Financial Informatics with R: A Field Guide

Jake Vestal

22 May 2019

Contents

1 Prerequisites **5**

2 Installation **7**

2.1 Installation 7

2.2 Setup 9

3 Literature **11**

4 Methods **13**

5 Applications **15**

5.1 Example one 15

5.2 Example two 15

6 Final Words **17**

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

Installation

When you've completed the steps in this section, and if everything installed correctly, you should be able to run the command

2.1 Installation

When you've completed the steps in this section, and if everything installed correctly, you should be able to run the command :

```
shiny::runGitHub(
  repo     = "shiny-examples",
  username = "rstudio",
  subdir   = "063-superzip-example"
)
```

which will point R to https://github.com/rstudio/shiny-examples/tree/master/063-superzip-example, download the app there (a neat example that visualizes US demographic data), and run it in your session of RStudio.

2.1.1 Install R

Clearly, you're going to need R installed! Depending on your OS, follow the instructions below to install R:

2.1.1.1 Mac OS X:

Download and install the .pkg file for the latest version of R found here double-click it to install R.

2.1.1.2 Windows:

1. Download the installer .exe file found here and double-click it to install R.
2. You'll also need **Rtools**. Download the .exe file found here and double-click it to install Rtools. Best to stick with the recommended version.

2.1.1.3 Ubuntu:

If you're using a different Linux distro, it's assumed that you know what you're doing – have at it :)

We're going to add the CRAN Project repository to your system's sources list, run `apt update`, and then install R, plus the development package `r-devel`, from the CRAN repo. To do this, open a terminal and go through the following steps:

1. Add the repo's GPG key.

   ```
   sudo apt-key adv --keyserver keyserver.ubuntu.com --recv-keys E298A3A825C0D65DFD57CBB651716619E084D
   ```

2. Add the repository to your sources list. If you're not using Ubuntu 18 (Bionic Beaver), don't forget to change "`bionic`" to your version's name in the command below. Allowed choices can be found here.

   ```
   sudo add-apt-repository 'deb https://cloud.r-project.org/bin/linux/ubuntu bionic-cran35/'
   ```

3. `sudo apt update`. Successful output confirms that the repo has been added; something like:

   ```
   Hit:2 https://cloud.r-project.org/bin/linux/ubuntu bionic-cran35/ InRelease
   ```

4. Install R with: `sudo apt install r-base r-devel`

5. Check that all's well. The command `sudo -i R` should print out information about your R install and should look something like this: "' R version 3.6.0 (2019-04-26) – "Planting of a Tree" Copyright (C) 2019 The R Foundation for Statistical Computing Platform: x86_64-pc-linux-gnu (64-bit)

R is free software and comes with ABSOLUTELY NO WARRANTY. You are welcome to redistribute it under certain conditions. Type 'license()' or 'licence()' for distribution details.

Natural language support but running in an English locale

R is a collaborative project with many contributors. Type 'contributors()' for more information and 'citation()' on how to cite R or R packages in publications.

Type 'demo()' for some demos, 'help()' for on-line help, or 'help.start()' for an HTML browser interface to help. Type 'q()' to quit R.

```
### Install RStudio

RStudio is the industry standard interactive development environment (IDE) for R, developed and maintai

Install RStudio by downloading and running the installer that matches your OS found [here](https://www.
```

```
### Install R Packages

Open up RStudio and run the command below to install the packges listed:
```

install.packages(c("devtools", "tidyverse", "roxygen2", "testthat", "knitr", "pkgdown", "shiny", "DT", "dygraphs", "plotly", "xts"))

```
Go get a coffee because this will probably take a few minutes.

### Restart your computer

Optional, but your computer works hard for you. Give it a break and let it restart. At the very least,

### Check that all's well
Run an example app hosted on GitHub. If it works, everything installed correctly:
```

shiny::runGitHub(repo = “shiny-examples”, username = “rstudio”, subdir = “063-superzip-example”) “‘

2.2 Setup

Chapter 3

Literature

Here is a review of existing methods.

Chapter 4

Methods

We describe our methods in this chapter.

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)
```

Reference a figure by its code chunk label with the `fig:` prefix, e.g., see Figure 4.1. Similarly, you can reference tables generated from `knitr::kable()`, e.g., see Table 4.1.

```
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, 2019) in this sample book, which was built on top of R Markdown and **knitr** (Xie, 2015).

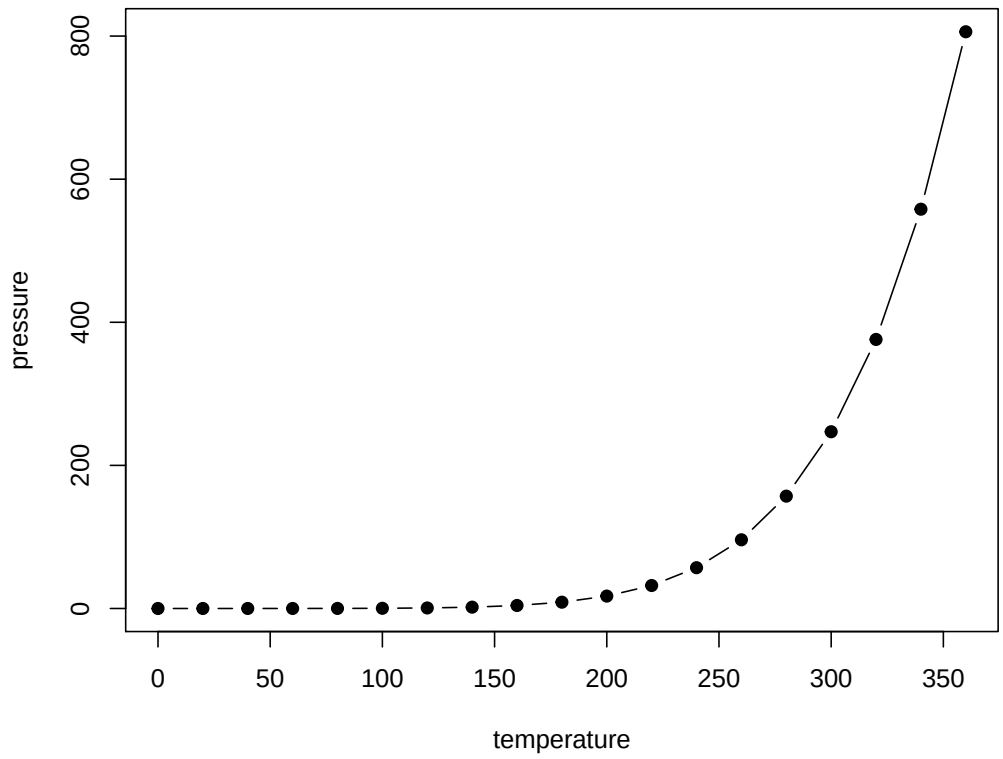

Figure 4.1: Here is a nice figure!

Table 4.1: 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 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.

Bibliography

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

Xie, Y. (2019). *bookdown: Authoring Books and Technical Documents with R Markdown*. R package version 0.10.