

```

1      /*
2      Examine differences among the following 6 treatments
3      N/N85 fed normally before weaning and 85 kcal/wk after
4      N/R40 fed normally before weaning and 40 kcal/wk after
5      N/R50 fed normally before weaning and 50 kcal/wk after
6      NP   standard diet to satiation
7      R/R50 fed a reduced diet of 50 kcal/wk before and after weaning
8      lopro normal before weaning, 50 kcal/wk after, protein decreasing w/ age
9
10     Variable of interest - Lifetime of mice (months) fed on 3 different diets.
11     */
12
13     /*
14     SAS applications of note:
15         PROC GLM
16         PROC MIXED
17         output from PROC MIXED using OUTP
18         PROC PLOT with vref option
19     */
20
21
22     dm'log;clear;output;clear';
23     options nodate nocenter nonumber ps=512 ls=132;
24     ODS HTML style=minimal rs=none
body='C:\Geaghan\EXST\EXST3201\Fall2005\SAS\MouseFeed02.html' ;
NOTE: Writing HTML Body file: C:\Geaghan\EXST\EXST3201\Fall2005\SAS\MouseFeed02.html
25
26     Title1 'Chapter 5 : Mouse feeding example';
27     filename input 'C:\Geaghan\EXST\EXST3201\Datasets\CSV\CASE0501.csv';
28
29
30     data MouseFeed; length diet $ 6; infile input missover DSD dlm=","
firstobs=2;
31         input Lifetime diet $;
32         datalines;
NOTE: The infile INPUT is:
      File Name=C:\Geaghan\EXST\EXST3201\Datasets\CSV\CASE0501.csv,
      RECFM=V,LRECL=256
NOTE: 349 records were read from the infile INPUT.
      The minimum record length was 5.
      The maximum record length was 10.
NOTE: The data set WORK.MOUSEFEED has 349 observations and 2 variables.
NOTE: DATA statement used (Total process time):
      real time           0.01 seconds
      cpu time            0.01 seconds
34     proc sort data=MouseFeed; by diet lifetime; run;
NOTE: There were 349 observations read from the data set WORK.MOUSEFEED.
NOTE: The data set WORK.MOUSEFEED has 349 observations and 2 variables.
NOTE: PROCEDURE SORT used (Total process time):
      real time           0.01 seconds
      cpu time            0.01 seconds
35     proc print data=MouseFeed; run;
NOTE: There were 349 observations read from the data set WORK.MOUSEFEED.
NOTE: The PROCEDURE PRINT printed page 1.
NOTE: PROCEDURE PRINT used (Total process time):
      real time           0.04 seconds
      cpu time            0.04 seconds

```

Chapter 5 : Mouse feeding example

```

Obs    diet    Lifetime
  1    N/N85    17.9
  2    N/N85    19.3
. . .
 58    N/R40    19.6
 59    N/R40    29.4
. . .
118    N/R50    18.6
119    N/R50    23.5
. . .
189    NP      6.4
190    NP      9.2
. . .
238    R/R50    24.2
239    R/R50    26.3
. . .
294    lopro   23.4
295    lopro   24.7
. . .
348    lopro   49.3
349    lopro   49.7
    
```

```

37      Title2 'Analysis of Variance with PROC GLM';
38      proc glm data=mousefeed;
39          class diet;
40          model lifetime = diet;
41      run;
42
43      Title2 'Analysis of Variance with PROC MIXED';
NOTE: The PROCEDURE GLM printed pages 2-3.
NOTE: PROCEDURE GLM used (Total process time):
      real time      0.03 seconds
      cpu time       0.03 seconds
    
```

Chapter 5 : Mouse feeding example
 Analysis of Variance with PROC GLM

The GLM Procedure

```

                Class Level Information
Class          Levels  Values
diet           6      N/N85 N/R40 N/R50 NP R/R50 lopro
    
```

```

Number of Observations Read      349
Number of Observations Used      349
    
```

Dependent Variable: Lifetime

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	5	12733.94181	2546.78836	57.10	<.0001
Error	343	15297.41532	44.59888		
Corrected Total	348	28031.35713			

```

R-Square      Coeff Var      Root MSE      Lifetime Mean
0.454275      17.21323      6.678239      38.79713
    
```

Source	DF	Type I SS	Mean Square	F Value	Pr > F
diet	5	12733.94181	2546.78836	57.10	<.0001

