Module 8

(Co)Variance functions

- **var(x)**

Computes the variance of ***x,*** which is a vector, matrix or dataframe.

- **covar(x,y)**

Computes the covariance of ***x*** and ***y,*** where both arguments are vectors, matrices or dataframes with comparable dimensions to each other.

- **anova(object)**

Computes the analysis of variance of ***object***, which is a variable holding the results of a model fit (such as a linear model fit).

Linear model fitting etc.

- **lm(formula, data, subset, weights, na.action, method = 'qr', model = TRUE, x = FALSE, y = FALSE, qr = FALSE, ..)**

Fits a linear model to the given data and is used for linear regression. Returns the coefficients of the fit. The arguments are:

- **formula –** an object of class 'formula', which is a symbolic description of the model to be fitted (essentially, the model description in mathematical terms)
- **data –** an optional dataframe or list. If not specified, the arguments specified in ***formula*** are taken as variables by default
- **subset –** an optional vector specifying the subset of data values to be used in the fitting
- **weights –** an optional vector of weights to be used in the fitting process. Defaults to NULL, but if specified, uses a weighted least squares process to fit the model
- **na.action –** a function that indicates what should happen to NA values in the fitting process. The ***action*** values are:
    - **na.fail –** the regression fails
    - **na.omit –** excludes NA values
    - **na.exclude –** similar to na.omit, but behaves differently only when used with other functions computing residuals and predictions. It corrects for the vector lengths when these operations are conducted
    - **NULL**
- **method –** the fitting method ***'qr'*** is the default and is widely applicable
- **model, x, y, qr –** If TRUE, the function returns these components of the fit
- **linearHypothesis(model,…)**

Generic function for testing a linear hypothesis for a variety of linear models. (NOTE: For mixed effects models, the default test is the Chi-Square test for testing fixed effects).