bottom right. On the right side of the page, there is a "Home" section with a "More Pages" button.



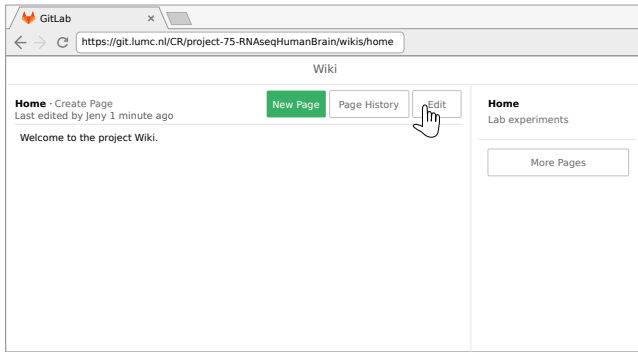
Adds information to the lab experiments page.

Example: view another page



Goes to the home wiki page.

Example: edit page



Begins to edit the home page.

Example: edit page

GitLab

https://git.lumc.nl/CR/project-75-RNAseqHumanBrain/wikis/home/edit

Wiki

Home · Create Page

New Page Page History Delete

Format Markdown

Content Write Preview

Welcome to the project wiki.

Check [here](lab-experiments) the lab log.

Styling with Markdown is supported

Commit message Add link to the lab experiments page.

Save changes Cancel

Home

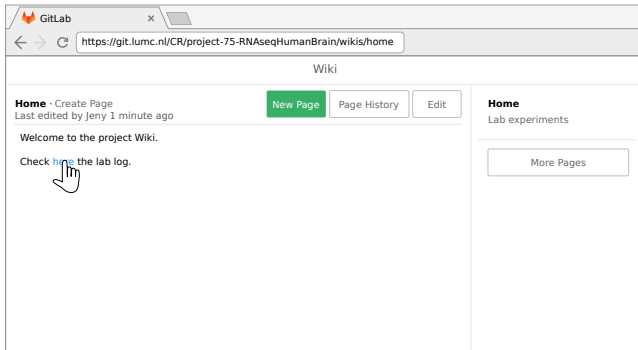
Lab experiments

More Pages



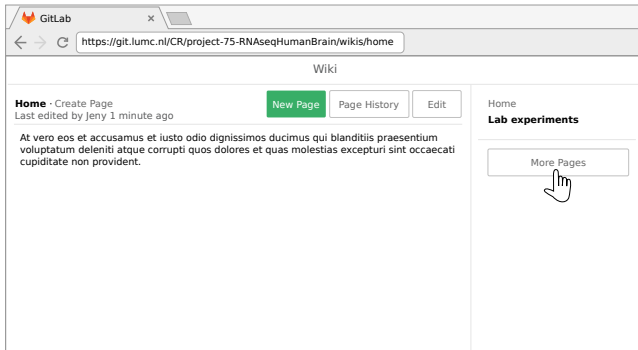
Adds link to the lab experiments page.

Example: edit page



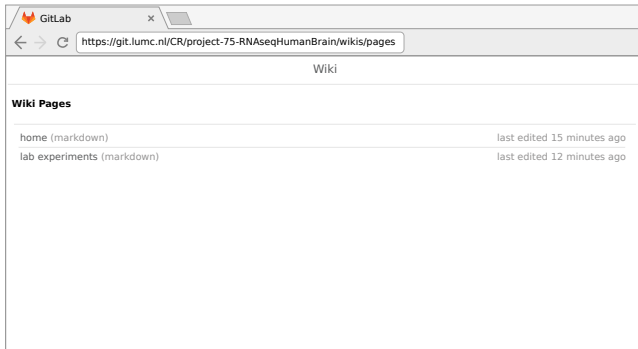
Checks the link.

Example: all pages listing



Checks all the pages.

Example: all pages listing



Checks all the pages.

Markdown



What is markdown?

- A plain text format that makes any document easy-to-write and easy-to-read.
- Various flavors exist:
 - GitLab Flavored Markdown (GFM).
- All “.md” files are automatically rendered in GitLab.
- Ideally, every directory in the project has a README.md file.

