

Applied Markdown for Researchers

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Markdown

Markdown

- Markdown is a *lightweight markup language*
 - Means that, unlike L^AT_EX or html it is not a programming language
 - Overall, known for its simplicity and readability, both in its raw form and rendered form
- Markdown is widely used in coding-related applications, such as:
 - GitHub
 - Jupyter Notebooks/Google Colab
 - R Markdown/Quarto
 - Stack Overflow
 - Slack
 - Notion/Obsidian
 - Reddit!

Markdown Syntax

- We've already talked about some basic Markdown syntax:
 - Headers use #
 - Lists use - or 1.
 - Emphasis uses * or _
 - Links use [text] (url)
- There are many more elements in Markdown, such as:
 - Images
 - Tables
 - Blockquotes
 - Code blocks
 - Footnotes
 - And more!
- You can consult the Markdown Guide for more information
 - Also the Coding for Economists markdown guide

Markdown flavours

- Markdown has “flavours” or “dialects” that add extra functionality
 - GitHub Flavored Markdown (GFM)
 - CommonMark
 - Pandoc Markdown
 - Markdown Extra
 - And more!
- These flavours add extra functionality, such as:
 - Tables
 - Footnotes
 - Strikethrough
 - Task lists
 - And more!
- The most common is GFM
 - See the GitHub Markdown Cheatsheet for more info
- Variations are very small, today we’re using Pandoc Markdown
 - See the Quarto documentation here

Compilation of Markdown

- In RMarkdown and Quarto, Markdown text is compiled through Pandoc
 - Pandoc is a universal document converter
- We do not need to understand much about the internal workings of Pandoc
- But know that Markdown can be used and compiled without any major software
 - Use VS Code (with the Markdown Preview Enhanced and Markdown All in One extensions)
 - Online, you may use Dillinger

Tables in Markdown

- Tables in Markdown are created using pipes | and hyphens -
 - The first row is the header row
 - The second row is the separator row
 - The rest of the rows are the data rows
- Example:

```
| Header 1 | Header 2 | Header 3 |
|-----|-----|-----|
| Data 1   | Data 2   | Data 3   |
| Data 4   | Data 5   | Data 6   |
```

- Renders as:

| Header 1 | Header 2 | Header 3 |
|----------|----------|----------|
| Data 1 | Data 2 | Data 3 |
| Data 4 | Data 5 | Data 6 |

Tables in Markdown

- While less clunky than L^AT_EX tables, they may be less flexible, depending on the “python
- This is since the focus is on readability and simplicity
- However, when trying to make complex tables, no one expects anyone to manually write them in Markdown
- Use Markdown tables generator or similar tools to generate tables
- We will later discuss how to export tables from statistical software to Markdown

Code: inline and blocks

- As mentioned before, since Markdown is heavily oriented to software documentation, a big thing about it is how we write code within it
- Inline code is written using backticks `
- Code blocks are written using triple backticks ```
- Example:

This is an inline code: ``print("Hello, world!")``

Code: inline and blocks

- This is a code block:

```
print("Hello, world!")
```

- Code blocks should include the name of the language for syntax highlighting. Eg. ````r` for R code or ````python` for Python code
 - Unfortunately Stata is not supported by default.

Divs and spans in Markdown

- Divs and spans are used to apply CSS styles to Markdown elements
- Divs are something coming from HTML, and are used to apply styles to blocks of text
- We will typically not need this unless you're deep in the weeds of web development
 - Typically academic documents can be styled with L^AT_EX
- However, a div in Quarto is often useful for defining images and table environments
 - Same idea as in L^AT_EX

Divs in Markdown

- Example of a div in Quarto:

```
::: {.myclass}
```

```
This is a div
```

```
:::
```

Divs in Markdown

- For a table in Quarto, which includes a caption:

```
::: {#tbl-panel layout-ncol=2}
```

| Col1 | Col2 | Col3 |
|------|------|------|
| A | B | C |
| E | F | G |
| A | G | G |

```
: First Table {#tbl-first}
```

| Col1 | Col2 | Col3 |
|------|------|------|
| A | B | C |
| E | F | G |
| A | G | G |

L^AT_EX in Markdown

L^AT_EX in Markdown

- While the most basic of Markdown may not support L^AT_EX, using it in VS Code or RMarkdown is very easy
- You can simply write L^AT_EX code within Markdown
- For example, to write an equation in Markdown:

This is an equation: `$y = \beta_0 + \beta_1 x$`

- This renders as:

This is an equation: $y = \beta_0 + \beta_1 x$

L^AT_EX in Markdown

- We typically will not be able to use L^AT_EX packages in Markdown
- This is because Markdown is not a programming language, and does not have the same functionality as L^AT_EX
- Unless we're in Quarto and outputting to PDF, we will not be able to use L^AT_EX packages
- In the latter case, we can use L^AT_EX packages in the YAML header

```
output:
  pdf_document:
    includes:
      in_header: header.tex
```


RMarkdown and Quarto

RMarkdown and Quarto

- RMarkdown is probably the most common way to be introduced to Markdown for researchers
- It allows to create dynamic documents, mixing Markdown with R code
- Quarto is a newer tool that allows for more flexibility and customization, plus works seamlessly with other languages

RMarkdown and Quarto

- We've spoken about these tools before in our R module
- Posit Co.'s guide to Quarto, [here](#)
- We will focus on how to make documents different to the ones we've seen before

Quarto for presentations

- Quarto can be used to create presentations, like the one you're seeing now
- This is done by using the `beamer` format in the YAML header
 - Alternatively, you can use `revealjs` for a more modern look
 - Can also output to powerpoint, with less flexibility but more compatibility

Quarto for presentations

- The YAML header for a presentation in Quarto looks like this:

```
---  
title: Applied Markdown for Researchers  
institute: Laboratorio de Investigación para el Desarrollo del E  
author: Daniel Sánchez Pazmiño, MA  
date: 2025-02-01  
theme: berlin # or any other theme  
format: beamer # this is the format of \LaTeX \ beamer  
incremental: false # this is for incremental slides  
---
```

Quarto for presentations

- The rest of the document is written in Markdown
- To create new slides in Quarto, you use `---` to separate slides
 - Alternatively, create a new slide with `##` or `#`
- The “incremental” option in the YAML header allows for incremental slides
 - This means that bullet points will appear one by one

Using Quarto templates

- As of today, Quarto can create books, websites, dashboards, and many other things
- RStudio has templates for these, which can be very easily accessed
- VS Code can also use Quarto templates using the Command Palette (Ctrl + Shift + P)
- You can always consult the Quarto documentation for more information