

# Intro to Quarto

# Welcome!

# Housekeeping!

- Be kind and curious!
- Slack and Zoom chat
- Ask questions

# Schedule (Day 1)

Time	Activity
10:30-11:30	Welcome + Intro to Quarto
11:30-12:30	Creating basic websites
12:30-13:30	<i>Break</i>
13:00-15:00	Advanced website features

# Schedule (Day 2)

Time	Activity
10:30-11:00	Publishing
11:00-12:30	Customization and branding
12:30-13:30	<i>Break</i>
13:00-15:00	Interactivity

# About me

## Andrew Heiss

[andrewheiss.com](http://andrewheiss.com) [@andrew.heiss.phd](https://www.linkedin.com/in/andrewheiss)

[@andrewheiss](https://twitter.com/andrewheiss) [andrewheiss](https://www.linkedin.com/in/andrewheiss)

- Assistant professor of public policy, Georgia State University
- Data visualization, statistics, and causal inference



# Meeting you where you are

This course is designed for someone who:

- Knows some R or Python
- Maybe has an idea for a website
- Is relatively new to Quarto
- Wants to customize Quarto output

You'll learn:

- What Quarto is and how to use it
- How to create and publish websites with Quarto
- How to customize Quarto output

# Course structure

## My turn

- Lecture segments
- Feel free to just watch, take notes, browse docs, or tinker around with the code

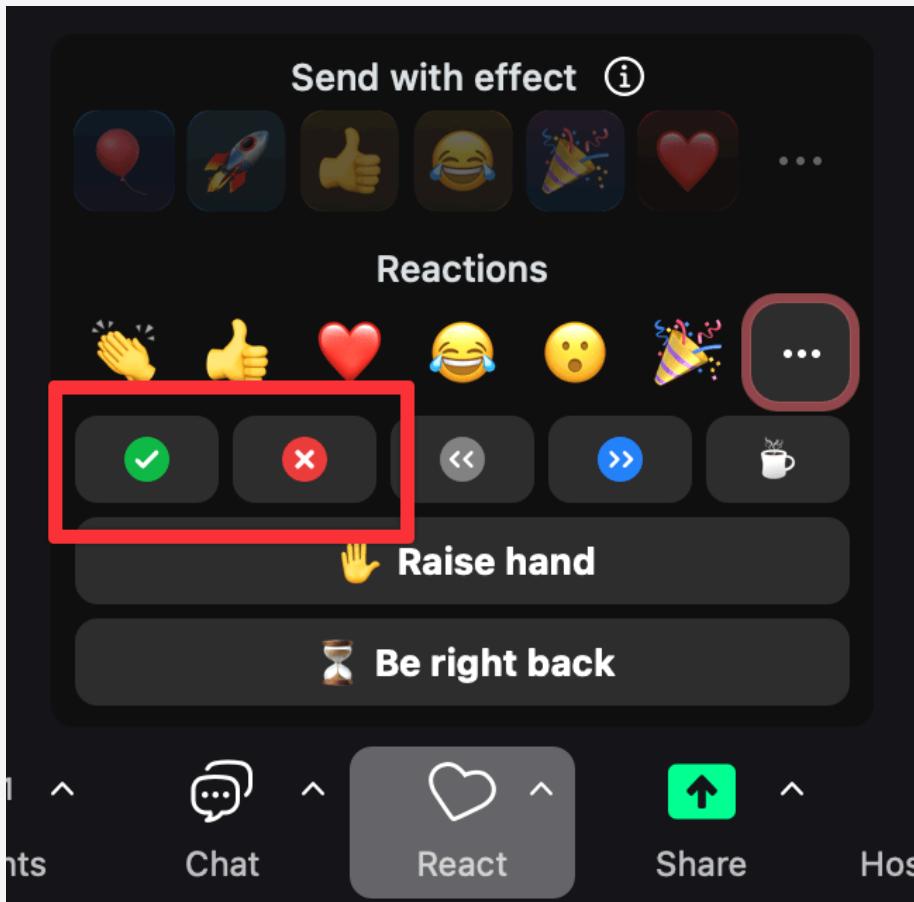
## Your turn

- Exercises for you to do
- Work on your own or with others

# Bring your own ideas!

- The best way to learn is by building something
- I've given you playground code, but *it's not great*
  - *This is by design!*
  - You're not learning a specific statistical method for a specific type of data; you're exploring the whole world of web design with Quarto
- You'll have time during the "Your turn"s to play around and experiment. Try to use these new principles and skills to create something

# Getting help



## Use Zoom reactions

- ✗ =  
"I'm stuck and need help!"
- ✅ =  
"I finished the exercise"

Ask longer, more detailed questions in Slack

# Your turn

Introduce yourself:

- Name
- Professional affiliation
- On a scale of 1-10, how well do you know...
  - Quarto?
  - R?
  - Python?
  - HTML and CSS?
- What do you hope to get out of this course?

