R

2023-07-01

Contents

Chapter 1

Footnotes and citations

1.1 Footnotes

Footnotes are put inside the square brackets after a caret `^[]`. Like this one [1].

1.2 Citations

Reference items in your bibliography file(s) using `@key`.

For example, we are using the **bookdown** package [Xie, 2023] (check out the last code chunk in index.Rmd to see how this citation key was added) in this sample book, which was built on top of R Markdown and **knitr** [Xie, 2015] (this citation was added manually in an external file book.bib). Note that the `.bib` files need to be listed in the index.Rmd with the YAML `bibliography` key.

The RStudio Visual Markdown Editor can also make it easier to insert citations: https://rstudio.github.io/visual-markdown-editing/#/citations

[1] This is a footnote.

1 R

All chapters start with a first-level heading followed by your chapter title, like the line above. There should be only one first-level heading (`#`) per .Rmd file.

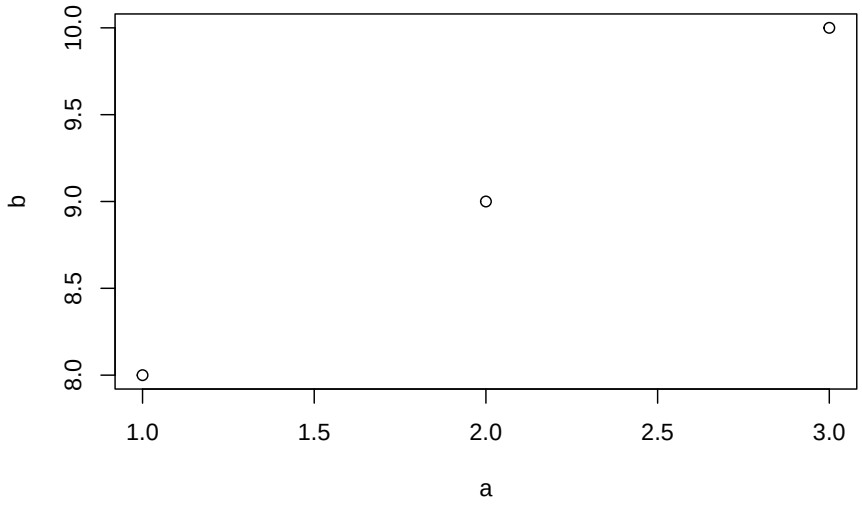
1.1

All chapter sections start with a second-level (`##`) or higher heading followed by your section title, like the sections above and below here. You can have as many as you want within a chapter.

1.1.1 R

Chapters and sections are numbered by default. To un-number a heading, add a `{.unnumbered}` or the shorter `{-}` at the end of the heading, like in this section.

```
a<- c(1,2,3)
b <- c(8,9,10)
plot(a,b)
```



1.1.2 Rstudio

1.1.3 R

1.2

1.3

2

Cross-references make it easier for your readers to find and link to elements in your book.

2.1

There are two steps to cross-reference any heading:

1. Label the heading: `# Hello world {#nice-label}`.
    - Leave the label off if you like the automated heading generated based on your heading title: for example, `# Hello world` = `# Hello world {#hello-world}`.
    - To label an un-numbered heading, use: `# Hello world {-#nice-label}` or `{# Hello world .unnumbered}`.
2. Next, reference the labeled heading anywhere in the text using `\@ref(nice-label)`; for example, please see Chapter **??**.
    - If you prefer text as the link instead of a numbered reference use: any text you want can go here.

2.2

Figures and tables *with captions* can also be cross-referenced from elsewhere in your book using `\@ref(fig:chunk-label)` and `\@ref(tab:chunk-label)`, respectively.

See Figure 1.1.

```
par(mar = c(4, 4, .1, .1))
plot(pressure, type = 'b', pch = 19)
```

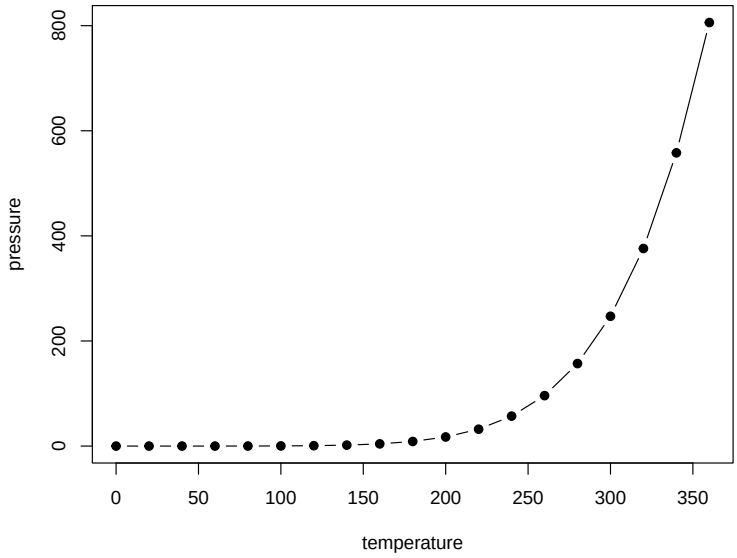


Figure 1.1: Here is a nice figure!

Don't miss Table 1.1.

```
knitr::kable(
  head(pressure, 10), caption = 'Here is a nice table!',
  booktabs = TRUE
)
```

2.3

Table 1.1: Here is a nice table!

temperature	pressure
0	0.0002
20	0.0012
40	0.0060
60	0.0300
80	0.0900
100	0.2700
120	0.7500
140	1.8500
160	4.2000
180	8.8000

3 R

You can add parts to organize one or more book chapters together. Parts can be inserted at the top of an .Rmd file, before the first-level chapter heading in that same file.

