

Organizing your data and software with a reproducible project workflow

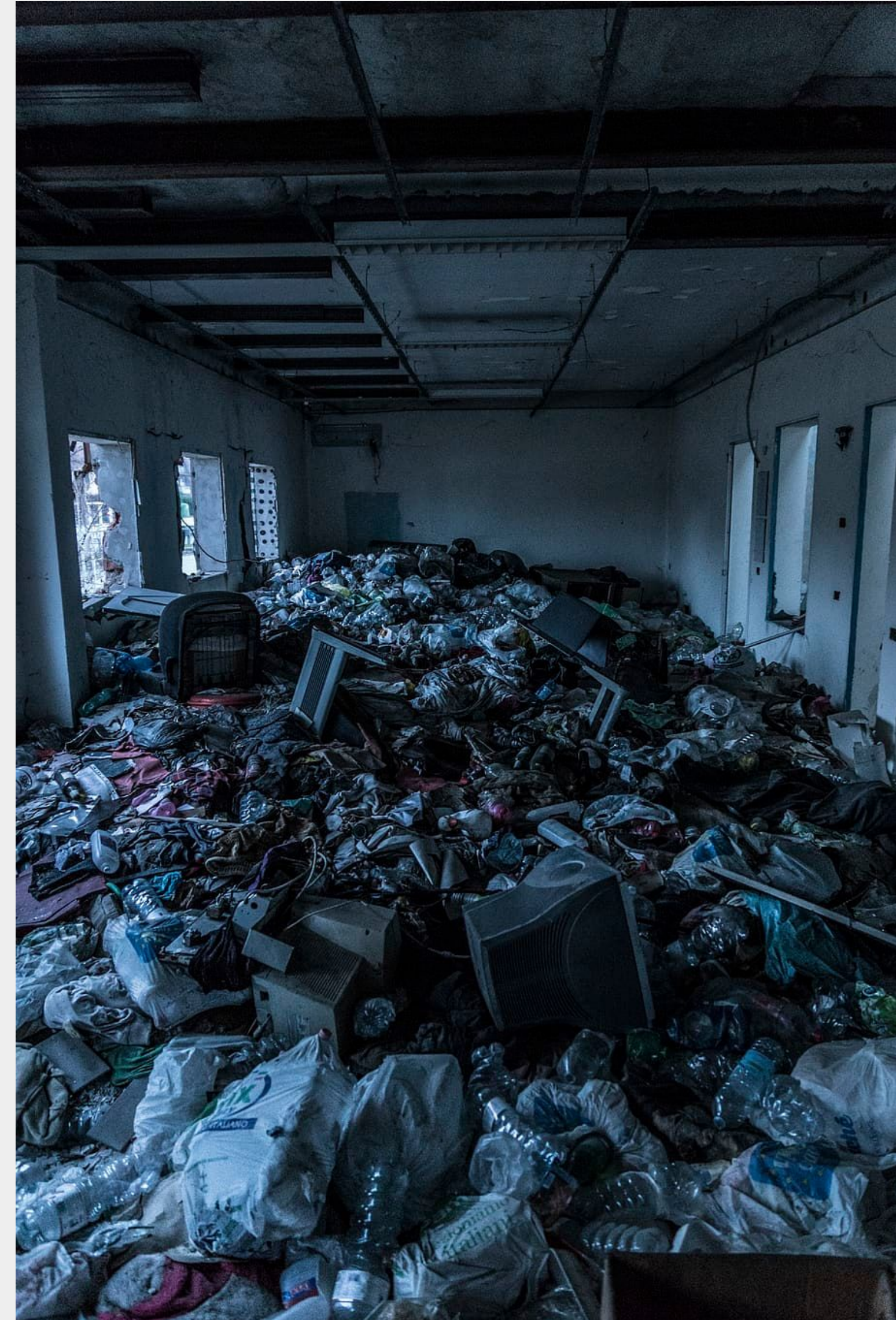
DCC Spring Training Days 2024
April 25th 2024

Renate Mattiszk, Saxion UAS
Meron Vermaas, VU
Stephanie van de Sandt, VU

What does your living room look like?



Forgemind ArchiMedia / CC BY 2.0 / Flickr



<https://www.wallpaperflare.com/garbage-inside-a-room-abandoned-abandoned-building-decay-dirty-wallpaper-arqkg>

How is your Desktop organized?

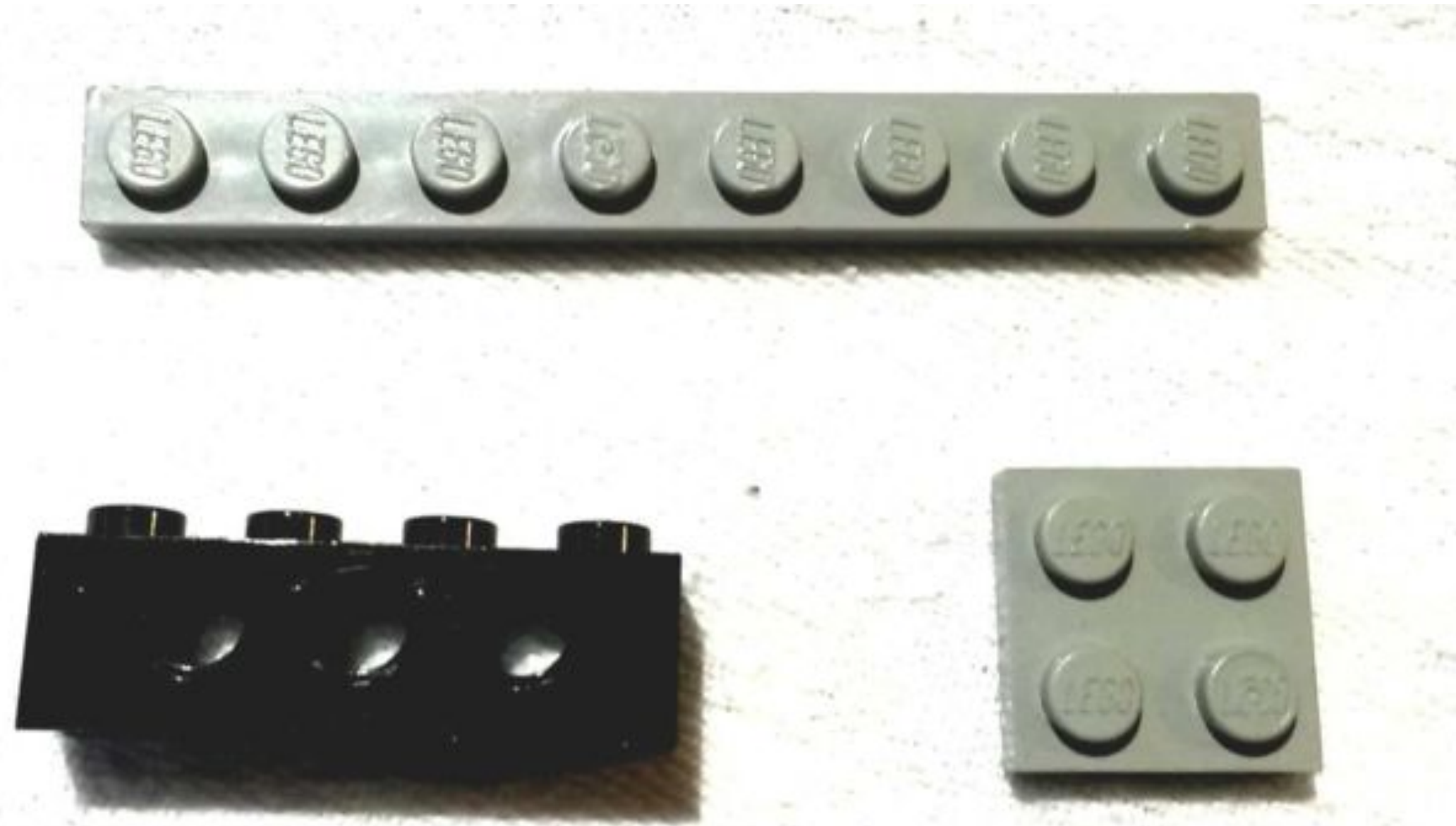


Anastasia Shuraeva: A White Wooden Closet of a Woman.
Pexels



Ron Lach: Photo of an Untidy and Messy White Wooden Closet. Pexels

How many research data / software files do you have?



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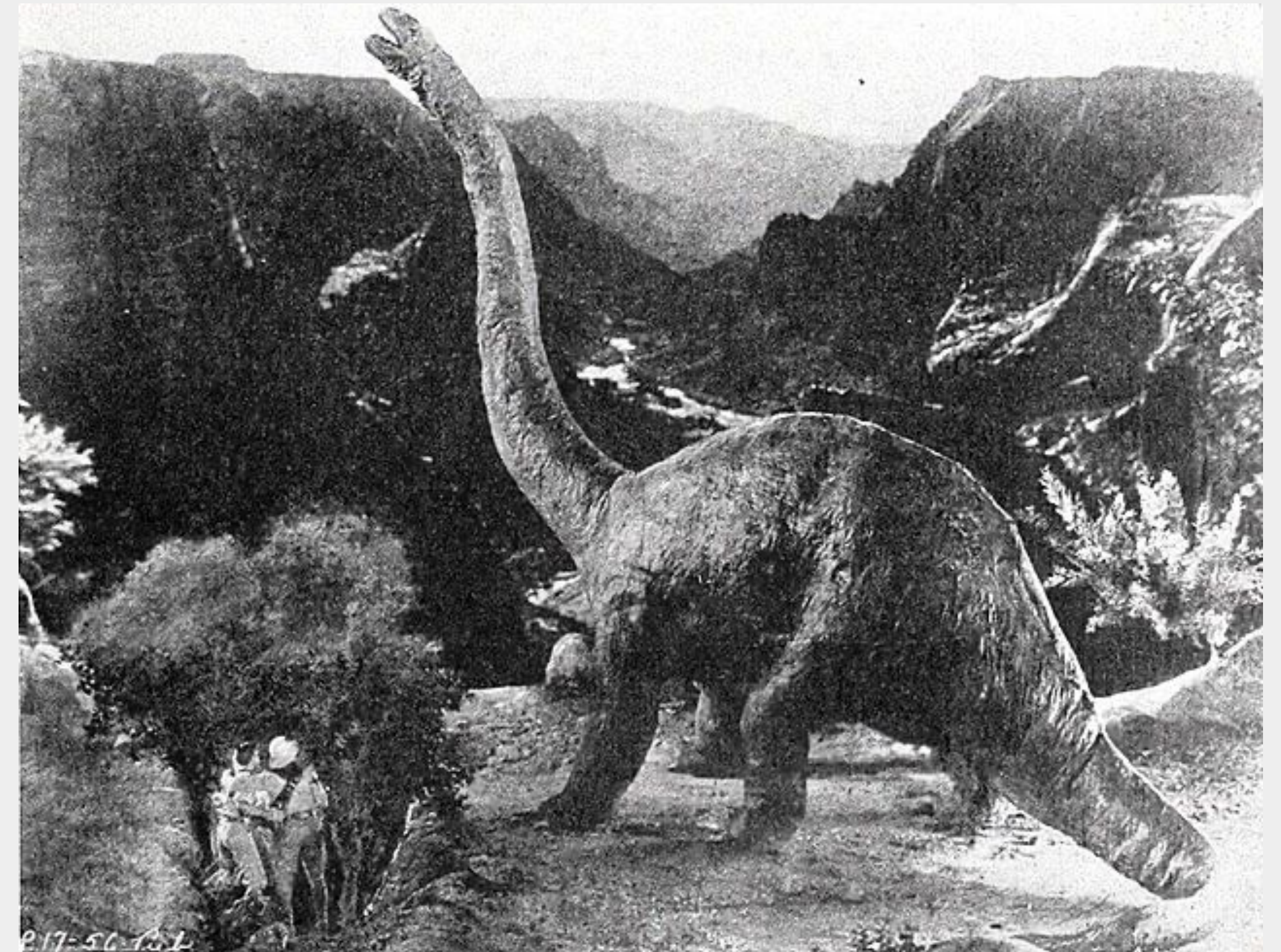


This image was originally posted to Flickr by pasukaru76 at <https://www.flickr.com/photos/38451115@N04/9824401426>

Do you know where the data from your first work is located right now?



Tuxyso / Wikimedia Commons / CC-BY-SA-4.0



This work is in the public domain.

Planning our Workshop

How we will run the workshop today with you

<https://edu.nl/h89dk>



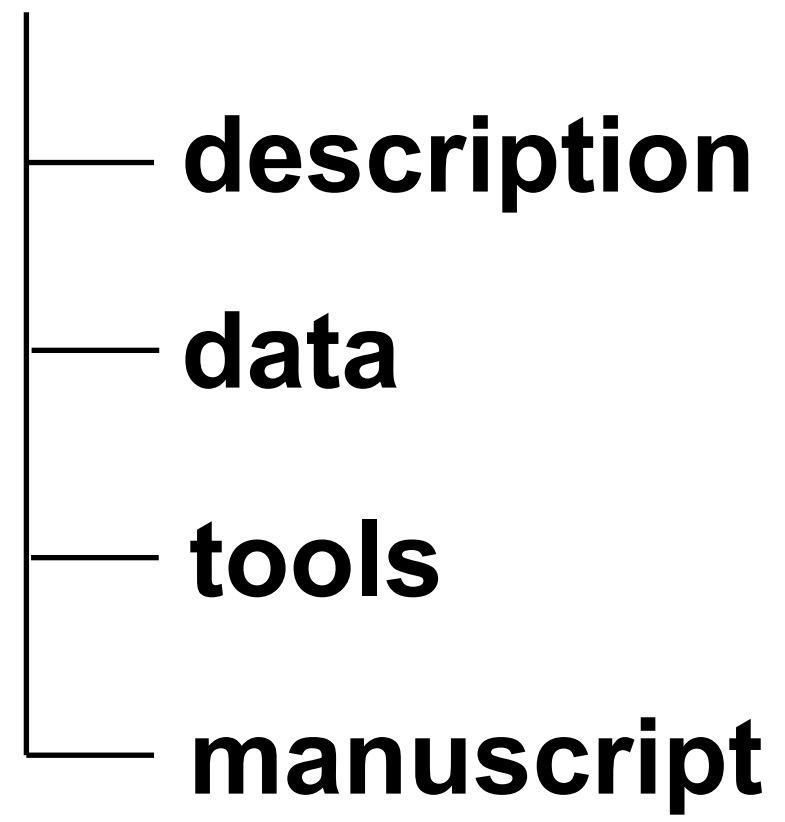
PRESENT

Organizing and structuring a project

1. Save your project in a single folder.



my_project

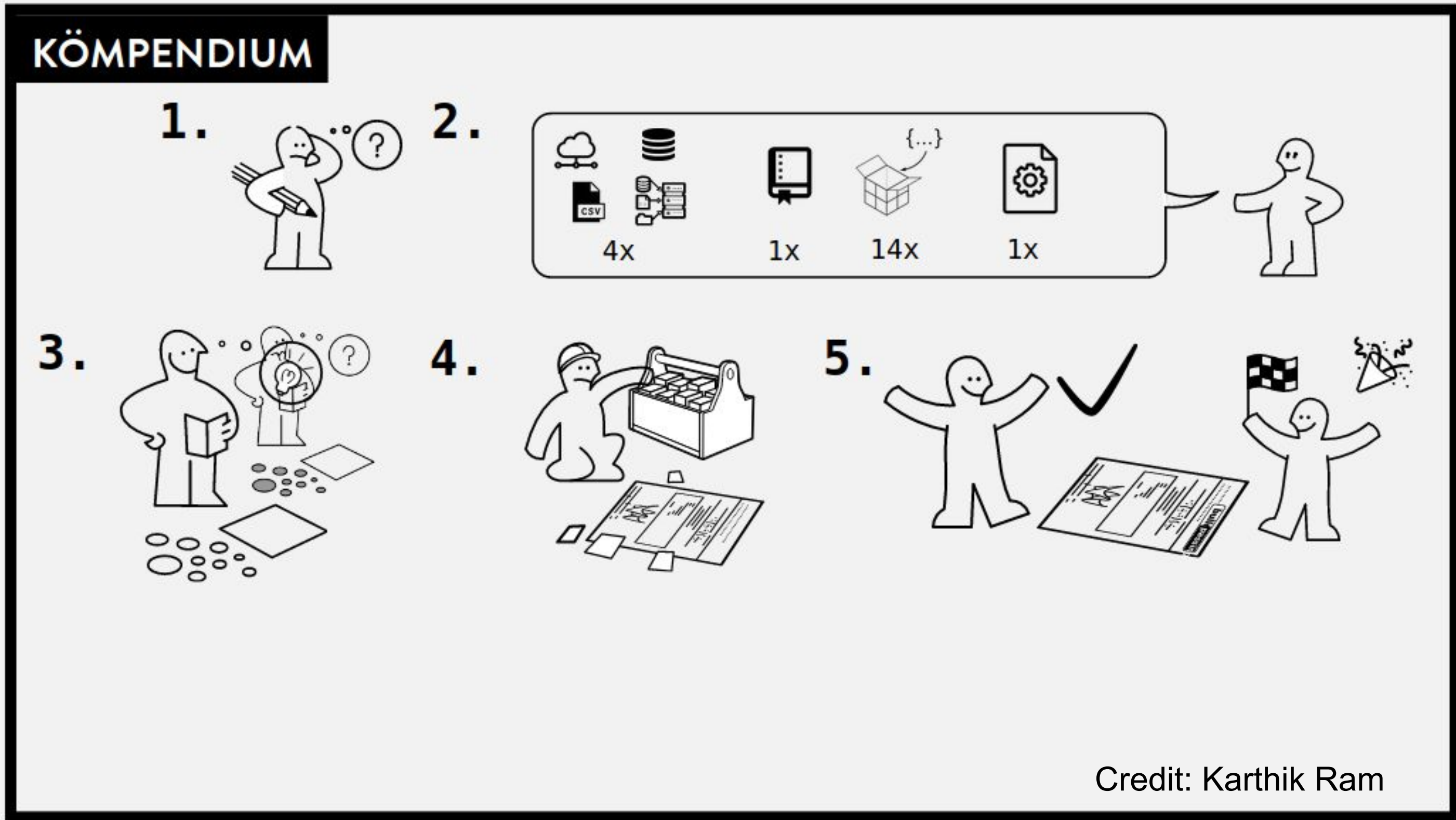


description

data

tools

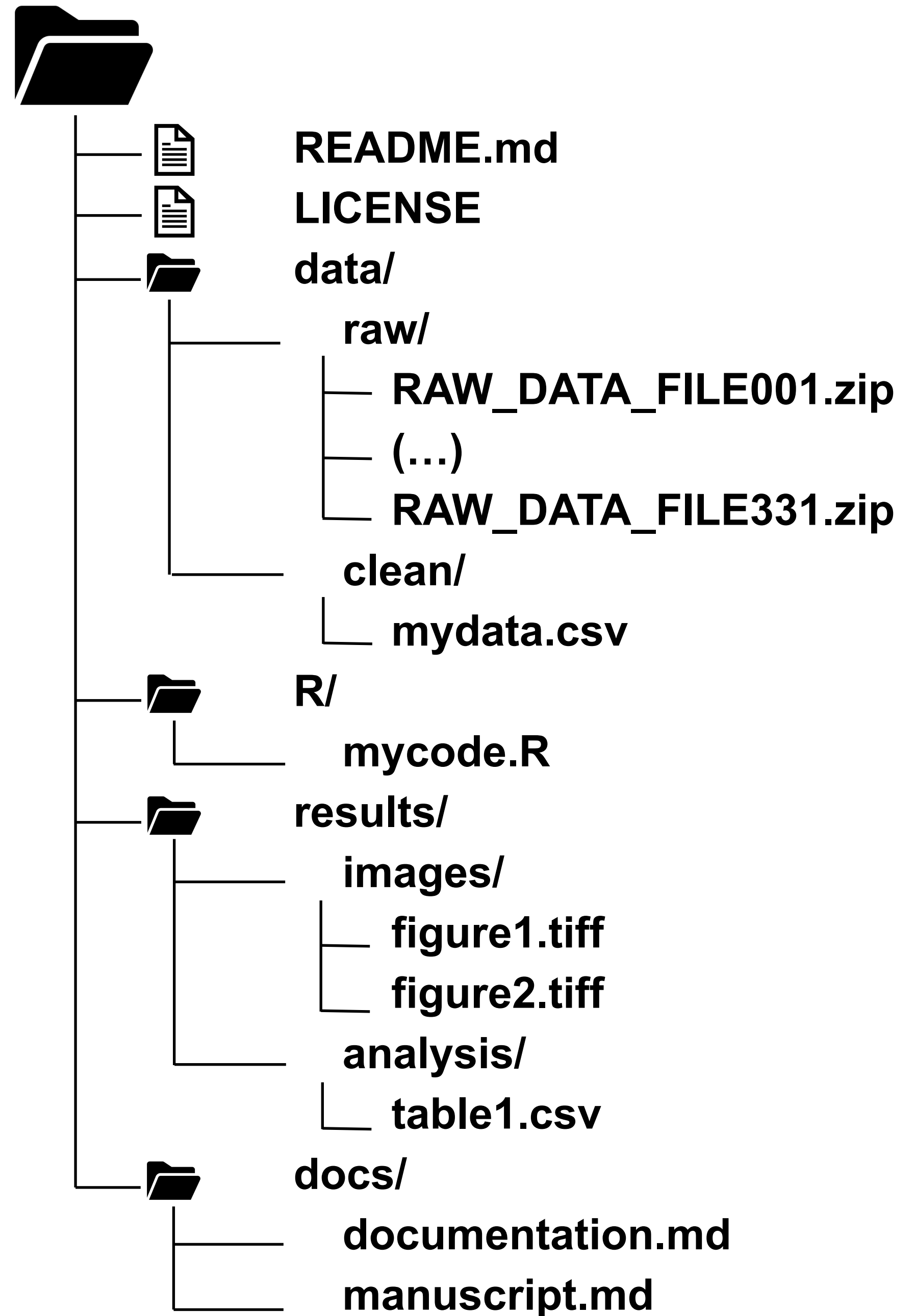
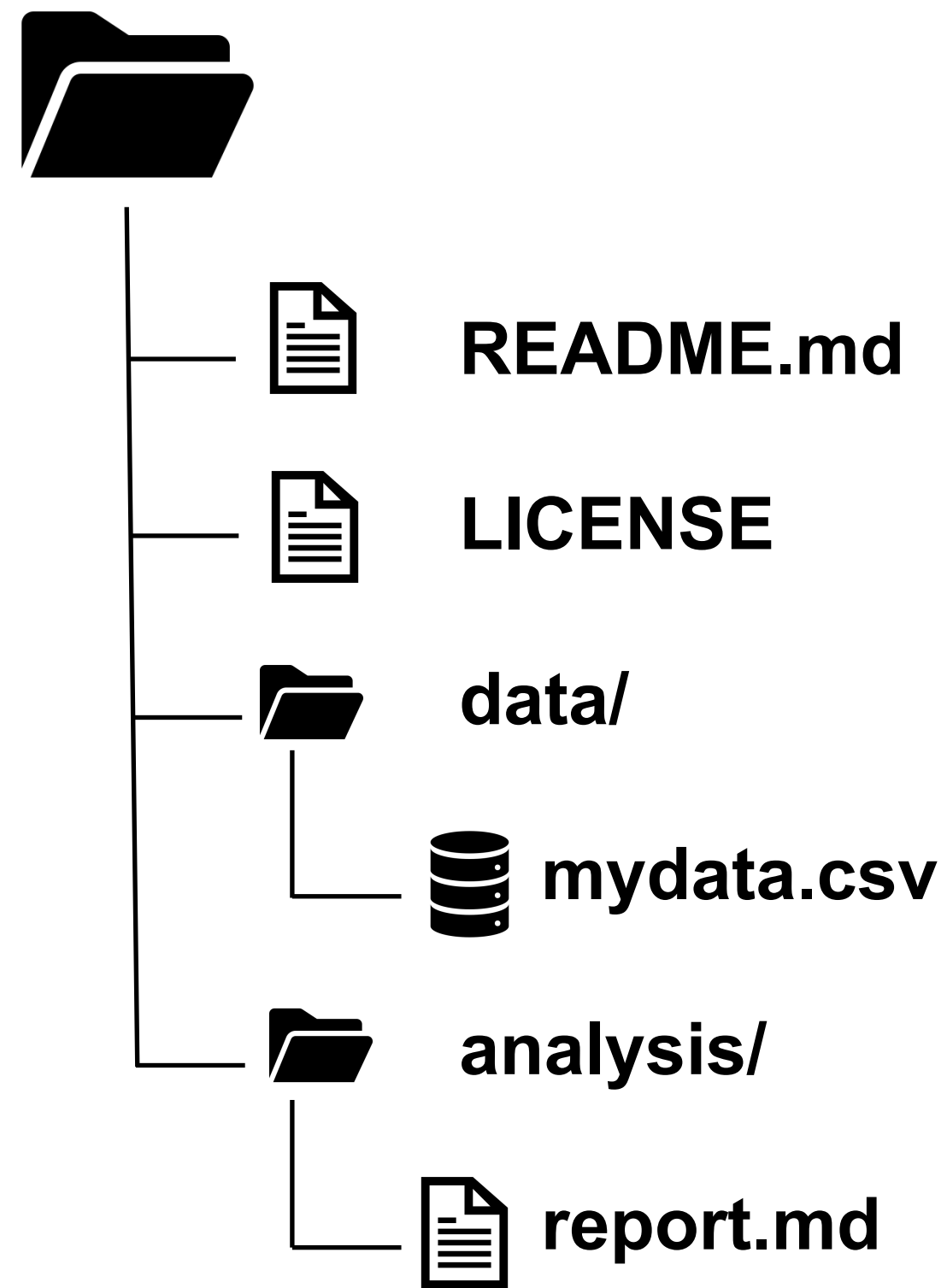
manuscript

