Course 02441: Applied Statistics and Statistical Software

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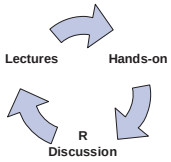
Today's program: outline

- General Linear Models (Introduction)
- Hands-on exercises



Methods covered in the course

- Descriptive statistics — Day I
- Comparing treatment means (t-test and non-parametric tests) — Day I
- Multiple regression analysis — Day II
- Analysis of variance — Day III
- Analysis of proportions and counts — Day IV
- The general linear model — Day V

Simple linear regression

- To model the relationship between two variables Y and X, we may consider a simple linear regression model on the form

$$Y_i = \alpha + \beta X_i + \varepsilon_i$$

Intercept, Slope, Dependent variable, Independent variable, Residuals

One-way ANOVA

- To model the relationship between a variable Y and a factor X, we may consider a simple linear regression model on the form

$$Y_{ij} = \alpha_i + \varepsilon_{ij}$$

Dependent Variable; Independent Factor variable (here denotes level of X); Residuals

ANCOVA

- If we want to model the dependency of a variable Y as a function of both, a variable X and a factor Z, we may use an analysis of covariance (ANCOVA)

$$Y_{ij} = \alpha_i + \beta_1 \cdot X_j + \varepsilon_{ij}$$

ANCOVA

- How should we interpret the model

$$Y_{ij} = \alpha_i + \beta_1 \cdot X_j + \varepsilon_{ij}$$

Extending the model

- The model can be extended to have different slopes for different groups
- There can be more factors or more independent variables
- We can transform or create new (dummy) variables
- And much more!