

A Macro for Displaying Correlation Matrices

Diana L. Urbauer, Applied Logic Associates, Inc., Houston, Texas
Stephen I. Black, Applied Logic Associates, Inc., Houston, Texas

ABSTRACT

Pearson correlations are often used to examine the linear association between two variables. In addition to knowing the magnitude of the association, researchers are interested in whether the obtained correlations are statistically different from zero, meaning that a relationship probably does exist and that the correlations were not generated by chance. When measuring the association of several variables together, a correlation matrix is created which displays the correlations for all pairings of variables. This poster presents code which will produce a correlation matrix that is easy to interpret and concisely displays the Pearson correlations while flagging those that are statistically significant at both the $\alpha = 0.05$ and $\alpha = 0.01$ levels.

INTRODUCTION

A SAS® macro, CORR, is written to concisely display correlation matrices and to flag those correlations which are statistically significant at $\alpha = 0.05$ and at $\alpha = 0.01$. The macro, CORR, can correlate variables with other variables to display a rectangular matrix, or it can correlate variables with themselves to display a triangular matrix. The advantage of using this macro over Proc Corr is that the output is presented in a much simpler format which facilitates examination of the results. This macro only uses the CORR and PRINT procedures in SAS/BASE.

The macro is written so that the user only specifies the name of the data set that contains the variables to be correlated, the names of the variables to be correlated and labels for these variables. If specific combinations of correlations are desired, the user also defines the variables that will be correlated with the variables listed in the VAR statement as well as their corresponding labels.

Correlations are calculated using PROC CORR. The number of observations used to calculate the correlations and the statistical significance of the correlations are calculated in separate data steps. The output is generated using a PROC PRINT.

There are three restrictions in using this macro:

1. User-specified titles must be coded before the macro is called.
2. If several variables are being correlated that have the same root but sequentially different suffixes, the variables must be individually listed rather than implicitly defined by only specifying the first and last variables separated by a hyphen. The macro is currently being modified to allow for an implied listing of variables.
3. Variable labels must be in quotes and must be separated by backslashes.

The code for this macro follows along with examples of its output. Output directly obtained from PROC CORR is also included to allow for comparisons between the macro and the procedure.

For more information, contact:

Diana L. Urbauer
Applied Logic Associates, Inc.
5615 Kirby Drive
Suite 710
Houston, TX 77005-2495

Phone: (713) 529-4747 ext. 118
Fax: (713) 529-4904
E-mail: diana_u@alogic.com

```

*****
*
* Client:          All Clients of Applied Logic Associates, Inc.
*
* Protocol:        All Protocols
*
* Program:         H:\SASHMACRO\CORR.SAS
*
* Data Files:      NONE
*
* Output:          NONE
*
* Tables:          NONE
*
* Case Report Forms: NONE
*
* Programmer:      Diana L. Urbauer
*
* Date:            September 12, 1995
*
* Description:      This program calculates correlations and prints
*                   the results in a concise correlation matrix.
*
* Validation:       User_ID      Date
*
* -----
*
* DESCRIPTION OF MACRO PARAMETERS SENT FROM YOUR PROGRAM:
*
* DATA:           User-specified dataset that contains the variables of interest
*
* _VAR:            Variables to be correlated (if correlated with another set
*                   of variables, the _VAR variables will be listed down the
*                   matrix)
*
* _WTH:            Variables that the VAR will be correlated with (these
*                   variables will be listed across the matrix)
*                   (DEFAULT: None)
*
* VARLAB:          Labels for the variables specified in _VAR
*
* WTHLAB:          Labels for the variables specified in _WTH
*
* -----
*
* RESTRICTIONS:
*
* 1. Titles must be specified before macro is called.
*
* 2. Variables to be correlated must be listed. This macro will not
*    accept variables specified in the form of XXXX1-XXXXn.
*
* 3. Labels must be in quotes and must be separated by a backslash (/).
*    E.g. 'Lab 1'/'Doctor's Lab'/'Lab 2'
*
*****