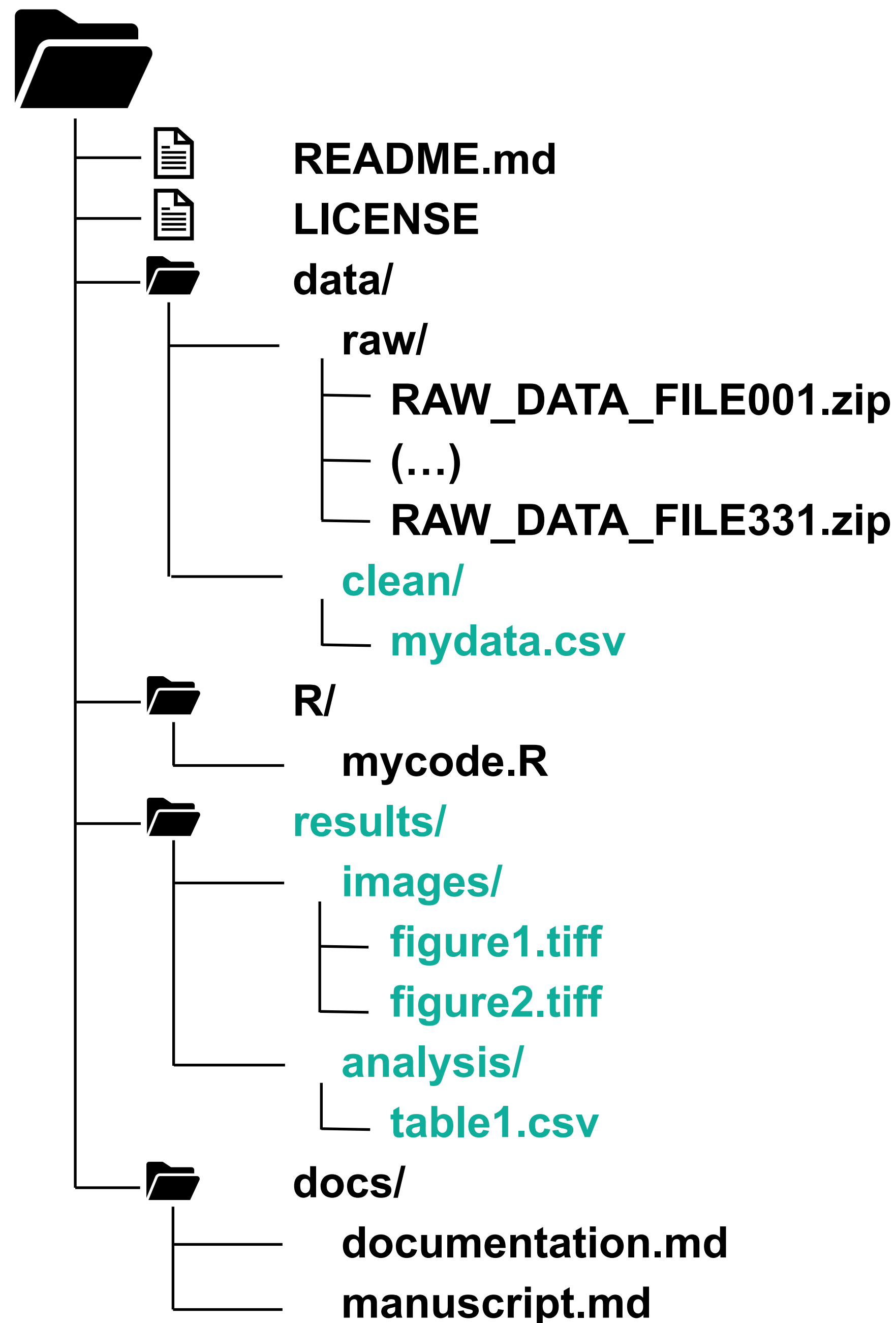
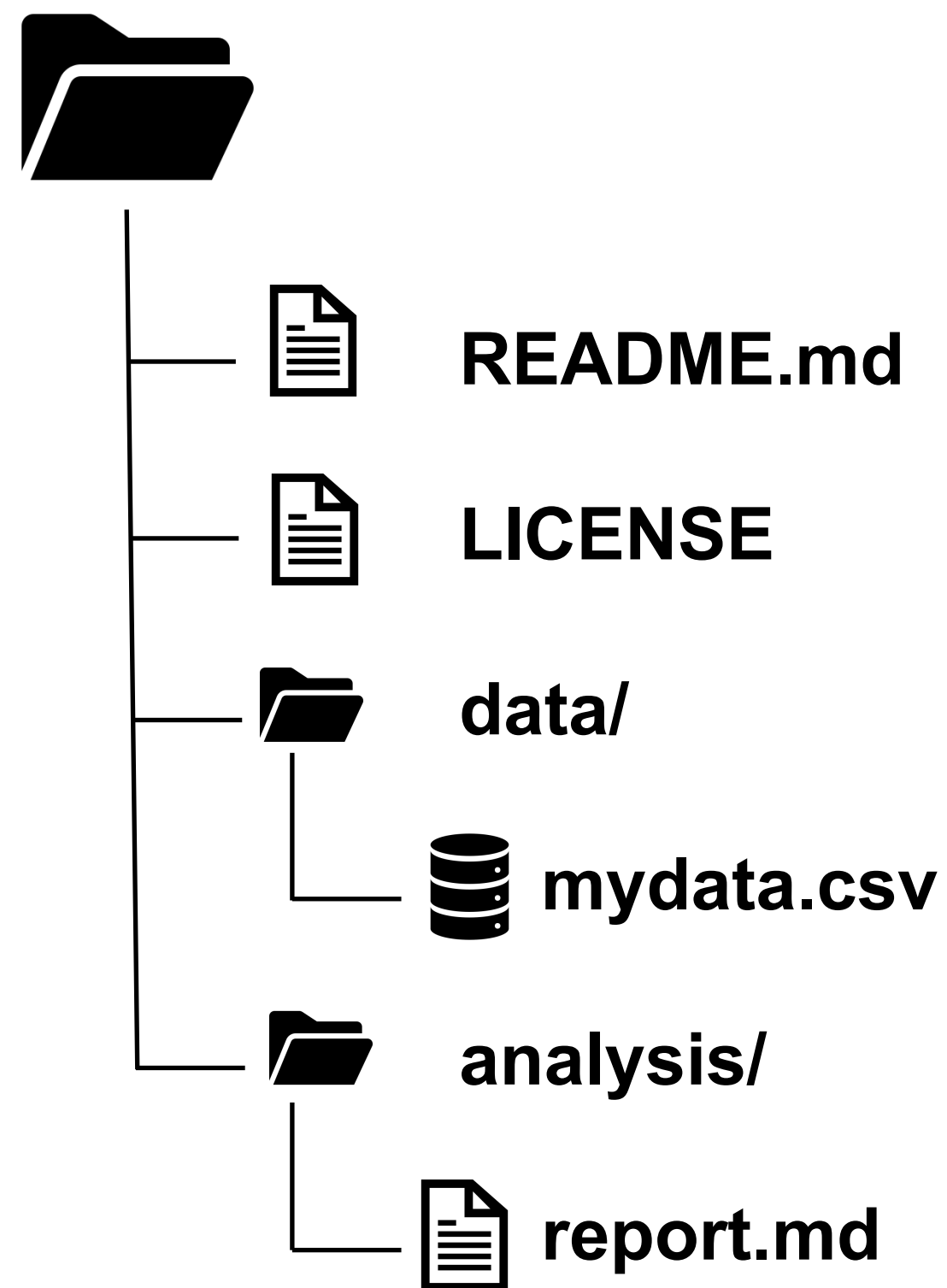


Credit: Scriberia for The Turing Way

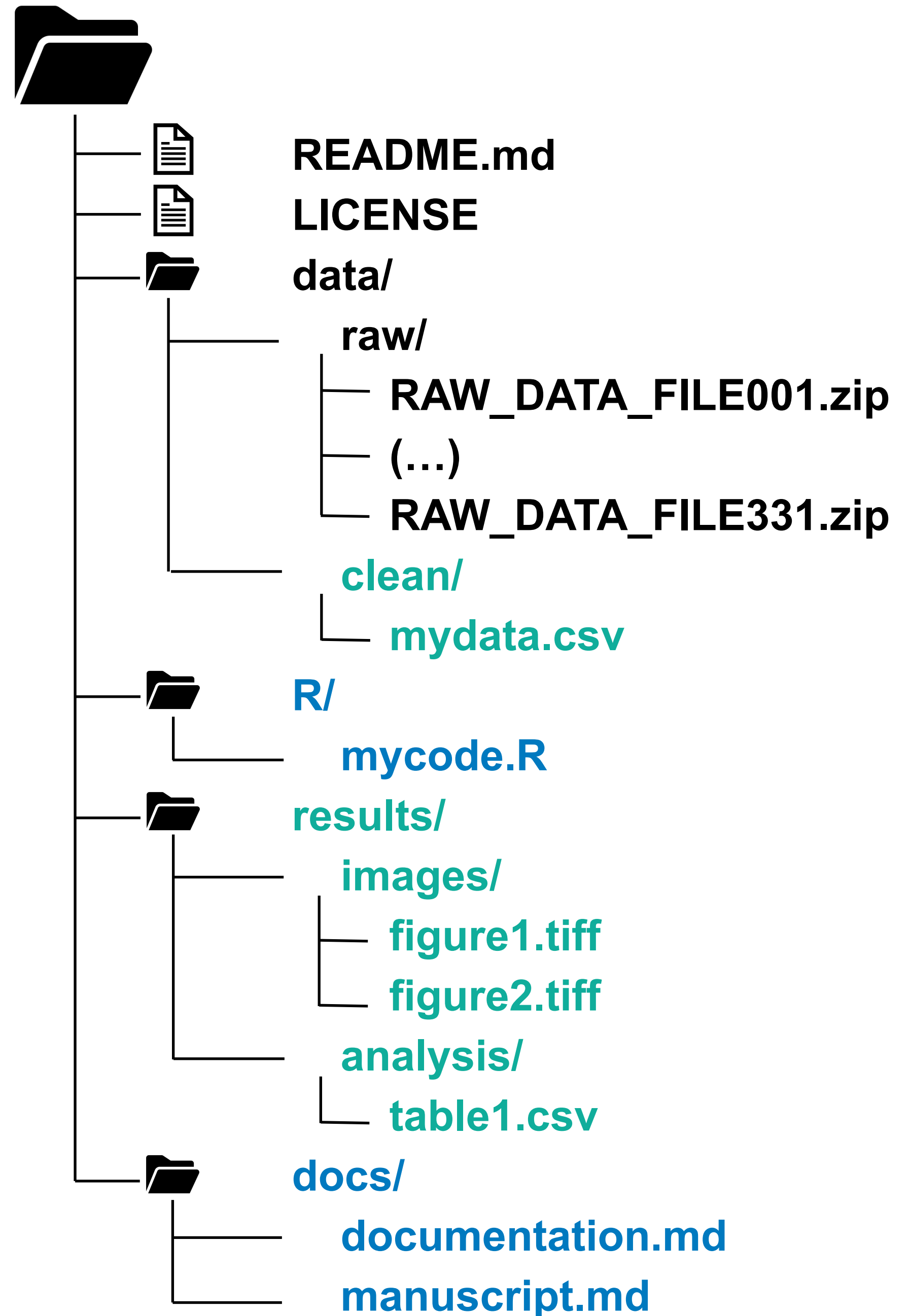
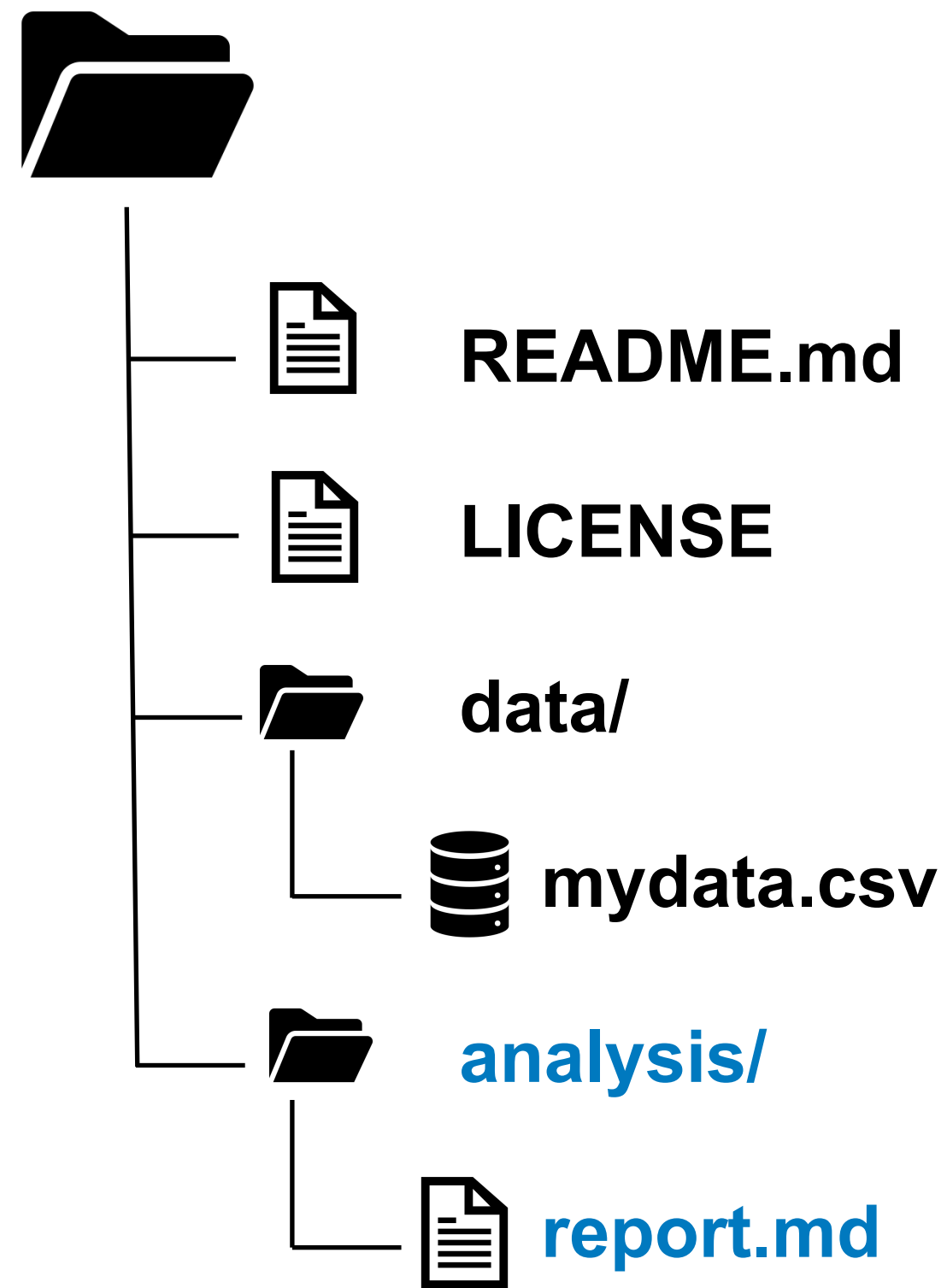
Credit: Karthik Ram

2. Devise a logical system of sub-folders.

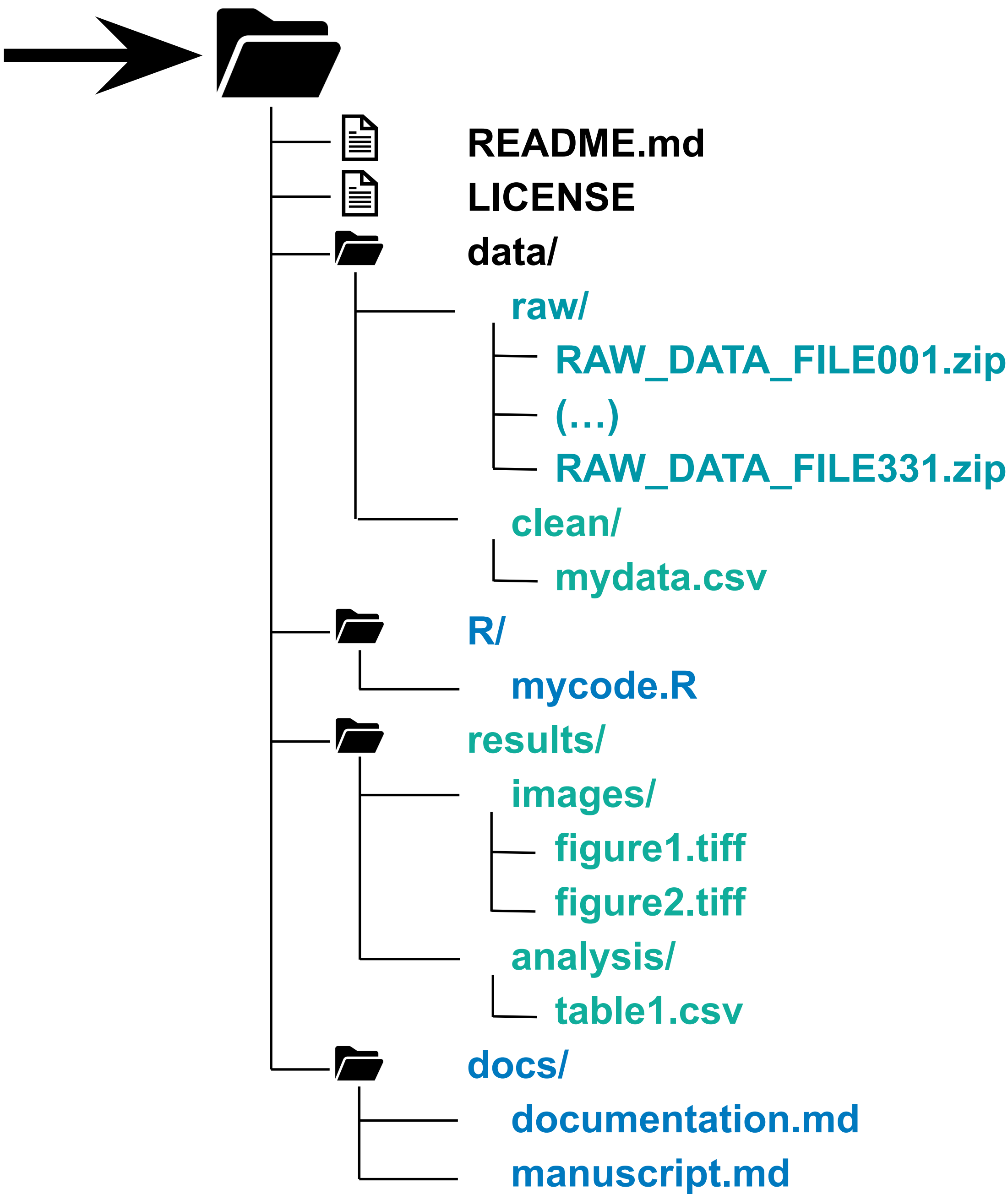
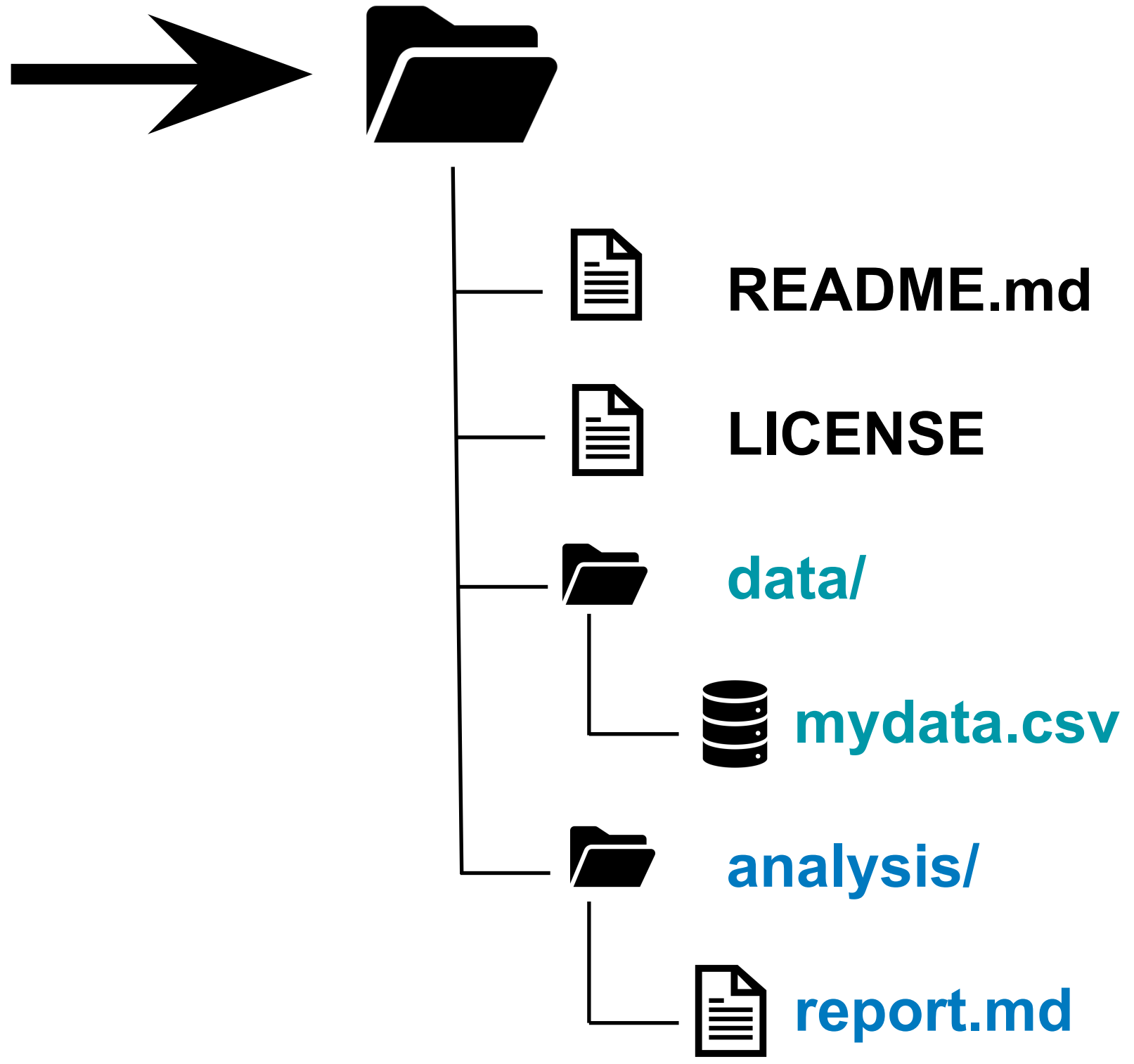




Automatically
generated
Human written
Read-only



Automatically generated
Human written
Read-only



Automatically generated
Human written
Read-only



(CC0

)

3. Introduce the project (or sub-folder) in a README.

- **What** is the project about?
- **Who** are involved?
- **How** was the data collected?
- **When & where** is the research conducted?

