A Minimal Book Example

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2020-03-01

Contents

Chapter 1

Prerequisites

This is a *sample* book written in **Markdown**. You can use anything that Pandoc's Markdown supports, e.g., a math equation $a^2 + b^2 = c^2$.

The **bookdown** package can be installed from CRAN or Github:

```
install.packages("bookdown")
# or the development version
# devtools::install_github("rstudio/bookdown")
```

Remember each Rmd file contains one and only one chapter, and a chapter is defined by the first-level heading `#`.

To compile this example to PDF, you need XeLaTeX. You are recommended to install TinyTeX (which includes XeLaTeX): https://yihui.name/tinytex/.

Chapter 2

Introduction

You can label chapter and section titles using `{#label}` after them, e.g., we can reference Chapter 2. If you do not manually label them, there will be automatic labels anyway, e.g., Chapter 4.

Figures and tables with captions will be placed in `figure` and `table` environments, respectively.

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

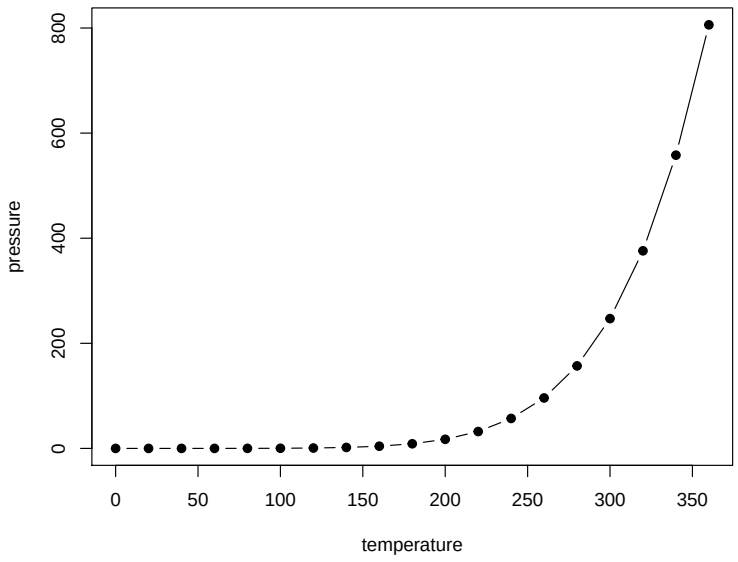

Figure 2.1: Here is a nice figure!

Table 2.1: Here is a nice table!

Sepal.Length	Sepal.Width	Petal.Length	Petal.Width	Species
5.1	3.5	1.4	0.2	setosa
4.9	3.0	1.4	0.2	setosa
4.7	3.2	1.3	0.2	setosa
4.6	3.1	1.5	0.2	setosa
5.0	3.6	1.4	0.2	setosa
5.4	3.9	1.7	0.4	setosa
4.6	3.4	1.4	0.3	setosa
5.0	3.4	1.5	0.2	setosa
4.4	2.9	1.4	0.2	setosa
4.9	3.1	1.5	0.1	setosa
5.4	3.7	1.5	0.2	setosa
4.8	3.4	1.6	0.2	setosa
4.8	3.0	1.4	0.1	setosa
4.3	3.0	1.1	0.1	setosa
5.8	4.0	1.2	0.2	setosa
5.7	4.4	1.5	0.4	setosa
5.4	3.9	1.3	0.4	setosa
5.1	3.5	1.4	0.3	setosa
5.7	3.8	1.7	0.3	setosa
5.1	3.8	1.5	0.3	setosa

Reference a figure by its code chunk label with the `fig:` prefix, e.g., see Figure 2.1. Similarly, you can reference tables generated from `knitr::kable()`, e.g., see Table 2.1.

```
knitr::kable(
  head(iris, 20), caption = 'Here is a nice table!',
  booktabs = TRUE
)
```

You can write citations, too. For example, we are using the **bookdown** package (Xie, 2020) in this sample book, which was built on top of R Markdown and **knitr** (Xie, 2015).

Chapter 3

Literature

Here is a review of existing methods.

Chapter 4

Methods

We describe our methods in this chapter.

Chapter 5

Applications

Some *significant* applications are demonstrated in this chapter.

5.1 Example one

Adding some text here…

5.2 Example two

Chapter 6

Python

6.1 A normal R code chunk

```
library(reticulate)
x = 42
print(x)
```

```
## [1] 42
```

6.2 Modify an R variable

In the following chunk, the value of `x` on the right hand side is 42, which was defined in the previous chunk.

```
x = x + 12
print(x)
```

```
## [1] 54
```

6.3 A Python chunk

This works fine and as expected.

```
print('Python version = ', sys.version)
```

```
## Python version =  3.5.2 (default, Nov 12 2018, 13:43:14)
## [GCC 5.4.0 20160609]
```

```
x = 42 * 2
print(x)
```

```
## 84
```

The value of `x` in the Python session is 84. It is not the same `x` as the one in R.

6.4 Modify a Python variable

```
x = x + 18
print(x)
```

```
## 102
```

Retrieve the value of `x` from the Python session again:

```
py$x
```

```
## [1] 102
```

Assign to a variable in the Python session from R:

```
py$y = 1:5
```

See the value of `y` in the Python session:

```
print(y)
```

```
## [1, 2, 3, 4, 5]
```

6.5 Python graphics

You can draw plots using the **matplotlib** package in Python.

```
# import matplotlib
# matplotlib.use('agg')
# import matplotlib.pyplot as plt
# plt.plot([0, 2, 1, 4])
# plt.show()
```

Chapter 7

Final Words

We have finished a nice book.

Bibliography

Xie, Y. (2015). *Dynamic Documents with R and knitr*. Chapman and Hall/CRC, Boca Raton, Florida, 2nd edition. ISBN 978-1498716963.

Xie, Y. (2020). *bookdown: Authoring Books and Technical Documents with R Markdown*. R package version 0.17.2.