

I have constructed the second intellectual mini-festival for next Thursday (14-Mar). The main topics for the quiz will be two-way ANOVA, simple linear regression, and indicator variable regression. Specifically, you will be asked to do the following things:

- 1) I will provide R output that performs a complete two-way ANOVA both on the original scale and on a transformed scale. You will be asked to check assumptions, decide which scale to use for interpretation, assess for or against effects (interaction and main), identify significant differences among level or group means (depending on which effects are present), determine which level or group means are larger or smaller and by how much, place significance letters on an appropriate effects plot, and properly interpret a back-transformed difference in means.
- 2) I will provide R output that performs a complete simple linear regression both on the original scale and on a transformed scale. You will be asked to check assumptions, decided which scale to use for interpretation, assess if a significant relationship exists in the data, specifically describe what that relationship is, decide what type of prediction to make (fit or prediction), and interpret the proper prediction or confidence interval (possibly back-transformed to the original scale).
- 3) You will be asked to perform two “short-answer” questions (no choice will be offered – i.e., answer two of two). Things that I would prepare for in this regard are: interpretations of models in both two-way and SLR; interpretations of SS, MS, and F in both two-way and SLR; value of simultaneously manipulating two factors in a study; describing why main effects cannot be interpreted if there is an interaction effect; algebraically demonstrating how to “linearize” an exponential or power function and how one would estimate the parameters in the original function; and why prediction and confidence interval widths differ.
- 4) You will be given background information about an IVR and asked to construct indicator variables, construct the ultimate full model, interpret all parameters, identify the models in hypotheses for the parallel lines tests, and identify the models in hypotheses for the coincident lines test.

All questions will be hand-written (not typed, as there will be no access to computers during the quiz) so I strongly urge you to write as nicely as you possibly can and in pencil (red pens will result in an “F” for the quiz, any other pen will result in a “D”). You should also bring a calculator (you will not be allowed to use the calculator on the computer and you will not be allowed to share a calculator with someone in the class). Also, make sure to answer all questions with intervals rather than point estimates as appropriate (e.g., “I am 95% confident that the value of the intercept is between 3.5 and 5.6”).

Let me know if you have any questions.