Sep 03, 07 4:48 **x3_7.sas** Page 1/1

```
/* x3_7.sas */
/* Purpose:  */

title1 'Example 3.7.';

data a;
  input x y;
  x2=x*x;
  v=x2;
  if v=0 then v=1;
  w=1/v;
  cards;
 0 0.4
 1 0.3
 2 1.5
 3 1.3
 4 1.9
 5 4.2
 6 8.0
10  .
;

proc print data=a;
title2 'List of data. Note: observation 8 is only used when predicting.';

proc glm data=a;
  model y=x2 /noint solution xpx inverse p clm;
  weight w;
title2 '(Weighted) Analysis by GLM. Confidence limits for mean calculated.';

proc glm data=a;
  model y=x2 /noint p cli;
  weight w;
title2 '(Weighted) Analysis by GLM. Prediction limits for observation calculated

run;
```

```
                        Example 3.7.                                         1
    List of data. Note: observation 8 is only used when predicting.

                 Obs     x     y     x2      v        w

                  1      0    0.4     0      1     1.00000
                  2      1    0.3     1      1     1.00000
                  3      2    1.5     4      4     0.25000
                  4      3    1.3     9      9     0.11111
                  5      4    1.9    16     16     0.06250
                  6      5    4.2    25     25     0.04000
                  7      6    8.0    36     36     0.02778
                  8     10     .    100    100     0.01000

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                        Example 3.7.                                         2
   (Weighted) Analysis by GLM. Confidence limits for mean calculated.

                       The GLM Procedure

            Number of Observations Read           8
            Number of Observations Used           7

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                        Example 3.7.                                         3
   (Weighted) Analysis by GLM. Confidence limits for mean calculated.

                       The GLM Procedure

                        The X'WX Matrix

                                     x2                  y

          x2                         91               17.2
          y                        17.2       3.7092805556

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                        Example 3.7.                                         4
   (Weighted) Analysis by GLM. Confidence limits for mean calculated.

                       The GLM Procedure

                      X'WX Inverse Matrix

                                     x2                  y

          x2                0.010989011        0.189010989
          y                 0.189010989       0.4582915446
```



```
                        Example 3.7.                                         5
   (Weighted) Analysis by GLM. Confidence limits for mean calculated.

                       The GLM Procedure

Dependent Variable: y

Weight: w

                                         Sum of
 Source                      DF         Squares     Mean Square    F Value    Pr > F

 Model                        1      3.25098901      3.25098901      42.56    0.0006

 Error                        6      0.45829154      0.07638192

 Uncorrected Total            7      3.70928056


              R-Square     Coeff Var      Root MSE        y Mean

              0.876447      39.83716      0.276373      0.693756

NOTE: No intercept term is used: R-square is not corrected for the mean.


 Source                      DF       Type I SS     Mean Square    F Value    Pr > F

 x2                           1      3.25098901      3.25098901      42.56    0.0006


 Source                      DF     Type III SS     Mean Square    F Value    Pr > F

 x2                           1      3.25098901      3.25098901      42.56    0.0006


                                                Standard
       Parameter           Estimate                Error    t Value    Pr > |t|

       x2              0.1890109890           0.02897174       6.52      0.0006
```

Example 3.7. 6
(Weighted) Analysis by GLM. Confidence limits for mean calculated.

The GLM Procedure

Observation	Observed	Predicted	Residual
1	0.40000000	0.00000000	0.40000000
2	0.30000000	0.18901099	0.11098901
3	1.50000000	0.75604396	0.74395604
4	1.30000000	1.70109890	-0.40109890
5	1.90000000	3.02417582	-1.12417582
6	4.20000000	4.72527473	-0.52527473
7	8.00000000	6.80439560	1.19560440
8 *	.	18.90109890	.

Observation	95% Confidence Limits for Mean Predicted Value	
1	0.00000000	0.00000000
2	0.11811969	0.25990229
3	0.47247877	1.03960915
4	1.06307722	2.33912058
5	1.88991506	4.15843658
6	2.95299229	6.49755716
7	4.25230889	9.35648232
8 *	11.81196915	25.99022865

* Observation was not used in this analysis

Sum of Squared Residuals	0.45829154
Sum of Squared Residuals - Error SS	-0.00000000
PRESS Statistic	0.59195445
First Order Autocorrelation	0.17917472
Durbin-Watson D	1.20588539

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Example 3.7. 7
(Weighted) Analysis by GLM. Prediction limits for observation calculated.

The GLM Procedure

Number of Observations Read	8
Number of Observations Used	7

Example 3.7. 8
(Weighted) Analysis by GLM. Prediction limits for observation calculated.

The GLM Procedure

Dependent Variable: y

Weight: w

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	1	3.25098901	3.25098901	42.56	0.0006
Error	6	0.45829154	0.07638192		
Uncorrected Total	7	3.70928056			

R-Square	Coeff Var	Root MSE	y Mean
0.876447	39.83716	0.276373	0.693756

NOTE: No intercept term is used: R-square is not corrected for the mean.

Source	DF	Type I SS	Mean Square	F Value	Pr > F
x2	1	3.25098901	3.25098901	42.56	0.0006

Source	DF	Type III SS	Mean Square	F Value	Pr > F
x2	1	3.25098901	3.25098901	42.56	0.0006

Parameter	Estimate	Standard Error	t Value	Pr > |t|
x2	0.1890109890	0.02897174	6.52	0.0006

```
                          Example 3.7.                                 9
   (Weighted) Analysis by GLM. Prediction limits for observation calculated.

                        The GLM Procedure

     Observation             Observed           Predicted            Residual

               1           0.40000000          0.00000000          0.40000000
               2           0.30000000          0.18901099          0.11098901
               3           1.50000000          0.75604396          0.74395604
               4           1.30000000          1.70109890         -0.40109890
               5           1.90000000          3.02417582         -1.12417582
               6           4.20000000          4.72527473         -0.52527473
               7           8.00000000          6.80439560          1.19560440
               8 *          .                 18.90109890           .

                                 95% Confidence Limits for
                Observation      Individual Predicted Value

                          1         -0.67625988      0.67625988
                          2         -0.49095445      0.86897643
                          3         -0.62588184      2.13796975
                          4         -0.42564002      3.82783783
                          5          0.09095469      5.95739696
                          6          0.90766152      8.54288793
                          7          2.01096951     11.59782170
                          8 *        9.10372666     28.69847114


* Observation was not used in this analysis


              Sum of Squared Residuals                 0.45829154
              Sum of Squared Residuals - Error SS     -0.00000000
              PRESS Statistic                          0.59195445
              First Order Autocorrelation              0.17917472
              Durbin-Watson D                          1.20588539
```