04 : 00

# Introduction to Quarto

**Quarto is an...**  
open-source  
scientific and technical  
publishing system  
built on Pandoc.

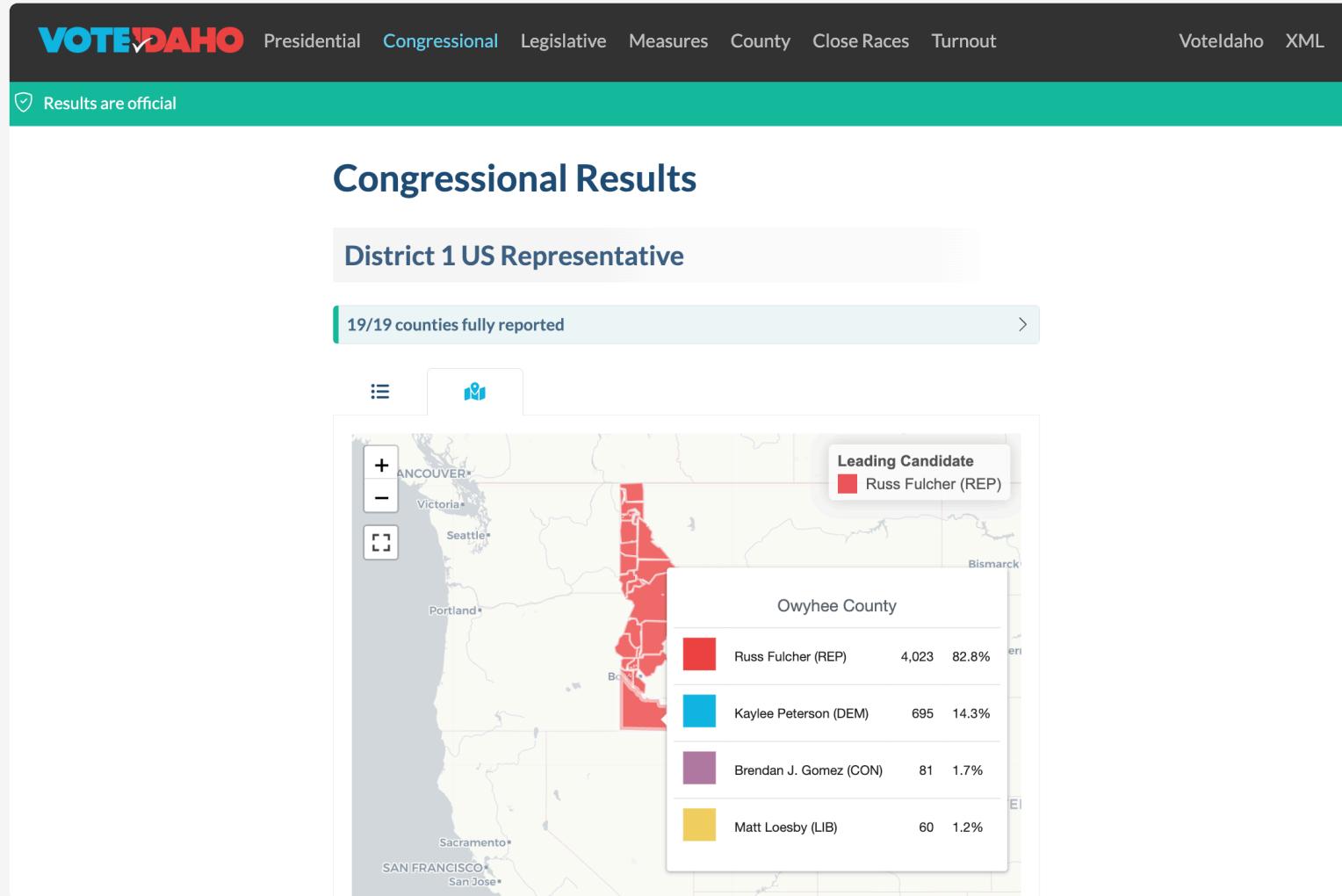
# With Quarto...

...you can **weave** together **narrative** and **code** to produce elegantly formatted output such as documents, web pages, blog posts, books, dashboards, and more.

- Create dynamic content with Python, R, Julia, and Observable
- Edit documents in your favorite editor
- Publish technical content in HTML, PDF, Microsoft Word, and more
- Share content by publishing to the internet

# Display data and results

2024 Idaho election results, by Gabe Osterhout and Andrew Heiss



# Walk through a story

**Council Housing & Neighborhood Income Inequality in Vienna** by Tamara Premrov and Matthias Schnetzer (European Centre for Social Welfare Policy and Research, Austria)



# Publish papers

## Navigating Hostility: The Effect of Nonprofit Transparency and Accountability on Donor Preferences in the Face of Shrinking Civic Space

by Suparna Chaudhry, Marc Dotson, and Andrew Heiss

[HTML](#)[PDF](#)[Word](#)

### Modeling and estimands

We analyze the results using a multilevel Bayesian multinomial model (see the appendix for complete model details). Our experimental data has a natural hierarchical structure, with 3 questions nested inside 12 separate experimental tasks, nested inside each of the 1,016 respondents, which lends itself to multilevel modeling (Jensen et al., 2021). Since it was impossible for every respondent to see every possible choice, we limit our analysis to the 576 combinations of feature levels (2 transparency × 2 accountability × 3 government relationships × 4 organizations × 4 issues × 3 funding) and use the multinomial model to calculate predicted probabilities of choice selection for each combination of possible treatment values. We then collapse this set of predicted probabilities into estimated marginal means (EMMs) for specific features of interest while marginalizing or averaging over all other predicted variables (Arel-Bundock et al., 2024; Leeper et al., 2020). This marginalization process allows us to isolate the statistical effect of each feature in isolation. We include a complete table of model results in Table A5, along with a brief illustration of converting from regression

Table of contents
Introduction
What determines individual donor behavior?
Research design
Sample
Experimental design
<b>Modeling and estimands</b>
Results
Discussion
Conclusion
Statements and declarations
References

Other formats
<a href="#">PDF (hikmat)</a>
<a href="#">Manuscript PDF (hikmat-manuscript)</a>

Multinomial probability of selection of choice, in respondent  
Choice<sub>i,j</sub> ~ Categorical({μ<sub>1,i,j</sub>, μ<sub>2,i,j</sub>, μ<sub>3,i,j</sub>})

