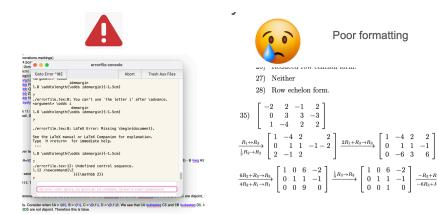# Bookdown: Flexible Document Creation in RStudio

By: Joseph Thiers

Ever have trouble with your LaTeX document?

Poor formatting

Introducing Bookdown

▶ Generate printer-ready books and ebooks from R Markdown documents.

▶ A markup language easier to learn than LaTeX, and to write elements such as section headers, lists, quotes, figures, tables, and citations.

▶ Multiple choices of output formats: PDF, LaTeX, HTML, EPUB, and Word.

▶ Support a wide range of languages: R, C/C++, Python, Fortran, Julia, Shell scripts, and SQL, etc.

▶ LaTeX equations, theorems, and proofs work for all output formats.

▶ Can be published to GitHub, bookdown.org, and any web servers.

▶ Integrated with the RStudio IDE.

But why Bookdown?

MArkdowns better friend Pandoc allows robust markdown editing.

```
31
32   Bookdown supports a wide range of Markdown formatting.
33
34   - **Bold**: `**bold text**` → **bold text**
35   - *Italics*: `*italicized text*` → *italicized text*
36   - **Bullet Points**:
37     - First item
38     - Second item
39   - **Numbered Lists**:
40     1. First item
41       - Even sublists
42       - Like this
43     2. Second item
44
45   For additional text formatting options refer to [Chapt
46
```
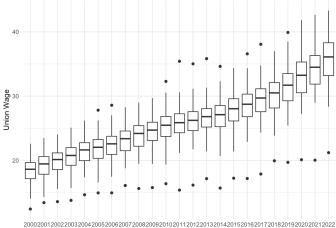
Seamlessly Embed Code

- **Union Wage Premium**: I also calculated the "union wage premium," which is basically the extra amount union workers make compared to nonunion workers.

```
union_wage_premium <- filtered_wages[,
      list(raw_premium = mean(union_wage_premium_raw, na.rm = TRUE),
      adjusted_premium = mean(union_wage_premium_adjusted,
                              na.rm = TRUE)), by = year]
```

Including plots

```r
ggplot(filtered_wages, aes(x = factor(year), y = union_wage)) +
  geom_boxplot() +
  labs(x = "Year", y = "Union Wage") +
  theme_minimal()
```

Seamless LaTeX Integration

Proofs can be added using the `proof` environment.

```
::: {.proof}
\textbf{Proof: }Let $x \in \mathbb Z$. Suppose $7x+5$ is odd. Then $7x+5=2k+1$ for some $k
\begin{align*}
    7x+5&=2k+1\\
    7x&=2k-4\\
    x&=2k-6x-4\\
    x&=2(k-3x-2).
\end{align*}
Since $k-3x-2 \in \mathbb Z$, $x$ is even.
:::
```

Proof. Let $x \in \mathbb{Z}$. Suppose $7x + 5$ is odd. Then $7x + 5 = 2k + 1$ for some $k \in \mathbb{Z}$. Then

$$7x + 5 = 2k + 1$$
$$7x = 2k - 4$$
$$x = 2k - 6x - 4$$
$$x = 2(k - 3x - 2).$$

Since $k - 3x - 2 \in \mathbb{Z}$, x is even.

Customizable Aesthetics via CSS

```css
15   .blackbox {
16       padding: 1em;
17       background: black;
18       color: white;
19       border: 2px solid orange;
20       border-radius: 10px;
21   }
22   .center {
23       text-align: center;
24   }
25   h1, h2, h3, h4, h5, h6 {
26       font-family: "Times New Roman", Times, serif;
27       color: darkblue;
28   }
29   hr {
30       border: 1px solid black;
31       width: 100%;Z
32   }
33
```

CSS Edits

5.4   Tips for LaTeX in Bookdown

- **Use Labels Consistently**: Use meaningful and unique labels for cross-referencing.
- **Use Math Mode**: Always enclose mathematical symbols in `$...$` or `$$...$$` to render correctly.
- **Add Theorem Styles**: Customize theorem environments in `_bookdown.yml` for specific needs:

```
markdown theorem: lab: "Theorem " lem: "Lemma "
```

EXERCISE TIME!

