Quarto

Le mot de la fin

today

Hello Quarto

Share • Collaborate • Teach • Reimagine
(un Notebook pour les Gouverner tous)

Aurélie Mercadié

Christophe Regouby

Hello
my name is
Aurélie

Hello
my name is
Christophe

une HIS-TOIRE DU NOTEBOOK

Une définition

Une définition

Le Notebook, c’est la rencontre entre

- **l’exécution** du code

- la narration
  - l’intention
  - l’approche
  - les résultats

Quelques exemples

Quelques exemples

Quelques exemples

Read all metadata

We have more than 1.3 millions documents

[5]:
```
%%time
with open(pkl_file, "rb") as pk:
    all_metadata = pickle.load(pk)
print(f"There are {len(all_metadata):,d} documents, total size is {total_size(all_metadata) / mb} MB")
```

```
There are 1,360,527 documents, total size is 3581.0042362213135 MB
CPU times: user 1min 17s, sys: 4.06 s, total: 1min 21s
Wall time: 1min 21s
```

Convert to dataframe

Generate list of tuples docID/metadata name/metadata value

[6]:
```
%%time
DocMeta = namedtuple('DocMeta', ["doc_id", "metadata_name", "metadata_value"])
list_tuples = []
for doc in all_metadata:
    for m, v in doc["metadata"].items():
        list_tuples.append(DocMeta._make((doc["GUID"], m, v)))
```

```
CPU times: user 42.8 s, sys: 1.94 s, total: 44.7 s
Wall time: 44.7 s
```

Create

- dataframe from list of tuples
- cast every metedata value to strings
- create metadata name/value pair for one-hot encoding

[7]:
```
%%time

metadata_df =  pd.DataFrame.from_records(list_tuples, columns=DocMeta._fields)
metadata_df["metadata_value"] = metadata_df["metadata_value"].astype(str)
metadata_df["full_metadata"] = metadata_df["metadata_name"].str.cat(metadata_df["metadata_value"], sep="__")
print(f"There are {len(metadata_df):,d} doc/metadata pairs")
metadata_df.head()
```

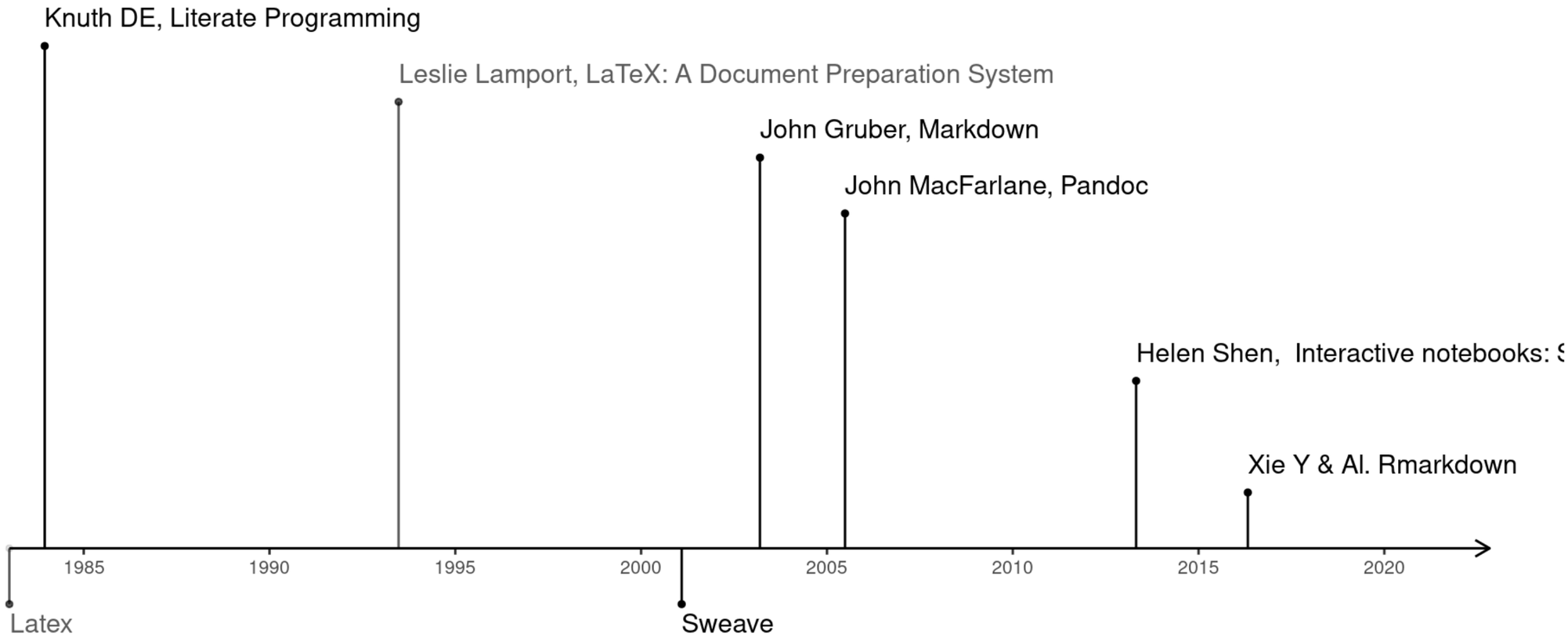
```
There are 24,064,266 doc/metadata pairs
CPU times: user 17.4 s, sys: 3.75 s, total: 21.2 s
Wall time: 21.1 s
```

[7]:

	doc_id	metadata_name	metadata_value	full_metadata
0	4f9c3397-691d-3122-bcc0-463d81a2a05c	Content-Encoding	windows-1252	Content-Encoding__windows-1252
1	4f9c3397-691d-3122-bcc0-463d81a2a05c	Content-Length	16896	Content-Length__16896

Quelques exemples

Les publications

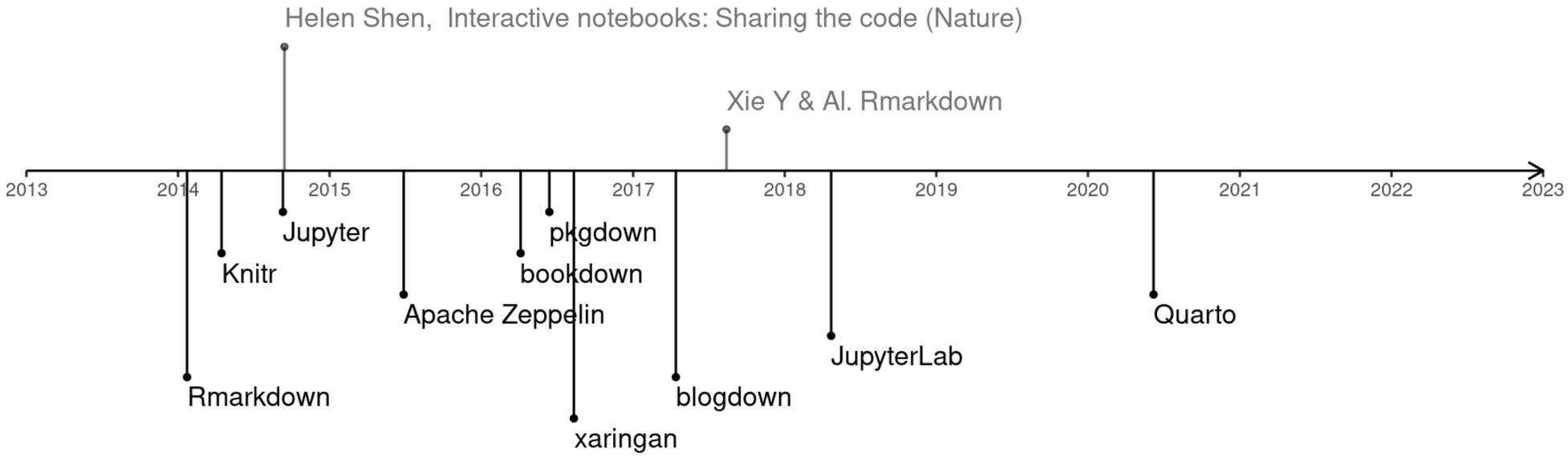


23 Databases

24 Arrow

Later in the chapter, we'll also see some connections between arrow and duckdb, so we'll also need dbplyr and duckdb.

Les packages



Les packages

tout un écosystème...

Hello, Quarto?

