Structure of Quarto notebooks

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1 Learning objectives

1. Understand the structure of the Quarto notebook
2. Understand the difference and relationships between notebooks and rendered documents

2 Quarto notebooks vs. rendered documents

A Quarto notebook and its corresponding rendered document(s) serve different purposes but are closely connected.

- The **Quarto notebook** is the **source document** where content is defined.
- The **rendered document** is the **output** generated from the Quarto notebook. Common rendered document formats include:

  - HTML for interactive web-based reports.
  - PDF for professional and printable documents.
  - Word for editable text-based outputs.

A single Quarto notebook can be rendered into multiple formats. While there may be some limitations when targeting different formats, this flexibility is one of Quarto's core strengths, making it a powerful tool for creating versatile and reusable documents.

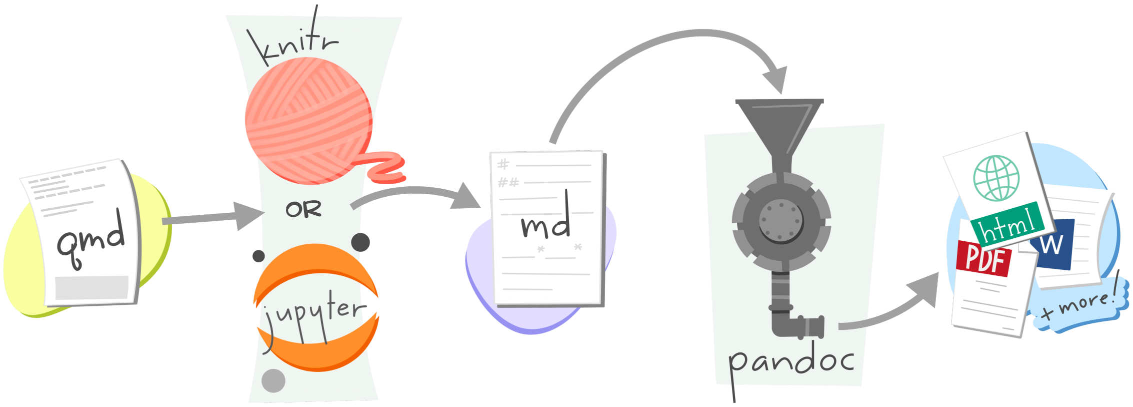
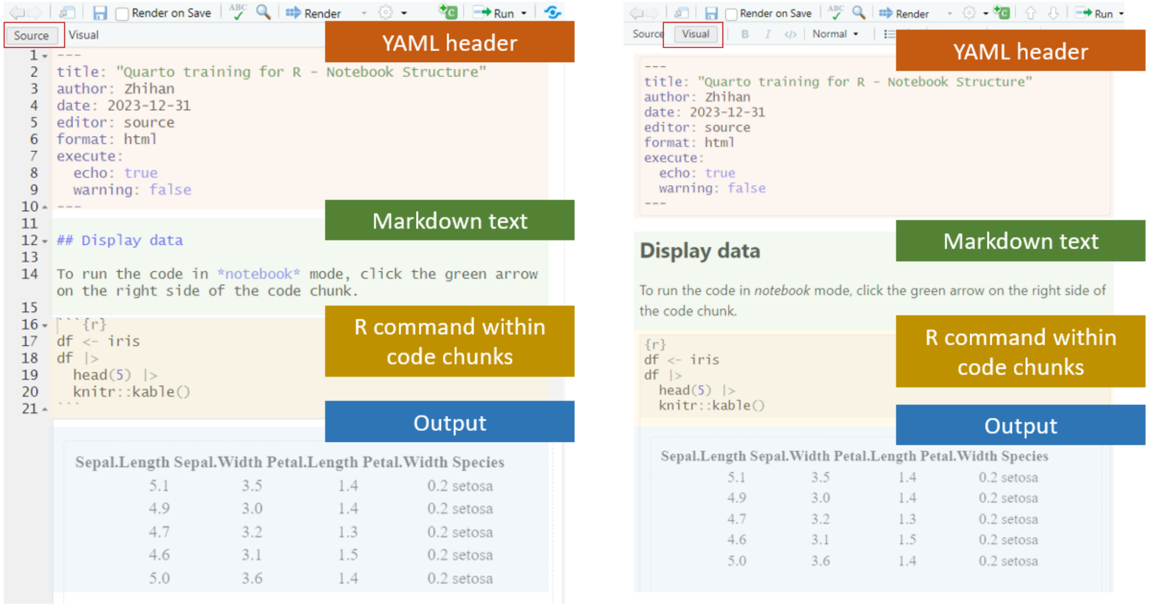


Figure 1: Artwork by Allison Horst.

