This time: 2 sample problem (quant.)
Next time: 2 sample problem (%)
Read: LN pp. 203-213 Today: LN L-186
R-27 has info on matched pairs
Hwk 3 due next Tue; see web page for wed. disc. sec. next week
Matched Pairs: The difference between pairs is what's important  D = T - C
    mean of differences = \( \bar{d} \)
    SE of differences = \( S_d \)
types of pairs: control/treatment (note: has 2 subjects as column number by 2 groups)
    before/after (aka longitudinal design)
    2 diff. but comparable variables on an individual (ex: hind & fore leg length)
fun fact: gazelle/deer jumps called stotting, pronking, or pronging
HW 3 #4: it is some kind of paired comparison: held day constant, compared 2 things
    not like C/T design or longitudinal design (before/after); is like deer data!
for deer example:
    Start with sample: the observed
    Then population: extend to broader universe
    Make inf. summary and fill out 1st two rows with 1 & 3
    Layout imaginary dataset
    Find long run hist of \( \bar{d} \) accounting for uncertainty in \( S_d \)
    \[
    t.d = \frac{\bar{d}}{S_d} \approx \frac{80}{8} = 10
    \]
    \[
    95\% CI for \( \mu_d \) = \( \bar{d} \pm (2.262) S_d (t.a) \)
    \[
    = 3.30 \pm (2.262)(0.97) \approx 2.19
    \]
    Daphnia example: an analysis of 2 independent samples, not paired!
    Ask: look at first two rows, is there any connection between the two numbers? no - indep. sample
    Need to make a double model to include both groups!
    Start as usual w/sample (the observed _) and variable being measured, use \( \bar{y} \) & \( S \) because
    outcome are quantitative continuous (use \( \bar{y} \), and \( \bar{y} \) to differentiate)
continue as usual
note: book should say +0.0428 days
keep focusing on differences (to pick pos or neg)
\{ same but set up one diagram with \bar{y}_1
and copy with \bar{y}_2 
fill out top 2 rows of inferential summary
Q1: \text{SE}(\bar{y}_2 - \bar{y}_1) = ?
Q2: \text{SE}(\bar{y}_2 - \bar{y}_1) \neq \text{SE}(\bar{y}_2) \neq \text{SE}(\bar{y}_1)
\bar{y}_1 \text{ unc. is } \hat{SE}_1 = 0.27 \text{ days}
\bar{y}_2 \text{ unc. is } \hat{SE}_2 = 0.24 \text{ days}

\text{A2: (math)}
\text{fact:}
\frac{\text{SE}(\bar{y}_2 - \bar{y}_1)}{\text{SE}(\bar{y}_1)} \text{ or } \frac{\text{SE}(\bar{y}_2 - \bar{y}_1)}{\text{SE}(\bar{y}_2)}
\text{has to be larger than bigger side!}
\text{D\#2 can't have legs longer than both legs together}
0.27 < \text{SE}(\bar{y}_2 - \bar{y}_1) < (0.27 + 0.24)
can fill 3rd row of inf. summary!
now do long run hist of (\bar{y}_2 - \bar{y}_1)

(n doesn't need to be same in both groups)
95% \text{ CI: } \bar{y}_2 \pm 2.174 \hat{SE}(\bar{y}_2 - \bar{y}_1)
P.194 has full formula, but you don't need that (JMP knows it!)

2 versions of 2 independent story:
version A: unsure whether pop. SDs are the same \text{(unpooled)} = unequal variances for JMP
version B: suspect that they are the same \text{(pooled)}