Quarto **unifie** et **étend** l'écosystème R Markdown

Quarto **unifie** et **étend** l'écosystème R Markdown

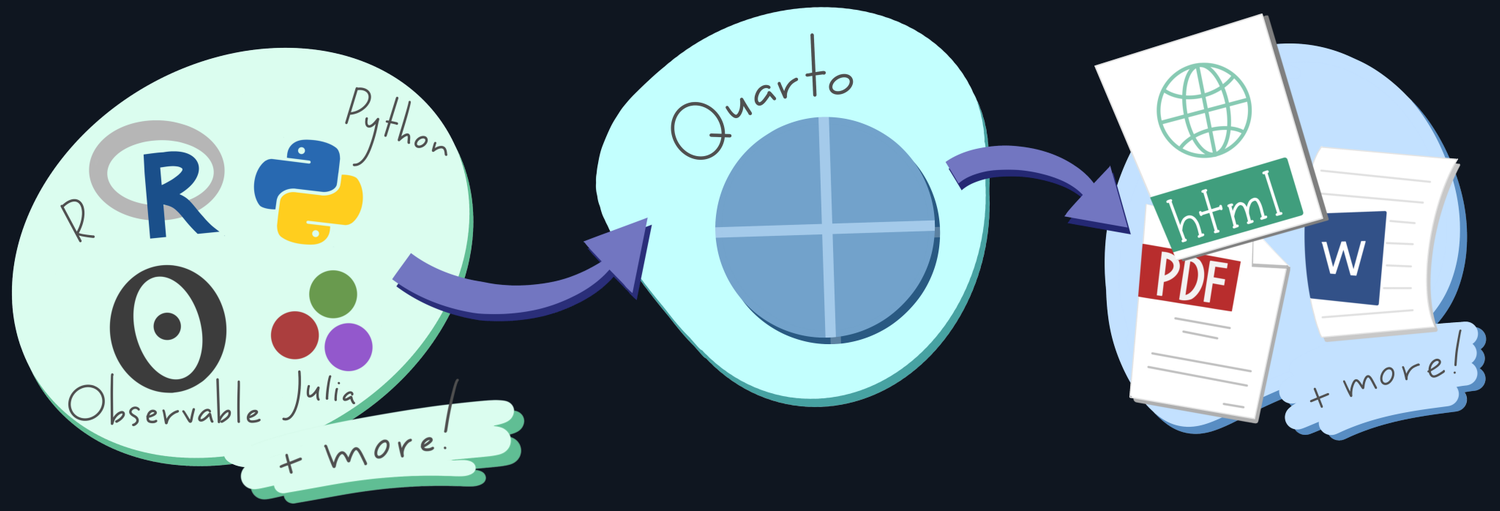
unifie les fans de R Markdown

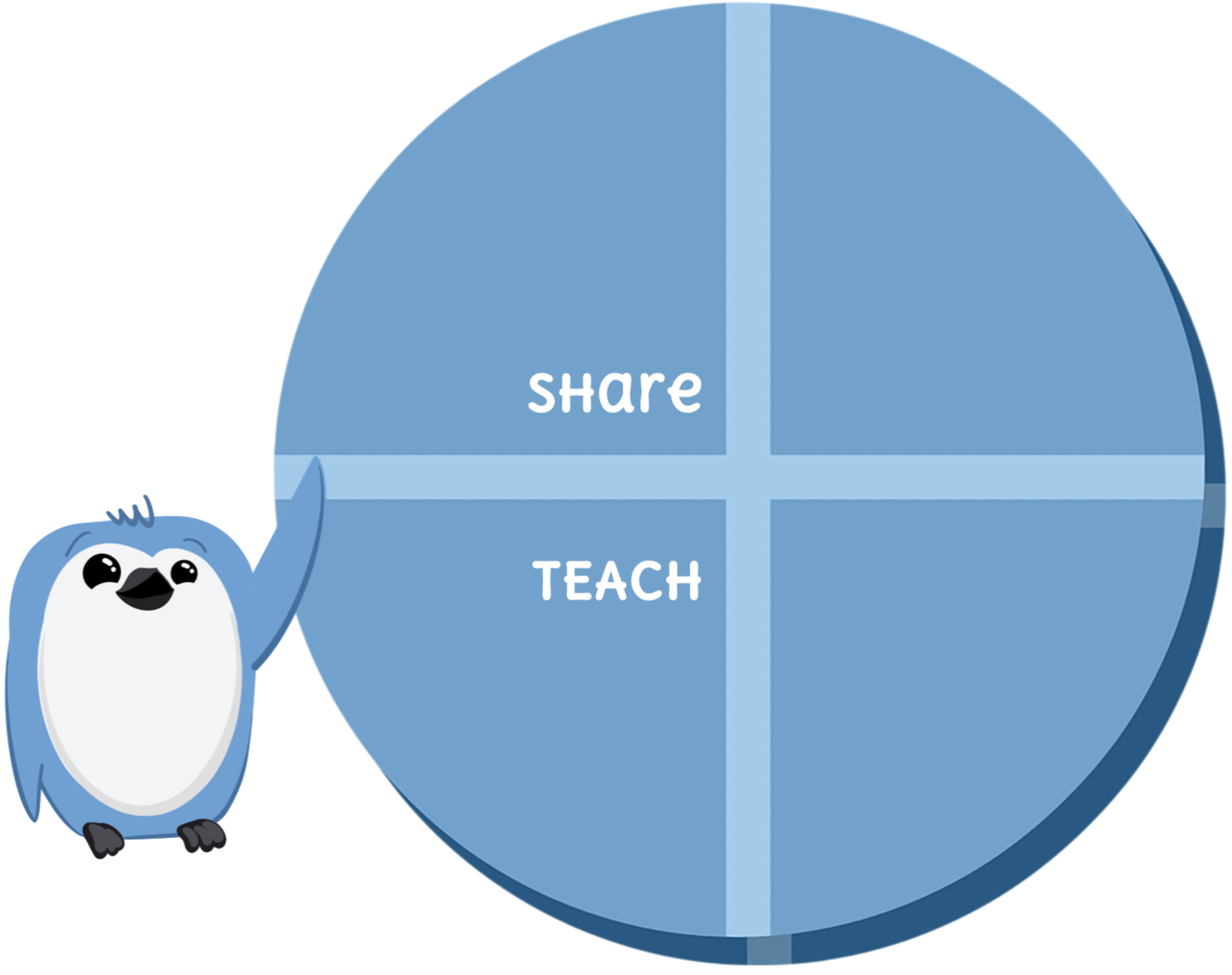
étend l'écosysteme à ceux qui ne connaissent pas R Markdown

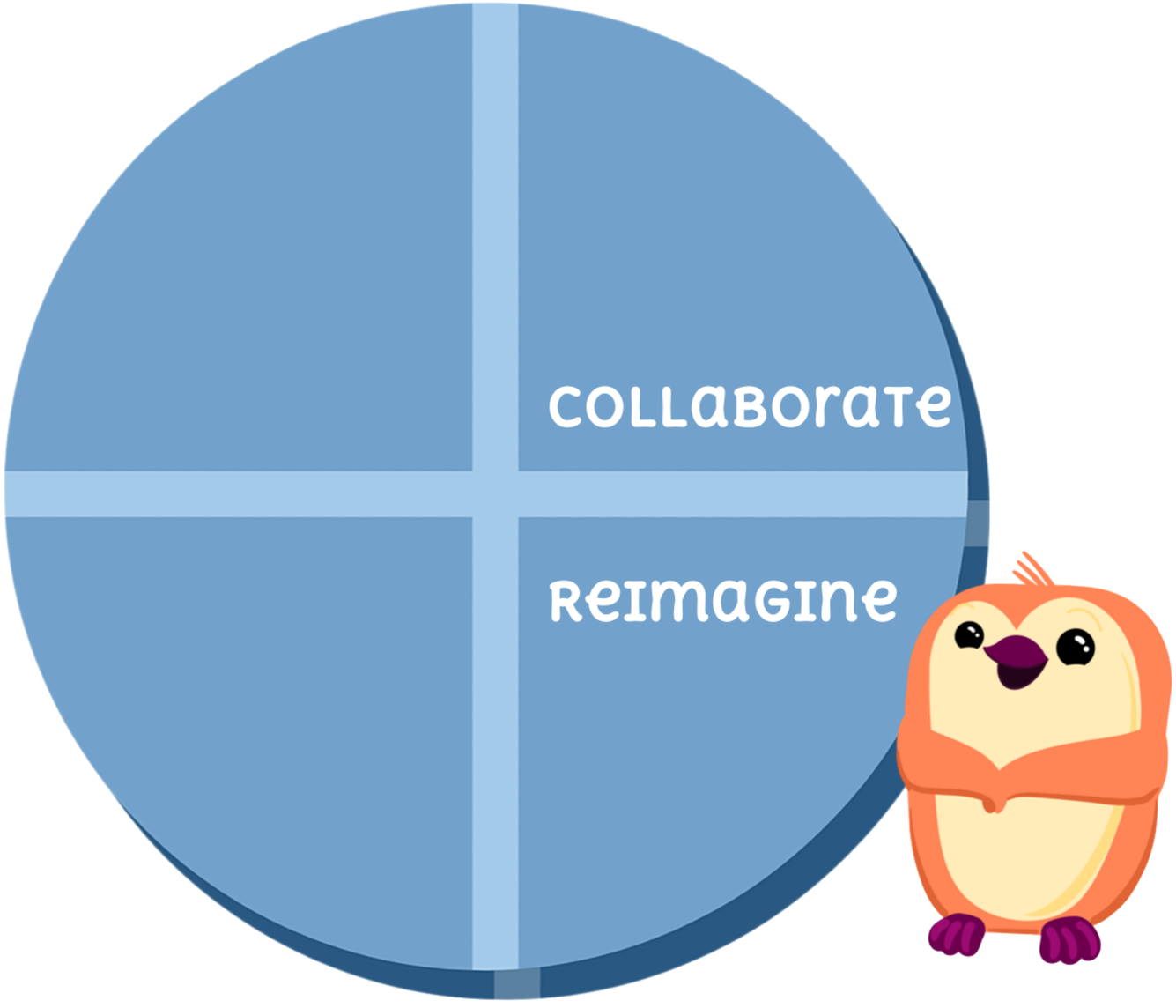
Quarto se présente comme le nouveau système open-source
de publication d’articles scientifiques and techniques

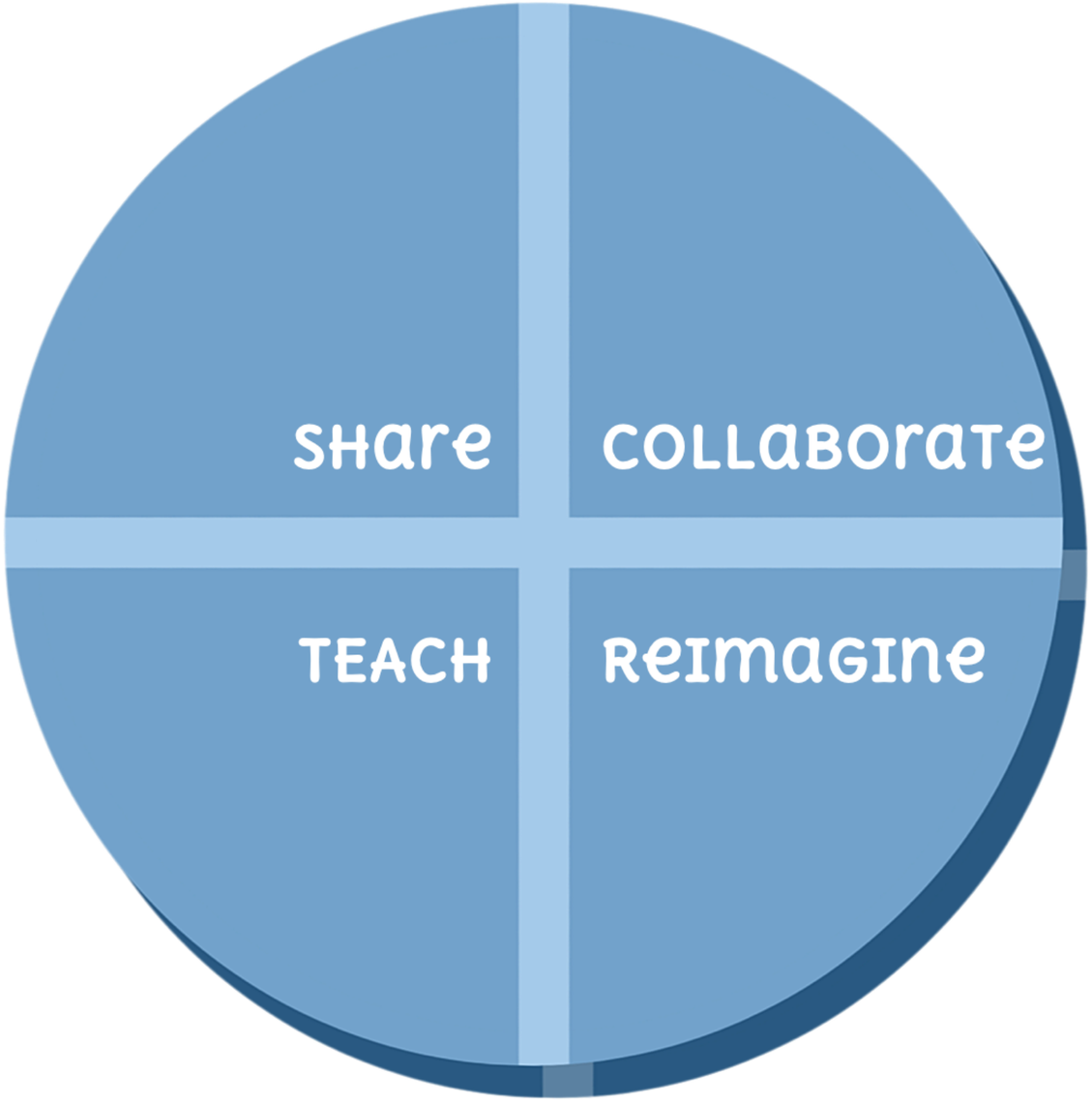
Quarto se présente comme le nouveau système open-source de publication d’articles scientifiques and techniques

