A Minimal Book Example

Yihui Xie

2018-09-01

目录

第一章 Prerequisites **5**

第一章　Prerequisites

This is a *sample* book written in **Markdown**. You can use anything that Pandoc's Markdown supports, e.g., a math equation $a^2 + b^2 = c^2$.

$$
\begin{aligned}
p(\boldsymbol{\theta}|Y) &= \frac{p(\boldsymbol{\theta}, Y)}{p(Y)} && \text{[条件概率定义]} \\
&= \frac{p(Y|\boldsymbol{\theta})p(\boldsymbol{\theta})}{p(Y)} && \text{[链式法则]} \\
&= \frac{p(Y|\boldsymbol{\theta})p(\boldsymbol{\theta})}{\int_{\Theta} p(Y, \boldsymbol{\theta}) d\boldsymbol{\theta}} && \text{[全概率公式]} \\
&= \frac{p(Y|\boldsymbol{\theta})p(\boldsymbol{\theta})}{\int_{\Theta} p(Y|\boldsymbol{\theta})p(\boldsymbol{\theta}) d\boldsymbol{\theta}} && \text{[链式法则]} \\
&\propto p(Y|\boldsymbol{\theta})p(\boldsymbol{\theta}) && \text{[Y 是固定的]}
\end{aligned}
$$

The **bookdown** package can be installed from CRAN or Github:

```
install.packages("bookdown")
# or the development version
# devtools::install_github("rstudio/bookdown")
```

插入横线，续表的中文化

```
library(kableExtra)
db <- mtcars[, 1:7]
db2 <- cbind(rownames(db), db)
colnames(db2) <- c("Methods", rep(c("Bias", "RMSE"), 3), "")

kable(db2,
  format = "latex", booktabs = TRUE, escape = T, row.names = F,
  longtable = T, caption = " 第 1 种类型的统计表格样式"
) %>%
  kable_styling(
    latex_options = c("striped", "hold_position", "repeat_header"),
    full_width = F, position = "center"
```

```
) %>%
add_header_above(c(" ",
  "$\\\\sigma^2$" = 2, "$\\\\phi$" = 2,
  "$\\\\tau^2$" = 2, "$r=\\\\delta/\\\\phi$" = 1
), escape = F) %>%
footnote(
  general_title = " 注: ", title_format = "italic", threeparttable = T,
  general = "* 星号表示的内容很长很长很长很长很长长长长长长长长长长长长长长长长长长长长"
)
```

表 1.1: 第 1 种类型的统计表格样式

	σ^2		ϕ		τ^2		$r = \delta/\phi$
Methods	Bias	RMSE	Bias	RMSE	Bias	RMSE	
Mazda RX4	21.0	6	160.0	110	3.90	2.620	16.46
Mazda RX4 Wag	21.0	6	160.0	110	3.90	2.875	17.02
Datsun 710	22.8	4	108.0	93	3.85	2.320	18.61
Hornet 4 Drive	21.4	6	258.0	110	3.08	3.215	19.44
Hornet Sportabout	18.7	8	360.0	175	3.15	3.440	17.02
Valiant	18.1	6	225.0	105	2.76	3.460	20.22
Duster 360	14.3	8	360.0	245	3.21	3.570	15.84
Merc 240D	24.4	4	146.7	62	3.69	3.190	20.00
Merc 230	22.8	4	140.8	95	3.92	3.150	22.90
Merc 280	19.2	6	167.6	123	3.92	3.440	18.30
Merc 280C	17.8	6	167.6	123	3.92	3.440	18.90
Merc 450SE	16.4	8	275.8	180	3.07	4.070	17.40
Merc 450SL	17.3	8	275.8	180	3.07	3.730	17.60
Merc 450SLC	15.2	8	275.8	180	3.07	3.780	18.00
Cadillac Fleetwood	10.4	8	472.0	205	2.93	5.250	17.98
Lincoln Continental	10.4	8	460.0	215	3.00	5.424	17.82
Chrysler Imperial	14.7	8	440.0	230	3.23	5.345	17.42
Fiat 128	32.4	4	78.7	66	4.08	2.200	19.47
Honda Civic	30.4	4	75.7	52	4.93	1.615	18.52
Toyota Corolla	33.9	4	71.1	65	4.22	1.835	19.90
Toyota Corona	21.5	4	120.1	97	3.70	2.465	20.01
Dodge Challenger	15.5	8	318.0	150	2.76	3.520	16.87
AMC Javelin	15.2	8	304.0	150	3.15	3.435	17.30

