Bookdown, Travis, Fonts

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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.org/tinytex/.

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)
```

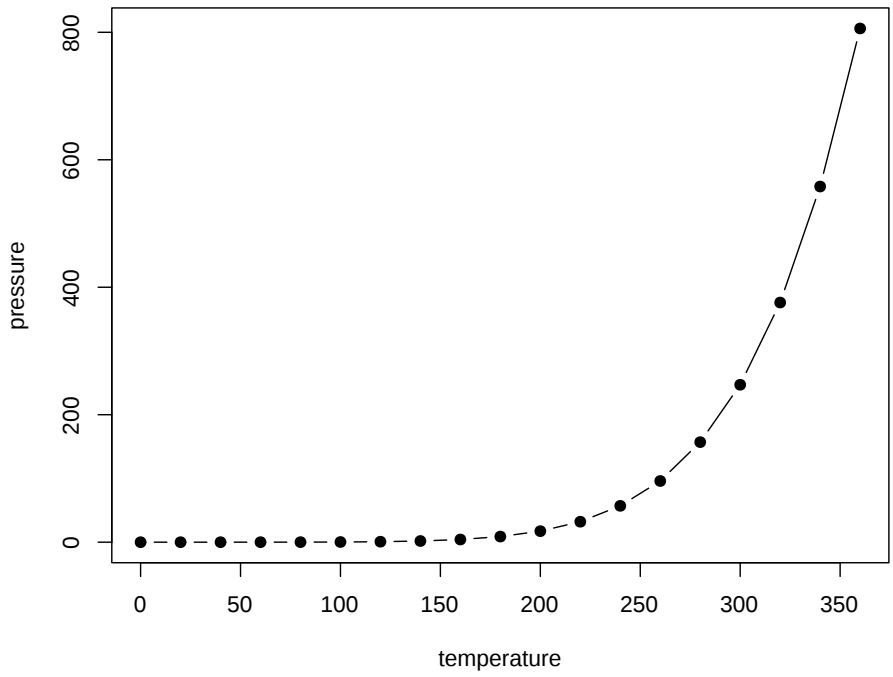

Abbildung 1: Here is a nice figure!

Reference a figure by its code chunk label with the `fig:` prefix, e.g., see Figure 1. Similarly, you can reference tables generated from `knitr::kable()`, e.g., see Table 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).

Tabelle 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

3 Literature

Here is a review of existing methods.

4 Methods

4.1 Plotting

With FONTS!

```
library(extrafont) # For fontstuff
```

```
## Registering fonts with R
```

```
# for PDF output
loadfonts()
fonttable()
```

```
## data frame with 0 columns and 0 rows
```

```
# using ragg for png
# loading just for renv to pick it up
library(ragg)
```

```
library(ggplot2)

p <- ggplot(iris, aes(x = Species, y = Sepal.Length, color = Species, fill = Species)) +
   geom_boxplot(alpha = .75, show.legend = FALSE) +
   scale_color_brewer(palette = "Dark2", aesthetics = c("color", "fill")) +
   labs(
      title = "Yet another iris plot",
      subtitle = "At least make it kind of neat to look at maybe?",
      x = "I should google those species",
      y = "*Googleing 'Sepal'*",
      caption = "Hi!"
   )

