جامعة نيويورك أبوظبي
NYU | ABU DHABI

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Biostatistics with R – II: The Linear Model

Curriculum Overview – Public Health Research Centre (PHRC) NYUAD

Course Descriptions

Statistical methods are often used as a guided learning approach. Linear statistical methods are frequently used in this learning procedure. In medical research and social sciences, linear regression models are useful statistical method in research and in data analyses.

The aim of this course is to give a brief introduction to correlation between two variables, simple and multiple linear regression models, and the quantile regression model with the open source, powerful and highly extensible free software (R Project) and RStudio (RStudio Interface). This course assumes that the course participants have been given an "Introduction To R".

Course Planning

These eight courses modules are

- Correlation between Two Variables (2 sessions, each session lasts circa 90 minutes)
    - Pearson's correlation coefficient
    - Spearman's rank correlation
    - Kendall's rank correlation
    - Association and agreement
- Introduction to Linear Regression Model in R (2 sessions, each session lasts circa 90 minutes)
    - The Model
    - The Estimation of Regression Coefficients and σ^2
    - Confidence Intervals of Regression Coefficients
    - Hypothesis Tests
    - The Worth of The Model - The R^2

- Multiple Linear Regression Model in R (2 sessions, each session lasts circa 90 minutes)
    - The Model
    - The Ordinary Least Squares (OLS) Estimator
    - The Properties and 95% Confidence Interval (CI)
    - The Gauss Markov Theorem
    - General Notations
- Introduction to Quantile Regression Models in R (2 sessions, each session lasts circa 90 minutes)
    - The Quantile Regression Model
    - The advantage of Quantile Regression
    - The Regression Quantile Estimates
    - The 95% Confidence Interval (CI) of The Estimates
    - The Linear Tests