A Minimal Capstone Report Example

, ,

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Contents

This book is a final report of a capstone project by [Team Name].

Team Members: [Team Member Name]

Course Name: Foundations of Data Science with Capstone at SMU

Course Term: Summer 2021

Course Description: Data science is the interdisciplinary study of the tools and theory behind using data to extract knowledge. It combines ideas from statistics, computer science, and particular domains in the physical and social sciences in order to make predictions and optimal decisions.

This SMU summer intensive course is designed with a practical approach. The students will be guided to learn the basics and move on to more advanced topics in 2 weeks. The final 1 week will be dedicated to practicing and presenting data science skills and competency through capstone projects.

The Data Science Capstone is a team-based, project-based session, providing an opportunity to apply data science skills and knowledge obtained from the first 2 weeks of the foundation session. Teams of two or three students, under the direction of the course instructor and teaching assistants, will be working on a data project. The primary objective is to educate the students in solving real world data science problems in professional settings by leveraging their own computational, statistical, and domain skills.

The capstone requires two outcomes: A final report (this book) and a final presentation.

Chapter 1

. (1) (2)

(R Markdown , , R Code Chunks, .)

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 **??**.

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, 2021) in this sample book, which was built on top of R Markdown and **knitr** (Xie, 2015).

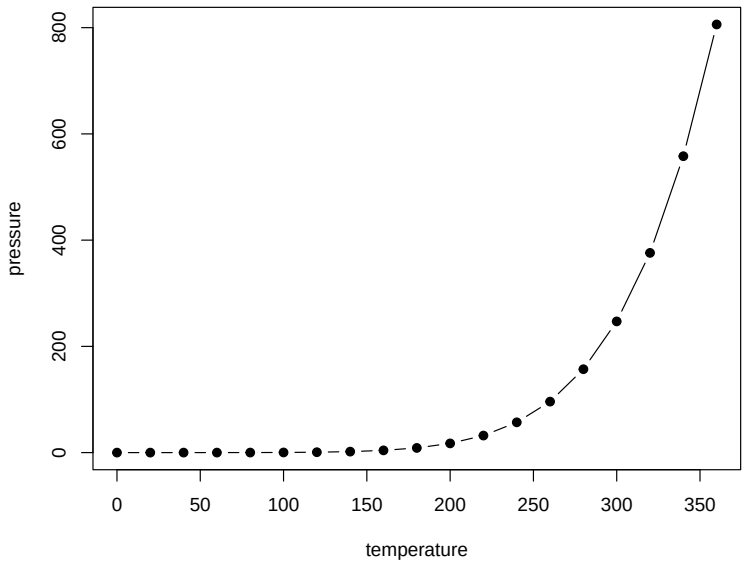

Figure 1.1: Here is a nice figure!

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

Data Dictionary .

2.1

2.2 Data Dictionary

- variable1: describe what variable1 is about
- variable2: describe what variable2 is about
- variable3: describe what variable3 is about

Chapter 3

Exploratory Data Analysis (EDA) .

LaTeX .

Math can be added in body using usual syntax like this

3.1 Math example

p is unknown but expected to be around 1/3. Standard error will be approximated

$$SE = \sqrt{(\frac{p(1-p)}{n})} \approx \sqrt{\frac{1/3(1-1/3)}{300}} = 0.027$$

You can also use math in footnotes like this[1].

We will approximate standard error to 0.027[2]

3.2 Example two

3.3 Example three

[1] where we mention $p = \frac{a}{b}$

[2] p is unknown but expected to be around 1/3. Standard error will be approximated

$$SE = \sqrt{(\frac{p(1-p)}{n})} \approx \sqrt{\frac{1/3(1-1/3)}{300}} = 0.027$$

Chapter 4

(Applications)

apply .

Some *significant* applications are demonstrated in this chapter.

4.1 Example one

4.2 Example two

Chapter 5

summarize future study .

5.1 Future Study

Bibliography

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

Xie, Y. (2021). *bookdown: Authoring Books and Technical Documents with R Markdown*. R package version 0.22.