RegressionModelsNotes

Coursera Course by John Hopkins University

INSTRUCTORS: Dr. Brian Caffo, Dr. Roger D. Peng, Dr. Jeff Leek

Contents

Intro

This course covers regression analysis, least squares and inference using regression models. Special cases of the regression model, ANOVA and ANCOVA will be covered as well. Analysis of residuals and variability will be investigated. The course will cover modern thinking on model selection and novel uses of regression models including scatterplot smoothing.

GitHub Link for Lectures

Link to the GitHub for this course

Course Book

Regression Models for Data Science in R, through Leanpub

Further Reading: **Advanced Linear Models for Data Science**

Instructor's Note

"*We believe that the key word in Data Science is 'science'. Our course track is focused on providing you with three things:*
1) *An introduction to the key ideas behind working with data in a scientific way that will produce new and reproducible insight*
2) *An introduction to the tools that will allow you to execute on a data analytic strategy, from raw data in a database to a completed report with interactive graphics*
3) *Giving you plenty of hands on practice so you can learn the techniques for yourself.*

Regression Models represents a both fundamental and foundational component of the series, and it presents the single most practical data analysis toolset. Using only a bare minimum of mathematics, we will attempt to provide you with the fundamentals for the application and practice of regression. We are excited about the opportunity to attempt to scale Data Science education. We intend for the courses to be self-contained, fast-paced, and interactive, and we intend to run them frequently to give people with busy schedules the opportunity to work on material at their own pace.

Brian Caffo and the Data Science Track Team"

Data Science Specialization Community Site

The site is created using GitHub Pages

In addition, Johns Hopkins has **a site on Statistical Methods and Applications for Research in Technology** that Dr. Caffo helps manage.

Reminder to commit (01) delete this line *AFTER* committing

Least Squares and Linear Regression

Regression

Introduction to Regression

Introduction to Basic Least Squares

Technical Details

Introductory Data Example

Lesson with `swirl()`: Introduction

Reminder to commit (02) delete this line *AFTER* committing

Linear Least Squares

Notation and Background

Linear Least Squares

Linear Least Squares Coding Example

Technical Details

Lesson with `swirl()`: Least Squares Estimation

Reminder to commit (03) delete this line *AFTER* committing

Regression to the Mean

Regression to the Mean

Lesson with `swirl()`: Residuals

Reminder to commit (04) delete this line *AFTER* committing

Quiz 1

Reminder to commit (S1) delete this line *AFTER* committing

Linear Regression & Multivariable Regression

Statistical Linear Regression Models

Statistical Linear Regression Models

Interpreting Coefficients

Linear Regression for Prediction

Lesson with `swirl()`: Introduction to Multivariable Regression

Reminder to commit (05) delete this line *AFTER* committing

Residuals

Residuals

Residuals, Coding Example

Residual Variance

Lesson with `swirl()`: Residual Variation

Reminder to commit (06) delete this line *AFTER* committing

Inference in Regression

Inference in Regression

Coding Example

Prediction

Lesson with `swirl()`: MultiVar Examples

Reminder to commit (07) delete this line *AFTER* committing

Quiz 2

Reminder to commit (S2) delete this line *AFTER* committing

Multivariable Regression, Residuals, & Diagnostics

Multivariable Regression

Multivariable Regression Part 1

Multivariable Regression Part 2

Multivariable Regression Continued

Reminder to commit (08) delete this line *AFTER* committing

Multivariable Regression Tips and Tricks

Multivariable Regression Examples Part 1

Multivariable Regression Examples Part 2

Multivariable Regression Examples Part 3

Multivariable Regression Examples Part 4

Lesson with `swirl()`: MultiVar Examples2

Lesson with `swirl()`: MultiVar Examples3

Reminder to commit (09) delete this line *AFTER* committing

Adjustment

Adjustment Examples

Reminder to commit (10) delete this line *AFTER* committing

Residuals Again

Residuals and Diagnostics Part 1

Residuals and Diagnostics Part 2

Residuals and Diagnostics Part 3

Lesson with `swirl()`: Residuals Diagnostics and Variation

Reminder to commit (11) delete this line *AFTER* committing

Model Selection

Model Selection Part 1

Model Selection Part 2

Model Selection Part 3

Reminder to commit (12) delete this line *AFTER* committing

Practice Exercise in Regression Modeling

Quiz 3

Reminder to commit (S3) delete this line *AFTER* committing

Logistic Regression and Poisson Regression

GLMs

Logistic Regression

Logistic Regression Part 1

Logistic Regression Part 2

Logistic Regression Part 3

Lesson with `swirl()`: Variance Inflation Factors

Lesson with `swirl()`: Overfitting and Underfitting

Reminder to commit (13) delete this line *AFTER* committing

Poisson Regression

Poisson Regression Part 1

Poisson Regression Part 2

Lesson with `swirl()`: Binary Outcomes

Lesson with `swirl()`: Count Outcomes

Reminder to commit (14) delete this line *AFTER* committing

Hodgepodge

Mishmash

Hodgepodge

Reminder to commit (15) delete this line *AFTER* committing

Quiz 4

Reminder to commit (S4) delete this line *AFTER* committing

Course Project

Reminder to commit (P1) delete this line *BEFORE* committing