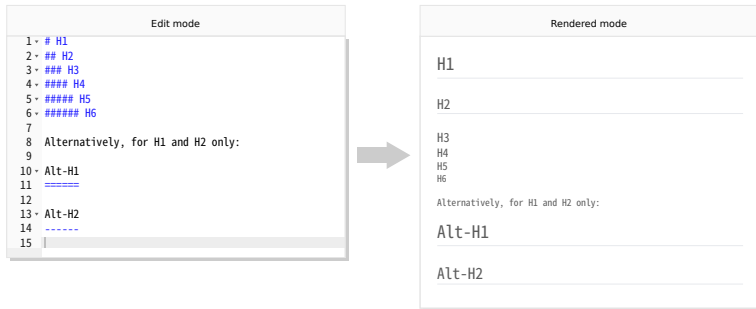
Markdown

Used for

- Comments.
- Issues descriptions / comments.
- Milestones descriptions.
- Wiki pages.
- Markdown documents inside the repository.

Markdown

Headers



Markdown

Emphasis

Edit mode

```
1 Emphasis, aka italics, with asterisks or underscores.
2
3 Strong emphasis, aka bold, with asterisks
4 or underscores.
5
6 Combined emphasis with asterisks and underscores.
7
8 Strikethrough uses two tildes. Scratch this.
9
```



Rendered mode

Emphasis, aka italics, with *asterisks* or underscores.

Strong emphasis, aka bold, with **asterisks** or **underscores**.

Combined emphasis with ***asterisks and underscores***.

Strikethrough uses two tildes. ~~Scratch this.~~

Note that GFM ignores multiple underscores in words.

Markdown

Lists

Edit mode

```
1 1. First ordered list item
2 2. Another ordered item
3  * Unordered sub-list.
4 3. Another ordered item
5 1. Ordered sub-list
6 4. And another item.
7
8  * Unordered list can use asterisks
9  - Or minuses
10 + Or pluses
11
```



Rendered mode

1.First ordered list item
2.Another item
 • Unordered sub-list.
3.Another ordered item
 1.Ordered sub-list
4.And another item.

• Unordered list can use asterisks
• Or minuses
• Or pluses

Markdown

Links

Edit mode

```
1 [I'm an inline-style link](https://www.lumc.nl/)
2
3 [I'm an inline-style link with title](https://www.lumc.nl/ "LUMC Homepage")
4
5 [I'm a reference-style link][Arbitrary case-insensitive reference text]
6
7 [I'm a relative reference to a repository file](../blob/master/LICENSE)
8
9 [You can use numbers for reference-style link definitions][1]
10
11 Or leave it empty and use the [link text itself]().
12
13 URLs and URLs in angle brackets will automatically get turned into links.
14 https://www.lumc.nl/ or <https://www.lumc.nl/>
15
16 Some text to show that the reference links can follow later.
17
18 [arbitrary case-insensitive reference text]: https://www.albinusnet.nl/
19 [1]: https://www.albinusnet.nl/
20 [link text itself]: https://www.lumc.nl/
21
```

Rendered mode

I'm an inline-style link

I'm an inline-style link with title

I'm a reference-style link

I'm a relative reference to a repository file

You can use numbers for reference-style link definitions

Or leave it empty and use the link text itself.

URLs and URLs in angle brackets will automatically get turned into links. <https://www.lumc.nl/> or <https://www.lumc.nl/>

Some text to show that the reference links can follow later.

You can use relative links in main repository as well as in the wiki, but not between each other.

Markdown

Images

```


Edit mode
1 Here's our logo (hover to see the title text):
2
3 Inline-style:
4 ![alt text](https://lumc.nl/logo.png "Logo Title Text 1")
5
6 Reference-style:
7 ![alt text][logo]
8
9 [logo]: https://lumc.nl/logo.png "Logo Title Text 2"
10


```



```

Rendered mode
Here's our logo (hover to see the title text):

Inline-style:


Reference-style:


```

Markdown

Line breaks

Edit mode

```
1 Roses are red [followed by line break]
2 Violets are blue [followed by two or more line breaks].
3
4 Sugar is sweet
5
```



Rendered mode

Roses are red [followed by line break] Violets are blue [followed by two or more line breaks].
Sugar is sweet

Markdown

Blockquotes



Markdown

Horizontal rule

```
1 Three or more...
2
3 ---
4
5 Hyphens
6
7 ***
8
9 Asterisks
10
11 ---
12
13 Underscores
14
```



```
Rendered mode

Three or more...
-----

Hyphens
-----

Asterisks
-----

Underscores
```


Markdown

Tables

Edit mode

```
1 Tables aren't part of the core Markdown spec, but they
2 are part of GFM.
3
4 The row of dashes between the table header and body must
5 have at least three
6 dashes in each column.
7
8 By including colons in the header row, you can align the
9 text
10 within that column:
11
12 | Left Aligned | Centered | Right Aligned |
13 | :-----: | :-----: | :-----: |
14 | Cell 1 | Cell 2 | Cell 3 |
15 | Cell 4 | Cell 5 | Cell 6 |
16
17
```



Rendered mode

Tables aren't part of the core Markdown spec, but they are part of GFM.