Other inspiration...

- Abbreviations
- Folder structure
- File explanations
- References & links

4. Use interoperable file types.

	A	B	C
1	Letter	Number	
2	A	124	
3	B	125	
4	C	126	
5	A	127	
6	B	128	
7	C	129	
8	A	130	
9	B	131	
10	C	132	
11	A	133	

Bestandsnaam: datafile_1.xlsx

Opslaan als: CSV UTF-8 (door komma's gescheiden) (*.csv)

```
Letter;Number
A;124
B;125
C;126
A;127
B;128
C;129
A;130
B;131
C;132
A;133
D;124
E;4005
```

5. Use descriptive and logical file names.

File names should be

- Machine readable
- Human readable
- Logically sortable

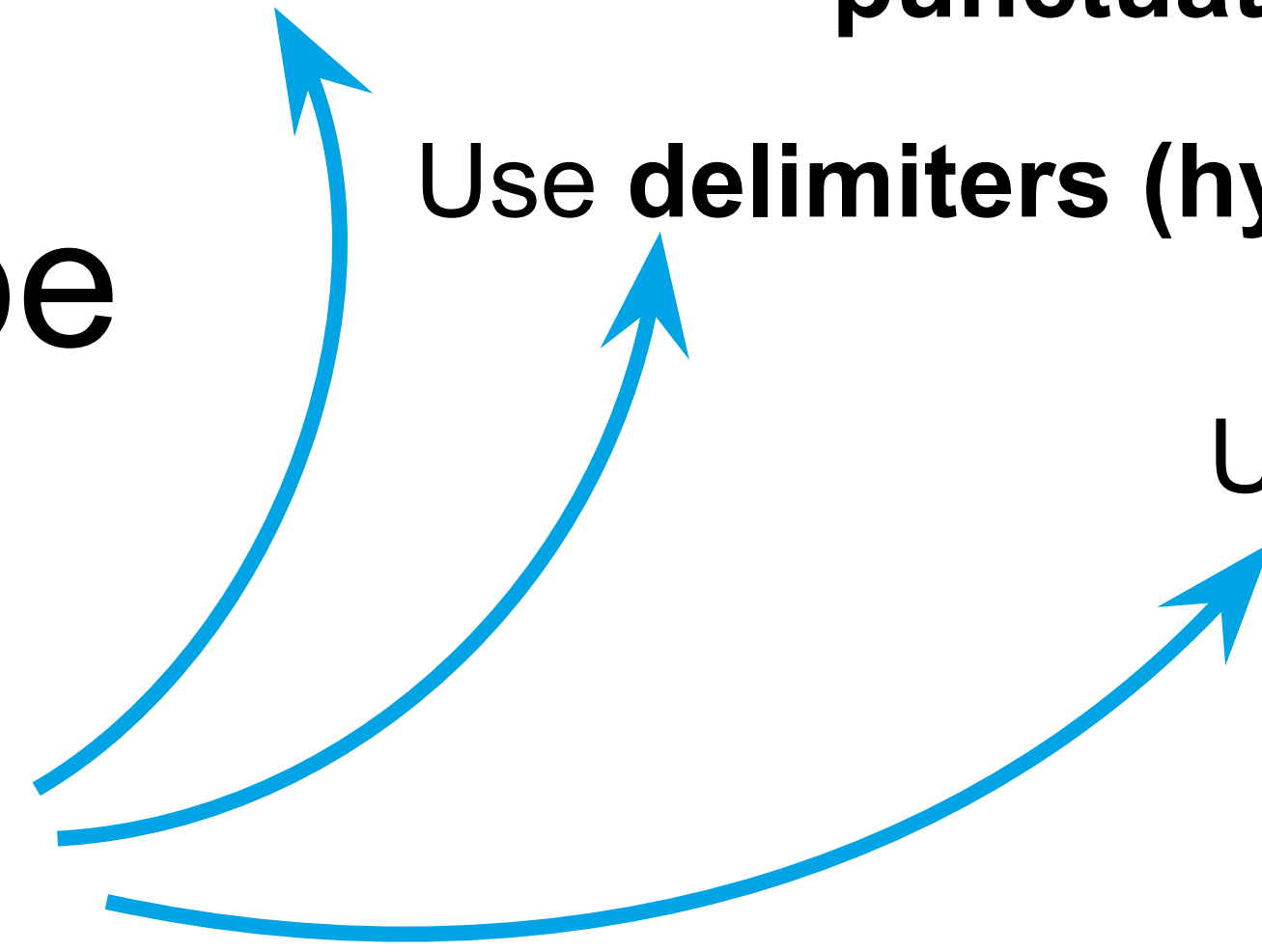
File names should be

- Machine readable
- Human readable
- Logically sortable

Avoid **spaces, accents, odd punctuation...**

Use **delimiters (hyphens, underscores)** for easy separation of elements

Use **informative elements** so that files can be easily found



in that case...

(underscores)
SCREAMING_SNAKE_CASE
(UPPER_SNAKE)

first word lower
capitalize all following words
camelCase

(dash)
kebab-case
(words-on-a-skewer)

(underscore)
snake_case
(lower_snake)

see also: UpperCamel
aka PascalCase

Which set of file(name)s do you want at 3 AM before a deadline?

File names should be













- Machine readable
- Human readable
- Logically sortable

Use informative elements

01_marshall-data.md	01.md
01_marshall-data.r	01.r
02_pre-dea-filtering.md	02.md
02_pre-dea-filtering.r	02.r
03_dea-with-limma-voom.md	03.md
03_dea-with-limma-voom.r	03.r
04_explore-dea-results.md	04.md
04_explore-dea-results.r	04.r
90_limma-model-term-name-fiasco.md	90.md
90_limma-model-term-name-fiasco.r	90.r
Makefile	Makefile
figure	figure
helper01_load-counts.r	helper01.r
helper02_load-exp-des.r	helper02.r
helper03_load-focus-statinf.r	helper03.r
helper04_extract-and-tidy.r	helper04.r
tmp.txt	tmp.txt

File names should be

- Machine readable
- Human readable
- Logically sortable

Name
 LEICA_Dmelanogaster_dpp-RNAi_20200822_03.zip
 LEICA_Dmelanogaster_dpp-RNAi_20200822_02.zip
 LEICA_Dmelanogaster_dpp-RNAi_20200822_01.zip
 LEICA_Dmelanogaster_dpp-RNAi_20200815_04.zip
 LEICA_Dmelanogaster_dpp-RNAi_20200815_03.zip
 LEICA_Dmelanogaster_dpp-RNAi_20200815_02.zip
 LEICA_Dmelanogaster_dpp-RNAi_20200815_01.zip
 LEICA_Dmelanogaster_ctrl_20200823_02.zip
 LEICA_Dmelanogaster_ctrl_20200823_01.zip
 LEICA_Dmelanogaster_ctrl_20200815_03.zip
 LEICA_Dmelanogaster_ctrl_20200815_02.zip
 LEICA_Dmelanogaster_ctrl_20200815_01.zip



6. Make your data tidy.

“**TIDY DATA** is a standard way of mapping the meaning of a dataset to its structure.”

—HADLEY WICKHAM

In tidy data:

- each variable forms a column
- each observation forms a row
- each cell is a single measurement

each column a variable



id	name	color
1	floof	gray
2	max	black
3	cat	orange
4	donut	gray
5	merlin	black
6	panda	calico

each row an observation

Wickham, H. (2014). Tidy Data. Journal of Statistical Software 59 (10). DOI: 10.18637/jss.v059.i10

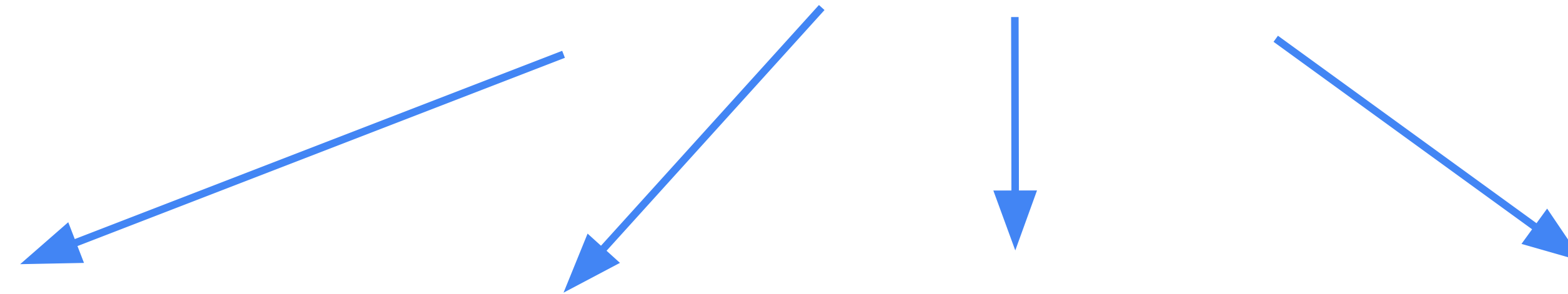
An example of untidy data: Weather measurements

sensor_id	Temp day 1	Sun day 1	Temp day 2	Sun day 2
NY_01	26	189	25	594
Amst_01	12	2,8	16	0,7
NY_02	30	254	15	5

An example of untidy data: Weather measurements

Sensor_id	Temp day 1	Sun day 1	Temp day 2	Sun day 2
NY_01	26	189	25	594
Amst_01	12	2,8	16	0,7
NY_02	30	254	15	5

Values in column names



Sensor_id	Temp day 1	Sun day 1	Temp day 2	Sun day 2
NY_01	26	189	25	594
Amst_01	12	2,8	16	0,7
NY_02	30	254	15	5

Multiple observations in a single row

Sensor_id	Temp day 1	Sun day 1	Temp day 2	Sun day 2
NY_01	26	189	25	594
Amst_01	12	2,8	16	0,7
NY_02	30	254	15	5

Same data, now in a tidy format

Readme:
Temp = Celsius
Sun = minutes of
sunshine/day

Sensor_id	Element	Day	Measurements
Amst_01	Temp	1	12
Amst_01	Sun	1	168
Amst_01	Temp	2	16
Amst_01	Sun	2	42
NY_01	Temp	1	-3
NY_01	Sun	1	189
NY_01	Temp	2	-4
NY_01	Sun	2	594
NY_02	Temp	1	-1
NY_02	Sun	1	254
NY_02	Temp	2	15
NY_02	Sun	2	300

Same data, now in a tidy format

Readme:
Temp = Celsius
Sun = minutes of
sunshine/day

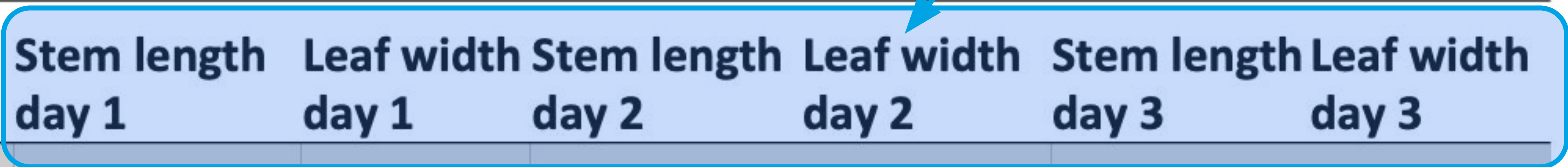
sensor_id	Day	Temp	Sun
Amst_01	1	12	168
Amst_01	2	16	42
NY_01	1	-3	189
NY_01	2	-4	594
NY_02	1	-1	254
NY_02	2	15	300

An example of untidy data: plant measurements

Plant_no	Treatment	Stem length day 1	Leaf width day 1	Stem length day 2	Leaf width day 2	Stem length day 3	Leaf width day 3
A1_14	control	120	21	122	23	124	25
A1_18	control	132	23	135	25	138	27
A1_21	control	131	18	133	20	135	21
A2_09	UV	109	29	114	31	115	31
A3_02	UV	125	25	127	27	129	28
A3_10	UV	130	12	133	14	136	16

An example of untidy data: plant measurements

Values in column names



Plant_no	Treatment	Stem length day 1	Leaf width day 1	Stem length day 2	Leaf width day 2	Stem length day 3	Leaf width day 3
A1_14	control	120	21	122	23	124	25
A1_18	control	132	23	135	25	138	27
A1_21	control	131	18	133	20	135	21
A2_09	UV	109	29	114	31	115	31
A3_02	UV	125	25	127	27	129	28
A3_10	UV	130	12	133	14	136	16

An example of untidy data: plant measurements

Multiple observations in a single

row

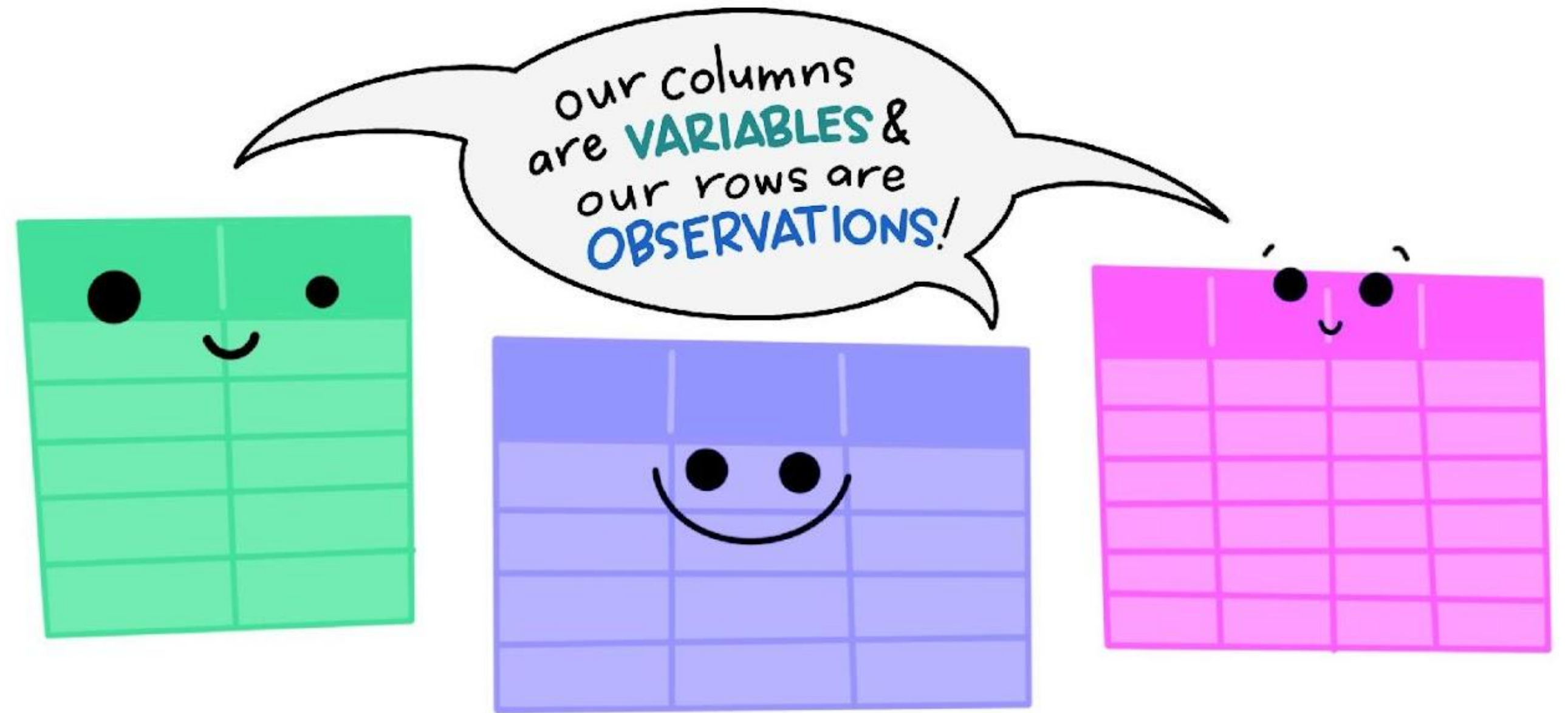
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A1_18	control	132	23	135	25	138	27
A1_21	control	131	18	133	20	135	21
A2_09	UV	109	29	114	31	115	31
A3_02	UV	125	25	127	27	129	28
A3_10	UV	130	12	133	14	136	16

Same data, now in a tidy format

Plant_no	Treatment	Element	Day	Measurement
A1_14	control	Stem length	1	120
A1_14	control	Leaf width	1	21
A1_14	control	Stem length	2	122
A1_14	control	Leaf width	2	23
A1_14	control	Stem length	3	124
A1_14	control	Leaf width	3	25
A1_18	control	Stem length	1	132
A1_18	control	Leaf width	1	23
A1_18	control	Stem length	2	135
A1_18	control	Leaf width	2	25
A1_18	control	Stem length	3	138
A1_18	control	Leaf width	3	27
A1_21	control	Stem length	1	131

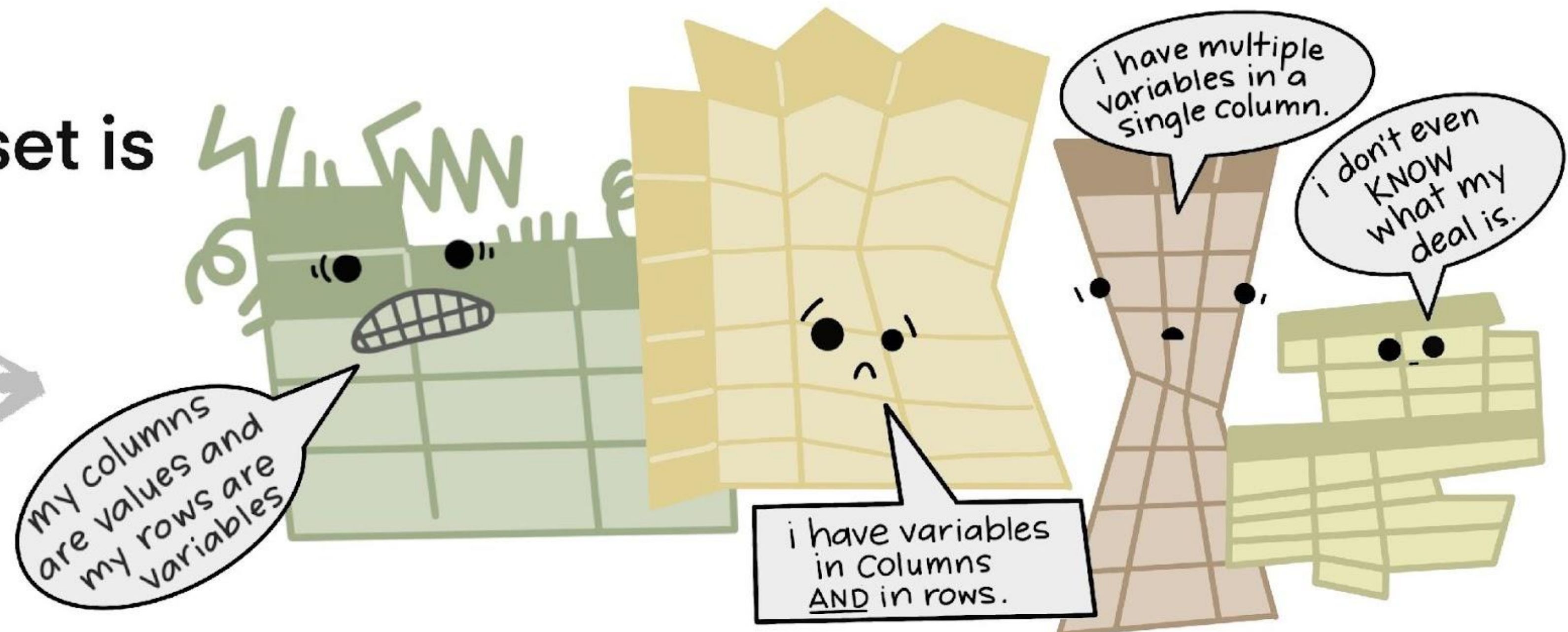
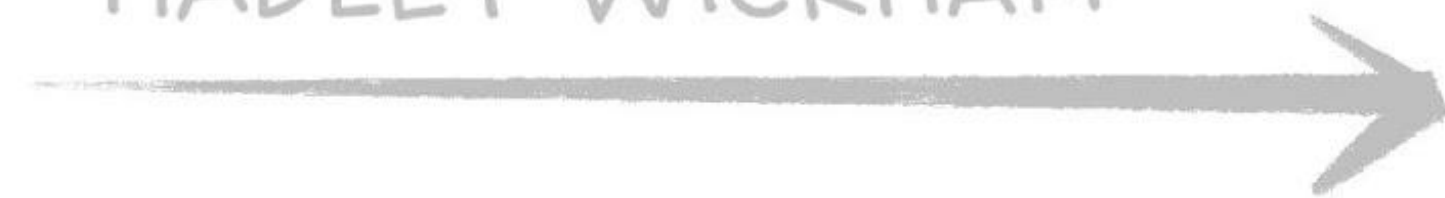
+ 23 more rows

The standard structure of tidy data means that "tidy datasets are all alike..."



