

# Programming for Community Ecology and Macroecology

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*2017-11-11*



# Contents



# Preface

This short book introduces an R package, **bookdown**, to change your workflow of writing books. It should be technically easy to write a book, visually pleasant to view the book, fun to interact with the book, convenient to navigate through the book, straightforward for readers to contribute or leave feedback to the book author(s), and more importantly, authors should not always be distracted by typesetting details.

The **bookdown** package is built on top of R Markdown (<http://rmarkdown.rstudio.com>), and inherits the simplicity of the Markdown syntax (you can learn the basics in five minutes; see Section ??), as well as the possibility of multiple types of output formats (PDF/HTML/Word/...). It has also added features like multi-page HTML output, numbering and cross-referencing figures/tables/sections/equations, inserting parts/appendices, and imported the GitBook style (<https://www.gitbook.com>) to create elegant and appealing HTML book pages. This book itself is an example of how you can produce a book from a series of R Markdown documents, and both the printed version and the online version can look professional. You can find more examples at <https://bookdown.org>.

Despite the package name containing the word “book”, **bookdown** is not only for books. The “book” can be anything that consists of multiple R Markdown documents meant to be read in a linear sequence, such as course handouts, study notes, a software manual, a thesis, or even a diary. In fact, many **bookdown** features apply to single R Markdown documents as well (see Section ??).



Figure 1: Creative Commons License



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

For now, you have to install the development versions of **bookdown** from Github:

```
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 to install XeLaTeX.





## Chapter 2

# Introduction

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

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)
```

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

```
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 (?) in this sample book, which was built on top of R Markdown and **knitr** (?).

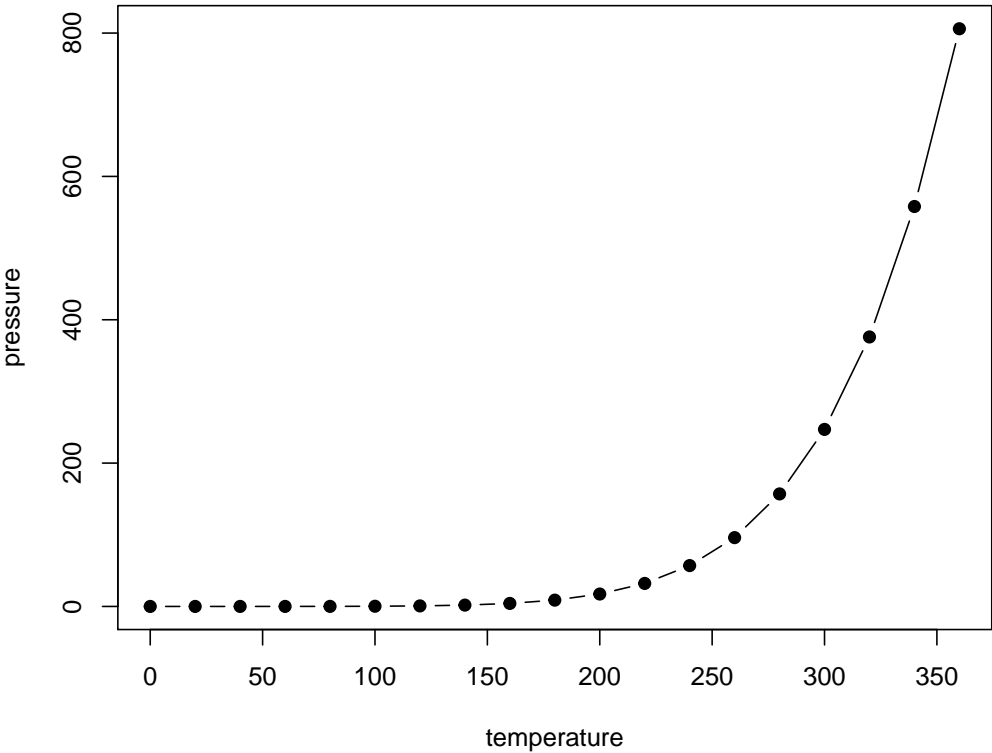


Figure 2.1: Here is a nice figure!

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

## 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

### 5.2 Example two





## Chapter 6

# Final Words

We have finished a nice book.