Key for HSTA559 Quiz on 17 February

1. **Given a 95% CI, with limits (a, b), how do you interpret the CI?**

   Answer: The standard correct answer is to say that one may have 95% confidence that this particular numerical interval has captured the parameter being estimated. Other answers, also correct, are these:
   i. That the limits a and b provide a range of values for the population parameter that are reasonable, with 95% confidence, given these data.
   ii. That, intervals computed like this one was, will tend to capture the population parameter 95% of the time.

   Common mistakes: a. Not to distinguish between sample statistics and population parameters, b. To say that one can be 95% certain that the interval (a, b) contains the population parameter (many said 'mean', some said 'difference between means' – when nothing had been said about what the statistic was estimating), c. To use the word 'probability' inappropriately.

2. **Why are dependent sample test statistics different from their independent sample counterparts?** *[No one got full credit for answers on this; in fact, I thought of it as a challenging question whose main purpose would be to encourage your study and thinking about it, and related matters.]*

   Background: All test statistics depend on estimates of standard errors, *i.e.*, estimates of the standard deviations of their (theoretical) sampling distributions. (A correct answer would not have to say this, but the concept should be present in some way because it is fundamental.)

   Answer: Dependent sample statistics are based on standard error estimates that derive from the variance of (sample) difference scores. Independent sample statistics use standard error estimates based on pooled within sample variances. More could be said, but this would be sufficient.

   Common mistakes: a. To ignore the term 'test statistics' and then describe in some way how the two kinds of 'designs' (dependent and independent) differ from one another, b. To write about interactions in the case of dependent samples; this is/was a bad idea since it deflects attention from the key idea. c. To mention how correlation (between columns of scores) somehow matters for dependent samples, but not for independent samples; in fact, test statistics for dependent sample problems do not depend on the size or sign of this correlation. d. To write about the role of 'matching' for dependent samples, and how matching is not involved for independent samples; but this is not relevant since 'matching' is generally not used for what I have called paradigms 1a and 1b (see Enhancing graphics paper).