"...but every messy dataset is messy in its own way."

-HADLEY WICKHAM



1. Save your project in a single folder
2. Devise a logical system of sub-folders
3. Introduce the project in a README
4. Use interoperable file types
5. Use descriptive and logical file names
6. Make your data tidy

Exercise Present:

<https://dcc-training-lab.github.io/project-management/lessons/present.html#exercise>

A photograph of a vintage computer room. In the foreground, a woman with short brown hair, wearing a light-colored jacket, is seated at a desk, looking down at a large sheet of paper. She is using a beige desktop computer with a monitor and keyboard. The monitor displays the number '21'. In the background, several other people are seated at similar computer workstations, some looking at their screens. The room has a wooden floor and a plain wall. The overall atmosphere is that of a busy, early computer lab.

PAST

Recording project history

Organise versions

“notFinal.doc” by Jorge Cham,
<https://www.phdcomics.com>



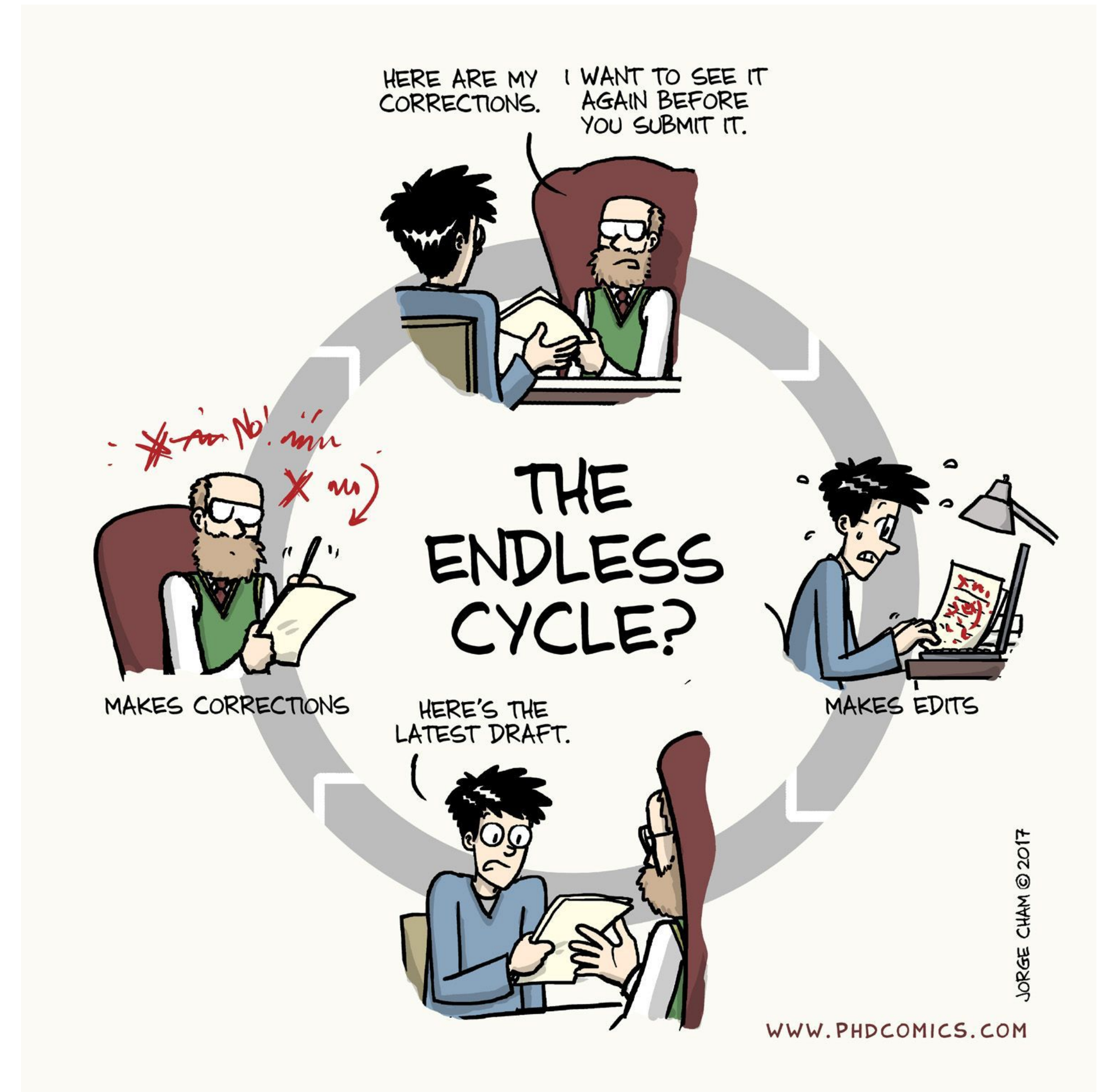
Revert Time

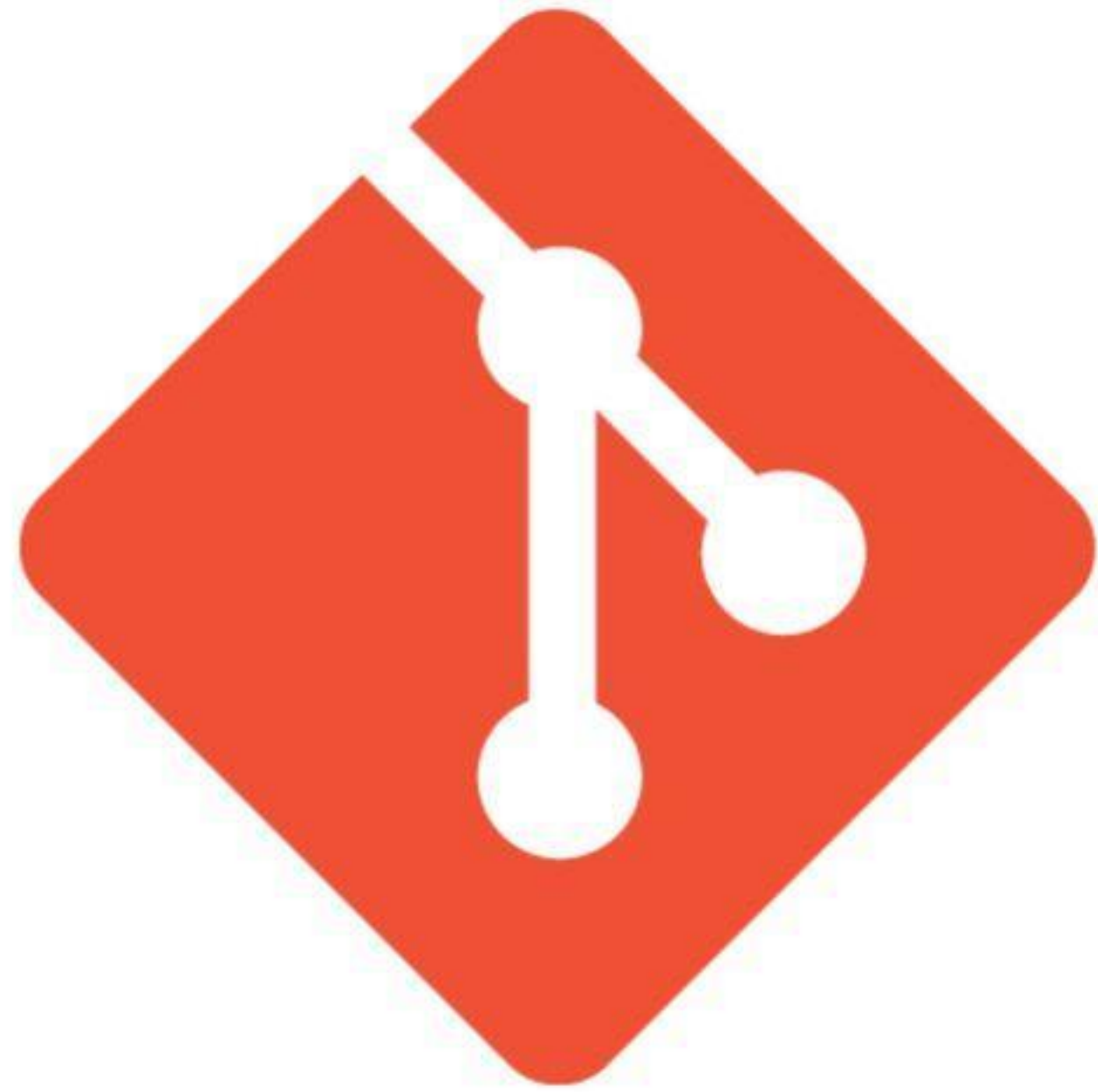


Jorge Cham, <https://www.phdcomics.com>

~~Painless~~ less painful collaboration



“notFinal.doc” by Jorge Cham,
<https://www.phdcomics.com>





git

Git vs GitHub

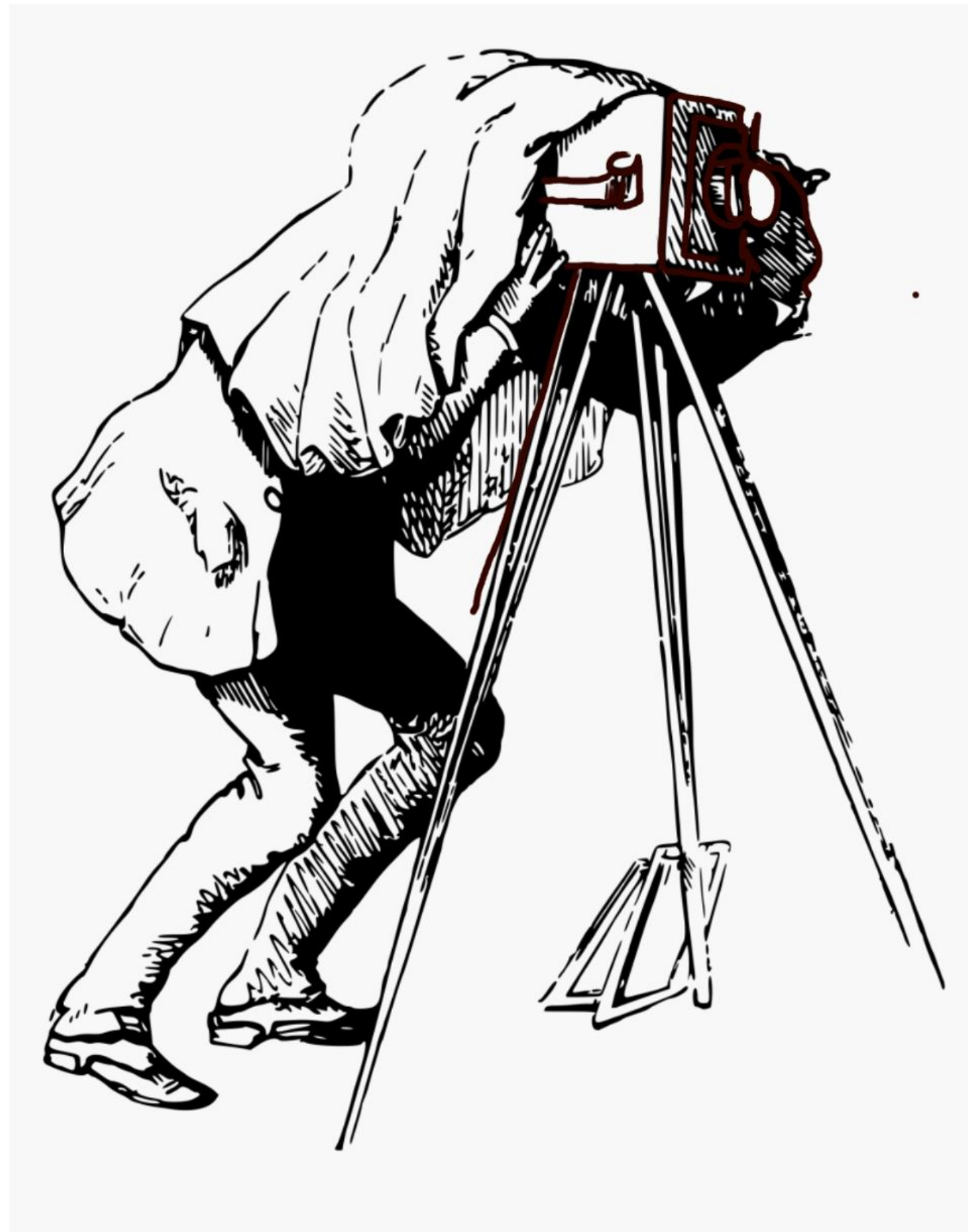
 git	 GitHub
1. It is a software	1. It is a service
2. It is installed locally on the system	2. It is hosted on Web
3. It is a command line tool	3. It provides a graphical interface
4. It is a tool to manage different versions of edits, made to files in a git repository	4. It is a space to upload a copy of the Git repository
5. It provides functionalities like Version Control System Source Code Management	5. It provides functionalities of Git like VCS, Source Code Management as well as adding few of its own features



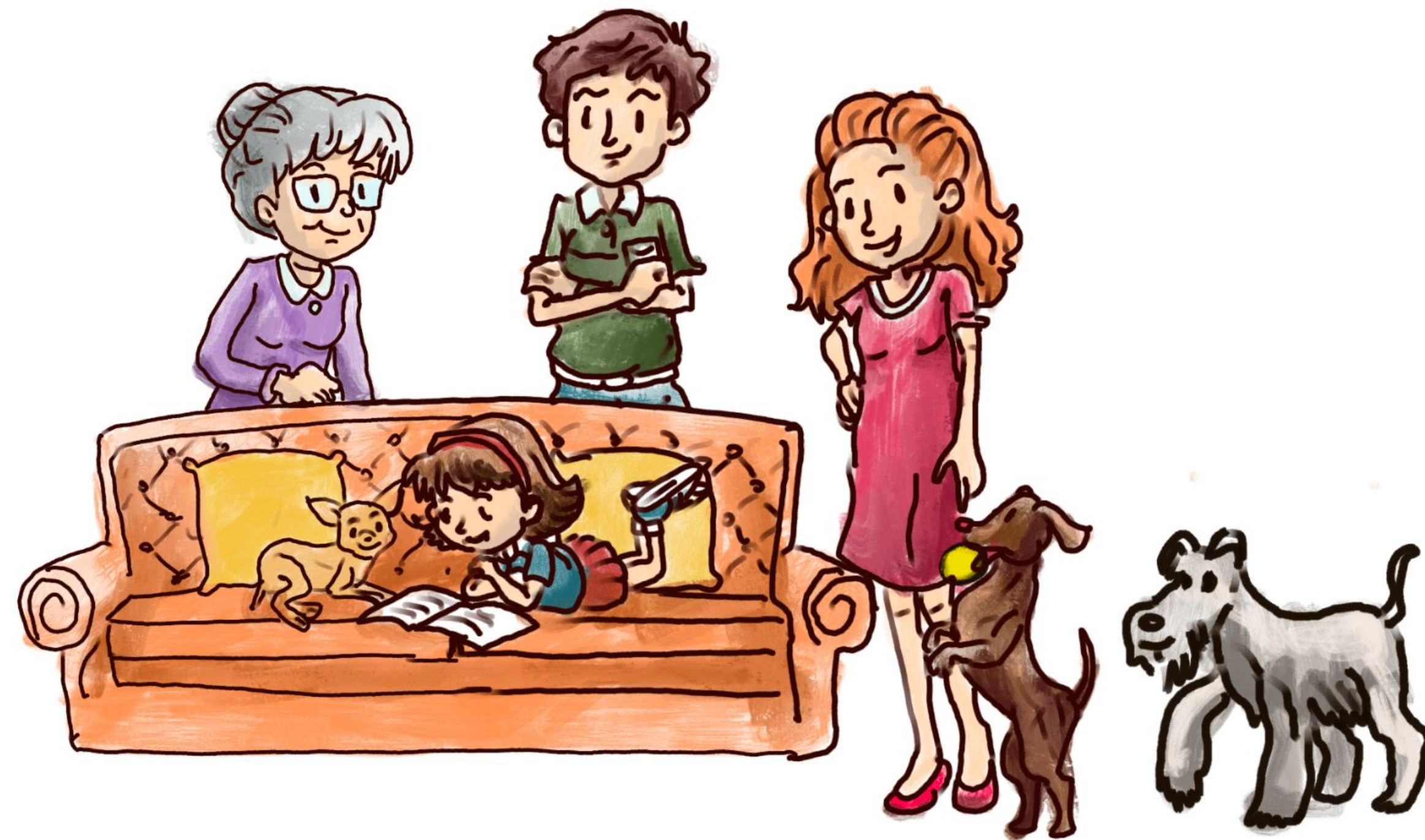
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But what is git exactly?!

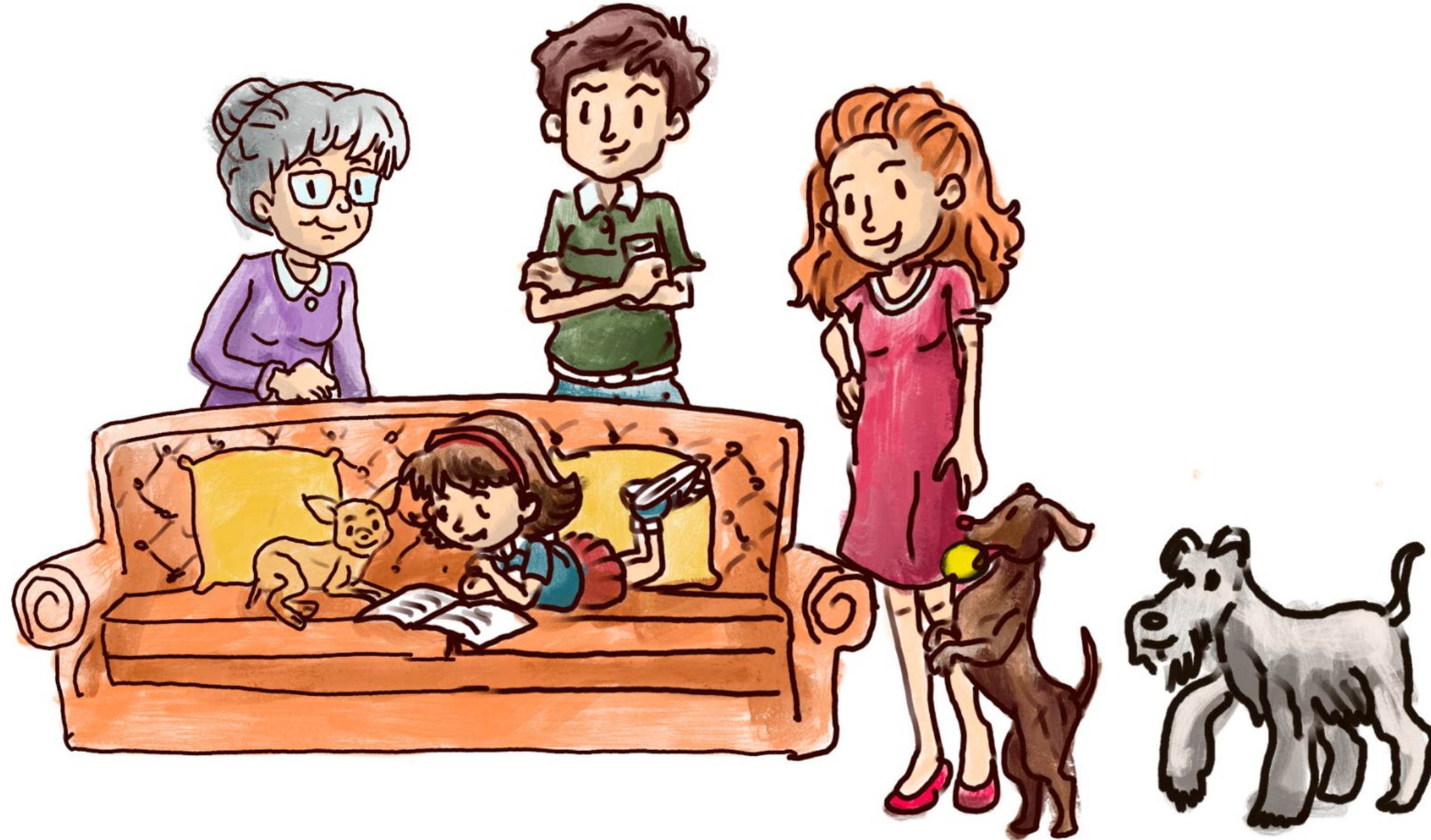
Imagine Git like a Photographer



That allows you to capture the moment

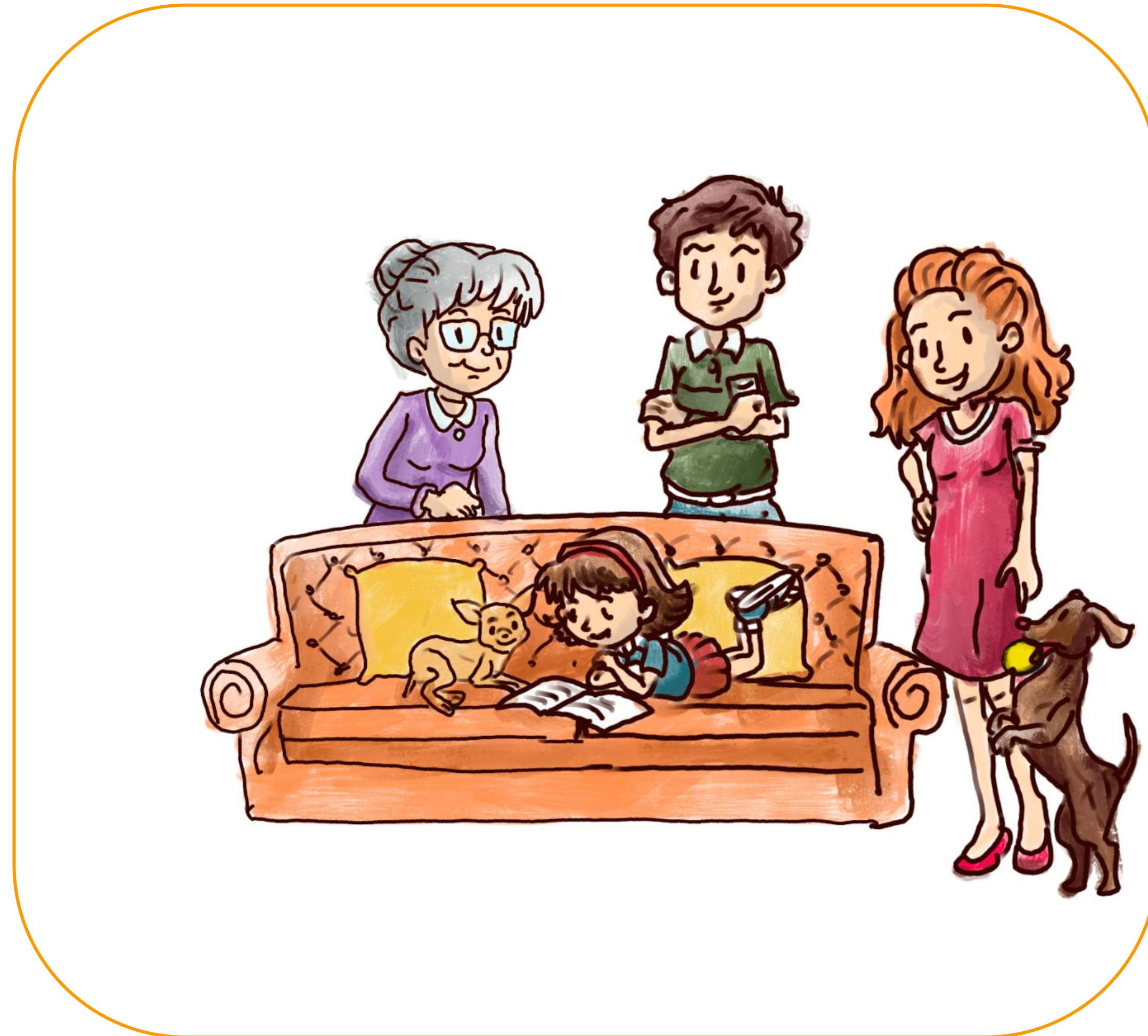


Staging in Git



By default captures everything in the git project.

