

STAC67H3 REGRESSION ANALYSIS

Fall 2013

Course Description:

This course covers some of the theory and methodology of regression. Topics to be covered include: least squares estimation, residual analysis, inference of regression parameters under assumptions of normality of errors, remedial procedures for violation of assumptions, model selection procedures, collinearity models for categorical data. Examples will use R for computation and students will be expected to interpret R codes and outputs on tests and the exam.

Course Schedule:

Lectures: Mon 10-12noon. SW128
Wed 12-1pm, IC220

Instructor: Mahinda Samarakoon
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Office: IC442
Office hours: Wed 3-5pm

Textbook

The textbook is Applied Linear Regression Models, 4th edition by Kutner, Nachtsheim and Neter. We will be covering most of chapters 1 through 8 and selected topics from other chapters, as time permits.

Evaluation

Assignments: 30%
Midterm Test: 20%
Final exam: 50%

Assignments

There are three assignments. Do not expect to be able to do an assignment in the few days before it is due. Start working on them as early as you can.

Practice Problems

Practice problems from the text will be assigned regularly. The practice problems are to help you prepare for the test and exam and are not to be handed in.

Computing

Students will be using, R for computing. **No previous computing experience is assumed.** With this software, you will analyze the data sets used in the text exercises. The data sets can be found on the CD accompanying the textbook.

Missed Tests

There are no make-up tests. If the test is missed for a valid reason, you must submit appropriate documentation to the course instructor within one week of the test. Print on it your name, student number, course number, and date. If documentation is not received in time, your test mark will be zero. **If a test is missed for a valid reason, its weight will be shifted to the final exam.**

STAC67H3 (FALL 2013) - TENTATIVE LECTURE GUIDE

Week 1: Introduction to course, Simple linear regression [Ch1, p2], parameter estimation, interpretation

Week 2 Properties of the least square estimates [p18]

Week 3: Inferences in regression and correlation [Ch2, p40]

Week 4: Diagnosis and remedial measures [Ch3 100]

Week 5: Simultaneous inferences and other topics[Ch4, p154]

Week 6: Matrix approach to SLR [Ch5, p176]

Week 7: Multiple regression I [Ch 6, p214]: General linear model [p217], Estimation of parameters [p223], ANOVA [p225], Diagnosis and remedial measures [p232]

Week 8: Multiple regression II [Ch 7, p214]: Extra sums of squares, Multicollinearity [p278]

Week 9: Regression models for quantitative and qualitative predictors [Ch 8, p294], Polynomial and higher order models, interaction models [p306], Qualitative predictors [p313]

Week 10: Building the regression model [343] Criteria for model selection [Ch 9 p353]

Week 11: Diagnostics [Ch10p384] outliers [390], residuals, Studentized residuals [394], deleted residuals [395], leverage values[398], DFFITS, DFBETAS, Cook's distance [402], multicollinearity, variance inflation factors [406]

Week 12: Logistic regression [ch14 p555], Selected topics