Model for probability of each option  
{μ<sub>1,i,j</sub>, μ<sub>2,i,j</sub>, μ<sub>3,i,j</sub>} = (β<sub>0</sub> + b<sub>0j</sub>) + β<sub>1,2,3</sub>Organization<sub>i,j</sub> + β<sub>4,5,6</sub>Issue area<sub>i,j</sub> + β<sub>7</sub>Transparency<sub>i,j</sub> + β<sub>8</sub>Accountability<sub>i,j</sub> + β<sub>9,10</sub>Funding source<sub>i,j</sub> + β<sub>11,12</sub>Government relationship<sub>i,j</sub>

b<sub>0j</sub> ~ N(0, σ<sub>0</sub>) Respondent-specific offsets from global probability

Priors  
β<sub>0...12</sub> ~ N(0, 3) Prior for choice-level intercept and coefficients  
σ<sub>0</sub> ~ Exponential(1) Prior for between-respondent variability

We do not include any respondent-level covariates beyond the treatment variables. Because this is an experimental design, any statistical confounding is accounted for during the process of randomization and covariates should have no systematic effect on treatment effects. We do not work with the raw results of the multinomial model directly. Given the conjoint design, we instead create a complete balanced grid of all 576 combinations of feature levels (2 transparency × 2 accountability × 3 government relationships × 4 organizations × 4 issues × 3 funding) and use the model to calculate predicted probabilities of choice selection for each combination of possible treatment values. We then collapse this set of predicted probabilities into estimated marginal means (EMMs) for specific features of interest while marginalizing or averaging over all other predicted variables (Arel-Bundock et al., 2024; Leeper et al., 2020). This marginalization process allows us to isolate the statistical effect of each feature in isolation. We include a complete table of model results in Table A5, along with a brief illustration of converting from regression

# Share research

## Pandemic Pass? Treaty Derogations and Human Rights Practices During COVID-19 by Suparna Chaudhry, Audrey Comstock, and Andrew Heiss

The screenshot shows a research project page titled "Pandemic Pass? Treaty Derogations and Human Rights Practices During COVID-19" by Suparna Chaudhry, Audrey Comstock, and Andrew Heiss. The page has a dark blue header with navigation links: "Pandemic Pass?", "Data and replication", "Analysis", "Presentations", "Paper", and a search bar. A sidebar on the left contains links for "Data", "Replication", and "Other details". The main content area is titled "Download final data" and describes three formats: CSV, RDS, and DTA. It includes download buttons for "weekly\_panel.csv", "weekly\_panel.rds", and "weekly\_panel.dta" under the "Weekly data" section, and "quarterly\_panel.csv", "quarterly\_panel.rds", and "quarterly\_panel.dta" under the "Quarterly data" section. A "Data details" link is at the bottom right.

Pandemic Pass? Data and replication Analysis Presentations Paper ▾

Data > Download final data

## Download final data

The cleaned data is available in three formats:

- CSV file for any program
- `.rds` file for R (load with `df <- readRDS("weekly_panel.rds")`)
- `.dta` file for Stata (load with `use "weekly_panel.dta"`)

### Weekly data

[weekly\\_panel.csv](#) [weekly\\_panel.rds](#) [weekly\\_panel.dta](#)

### Quarterly data

[quarterly\\_panel.csv](#) [quarterly\\_panel.rds](#) [quarterly\\_panel.dta](#)

Data details →

# Teach classes

**Data Science for the Social Sciences**, Gov 50, Harvard University, taught by Matt Blackwell

Gov 50      Syllabus   Schedule   Staff   Materials   Assignments   Resources   Ed   Gradescope   Q