Git add specific files



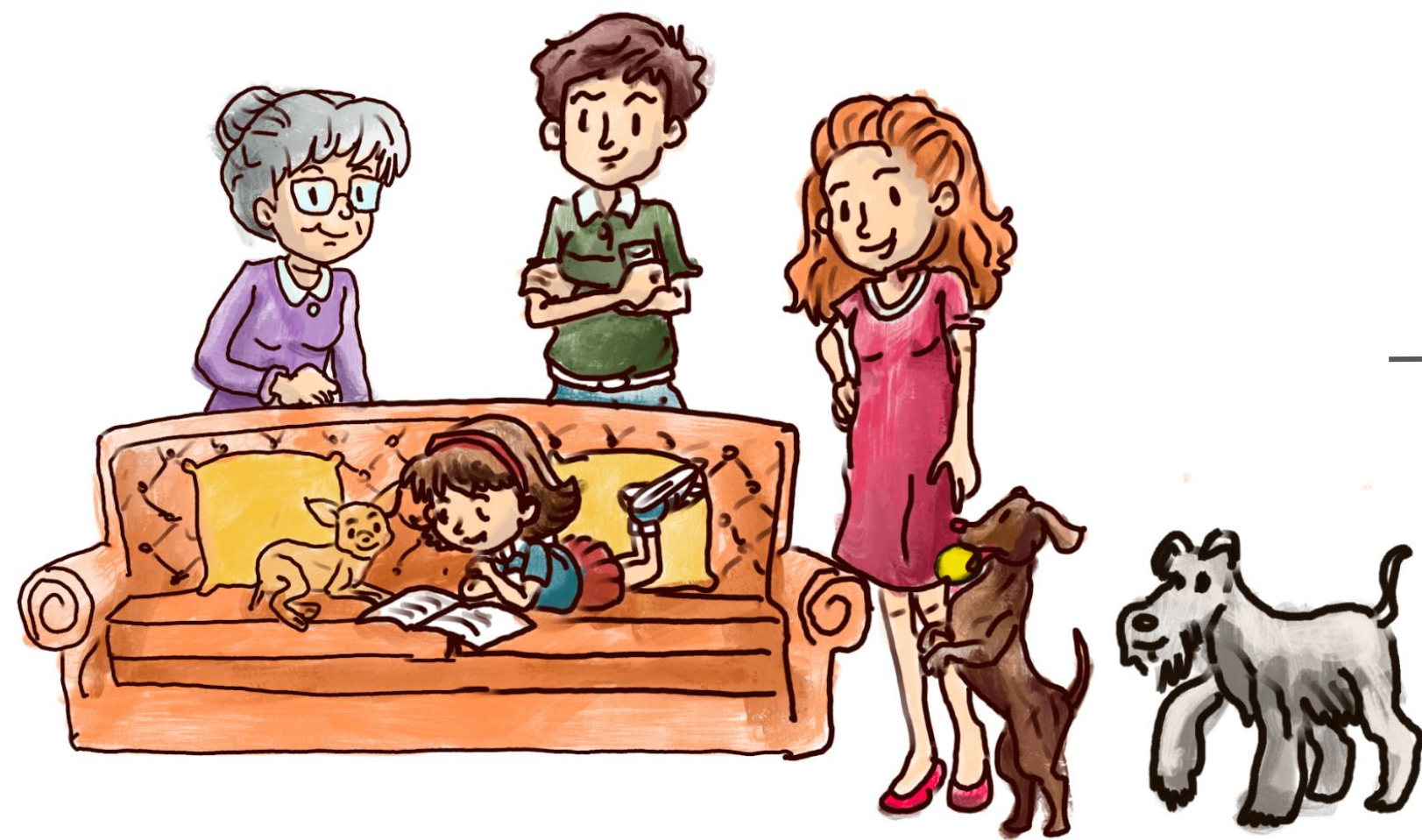
Move objects you want to capture into the focus

Adding Moments to an Album

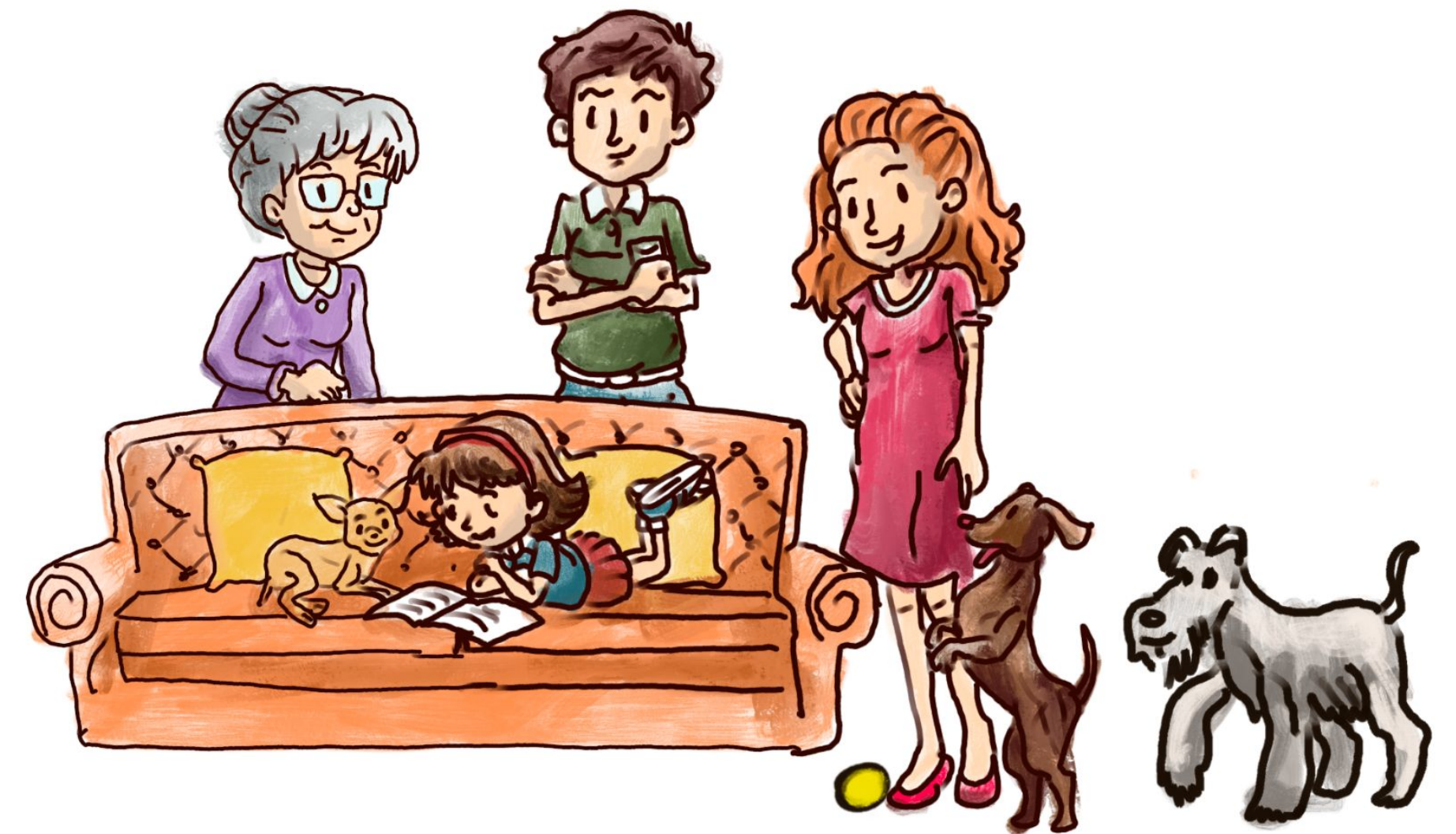
"Family Christmas
2023"



Tracking Changes



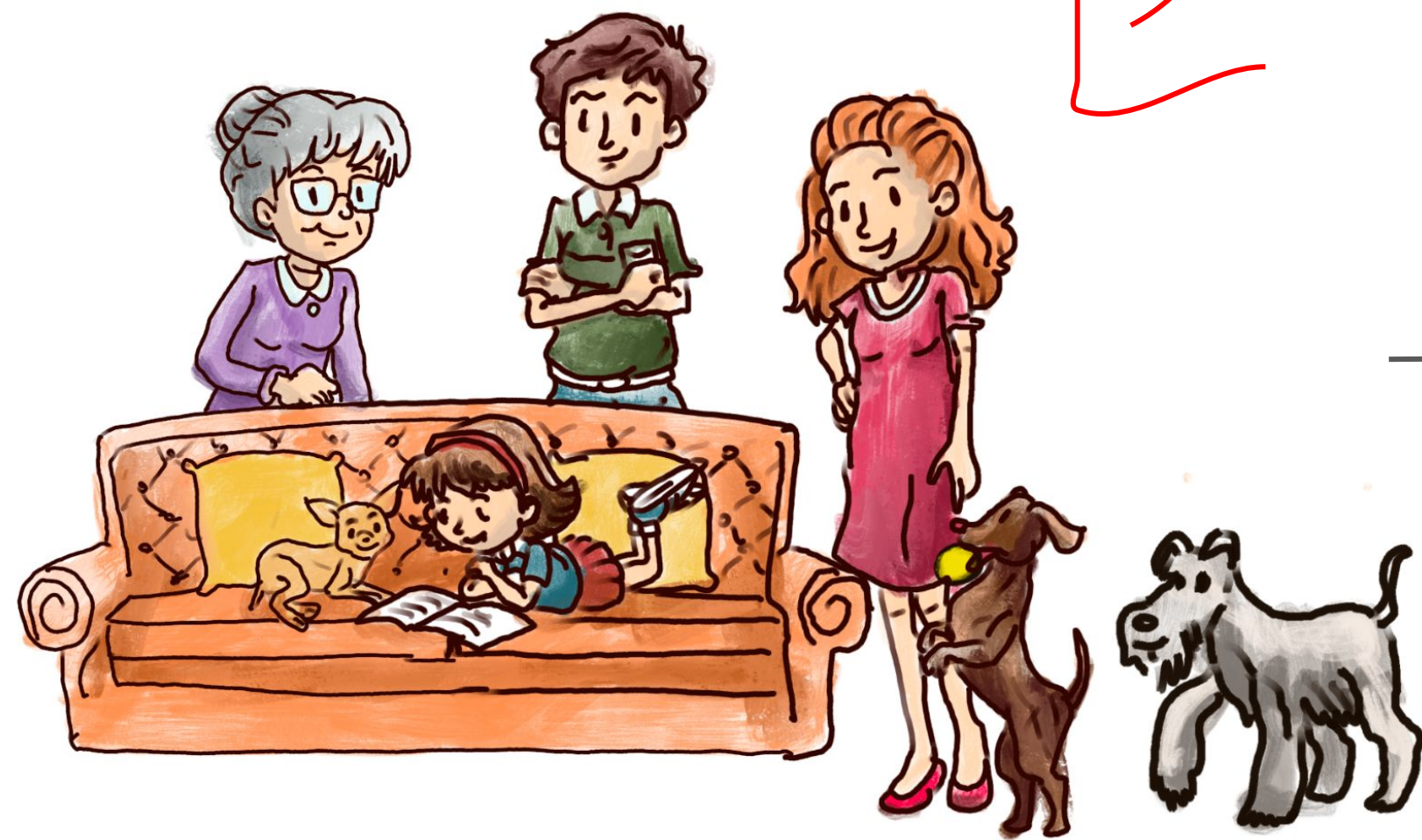
Family Christmas 2023



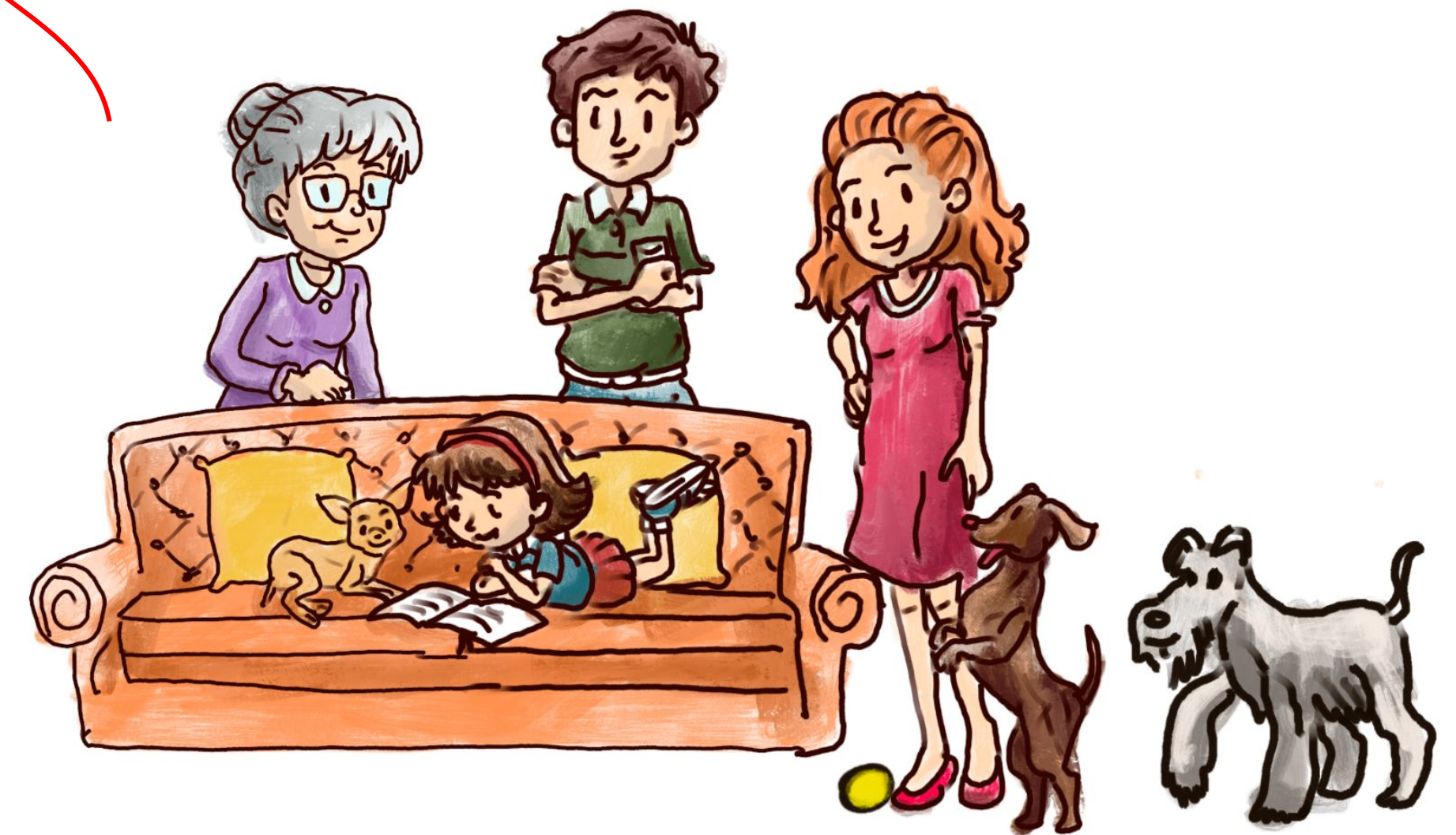
Family Christmas 2023+10 seconds

Restoring older versions

Family-Christmas.png



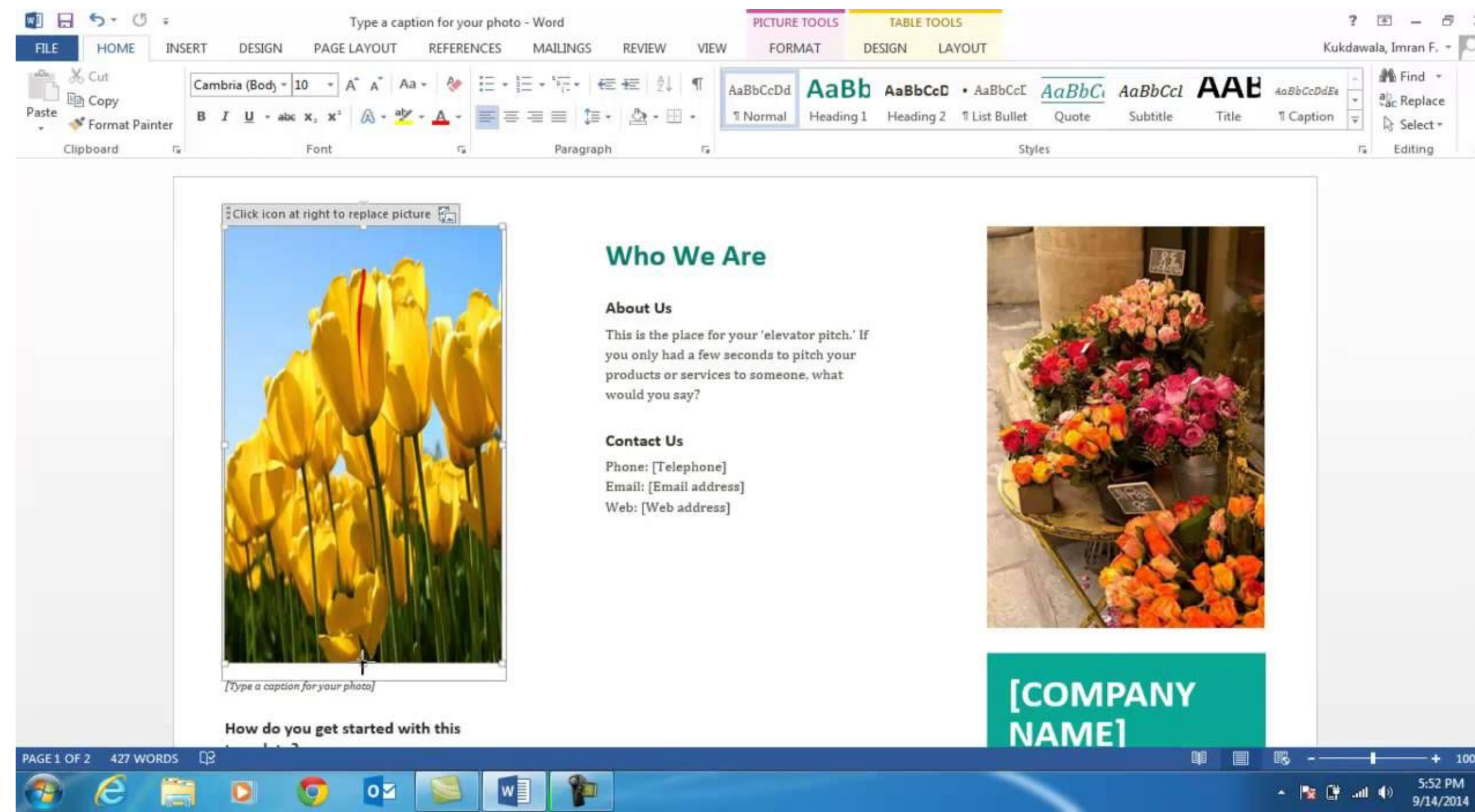
Family Christmas 2023



Family Christmas 2023+10 seconds

Word Documents and Git

- Git works great for code because it compares text;
- Also works with .csv data
- Can also be used for markdown text files (e.g. LaTeX);
- Doesn't work great for Microsoft Word/Excel documents

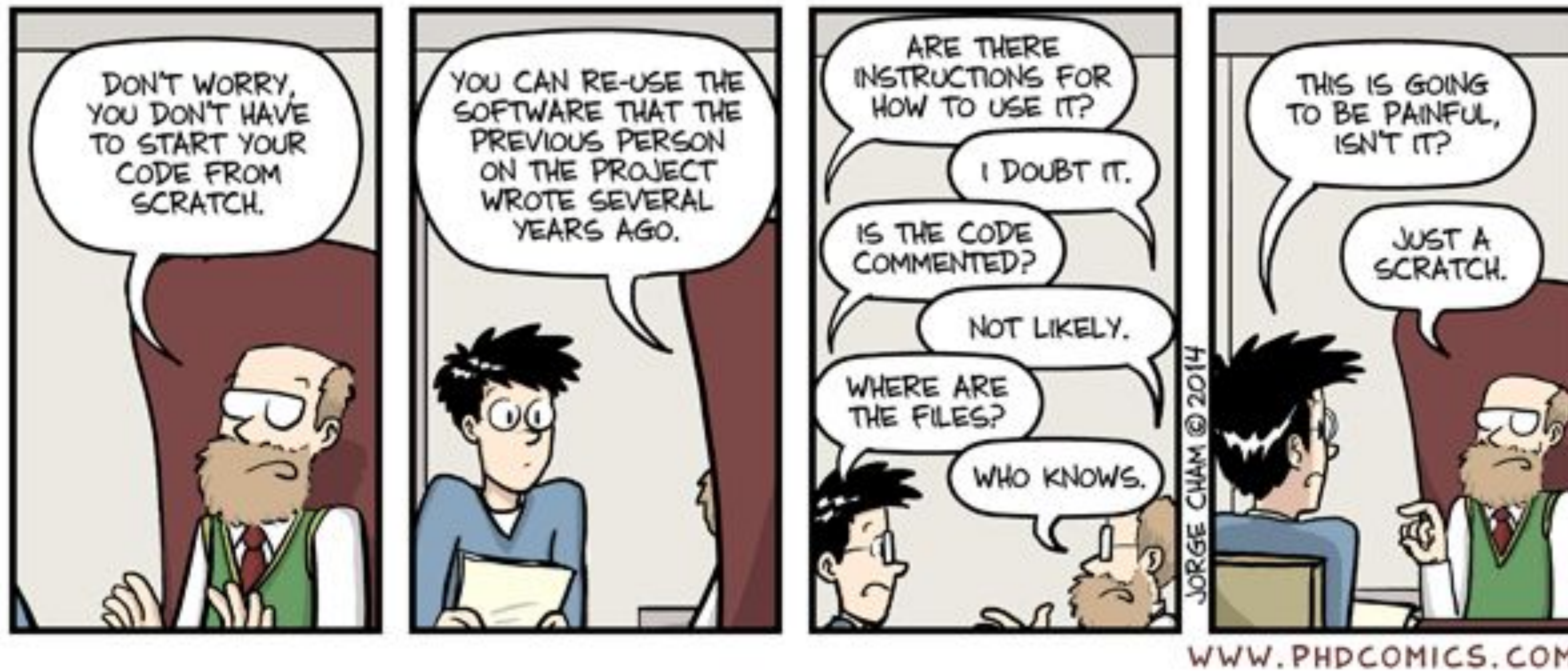




1. It is a service
2. It is hosted on Web
3. It provides a graphical interface
4. It is a space to upload a copy of the **Git** repository
5. It provides functionalities of Git like VCS, Source Code Management as well as adding few of its own features

But what is GitHub exactly?!