3 Structure of a Quarto notebook

There are three basic components to a Quarto notebook:

- a unique (YAML) header,
- (markdown) text areas, and
- code areas (and their output).



YAML header

Markdown text

R command within code chunks

Output

~~~
---
title: "Quarto training for R - Notebook Structure"
author: Zhihan
date: 2023-12-31
editor: source
format: html
execute:
  echo: true
  warning: false
---

## Display data

To run the code in *notebook* mode, click the green arrow
on the right side of the code chunk.

```{r}
df <- iris
df |>
  head(5) |>
  knitr::kable()
```
~~~

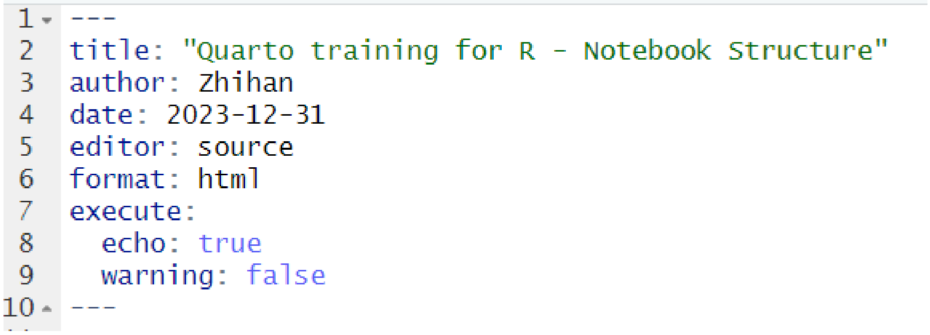
```
Sepal.Length Sepal.Width Petal.Length Petal.Width Species
         5.1         3.5          1.4         0.2 setosa
         4.9         3.0          1.4         0.2 setosa
         4.7         3.2          1.3         0.2 setosa
         4.6         3.1          1.5         0.2 setosa
         5.0         3.6          1.4         0.2 setosa
```

Display data

To run the code in *notebook* mode, click the green arrow on the right side of the code chunk.

3.1 Header

At the top of the Quarto notebook, you will see something that looks as follows:



```
---
title: "Quarto training for R - Notebook Structure"
author: Zhihan
date: 2023-12-31
editor: source
format: html
execute:
  echo: true
  warning: false
---
```

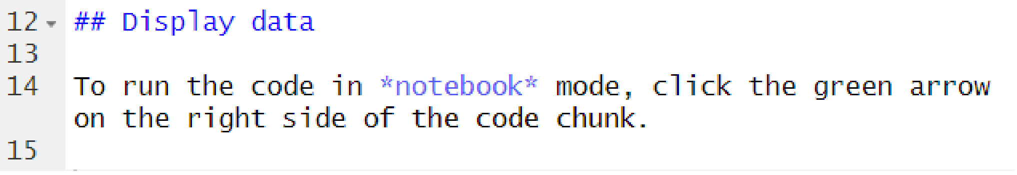
This section is called the **YAML header** and it contains commands and metadata about the Quarto notebook. There is only one unique header in a Quarto notebook and it is always surrounded by `---` lines on the top and bottom of the section.

YAML is a data format that has the form of a **key: value pairing** to store data. The keys in this case are *title* and *format*; they are are some of many settings that Quarto has available to use. The values are those that follow the key (e.g., "Untitled" for *title*). These key data are used to store the settings that Quarto will use to render the output document.

More HTML options: HTML Options

3.2 Text areas

In white background areas, you find **Markdown text** which will appear as regular text in the rendered document.

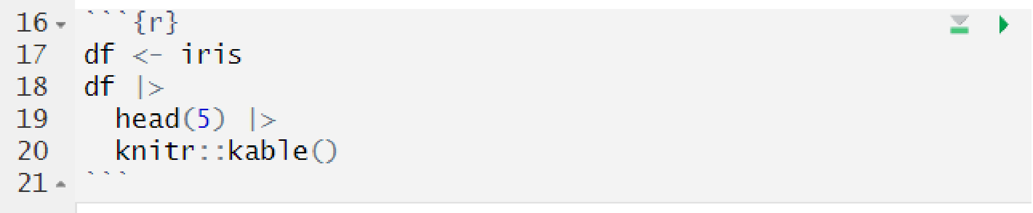


```
## Display data

To run the code in *notebook* mode, click the green arrow
on the right side of the code chunk.