## Data Science for the Social Sciences

Learning to use data to explore the social, political, and economic world

Gov 50 • Fall 2023  
Harvard University

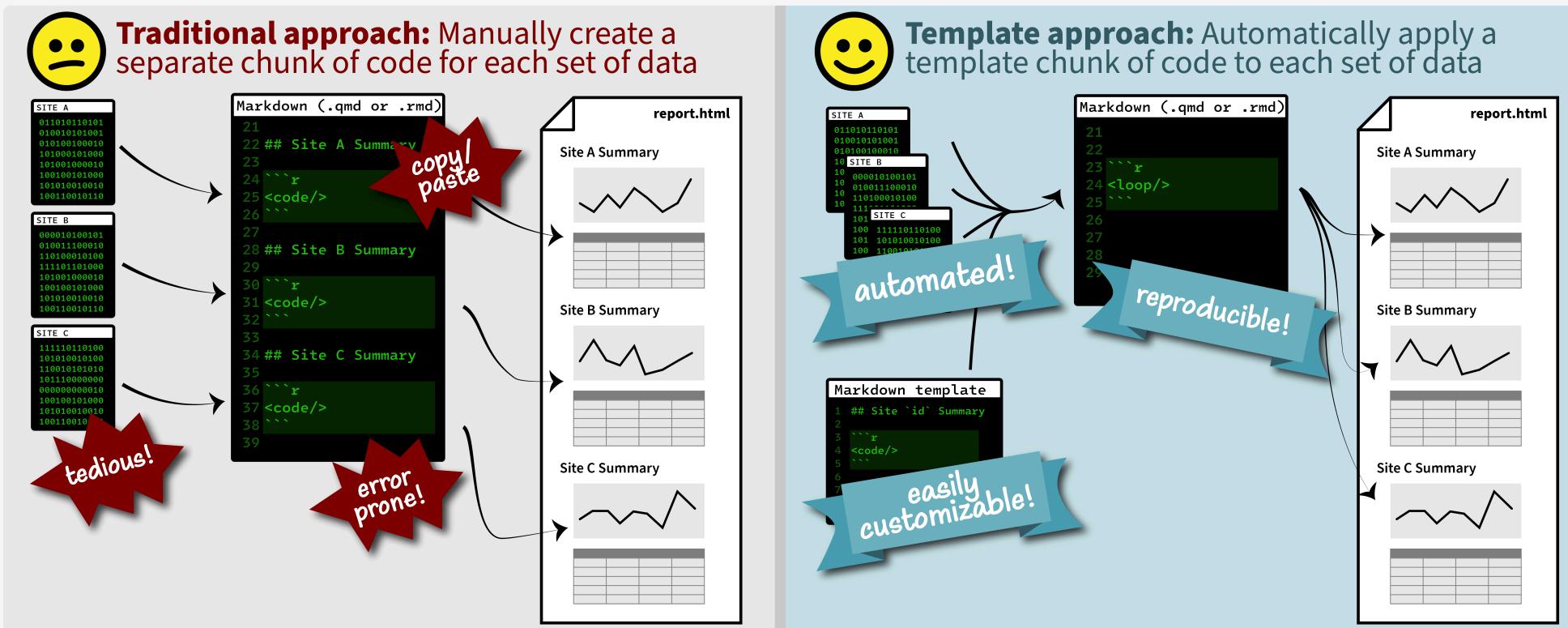


---

<b>Instructor</b>  <a href="#">Prof. Matt Blackwell</a>  CGIS Knafel 305  <a href="mailto:mblackwell@gov.harvard.edu">mblackwell@gov.harvard.edu</a>  <a href="#">matt_blackwell</a>  <a href="#">Schedule an appointment</a>	<b>Course details</b>  Tue/Thu  September 3rd-December 20th, 2023  12:00-1:15 PM  Emerson 105  <a href="#">Slack</a>	<b>Contacting me</b> General questions about the course should be posted to either the course Ed Discussion board or the course Slack. Someone on the teaching staff will attempt to respond to these messages within 25 hours, but also remember that life can be busy and chaotic for everyone (including me!), so if I don't respond right away, don't worry! For other issues (absences, etc),
---	--	---

# Automate and reproduce your output

Duplicating Quarto elements with code templates to reduce copy and paste errors by Althea A. Archer (United States Geological Survey)



# Get your team on the same page

We Converted Our Documentation to Quarto by Melissa Van Bussel (Statistics Canada)

We Converted our Documentation to Quarto - posit::conf(2023)



- Website for R/Python User Group
- Training resources
- Presentations

# Gapminder Report

## Health and Wealth Around the World

Gapminder data, 1952–2007

### Introduction

This analysis shows trends in life expectancy and GDP per capita for 142 countries from XXXX to YYYY. The data was originally collected by Hans Rosling and the Gapminder foundation.

### Continent-level trends

Average life expectancy increased substantially between XXXX and YYYY. Asia saw the biggest average increase (see [Table 1](#)).

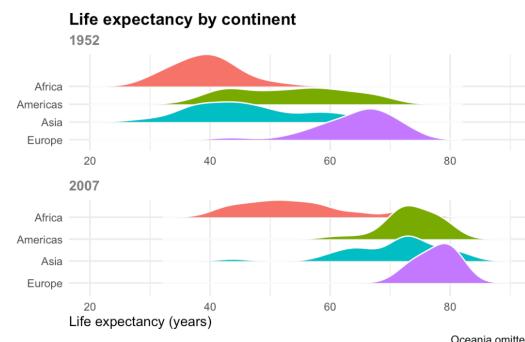


Figure 1: Distribution of life expectancy within continents

Table 1: Change in average life expectancy by continent

Continent	Averages		
	1952	2007	Change
Asia	46.3	70.7	24.4
Americas	53.3	73.6	20.3
Africa	39.1	54.8	15.7
Europe	64.4	77.6	13.2

# This is what you'll work on today!

# “Literate programming”

The screenshot shows the Quarto IDE interface with the following details:

- Title Bar:** quarto-websites-exercises\_2025-10
- Toolbar:** Includes New, Open, Save, and various file-related icons.
- Explorer:** Shows the project structure with files: 01-exercise.qmd, Data: gapminder, and QUARTO-WEBSITES-EXERCISES... (containing bib, data, .gitignore, 01-exercise.html, and 01-exercise.qmd).
- Code Editor:** The main editor pane displays the content of 01-exercise.qmd. The code includes R code chunks, comments, and sections like **Introduction** and **Continent-level trends**. A preview tab shows a visualization titled "Health and Wealth Around the World".
- Console:** Shows the output of the R session, including the R version (R 4.5.1) and the URL of the generated website (<http://localhost:5819/>).
- Output:** Displays the generated website content, which includes:
  - Health and Wealth Around the World**: A title card for Gapminder data from 1952-2007.
  - Introduction**: A brief introduction stating that average life expectancy increased substantially between XXXX and YYYY, with Asia seeing the biggest increase.
  - Continent-level trends**: A section showing the distribution of life expectancy by continent in 1952 and 2007. The 1952 chart shows lower life expectancies across all continents, while the 2007 chart shows higher life expectancies, particularly in Asia.
  - Figure 1: Distribution of life expectancy within continents**: Describes the distribution of life expectancy within continents for 1952 and 2007.
  - Table 1: Change in average life expectancy by continent**: A table showing the average life expectancy for each continent in 1952 and 2007, along with the change in average life expectancy.
  - Averages**: A table showing continent names, their 1952 average life expectancy, their 2007 average life expectancy, and the change in average life expectancy.
  - Country-level trends**: A section showing the relationship between GDP per capita and life expectancy in 2007.
  - Figure 2**: A scatter plot titled "Health and wealth in 2007" showing Life expectancy (years) on the Y-axis versus GDP per capita on the X-axis. The plot includes a regression line and bubble markers representing country population sizes and continents (Africa, Americas, Asia, Europe).

