**MA\*726 Statistical and Data Analysis**

Simulation of random variables from discrete, continuous, multivariate distributions and stochastic processes, Monte-Carlo methods. Regression analysis, scatterplot, residual analysis. Computer Intensive Inference Methods - Jack-Knife, Bootstrap, cross validation, Monte Carlo methods and permutation tests. Graphical representation of multivariate data, Cluster analysis, Principal component analysis for dimension reduction.

**References:**

1. Simulation" by Sheldon M. Ross (Academic Press, Fourth Edition), 2006, Chaps. 1-5, Low price Indian edition is available
2. Bootstrap from "An Introduction to the Bootstrap" by B. Efron and R.J. Tibshirani (Chapman and Hall), 1994, Chapters 1-6, 12,13 .
3. Jackknife from "An Introduction to the Bootstrap" by B. Efron and R.J. Tibshirani (Chapman and Hall), 1994, Chapter 11.
4. Cluster Analysis from "Cluster Analysis" by B.S. Everitt, S. Landau, M. Leese, D. Stahl, (Wiley), 2011, Chapters 1-4
5. E.M. Algorithm from "The EM Algorithm and. Extensions" by G. M. McLachlan and T. Krishnan, (Wiley), 1997, Chap. 1,(Chapters 2-4 are needed for better understanding).
6. LASSO from "Regression Shrinkage and Selection via the Lasso" by R. Tibshirani, Journal of Royal Statistical Society, (1996) 58, No. 1, pp. 267-288.