



Swiss Federal Institute of Technology Zurich

Seminar for
Statistics

Department of Mathematics

Master Thesis

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Student Muster

The title of my thesis
which should be split on
several lines
if it is too long

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Adviser: Prof. Dr. Sara van de Geer

Dedication

To some special person

Preface

First words and acknowledgements.

Abstract

Short summary of my thesis.

Contents

Notation	xi
1 Introduction	1
2 First Chapter	3
2.1 To include a picture	3
2.2 To make a proof	4
2.3 To include Rcode	4
2.4 Other information	4
3 Summary	5
3.1 Future Work	5
Bibliography	7
A Complementary information	9
A.1 Including Rcode with verbatim	9
A.2 Including Rcode with the <i>listings</i> package	10
A.3 Using Sweave (or knitr) to include Rcode (and more) in your report	11
B Yet another appendix....	13
B.1 Description	13
B.2 Tables	13
C 2nd Appendix: More sophisticated R code listing	15
C.1 Chapter 5	15
Epilogue	17

List of Figures

- 2.1 Geyser data: binned histogram, Silverman's and another kernel 3
- 2.2 Geyser data: binned histogram, Silverman's and another kernel 3

List of Tables

B.1 Test results	13
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Notation

Explain your symbols and abbreviations.

Chapter 1

Introduction

Description of the work. Prepare the reader for the following chapters.

You will cite literature here, typically, but

Chapter 2

First Chapter

2.1 To include a picture

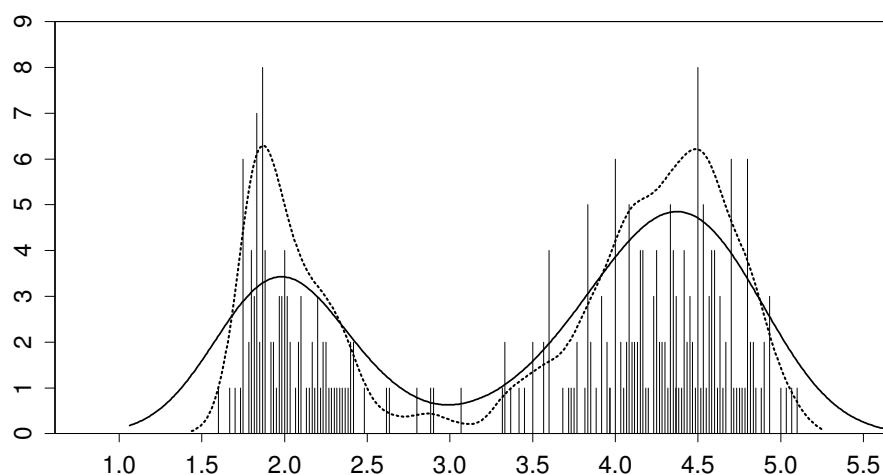


Figure 2.1: Old Faithful Geyser eruption lengths, $n = 272$; binned data and two (Gaussian) kernel density estimates ($\times 10$) with $h = h^* = .3348$ and $h = .1$ (dotted).

Or also with `includegraphics`:

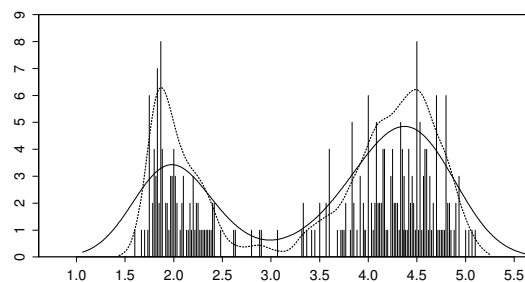


Figure 2.2: Old Faithful Geyser eruption lengths, $n = 272$; binned data and two (Gaussian) kernel density estimates ($\times 10$) with $h = h^* = .3348$ and $h = .1$ (dotted).

2.2 To make a proof

Proof. $1 + 1 = 2$

□

2.3 To include Rcode

See information in Appendix [A](#).

2.4 Other information

Put a text between quotes: make sure to use nice quotes, such as “quote”.

Cite an article or book you refer shortly here, and then listed in the bibliography: [Bar and Meier \(2001\)](#). Or mention that [Hampel](#) (a person) or [Stahel and Weisberg](#) (two persons) have already done quite a bit work.

Referencing a different part of your work: please refer to Appendix [A](#).

Chapter 3

Summary

Summarize the presented work. Why is it useful to the research field or institute?

3.1 Future Work

Possible ways to extend the work.

Bibliography

- Bar, F. and H. Meier (2001). Title of the article. *Journal where the article has been published volume of the journal*, 12–77. [4](#)
- Hampel, F. R. (1985). The breakdown points of the mean combined with some rejection rules. *Technometrics* 27(2), 95–107. [4](#)
- Stahel, W. and S. Weisberg (1991). *Directions in Robust Statistics and Diagnostics*, 2 vol. N. Y.: Springer-Verlag. [4](#)

Appendix A

Complementary information

Additional material. For example long mathematical derivations could be given in the appendix. Or you could include part of your code that is needed in printed form. You can add several Appendices to your thesis (as you can include several chapters in the main part of your work).

