

6-DAY WORKSHOP

on Statistical Modelling — Regression Techniques

A comprehensive certificate programme spanning classical regression through modern predictive modelling in R

DAY 1 Foundations of Regression (6 hours)

Introduction to Statistical Modelling — 1.5 hours

- Types of data and response variables
- Model building process
- Exploratory data analysis

Simple Linear Regression — 2 hours

Multiple Linear Regression — 2.5 hours

DAY 2 Model Diagnostics and Extensions (6 hours)

Regression Diagnostics — 2 hours

- Residual analysis
- Heteroscedasticity
- Influential observations
- Multicollinearity

Categorical Predictors and Interaction Effects — 2 hours

Model Selection Techniques

- AIC, BIC

Forward, backward, and stepwise selection — 2 hours

DAY 3 Regression Models for Binary data (6 hours)

Logistic Regression — 3 hours

- Binary logistic regression
- Interpretation of odds ratios
- logistic regression for classification(ROC, confusion matrix)

Multinomial and Ordinal Logistic Regression — 1.5 hours

Applications and Hands-on Exercises — 1.5 hours

DAY 4 Count Data Regression (6 hours)

Introduction to Count Data — 1 hour

Poisson Regression — 2 hours

Overdispersion and Model Diagnostics — 1 hour
Negative Binomial Regression — 2 hours

DAY Regularisation and Related Topics(6 hours)

Principal Component Regression (PCR) — 2 hours
Regularization Methods — 2 hours
• Ridge regression • LASSO • Elastic Net
Introduction to Nonparametric Regression — 2 hours
• Kernel regression • Spline regression

DAY 6 Tree-Based Models and Modern Regression (6 hours)

Classification and Regression Trees (CART) — 2 hours
Boosting: AdaBoost, XGBoost — 2 hours
Choosing the Appropriate Statistical Model & Workshop Wrap-up — 2 hour