# Why Quarto?

- Multilingual and independent of computational systems
- Quarto comes “**batteries included**” straight out of the box
- Consistent expression for core features
- Extension system
- Enable “single-source publishing”—create Word, PDFs, HTML, etc. from one source
- Use defaults that meet accessibility guidelines

# Quarto formats

Feature	Quarto
Basic formats	<a href="#">html</a> , <a href="#">pdf</a> , <a href="#">docx</a> , <a href="#">typst</a>
Beamer	<a href="#">beamer</a>
PowerPoint	<a href="#">pptx</a>
HTML slides	<a href="#">revealjs</a>
Advanced layout	<a href="#">Quarto Article Layout</a>
Cross references	<a href="#">Quarto Crossrefs</a>
Websites & blogs	<a href="#">Quarto Websites</a> , <a href="#">Quarto Blogs</a>
Books	<a href="#">Quarto Books</a>
Interactivity	<a href="#">Quarto Interactive Documents</a>
Journal articles	<a href="#">Journal Articles</a>
Dashboards	<a href="#">Quarto Dashboards</a>

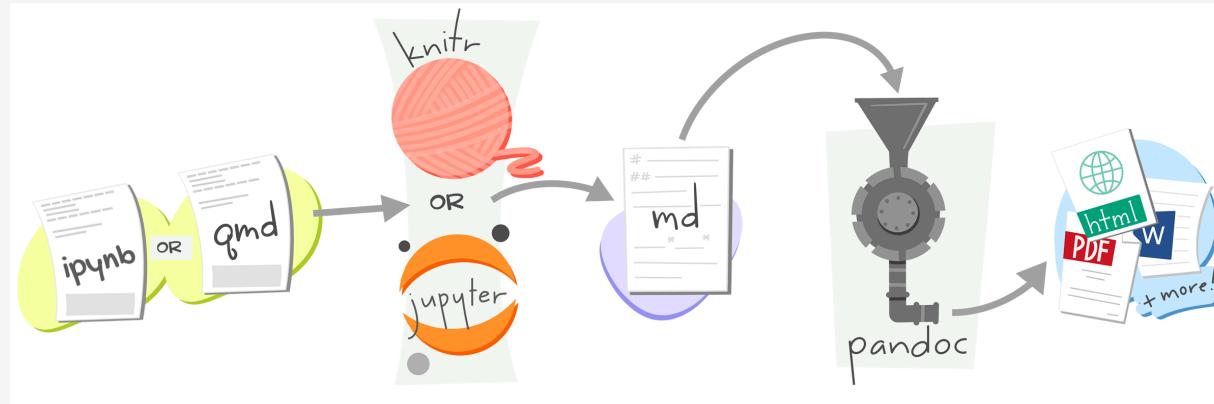
# How it works

Quarto is a command line interface (**CLI**) that renders plain text formats ([.qmd](#), [.rmd](#), [.md](#)) OR mixed formats ([.ipynb](#)/Jupyter notebook) into static PDF/Word/HTML reports, books, websites, presentations and more.

```
1  Usage: quarto
2  Version: 1.8.24
3
4  Description:
5
6  Quarto CLI
7
8  Options:
9
10 -h, --help      - Show this help.
11 -V, --version   - Show the version number for this program.
12
13 Commands:
14
15 render          [input] [args...]
16 preview         [file] [args...]
17 serve           [input]
18 create          [type] [commands...]
19 create-project  [dir]
20 convert          <input>
21 pandoc          [args...]
22 typst           [args...]
23 run              [script] [args...]
24 add              <extension>
25 install          [target...]
```

- Render files or projects to various document types.
- Render and preview a document or website project.
- Serve a Shiny interactive document.
- **Create a Quarto project or extension**
- Create a project for rendering multiple documents
- Convert documents to alternate representations.
- Run the version of Pandoc embedded within Quarto.
- Run the version of Typst embedded within Quarto.
- Run a TypeScript, R, Python, or Lua script.
- Add an extension to this folder or project
- Installs an extension or global dependency.

# Under the hood



- `jupyter` or `knitr` evaluates Python, Julia, R, or Observable code and returns a `.md` file along with the evaluated code
- Quarto applies Lua filters + CSS/LaTeX which is then evaluated alongside the `.md` file by Pandoc and converted to a final output format

# **Environment options**

You have a couple options for following along today:

- 1. Posit Cloud** (RStudio in the cloud)
- 2. Local installation** (RStudio, Positron, or VS Code on your computer)

# Your turn

Go to the course website and click on **Setup** in the sidebar.

**[andhs.co/quarto-websites-2025](https://andhs.co/quarto-websites-2025)**

Follow the instructions for either Option 1 or Option 2.

05 : 00

# Quarto workflow

- Open a `.qmd` file.
- Preview/render the document.
- Make a change and preview/render again.



# Render/preview

RStudio



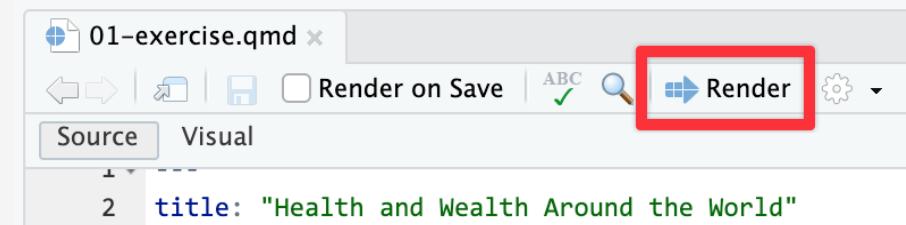
⌘ ⌘ K



Ctrl + Shift + K

Positron / VS Code

Terminal



# Your turn

- Open `01-exercise.qmd`
- Preview/render the document
  - If you're using Posit Cloud, you might be asked to allow pop-ups
- Edit the title and preview the document again.