A.1 Including Rcode with verbatim

A simple (rather too simple, see [A.2](#)) way to include code or *R* output is to use `verbatim`. It just prints the text however it is (including all spaces, “strange” symbols,...) in a slightly different font.

```
## loading packages
library(RBGL)
library(Rgraphviz)
library(boot)
```

```
## global variables
X_MAX <- 150
```

```
    This allows me to put as many s p a c e s as I want.
I can also use \ and ' and & and all the rest that is usually only
accepted in the math mode.
```

```
I can also make as
                many
            line
        breaks as
I want... and
                where I want.
```

But really recommended, much better is the following:

However, it is much nicer to use the *listings* package to include Rcode in your report. It allows you to number the lines, color the comments differently than the code, and so on. All the following is produced by simply writing `\lstinputlisting{figures/picture.R}` in your L^AT_EX “code”:

or `\lstinputlisting{/u/maechler/R/Pkgs/sfsmisc/R/ellipse.R}` :

[illegible]

A.3 Using Sweave (or knitr) to include Rcode (and more) in your report

The easiest (and most elegant) way to include Rcode and its output (and have all your figures up to date with your report) is to use Sweave—or the **knitr** R package with even more possibilities.

Search the web to find lots of intro material on how to use Sweave or **knitr** ([on Wikipedia](#)).

Appendix B

Yet another appendix....

B.1 Description

Something details.

Something else other definition.

B.2 Tables

Refer to Table [B.1](#) to see a left justified table with caption on top.

Table B.1: Results.

Student	Grade
Marie	6
Alain	5.5
Josette	4.5
Pierre	5

Appendix C

2nd Appendix: More sophisticated R code listing

Chapter-wise listing of parts of R code, using

- firstline=n1
- lastline=n2
- title=<text>

e.g., for the first example below

```
\lstinputlisting[firstline=1,lastline=32,title= \texttt{ellipse.R}]{ellipse.R}
```

C.1 Chapter 5

```
1 ellipsePoints ← function(a,b, alpha = 0, loc = c(0,0), n = 201,
2                       keep.ab.order = FALSE)
3 {
4   ## Purpose: ellipse points, radially equispaced, given geometric par.s
5   ## -----
6   ## Arguments: a, b : length of half axes in (x,y) direction
7   ##              alpha: angle (in degrees) for rotation
8   ##              loc  : center of ellipse
9   ##              n    : number of points
10  ## -----
11  ## Author: Martin Maechler, Date: 19 Mar 2002
12
13  stopifnot(is.numeric(a), is.numeric(b))
14  reorder ← a < b && keep.ab.order
15  B ← min(a,b)
16  A ← max(a,b)
17  ## B <= A
18  d2 ← (A-B)*(A+B) ## = A^2 - B^2
19  phi ← 2*pi*seq(0,1, len = n)
20  sp ← sin(phi)
21  cp ← cos(phi)
22  r ← a*b / sqrt(B^2 + d2 * sp^2)
23  xy ← r * if(reorder) cbind(sp, cp) else cbind(cp, sp)
24  ## xy are the ellipse points for alpha = 0 and loc = (0,0)
25  al ← alpha * pi/180
26  ca ← cos(al)
27  sa ← sin(al)
28  xy %%% rbind(c(ca, sa), c(-sa, ca)) + cbind(rep(loc[1],n),
```

```
29 |                                     rep(loc[2],n))  
30 | }
```

ellipse.R

Epilogue

A few final words.

Declaration of Originality

The signed declaration of originality is a component of every semester paper, Bachelor's thesis, Master's thesis and any other degree paper undertaken during the course of studies, including the respective electronic versions.

Lecturers may also require a declaration of originality for other written papers compiled for their courses.

I hereby confirm that I am the sole author of the written work here enclosed and that I have compiled it in my own words. Parts excepted are corrections of form and content by the supervisor .

Title of work (in block letters):

Authored by (in block letters):

For papers written by groups the names of all authors are required.

Name(s):

First name(s):

Muster	Student

With my signature I confirm that

- I have committed none of the forms of plagiarism described in the Citation etiquette information sheet.
- I have documented all methods, data and processes truthfully.
- I have not manipulated any data.
- I have mentioned all persons who were significant facilitators of the work .
- I am aware that the work may be screened electronically for plagiarism.
- I have understood and followed the guidelines in the document *Scientific Works in Mathematics*.

Place, date:

Signature(s):

Zurich August 19th 2009	bla

For papers written by groups the names of all authors are required. Their signatures collectively guarantee the entire content of the written paper.