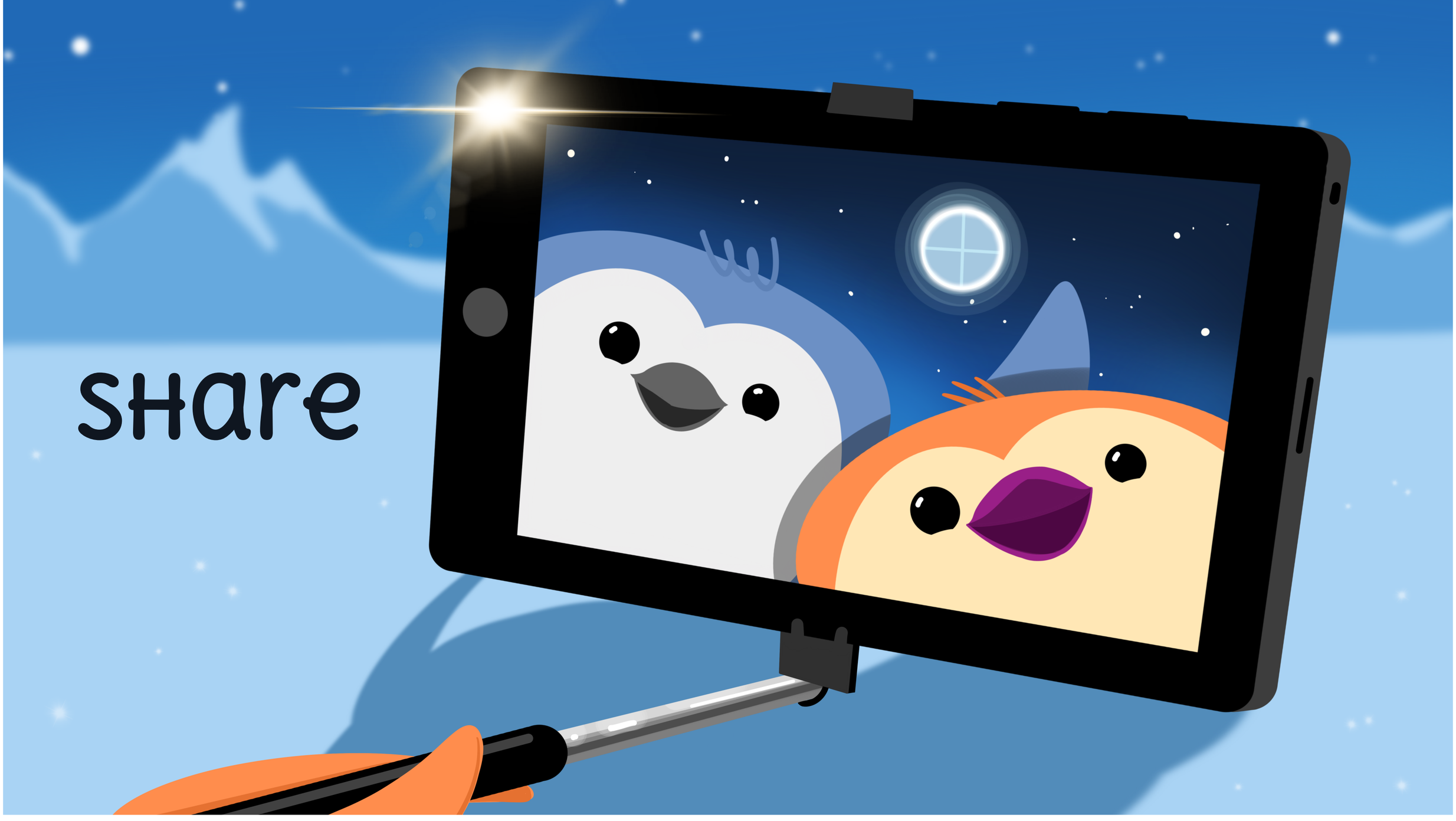
dans le but de rendre le process de création
et de collaboration radicalement plus simple


R
Python
Observable
Julia
+ more!
Quarto
html
PDF
W
+ more!


share
TEACH

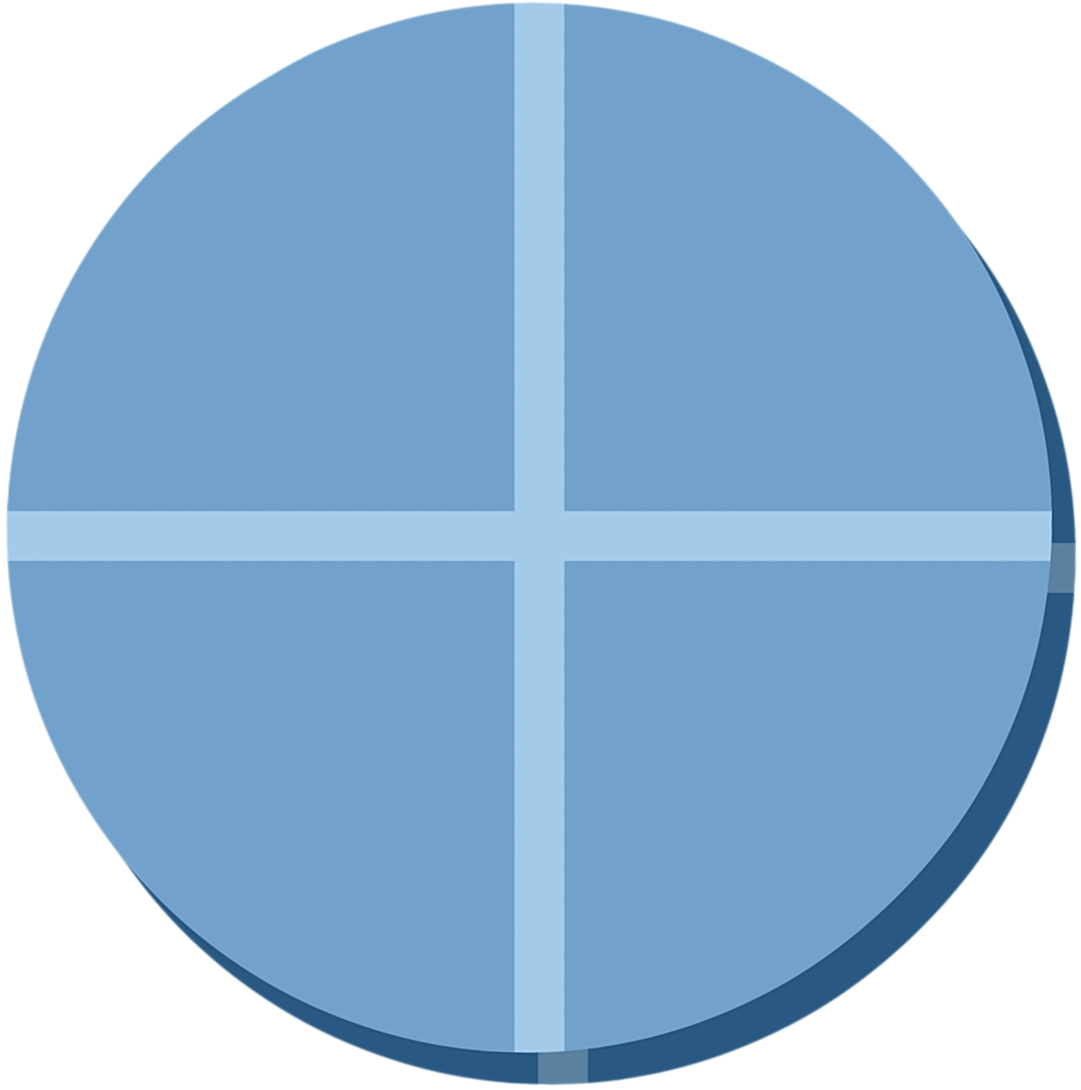

COLLABORATE
REIMAGINE


SHARE
COLLABORATE
TEACH
REIMAGINE


share

The R Markdown ecosystem

Quarto: Next generation R Markdown



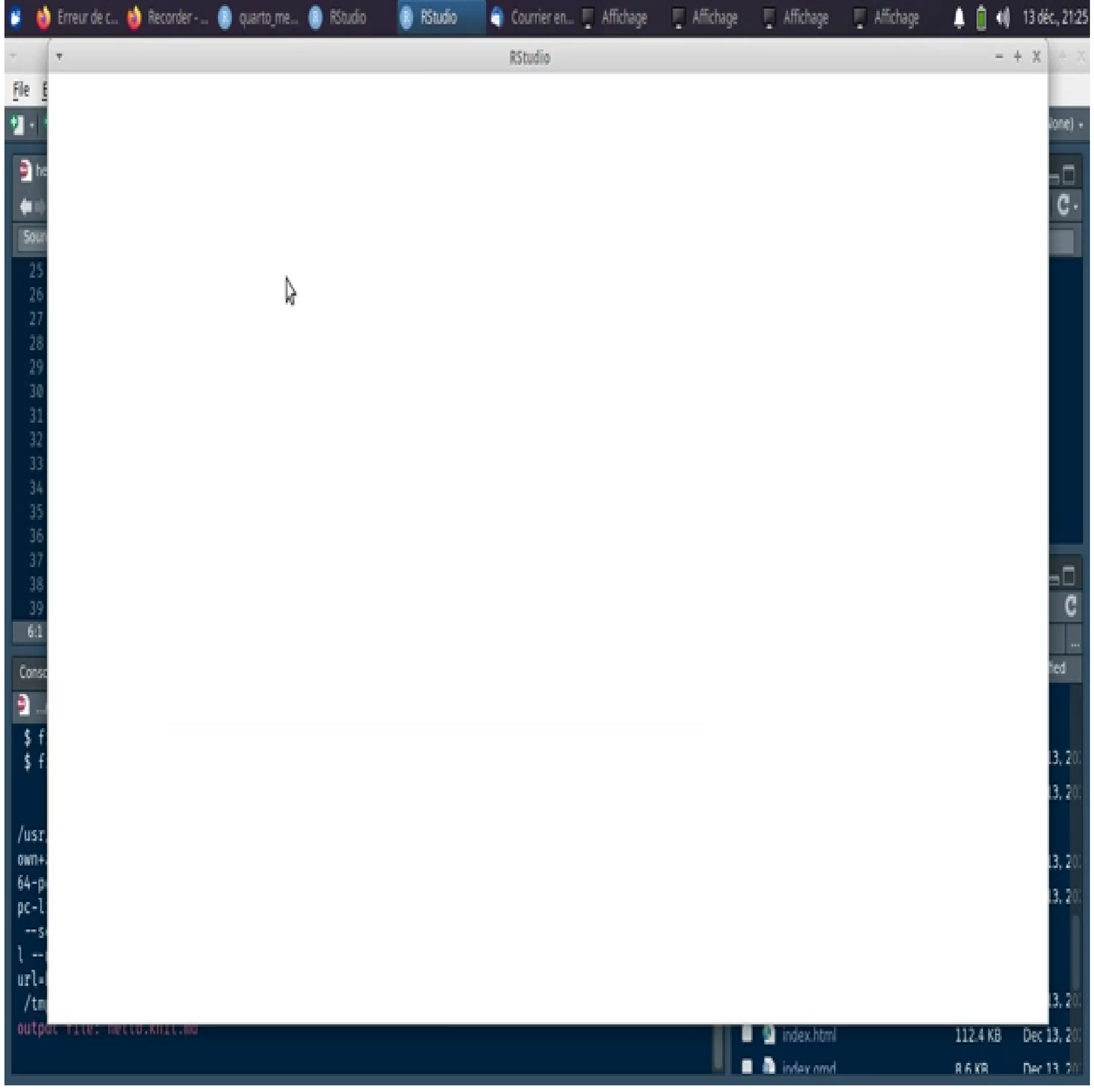
Quarto highlights

Consistent implementation of attractive and handy features across outputs: tabsets, code-folding, syntax highlighting, etc.