GitHub - Why?

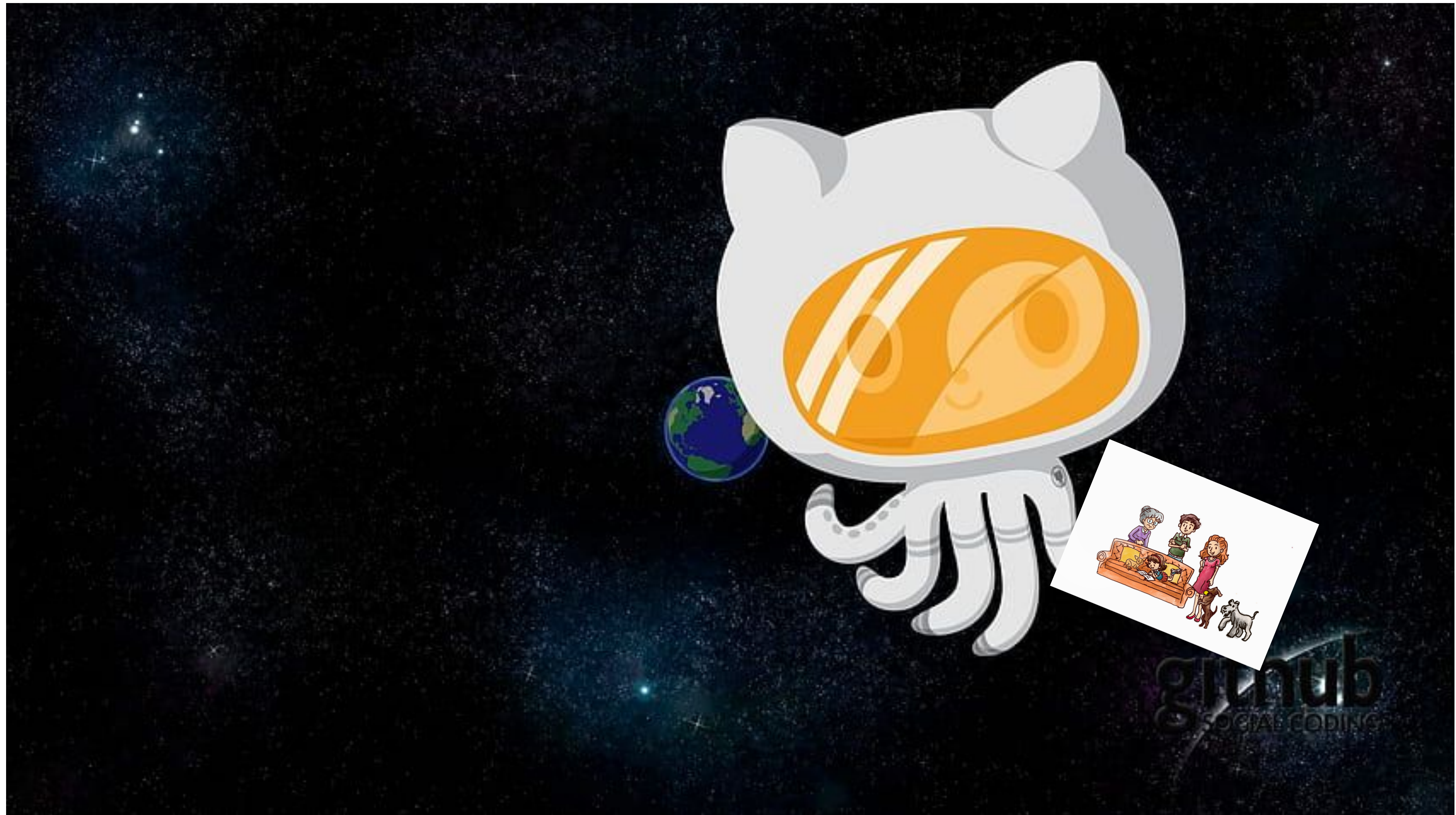


Jorge Cham, <https://www.phdcomics.com>

Collaborative Aspect



Cloud Aspect

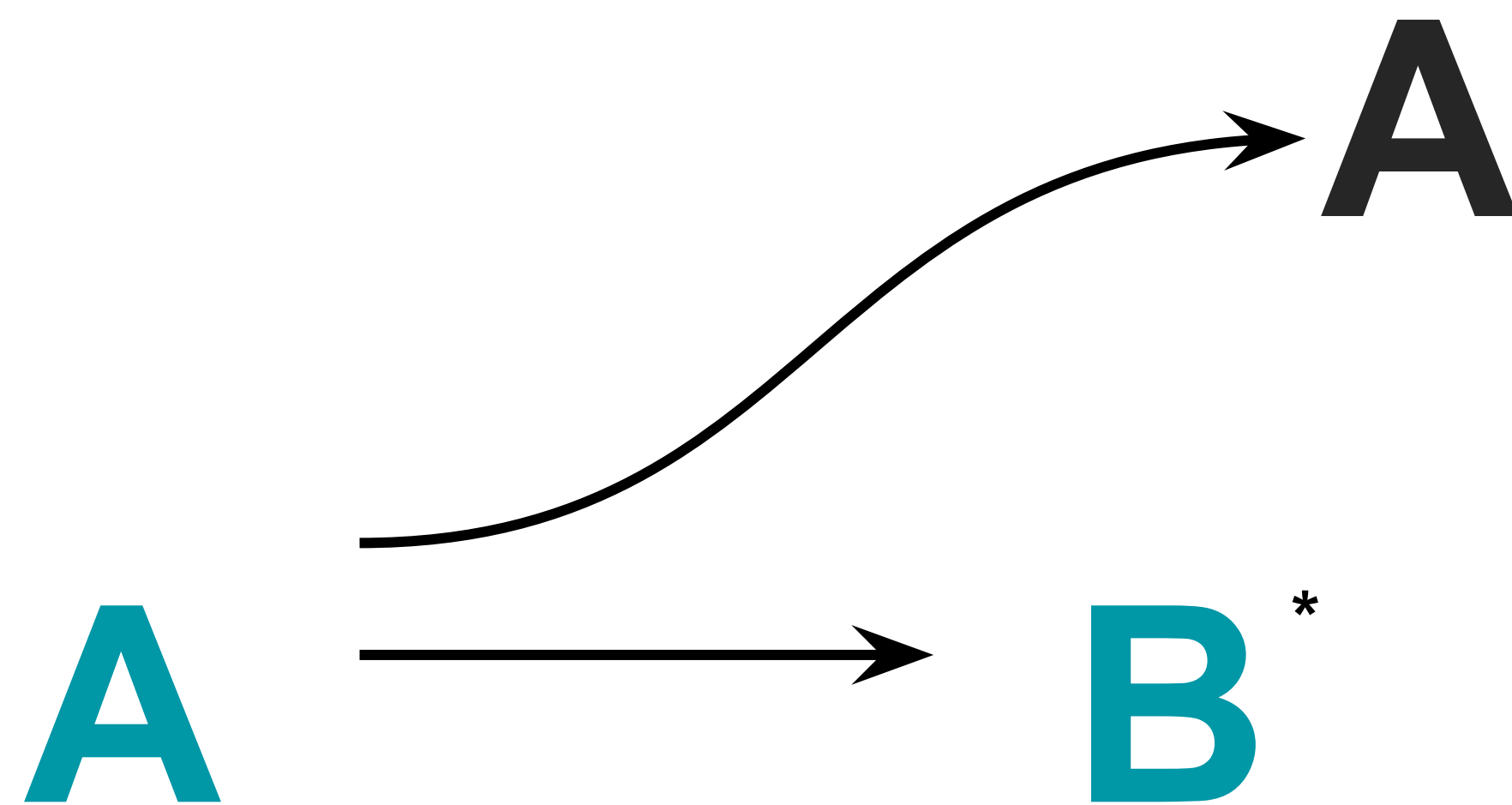


Demo

A vintage photograph of a computer classroom. In the foreground, a young woman with dark hair, wearing a light-colored jacket, is seated at a computer terminal. She is looking down at a large sheet of paper she is holding, with her right hand on the keyboard. The computer terminal is a large, beige, boxy machine with a built-in monitor and keyboard. The monitor displays the number '21' and a white rectangular area. In the background, several other students are seated at similar computer terminals, some looking at their screens. The room has a wooden floor and a plain wall. The overall atmosphere is that of a busy, early computer lab.

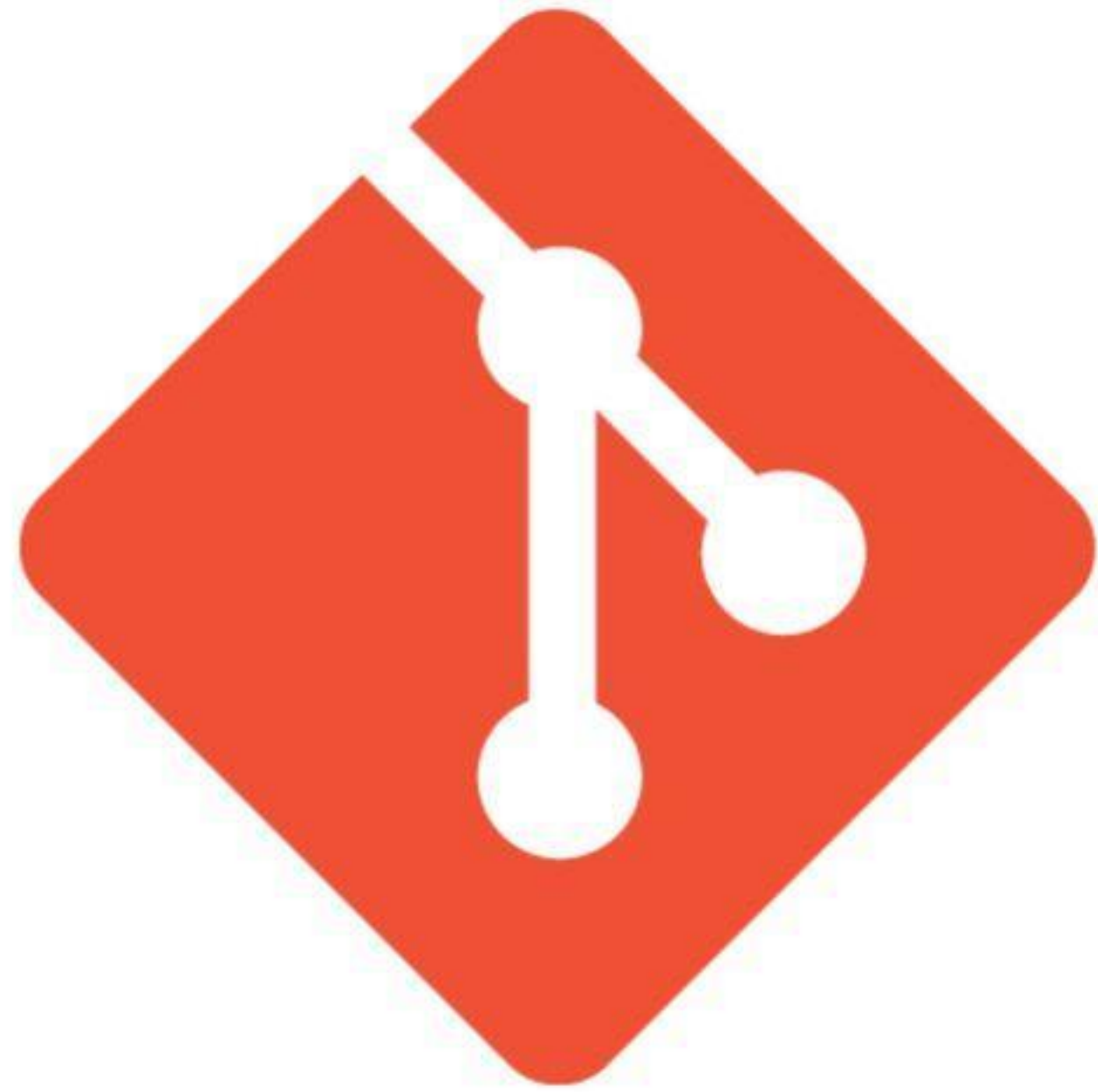
PAST

Recording project history



*) Thanks to: **A** , but not **A**

-----> *time goes on...* ----->



git

1. Keep a changelog

Changelog

All notable changes to this project will be documented in this file.

The format is based on [Keep a Changelog](https://keepachangelog.com/en/1.0.0/) and this project adheres to [Semantic Versioning](https://semver.org/spec/v2.0.0/).

[Unreleased]

[1.0.0] - 2017-06-20

Added

- New visual identity by [@tylerfortune8](https://github.com/tylerfortune8).
- Version navigation.
- Links to latest released version in previous versions.
- "Why keep a changelog?" section.
- "Who needs a changelog?" section.
- "How do I make a changelog?" section.

∞ How do I make a good changelog?

Credit: keepachangelog.com

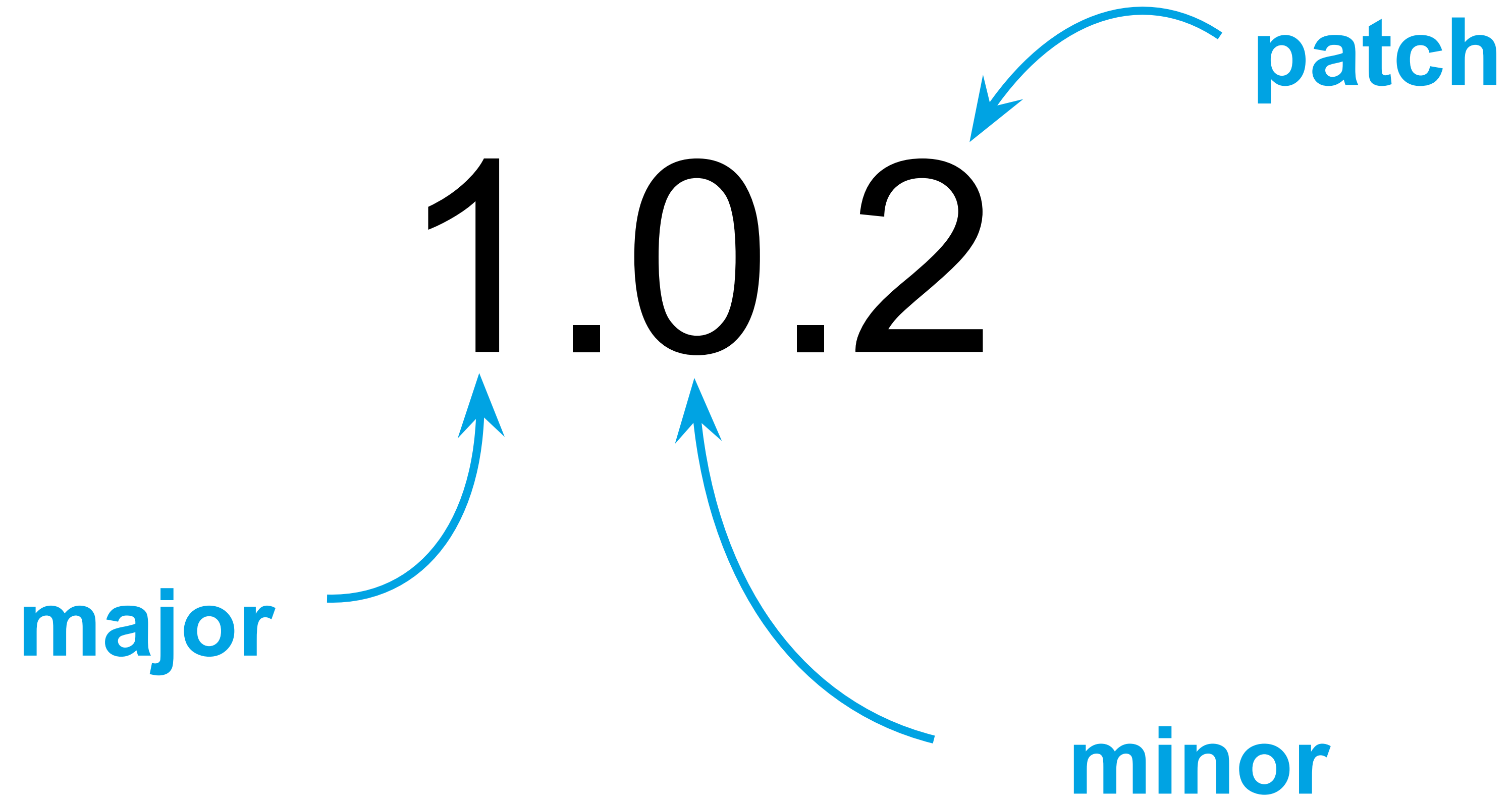
Guiding Principles

- Changelogs are *for humans*, not machines.
- There should be an entry for every single version.
- The same types of changes should be grouped.
- Versions and sections should be linkable.
- The latest version comes first.
- The release date of each version is displayed.
- Mention whether you follow **Semantic Versioning**.

