PSTAT 126

Regression Analysis

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Lecture 0
Course Introduction

Course Content

- This course introduces the theory and application of linear regression models.
- Topics: simple and multiple regression models; estimation; inference; prediction; regression diagnostics; model selection; shrinkage methods; analysis of variance.
- R: Solving real-world problems.

Class Format

Canvas

- Lecture slides and labs will be available on *Canvas/Gauchospace* and also here: `shorturl.at/fgrt8`
- You will need to close and open again the link to fetch newly added content.
- Homework assignments and quizzes will also be given out on *Canvas/Gauchospace*, and should be turned in there. Other forms of submission will not be accepted.
- All Q&A related to course content, homework assignments, R programming, and quizzes should be done on the nectir channel `https://app.nectir.io/invite/frdqQD`.

References

The lecture slides are self-contained. You may find the following textbooks helpful:

- Faraway, J. J. (2005), *Linear Models with R*, Chapman & Hall.
- Weisberg, S. (2005), *Applied Linear Regression*, 3rd edition, Wiley.

R programming

- *R for Data Science* by Grolemund and Wickham. `https://r4ds.had.co.nz/index.html`

Grading

- **40 %**. Homeworks. (Four hw assignments, due every two weeks.)
- **20 %**. Quizzes (On canvas)
- **40 %**. Final exam

Homework

- R coding & Math deriving/proof.
- Typically you will have 2 weeks to complete the homework.
- Late homework will receive 20% point deduction.
- Homework will not be accepted more than 24 hrs late.

R, Rstudio & Rmarkdown

R. Userfriendly programming language for statistical analysis.
R studio. Integrated development environment (IDE) for R.
R markdown (Rmd). Generates reproducible document with R.

- Syntax is very simple.
- Integrated with LaTeX, easy to write math formulas.
- Example: HomeworkTemplate.Rmd. (on `/homeworks/Template` on the server)

Task: Start setting up the R working environment (either in your own computer or in the server)!

Homework submission Format

- Online submission via Canvas/Gauchospace
- Submission must contain: R markdown code (.Rmd file), PDF generated, supplementary files if needed.
- We should be able to run R markdown code to obtain identical PDF file.

Next...

- Make sure you can knit HomeworkTemplate.Rmd.
- Lab sessions start on the 2nd week.
- Read from *R for Data Science*: Ch 1&2 (very short), Ch 27 on (Rmd).