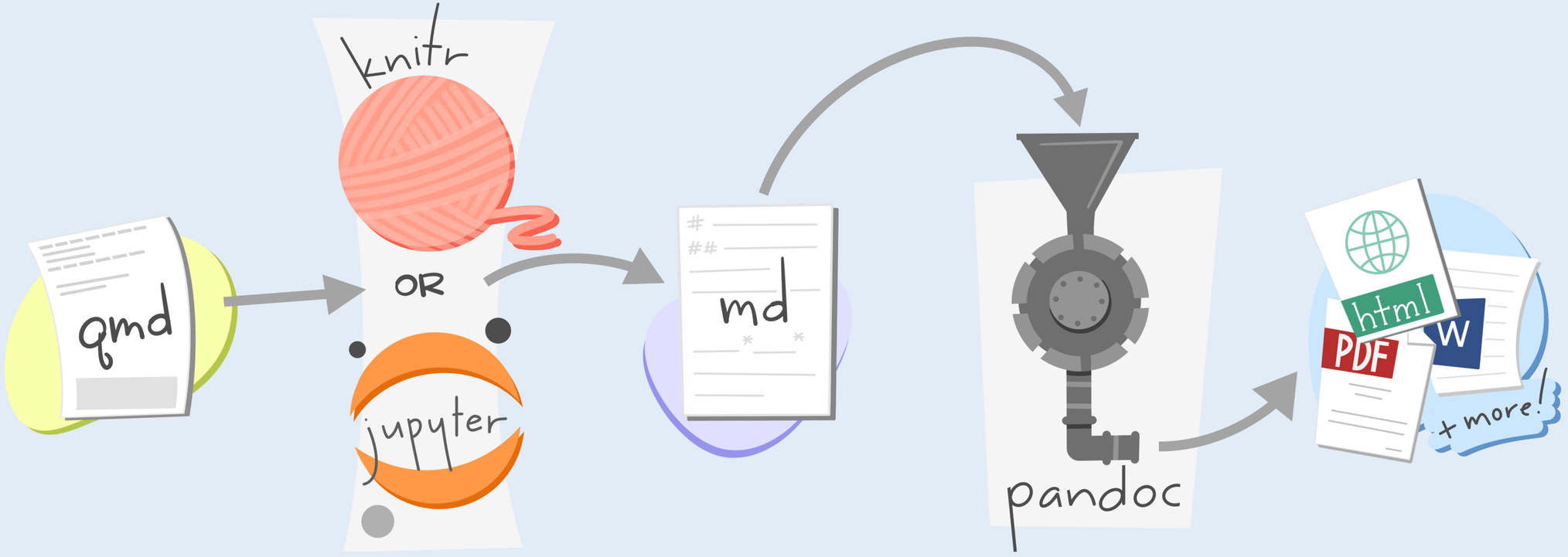
Guardrails, particularly helpful for new learners: YAML completion, informative syntax errors, etc.

More accessible defaults as well as better support for accessibility

Support for other languages like Python, Julia, Observable, and more via Jupyter engine for executable code chunks.


RStudio
File
index.html
112.4 KB

Quarto CLI orchestrates each step of rendering



Quarto makes moving between formats straightforward

Document

lesson-1.qmd

```
title: "Lesson 1"
format: html
```

Presentation

lesson-1.qmd

```
title: "Lesson 1"
format: revealjs
```

Website

_quarto.yml

```
project:
  type: website

website:
  navbar:
    left:
      - lesson-1.qmd
```

Quarto facilitates open sharing

Tooling that makes it easy to share what you do
with the world on the web is incredibly useful

It’s useful not just to you, but to the world
as it facilitates open sharing of knowledge
for learning and for reuse

collaborate

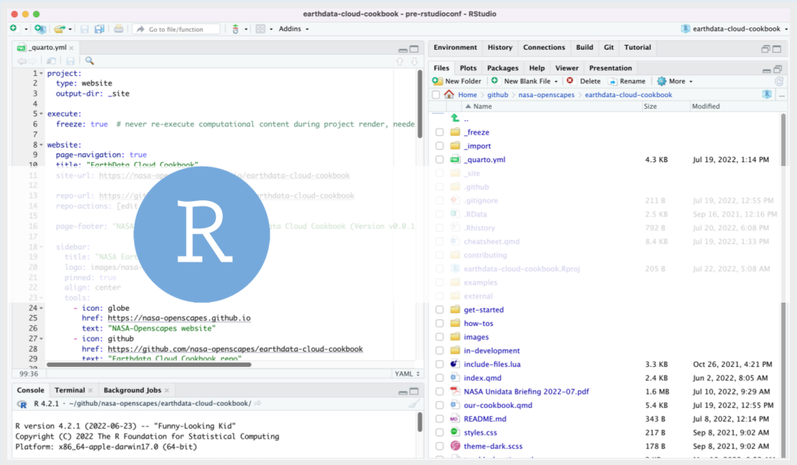
Many Data scientists use Python

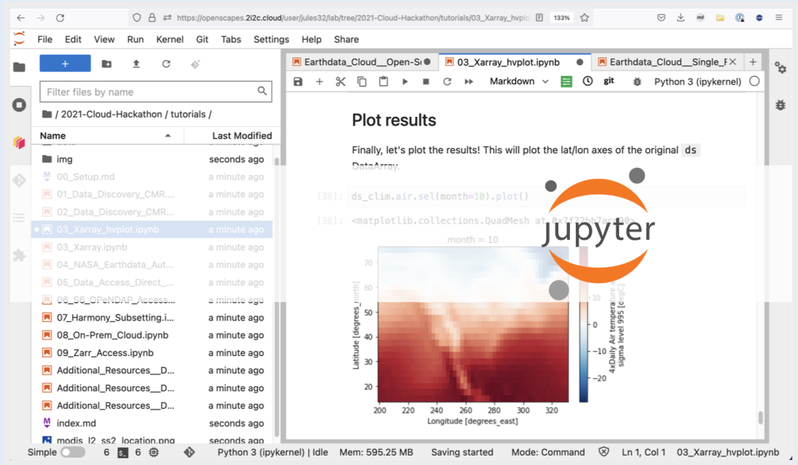
Quarto enables collaborating across coding languages

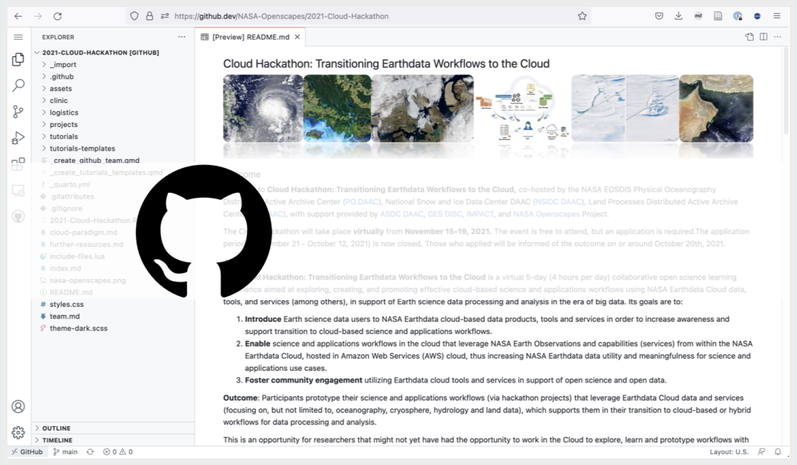
_quarto.yml

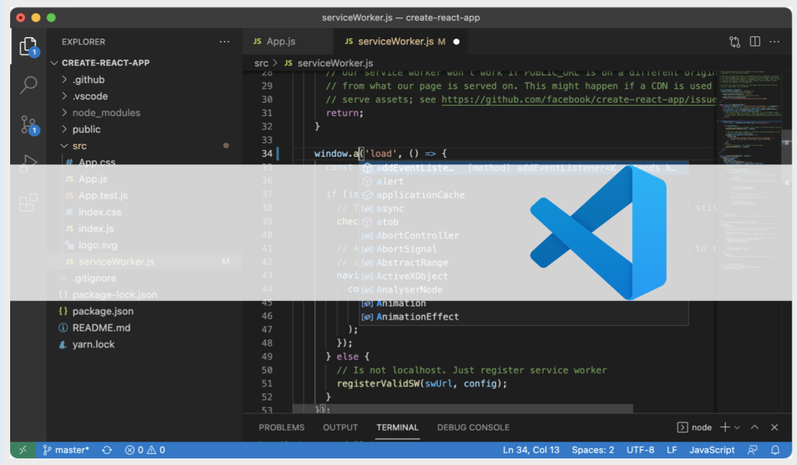
```yaml
contents:
  - section: in-development/index.qmd
    contents:
      - in-development/earthdata-access-demo.ipynb
      - in-development/nsidc/icesat2-cmr-onprem-vs-cloud.ipynb
      - in-development/lpdaac/lpdaac_ecostress_lste_kerchunk.ipynb
      - in-development/matlab-aws.qmd
      - in-development/earthdata-python-r-handoff.rmd
  - section: contributing/onboarding.qmd
    contents:
      - contributing/quarto-website-tutorial.md
```

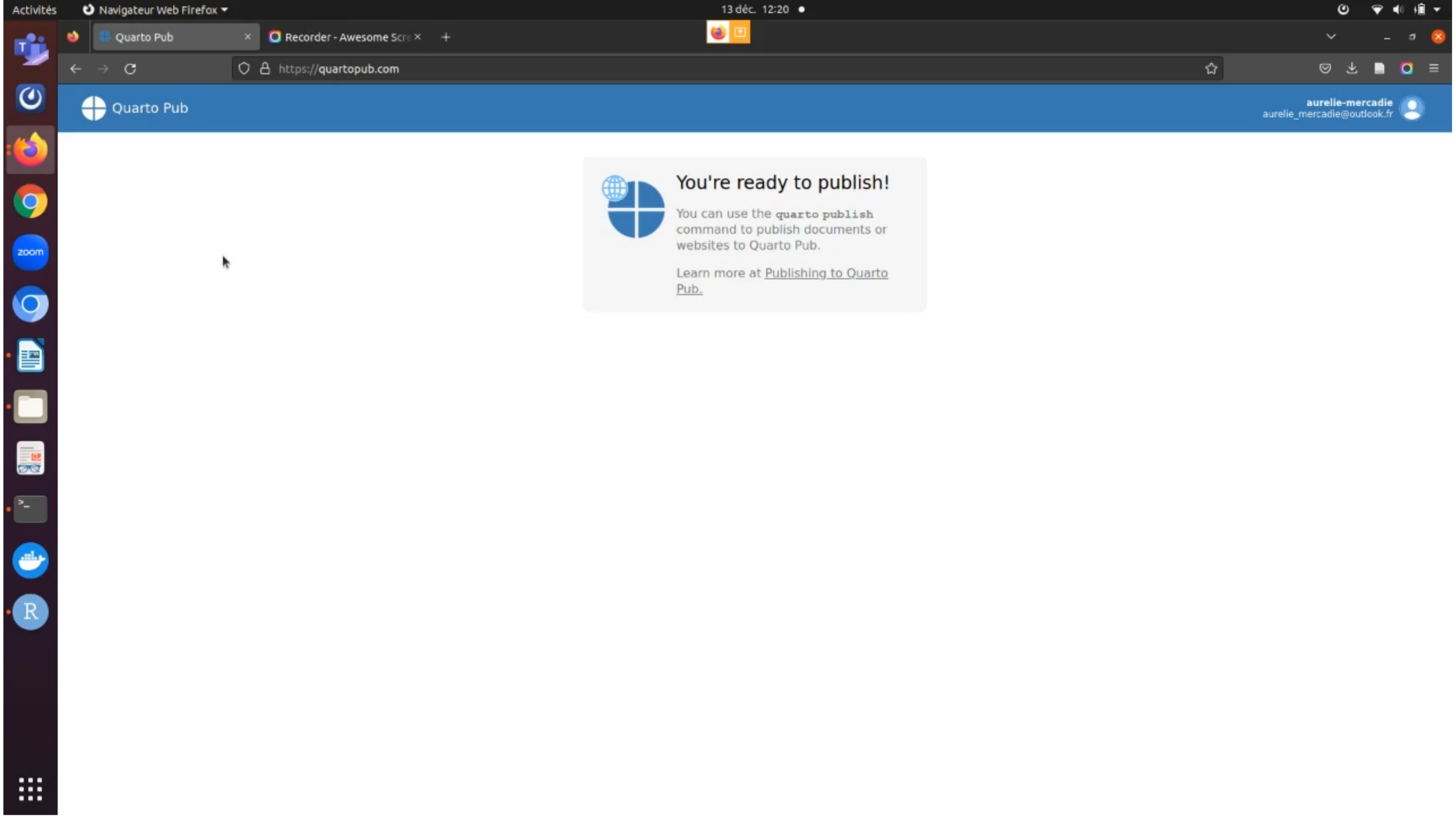
Quarto enables contributing from our current tools