The row of dashes between the table header and body must have at least three dashes in each column.

By including colons in the header row, you can align the text within that column:

Left Aligned	Centered	Right Aligned
Cell 1	Cell 2	Cell 3
Cell 4	Cell 5	Cell 6

Footnotes

Edit mode

```
1 You can add footnotes to your text as follows.[^2]
2
3 Here is some more text.
4
5 And here even more.
6
7 [^2]: This is my awesome footnote.
8
```



Rendered mode

You can add footnotes to your text as follows. ¹

Here is some more text.

And here even more.

1. This is my awesome footnote.

Markdown

Task lists

Edit mode

```
1 You can add task lists to issues, merge requests and
2 comments.
3
4 To create a task list, add a specially-formatted
5 Markdown list, like so:
6 - [x] Completed task
7 - [ ] Incomplete task
8   - [ ] Sub-task 1
9   - [x] Sub-task 2
10  - [ ] Sub-task 3
11
12 Task lists can only be created in descriptions, not in
13 titles.
14
15 Task item state can be managed by editing the
16 description's Markdown or by toggling the rendered
17 check boxes.
```



Rendered mode

You can add task lists to issues, merge requests and comments.

To create a task list, add a specially-formatted Markdown list, like so:

- ☒ Completed task
 - ☐ Sub-task 1
 - ☒ Sub-task 2
 - ☐ Sub-task 3
- ☐ Incomplete task

Task lists can only be created in descriptions, not in titles.
Task item state can be managed by editing the description's Markdown or by toggling the rendered check boxes.

Markdown

Further information

- <https://docs.gitlab.com/ce/user/markdown.html>
- www.markdowntutorial.com



Quick actions

- Textual shortcuts for common actions on issues, epics, merge requests, and commits.
- Each command should be on a separate line in order to be properly detected and executed.
- Once executed, the commands are removed from the text body.

https://docs.gitlab.com/ce/user/project/quick_actions.html

Time tracking

Allows you to track estimates and time spent on issues within GitLab.

- To enter an estimate: `/estimate 11w 6dh 7h`.
- To enter a time spent: `/spend 5wd 3h 2h`.

The screenshot shows the 'Time tracking' section for Milestone 8.11. It features a progress bar where the blue segment represents 'Spent 5w 3d 2h' and the grey segment represents 'Estimated 11w 6d 7h'. A tooltip above the bar indicates '6w 3d 5h remaining'. Below the bar, there are fields for 'Due date' (currently 'No due date') and an 'Edit' link.

Milestone	Edit
8.11	
Time tracking	
6w 3d 5h remaining	
Spent 5w 3d 2h	Estimated 11w 6d 7h
Due date	Edit
No due date	

https://docs.gitlab.com/ce/workflow/time_tracking.html

Crosslinking issues

You can mention an issue in your commit message:

```
git commit -m "this is my commit message. Ref #xxx"
```

You're creating a relationship between the the issue itself and the commit related to that issue.

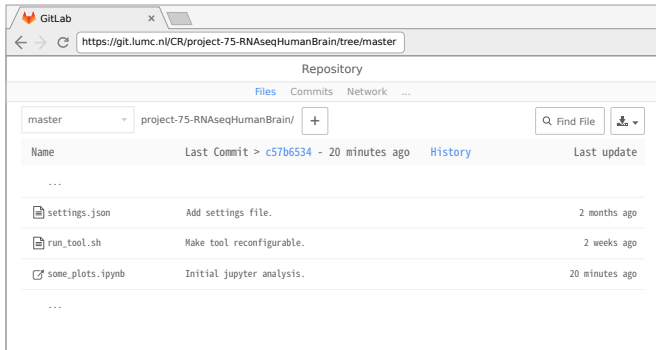
You can also use this in other issues.

```
https://docs.gitlab.com/ce/user/project/issues/crosslinking\_issues.html
```


GitLab jupyter notebook extension

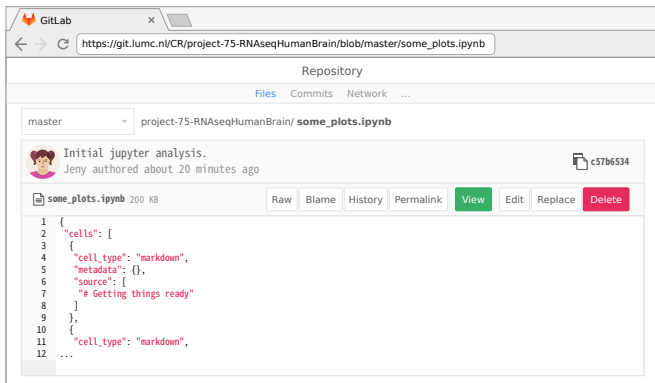
View rendered IPython (Jupyter) notebooks in GitLab.

