Sep 03, 07 4:51 **x6_1.sas** Page 1/1

```
/* x6_1.sas */
/* Purpose:  */

title1 'Example 6.1.';

data a;
  input group$ si al number;
  cards;
earth 22.10 7.40 100000000
moon  19.4  5.9  1
moon  21.5  4.0  1
moon  19.2  4.0  1
moon  18.4  5.4  1
moon  20.6  6.2  1
moon  19.8  5.7  1
moon  18.7  6.0  1
;

proc print data=a;
title2 'List of data. Number of samples for earth set "high" (arbitrary).';

proc corr cov data=a;
  var si al;
  by group;
title2 'Simple statistics.';

proc glm data=a;
  class group;
  model si al=group;
  manova h=group /printe printh;
  weight number;
title2 'Test using GLM manova, and number of samples as weight. (Quick and dirty

run;
```

```
                                Example 6.1.                                   1
      List of data. Number of samples for earth set "high" (arbitrary).

                     Obs    group     si      al       number

                      1     earth    22.1    7.4    100000000
                      2     moon     19.4    5.9            1
                      3     moon     21.5    4.0            1
                      4     moon     19.2    4.0            1
                      5     moon     18.4    5.4            1
                      6     moon     20.6    6.2            1
                      7     moon     19.8    5.7            1
                      8     moon     18.7    6.0            1

/><<>><<>><<>><<>><<>><<>><<>><<>><<>><<>><<>><<>><<>><<>><<>><<>><<>><<>><<>><<>><<
                                Example 6.1.                                   2
                             Simple statistics.

--------------------------------- group=earth ----------------------------------

                             The CORR Procedure

                        2  Variables:    si       al


                        Covariance Matrix, DF = 0

                                    si                 al

                     si              .                  .
                     al              .                  .


                             Simple Statistics

 Variable          N         Mean      Std Dev          Sum      Minimum      Maximum

 si                1     22.10000            .     22.10000     22.10000     22.10000
 al                1      7.40000            .      7.40000      7.40000      7.40000

                     Pearson Correlation Coefficients, N = 1
                            Prob > |r| under H0: Rho=0

                                    si            al

                         si        .             .
                                    .             .

                         al        .             .
                                    .             .
```



```
                                Example 6.1.                                   3
                             Simple statistics.

---------------------------------- group=moon ----------------------------------

                             The CORR Procedure

                        2  Variables:    si       al


                        Covariance Matrix, DF = 6

                                    si                 al

                     si       1.179523810       -0.307619048
                     al      -0.307619048        0.868095238


                             Simple Statistics

 Variable          N         Mean      Std Dev          Sum      Minimum      Maximum

 si                7     19.65714      1.08606    137.60000     18.40000     21.50000
 al                7      5.31429      0.93172     37.20000      4.00000      6.20000


                   Pearson Correlation Coefficients, N = 7
                          Prob > |r| under H0: Rho=0

                                    si            al

                         si       1.00000      -0.30400
                                                 0.5074

                         al      -0.30400       1.00000
                                   0.5074

/><<>><<>><<>><<>><<>><<>><<>><<>><<>><<>><<>><<>><<>><<>><<>><<>><<>><<>><<>><<>><<
                                Example 6.1.                                   4
   Test using GLM manova, and number of samples as weight. (Quick and dirty!)

                              The GLM Procedure

                           Class Level Information

                     Class         Levels    Values

                     group              2    earth moon


                   Number of Observations Read           8
                   Number of Observations Used           8
```

Example 6.1. 5
Test using GLM manova, and number of samples as weight. (Quick and dirty!)

The GLM Procedure

Dependent Variable: si

Weight: number

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	1	41.77285423	41.77285423	35.42	0.0010
Error	6	7.07714285	1.17952381		
Corrected Total	7	48.84999708			

R-Square	Coeff Var	Root MSE	si Mean
0.855125	4.914293	1.086059	22.10000

Source	DF	Type I SS	Mean Square	F Value	Pr > F
group	1	41.77285423	41.77285423	35.42	0.0010

Source	DF	Type III SS	Mean Square	F Value	Pr > F
group	1	41.77285423	41.77285423	35.42	0.0010

Example 6.1. 6
Test using GLM manova, and number of samples as weight. (Quick and dirty!)

The GLM Procedure

Dependent Variable: al

Weight: number

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	1	30.45142645	30.45142645	35.08	0.0010
Error	6	5.20857142	0.86809524		
Corrected Total	7	35.65999787			

R-Square	Coeff Var	Root MSE	al Mean
0.853938	12.59076	0.931716	7.400000

Source	DF	Type I SS	Mean Square	F Value	Pr > F
group	1	30.45142645	30.45142645	35.08	0.0010

Source	DF	Type III SS	Mean Square	F Value	Pr > F
group	1	30.45142645	30.45142645	35.08	0.0010

/><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><<

Example 6.1. 7
Test using GLM manova, and number of samples as weight. (Quick and dirty!)

The GLM Procedure
Multivariate Analysis of Variance

E = Error SSCP Matrix

	si	al
si	7.0771428468	-1.845714295
al	-1.845714295	5.208571421

Partial Correlation Coefficients from the Error SSCP Matrix / Prob > |r|

DF = 6	si	al
si	1.000000	-0.304002 0.5074
al	-0.304002 0.5074	1.000000

```
                              Example 6.1.                                  8
  Test using GLM manova, and number of samples as weight. (Quick and dirty!)

                           The GLM Procedure
                   Multivariate Analysis of Variance

                   H = Type III SSCP Matrix for group

                                  si                 al

                 si      41.772854229      35.665711798
                 al      35.665711798      30.451426447


         Characteristic Roots and Vectors of: E Inverse * H, where
                   H = Type III SSCP Matrix for group
                         E = Error SSCP Matrix

         Characteristic               Characteristic Vector  V'EV=1
                   Root    Percent                si              al

             16.8806160     100.00      0.31901003      0.37090889
              0.0000000       0.00     -0.23220856      0.27197030


              MANOVA Test Criteria and Exact F Statistics for
                 the Hypothesis of No Overall group Effect
                   H = Type III SSCP Matrix for group
                         E = Error SSCP Matrix

                          S=1    M=0    N=1.5

Statistic                        Value    F Value    Num DF    Den DF    Pr > F

Wilks' Lambda               0.05592648      42.20         2         5    0.0007
Pillai's Trace              0.94407352      42.20         2         5    0.0007
Hotelling-Lawley Trace     16.88061601      42.20         2         5    0.0007
Roy's Greatest Root        16.88061601      42.20         2         5    0.0007
```