Activités
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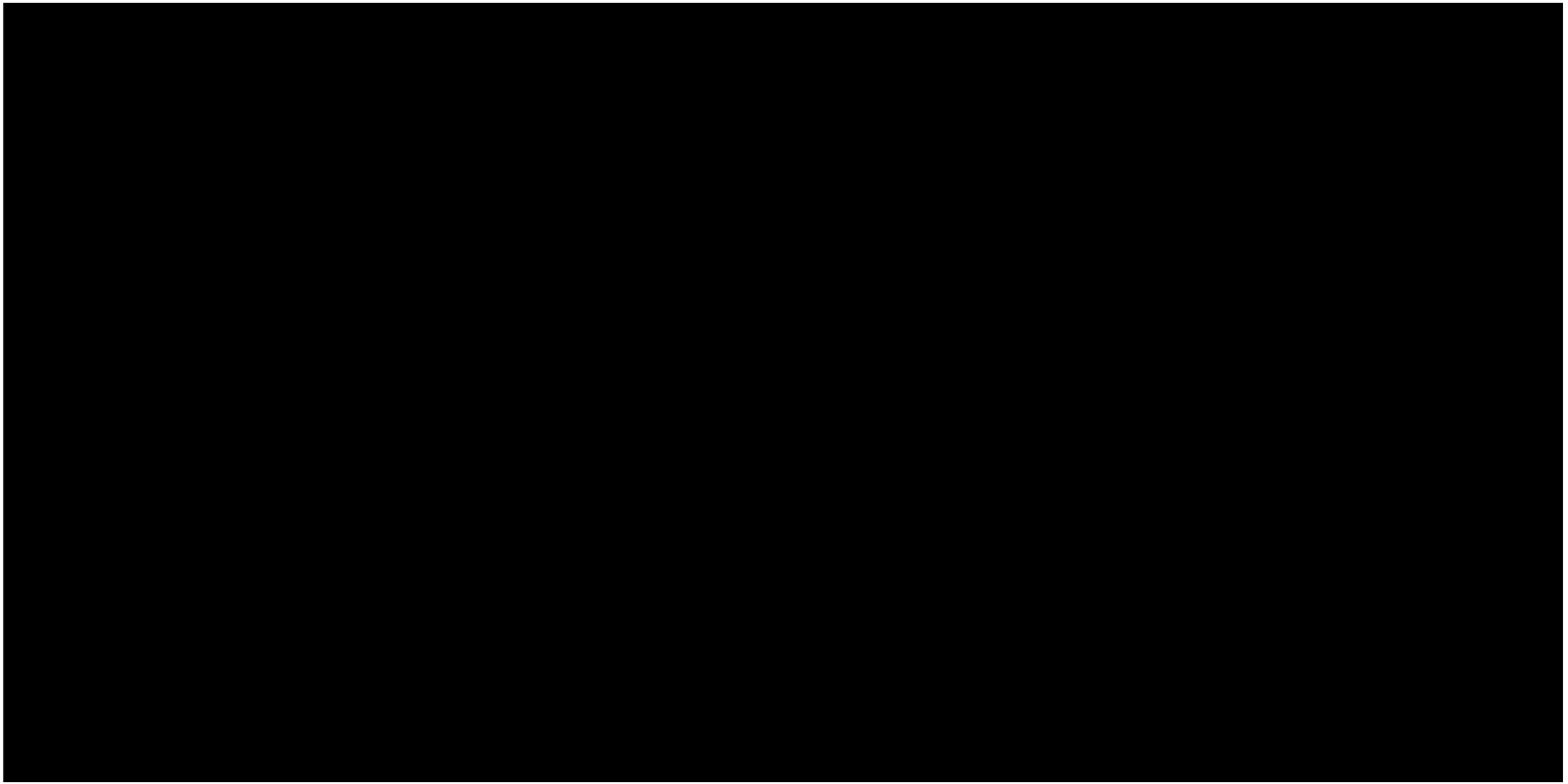
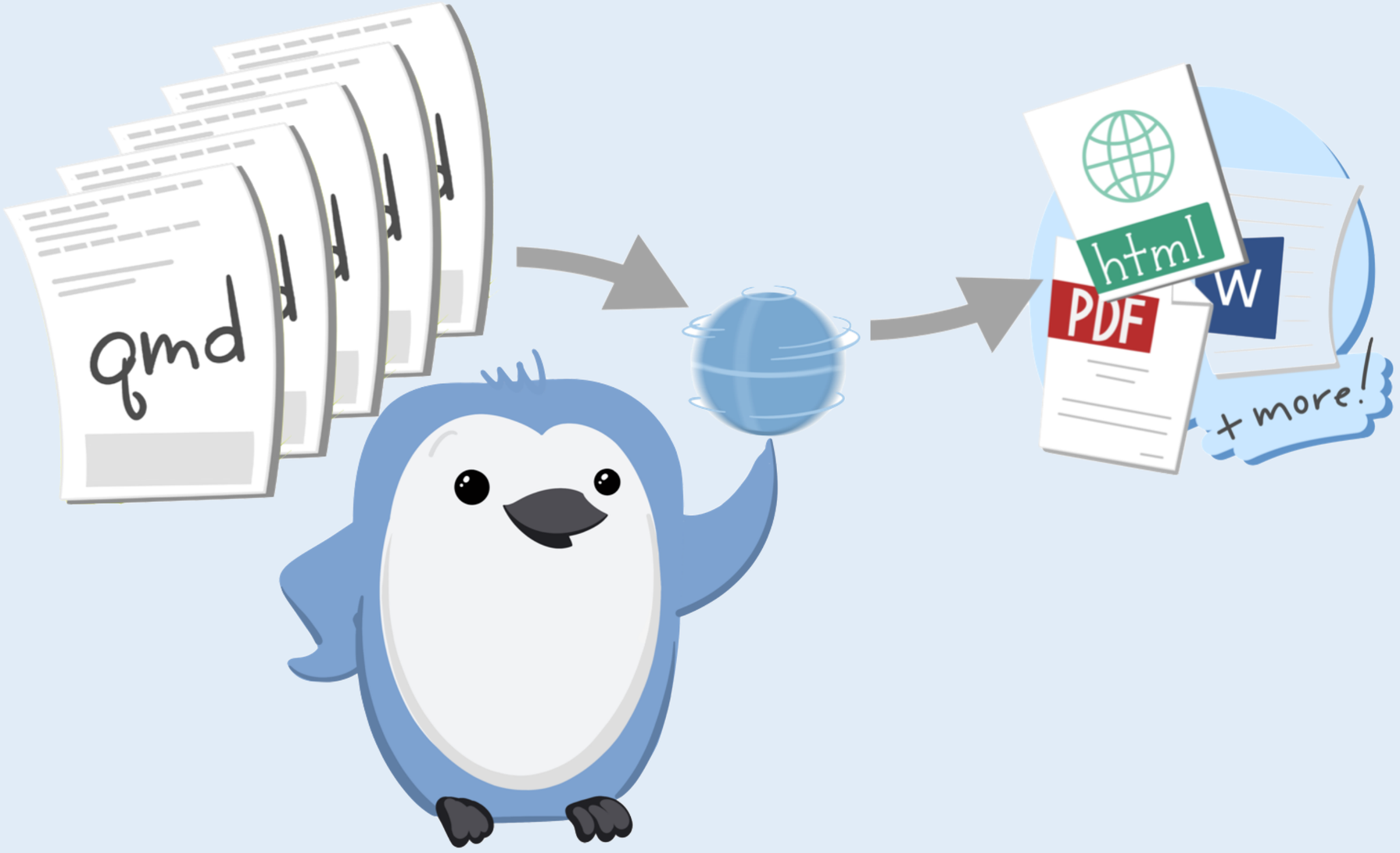
13 déc. 12:20
Quarto Pub
Recorder - Awesome Scre
https://quartopub.com
Quarto Pub
aurelie-mercadie
aurelie_mercadie@outlook.fr
You're ready to publish!
You can use the quarto publish command to publish documents or websites to Quarto Pub.
Learn more at Publishing to Quarto Pub.

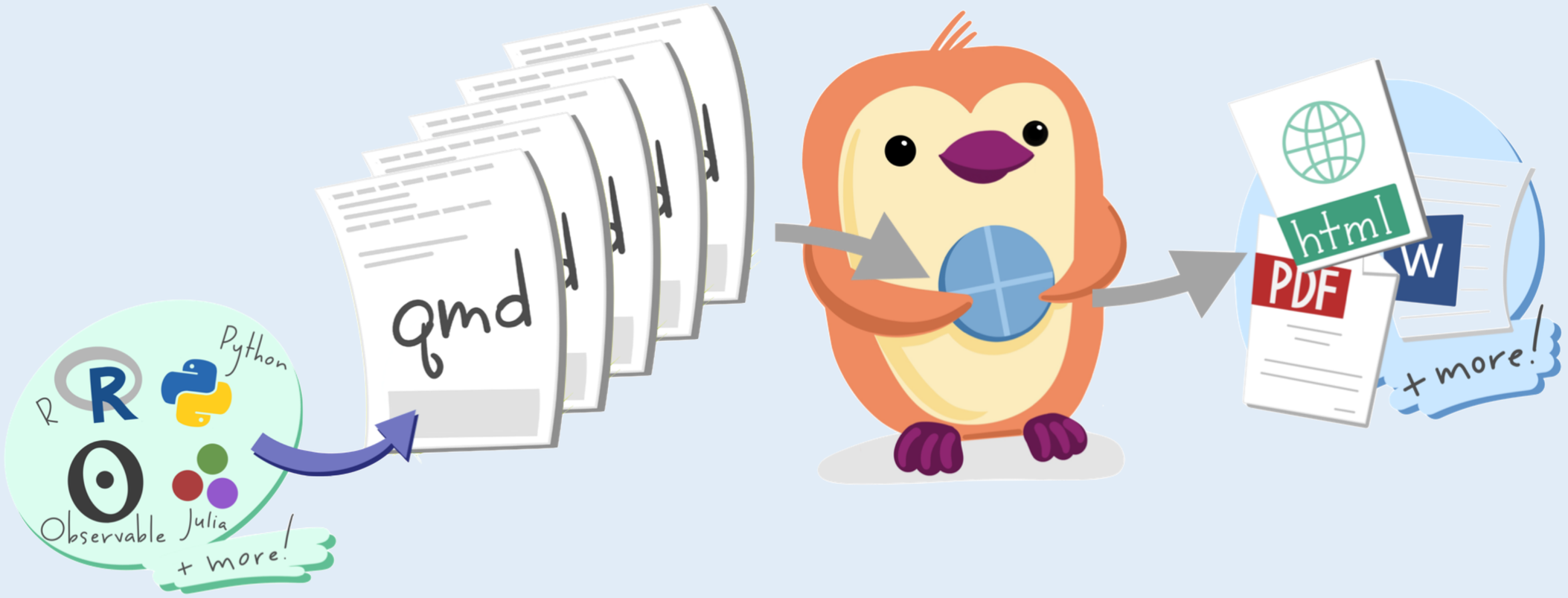
teach



Quarto flattens the learning curve



Quarto can grow with learners in a profound way



camembr.quarto.pub/hello-quarto

La technique

Installer

Suivre les instructions de Quarto.org.

> **Remarque**
>
> Nécessaire d'avoir une certaine version de l'IDE RStudio (v2022.07).

