## Stat 135, Fall 2006 A. Adhikari HOMEWORK 8 (due Friday 11/3)

There's nothing strange about doing the Ch 13 problems first. You'll see after you've done them.

1. 13.7. It's easy enough to get R to do the test, so that's not the point. The point is: where's the randomization? In order to justify running a statistical test on these data, you have to believe in a particular set of assumptions about what is random and in what way it is random. What are those assumptions, and do you believe them?

In general, watch out. People run statistical tests on all kinds of data. It is important to understand, very clearly, exactly what is being tested, under what assumptions the test is valid, and in what way those assumptions reflect reality.

**2.** 13.8.

**3.** 11.24.

**4.** 11.26.

5. 11.29. This is a good method, frequently used now that computers can draw samples so easily.

**6.** 11.40a. Yes, just part (a). You can do dotplots if you like, or find some other way of displaying the data so that it is easy to compare the two sets of values.

**7.** 11.40b-c. Are the data paired? What are the other assumptions under which you can do what is asked in the problems. Do you think the assumptions are reasonable?

You should look at the middle of page 428, right above Example C. You'll see that the calculations get very mysterious as assumptions change. It may be comforting for you to know that in the context where that strange calculation of degrees of freedom arises, you can always do conservative inference by using the t distribution whose degrees of freedom equal r-1 where r is the smaller of the two sample sizes. That means, if you use  $t_{r-1}$ , your confidence intervals may be wider than necessary but they'll have at least the right level, and the significance level of your test will be no bigger than if you used the distribution with the strange degrees of freedom given in the text.

8. 11.40d. What are the assumptions behind the method you have chosen, and what are the null and alternative hypotheses that you are testing?

**9.** 11.50a-b.

**10.** 11.50c. For every test, state all assumptions and hypotheses carefully.