Foundations of data science

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Preface

Under construction

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Introduction

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 3.

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)
```

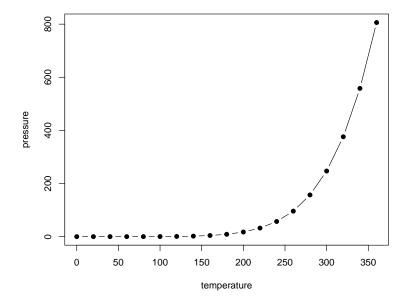


Figure 2.1: Here is a nice figure!

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

Table 2.1: Here is a nice table!

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, 2023) in this sample book, which was built on top of R Markdown and **knitr** (Xie, 2015).

Methods

We describe our methods in this chapter.

Math can be added in body using usual syntax like this

math example 3.1

p is unknown but expected to be around 1/3. Standard error will be approximated

$$SE = \sqrt(\frac{p(1-p)}{n}) \approx \sqrt{\frac{1/3(1-1/3)}{300}} = 0.027$$

You can also use math in footnotes like this¹.

We will approximate standard error to 0.027^2

$$SE = \sqrt(\frac{p(1-p)}{n}) \approx \sqrt{\frac{1/3(1-1/3)}{300}} = 0.027$$

 $^{^1}$ where we mention $p=\frac{a}{b}$ 2p is unknown but expected to be around 1/3. Standard error will be approximated

Applications

Some significant applications are demonstrated in this chapter.

- 4.1 Example one
- 4.2 Example two

Final Words

We have finished a nice book.

Literature

Here is a review of existing methods.

Bibliography

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

Xie, Y. (2023). bookdown: Authoring Books and Technical Documents with R Markdown. R package version 0.33.