```

```

%MACRO CORR(DATA=, _VAR=, _WITH=, VARLAB=, WITHLAB=) ;

  %IF & WITH NE %QUOTE( )
    %THEN
      %DO ;

        * Correlations in the format of one variable with another * ;

        DATA DF99999 (DROP = &_VAR &_WITH I J) ;
          SET &DATA ;

          %LET VCTR99 = 1 ; * Counts number of VAR variables * ;
          %LET WCTR99 = 1 ; * Counts number of WITH variables * ;
          %LET FLAG99 = 0 ; * Flag for looping * ;

          %DO %WHILE (&FLAG99 = 0) ;
            %LET ARRAY = %SCAN(& VAR,&VCTR99) ; * Temporarily holds a _VAR variable * ;
            %IF &ARRAY = %QUOTE('')
              %THEN
                %LET FLAG99 = 1 ;
              %ELSE
                %DO ;
                  VAR&VCTR99 = &ARRAY ; * VAR array variable name * ;
                  %LET VCTR99 = %EVAL(&VCTR99 + 1) ;
                %END ;
              %END ;

            %LET VCTR99 = %EVAL(&VCTR99 - 1) ; * Resets to number of _VAR variables * ;
            %LET FLAG99 = 0 ; * Resets flag for another DO Loop * ;

            %DO %WHILE (&FLAG99 = 0) ;
              %LET ARRAY = %SCAN(& WITH,&WCTR99) ; * Temporarily holds the WITH variable * ;
              %IF &ARRAY = %QUOTE('')
                %THEN
                  %LET FLAG99 = 1 ;
                %ELSE
                  %DO ;
                    WITH&WCTR99 = &ARRAY ; * WITH variable array * ;
                    %LET WCTR99 = %EVAL(&WCTR99 + 1) ;
                  %END ;
                %END ;

              %LET WCTR99 = %EVAL(&WCTR99 - 1) ; * Resets to number of WITH variables * ;
              %LET TCTR99 = %EVAL(&VCTR99 * &WCTR99) ; * Number of _VAR variables x Number of WITH variables * ;

              ARRAY VAR(&VCTR99) VAR1 - VAR&VCTR99 ; * Array of VAR variables * ;
              ARRAY WITH(&WCTR99) WITH1 - WITH&WCTR99 ; * Array of WITH variables * ;

              * Array of number of non-missing obs for each combination of (_VAR,WITH) variables * ;

              ARRAY NP(&VCTR99,&WCTR99) NP1 - NP&TCTR99 ;

              DO I = 1 TO &VCTR99 ;
                DO J = 1 TO &WCTR99 ;
                  NP(I,J) = N(_VAR(I),WITH(J)) ;
                %END ;
              %END ;
            %END ;
          %END ;
        %END ;
      %END ;
    %END ;
  %END ;

```

```

        DUMMY = 1 ; * Dummy variable for merging * ;

RUN ;

* Correlates data * ;

PROC CORR DATA = DF99999 OUTP = _CR9999_ NOPRINT ;
    VAR WTH1 - WTH&MCTR99 ;
    WITH VAR1 - VAR&VCTR99 ;
    BY DUMMY ;
RUN ;

* Creates a numeric variable for merging later * ;

DATA CR9999 ;
    SET _CR9999_ ;

    NUM = SUBSTR(_NAME_,4,4)/1 ;

RUN ;

* Gets the number of observations used when calculating correlations * ;

DATA DF99998 (KEEP = _NAME_ NDF1 - NDF&MCTR99 NUM) ;
    SET DF99999 ;
    BY DUMMY ;

    ARRAY DF(&VCTR99,&MCTR99) DF1 - DF&TCTR99 ; * Number of obs. used (horizontal format) * ;
    ARRAY NDF(&MCTR99) NDF1 - NDF&MCTR99 ; * Number of obs. used (vertical format) * ;

    * Array of number of non-missing obs for each combination of (_VAR,WITH) variables * ;

    ARRAY NP(&VCTR99,&MCTR99) NP1 - NP&TCTR99 ;

    LENGTH _NAME_ $ 8 ; * Holds name of WITH variable * ;

    * Gets number of observations used to calculate correlations * ;

    DO I = 1 TO &VCTR99 ;
        DO J = 1 TO &MCTR99 ;
            IF NP(I,J) = 2 THEN DF(I,J) + 1 ;
        END ;
    END ;

    IF LAST.DUMMY ;

    * Puts number of obs. used in vertical format * ;

    DO NUM = 1 TO &VCTR99 ;
        DO J = 1 TO &MCTR99 ;
            NDF(J) = DF(NUM,J) ;
        END ;
        NAME = 'VAR' || LEFT(PUT(NUM,4.)) ;
        OUTPUT ;
    END ;

RUN ;