```

Markdown is actually a markup language, which can have formatting such as headings, italics, bold, numbers, and bullets.

3.3 Code areas

Code chunks, typically shown within gray backgrounds, execute commands in Quarto.

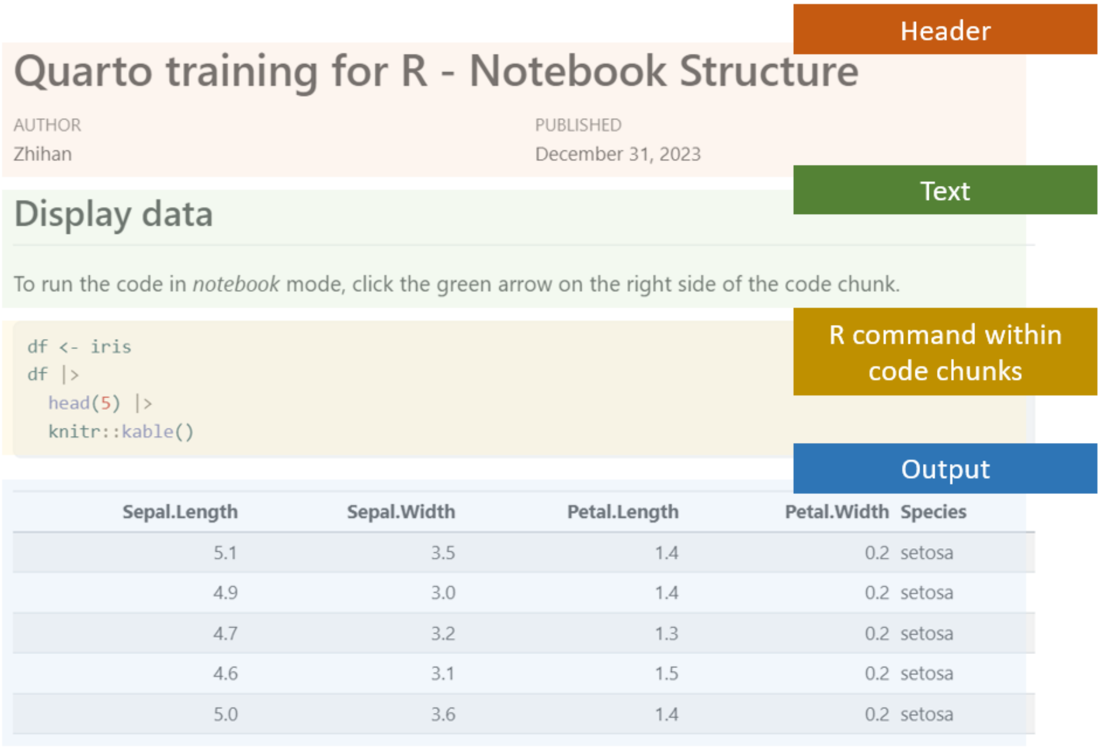


~~~
```{r}
df <- iris
df |>
  head(5) |>
  knitr::kable()
```
~~~

In the example provided, R code is being run and identified with the **{r}** tag. These commands may handle data processing, cleaning, or the generation of visual outputs that are integrated into the final document.

4 Structure of a rendered document

The rendered document translates the notebook's structure, content, and code outputs into a polished, static format for presentation or sharing.



Quarto training for R - Notebook Structure

AUTHOR
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Display data

To run the code in *notebook* mode, click the green arrow on the right side of the code chunk.

```
df <- iris
df |>
  head(5) |>
  knitr::kable()
```

Sepal.Length	Sepal.Width	Petal.Length	Petal.Width	Species
5.1	3.5	1.4	0.2	setosa
4.9	3.0	1.4	0.2	setosa
4.7	3.2	1.3	0.2	setosa
4.6	3.1	1.5	0.2	setosa
5.0	3.6	1.4	0.2	setosa

5 References

- The Epidemiologist R Handbook
- Analytically reproducible documents