1. Installer Quarto CLI
2. Installer le package éponyme `quarto`

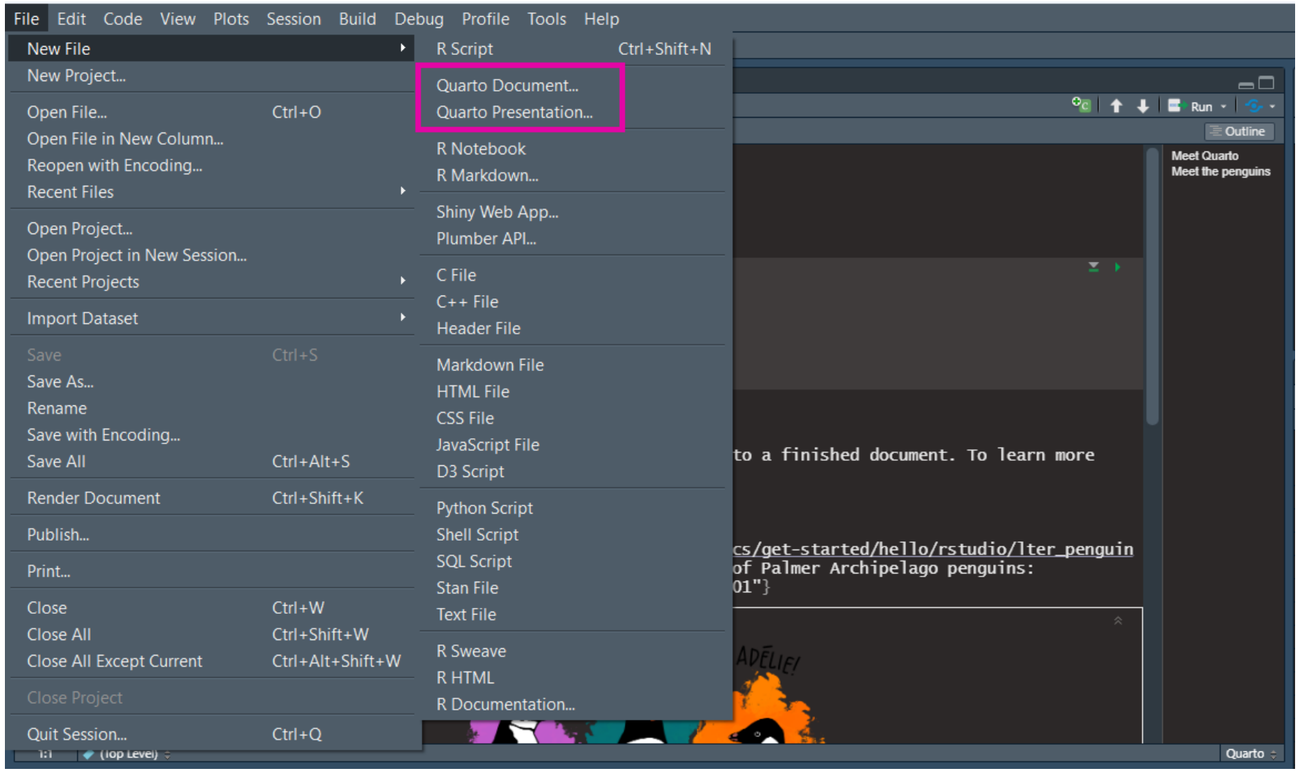
> Quarto peut s'utiliser en dehors de tout IDE, directement en ligne de commande

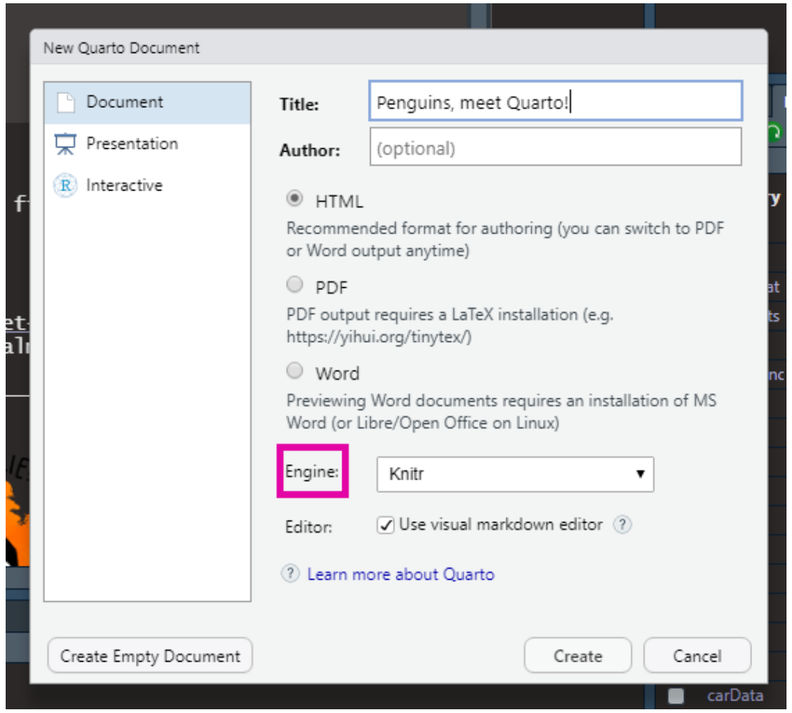
Créer un notebook

Une fois l'installation faite, comment lancer Quarto?

RStudio | Jupyter

Des formats de fichiers spéciaux proposés dans `File`: une nouvelle extension, `.qmd`



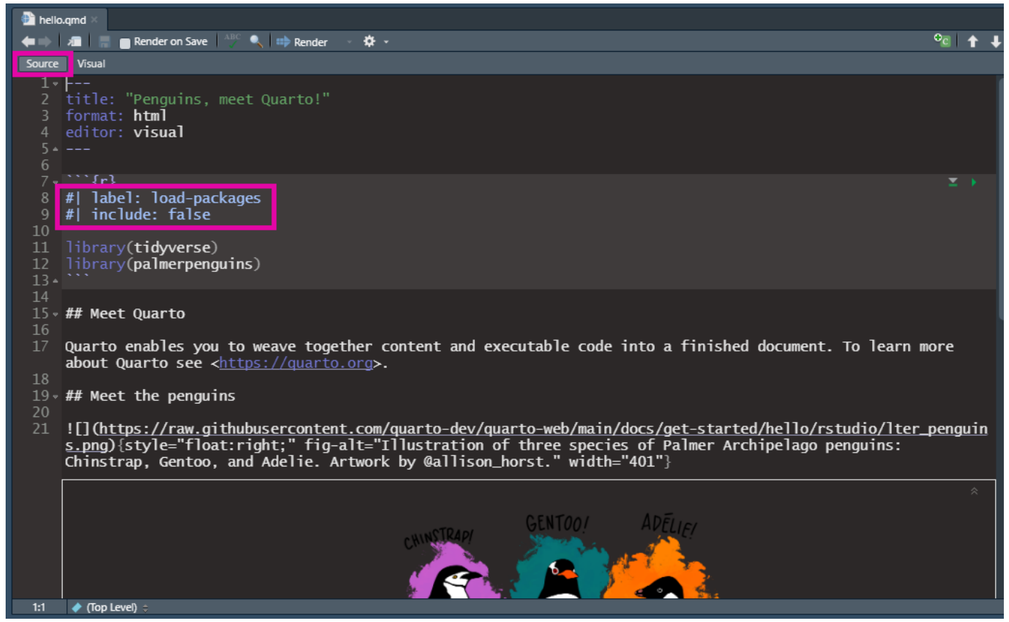


Créer un notebook

Une fois l'installation faite, comment lancer Quarto?

RStudio | Jupyter

Un bouton `Render` au lieu de `Knitr` pour générer le document

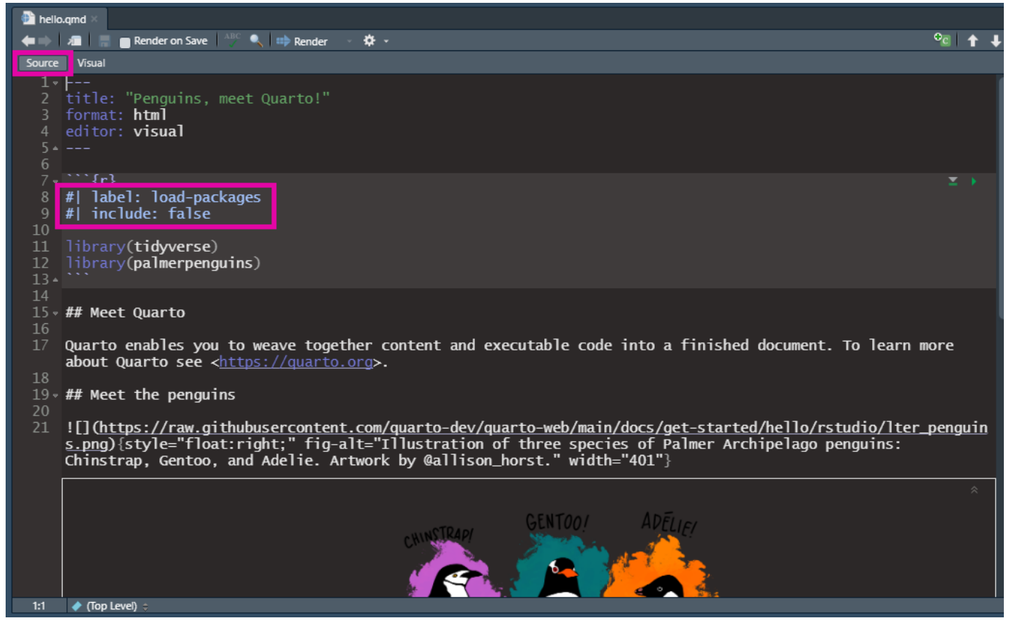


Créer un notebook

Une fois l'installation faite, comment lancer Quarto?

RStudio | Jupyter

Une autre manière de spécifier les "chunk options" (pipe natif #|)

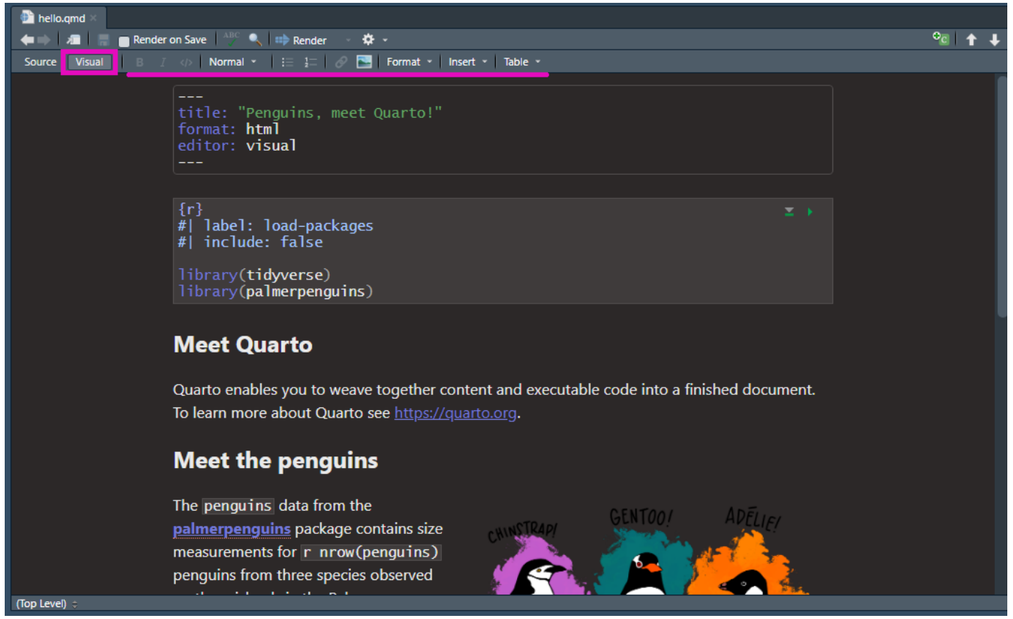


Créer un notebook

Une fois l'installation faite, comment lancer Quarto?

RStudio | Jupyter

Deux modes: **Source** ou **Visual**, possible d'aller de l'un à l'autre à volonté



Que peut-on faire en Quarto ?

Que peut-on faire en Quarto ?

- des rapports;
- des présentations;
- des sites web;
- des livres et articles.

