Assignment 2 Part 1 (35%)

Refer to the air-conditioning data set *aircondit* provided in the *boot* package. The 12 observations are the times in hours between failures of air-conditioning equipment. Assume that the times between failures follow an exponential model $Exp(\lambda)$. Obtain the MLE of the hazard rate λ and use bootstrap to estimate the bias and standard error of the estimate. Evaluate the three alternative procedures you have learned to generate bootstrap samples (*for* loop, *replicate* function and *boot* function), in terms of computation time for 10000 samples.

Assignment 2 Part 2 (35%)

Obtain the 4 types of bootstrap confidence intervals you have learned, to the 4 predictive models you developed in Part 1, Assignment 1 and to the logistic regression model you developed in Part 2 of Assignment 1. Compare these intervals to the ones derived by applying the *confint* function to the *lm*, *rq* and *glm* objects you have created. Discuss your findings.

Assignment 2 Part 3 (30%)

create own datasets

Implement the bivariate Spearman rank correlation test for independence as a permutation test. Use the *cor* function with *method*=*"spearman"*. Compare the achieved significance level of the permutation test with the p-value reported by *cor.test* on the same samples.

Assignment 2

- Submit your responses in Blackboard in a pdf file by midnight, September 28.
- Use the following file name: LASTNAME_FIRSTNAME_ASUID_ASSIGNMENTNUMBER
- Prepare your pdfs carefully; each week some of you will present their work.
- Include a separate file with the script that contains the `R` commands you used. Use the same file name as for the pdf file.