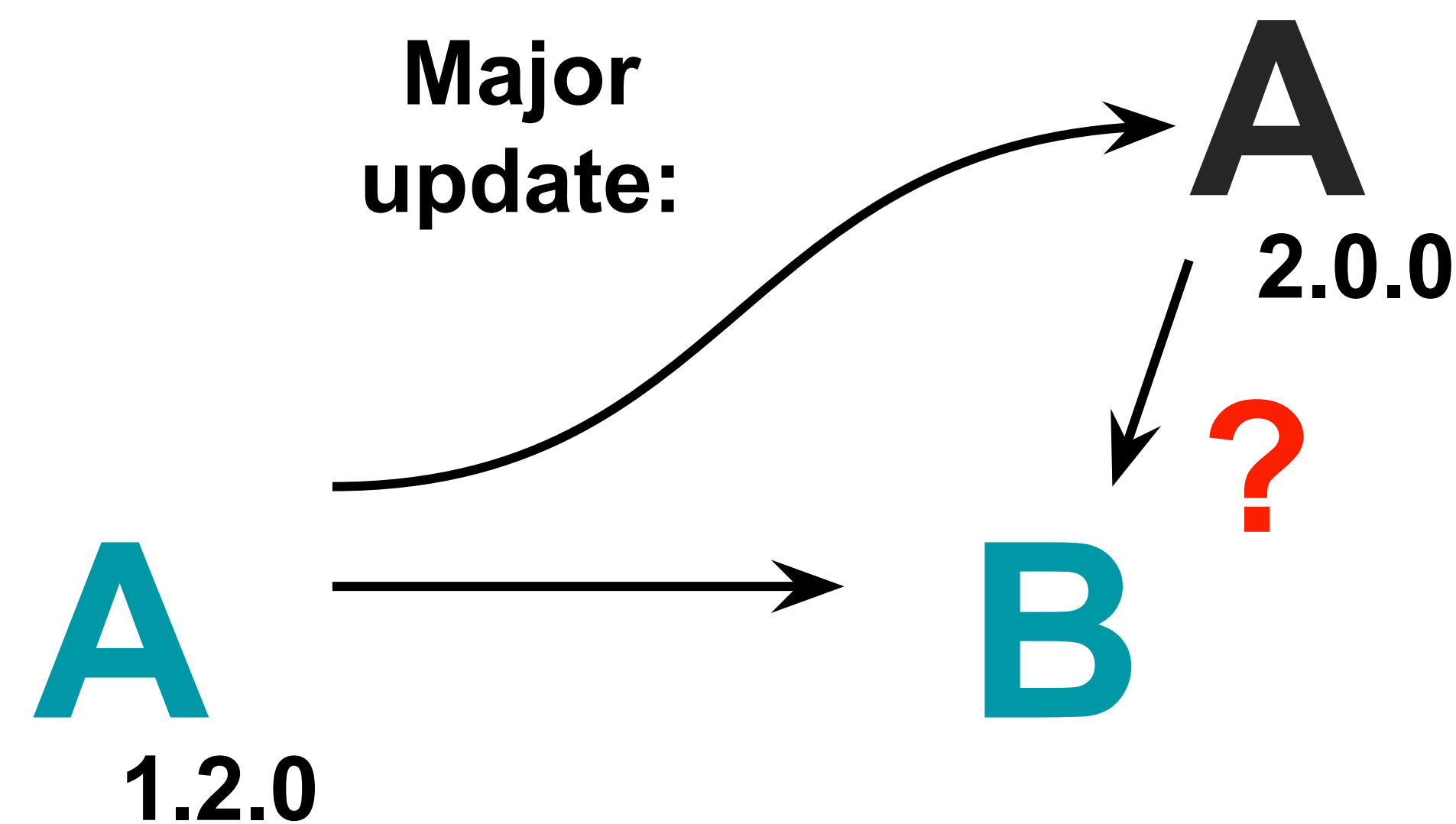
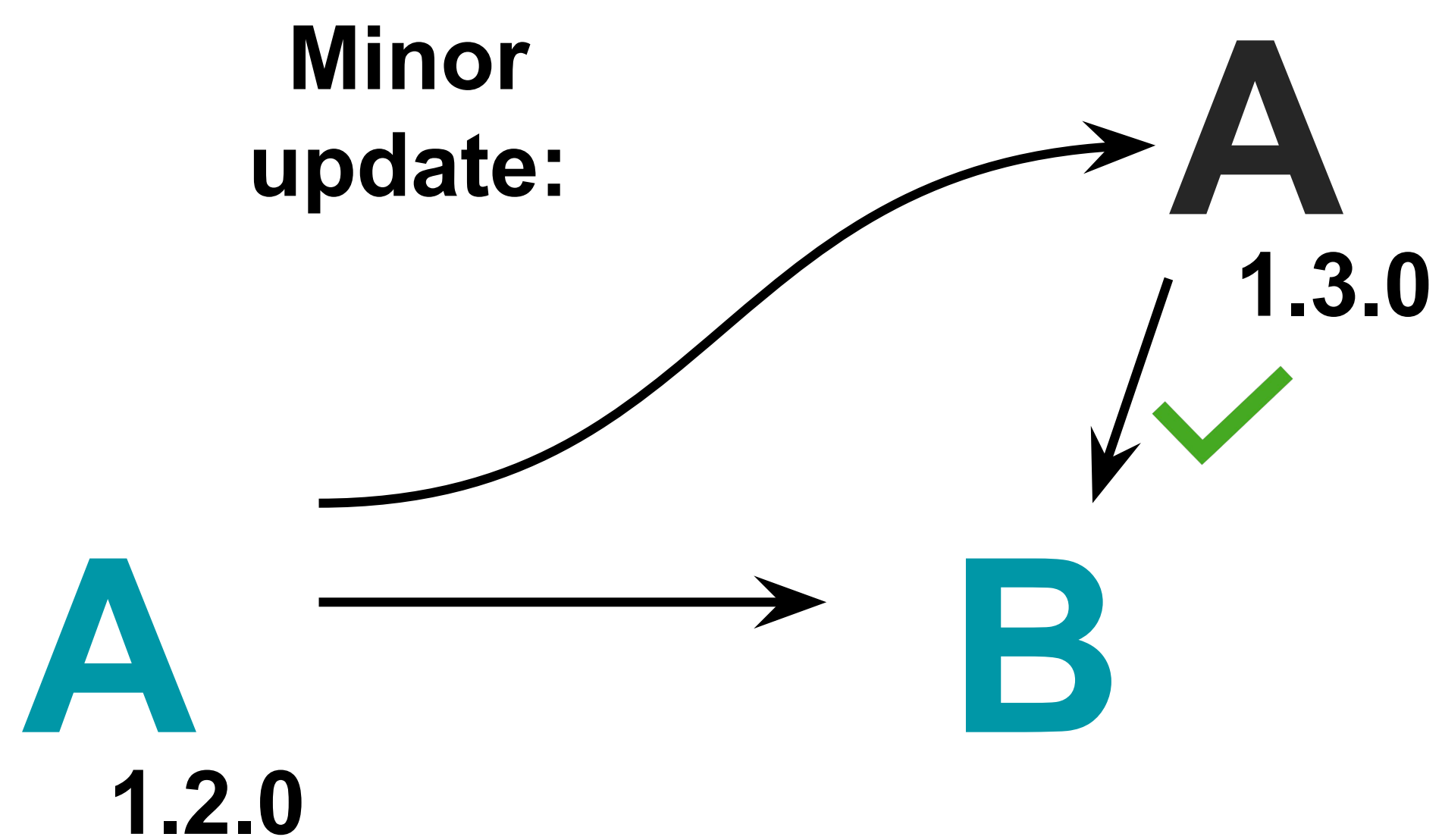
Types of changes

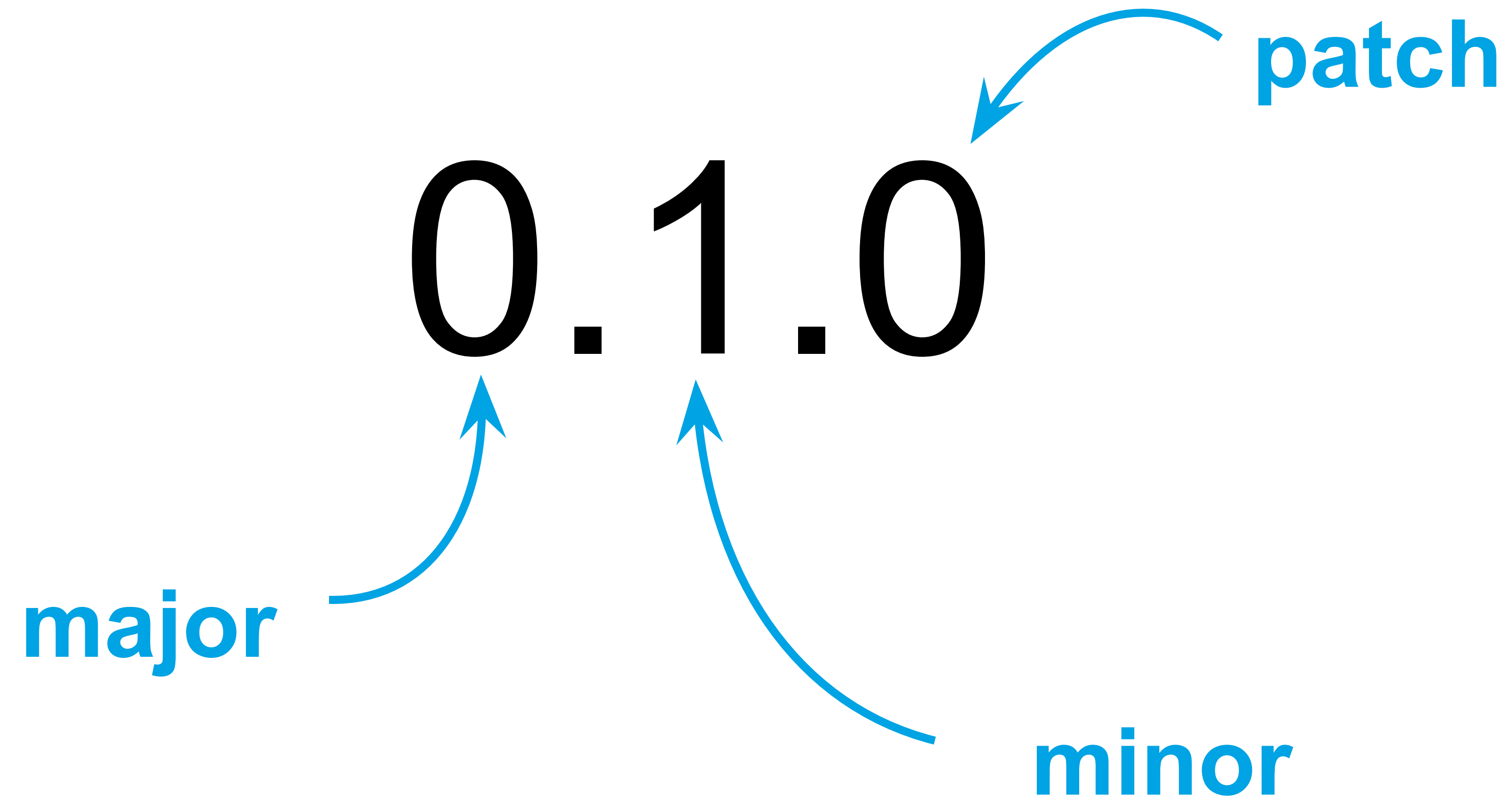
- **Added** for new features.
- **Changed** for changes in existing functionality.
- **Deprecated** for soon-to-be removed features.
- **Removed** for now removed features.
- **Fixed** for any bug fixes.
- **Security** in case of vulnerabilities.

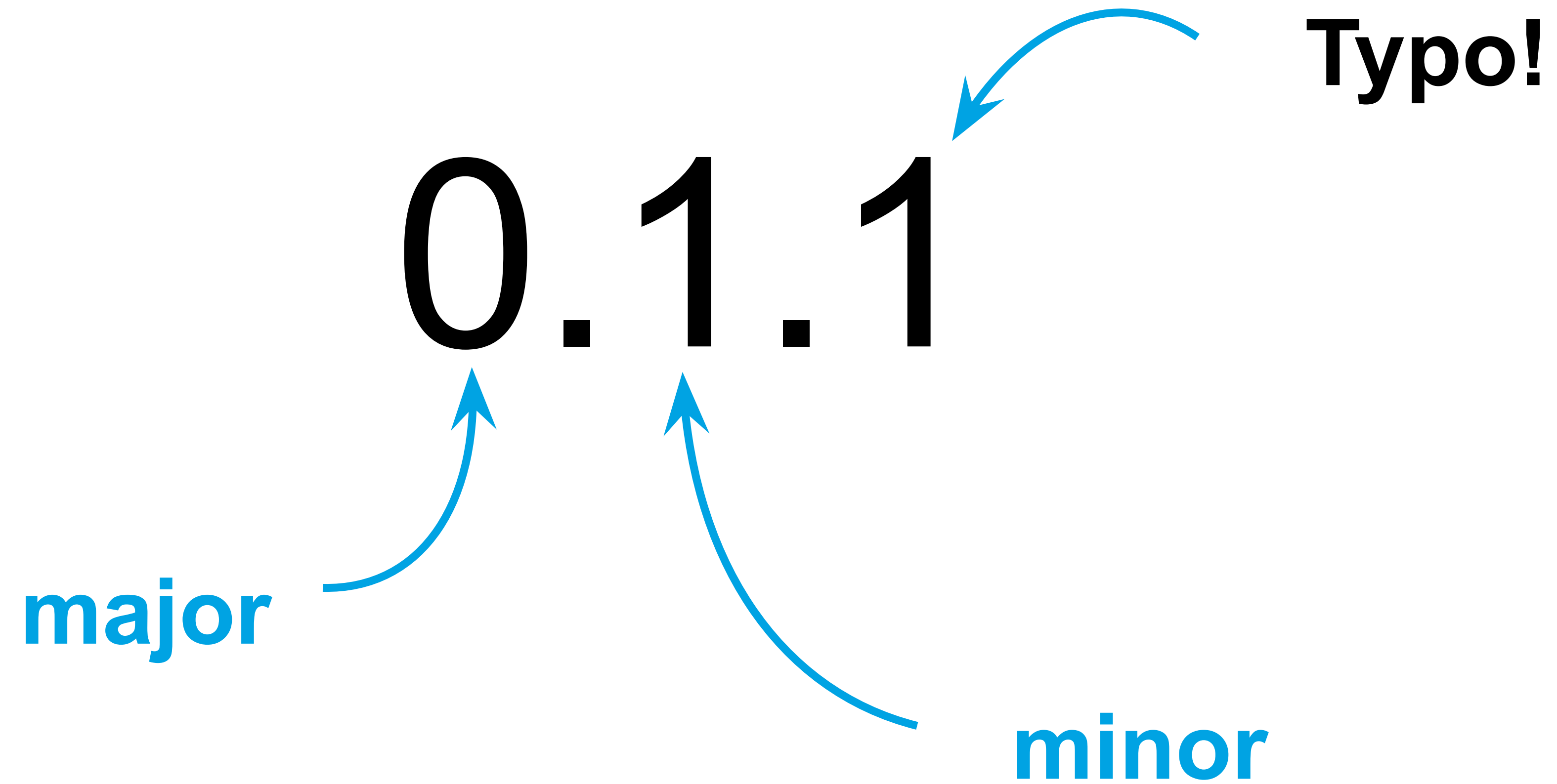
2. Formalize updates using semantic versioning



major
minor
patch







Changelog

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"FINAL".doc



FINAL.doc!



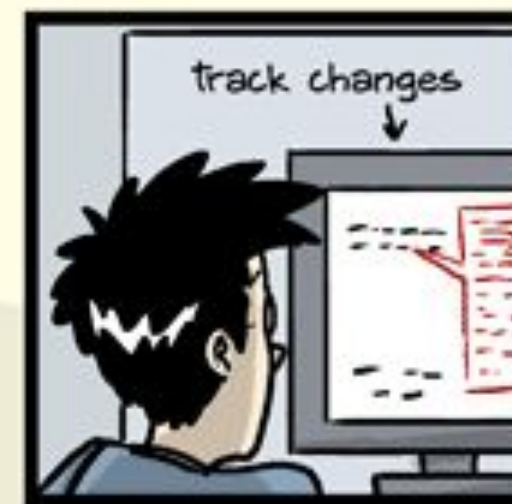
FINAL_rev.2.doc



FINAL_rev.6.COMMENTS.doc



FINAL_rev.8.comments5.
CORRECTIONS.doc



FINAL_rev.18.comments7.
corrections9.MORE.30.doc



FINAL_rev.22.comments49.
corrections.10.#@\$%WHYDID
ICOMETOGRADSCHOOL?????.doc

JORGE CHAM © 2012

Exercise Past

<https://dcc-training-lab.github.io/project-management/lessons/past.html>

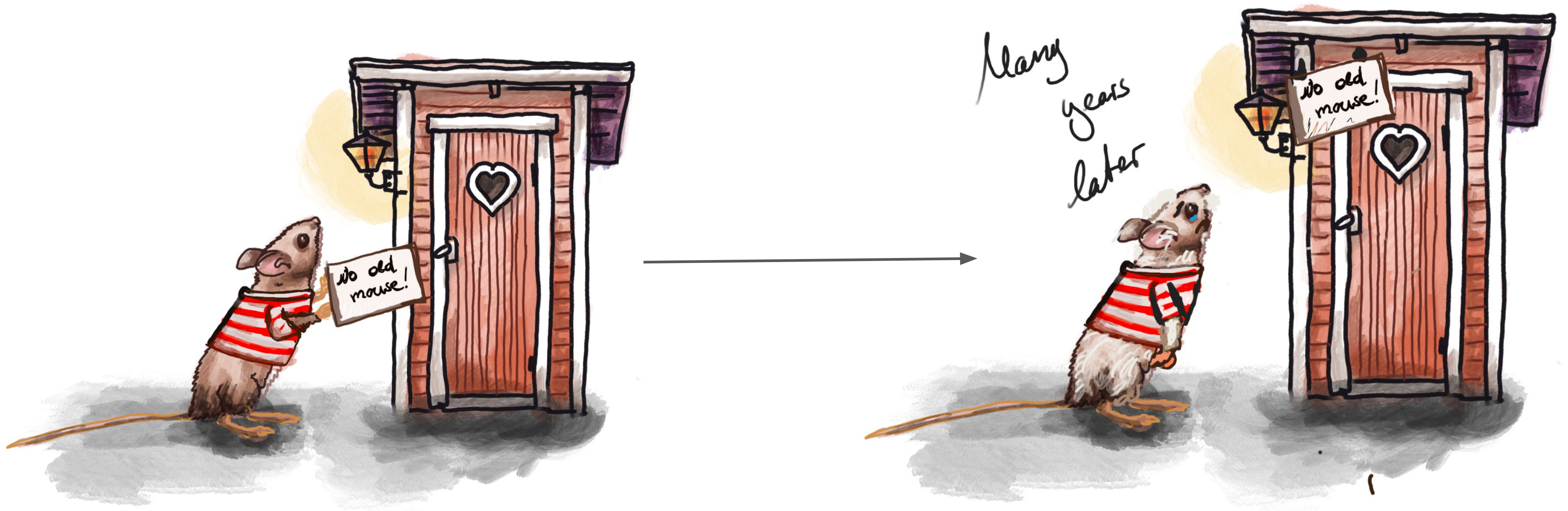
A futuristic spacecraft is shown in space, with a satellite in the background. The spacecraft is a sleek, white, elongated object with a pointed nose and a small antenna. It is positioned in the upper left quadrant of the frame. The satellite is a smaller, cylindrical object with a dark top and a white body, located in the lower right quadrant. The background is a view of Earth from space, showing the blue atmosphere and the white clouds of the planet. The word "FUTURE" is written in large, white, bold, sans-serif capital letters across the center of the image.

FUTURE

Publishing and archiving your project for future use

Step 1: control how your work will be used by others
(and yourself!)

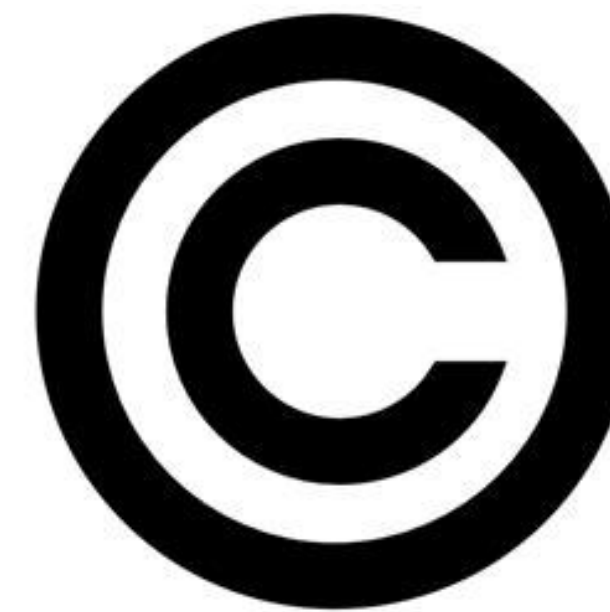
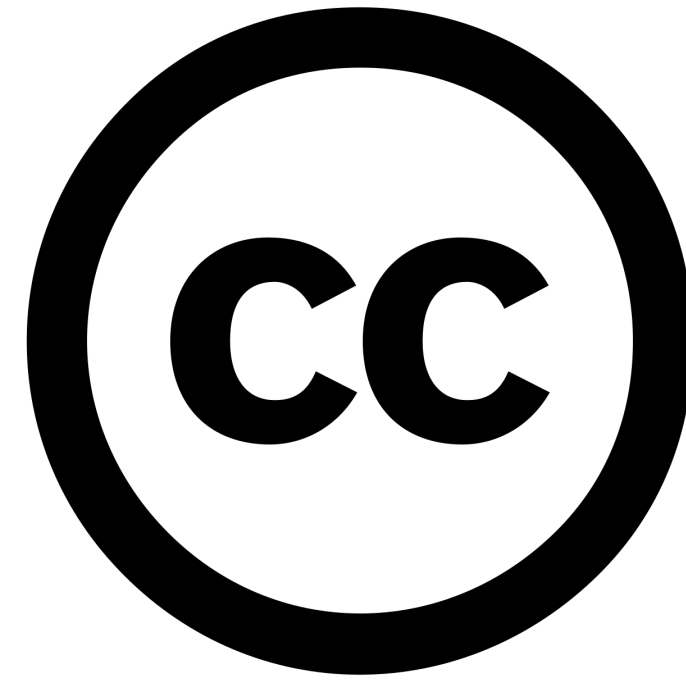
Why should I choose a license?



Your project ...

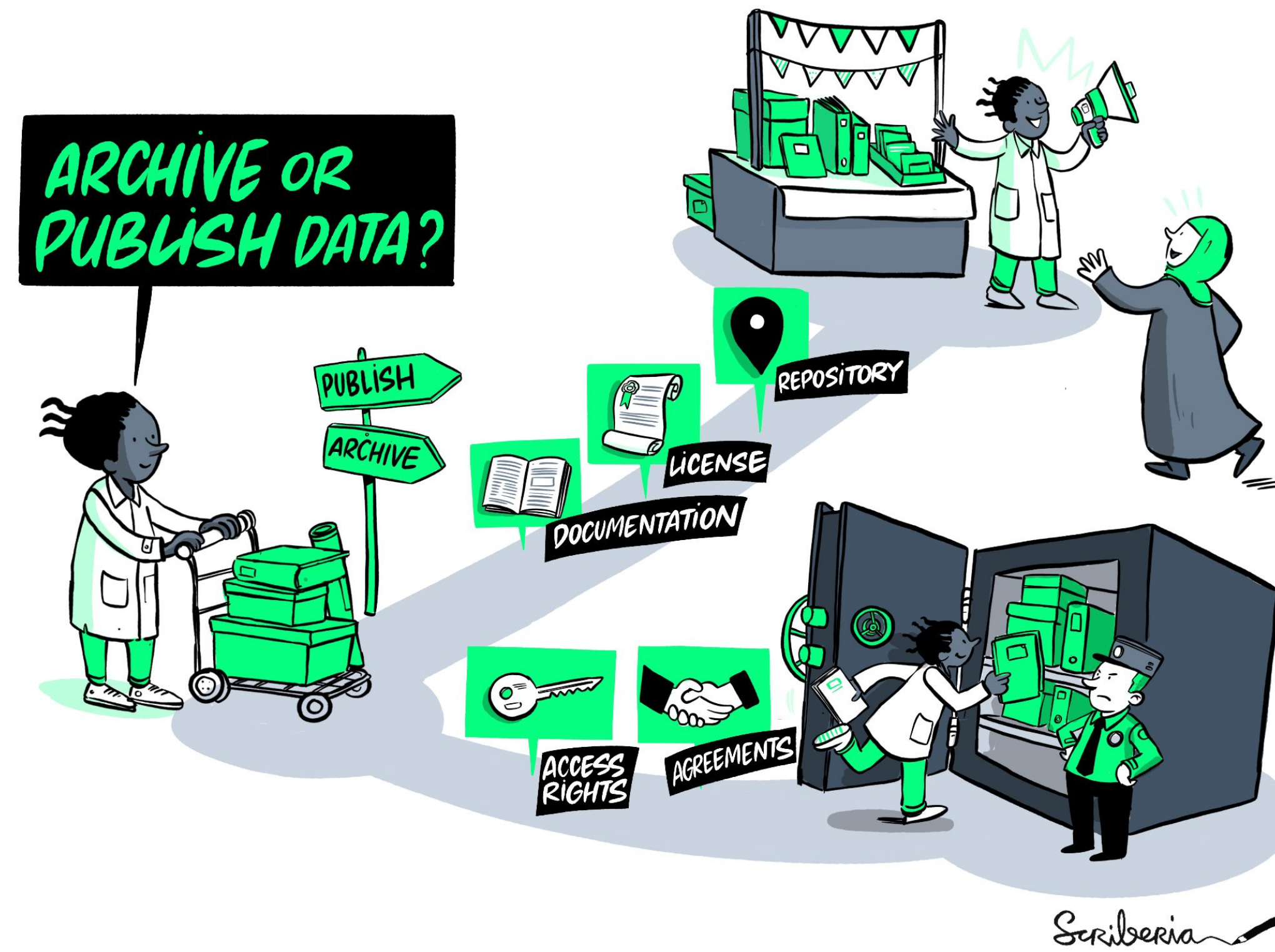
Open license

Restrictive license





Sensitive information?!