```

```

* Formats the VAR variables by creating a variable * ;
* with meaningful names to correspond to the SAS variable * ;
* names * ;

%LET CTR = 0 ;

DATA _NAME_ ;
    LENGTH NAMEVAR $ 40 ;

    %DO I = 1 %TO &WCTR99 ;
        %LET CTR = %EVAL(&CTR+1) ;
        NAMEVAR = %SCAN(&VARLAB,&CTR,/) ;

        NUM = &I ;

        OUTPUT ;
    %END ;

RUN ;

* Merges the correlation dataset, the dataset with DFs and * ;
* the dataset with formatted variable names * ;

DATA TH99999 (KEEP = NAMEVAR VAL1 - VAL&WCTR99) ;
    MERGE CR9999
          DF99998 (IN = A)
          NAME_ ;
    BY NUM ;

    IF A ;

    LENGTH VAL1 - VAL&WCTR99 $ 10 ;

    * Tests r for statistical difference from 0 and flags all * ;
    * correlations that are statistically significant. * ;

    ARRAY VAL(&WCTR99) $ VAL1 - VAL&WCTR99 ;
    ARRAY NDF(&WCTR99) NDF1-NDF&WCTR99 ;
    ARRAY WTH(&WCTR99) WTH1-WTH&WCTR99 ;
    ARRAY T(&WCTR99) T1-T&WCTR99 ;
    ARRAY P(&WCTR99) P1-P&WCTR99 ;

    DO I = 1 TO &WCTR99 ;
        SELECT ;
            WHEN(WTH(I) = 1 OR WTH(I) = -1)
                VAL(I) = TRIM(PUT(WTH(I),7.4)) ;
            WHEN(-1 < WTH(I) < 1)
                DO ;
                    T(I) = ABS((SQRT(NDF(I)-2)*WTH(I))/
                                (SQRT(1-WTH(I)*WTH(I)))) ; * T-statistics * ;
                    P(I) = 2*(1-PROBT(T(I),NDF(I)-2)) ; * P-value * ;

                    IF P(I) NE .
                        THEN
                            IF P(I) < 0.01
                                THEN

```

```

                                VAL(I) = TRIM(PUT(WTH(I),7.4))||' **' ;
ELSE
    IF P(I) < 0.05
        THEN
            VAL(I) = TRIM(PUT(ROUND(WTH(I),0.0001),7.4))||' *' ;
        ELSE
            VAL(I) = TRIM(PUT(ROUND(WTH(I),0.0001),7.4)) ;

                                END ;
                                OTHERWISE VAL(I) = ' ' ;
                                END ;

END ;

LABEL NAMEVAR = 'Variable' ;

* Labels WITH variables * ;

%LET FLAG = 0 ;
%LET CTR = 1 ;

%DO %WHILE (&FLAG = 0 AND &CTR LE &MCTR99) ;
    %LET ARRAY = %SCAN(&WTHLAB,&CTR,/) ;
    %IF &ARRAY = %QUOTE( )
        %THEN
            FLAG = 1 ;
        %ELSE
            %DO ;
                LABEL VAL&CTR = &ARRAY ;
                %LET CTR = %EVAL(&CTR + 1) ;
            %END ;
    %END ;

RUN ;

RUN ;

PROC PRINT DATA = TM99999 LABEL NOOBS ;
    VAR VAL1 - VAL&MCTR99 ;
    ID NAMEVAR ;

    FOOTNOTE9 "** significant at alpha = 0.05" ;
    FOOTNOTE10 "*** significant at alpha = 0.01" ;

RUN ;

%END ;

%ELSE
%DO ;

    * Correlations in the form of a lower triangular matrix * ;
    * (or a variable with itself) * ;

    DATA DF99999 (DROP = &_VAR &_WTH I J) ;
        SET &DATA ;

        %LET VCTR99 = 1 ; * Counts number of VAR variables * ;
        %LET FLAG99 = 0 ; * Flag for looping * ;

```

```

%DO %WHILE (&FLAG99 = 0) ;
  %LET ARRAY = %SCAN(&VAR,&VCTR99) ; * Temporarily holds a _VAR variable * ;
  %IF &ARRAY = %QUOTE('')
    %THEN
      %LET FLAG99 = 1 ;
    %ELSE
      %DO ;
        VAR&VCTR99 = &ARRAY ; * VAR array variable name * ;
        %LET VCTR99 = %EVAL(&VCTR99 + 1) ;
      %END ;
    %END ;

%LET DIM1 = %EVAL(&VCTR99 - 2) ; * Dimensions of the corr. matrix * ;
%LET VCTR99 = %EVAL(&VCTR99 - 1) ; * Resets to number of VAR variables * ;
%LET DIMSQ = %EVAL(&DIM1 * &DIM1) ; * Number of cells in corr. matrix * ;

ARRAY _VAR(&VCTR99) VAR1 - VAR&VCTR99 ; * Array of _VAR variables * ;

* Array of number of non-missing obs for each combination of VAR variables * ;

ARRAY NP(&DIM1,&DIM1) NP1 - NP&DIMSQ ;

DO I = 1 TO &DIM1 ;
  DO J = I+1 TO &VCTR99 ;
    NP(I,J-1) = N(_VAR(I),_VAR(J)) ;
  END ;
END ;

DUMMY = 1 ; * Dummy variable for merging * ;

RUN ;

* Correlates data * ;

PROC CORR DATA = DF99999 OUTP = _CR9999_ NOPRINT ;
  VAR VAR1 - VAR&VCTR99 ;
  BY DUMMY ;
RUN ;

* Creates a numeric variable for merging later * ;

DATA CR9999 ;
  SET _CR9999_ ;

  NUM = SUBSTR(_NAME_,4,4)/1 ;

RUN ;

* Gets the number of observations used when calculating correlations * ;

DATA DF99998 (KEEP = _NAME_ NDF1 - NDF&DIM1_NUM) ;
  SET DF99999 ;
  BY DUMMY ;

  ARRAY DF(&DIM1,&DIM1) DF1 - DF&DIMSQ ; * Number of obs. used (horizontal format) * ;
  ARRAY NDF(&DIM1)_NDF1 - NDF&DIM1_ ; * Number of obs. used (vertical format) * ;

  * Array of number of non-missing obs for each combination of (_VAR.WITH) variables * ;

