Dynamic Documents 2

APA Manuscripts

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Week 5, Class 1

Agenda

- Questions
- Some leftover R Markdown
  - bold/italicize/code
  - TOC
- Some {papaja} modifications
- Equations
- Lab

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Learning objectives for today

- Understand how to include latex extensions in RMD
- Be able to produce basic equations

What questions do you have?

Revisiting *git*

Talk with neighbor. What do these terms mean?

- clone
- pull
- stage
- commit
- push
- repo
- remote

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- *Italics* are specified similarly, but with a single asterisk (i.e., `*italicized text*`) or underscores (i.e., `_italicized text_`).
- `Code` is defined by back-ticks `` `code` ``
- This is the same as in-line code specification, but without telling it the language

Table of Contents

You can easily specify a table of contents with

```
---
output:
  html_document:
    toc: true
---
```

A table of contents will then be automatically generated for you based on your headers

Change TOC depth

- By default, the TOC will only go down to 3 levels
- Change that with

```
---
output:
  html_document:
    toc: true
    toc_depth: 5
---
```

Floating TOC

For HTML documents, allow the TOC to float along the side as you scroll

```
---
output:
  html_document:
    toc: true
    toc_float: true
---
```

Code folding

Provide a button for people to be able to see the code, but otherwise have it hidden

```
---
output:
  html_document:
    toc: true
    toc_float: true
    code_folding: "hide"
---
```

(example)

Escaping

- Sometimes you may not want the formatting to occur, and instead just show what you've typed.
- Escape with \

Escaping

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\# I didn't want a header

Escaping

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- Escape with \

I didn't want a header

So I escape the pound symbol like this \#

LaTeX vs R Markdown

- LaTeX considerably more complicated
  - Probably won't really ever need it
- LaTeX is the engine behind R Markdown for rendering PDF
  - Why we'd use some extensions from there for PDF

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Essentially

R Markdown let's us get *most* of the benefit of LaTeX without actually having to learn it.

Really want to see it?

```
output:
  pdf_document:
    keep_tex: true
```

Open the resulting .tex file.

Including other options

Specify `header-includes` in your YAML

Including other options

Specify `header-includes` in your YAML

Example from a relatively complicated doc

```
header-includes:
  - \pagenumbering{gobble}
  - \usepackage{placeins}
  - \usepackage{float}
  - \usepackage{caption}
  - \captionsetup[figure]{labelformat = empty}
  - \usepackage{xcolor}
  - \definecolor{link}{rgb}{0, 0, 238}
  - \usepackage{booktabs}
```

Option to consider for {papaja}

Change

```
classoption: "man"
```

to

```
classoption: "man, fleqn"
```

To get "flush equations" (i.e., left aligned and indented, rather than centered)

Even better

```
classoption: "man, fleqn, noextraspace"
```

Removes some of the extra space around headers

Add some LaTeX option

```
header-includes:
  - \raggedbottom
  - \setlength{\parskip}{0pt}
```

This will help (save you lots of time googling) remove the extra space between paragraphs.

Showing the differences visually

(demo)

Equations (briefly)

Produce inline equations using LaTeX `$ Equation stuff here $`

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Produce equations in "Display" mode with

```
$$

Equation stuff here

$$
```

Greek letters

Lower-case

- \alpha α
- \beta β
- \gamma γ
- \delta δ
- \epsilon ϵ
- \zeta ζ
- \eta η
- \theta θ
- \iota ι
- \kappa κ
- \lambda λ
- \mu μ
- \nu ν
- \xi ξ
- \omicron o
- \pi π
- \rho ρ
- \sigma σ
- \tau τ
- \upsilon υ
- \phi ϕ
- \chi χ
- \psi ψ
- \omega ω

Greek letters

Upper-case

- `\Gamma` Γ
- `\Delta` Δ
- `\Theta` Θ
- `\Lambda` Λ
- `\Xi` Ξ
- `\Pi` Π
- `\Sigma` Σ
- `\Upsilon` Υ
- `\Phi` Φ
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- `\Omega` Ω

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Note they're not all here...

Lots of other things

- `$\sum_{i=0}^n x_i$` $\sum_{i=0}^n x_i$
- `$\frac{a}{b}$` $\frac{a}{b}$
- Subscript with underscores `\beta_{0i}` β_{0i}
- Superscript with `^` `q^{(a + b)}` $q^{(a+b)}$

Many more possibilities

Quick example

```
$$
`\begin{align}
  \sqrt{37} & = \sqrt{\frac{73^2-1}{12^2}} \\\
            & = \sqrt{\frac{73^2}{12^2}\cdot\frac{73^2-1}{73^2}} \\\
            & = \sqrt{\frac{73^2}{12^2}}\sqrt{\frac{73^2-1}{73^2}} \\\
            & = \frac{73}{12}\sqrt{1 - \frac{1}{73^2}} \\ \
            & \approx \frac{73}{12}\left(1 - \frac{1}{2\cdot73^2}\right)
\end{align}`
$$
```

$$
\begin{aligned}
\sqrt{37} &= \sqrt{\frac{73^2-1}{12^2}} \\
&= \sqrt{\frac{73^2}{12^2}\cdot\frac{73^2-1}{73^2}} \\
&= \sqrt{\frac{73^2}{12^2}}\sqrt{\frac{73^2-1}{73^2}} \\
&= \frac{73}{12}\sqrt{1-\frac{1}{73^2}} \\
&\approx \frac{73}{12}\left(1-\frac{1}{2\cdot 73^2}\right)
\end{aligned}
$$

`

$$
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&= \sqrt{\frac{73^2}{12^2}} \sqrt{\frac{73^2 - 1}{73^2}} \\
&= \frac{73}{12} \sqrt{1 - \frac{1}{73^2}} \\
&\approx \frac{73}{12} \left(1 - \frac{1}{2 \cdot 73^2}\right)
\end{aligned}
$$

`

Take home message

You can create beautiful typeset equations. {mathpix} is a great place to start!

Some resources

- Chapter 3 of The Not So Short Introduction to LaTeX
- mathjax tutorial

Lab