

OPTIONS LS=80 PS=66 MPRINT NODATE PAGENO=1 NOCENTER; (ch6-4_exp6-7_HO.out)

DM "LIST; CLEAR; LOG; CLEAR;";

*****;

%LET file_n1 = exp6_7.txt;

FILENAME file1 URL "http://www.uvm.edu/~rsingle/stat231/data/kuehl/&file_n1";

DATA bl;

INFILE file1 FIRSTOBS=2 EXPANDTABS;

INPUT type kneading strength;

RUN;

PROC GLM DATA=bl;

CLASS type kneading;

MODEL strength = type kneading type*kneading;

MEANS type kneading;

LSMEANS type kneading / STDERR;

LSMEANS type*kneading / SLICE=kneading;

OUTPUT OUT=b2 PREDICTED=pred RESIDUAL=resid;

RUN;

Note: unequal obs/cell -->

- different results for Type I & Type III SS.

- differences between the MEANS and LSMEANS results.

Class	Levels	Values
type	2	1 2
kneading	3	1 2 3

Dependent Variable: strength

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	5	10873.38095	2174.67619	193.66	<.0001
Error	8	89.83333	11.22917		
Corrected Total	13	10963.21429			

R-Square	Coeff Var	Root MSE	strength Mean
0.991806	4.104456	3.350995	81.64286

Source	DF	Type I SS	Mean Square	F Value	Pr > F
type	1	1518.005952	1518.005952	135.18	<.0001
kneading	2	8401.925794	4200.962897	374.11	<.0001
type*kneading	2	953.449206	476.724603	42.45	<.0001

Source	DF	Type III SS	Mean Square	F Value	Pr > F
type	1	710.453704	710.453704	63.27	<.0001
kneading	2	6806.452381	3403.226190	303.07	<.0001
type*kneading	2	953.449206	476.724603	42.45	<.0001

MEANS

Level of type	N	Mean	Std Dev
1	6	93.6666667	19.2319179
2	8	72.6250000	32.9412356

Level of kneading	N	Mean	Std Dev
1	5	109.400000	3.9749214
2	5	83.000000	19.8620241
3	4	45.250000	7.3654599

Least Squares Means

type	strength LSMEAN	Standard Error	Pr > t
1	86.7777778	1.5124228	<.0001
2	71.3888889	1.2064960	<.0001

kneading	strength LSMEAN	Standard Error	Pr > t
1	109.000000	1.529513	<.0001
2	79.416667	1.529513	<.0001
3	48.833333	1.934698	<.0001

Least Squares Means for type*kneading

type	kneading	strength LSMEAN
1	1	107.000000
1	2	97.333333
1	3	56.000000
2	1	111.000000
2	2	61.500000
2	3	41.666667

type*kneading Effect Sliced by kneading for strength

kneading	DF	Sum of Squares	Mean Square	F Value	Pr > F
1	1	19.200000	19.200000	1.71	0.2273
2	1	1540.833333	1540.833333	137.22	<.0001
3	1	154.083333	154.083333	13.72	0.0060