

Applied Statistical Regression – HS 2010

People:

Lecturer: **Dr. Marcel Dettling** (marcel.dettling@zhaw.ch)

Coordinators: **Christian Kerkhoff** (kerkhoff@stat.math.ethz.ch)

Fabio Sigrist (sigrist@stat.math.ethz.ch)

Course Schedule:

All lectures will be held at HG D1.2, on Mondays from 8.15-9.00, resp. 9.15-10.00.

Week	Date	L/E	Topics
01	20.09.2010	---	---
02	27.09.2010	L/L	Simple regression
03	04.10.2010	E/E	Introduction to R
04	11.10.2010	L/L	Multiple regression
05	18.10.2010	L/E	Model diagnostics
06	25.10.2010	L/L	Model extensions
07	01.11.2010	L/E	Model choice 1
08	08.11.2010	L/L	Model choice 2
09	15.11.2010	L/E	Introduction to GLMs
10	22.11.2010	L/L	Logistic regression
11	29.11.2010	L/E	Regression for count data
12	06.12.2010	L/L	Regression for nominal and ordinal response
13	13.12.2010	E/E	Exercises
14	20.12.2010	L/L	Advanced Topics

Exercise Schedule:

The exercises start on October 4, 2010 from 8.15 to 10.00 with an introduction to the statistical software package R. Thereafter, the exercise schedule is as follows:

Series	Date	Topic	Hand-In	Discussion
01	04.10.2010	Data analysis with R	---	04.10.2010
02	04.10.2010	Simple linear regression	11.10.2010	18.10.2010
03	18.10.2010	Multiple regression/diagnostics	25.10.2010	01.11.2010
04	01.11.2010	Multiple regression/various	08.11.2010	15.11.2010
05	15.11.2010	Model choice	22.11.2010	29.11.2010
06	29.11.2010	Logistic regression	06.12.2010	13.12.2010
07	13.12.2010	Count and ordinal data	---	13.12.2010

The exercises will be held at the computer labs of ETH, for the room organization see the table below. For the exercises you are allowed to bring your own notebook. The default option however is to work on the desktop stations at the labs, where a basic installation of R is available. In order to be able to work on the desktop stations, you need an account. For external students who neither have an ETH account nor can bring their personal notebook, please speak to one of the coordinators.

Room	Student Last Name
HG E27	Ag-Go
HG E26.1	Ha-Pa
HG E26.3	Pe-Zh

After the exercises are handed out and shortly discussed at the labs, you can work on them during the remaining time of the exercise lessons. You are expected to complete the work within the following week as homework.

The solved exercises should then be placed in the corresponding tray in HG J68 until 11.55am of the due date. They can also be sent (timely!) via e-mail to the respective assistant. Please note that only recapitulatory documents shall be handed in, but no R script files.

Software:

The exercises will be based on the statistical software package R. This is a freely available open source suite which works on all platforms, see (<http://stat.ethz.ch/CRAN/>). A good primer is the R tutorial that will be discussed in the exercises of October 4. Further documentation is available from CRAN.

The exercises will be held at the computer labs of ETH. On these occasions, you are allowed to bring your own notebook. However, the default option is to work on the desktop stations at the labs, for which you need an account. If you neither have a notebook nor and ETH account, please speak to one of the coordinators.

Written Material

A scriptum for this course will be provided. However, as it will only be written during the semester, it will be published chapter by chapter. New pages will be sent out via e-mail (i.e. the one you registered with ETH) as soon as they are ready. The complete and corrected version will be available after the course, but in time for the exam.

The scriptum, as well as the slides that are presented during the lectures, the exercise sheets, the sample solutions and some instructional datasets are also available for download from the course website at <http://stat.ethz.ch/education/semesters/as2010/asr>.

Attendance Certificate:

There are no conditions for obtaining the attendance certificate. A note for the doctoral students: they need to attain the exam for obtaining the credit points.

Exam

There will be a written exam during the regular session that lasts 120 minutes. It will be "open book", thus you are allowed to bring any written materials you wish. We also recommend bringing a pocket calculator. However, notebooks/computers are not allowed.

Literature:

- 1) **Applied Regression Analysis**, N. Draper and H. Smith, Wiley Interscience, 3rd Edition (1998). ISBN-10: 0471170828. 736 pages, ca. 100\$.
- 2) **Introduction to Linear Regression Analysis**, D. Montgomery, E. Peck, G. Vining, Wiley-Interscience, 4th Edition (2006). ISBN-10: 0471754951. 640 pages, ca. 85\$.
- 3) **Applied Regression Analysis and Generalized Linear Models**, J. Fox, Sage Publications, 2nd Edition (2008). ISBN-10: 0761930426. 688 pages, ca. 82\$.