# 1. Derive the degrees of freedom in the fitted values for smoothed ANOVA (Hodges 2013, p. 119, equation 4.16). Hint: remember $A_1'A_1 = cnI_M$, $A_2'A_2 = cnI_N$, $A_1'A_2 = 0$.

INSTRUCTIONS APPLYING TO QUESTIONS 2 AND 3:

Report your work explicitly. Your report should include the following:

(i) Say whether it is a Bayesian or conventional analysis.
(ii) Say which software you used; include any code you've written as an appendix.
(iii) Write down the model as an equation.

If your analysis includes a penalized spline:

(iii) Describe the basis you used, including
-- the number of knots and how you placed them (do not say "I used the program's default"; say what that default is)
-- the type of basis functions (broken-stick linear, radial, etc.).
(iv) Describe the penalty (probably simple, but describe it anyway).
(v) Give a plot showing the data and the fit. If you fit more than one model, you might want to put both fits on the same plot, so it's easy to compare them.

Write this in English prose with enough connecting words so I can follow it. I want you to practice presenting material, which includes writing.

# 2. Fit to the pig-jawbone data at least one of the additive models we discussed in class, which differed mainly in the model for transects within pig. You can use one pig's data or more than one pig's, as you prefer. Use one or more of these software approaches:
(i) Write your own code in R to implement what we've done in class
(ii) Use the SAS macros in RWC
(iii) Use SemiPar in R
(iv) Use WinBUGS.

DO NOT USE OTHER APPROACHES unless you ask me first and I say it's OK.

# 3. Fit a smoothed ANOVA to the soft-liner-gaps data (on the web page for Hodges 2013). Don't just fit the ones I discussed in class (which are in the Hodges, Cui, Sargent, Carlin 2007 Technometrics paper). Try something you think is interesting; here are some possibilities:

-- Use a different basis, i.e., different columns of $A_1$ and $A_2$.
-- Use REML instead of our Bayesian analysis.
-- Use a different j(k) in grouping columns.

Due Wed Feb 26