p + theme_minimal()
```

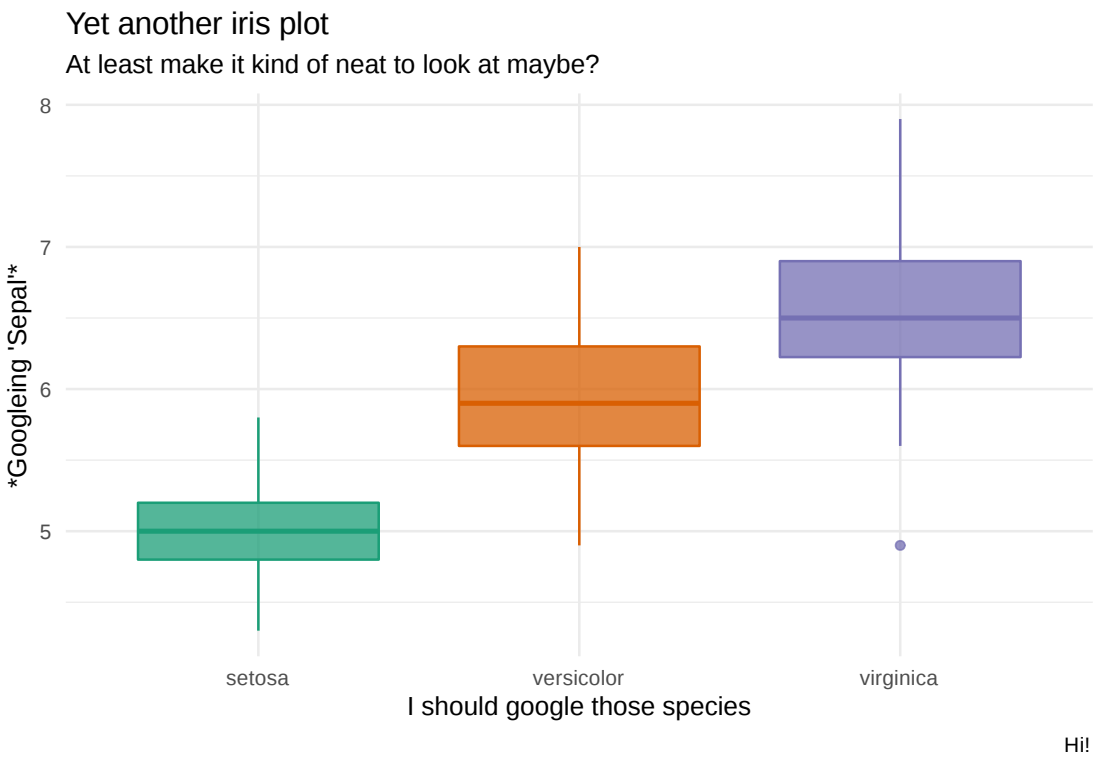

Abbildung 2: A plot.

```
p + theme_minimal(base_family = "Source Sans Pro")
```

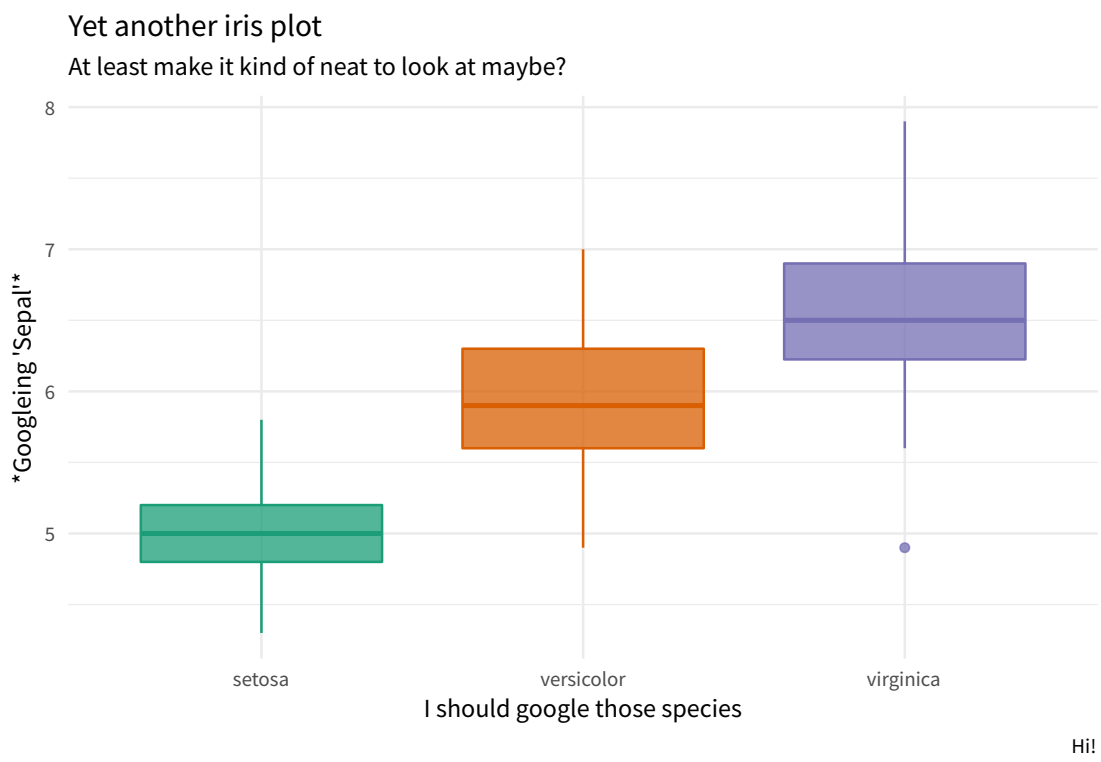

Abbildung 3: A plot.

