Course 27411 Exercises 18/2 2013

Exercise MLR1 ("Basic practice:" to the extend time allows)

1. Import the Leslie Salt data from chapter 3 in Lattin et. al (2003).)(Use the '.00D' version uploaded in Campusnet – it is an (old) Unscrambler version – to be directly imported). Try to reproduce the stuff from the book/lecture – start by:
    a. Do some univariate explorative analysis (plots, distributions etc) for each variable
    b. Construct the log(price) variable – compare it's distribution with the original variable.
    c. Investigate (plotting,correlation,regression) the relationships between the log(price) and the other variables one at a time. (Use eg. scatterplots with "statistics")
    d. Try do re-produce the correlation matrix, p. 51.
    e. Do the MLR analysis - remove non-significant variables, check residuals etc. etc.

Exercise MLR2 (IMPORTANT – to be presented by Team 2 Monday 25/2)

Analyze the Prostate data from the following book website:
http://www-stat-class.stanford.edu/~tibs/ElemStatLearn/ (check p. 47-48 of Hastie et. al and/or the uploaded pdf-file with a little description of the data) (Use the uploaded version ".00D" version in Campusnet to avoid import problems. Import this as an "Unscrambler" fil – option no 2 on the list)

Try to answer the following questions:

1. What are the pair-wise relations between lpsa and the other variables – any indications of important relations?
2. Are there any clearly non-normal (e.g. skew) distributions among the variables?
3. Run the 8-variable MLR analysis and try to reduce the model by removing the most non-significant variables one by one – what is the final model?
4. Interpret the parameters of the final model – compare with the investigation in 1.
5. What is the estimate (and interpretation) of the residual standard deviation?
6. Investigate the validity/assumptions of the final model:
    a. Residual checks
    b. Influential/outlying observations
    c. Any additional model structure? (non-linearities, iteractions?)(diagnostics plots and/or model extensions)

Exercise MLR3 (OPTIONAL)

To be found as MLRexercise3.pdf on the website.