Source	DF	Type III SS	Mean Square	F Value	Pr > F
diet	5	12733.94181	2546.78836	57.10	<.0001

```

44      proc mixed data=mousefeed;
45          class diet;
46          model lifetime = diet / outp=resids;
47      run;
NOTE: The data set WORK.RESIDS has 349 observations and 9 variables.
NOTE: The PROCEDURE MIXED printed page 4.
NOTE: PROCEDURE MIXED used (Total process time):
      real time          0.07 seconds
      cpu time           0.07 seconds

```

Chapter 5 : Mouse feeding example
 Analysis of Variance with PROC MIXED

The Mixed Procedure

```

                        Model Information
Data Set                WORK.MOUSEFEED
Dependent Variable     Lifetime
Covariance Structure   Diagonal
Estimation Method      REML
Residual Variance Method Profile
Fixed Effects SE Method Model-Based
Degrees of Freedom Method Residual

                        Class Level Information
Class   Levels   Values
diet    6        N/N85 N/R40 N/R50 NP R/R50 lopro

```

```

                        Dimensions
Covariance Parameters      1
Columns in X               7
Columns in Z               0
Subjects                   1
Max Obs Per Subject       349

```

```

                        Number of Observations
Number of Observations Read      349
Number of Observations Used      349
Number of Observations Not Used   0

```

```

Covariance Parameter Estimates
Cov Parm      Estimate
Residual      44.5989

```

```

                        Fit Statistics
-2 Res Log Likelihood      2300.3
AIC (smaller is better)   2302.3
AICC (smaller is better)  2302.4
BIC (smaller is better)   2306.2

```

```

                        Type 3 Tests of Fixed Effects
Effect      Num      Den      F Value      Pr > F
diet        5        343      57.10        <.0001

```

```

49      proc print data=resids; run;
NOTE: There were 349 observations read from the data set WORK.RESIDS.
NOTE: The PROCEDURE PRINT printed page 5.
NOTE: PROCEDURE PRINT used (Total process time):
      real time          0.13 seconds
      cpu time           0.14 seconds

```

Chapter 5 : Mouse feeding example
 Analysis of Variance with PROC MIXED

Obs	diet	Lifetime	Pred	StdErr Pred	DF	Alpha	Lower	Upper	Resid
1	N/N85	17.9	32.6912	0.88455	343	0.05	30.9514	34.4311	-14.7912
2	N/N85	19.3	32.6912	0.88455	343	0.05	30.9514	34.4311	-13.3912
3	N/N85	19.8	32.6912	0.88455	343	0.05	30.9514	34.4311	-12.8912
4	N/N85	21.9	32.6912	0.88455	343	0.05	30.9514	34.4311	-10.7912
5	N/N85	22.3	32.6912	0.88455	343	0.05	30.9514	34.4311	-10.3912
6	N/N85	24.5	32.6912	0.88455	343	0.05	30.9514	34.4311	-8.1912
7	N/N85	27.9	32.6912	0.88455	343	0.05	30.9514	34.4311	-4.7912
8	N/N85	28.8	32.6912	0.88455	343	0.05	30.9514	34.4311	-3.8912
9	N/N85	29.2	32.6912	0.88455	343	0.05	30.9514	34.4311	-3.4912
10	N/N85	29.3	32.6912	0.88455	343	0.05	30.9514	34.4311	-3.3912
11	N/N85	29.6	32.6912	0.88455	343	0.05	30.9514	34.4311	-3.0912
12	N/N85	30.1	32.6912	0.88455	343	0.05	30.9514	34.4311	-2.5912
13	N/N85	30.3	32.6912	0.88455	343	0.05	30.9514	34.4311	-2.3912
14	N/N85	31.0	32.6912	0.88455	343	0.05	30.9514	34.4311	-1.6912
15	N/N85	31.4	32.6912	0.88455	343	0.05	30.9514	34.4311	-1.2912
16	N/N85	31.4	32.6912	0.88455	343	0.05	30.9514	34.4311	-1.2912
17	N/N85	31.5	32.6912	0.88455	343	0.05	30.9514	34.4311	-1.1912
18	N/N85	31.5	32.6912	0.88455	343	0.05	30.9514	34.4311	-1.1912
...									
58	N/R40	19.6	45.1167	0.86216	343	0.05	43.4209	46.8124	-25.5167
59	N/R40	29.4	45.1167	0.86216	343	0.05	43.4209	46.8124	-15.7167
...									
118	N/R50	18.6	42.2972	0.79256	343	0.05	40.7383	43.8561	-23.6972
119	N/R50	23.5	42.2972	0.79256	343	0.05	40.7383	43.8561	-18.7972
...									
189	NP	6.4	27.4020	0.95403	343	0.05	25.5255	29.2785	-21.0020
190	NP	9.2	27.4020	0.95403	343	0.05	25.5255	29.2785	-18.2020
...									
238	R/R50	24.2	42.8857	0.89242	343	0.05	41.1304	44.6410	-18.6857
239	R/R50	26.3	42.8857	0.89242	343	0.05	41.1304	44.6410	-16.5857
...									
294	lopro	23.4	39.6857	0.89242	343	0.05	37.9304	41.4410	-16.2857
295	lopro	24.7	39.6857	0.89242	343	0.05	37.9304	41.4410	-14.9857

```

51      Title3 'Proc univariate check of the residuals from ANOVA';
52      proc univariate data=resids plot normal;
53          var resid;
54      run;
    
```