```
p + theme_minimal(base_family = "Roboto Condensed")
```

4.2 Math

Using one dollar sign: $\beta = (X^T X)^{-1} X^T Y$

Display style with two dollar signs:

$$\beta = (X^T X)^{-1} X^T Y$$

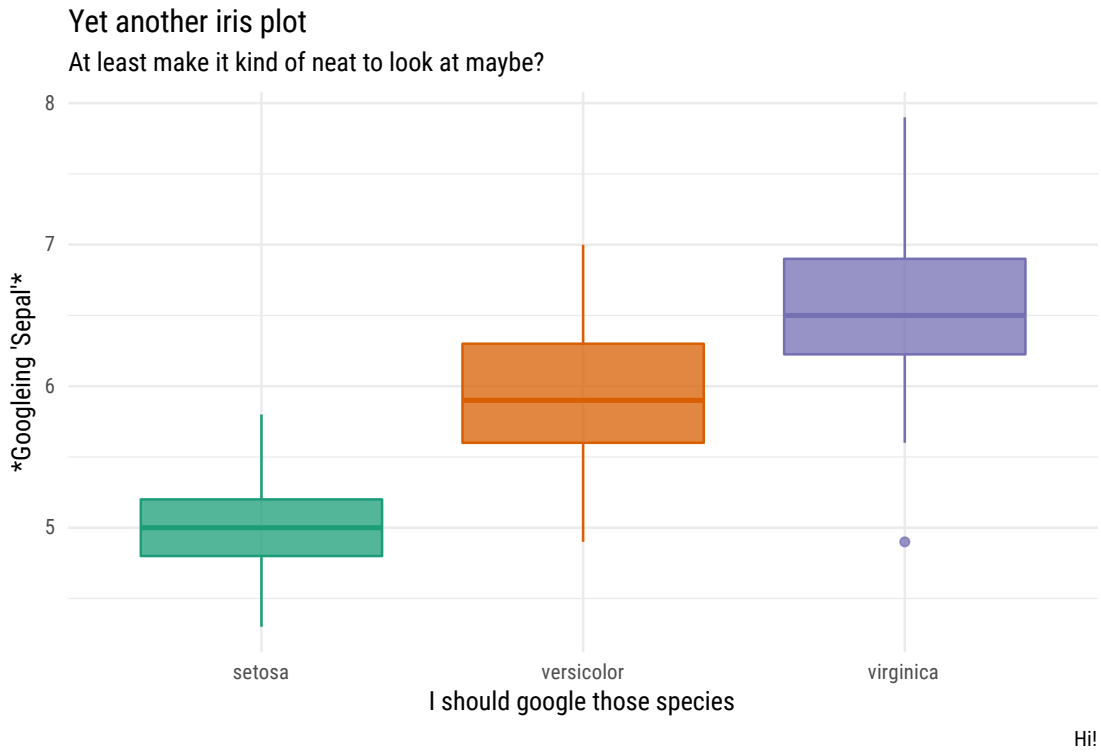

Abbildung 4: A plot.

4.2.1 Using environments

$$\begin{aligned}
\mathbb{E}(\widehat{\beta}) &= \mathbb{E}\left(\left(X^T X\right)^{-1} X^T Y\right) && (1)\\
&= \mathbb{E}\left(\left(X^T X\right)^{-1} X^T \left(X\beta + \varepsilon\right)\right) && (2)\\
&= \mathbb{E}\left(\left(X^T X\right)^{-1} X^T X\beta + \left(X^T X\right)^{-1} X^T \varepsilon\right) && (3)\\
&= \underbrace{\left(X^T X\right)^{-1} X^T X\,\beta}_{=I} + \underbrace{\left(X^T X\right)^{-1} X^T \mathbb{E}(\varepsilon)}_{=0} \quad \Big| \; \mathbb{E}(\varepsilon) = 0 && (4)\\
&= \beta \qquad \square && (5)
\end{aligned}$$

`equation` from bookdown book:

$$f\left(k\right) = \binom{n}{k} p^k \left(1-p\right)^{n-k} \tag{6}$$

5 Applications

Some significant applications are demonstrated in this chapter.

5.1 Example one

5.2 Example two

6 Final Words

We have finished a nice book.

Literatur

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 0.18.