Example: jupyter notebook



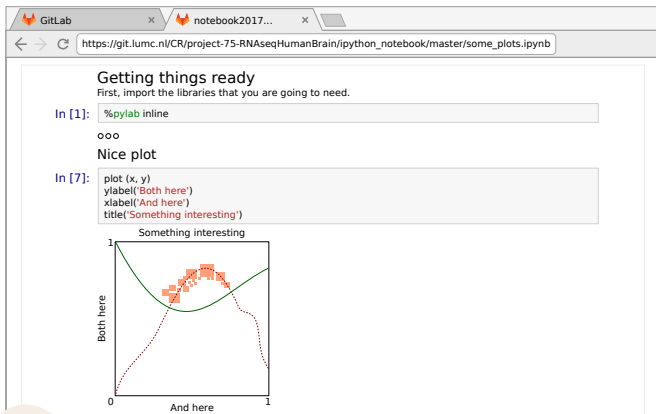
Looks for Jupyter notebook file.

Example: jupyter notebook file text view



Views the jupyter file in text mode.

Example: jupyter notebook rendered view

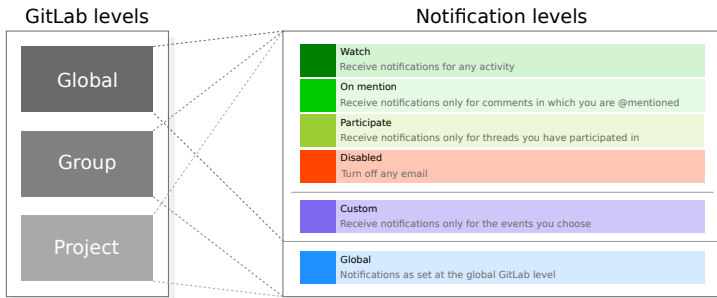


Jeny

Views the actual notebook.

GitLab Notifications

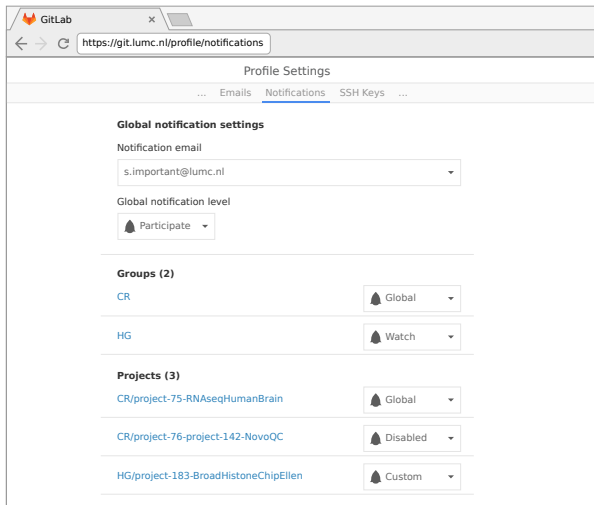
GitLab notifies a user when important events occur.



By default, all projects and groups will use the global notifications setting.

More information here [here](#).

GitLab Notifications Settings



The screenshot shows the GitLab web interface for a user's profile settings, specifically the 'Notifications' tab. The browser address bar shows the URL 'https://git.lumc.nl/profile/notifications'. The page title is 'Profile Settings'. Below the title, there are tabs for 'Emails', 'Notifications' (which is selected), and 'SSH Keys'. The 'Global notification settings' section includes a 'Notification email' dropdown menu set to 's.important@lumc.nl' and a 'Global notification level' dropdown menu set to 'Participate'. Below this, there are two sections: 'Groups (2)' and 'Projects (3)'. Each section lists items with their notification level set to 'Global', 'Watch', or 'Disabled'.

