

## Assignment 3

Due next Thursday (09/22/05)

1. To study the effects of pesticides on birds, a scientist randomly and equally allocates  $N = 65$  chicks to five diets (a control and four with a different pesticide included). After a month each chick's calcium content (mg) in 2 cm length of bone is measured resulting in the following:

	Control	1	pesticide		
			2	3	4
Mean	11.54	11.00	11.42	11.44	11.28
St.Dev	.27	.47	.31	.42	.31

Construct the ANOVA table (i.e. compute the between and within SS) and test if there appears to be any differences in means (use  $\alpha = 0.01$ )

2. In a study of the effect of glucose on insulin release, identical specimens of pancreatic tissue were equally and randomly assigned to three different levels of glucose concentration (low, medium, high). The amount of insulin produced by each tissue after treatment was recorded. The data set, `insulin.dat`, can be downloaded from the class website. In `insulin.dat`, the first column contains the amounts at the low concentration, the second column the amounts at the medium concentration, and the third column the amounts at the high concentration. To read a data set like this, do the following in the data step to create a data set suitable for the `glm` procedure.

```
data insulin;
infile 'H:\dataset\insulin.dat';
input t1 t2 t3;
y=t1; trt=1; output;
y=t2; trt=2; output;
```

```
y=t3; trt=3; output;  
drop t1 t2 t3;
```

This creates a treatment variable ( $trt$ ) and a response variable ( $y$ ).

- a). Test the hypothesis that there is no difference across treatments in the amount of insulin produced (use  $\alpha = 0.01$ ).
- b). Assess whether the assumptions are valid?
- c). Construct 99% CIs for the average insulin amounts at the low, medium and high glucose concentrations separately. The formula can be found in Montgomery Section 3-3.3 Equation (3-12). Based on each confidence interval, does it appear the average amount of insulin is significantly different than 3.5?