05 : 00

# Quarto documents

# Anatomy of a Quarto document

.qmd file format with three components:

1. **YAML**: Metadata
2. **Text**: Markdown
3. **Code**: R, Python, Observable, and Julia

**Weave it all together**, and you have beautiful, powerful, and useful outputs!

# Anatomy of a Quarto document

## Metadata: YAML

```
my-document.qmd
```

```
1 ---
2 title: "My Cool Document"
3 format: html
4 ---
```

- “Yet another markup language”
- Metadata of your document
- Starts and ends with `---`
- Uses key-value pairs in the format `key: value`

# Anatomy of a Quarto document

## Text: Markdown

```
my-document.qmd
```

```
1 ---
2 title: "My Cool Document"
3 format: html
4 ---
5
6 This analysis explores data from the Gapminder foundation.
```

- Markdown is a lightweight language for creating formatted text
- Quarto is based on Pandoc and uses its variation of markdown as its underlying document syntax

# Anatomy of a Quarto document

## Text: Markdown

```
my-document.qmd
```

- 1 The `gapminder.csv` dataset contains data from
- 2 the [\*\*Gapminder foundation\*\*](<https://www.gapminder.org/>).



The `gapminder.csv` dataset contains data from the  
**Gapminder foundation**.

# Anatomy of a Quarto document

## Text: Markdown

### Markdown syntax

\*italics\* and \*\*bold\*\*

superscript<sup>2</sup> / subscript<sub>2</sub>

~~strikethrough~~

`verbatim code`

### Output

*italics* and **bold**

superscript<sup>2</sup> /  
subscript<sub>2</sub>

~~strikethrough~~

verbatim code

**General Markdown guide**

# Anatomy of a Quarto document

## Code

```
my-document.qmd
1 ---
2 title: "My Cool Document"
3 format: html
4 ---
5
6 The `gapminder.csv` dataset contains data from the [**Gapminder foundation*]
7
8 ````{r}
9 library(tidyverse)
10
11 df <- read_csv("data/gapminder.csv")
12
13 ggplot(df, aes(x = gdpPercap, y = lifeExp)) +
14   geom_point(aes(size = pop, color = continent)) +
15   scale_x_log10()
16 ````
```

# Anatomy of a Quarto document

## Code

```
my-document.qmd
1 ---
2 title: "My Cool Document"
3 format: html
4 ---
5
6 The `gapminder.csv` dataset contains
7
8 ```{r}
9 library(tidyverse)
10
11 df <- read_csv("data/gapminder.csv")
12
13 ggplot(df, aes(x = gdpPercap, y = lifeExp))
14   geom_point(aes(size = pop, color = continent))
15   scale_x_log10()
16 ```


```

- Code chunks begin and end with three backticks
- Code chunks are identified with a programming language in between {}

# Anatomy of a Quarto document

**Inline code** executes code *within* Markdown

```
my-document.qmd
```

```
1 ``{r}
2 countries <- 147
3
4
5 There are `r countries` in the dataset.
```



There are 147 countries in the dataset.

# Anatomy of a Quarto document

**Code** can include optional chunk options, in YAML style, identified by `#|` at the beginning of the line

```
my-document.qmd
1 The `gapminder.csv` dataset contains data from the [**Gapminder foundation*
2
3 ````{r}
4 #| label: fig-neat-plot
5 #| echo: false
6 #| fig-width: 6
7 #| fig-height: 3.8
8 #| fig-cap: "My neat plot"
9
10 library(tidyverse)
11
12 df <- read_csv("data/gapminder.csv")
13
14 ggplot(df, aes(x = gdpPercap, y = lifeExp)) +
15   geom_point(aes(size = pop, color = continent)) +
16   scale_x_log10()
17 ````
```

# Anatomy of a Quarto document

**Code** can include optional chunk options, in YAML style, identified by `#|` at the beginning of the line

Option	Description
<code>eval</code>	Evaluate the code chunk
<code>echo</code>	Include the source code
<code>warning</code>	Include warnings
<code>include</code>	Include code and results

**Other chunk options**

# Your turn

- Open `01-exercise.qmd` and run some of the code chunks (in order!).
- Add `#| include: false` to the second chunk and preview again. Switch it back to `true` or remove it. Preview again.
- In the YAML area, add an `author` field and add your name. Preview again.
- Change `code-fold` to be true. Preview again.
- Edit the first paragraph to:
  1. Make something bold
  2. Make “the Gapminder foundation” link to <https://www.gapminder.org>
  3. Replace `xxxx` and `YYYY` with inline code instead of hardcoded values. The first code chunk creates R objects named `first_year` and `last_year`—use those.

05:00

# Authoring Quarto

# Images and links

## Markdown syntax

<<https://quarto.org>>

[Quarto](<https://quarto.org>)



## Output

<https://quarto.org>

Quarto



# Tables

1	Right	Left	Default	Center	
2					
3	12	12	12	12	
4	123	123	123	123	
5	1	1	1	1	



**Right Left Default Center**

12	12	12	12
123	123	123	123
1	1	1	1

# Tables

```
1 | Right | Left | Default | Center |
2 |-----:|:-----|-----:|-----:|
3 |     12 | 12   | 12    | 12    |
4 | 123  | 123  | 123   | 123   |
5 |     1  | 1    | 1     | 1     |
6
7 : Table Column Widths {tbl-colwidths="[10,30,30,30]"}  
↓
```

Table Column Widths

Right	Left	Default	Center
12	12	12	12
123	123	123	123
1	1	1	1

# Citations

```
my-document.qmd
```

```
1 ---  
2 title: "My Cool Document"  
3 format: html  
4 bibliography: references.bib  
5 ---  
6  
7 Computers are neat [@Lovelace:1842].
```



Computers are neat (Lovelace 1842).

