Statistics 429   Applied Regression Analysis

(see Course Descriptions for the applicable academic year: http://www.ucalgary.ca/pubs/calendar/)

Syllabus

Topics	Hours
Introduction to principles of regression analysis. Relationship between variables. Simple linear regression.	3
Parameter estimation in simple linear regression. Rigorous derivation of the distribution of the parameter estimators. Confidence intervals for parameters.	3
ANOVA for simple regression. Various forms of ANOVA. The precision of the estimates regression. Lack of fit and pure error including corresponding ANOVA and tests. Computer solutions.	3
Forecasting and rigorous derivation of the distribution of various predicted values: individual mean regression. Confidence intervals. Inverse regression and correlation. Computer solutions.	3
Introduction into vector and matrix algebra. Matrix operations, inverses and systems of linear equations.	3
Simple linear regression in a matrix form. Review of points 2-4 using vectors and matrices.	3
General multivariate regression in a matrix form including various forms of ANOVA. Partial and sequential F-tests. Testing a general linear hypothesis in regression.	3
Residual analysis. Residual plots. Outliers and serial correlation of residuals. Runs test and Durbin-Watson test of residuals.	3
Polynomial regression and models involving transformations of variables and dummy variables.	2
Regression algorithms: best regression and stepwise regression. Use of computer packages.	4
Nonlinear regression. Parameter estimation. Iterative algorithms.. Response surface analysis.	$\underline{3}$ 33

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1995.03.17
Prerequisite change 2009:07:01