ST 512 HW 8

All Problems: Due Thursday, April 21^{st} in *lecture* at the beginning of class.

Note: Remember to include your ***code*** with your typed problems submitted in class.

17.9 (4 pts)

(a) (4 pts) You only need to do part (a).

17.13 (37 pts)

(a) (15 pts) The models we are using are "linear statistical models" - that's just the technical term for exactly what we've been doing in class. You do not need to list the constraints for fixed effects, but you do need to list the assumptions for any random effects. (1 pt/identified term, 1 pt/assumption)

(b) (8 pts) The expected mean squares for this experiment are given below for you - but you need to determine the degrees of freedom associated with each. Show the formula you used. (1 pt/df)

Source	Expected Mean Square (EMS)
A	$\sigma^2 + n\sigma^2_{ABC} + nb\sigma^2_{AC} + nc\sigma^2_{AB} + nbc\sigma^2_A$
B	$\sigma^2 + n\sigma^2_{ABC} + nc\sigma^2_{AB} + nac\psi^2_B$
C	$\sigma^2 + n\sigma^2_{ABC} + nb\sigma^2_{AC} + nab\psi^2_C$
AB	$\sigma^2 + n\sigma^2_{ABC} + nc\sigma^2_{AB}$
AC	$\sigma^2 + n\sigma^2_{ABC} + nb\sigma^2_{AC}$
BC	$\sigma^2 + n\sigma^2_{ABC} + na\psi^2_{BC}$
ABC	$\sigma^2 + n\sigma^2_{ABC}$
Error	σ^2

(c) (14 pts) Ignore the book - Provide the appropriate F test for all effects in the model. (1 pt/test) For each F test, state whether the degrees of freedom can be taken from the ANOVA table or would need to be calculated with Satterthwaite's approximation. (1 pt/answer)

The following problems require SAS and your code for these problems should be submitted with your answers. Remember, your solutions to these questions should not require the reader to see your output for themselves!

17.10 (14 pts)

(a) (9 pts) Remember to include any assumptions! (1 pt/identified term, 1 pt/assumption)

(b) (5 pts) Use the Type 3 method in PROC MIXED to get your answers.

17.11 (12 pts) No need to repeat anything from 17.10, but include your decisions (1 pt each) and conclusions (3 pts each)

17.27 (27 pts)

(a) (10 pts) Remember to include any assumptions! (1 pt/identified term, 1 pt/assumption)

(b) (5 pts) Use the Type 3 method in PROC MIXED to get your answers.

(c) (12 pts) Include your decisions (1 pt each) and conclusions (3 pts each)

17.28 (16 pts) Only do parts (a) and (c)

(a) (10 pts) Provide the Type 3 estimates (4 pts) and the REML estimates (4 pts). Which estimates would you prefer and why? (2 pts)

(c) (6 pts) Interpret your interval (3 pts) in addition to providing it (3 pts)