Quarto rend possible de passer de l'un à l'autre sans (presque) aucune modification dans le code!

Rapports

- HTML
- PDF
- Word

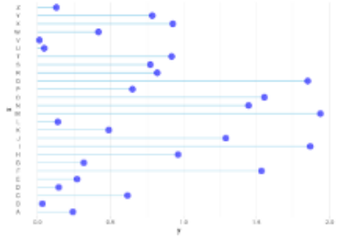
Quoi de plus que dans Rmarkdown (HTML) ?

Rapport HTML : formats

- `margin` : Mettre des figures à côté (et non plus juste en dessous) du code

▼ Code

```
# Create data
data <- data.frame(
  x=LETTERS[1:26],
  y=abs(rnorm(26))
)

# Horizontal version
ggplot(data, aes(x=x, y=y)) +
  geom_segment( aes(x=x, xend=x, y=0, yend=y), color="skyblue") +
  geom_point( color="blue", size=4, alpha=0.6) +
  theme_light() +
  coord_flip() +
  theme(
    panel.grid.major.y = element_blank(),
    panel.border = element_blank(),
    axis.ticks.y = element_blank()
  )
```

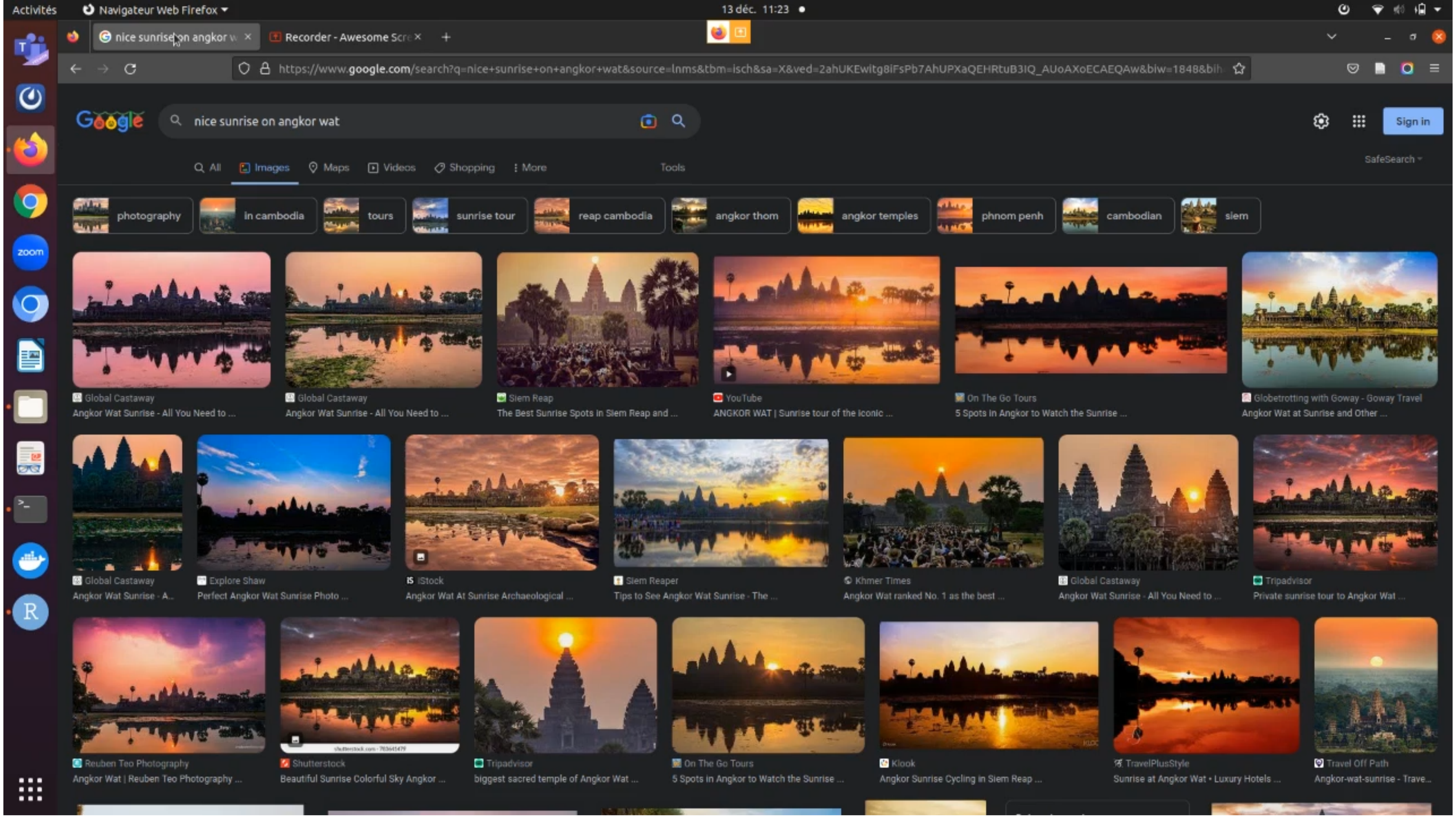


A lollipop plot!

- `columns` : arranger plus ou moins la place prise par l'objet en fonction du bloc

Rapport HTML: le copier-coller

Possible de copier-coller une image (s'enregistre automatiquement dans un dossier `images`)


Activités
Navigateur Web Firefox
13 déc. 11:23
nice sunrise on angkor w
Recorder - Awesome Scre
https://www.google.com/search?q=nice+sunrise+on+angkor+wat&source=lnms&tbm=isch&sa=X&ved=2ahUKEwitg8iFsPb7AhUPXaQEHRtuB3IQ_AUoAXoECAEQAw&biw=1848&bih
Google
nice sunrise on angkor wat
Sign in
All
Images
Maps
Videos
Shopping
More
Tools
SafeSearch
photography
in cambodia
tours
sunrise tour
reap cambodia
angkor thom
angkor temples
phnom penh
cambodian
siem
Global Castaway
Angkor Wat Sunrise - All You Need to ...
Global Castaway
Angkor Wat Sunrise - All You Need to ...
Siem Reap
The Best Sunrise Spots in Siem Reap and ...
YouTube
ANGKOR WAT | Sunrise tour of the iconic ...
On The Go Tours
5 Spots in Angkor to Watch the Sunrise ...
Globetrotting with Goway - Goway Travel
Angkor Wat at Sunrise and Other ...
Global Castaway
Angkor Wat Sunrise - A...
Explore Shaw
Perfect Angkor Wat Sunrise Photo ...
iStock
Angkor Wat At Sunrise Archaeological ...
Siem Reaper
Tips to See Angkor Wat Sunrise - The ...
Khmer Times
Angkor Wat ranked No. 1 as the best ...
Global Castaway
Angkor Wat Sunrise - All You Need to ...
Tripadvisor
Private sunrise tour to Angkor Wat ...
Reuben Teo Photography
Angkor Wat | Reuben Teo Photography ...
Shutterstock
Beautiful Sunrise Colorful Sky Angkor ...
Tripadvisor
biggest sacred temple of Angkor Wat ...
On The Go Tours
5 Spots in Angkor to Watch the Sunrise ...
Klook
Angkor Sunrise Cycling in Siem Reap ...
TravelPlusStyle
Sunrise at Angkor Wat • Luxury Hotels ...
Travel Off Path
Angkor-wat-sunrise - Trave...

Rapport HTML: le copier-coller

Ainsi que du texte formaté (Quarto va conserver ce format).

Rapport HTML : autres

Les trucs un peu gadget (mais quand même cool!) :

- Pouvoir afficher le rapport en mode clair ou sombre[1].
- Le code: copier-coller, cacher/montrer, séparer automatiquement en plusieurs lignes
- Afficher les citations et notes de bas de page en passant la souris dessus
- `code-link` ou intégrer l'URL des pages d'aide des fonctions R[2].

Présentations

- Reveal.js
- Beamer
- Même possible d’exporter en `.ppt`

Quoi de plus que dans RMarkdown ?

Présentation HTML : surligner le code

Faire apparaître au fur et à mesure le code pour pouvoir le commenter plus facilement

```
# Most basic bubble plot
data %>%
  arrange(desc(pop)) %>%
  mutate(country = factor(country, country)) %>%
  ggplot(aes(x=gdpPercap, y=lifeExp, size=pop, fill=continent)) +
    geom_point(alpha=0.5, shape=21, color="black") +
    scale_size(range = c(.1, 24), name="Population (M)") +
    scale_fill_viridis(discrete=TRUE, guide=FALSE, option="A") +
    theme_ipsum() +
    theme(legend.position="bottom") +
    ylab("Life Expectancy") +
```

Présentation HTML : `chalkboard`

- Un outil pour entourer, dessiner, écrire sur le slide
- Un tableau noir + craie avec possibilité d’intégrer les notes aux slides

Pour en savoir plus: chalkboard

Présentation HTML : extension pointeur

```
$ quarto install extension quarto-ext/pointer
```

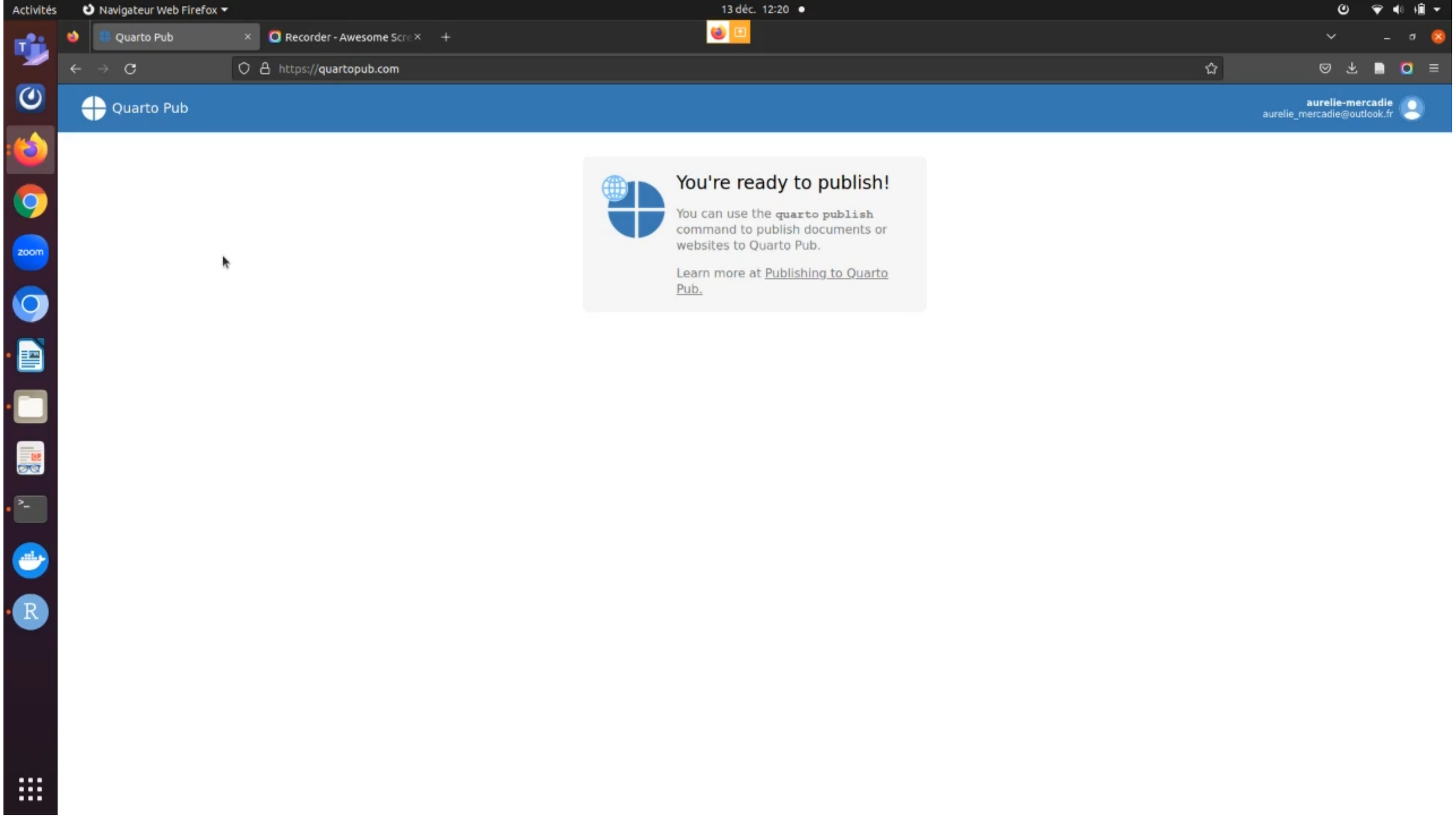
Raccourci = Touche q pour switcher entre le curseur et le pointeur.

