Working with experimental data — mixed effects models — Exam

Please answer the following questions. Write down the answer and email your answer to `oliver@kirchkamp.de` before 15. August 2009, 15:00.

On the homepage of the course you find a dataset `examME.Rdata` which you may need to answer some of the questions. The dataset is also available for for Stata users as `examME.dta`.

In your answers to the following questions, please write down the commands you use. Please also include the output of your commands.

1. The dataset contains data from a ficticious experiment. The data is organised as follows:

   - Treatment — the treatment in the experiment. Theory predicts that the "red" treatment leads to a higher effort.
   - matchingGroup — an index for the group of players that are playing together in the lab in one group.
   - playerid — an index that is unique for each player.
   - stage — the experiment is organised in two stages. In each stage a participant follows one treatment.
   - period — the period within a stage.
   - effort — the effort exerted by the participant.

2. Run a pooled OLS regression to explain the effect of the treatment on the effort. Does the "red" treatment really yield more effort?

3. When you estimate standard errors in the above regression, can you use clustering for repeated observations. How can this be done. What problem do you see?

4. Estimate a mixed effects model with a fixed effect for the treatment and random effects for the repeated observations (matching groups and participants). In a first estimation include only random effects for the intercept.

5. Now also include a random effect for the treatments.

6. How can you determine whether it is worthwhile to also include a random effect for the treatments?

7. Somebody tells you that random effects can be biased. Do you know a safer method? How can you decide what to do?