Add a numbered part: `# (PART) Act one {-}` (followed by `# A chapter`)

Add an unnumbered part: `# (PART\*) Act one {-}` (followed by `# A chapter`)

Add an appendix as a special kind of un-numbered part: `# (APPENDIX) Other stuff {-}` (followed by `# A chapter`). Chapters in an appendix are prepended with letters instead of numbers.

3.1 R

```
load("C:/Users/liren/Desktop/R / /    /  /data_rdata/data_rdata/Data_Set_1.rdata")#
head(data_set_1) #
```

```
##   Threshold
## 1       1.0
## 2       1.0
## 3       1.1
## 4       1.4
## 5       1.4
## 6       1.4
```

```
str(data_set_1) #
```

```
## 'data.frame':    470 obs. of  1 variable:
##  $ Threshold: num  1 1 1.1 1.4 1.4 1.4 1.5 1.7 1.9 2 ...
##  - attr(*, "var.labels")= chr "Mechanical threshold (sheep)"
```

```r
table(data_set_1) #
```

```
## Threshold
##    1  1.1  1.4  1.5  1.7  1.9    2  2.1  2.2  2.3  2.4  2.5  2.6  2.7  2.8  2.9
##    2    1    3    1    1    1    1    8    3    4    4    4    5    5    7    3
##    3  3.1  3.2  3.3  3.4  3.5  3.6  3.7  3.8  3.9    4  4.1  4.2  4.3  4.4  4.5
##    4   10   12    5    9   14   10    9   10    5    7   19   17   14    8   15
##  4.6  4.7  4.8  4.9    5  5.1  5.2  5.3  5.4  5.5  5.6  5.7  5.8  5.9    6  6.1
##   14   14   18   11    8    9    9    5    8    5    6    6    5    8    4    3
##  6.2  6.3  6.4  6.5  6.6  6.7  6.8  6.9    7  7.1  7.2  7.4  7.5  7.6  7.7  7.8
##    2    4    5    5    1    4    6    3    2    3    1    3    2    3    1    3
##  7.9    8  8.1  8.2  8.3  8.4  8.5  8.6  8.7  8.8  8.9    9  9.1  9.2  9.3  9.4
##    3    2    1    2    1    2    3    1    1    1    3    1    1    1    3    2
##  9.5  9.6  9.7  9.8  9.9   10 10.2 10.3 10.4 10.5 10.7 10.8 10.9   11 11.3 11.5
##    3    3    2    2    1    3    2    1    1    2    2    1    2    1    1    1
## 11.8   12 12.3 12.4 12.6 12.8 12.9 13.4 13.8   14 14.5 14.9
##    1    1    1    1    1    1    1    1    1    1    1    1
```

```r
summary(data_set_1)
```

```
##    Threshold
##  Min.   : 1.000
##  1st Qu.: 3.700
##  Median : 4.650
##  Mean   : 5.252
##  3rd Qu.: 6.100
##  Max.   :14.900
```

3.2

4 R

4.1

Footnotes are put inside the square brackets after a caret `^[]`. Like this one [2].

4.2

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[2] This is a footnote.

5 R

5.1

Here is an equation.

$$f\left(k\right) = \binom{n}{k} p^k \left(1-p\right)^{n-k} \tag{1.1}$$

You may refer to using `\@ref(eq:binom)`, like see Equation (1.1).

5.2

Labeled theorems can be referenced in text using `\@ref(thm:tri)`, for example, check out this smart theorem 1.1.

Theorem 1.1. *For a right triangle, if c denotes the* length *of the hypotenuse and a and b denote the lengths of the* ***other*** *two sides, we have*

$$a^2 + b^2 = c^2$$

Read more here https://bookdown.org/yihui/bookdown/markdown-extensions-by-bookdown.html.

5.3

The R Markdown Cookbook provides more help on how to use custom blocks to design your own callouts: https://bookdown.org/yihui/rmarkdown-cookbook/custom-blocks.html

6 R

6.1 Publishing

HTML books can be published online, see: https://bookdown.org/yihui/bookdown/publishing.html

6.2 404 pages

By default, users will be directed to a 404 page if they try to access a webpage that cannot be found. If you'd like to customize your 404 page instead of using the default, you may add either a `_404.Rmd` or `_404.md` file to your project root and use code and/or Markdown syntax.

Bookdown HTML books will provide HTML metadata for social sharing on platforms like Twitter, Facebook, and LinkedIn, using information you provide in the `index.Rmd` YAML. To setup, set the `url` for your book and the path to your `cover-image` file. Your book's `title` and `description` are also used.

This `gitbook` uses the same social sharing data across all chapters in your book- all links shared will look the same.

Specify your book's source repository on GitHub using the `edit` key under the configuration options in the `_output.yml` file, which allows users to suggest an edit by linking to a chapter's source file.

Read more about the features of this output format here:

https://pkgs.rstudio.com/bookdown/reference/gitbook.html

Or use:

```
?bookdown::gitbook
```

7 R

7.1 Publishing

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Bibliography

Yihui Xie. *Dynamic Documents with R and knitr*. Chapman and Hall/CRC, Boca Raton, Florida, 2nd edition, 2015. URL http://yihui.org/knitr/. ISBN 978-1498716963.

Yihui Xie. *bookdown: Authoring Books and Technical Documents with R Markdown*, 2023. URL https://CRAN.R-project.org/package=bookdown. R package version 0.34.