Professor Notes About the "Hypothesis Testing" Homework

- On question 2 in the first section, make sure to multiply the result from 'distrib()' by two because the alternative hypothesis is the two-tailed "not equals" situation. Also make sure (before multiplying by two) to find the area into the nearest tail (i.e., to the left if the observed statistic is less than the hypothesized mean or to the right if the observed statistic is greater than the hypothesized mean).
- On all questions, make sure to use the standard error rather than the standard deviation.
- Note that the hypotheses should be written "mathematically" rather than as sentences (see the key below).

P-Value Calculations and Decisions

1. The p-value is "the probabiity of observing a sample mean of 73 or less if the population mean is 80." The null hypothesis is rejected because the p-value (=0.0276)$< \alpha$.

2. The p-value is "the probabiity of observing a sample mean of 1370 or 'different' if the population mean is 1500." The null hypothesis is not rejected because the p-value (=0.3041)$> \alpha$.

Beetle Size

1. $H_A : \mu > 190$ vs. $H_0 : \mu = 190$.

2. $\bar{x}$=194.167 mm.

3. p-value=0.103.

4. Do not reject H_0 because the p-value $> \alpha$.

5. Average thorax does not appear to be greater than 190 mm.¡/li¿

R Appendix.

```
library(NCStats)

# P-values
distrib(73,mean=80,sd=20/sqrt(30))
2*distrib(1370,mean=1500,sd=800/sqrt(40))

## Beetle question
setwd("c:/stats")
d <- read.csv("Beetles.csv")
d <- filterD(d,species=="Halticus.oleracea")
distrib(round(194.167,mean=190,sd=14/sqrt(18),lower.tail=FALSE)
```