## References

Lovelace, Ada Augusta. 1842. "Sketch of the Analytical Engine Invented by Charles Babbage, by LF Menabrea, Officer of the Military Engineers, with Notes Upon the Memoir by the Translator." *Taylor's Scientific Memoirs* 3: 666–731.

# Citations

```
my-document.qmd
```

```
1 ---  
2 title: "My Cool Document"  
3 format: html  
4 bibliography: references.bib  
5 csl: apa.csl  
6 ---  
7  
8 Computers are neat [@Lovelace:1842].
```



Computers are neat (Lovelace, 1842).

## References

Lovelace, A. A. (1842). Sketch of the analytical engine invented by Charles Babbage, by LF Menabrea, officer of the military engineers, with notes upon the memoir by the translator. *Taylor's Scientific Memoirs*, 3, 666–731.

# Citations

```
my-document.qmd
```

```
1 ---  
2 title: "My Cool Document"  
3 format: html  
4 bibliography: references.bib  
5 csl: chicago-notes-bibliography.csl  
6 ---  
7  
8 Computers are neat [@Lovelace:1842].
```



Computers are neat<sup>1</sup>.

## Footnotes

1. Ada Augusta Lovelace, "Sketch of the Analytical Engine Invented by Charles Babbage, by LF Menabrea, Officer of the Military Engineers, with Notes Upon the Memoir by the Translator," *Taylor's Scientific Memoirs* 3 (1842): 666-731. ↵

# Citations

**Zotero + Better BibTeX**  
can manage references  
and export them for  
Quarto

10,000 bibliographic styles  
are available at  
**<https://www.zotero.org/styles>**



# Don't memorize this stuff!

The screenshot shows a navigation bar with links for Overview, Get Started, Guide, Extensions, Reference, Gallery, Blog, Help, social media icons, and a search bar. A 'supported by posit' logo is also present. The main content area has a breadcrumb trail: Guide > Authoring > Scholarly Writing > Citations. The left sidebar contains a hierarchical menu for 'Authoring' and 'Computations'. The right sidebar lists 'On this page' topics like Overview, Bibliography Files, Citation Syntax, etc. The main content starts with a section titled 'Citations' and 'Overview', followed by a note about Typst citation processing, and ends with a section on 'Bibliography Files'.

Guide > Authoring > Scholarly Writing > Citations

## Citations

### Overview

Quarto will use Pandoc to automatically generate citations and a bibliography in a number of styles. To use this capability, you will need:

- A quarto document formatted with citations (see [Citation Markdown](#)).
- A bibliographic data source, for example a BibLaTeX (`.bib`) or BibTeX (`.bibtex`) file.
- Optionally, a `CSL` file which specifies the formatting to use when generating the citations and bibliography (when not using `natbib` or `biblatex` to generate the bibliography).

**Note**

When using `format: typst`, by default citation processing is handled by Typst, not Pandoc. See the [Typst](#) section below for more details.

## Bibliography Files

Quarto supports bibliography files in a wide variety of formats including BibLaTeX and CSL. Add a bibliography to your document using the [bibliography YAML](#).

Quarto.org > Guide > Authoring > Scholarly Writing > Citations

# Cross references

```
my-document.qmd
```

```
1 See @fig-neat-plot for more details.  
2  
3 ````{r}  
4 #| label: fig-neat-plot  
5 #| fig-cap: "My neat plot"  
6  
7 # Plot code here  
8 ````
```



See Figure 1 for more details.

...

Figure 1: My neat plot

# Don't memorize this stuff!



Overview Get Started Guide Extensions Reference Gallery Blog Help ▾



supported by

Guide  
Authoring  
Markdown Basics  
Figures  
Tables  
Diagrams  
Shortcodes  
Videos  
Embeds  
Callout Blocks  
Code Annotation  
Brand  
Article Layout  
Scholarly Writing  
Front Matter  
Title Blocks  
Citations  
Cross-References  
Basics  
Options  
Div Syntax  
Custom Floats  
Creating Citeable Articles  
Appendices  
Computations

Guide > Authoring > Scholarly Writing > Cross-References > Basics

## Cross References

### Overview

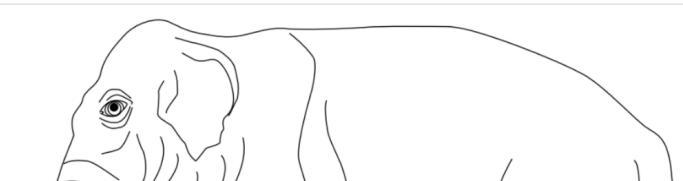
Cross-references make it easier for readers to navigate your document by providing numbered references and hyperlinks to various entities like figures and tables. Every cross-referenceable entity requires a label—a unique identifier prefixed with a cross-reference type e.g. `#fig-element`. For example, this is a cross-referenceable figure:

```
! [Elephant] (elephant.png) {#fig-elephant}
```

The presence of the label `(#fig-elephant)` makes this figure referenceable. This enables you to use the following syntax to refer to it elsewhere in the document:

```
See @fig-elephant for an illustration.
```

Here is what this would look like rendered to HTML:



On this page  
Overview  
References  
Lists  
Floats  
Figures  
Tables  
Code Listings  
Callouts  
Theorems and Proofs  
Equations  
Sections

Edit this page  
Report an issue

Quarto.org > Guide > Authoring > Scholarly Writing > Cross-References

# Divs and Spans

For further customization, you can add classes, attributes, and other identifiers to content using divs and spans.

