

The jumping data

February 9, 2011

The data:

```
Control 1 611
Control 1 621
Control 1 614
Control 1 593
Control 1 593
Control 1 653
Control 1 600
Control 1 554
Control 1 603
Control 1 569
Lowjump 2 635
Lowjump 2 605
Lowjump 2 638
Lowjump 2 594
Lowjump 2 599
Lowjump 2 632
Lowjump 2 631
Lowjump 2 588
Lowjump 2 607
Lowjump 2 596
Highjump 3 650
Highjump 3 622
Highjump 3 626
Highjump 3 626
Highjump 3 631
Highjump 3 622
Highjump 3 643
Highjump 3 674
Highjump 3 643
Highjump 3 650
```

The SAS code and output:

```
data jumping;
  infile "jumping.dat" delimiter='09'x;
```

```

input group $ g density;

proc glm;
  class group;
  model density=group;
  lsmeans group / adjust=tukey lines;
  lsmeans group / adjust=bon lines;

run;

```

The GLM Procedure

Class Level Information			
Class	Levels	Values	
group	3	Control Highjump Lowjump	

Number of Observations Read	30
Number of Observations Used	30

The GLM Procedure

Dependent Variable: density

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	7433.86667	3716.93333	7.98	0.0019
Error	27	12579.50000	465.90741		
Corrected Total	29	20013.36667			

R-Square	Coeff Var	Root MSE	density Mean
0.371445	3.495906	21.58489	617.4333

Source	DF	Type I SS	Mean Square	F Value	Pr > F
group	2	7433.866667	3716.933333	7.98	0.0019

Source	DF	Type III SS	Mean Square	F Value	Pr > F
group	2	7433.866667	3716.933333	7.98	0.0019

The GLM Procedure

Least Squares Means

Adjustment for Multiple Comparisons: Tukey

group	density LSMEAN	LSMEAN Number
Control	601.100000	1
Highjump	638.700000	2
Lowjump	612.500000	3

Least Squares Means for effect group
Pr > |t| for H0: LSMean(i)=LSMean(j)

Dependent Variable: density			
i/j	1	2	3
1		0.0016	0.4744
2	0.0016		0.0298
3	0.4744	0.0298	

Tukey Comparison Lines for Least Squares Means of group
 LS-means with the same letter are not significantly different.

density		LSMEAN	
LSMEAN	group	Number	
A	638.7	Highjump	2
B	612.5	Lowjump	3
B			
B	601.1	Control	1

The GLM Procedure
 Least Squares Means
 Adjustment for Multiple Comparisons: Bonferroni

density		LSMEAN
group	LSMEAN	Number
Control	601.100000	1
Highjump	638.700000	2
Lowjump	612.500000	3

Least Squares Means for effect group
 Pr > |t| for H0: LSMean(i)=LSMean(j)

Dependent Variable: density			
i/j	1	2	3
1		0.0018	0.7437
2	0.0018		0.0343
3	0.7437	0.0343	

Bonferroni Comparison Lines for Least Squares Means of group
 LS-means with the same letter are not significantly different.

density		LSMEAN	
LSMEAN	group	Number	
A	638.7	Highjump	2
B	612.5	Lowjump	3
B			
B	601.1	Control	1