Course manual R programming 2020/2021

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Welcome

This is the website for the course Programming in R at Tilburg University for the course year 2020/2021

Chapter 1

Introduction

You can label chapter and section titles using `{#label}` after them, e.g., we can reference Chapter 1. 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)
```

Reference a figure by its code chunk label with the `fig:` prefix, e.g., see Figure 1.1. Similarly, you can reference tables generated from `knitr::kable()`, e.g., see Table 1.1.

```
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).

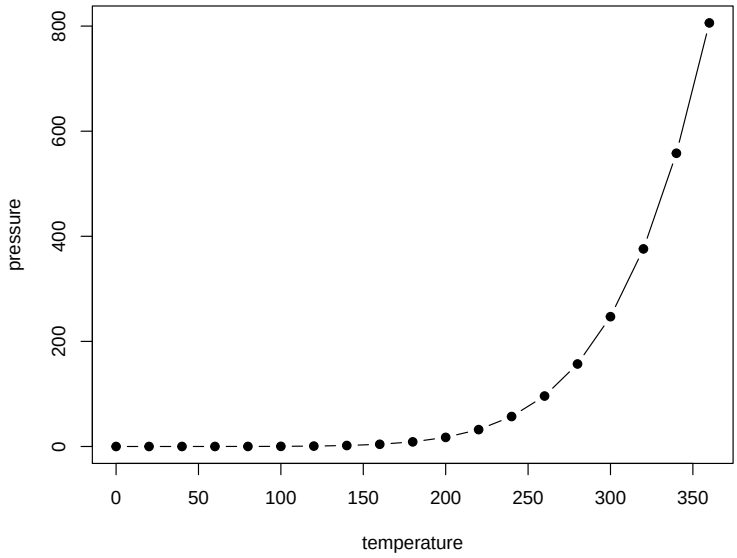

Figure 1.1: Here is a nice figure!

Table 1.1: 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 2

Installing the software

2.1 What do you need?

We assume you have a laptop (Windows or Mac). To be able to follow the course and use the software for other courses you need the following free software:

- R
- Rstudio
- TinyTex
- R packages

R is free software for importing data, manipulating data and statistical analysis. Once installed, you don't need to open the software.

We will use R in another program: Rstudio. Rstudio is a so called Integrated Development Environment (IDE), which allows you to write and run code.

Rstudio is able to transform your code to different nice outputs:

- notebook
- presentation
- article
- thesis
- much more (even this website and this course manual is build in Rstudio!)

Rstudio needs TinyTex to transform your code to pdf.

If you need to do things more often, it is useful to write a function to do these things. Other R users also use functions and store them in packages. Some of these packages are published online and can be used by all users. We will depend in our course on some of these packages.

The first package we will install is the package TinyTex, which is basically a function to install the TinyTex software on your computer, taking into account your operating system.

We also show you how to install other packages.

In this chapter we will instruct how to install the software.

2.2 Installing R

In this paragraph we will take you through the steps to install R.

1. Go to this website
2. Choose download R for your operating system. You can choose from Windows, Mac OS X for apple computers and Linux. If you don't know which operating system you have and you don't have an apple computer, you may guess you have a Windows computer.
3. After downloading, open the dowloaded file and follow the steps to install the program. Choose the default options.

Chapter 3

Methods

We describe our methods in this chapter.

Chapter 4

Applications

Some *significant* applications are demonstrated in this chapter.

4.1 Example one

4.2 Example two

Chapter 5

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 0.20.