

Introductory Exercise in SAS

Linear Mixed Models of Longitudinal Data

1 Introduction

For you to get familiar with SAS and PROC MIXED, you will be able to during this exercise examine the dataset Rats01. The data is briefly described on page 7 in Verbeke and Molenberghs.

2 Exercise

First you should download the file `rats01.sd2`, which is available at the course page, and create a library where you keep your data. The guide 'Getting started with SAS' in the help menu is very helpful for this.

When your library is created, there are some basic concepts you need to understand about SAS. You could first try and look at

- Writing SAS programs,
- Read the dataset into SAS,
- Finding the procedure that is suitable for your analysis
- and what options you should use for the procedure.

2.1 PROC MIXED

In this course we will mainly focus on PROC MIXED, a detailed description of this procedure is found at <http://www.sfu.ca/sasdoc/sashtml/stat/chap41/index.htm>

Try to understand the different options and statements that belongs to MIXED,

- What is the function of the options `data` and `method`? Which is the default for `method` and which do you think you will have use for during this course?
- The `title` statement is very convenient for keeping a check on your analyses later. Note that you can use several titles like

```
title 'Rat Data - Complete cases ' ;  
title2 'Rat Data - transformed time' ;
```

- What are the `CLASS` and `ID` and statements used for?

- Two very important statements in mixed linear models are RANDOM and REPEATED, here you can as an example specify different covariance structures and what output to display, try to understand their use and syntax
- Do not forget that the program has to be ended by a `run;`

Try to do inference for the model (3.9) and compare to the estimates at page 53 in Verbeke and Molenberghs. Recall that you should transform the time

$$\text{time}_2 = \log \left(1 + \frac{\text{age} - 45}{10} \right).$$

3 Summary

You do not need to hand in anything for this exercise, it is just for you understanding and preparation for the coming computer exercises.