Health Science Statistics using R and R Commander by Robin Beaumont

Chapter 26 Measuring the influence one variable on another: Regression

Learning Outcomes

* = more advanced outcomes

Learning outcome	**Tick box**
Be able to provide a definition of simple linear regression	q
Be aware of the different terminologies used to describe the variables involved and how the puritanical statistical interpretation is often ignored	q
Be able to give examples of the appropriate and inappropriate use of simple linear regression	q
Be able to describe the simple linear regression equation	q
Be aware of the simple linear regression model assumptions: LINE	q
Be able to describe the R^2 value in terms of total and regression (model) sums of squares	q
Be able to identify and interpret the various sums of squares and F value in the ANOVA table	q
Be able to describe simple linear regression as a statistical model	q
Be able to explain the link between *b* and *beta* and how this relates to interpreting the statistical model	q
Be aware that two types of interval can be calculated for the regression line	q
Be able to select the appropriate R Commander menu option/dialog box options to perform a simple linear regression	q
Be able to interpret a set of results including; coefficient estimates, standard error, t value, assumed population value, confidence interval, R squared (raw and adjusted) and p-value	q
Be able to select the appropriate R Commander menu option/dialog box options to draw the line of best fit	q
Be able to select the appropriate R Commander menu option/dialog box options to display the confidence intervals	q
Be able to select the appropriate R Commander menu option/dialog box options to display the various diagnostic plots	q
Be able to provide a basic interpretation of the various diagnostic plots	q
Be able to select the appropriate R Commander menu option/dialog box options to display the combined influence residual plot, and also be able to provide a basic interpretation of it	q

Learning outcome	**Tick box**
Be able to describe the process of modifying models to re-assess fit using AIC and BIC etc.	q
*Be able to create R code using the *lm()* function to carry out simple linear regression	q
*Be able to create R code to display the two types of interval that can be calculated for the regression line	q
*Be aware of various influence measures and how these relate to distance and leverage	q
*Be able to create R code to produce the various influence measures	q
*Be able to create R code to produce the various residual measures	q
*Be able to create R code to re-run the analysis with a subset of the original data and produce AIC and BIC	q
*Be able to write up a set of results in the appropriate style	q