## Divs

```
1 ::: {.border}
2 This adds the "border" class to some content.
3 :::
```

## Spans

```
1 [This is some text]{.class style="color: #cccccc;"}
```

# Divs

## Callout blocks

```
my-document.qmd
```

```
1 :::{.callout-tip}
2
3 Note that there are five types of callouts, including:
4 `note`, `tip`, `warning`, `caution`, and `important`.
5
6 :::
```



### Tip

Note that there are five types of callouts, including: `note`, `tip`, `warning`, `caution`, and `important`.

# Divs

## Multiple columns

```
my-document.qmd
```

```
1 ::: {layout-ncol=2}
2
3 
4
5 Photo by [The New York Public Library](https://unsplash.com/@nypl) on [Unsp
6 :::
```

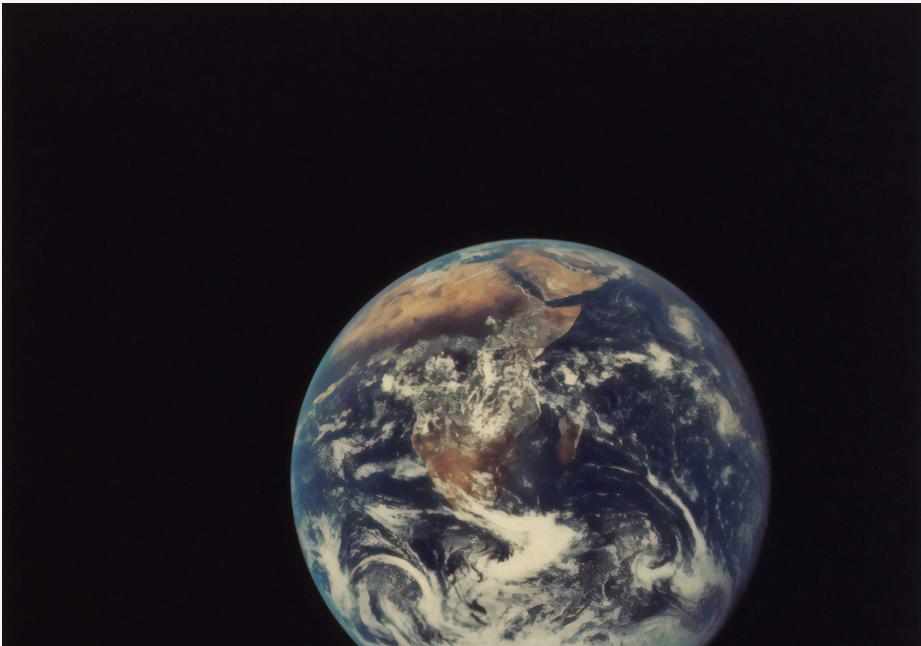


Photo by **The New York  
Public Library** on  
**Unsplash**

# Divs

## Tabs

my-document.qmd

```
1 ::: {.panel-tabset}
2 ## R
3
4 `library(dplyr)`
5
6 ## Python
7
8 `import pandas as pd`
9 :::
```

R

Python

library(dplyr)

# Spans

```
my-document.qmd
```

```
1 This is text that is [red]{style="color:red;"}.
```

This is text that is red.

# Changing formats

```
my-document.qmd
```

```
1  ---
2  title: "My Cool Document"
3  format: html
4  ---
```

# Changing formats

```
my-document.qmd
```

```
1 ---  
2 title: "My Cool Document"  
3 format: revealjs  
4 ---
```

# Health and Wealth Around the World

Gapminder data, 1952–2007

2025-10-16



# Don't memorize this stuff!

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Guide > Authoring > Markdown Basics

## Markdown Basics

### Overview

Quarto is based on Pandoc and uses its variation of markdown as its underlying document syntax. Pandoc markdown is an extended and slightly revised version of John Gruber's [Markdown](#) syntax.

Markdown is a plain text format that is designed to be easy to write, and, even more importantly, easy to read:

A Markdown-formatted document should be publishable as-is, as plain text, without looking like it's been marked up with tags or formatting instructions. – [John Gruber](#)

This document provides examples of the most commonly used markdown syntax. See the full documentation of [Pandoc's Markdown](#) for more in-depth documentation.

### Text Formatting

Markdown Syntax	Output
<code>*italics*, **bold**, ***bold italics***</code>	<i>italics</i> , <b>bold</b> , <b><i>bold italics</i></b>
<code>superscript^2^ / subscript~2~</code>	$\text{superscript}^2 / \text{subscript}_2$

On this page

- Overview
- Text Formatting
- Headings
- Links & Images
- Lists
- Footnotes
- Tables
- Source Code
- Raw Content
- Equations
- Diagrams
- Videos
- Page Breaks
- Divs and Spans
- Callout Blocks
- Other Blocks
- Other Spans
- Special Characters
- Keyboard Shortcuts

[Edit this page](#) [Report an issue](#)

# Your turn

- Add an [important](#) callout box to the introduction summarizing the report's findings. Preview the file.
- Change the caption for the first plot. Preview again.
- Change some text color to [#ec008b](#). Preview again.
- Edit the "Average life expectancy increased..." paragraph to say "According to Figure 1, average life expectancy increased...", **BUT** do it without typing "Figure 1". Preview again.
- In the first paragraph, add a citation to something in [bib/references.bib](#). Preview again.
- Change the bibliography style to APA. Preview again.

05 : 00

# What's next?

# Course outline

-  ~~Intro to Quarto~~
- Creating basic websites
- Advanced website features
- Publishing
- Customization and branding
- Interactivity