

MT-534

Statistical Method and Data Analysis

Inferences for Proportions and Count Data:

Inferences on proportion, Inferences for comparing two proportions, Inference for one-way and two-way count data (chi-square tests).

Multiple Linear Regressions:

Multiple linear regression model, Goodness of fit of the model, Statistical inference for multiple regression, ANOVA table for regression, Testing subset of parameters, Regression diagnostics, Multicollinearity, Polynomial regression, Variable selection methods, Best subset regression.

Analysis of Single Factor Experiments:

Completely randomized design, Multiple comparisons, Randomized block design, Model diagnostics using residual plots.

Two-Factor Experiments with Fixed Crossed Factors:

Model and estimates of its parameters, Model diagnostics, Multiple comparison between rows and columns, Unbalanced two-way layouts, 2k factorial experiment.

Analysis of Covariance:

Analysis of covariance of regression (ANCOVA), Analysis of covariance model with one covariate, Testing homogeneity of regression slopes, Analysis of covariance with multiple covariates.

Nonparametric Statistical Method:

Sign test, Wilcoxon signed rank test, Wilcoxon-Mann-Whitney test, Kruskal-Wallis test, Rank correlation methods, Bootstrap methods, Jackknife methods.

Time Series Analysis:

Modelling trend by polynomial functions, Detecting autocorrelation, The Durbin-Watson test for autocorrelation, Modelling of seasonal variation by using dummy and trigonometric functions.

Reference Books:

1. Tamhane A.C. and Dunlop D.D, *Statistics and Data Analysis*, Prentice-Hall, 2000.
2. Venables W.N and Ripley B.D, *Modern Applied Statistics with S-Plus*, 3rd Edition, Springer, 2000.