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1 Introduction

This is an R Markdown document. Markdown is a simple formatting syntax for authoring HTML, PDF, and MS Word documents. For more details on using R Markdown see <http://rmarkdown.rstudio.com>.

When you click the **Knit** button a document will be generated that includes both content as well as the output of any embedded R code chunks within the document. You can embed an R code chunk like this:

Note that the `echo = FALSE` parameter was added to the code chunk to prevent printing of the R code that generated the plot.

1.1 Abc

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Table 1: The summary of cars data.

speed	dist
Min. : 4.0	Min. : 2.00
1st Qu.:12.0	1st Qu.: 26.00
Median :15.0	Median : 36.00
Mean :15.4	Mean : 42.98
3rd Qu.:19.0	3rd Qu.: 56.00
Max. :25.0	Max. :120.00

2 Chapter X

2.1 Some text

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https://en.wikibooks.org/wiki/LaTeX/Bibliography_Management.

When you click the **Knit** button a document will be generated that includes both content as well as the output of any embedded R code chunks within the document. You can embed an R code chunk like this:

```
summary(cars)
```

```
##      speed      dist
##  Min.    : 4.0   Min.    :  2.00
##  1st Qu.:12.0   1st Qu.: 26.00
##  Median :15.0   Median : 36.00
##  Mean   :15.4   Mean    : 42.98
##  3rd Qu.:19.0   3rd Qu.: 56.00
##  Max.    :25.0   Max.    :120.00
```

or sometimes we like to have the result output only, add caption text and make a cross reference (e.g. see Table 1 and Table 2)

Table 2: The head of cars data.

speed	dist
4	2
4	10
7	4
7	22
8	16
9	10

2.2 Text with equations

An example of Model-assisted strategy for $p(s) = SRSWOR$ is presented next. Our model is defined for sample element $k \in s$ as

$$y_k = \beta_0 + \beta_1 x_k + \varepsilon_k, \quad (1)$$

where $k = 1, \dots, n$ and n denotes sample size. Regression estimator for population total t of y is

$$\hat{\theta}^* = \hat{t}_{REG} = \hat{t} + \hat{\beta}_1(t_x - \hat{t}_x), \quad (2)$$

where t_x is known population total of auxiliary x -variable, \hat{t} and \hat{t}_x are SRS estimators of t and t_x , respectively and $\hat{\beta}_1$ is estimated regression slope coefficient (Särndal et al., 1992).

The estimator of design variance of regression estimator is

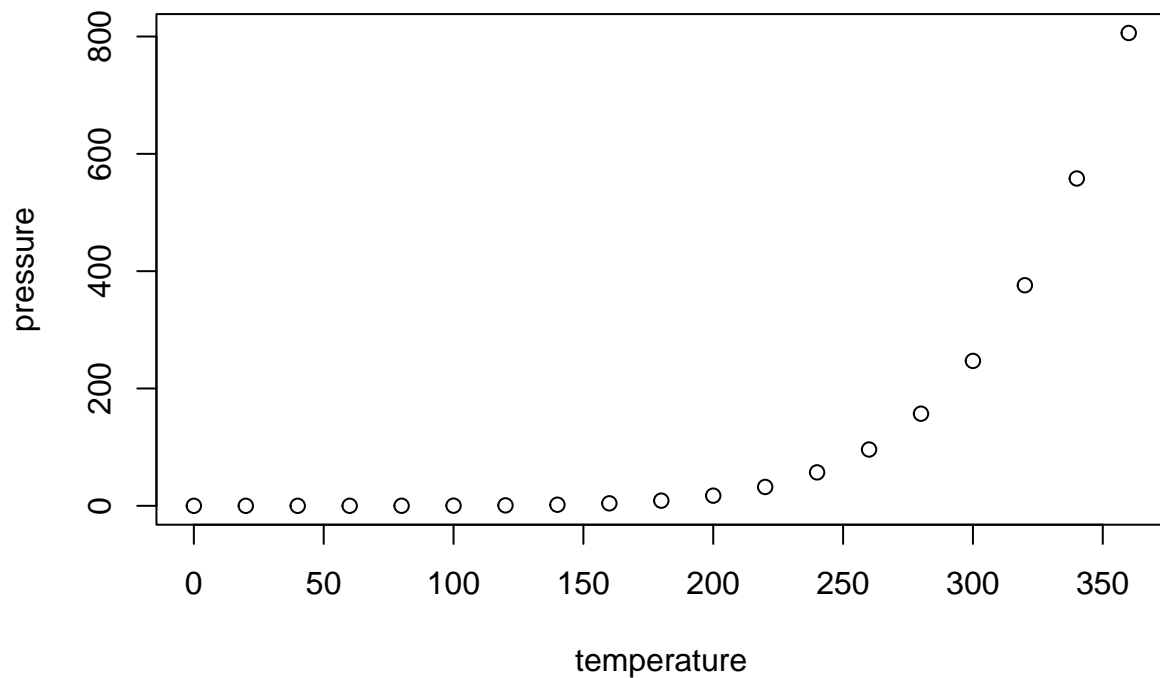
$$\hat{v}(\hat{t}_{REG}) = \hat{v}_{SRS}(\hat{t})(1 - \hat{\rho}_{yx}^2), \quad (3)$$

where $\hat{v}_{SRS}(\hat{t})$ is SRS variance estimator of \hat{t} and $\hat{\rho}_{yx}$ is sample correlation of y and x . In this strategy the auxiliary x -data are incorporated in the estimation procedure by a linear regression model.

