FW3200 – Quiz No. 2 **February 28, 2008**

You have 30 minutes. Take your time!
Note that this sheet has **two sides**. **Name:** A. Student

In class we considered an example where a single stand was sampled both before and after a treatment was applied. In the same plots, species evenness measured before and after the treatment. We applied a paired test for differences using the Excel Analysis ToolPak wizard. Here's the output:

t-Test: Paired Two Sample for Means		
	StandA	*StandB*
Mean	0.76283	0.81675
Variance	0.00257	0.01493
Observations	15	15
Pearson Correlation	0.61562	
Hypothesized Mean Difference	0	
df	14	
t Stat	-2.10176	
P(T<=t) one-tail	0.0270	
t Critical one-tail	1.76131	
P(T<=t) two-tail	0.05415	
t Critical two-tail	2.14478	

TWO TAIL [P(T<=t) one-tail / t Critical one-tail

ONE TAIL [P(T<=t) two-tail / t Critical two-tail

ONE: The table says the hypothesized mean difference is "0".

a) Give the **statistical** null hypothesis; **i.e., use symbols not words**:

Ho: $\mu_A - \mu_B = 0$

b) One possible research hypothesis is that evenness in Stand A is different than in Stand B. Give the corresponding **statistical** alternative hypothesis. Then, using the results above draw a conclusion for this statistical test, and explain your rationale.

Ha: $\mu_A - \mu_B \neq 0$

FAIL to reject because tcalc not less than tcrit

c) Another possible research hypothesis is that evenness in Stand A is **lower** than in Stand B. Give the corresponding **statistical** alternative hypothesis. Then, using the results above draw a conclusion for this statistical test, and explain your rationale.

Ha: $\mu_A - \mu_B < 0$

REJECT because tcalc < -tcrit
(one-tailed test)

TWO: Two ways of expressing a confidence interval are:

a) $\bar{x} \pm t_{\alpha/2,n-1} \cdot s_{\bar{x}}$ b) $\bar{x} \pm z_{\alpha/2} \cdot s_{\bar{x}}$

What is the difference between them? Explain.

As n becomes large, t becomes z.
The heuristic rule is to use t if $n < 100$.
Thus, use a) if $n < 100$.

THREE: Following is a partial setup for a goodness-of-fit test. The data are counts of students, by season they were born in, who took FW4130 a while back. The research hypothesis is that students are **twice as likely** to have been born in fall or winter than in spring or summer. This defines the expected ratio.

Fill in all of the blanks in the table.

Season	**Observed** frequency	**Expected** ratio	**Expected** proportion	**Expected** frequency
Spring	3	1	0.167	6
Summer	8	1	0.167	6
Fall	11	2	0.333	12
Winter	14	2	0.333	12
TOTAL	**36**	6	**1**	**36**

Write nothing below the line above.