NOTE: The PROCEDURE UNIVARIATE printed page 6.
 NOTE: PROCEDURE UNIVARIATE used (Total process time):
 real time 0.01 seconds
 cpu time 0.01 seconds

Chapter 5 : Mouse feeding example
 Analysis of Variance with PROC MIXED
 Proc univariate check of the residuals from ANOVA

The UNIVARIATE Procedure
 Variable: Resid (Residual)

Moments			
N	349	Sum Weights	349
Mean	0	Sum Observations	0
Std Deviation	6.63008974	Variance	43.95809
Skewness	-1.0096309	Kurtosis	0.95033652
Uncorrected SS	15297.4153	Corrected SS	15297.4153
Coeff Variation	.	Std Error Mean	0.35490057

Basic Statistical Measures			
Location		Variability	
Mean	0.000000	Std Deviation	6.63009
Median	0.814286	Variance	43.95809
Mode	2.383333	Range	35.53095
		Interquartile Range	8.56905

NOTE: The mode displayed is the smallest of 3 modes with a count of 4.

Tests for Location: Mu0=0

Test	-Statistic-	-----p Value-----
Student's t	t 0	Pr > t 1.0000
Sign	M 21.5	Pr >= M 0.0244
Signed Rank	S 3322.5	Pr >= S 0.0781

Tests for Normality

Test	--Statistic--	-----p Value-----
Shapiro-Wilk	W 0.93188	Pr < W <0.0001
Kolmogorov-Smirnov	D 0.088623	Pr > D <0.0100
Cramer-von Mises	W-Sq 0.824014	Pr > W-Sq <0.0050
Anderson-Darling	A-Sq 5.670552	Pr > A-Sq <0.0050

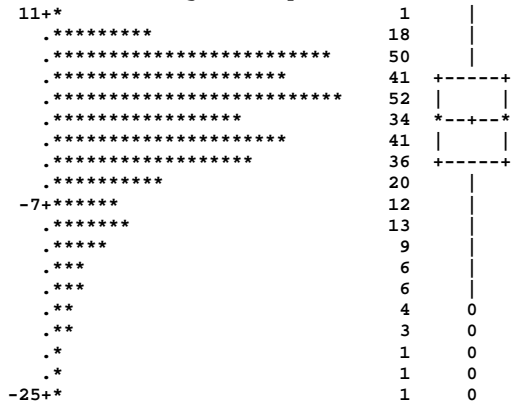
Quantiles (Definition 5)

Quantile	Estimate
100% Max	10.014286
99%	9.602817
95%	8.097959
90%	7.383333
75% Q3	5.183333
50% Median	0.814286
25% Q1	-3.385714
10%	-9.485714
5%	-13.391228
1%	-18.797183
0% Min	-25.516667

Extreme Observations

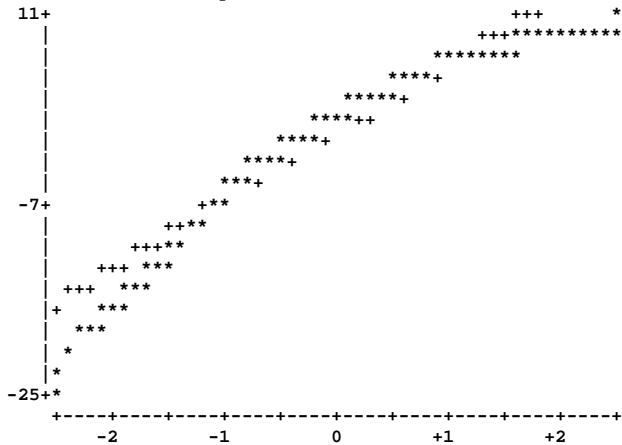
-----Lowest-----		-----Highest-----	
Value	Obs	Value	Obs
-25.5167	58	9.48333	117
-23.6972	118	9.60282	188
-21.0020	189	9.60877	57
-18.7972	119	9.61429	348
-18.6857	238	10.01429	349

