

Introduction to literate programming with Quarto

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Key terms

.qmd file- the file format of a Quarto document

YAML header- controls the 'settings,' located at the top of the document

Code chunks- sections of the document that contain code **Markdown text**- written content of the document using text and formatting

Rendering- process of running code and combining text to create a final output

Authoring- process of writing and structuring the document

Setting up Quarto

To open a new Quarto document in **RStudio**, follow these steps:

1. Select **File**
2. Select **New File**
3. Select **Quarto Document**
4. Customize the settings
5. Finally, hit **Create**

YAML customization

Additional elements you can add to the YAML header to customize your output:

The following changes the theme of the entire website to 'minty':

```
format:
  html:
    theme: minty
```

The following adds a side navigation to the website:

```
website:
  sidebar:
    style: docked
    search: true
```

Headings

Use section headings to organize content and add items to a navigation panel.

- Add a section heading with **##** followed by the section heading:
`## Section Name`
- Examples of section headings:
`## Introduction`
`## Data`
`## Literature`

Markdown text formatting

To **format text**, here are some keyboard shortcuts:

```
**bold**      → bold
*italic*     → italic
~~strikethrough~~ → strikethrough
`inline code` → inline code
- bullet point → • bullet point
```

Inserting links

Insert hyperlinked text or direct links:

- Link with title: `[title](link)`
- Link without title: `<https://link>`

Inserting images

Embed images directly into the document.

- Image by itself with no caption:
``
- Image with a caption below it:
`![caption](path/image.png)`
- Image that redirects you to a link:
`![caption](path/image.png)(link)`

Inserting callout boxes

Insert **callout boxes** by following the formats below:

```
! Important
::: callout-important
## Title
```

Text

```
:::
```

```
! Tip
```

Use "`::: callout-tip`" instead for a **callout-tip box**

```
! Note
```

Use "`::: callout-note`" instead for a **callout-note box**

Columns

Change the layout of sections by following these steps for **columns**:

1. Start with `::::: columns`
2. Begin 1st column with `::: column`
3. Add content and end with `:::`
4. Begin new column with `::: column`
5. Add content and end with `:::`
6. End entire section with `::::: columns`

Here is an example of what the syntax in Quarto would look like:

```
::::: columns
::: column

item 1

:::
::: column

item 2

:::
::::: columns
```

Introduction to literate programming with Quarto

Code chunks

Insert **code chunks** like the following:

```
```{r}
1 + 2
```
```

- Click the green “Insert Code Chunk” button on the toolbar
OR
- Start with 3 back ticks ``` and {r}
- Enter code (Example: “1 + 2”)
- End with 3 back ticks ```
OR
- Keyboard shortcuts:
Ctrl + Alt + I (Windows/Linux)
Cmd + Option + I (Mac)

Code display settings can be added to the YAML header:

- `code-fold: true/false` controls whether code is collapsible by reader
- `code-tools: true/false` adds or removes the functions

Inline R Code

To insert code directly in text, you can incorporate already **computed values**.

1. Compute the value and assign it to an object using `<-`

```
avg_final_weight <- mean(
  subset(ChickWeight, Time ==
max(Time))$weight
)
```

2. Insert the object into markdown text

```
By the end of the experiment,
the average chick weight was
`{r} round(avg_final_weight, 1)`
grams.
```

Creating a Table

You can use **pipe syntax** to create a table in Quarto

| vertical bars (pipes) separate columns

--- dashes in the second row identify the first row as table headers

For example:

```
Statistic	Weight	Time
Minimum	35.00	0.00
Median	...	...
```

Citations with Zotero

Zotero is a free reference management tool you can use to insert citations in by doing the following:

1. Open **Zotero** on your device
 2. In RStudio, switch to the “Visual Editor” mode
 3. Press the “Insert” button in the toolbar at the top
 4. Select “Citation” from the drop down options
 5. Choose the citation from the **Zotero Library** folders
 6. Click “Insert”
- For **in-text citations**, check the box that says “In-text” after Step 5.
 - “`bibliography: references.bib`” should have been automatically added to your YAML header
 - A **bibliography** is generated at the end of the document.

Publishing

Publishing involves sharing and making your Quarto document accessible.

One of the ways is publishing to **GitHub** using **GitHub Pages**. Here’s how:

1. In the YAML header, include:
`project:`
 `type: website`
 `output-dir: docs`
2. In the new Terminal, change directory to path of main folder
3. Make a `_quarto.yml` file
4. Add a `.nojekyll` file
5. Render to generate the HTML in the `docs/` folder
6. Initialize Git
7. Rename “master” to “main”
8. In **GitHub**, create a new repo
9. In Terminal, connect to local project
10. Render your site
11. Commit and push it to **GitHub**
12. In your repo Settings, click **Pages**
13. Change “none” to “main”
14. Change “/root” to “/docs”
15. Click Save

If you are using **Git Bash**, here’s how to connect it in your RStudio Terminal:

- Select “Terminals Options”
- Set new Terminals on the RStudio interface to open with Git Bash
- Open a new Terminal