Course Contents of Stats 100C: Linear Models

Simple Linear Regression Models

Prediction Problem

Linear Regression

Gauss-Markov Theorem

Estimation of Variance

Distribution Theory

Centered Model

Distribution Theory Using the Centered Model

Distribution Theory Using Non-Centered Model

A Note on Gamma Distribution

Coefficient of Determination

Variance & Covariance Operations

Inference

Prediction Interval

Hypothesis Testing

Likelihood Ratio Test

Power Analysis in Simple Regression

Extra Sum of Squares Method

Power Analysis Using Non-Central F Distribution

Multiple Regression

Gauss-Markov Theorem in Multiple Regression

Gauss-Markov Theorem for a Linear Combination

Review of Multivariate Normal Distribution

Theorems in Multivariate Normal Distribution

Mean and Variance in Multivariate Normal Distribution

Independent Vectors in Multiple Regression

Partial Regression

Partial Correlation

Constrained Least Squares

Quadratic Forms of Normally Distributed Random Variables

Efficiency of Least Squares Estimators

Information Matrix and Efficient Estimator

Confidence Intervals in Multiple Regression

F Test for the General Linear Hypothesis

F Statistics and t statistics in Multiple Regression

Power Analysis in Multiple Regression

F Statistics Using the Extra Sum of Squares

Testing the Overall Significance of the Model

Multi-Collinearity

Generalized Least Squares

Comparing Regression Equations

Deleting a Single Point in Multiple Regression

Influential Analysis

Externally Studentized Residual

A Note on Valuable Selection