

Applied Regression in R

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Why This Course?

Why This Course?

Statistics is increasingly popular everywhere.

(For PR reasons, we sometimes call it *data science* or *machine learning*)

Most problems in applied statistics can be solved using some kind of regression.

Why This Course?

Regression models can...

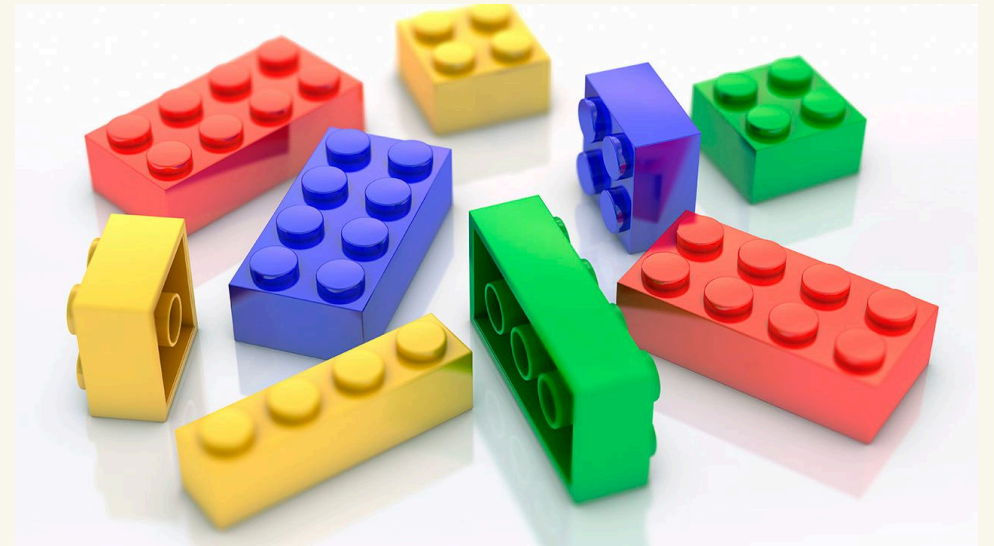
- ... estimate effect of group based learning on critical thinking skill.
- ... predict elections results.
- ... predict next quarter's GDP or unemployment rate.
- ... estimate effect of customer characteristics on spending habits.

Why This Course?

What people think statistics is.



What statistics actually is.



Why This Course?

Course goals:

1. Learn linear regression well enough to work on own projects (thesis, work)
2. Gain enough knowledge to start learning more complex stuff (generalized linear models)

Course Organisation

Course Structure

How does it work?

- Building linear regression (simple, multiple)
- Interpretation and visualization
- Inference (interval estimates, tests)
- Model fit

What is it good for?

- What's a model
- Explanative vs predictive modeling
- Variable selection

Common problems and how to solve them

- Assumption checking
- Nonlinear relationships
- Heteroskedasticity
- Non-normality

Required Background

1. Basic knowledge of statistics (expected value, variance, quantiles)
2. Basic knowledge of R (data import, manipulation, visualisation)

Completion Requirements

Group project (in class, submitted before the last meeting)

Research report (home work, until the end of semester)

Completion Requirements

Group project:

- Towards the end of the course, you'll be given a dataset and a research question.
- You'll be working in groups (1-3 members).
- In the last class, we'll discuss your findings.
- (You'll also get personal feedback)

Completion Requirements

Research report:

- You'll pick a dataset.
- Formulate your own research question.
- Answer the question using linear regression.
- Write a report
- Submit by the 15th of September 2026

Completion Requirements

- Which features predict song popularity on Spotify?
- Does gender wage gap in the US depend on the proportion of women in the industry?
- Are more expensive video games rated better?

Course Organisation

Course website:

- <https://sociology-fa-cu.github.io/applied-regression-r/>
- Slides, Data, Completion requirements, etc.

Any Questions?