表 1.1: 第 1 种类型的统计表格样式 *(continued)*

Methods	Bias	RMSE	Bias	RMSE	Bias	RMSE	
Camaro Z28	13.3	8	350.0	245	3.73	3.840	15.41
Pontiac Firebird	19.2	8	400.0	175	3.08	3.845	17.05
Fiat X1-9	27.3	4	79.0	66	4.08	1.935	18.90
Porsche 914-2	26.0	4	120.3	91	4.43	2.140	16.70
Lotus Europa	30.4	4	95.1	113	3.77	1.513	16.90
Ford Pantera L	15.8	8	351.0	264	4.22	3.170	14.50
Ferrari Dino	19.7	6	145.0	175	3.62	2.770	15.50
Maserati Bora	15.0	8	301.0	335	3.54	3.570	14.60
Volvo 142E	21.4	4	121.0	109	4.11	2.780	18.60

注：

* 星号表示的内容很长很长很长很长很长长长长长长长长长长长长长长长长长长长长长长长

`threeparttable = TRUE` 处理超长的注解标记，`add_header_above` 函数内的 `escape = F` 用来处理数学公式，`longtable = T` 表格很长时需要分页，因此使用续表

```
# 造一些数据
collapse_rows_dt <- expand.grid(
  Country = sprintf("Country with a long name %s", c("A", "B")),
  State = sprintf("State %s", c("a", "b")),
  City = sprintf("City %s", c("1", "2")),
  District = sprintf("District %s", c("1", "2"))
) %>%
  arrange(Country, State, City) %>%
  mutate_all(as.character) %>%
  mutate(
    C1 = rnorm(n()),
    C2 = rnorm(n())
  )
row_group_label_fonts <- list(
  list(bold = T, italic = T),
  list(bold = F, italic = F)
)

kable(collapse_rows_dt, "latex", longtable = TRUE,
  booktabs = T, align = "c", linesep = "",
```

```
  caption = " 第 2 种类型的统计表格样式"
) %>%
  kable_styling(
    latex_options = c("striped", "hold_position", "repeat_header"),
    full_width = F, position = "center"
  ) %>%
  column_spec(1, bold = T) %>%
  collapse_rows(1:3,
    latex_hline = "custom", custom_latex_hline = 1:3,
    row_group_label_position = "stack",
    row_group_label_fonts = row_group_label_fonts
  )
```

表 1.2: 第 2 种类型的统计表格样式

	City	District	C1	C2
Country with a long name A				
State a				
	City 1	District 1	0.8105812	-1.5852928
		District 2	1.4179038	0.6183236
	City 2	District 1	1.3476411	-0.0471493
		District 2	-0.5016625	-0.2134680
State b				
	City 1	District 1	-0.2870107	-0.4970279
		District 2	-0.9662371	0.5951959
	City 2	District 1	0.3049904	-0.1769102
		District 2	-0.2219533	-0.3058346
Country with a long name B				
State a				
	City 1	District 1	1.1572648	1.0044060
		District 2	0.1663139	1.5270802
	City 2	District 1	-0.8831136	1.2107975
		District 2	-0.5066262	-0.1710977
State b				
	City 1	District 1	0.3320892	-1.2652650
		District 2	-0.7597824	0.6592363

表 1.2: 第 2 种类型的统计表格样式 *(continued)*

Country	State	City	District	C1	C2
		City 2	District 1	-1.4505810	-1.9158731
			District 2	1.5479971	-0.9852655

To compile this example to PDF, you need XeLaTeX. You are recommended to install TinyTeX (which includes XeLaTeX): https://yihui.name/tinytex/.

软件信息

```
xfun::session_info(packages = c("rmarkdown","bookdown","kableExtra"),
                   dependencies = FALSE)
```

```
## R version 3.5.0 (2017-01-27)
## Platform: x86_64-pc-linux-gnu (64-bit)
## Running under: Ubuntu 14.04.5 LTS
##
## Locale:
##   LC_CTYPE=en_US.UTF-8       LC_NUMERIC=C
##   LC_TIME=en_US.UTF-8        LC_COLLATE=en_US.UTF-8
##   LC_MONETARY=en_US.UTF-8    LC_MESSAGES=en_US.UTF-8
##   LC_PAPER=en_US.UTF-8       LC_NAME=C
##   LC_ADDRESS=C               LC_TELEPHONE=C
##   LC_MEASUREMENT=en_US.UTF-8 LC_IDENTIFICATION=C
##
## Package version:
##   bookdown_0.7.18  kableExtra_0.9.0 rmarkdown_1.10
```