Section	Item	Notification Level
Groups (2)	CR	Global
	HG	Watch
Projects (3)	CR/project-75-RNAseqHumanBrain	Global
	CR/project-76-project-142-NovoQC	Disabled
	HG/project-183-BroadHistoneChipEllen	Custom

Project permissions

Action	Guest	Reporter	Developer	Maintainer	Owner
Create new issue	✓	✓	✓	✓	✓
Leave comments	✓	✓	✓	✓	✓
View wiki pages	✓	✓	✓	✓	✓
Pull project code		✓	✓	✓	✓
Download project		✓	✓	✓	✓
Label issues		✓	✓	✓	✓
Manage labels		✓	✓	✓	✓
Write a wiki			✓	✓	✓
Create/edit/delete project milestones			✓	✓	✓
Add new team members				✓	✓
Edit project				✓	✓
Switch visibility level					✓
Transfer project to another namespace					✓
Remove project					✓

Check the entire list [here](#). On public and internal projects the Guest role is not enforced. GitLab administrators receive all permissions.

Group permissions

Action	Guest	Reporter	Developer	Maintainer	Owner
Browse group	✓	✓	✓	✓	✓
Edit group					✓
Create subgroup					✓
Create project in group				✓	✓
Manage group members					✓
Remove group					✓
Manage group labels		✓	✓	✓	✓
Create/edit/delete group milestones			✓	✓	✓

If a user is both in a group's project and the project itself, the highest permission level is used.

Dealing with binary files

What are binary files?

Dealing with binary files

What are binary files?

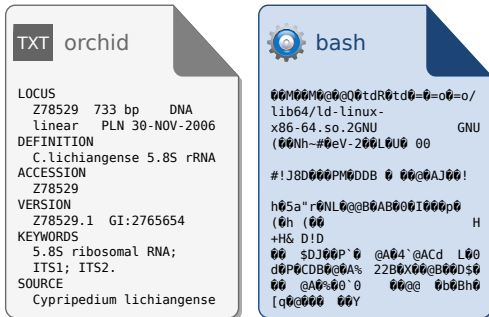
A binary file is a computer file that is not a text file. — Wikipedia

Dealing with binary files

What are binary files?

A binary file is a computer file that is not a text file. — Wikipedia

Common binary files: images, videos, archives, executables, etc.

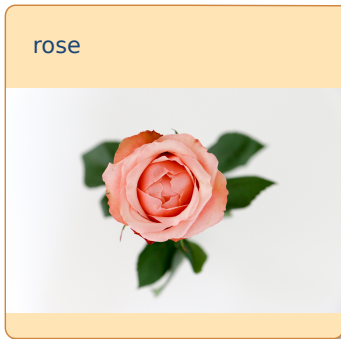
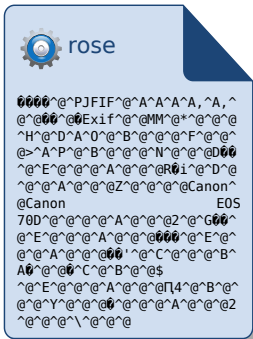


Dealing with binary files

What are binary files?

A binary file is a computer file that is not a text file. — Wikipedia

Common binary files: images, videos, archives, executables, etc.



Dealing with binary files

Storing binaries in repositories is considered bad practice, but ... sometimes unavoidable.

Good to know:

- Git shines for text files, but is not the best VCS for pictures.
- You won't be able to see differences between commits.
- Negative effect on disk space.
- You could only store *source* images, e.g., SVGs.

Dealing with large files

git-annex allows managing large files with git.

- Without checking the file contents into git.
- Only the tree hierarchy is tracked by git.
- To get the content of the file, a special step is necessary.



Instant messaging



`https://mattermost.lumc.nl/`

Extras

Follow up course

Code and data management with Git

- More advanced topics on version control.



Other Courses

- [Practical Linux](https://git.lumc.nl/courses/practical-linux-course)
<https://git.lumc.nl/courses/practical-linux-course>
- [Introduction to the Shark Cluster](https://git.lumc.nl/shark/SHARK/wikis/home)
<https://git.lumc.nl/shark/SHARK/wikis/home>
- [Code and Data Management with Git](https://git.lumc.nl/courses/gitcourse)
<https://git.lumc.nl/courses/gitcourse>
- [Scripting for Life Science Researchers](https://git.lumc.nl/courses/scriptingcourse)
<https://git.lumc.nl/courses/scriptingcourse>
- [Python Programming](https://git.lumc.nl/courses/programming-course)
<https://git.lumc.nl/courses/programming-course>

Acknowledgements

Jeroen Laros
Jonathan Vis
Guy Allard

<https://git.lumc.nl/mlefter/gitlab-intro-course/>