The Turing Way

Your project ...

Open license

Restrictive license

Data

Software

Data

Software

Example for Permissive Licenses for Data



Attribution

Others can copy, distribute, display, perform and remix your work if they credit your name as requested by you



No Derivative Works

Others can only copy, distribute, display or perform verbatim copies of your work



Share Alike

Others can distribute your work only under a license identical to the one you have chosen for your work

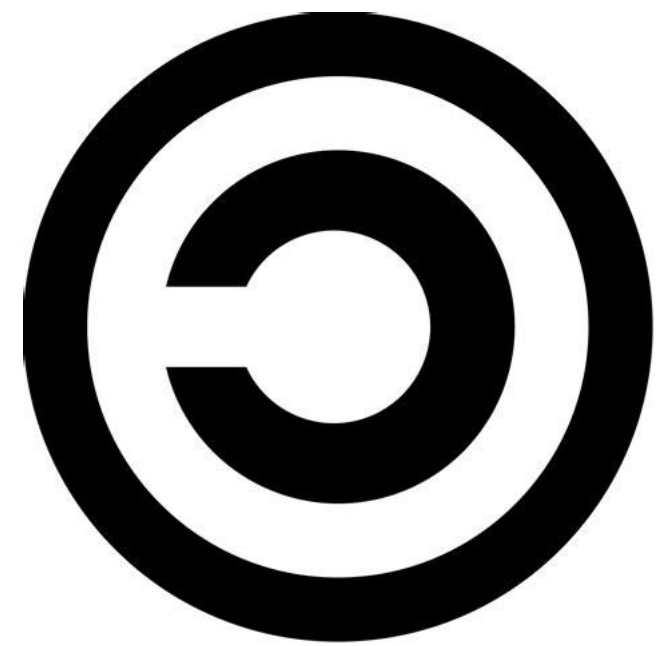


Non-Commercial

Others can copy, distribute, display, perform or remix your work but for non-commercial purposes only.



Restricted vs Permissive Software



How to find the right license?

Ask a data steward or privacy champion if in doubt.



A license finder may help you to get a good idea:





- <https://choosealicense.com>
- <https://data.europa.eu/elearning/en/module4/#/id/co-01>



2. Maintain your living project on GitHub.

A pull request


Update session-05.md #6




 Open XinyanFan-hub wants to merge 1 commit into `DCC-training-lab:main` from `XinyanFan-hub:main` 

 Conversation 0  Commits 1  Checks 0  Files changed 1


 **XinyanFan-hub** commented on Apr 20 First-time contributor 

update the instructor

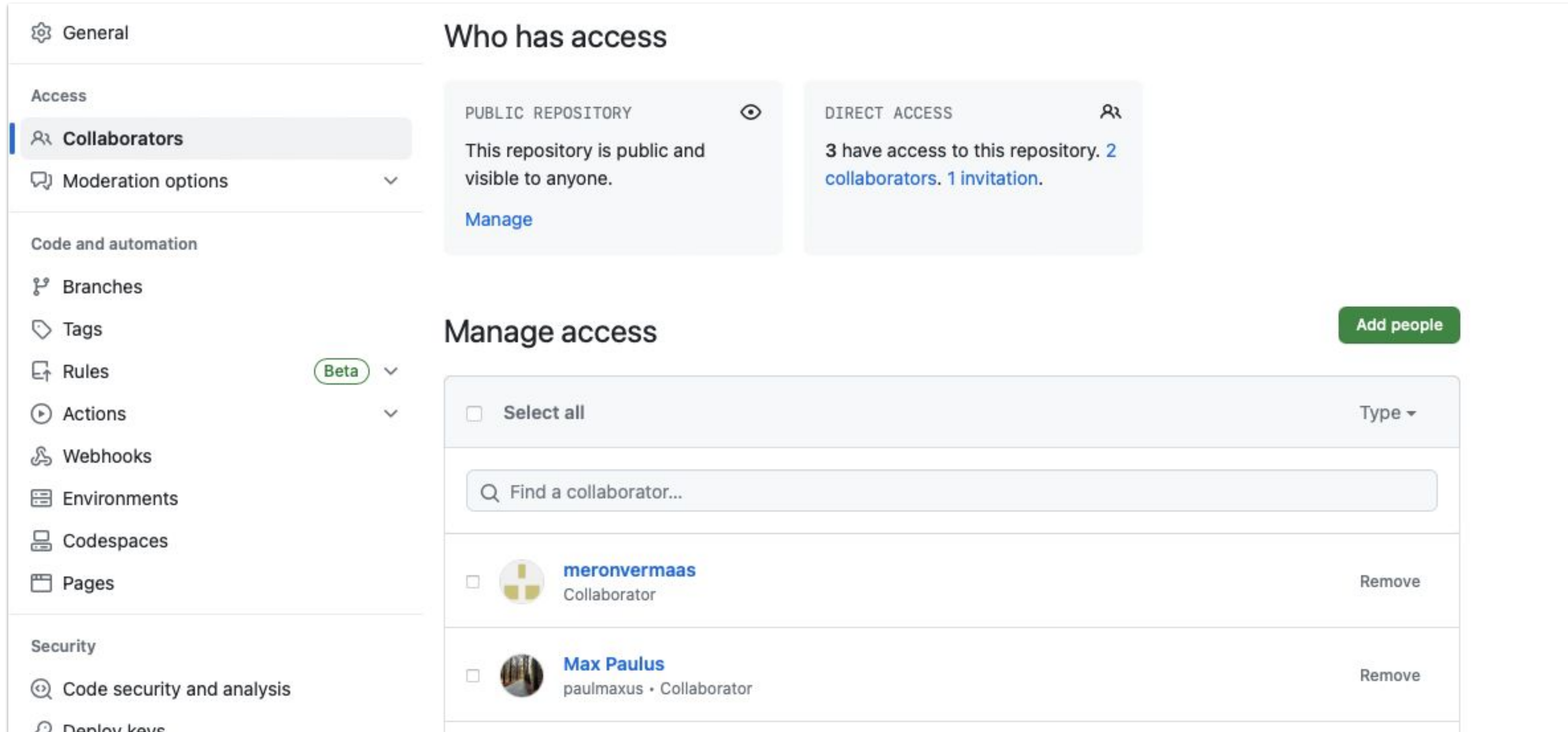


  Update session-05.md  Verified c075715

Add more commits by pushing to the `main` branch on `XinyanFan-hub/2023-spring-training-days`.


 **This branch has not been deployed**
No deployments

Inviting collaborators in 'settings' > 'collaborators'




The screenshot displays the 'Collaborators' settings page for a repository. The left sidebar contains navigation options: General, Access (with 'Collaborators' selected), Moderation options, Code and automation (with 'Beta' badge), Branches, Tags, Rules, Actions, Webhooks, Environments, Codespaces, Pages, Security, and Deploy keys. The main content area is titled 'Who has access' and shows two access types: 'PUBLIC REPOSITORY' (visible to anyone) and 'DIRECT ACCESS' (3 collaborators, 1 invitation). Below this is the 'Manage access' section, which includes a search bar and a list of current collaborators: 'meronvermaas' and 'Max Paulus' (paulmaxus), each with a 'Remove' button.

Who has access

PUBLIC REPOSITORY 

This repository is public and visible to anyone.



[Manage](#)

DIRECT ACCESS 

3 have access to this repository. [2 collaborators](#). [1 invitation](#).

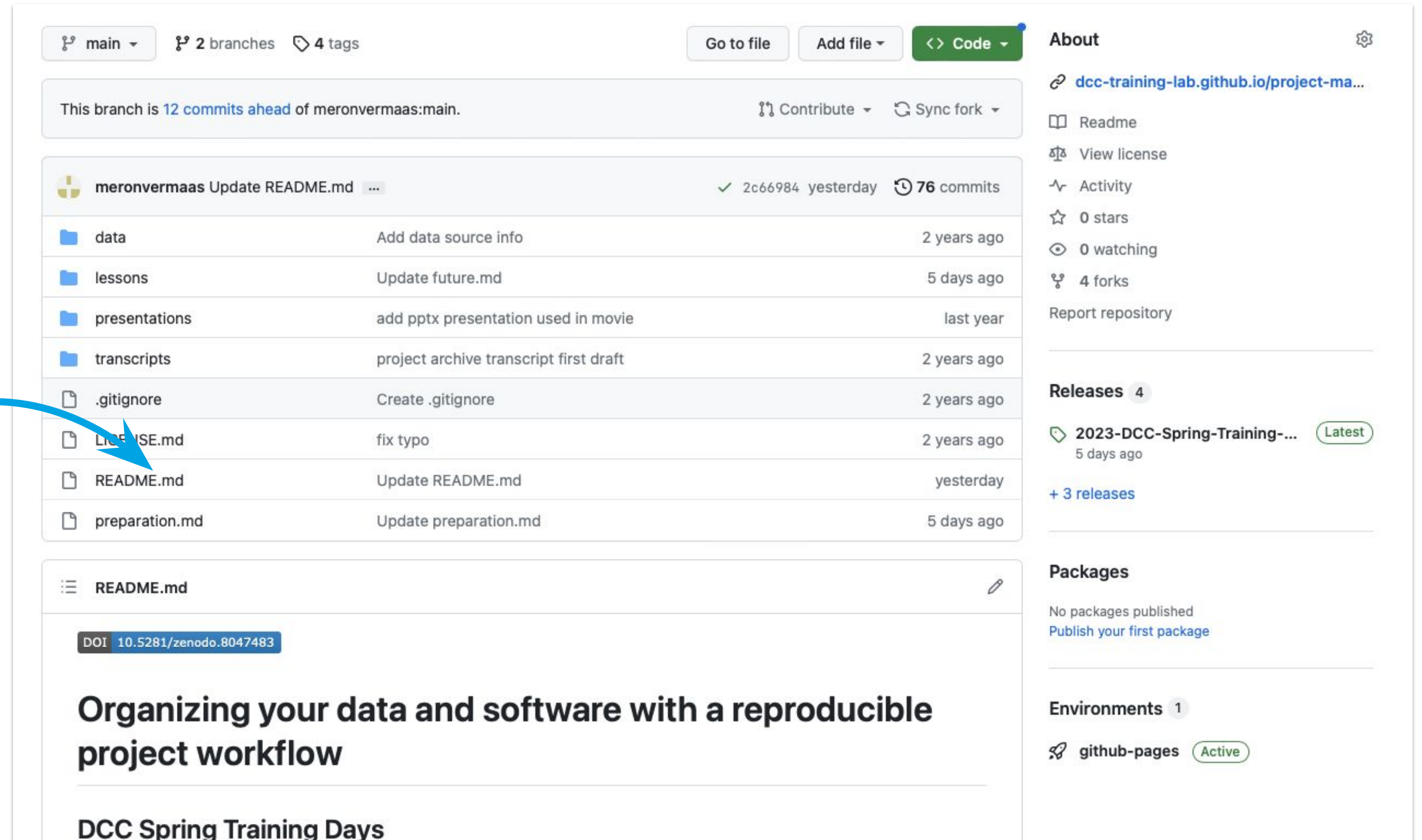
Manage access [Add people](#)

Select all Type ▾

<input type="checkbox"/>	 meronvermaas Collaborator	Remove
<input type="checkbox"/>	 Max Paulus paulmaxus • Collaborator	Remove

Showcasing

README right on
the
front page!



The screenshot shows a GitHub repository page for a project named 'project-ma...'. The repository is on the 'main' branch, which is 12 commits ahead of the upstream 'meronvermaas:main'. The repository has 2 branches and 4 tags. The file list shows several folders and files, with the 'README.md' file highlighted in blue. A blue arrow points from the text 'README right on the front page!' to the 'README.md' file in the list. The 'README.md' file is open, showing the title 'Organizing your data and software with a reproducible project workflow' and the subtitle 'DCC Spring Training Days'. The repository also has 76 commits, 0 stars, 0 watching, and 4 forks. The 'About' section shows the repository URL 'dcc-training-lab.github.io/project-ma...'. The 'Releases' section shows 4 releases, with the latest release '2023-DCC-Spring-Training-...' published 5 days ago. The 'Packages' section shows no packages published. The 'Environments' section shows 1 environment, 'github-pages', which is active.

main 2 branches 4 tags

Go to file Add file <> Code

This branch is 12 commits ahead of meronvermaas:main. Contribute Sync fork

meronvermaas Update README.md 2c66984 yesterday 76 commits

data	Add data source info	2 years ago
lessons	Update future.md	5 days ago
presentations	add pptx presentation used in movie	last year
transcripts	project archive transcript first draft	2 years ago
.gitignore	Create .gitignore	2 years ago
LICENSE.md	fix typo	2 years ago
README.md	Update README.md	yesterday
preparation.md	Update preparation.md	5 days ago

README.md

DOI 10.5281/zenodo.8047483

Organizing your data and software with a reproducible project workflow

DCC Spring Training Days

About

[dcc-training-lab.github.io/project-ma...](#)

- Readme
- View license
- Activity
- 0 stars
- 0 watching
- 4 forks

Report repository

Releases 4

2023-DCC-Spring-Training-... 5 days ago Latest

+ 3 releases

Packages

No packages published
[Publish your first package](#)

Environments 1

github-pages Active

3. Archive the project for posterity on Zenodo.

Why archiving?



A release in GitHub

The screenshot displays the GitHub Releases interface. At the top, there are tabs for 'Releases' and 'Tags', a 'Draft a new release' button, and a search bar for 'Find a release'. The main content area shows two releases. The first release, '2023-DCC-Spring-Training-Days', is marked as 'Latest' and was created 5 days ago by user 'vansteph'. It includes a description and two assets: 'Source code (zip)' and 'Source code (tar.gz)'. The second release, 'Zenodo Release of 2022 training material', was created on Apr 17 by 'vansteph' and includes a description and two assets. The left sidebar for each release shows the commit hash and a 'Compare' button.

Releases Tags

Draft a new release Find a release

5 days ago
vansteph
2023
c19735b
Compare

2023-DCC-Spring-Training-Days Latest

This is the material as used in our 2023 edition of this DCC spring training

▼ Assets 2

Source code (zip) 5 days ago

Source code (tar.gz) 5 days ago

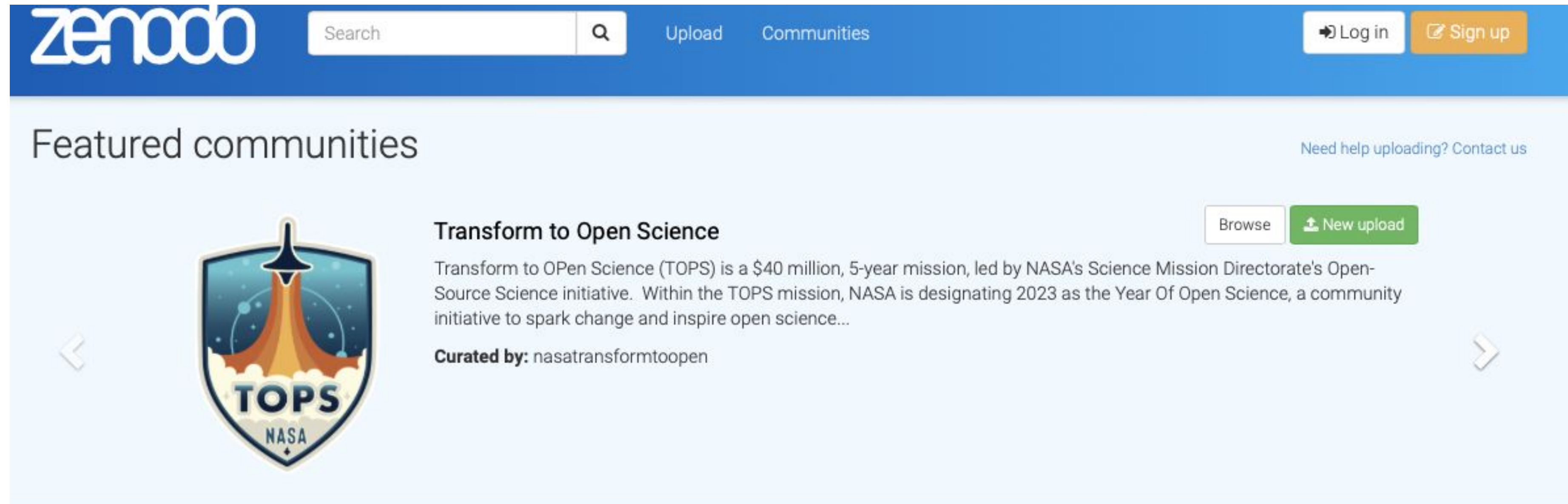
Apr 17
vansteph
2022.1
6f511a2
Compare

Zenodo Release of 2022 training material

This is the material of the DCC spring trainings days in 2022

► Assets 2


... can be automatically archived in Zenodo!



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Featured communities

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Transform to Open Science

Browse New upload

Transform to OPen Science (TOPS) is a \$40 million, 5-year mission, led by NASA's Science Mission Directorate's Open-Source Science initiative. Within the TOPS mission, NASA is designating 2023 as the Year Of Open Science, a community initiative to spark change and inspire open science...

Curated by: nasatransformtoopen

Recent uploads

June 20, 2023 (v14) Dataset Open Access

View

Binary black-hole surrogate waveform catalog

Scott E. Field; Chad R. Galley; Jan S. Hesthaven; Jason Kaye; Manuel Tiglio; Jonathan Blackman; Béla Szilágyi; Mark A. Scheel; Daniel A. Hemberger; Patricia Schmidt; Rory Smith; Christian D. Ott; Michael Boyle; Lawrence E. Kidder; Harald P. Pfeiffer; Vijay Varma

This repository contains all publicly available numerical relativity surrogate data for waveforms produced by the Spectral Einstein Code. The base method for building surrogate models can be found in Field et al., PRX 4, 031006 (2014). Several numerical relativity surrogate models are currently...

Uploaded on June 20, 2023

13 more version(s) exist for this record

Why use Zenodo?

- **Safe** – your research is stored safely for the future in CERN's Data Centre for as long as CERN exists.
- **Trusted** – built and operated by CERN and OpenAIRE to ensure that everyone can join in Open Science.
- **Citeable** – every upload is assigned a Digital Object Identifier (DOI), to make them citable and trackable.
- **No waiting time** – Uploads are made available online as soon as you hit publish, and your DOI is registered within seconds.
- **Open or closed** – Share e.g. anonymized

Obtain a DOI for your software for every release

Home / Account / GitHub

Settings

- Profile
- Change password
- Security
- Linked accounts
- Applications
- Shared links
- GitHub**

GitHub Repositories

(updated now) [Sync now ...](#)

Get started

- 1 Flip the switch**

Select the repository you want to preserve, and toggle the switch below to turn on automatic preservation of your software.

ON
- 2 Create a release**

Go to GitHub and [create a release](#). Zenodo will automatically download a .zip-ball of each new release and register a DOI.
- 3 Get the badge**

After your first release, a DOI badge that you can include in GitHub README will appear next to your repository below.

DOI 10.5281/zenodo.8475
(example)

Enabled Repositories

- [DCC-training-lab/2021-spring-training-days](#)

☰ README.md ✎

DOI 10.5281/zenodo.8047483

Organizing your data and software with a reproducible project workflow

Digital Object Identifier (DOI)



Publication date:
May 12, 2021

DOI:
DOI 10.5281/zenodo.4753914

Keyword(s):
R package Natura 2000 habitat environment
data Flanders Belgium

Related identifiers:
Supplement to
<https://github.com/inbo/n2khab/tree/v0.5.0>

Communities:
Research Institute for Nature and Forest (INBO)
Zenodo

License (for files):
[GNU General Public License v3.0 only](#)

License



Older versions



Versions

Version 0.5.0	May 12, 2021
10.5281/zenodo.4753914	
Version 0.4.0	Feb 10, 2021
10.5281/zenodo.4531807	
Version 0.3.1	Oct 26, 2020
10.5281/zenodo.4133524	
Version 0.3.0	Oct 16, 2020
10.5281/zenodo.4096139	
Version 0.2.0	May 8, 2020
10.5281/zenodo.3817690	

[View all 8 versions](#)

June 16, 2023 Software Open Access

DCC-training-lab/project-management: 2023-DCC-Spring-Training-Days

Barbara Vreede; Stephanie van de Sandt; meronvermaas

This is the material as used in our 2023 edition of this DCC spring training

Preview

project-management-2023.zip

- DCC-training-lab-project-management-c19735b
 - .gitignore 12 Bytes
 - LICENSE.md 114 Bytes
 - README.md 3.5 kB
 - data
 - README.md 712 Bytes
 - datafile_1.xlsx 9.1 kB
 - datafile_10.xlsx 9.2 kB
 - datafile_11.xlsx 9.2 kB
 - datafile_2.xlsx 9.1 kB
 - datafile_3.xlsx 9.1 kB
 - datafile_4.xlsx 9.1 kB
 - datafile_5.xlsx 9.1 kB
 - datafile_6.xlsx 9.2 kB
 - datafile_7.xlsx 9.3 kB
 - datafile_8.xlsx 9.3 kB
 - datafile_9.xlsx 9.2 kB
 - datafiles.zip 79.6 kB
 - lessons

Files (9.7 MB)

Name	Size	
DCC-training-lab/project-management-2023.zip	9.7 MB	Preview Download
md5:773d16e0a5d99d9251deef8e64f2fd43		

Citations 0

Show only: Literature (0) Dataset (0) Software (0) Unknown (0)

Citations to this version

Search

No citations.

Exercise

1. Add a license to the project
2. Connect your GitHub page to Zenodo SANDBOX.
3. Make a release from the GitHub main page:
4. Return to the GitHub page in your Zenodo profile and see what happened.

A group of people are seated in a circle of white folding chairs in a bright, minimalist room with white walls and a light-colored wooden floor. In the background, a large black-framed window looks out onto a green outdoor area where several people are standing and talking. A man in a dark suit stands on the left side of the room, holding a book or folder. On the right, a man in a blue plaid shirt stands next to a professional video camera on a tripod. The people in the circle are dressed in a mix of business-casual and casual attire, and many are looking towards the center of the circle. A large, semi-transparent blue rectangle is overlaid in the center of the image, containing the word "Discussion" in white, bold, sans-serif font.

Discussion

Answer these questions for yourself and share the answers with the group

What is the main take-away from this workshop?

What experience in your past has taught you an important lesson about project management?



Thank you!