



REGRESSION ANALYSIS

PROF. SOUMEN MAITY

Department of Mathematics
IISER Pune

PREREQUISITES : Probability and Statistics

INTENDED AUDIENCE : B.Sc, M.Sc, B.Tech, M.Tech

INDUSTRIES APPLICABLE TO : It will be recognized by several industries & academic institutes

COURSE OUTLINE

Regression analysis is one of the most powerful methods in statistics for determining the relationships between variables and using these relationships to forecast future observations. The foundation of regression analysis is very helpful for any kind of modelling exercises. Regression models are used to predict and forecast future outcomes. Its popularity in finance is very high; it is also very popular in other disciplines like life and biological sciences, management, engineering, etc. In this online course, you will learn how to derive simple and multiple linear regression models, learn what assumptions underline the models, learn how to test whether your data satisfy those assumptions and what can be done when those assumptions are not met, and develop strategies for building best models. We will also learn how to create dummy variables and interpret their effects in multiple regression analysis; to build polynomial regression models and generalized linear models.

ABOUT INSTRUCTOR

Prof. Soumen Maity is a Professor of Mathematics at Indian Institute of Science Education and Research (IISER) Pune. He received a PhD degree from the Theoretical Statistics & Mathematics Unit at Indian Statistical Institute (ISI) Kolkata, India in 2002. He has postdoctoral experience from Lund University, Indian Institute of Management (IIM) Kolkata and University of Ottawa. Prior to joining IISER Pune in 2009, he worked as an Assistant Professor at IIT Guwahati and IIT Kharagpur.

COURSE PLAN

Week 1 : Simple Linear Regression (Part A, B, C)

Week 2 : Simple Linear Regression (Part D, E)

Week 3 : Multiple Linear Regression (Part A, B, C)

Week 4 : Multiple Linear Regression (Part D); Selecting the best regression equation (Part A, B)

Week 5 : Selecting the best regression equation (Part C, D)

Week 6 : Multicollinearity (Part A, B, C)

Week 7 : Model Adequacy Checking (Part A, B, C)

Week 8 : Test for influential observations ; Transformations and weighting to correct model inadequacies (Part A)

Week 9 : Transformations and weighting to correct model inadequacies (Part B, C)

Week 10 : Dummy variables (Part A, B, C)

Week 11 : Polynomial Regression Models (Part A, B, C)

Week 12 : Generalized Linear Model (Part A, B); Non-Linear Estimation