Add an equation and a theorem to your document using LaTeX. Alternatively, copy over some LaTeX code you've written before and place it in one of your chapters.

With LaTeX

```latex
31  \titleformat{\section}
32    {\fontsize{10pt}{12pt}\bfseries} |
33    {\thesection}
34    {1em}
35    {}
36  \titleformat{\subsection}
37    {\fontsize{10pt}{12pt}\bfseries}
38    {\thesubsection}
39    {1em}
40    {}
41  \setlength{\fboxsep}{.8em}
42
43  \newenvironment{blackbox}{
44    \definecolor{shadecolor}{rgb}{0, 0, 0}
45    \color{white}
46    \begin{shaded}}
```

LaTeX Change

that mission hasn't changed. We need to keep building union power to make sure everyone gets a fair shake in this rapidly changing economy.

UNIONS MATTER!

Your take away from this should be that the more of us who join unions, the better all of our wages will be!

Output to multiple Formats

```
12 ▾ bookdown::pdf_book:
13 ▾   includes:
14        in_header: preamble.tex
15      latex_engine: xelatex
16      citation_package: natbib
17      keep_tex: yes
18 bookdown::epub_book: default
19 bookdown::word_document2: default
```

epub and Word

epub

...ocument Creation in RStudio

1 Introduction to Bookdown

In today's fast-paced academic and professional environments, the ability to create dynamic, reproducible documents is crucial. Bookdown empowers users to combine text, code, and visualizations in a single, streamlined workflow. It is ideal for creating the type of documentation that best fits your needs, whether that be single-page assignments, reports, academic papers, or even full-length books.

1.1 Why RStudio and Bookdown?

Bookdown offers a range of benefits: - Seamlessly integrates text, code, and figures. - Supports multiple output formats (HTML, PDF, EPUB). - Simplifies the creation of reproducible and professional documents. - Ideal for mathematics, statistics, and data science professionals.

Word

Bookdown: Flexible Document Creation in RStudio

Guide for Students, Researchers, and Professionals

Joseph Thiers

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1.2   What You'll Learn in This Tutorial

This tutorial will guide you through the essential aspects of using Bookdown:

- **Chapter 1**: Introduction to Bookdown – Learn about its purpose and benefits for structured documentation.

HTML and PDF

HTML

PDF

Robust Documentation

BOOKDOWN

Write HTML, PDF, ePub, and Kindle books with R Markdown

The **bookdown** package is an open-source R package that facilitates writing books and long-form articles/reports with R Markdown. Features include:

- Generate printer-ready books and ebooks from R Markdown documents.
- A markup language easier to learn than LaTeX, and to write elements such as section headers, lists, quotes, figures, tables, and citations.
- Multiple choices of output formats: PDF, LaTeX, HTML, EPUB, and Word.
- Possibility of including dynamic graphics and interactive applications (HTML widgets and Shiny apps).
- Support a wide range of languages: R, C/C++, Python, Fortran, Julia, Shell scripts, and SQL, etc.
- LaTeX equations, theorems, and proofs work for all output formats.

bookdown

Lots of additional Resources

▶ R Markdown Cookbook

▶ https://bookdown.org/yihui/rmarkdown-cookbook/

▶ Pandoc

▶ https://pandoc.org/

▶ RStudio Bookdown Community

▶ https://community.rstudio.com/tags/bookdown

▶ Gallery of Books to Download

▶ https://bookdown.org/home/archive/

Conclusion

QR for my Tutorial