STAT 217: Project 3

Due Friday, February 13 in class

You must work in a group of 2-3. There will be a point deduction if you do not work in a group.

A chicken farmer from Ohio currently feeds his chickens a horsebean supplement to help them grow. The farmer wants to make sure that he is feeding his chickens the best supplement he can. So, he conducts an experiment to measure and compare the effectiveness of 6 different supplements (horsebean, casein, linseed, meatmeal, soybean, and sunflower). Newly hatched chicks were randomly divided up into six groups. Each group was given a different feed supplement and their weights (grams) after six weeks were recorded. Conduct an analysis of the effects of feed type on the weight of chickens to determine which, if any, alternate supplements are superior to horsebean. Summarize your results in a written report following the Project Writing Guidelines.

Your analysis will involve two parts:

(1) First, use a One-Way ANOVA to assess evidence related to differences in the average weight gain of chicks for different supplements. In your Summary of Statistical Findings (Section III in your write-up) include the estimated mean weight for each supplement using the reference-coded model output. No confidence interval statements are necessary.

(2) Next, use a multiple comparison analysis to compare each supplement to the horsebean supplement. Add an additional two sentences to your Summary of Statistical Findings section. In these sentences, clearly note which supplements are detected to be different *from horsebean* and which supplement(s) would be recommended based on these results. No confidence interval statements are necessary.

R Code for the analysis is provided below. You will need to install the mosaic and multcomp packages if you have not already done so.

R Code

#Examine Data

data(chickwts)

head(chickwts)

require(mosaic)

favstats(weight~feed, data=chickwts)

boxplot(weight~feed, data=chickwts,ylab="Weight in Grams")

chickwts$feed<-factor(chickwts$feed,levels=c("horsebean","casein","linseed", "meatmeal","soybean","sunflower"))

#ANOVA

lm1<-lm(weight~feed,data=chickwts)

anova(lm1)

summary(lm1)

# Diagnostic Plots

par(mfrow=c(2,2))

plot(lm1)

par(mfrow=c(1,1))

#Multiple Comparison

require(multcomp)

pairs<-glht(lm1, linfct=mcp(feed="Tukey"))

confint(pairs)

old.par <- par(mai=c(1.5,2.5,1,1))

plot(pairs)