Making a cross reference to the equations (and sections, figures, etc.), for example to the previous regression estimator, is easy. Define a label inside of the equation environment (e.g. use `\label` and give some label name, in our example the name is `eq:RegressionEstimator`) and then call it using `\ref` command. In this case our reference to the regression estimator equation is (2).

2.3 Including Plots

You can also embed plots, for example:



Note that the `echo = FALSE` parameter was added to the code chunk to prevent printing of the R code that generated the plot.

To add caption and cross reference e.g. lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua (See Figure 1).

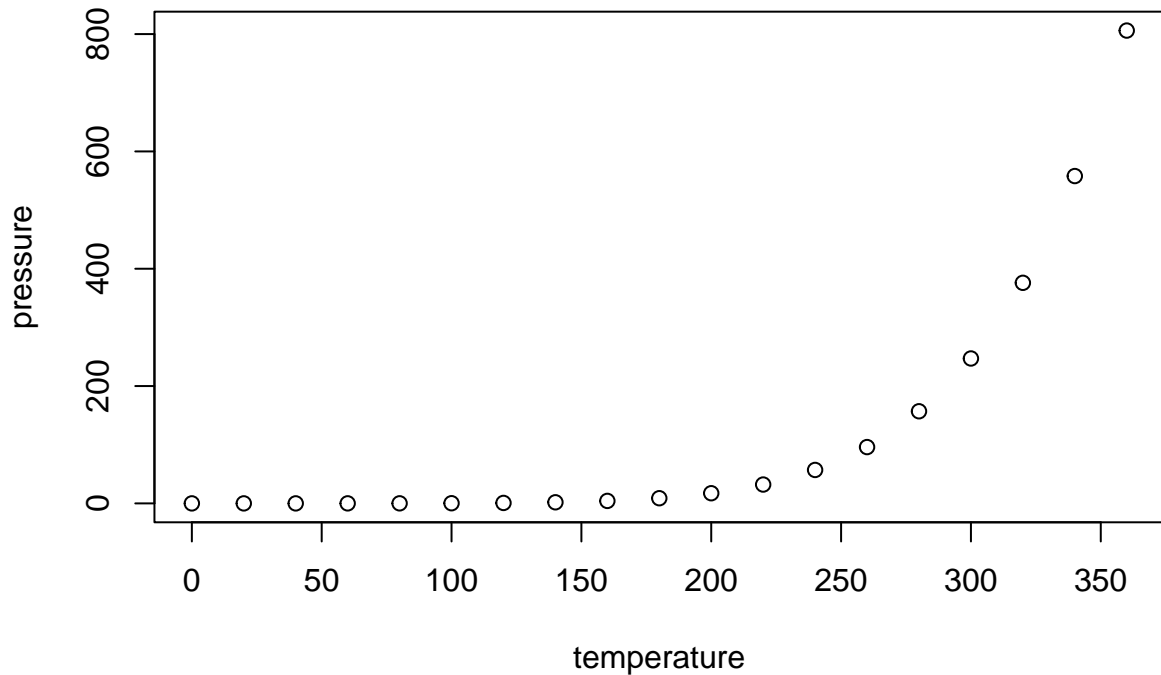


Figure 1: This a caption text to my plot.

3 Chapter Y

3.1 YYYY

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4 Chapter Z

4.1 ZZZZ

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5 Conclusions

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References

- Beaumont Jean-Francois, R. J. N. K. (2021). Ask the Experts. *The Survey Statistician* 83, 11–22.
- Bethlehem, J., F. Cobben, and B. Schouten (2009). Article Indicators for the Representativeness of Survey Response Indicators for the Representativeness of Survey Response. Technical report.
- Rao, J. N. (2020). On Making Valid Inferences by Integrating Data from Surveys and Other Sources. *Sankhya B* (1934), 1–31. Publisher: Sankhya B.
- Sakshaug, J. W., A. Cernat, and T. E. Raghunathan (2019). Do Sequential Mixed-Mode Surveys Decrease Nonresponse Bias, Measurement Error Bias, and Total Bias? An Experimental Study. *Journal of Survey Statistics and Methodology* 7(4), 545–571.
- Schork, J., C. A. Riillo, and J. Neumayr (2021). Survey Mode Effects on Objective and Subjective Questions: Evidence from the Labour Force Survey. *Journal of Official Statistics* 37(1), 213–237.
- Särndal, C.-E., B. Swensson, and J. Wretman (1992). *Model assisted survey sampling*. Springer series in statistics. New York, NY, US: Springer-Verlag Publishing.

Appendix

Appendix: something

Appendix: Codes

```
knitr::opts_chunk$set(echo = TRUE)
options(tinytex.verbose = TRUE)

# add your list of packages here inside of p_load() function. This list is an example
if (!require("pacman")) install.packages("pacman")
pacman::p_load(tidyverse, kable, haven, janitor, psych, lm.beta, broom, knitr)
knitr::include_graphics("figures/HY__TJ23_valtiL_EN_V1__CMYK.pdf")
summary(cars)
# table: summary of cars data
kable(summary(cars), caption = "The summary of cars data.", booktabs = TRUE)
# table: head of cars data
kable(head(cars), caption = "The head of cars data.", booktabs = TRUE)
plot(pressure)
# plot: pressure
plot(pressure)
```