Histogram Boxplot



* may represent up to 2 counts

Normal Probability Plot



```

56 options ps=52 ls=99;
57 proc plot data=resids;
58 plot resid * diet / vref=0;
59 plot resid * pred / vref=0;
60 run;
61 options ps=256 ls=99;

```

NOTE: There were 349 observations read from the data set WORK.RESIDS.

NOTE: The PROCEDURE PLOT printed pages 7-8.

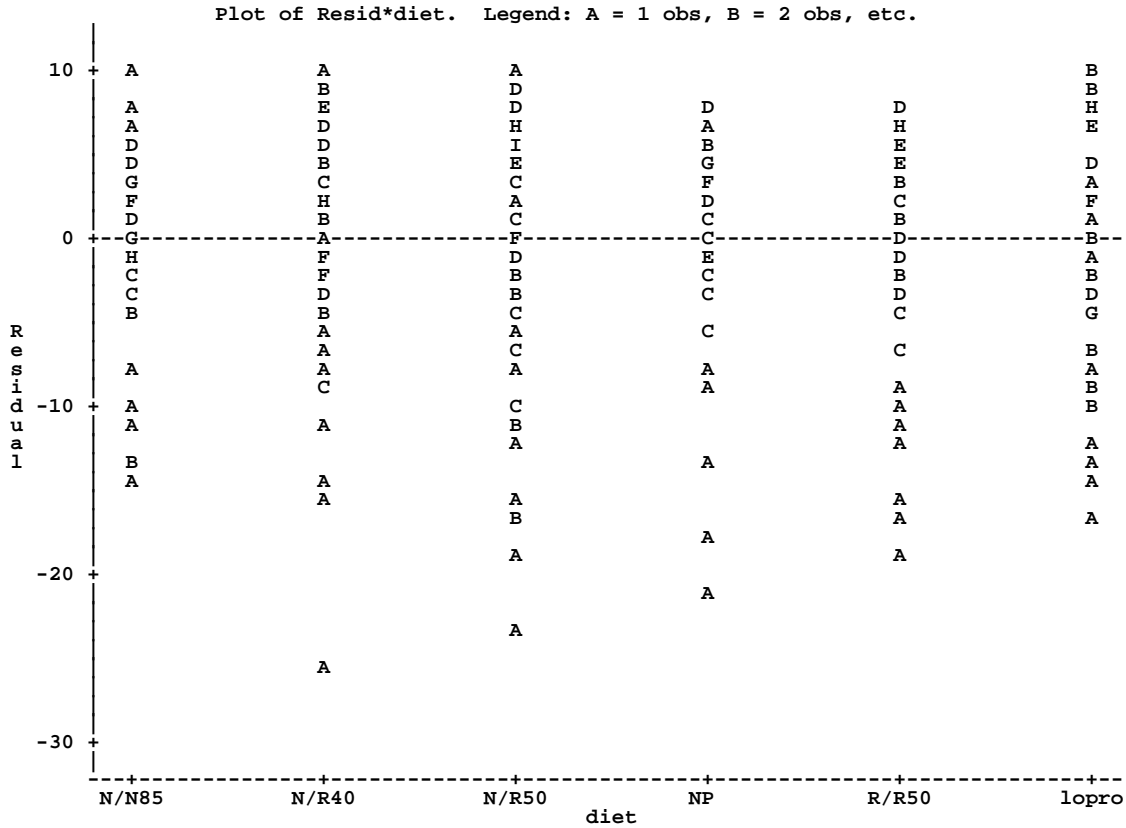
NOTE: PROCEDURE PLOT used (Total process time):

```

real time      0.00 seconds
cpu time       0.00 seconds

```

Chapter 5 : Mouse feeding example
 Analysis of Variance with PROC MIXED
 Proc univariate check of the residuals from ANOVA



Chapter 5 : Mouse feeding example
 Analysis of Variance with PROC MIXED
 Proc univariate check of the residuals from ANOVA

