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Practical Information

Last information:

- home assignment 6: due today (anytime),
- project report: due next Wednesday (15/4, anytime),
- last lab session: Wednesday 15/4, 9am-12pm,
- final exam: Wednesday 22/4, 9am-12pm, AVC Lecture Theatre B,
- new webpage item: course syllabus.

Today's session:

- exam topics today:
  - questions about exam assignments (types, calculations)?
  - exam practical remarks,
  - suggestions for your review/practice,
- presentation session: separate schedule,
- formal course evaluation (approx 10:45am) by GSR Office,
- additional review topics in today's lecture:
  - model choice (new slide),
  - overview of model types (new slide),

Exam Practical Remarks

Two versions of exam:

- "reduced" (Babafela, Niorn): 10am−12pm, 2 questions,
- "full" (Jennifer, Nora): 9am−12pm, 3 questions.

All aids (books and notes and calculators) are allowed,
− everything except a personal assistant or computer.

The questions have equal weight, unless specified otherwise − use your time sensibly!

Some hints and advices: (to use or not...)

- layout: essential requirements are
  - readability,
  - clear division between what is *in* the solution and what is not,
- conclusions should be part of all analyses,
- statistical model(s) should be part of all data analysis,
- explicit calculations may prevent loss of points due to typing errors (or the like),
- errors: if you realize an error and do not have time to correct it: write what is wrong, what should have been done and how the error would affect the result,
- sketches of computer analyses: specify i) how the suggested analysis would be done, and ii) how you would use and interpret the results.

Note: the exam finishes at 12pm (sharp!)

Suggestions for Your Review

Check: Course syllabus and Notes about exam on the web.

Suggested exercises to review:

- exams 2007−2014 (no exams for 2009−2010),
- all home assignments (in particular, my comments),
- all regular exercises listed for the lab sessions,
- perhaps also extra exercises listed for the lab sessions,
- perhaps also extra exercises in collections of "Additional problems" (solutions may exist at websites of previous years), e.g.
  - add10:9,11: suggest for "analysis based on Minitab/Stata listing" (run the models in the solution, and print out the session window),
  - add4:3, add7:8: suggest for "select model and sketch analysis",
- lots of exercises and problems in GO textbook (data files at Gary Oehlert website),
- don't skip the exercises on sample size...

Choice of Statistical Model

Some useful questions to ask about the data:

- purpose of study?
- response or explanatory variable?
- continuous or discrete/categorical variable?
- particular data structures? – e.g.
  - repeated measures / longitudinal data,
  - hierarchical structure,
  - split-plot units (some "treatments" on larger units than others) or subsampling,
- random (instead of fixed) effects?
- variable(s) of blocking type? (division of experimental units into homogeneous groups, with no intrinsic interest) – or obvious blocking schemes? (Latin square, BIBD etc.), versus "pure" replication,
- interactions between variables? (quantitative or categorical)
- continuous variable (explanatory or response) to be used for prediction of another variable? (regression)
- transformation? (to achieve normal distribution for residuals, homogeneity of variance, linear relation).

Overview of Model Types

Model type[1]	Characteristic	Topics for analysis
basic (VHM 801)	single explan. variable	4-step appr. for CI and test, ANOVA table, F-statistics, transformation e.g. Box-Cox
multiple linear regression	quantitative explanatory variables	residuals, diagnostics, outlier test, collinearity, test reduced/ full model, variable selection
ANOVA models, (general) linear models	categorical explanatory variables ("factors")	replications, blocks, interactions, contrasts, dummy variables, multiple comparisons, least squares means, designs: Latin square, BIBD, cross-over
random effects models	right hand side random variables (in addition to ε)	variance components, extra residuals, more complex SEs, 2 methods of analysis: ANOVA-based, (likelihood-based)
repeated measures, longitudinal data	repeated observ. on same "subject" over "time"	different approaches: separate times, response features, hierarchical/ split-plot, (ε-correction), (mixed w. correlation structure)

[1] models for continuous outcomes ( ) $\sim$ not in syllabus