# SURVIVAL ANALYSIS - COMPUTER ASSIGNMENT 2

## Description

This computer assignment may be solved using any program language and/or software package that you find suitable. If you do not have any preference or do not know which to choose, the recommendation is to use `R`.

It is ok to do the assignment in groups, but the group size must not be greater than three.

**Things to do:**

- Generate $n = 200$ Weibull distributed random numbers given by the density
$$f(t; a, b) = \frac{a}{b}(\frac{t}{b})^{a-1} \exp\{-(\frac{t}{b})^a\},\ t, a, b \geq 0,$$
with $a = 5.5$ and $b = 22.5$ and denote these by $T_i^{(1)}, i = 1, \ldots, n$, corresponding to life times of group 1.
- Generate $m = 100$ Weibull distributed random numbers with parameters $a = 4.5$ and $b = 28$ and denote these by $T_i^{(2)}, i = 1, \ldots, m$, corresponding to life times of group 2.
- Make separate Nelson-Aalen estimates for the two groups.
- Carry out a logrank test for testing that the cumulative hazards are not equal between the two groups.
- Fit a Cox regression model to the two group setting above and test the regression coefficient.
- Estimate survival curves for the two groups using Kaplan-Meier.
- Estimate survival curves for the two groups using the Cox-model.

## Questions to Answer

- Can you based on the Nelson-Aalen (or Kaplan-Meier) estimates say something about the assumption regarding proportional hazard?
- What does the logrank test say?
- Is there a difference between the two groups with respect to estimated regression coefficients?
- Comment on the comparison between the Kaplan-Meier curves and the Cox-curves.

## Report

For those of you who can not attend or have not finished the assignment during computer class you need to write a report:

- The report must be submitted as a pdf.
- Maximum report length is 3 pages.
- Base your argumentation based on a number of representative figures that *must be possible to read.*

- No code.