Blogs, sites webs

- Démo pour monter un site web en moins de 10 minutes: rstudio::conf(2022) keynote by Mine Çetinkaya-Rundel & Julia Stewart Lowndes

Pas possible ?! Ok, essayons de monter un site web...

1. Créer un compte Quarto.pub[3] et se connecter via le navigateur par défaut.
2. Faire le site et le publier.


Activités
Navigateur Web Firefox
13 déc. 12:20
Quarto Pub
Recorder - Awesome Scre
https://quartopub.com
Quarto Pub
aurelie-mercadie
aurelie_mercadie@outlook.fr
You're ready to publish!
You can use the quarto publish command to publish documents or websites to Quarto Pub.
Learn more at Publishing to Quarto Pub.

Blogs, sites webs

- Nouvelle tab qui apparaît (“Build”) pour voir en avant-première le rendu du site (avant publication)
- Une seule ligne dans le terminal pour publier le site: `quarto publish`
- Possible de monter un site web à la fois avec des outputs R et Python (`.qmd` et `.ipynb`)

Articles, books[4]

- On peut spécifier un format connu d'article scientifique (via CLI), i.e. ASS

Quarto est polyglote

Quarto est polyglote

Quarto permet d'exécuter du code

- python,
- R
- Observable.hq
- Julia ...
- dans le **même notebook**
- en partageant les données

les cellules de code

python

```python
import pandas
pingouin = pandas.read_csv("penguins.csv")
# ojs_define( pypingouin = pingouin)
```

R

```r
library(reticulate)
library(dplyr)
pingouin <- py$pingouin %>% mutate(bill_length_mm = 0.98 * bill_length
ojs_define( rpingouin = pingouin)
```

Observable.js

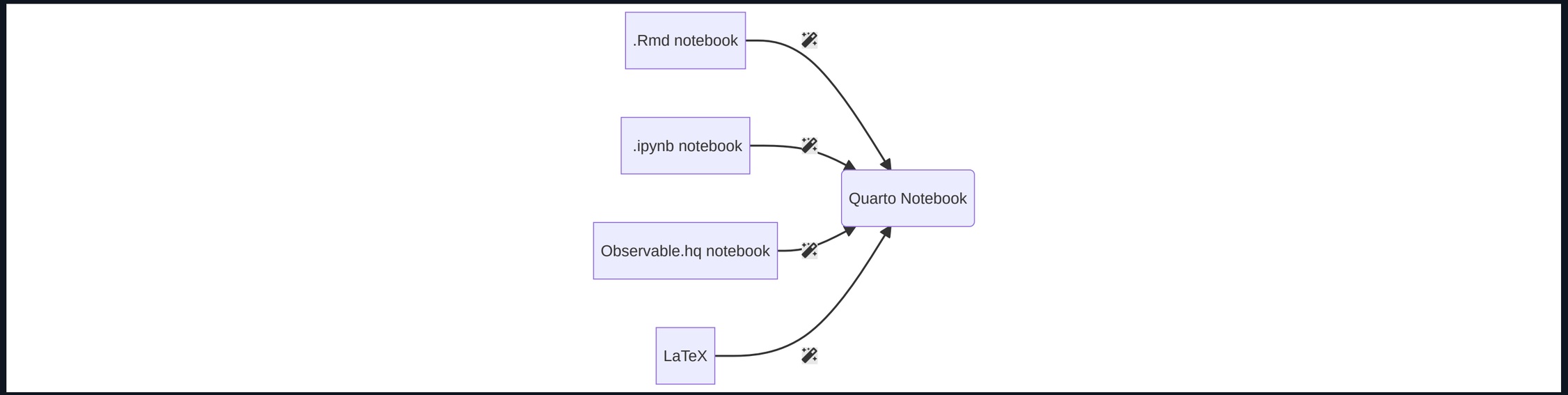
````
```{ojs}
//| echo: true
render(mySVG)
xProperty = 'flipper_length_mm'
yProperty = 'bill_length_mm'

function render(div) {
```
````

```
6    // draw on the SVG with D3
7    const selection = d3.select(div).select('svg');
8
9    const xExtent = d3.extent(rpingouin, d => d[xProperty]);
```

OJS Syntax Error (line 46, column 52)Unterminated template

MIGRATION
TO QUARTO

::: {style="margin-top: 50px; font-size: 1.5em; color: #75AADB;"} " Yes but I have so many of the following notebooks already "



Rmd migration
in 2.5 sec

Terminal

```
mv README.Rmd README.qmd
```

Rmd migration
in 7.5 sec

Console

```
# convert to Quarto doc with in-body chunk option
knitr::convert_chunk_header("to-convert.Rmd", "co
```

New documents :

Feature	R Markdown	Quarto
Basic Formats	• html_document • pdf_document • word_document	• html • pdf • docx
Beamer	• beamer_presentation	• beamer
PowerPoint	• powerpoint_presentation	• pptx
HTML Slides	• xaringan • ioslides • revealjs	• revealjs
Advanced Layout	• tufte • distill	• Quarto Article Layout
Cross References	• html_document2 • pdf_document2 • word_document2	• Quarto Crossrefs
Websites & Blogs	• blogdown • distill	• Quarto Websites • Quarto Blogs
Books	• bookdown	• Quarto Books
Interactivity	Shiny Documents	Quarto Interactive Documents
Journal Articles	rticles	Quarto Journal Articles
Paged HTML	pagedown	Planned
Dashboards	flexdashboard	Planned
Interactive Tutorials	learnr	No equivalent planned

ipynb migration

- step 1 :

```
VSCode Command Palette
```

```
Jupyter: Import Jupyter Notebook
```

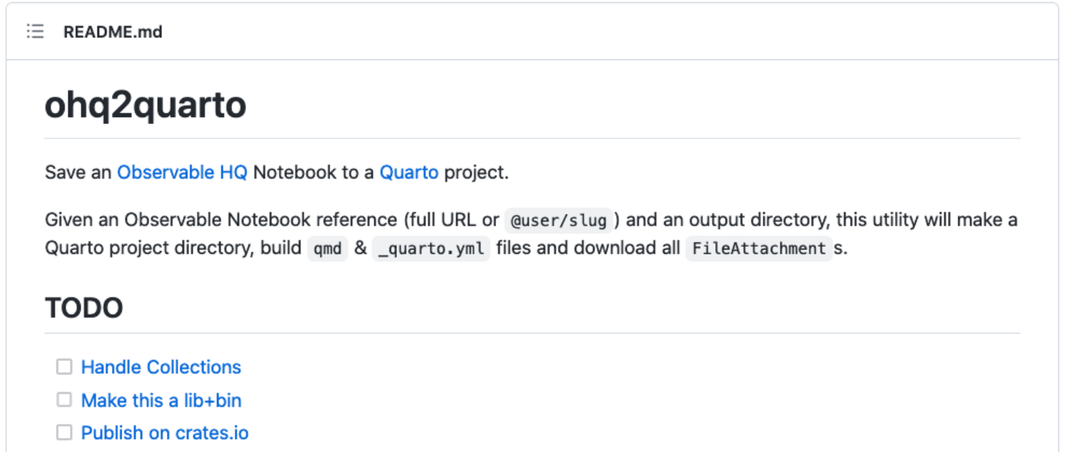
- step 2 :

```
VSCode Command Palette
```

```
Quarto: New document
```

Observable.hq migration

- install ohq2quarto from github: Save an Observable HQ Notebook to a Quarto project


README.md

ohq2quarto

Save an Observable HQ Notebook to a Quarto project.

Given an Observable Notebook reference (full URL or `@user/slug`) and an output directory, this utility will make a Quarto project directory, build `qmd` & `_quarto.yml` files and download all `FileAttachment`s.

TODO

- [ ] Handle Collections
- [ ] Make this a lib+bin
- [ ] Publish on crates.io

- step 1 : use the import command

```
Terminal
cargo run -- --ohq-ref @hrbrmstr/just-one-more-thing --output-dir ./exampl
```

LaTeX migration

WiP

(more at the post-event bar)

Et RMarkdown dans tout ça?

- Conversion `.Rmd` → `.qmd` simple et lecture de `.Rmd` via Quarto CLI possible
- Restera à moyen terme supporté par Posit...
- ...mais les efforts de développement/nouveautés seront concentrées sur Quarto

Quarto Vs. RMarkdown: les plus

- La plupart des choses peuvent être également faites en Rmarkdown, mais bien plus simple/“élégant” en Quarto (moins de bidouillage peut être)
- Possible de switcher entre de l’édition en code et de l’édition en clique-bouton (type Word, LibreOffice), pratique quand on oublie juste une commande!
- Propositions automatique dans le YAML header (`CTRL + espace`) et pour les chunk options: pareil, pratique quand on a un trou de mémoire (ou qu’on veut savoir toutes les options disponibles)
- Intéragir avec du notebook R ou Python **exactement de la même manière**
- Facile de naviguer entre plusieurs formats (peu de choses à modifier pour que le document s’édite)
- Gérer les outputs de différentes sortes dans un même document (comme un site web)

Quarto Vs. RMarkdown: les moins

- Tout nouveau, donc peu d'aide dans la communauté disponible

Merci !

Merci !

Say hello to Quarto!

- Pick up where we left off: github.com/mine-cetinkaya-rundel/hello-quarto-demo
- rstudio::conf(2022) – Quarto deep dive:
  - Tracy Teal - These are a few of my favorite things (about Quarto presentations)
  - Hamel Husain - Literate Programming With Jupyter Notebooks and Quarto
  - Devin Pastoor - Websites & Books & Blogs, oh my! Creating Rich Content with Quarto
- Video: Reproducible authoring with Quarto
- Video: Openscapes: Hello Quarto with NASA Openscapes, RLadies Santa Barbara, and JJ Allaire
- Quarto documentation: quarto.org
- Quarto gallery: quarto.org/docs/gallery
- Quarto tip a day: rstd.io/quartotip

Annotated Notes: Share

- Hex logos: https://github.com/rstudio/hex-stickers
- How it works: https://quarto.org/docs/get-started/hello/rstudio.html#how-it-works

Annotated Notes: Collaborate

Demo: JupyterLab JupyterHub managed by 2i2c https://2i2c.org

Other Rey with Quarto, throwback to https://jules32.github.io/useR-2019-keynote

Annotated Notes: Teach

- Photo credit for Holland Stam: https://undergraduateresearch.duke.edu/news/data-scraping-art-history-survey-texts
- 📦 arthistory: https://saralemus7.github.io/arthistory

Annotated Notes: Reimagine

FayLab Manual

- Learning by doing: migrating to Quarto from Bookdown

Quarto Mosaic

See also: 3 takeaways for planning for the year of open science

- https://openscapes.github.io/approach-guide
- https://nmfs-openscapes.github.io

Footnotes

1. pas posible pour les slides...

2. problème pour la faire fonctionner en revealjs et html...

3. solution pour publier des sites web, proposée par Quarto (Posit)

4. *Probablement d'autres aspects sympas, mais pas d'expérience sur ces formats.*