```

```

ARRAY NP(&_DIM1_,&_DIM1_) NP1 - NP&_DIMSQ_ ;

LENGTH _NAME_ $ 8 ; * Holds name of WITH variable * ;

* Gets number of observations used to calculate correlations * ;

DO I = 1 TO &DIM1_ ;
  DO J = I+1 TO &VCTR99 ;
    IF NP(I,J-1) = 2 THEN DF(I,J-1) + 1 ;
  END ;
END ;

IF LAST.DUMMY ;

* Puts number of obs. used in vertical format * ;
* (Makes a lower triangular matrix) * ;

DO I = 1 TO &DIM1_ ;
  DO J = 1 TO &DIM1_ ;
    NDF(J) = DF(J,I) ;
  END ;
  NUM = I+1 ;
  NAME = 'VAR' || LEFT(PUT(NUM,4.)) ;
  OUTPUT ;
END ;

RUN ;

* Formats the VAR variables by creating a variable * ;
* with meaningful names to correspond to the SAS variable * ;
* names * ;

%LET CTR = 0 ;

DATA _NAME_ ;

  LENGTH NAMEVAR $ 40 ;

  %DO I = 1 %TO &VCTR99 ;
    %LET CTR = %EVAL(&CTR+1) ;
    NAMEVAR = %SCAN(&VARLAB,&CTR,/) ;

    NUM = &I ;

    OUTPUT ;
  %END ;

RUN ;

* Merges the dataset with correlations, the dataset with DFs * ;
* and the dataset with formatted variable names * ;

DATA TM99999 (KEEP = NAMEVAR _NAME_ VAL1 - VAL&_DIM1_) ;
  MERGE CR9999
        DF99998 (IN = A)
        NAME_ ;
  BY NUM ;

```

```

IF A :
LENGTH VAL1 - VAL&_DIM1_ $ 10 NAMEVAR $ 40 ;

* Tests r for statistical difference from 0 and flags all      * ;
* correlations that are statistically significant.             * ;

ARRAY VAL(&_DIM1_) $ VAL1 - VAL&_DIM1_ ;
ARRAY NDF(&_DIM1_) NDF1-NDF&_DIM1_ ;
ARRAY VAR(&_DIM1_) VAR1-VAR&_DIM1_ ;
ARRAY T(&_DIM1_) T1-T&_DIM1_ ;
ARRAY P(&_DIM1_) P1-P&_DIM1_ ;

DO I = 1 TO &_DIM1_ ;
  IF NUM > 1
    THEN
      DO ;
        SELECT ;
          WHEN( VAR(I) = 1 OR VAR(I) = -1)
            VAL(I) = TRIM(PUT( VAR(I),7.4)) ;
          WHEN(-1 < VAR(I) < 1)
            DO ;
              T(I) = ABS((SQRT(NDF(I)-2)* VAR(I))/
                (SQRT(1- VAR(I)*VAR(I)))) ; * T-statistics * ;
              P(I) = 2*(1-PROBT(T(I),NDF(I)-2)) ; * P-value * ;
              IF P(I) NE .
                THEN
                  IF P(I) < 0.01
                    THEN
                      VAL(I) = TRIM(PUT( VAR(I),7.4))||' **' ;
                    ELSE
                      IF P(I) < 0.05
                        THEN
                          VAL(I) = TRIM(PUT(ROUND( VAR(I),0.0001),7.4))||' *' ;
                        ELSE
                          VAL(I) = TRIM(PUT(ROUND( VAR(I),0.0001),7.4)) ;
                        END ;
                      OTHERWISE VAL(I) = ' ' ;
                    END ;
                END ;
              ELSE
                VAL(I) = ' ' ;
              END ;
            END ;
          END ;
        END ;
      END ;
    END ;
  END ;
  LABEL NAMEVAR = 'Variable' ;

* Labels VAR variables * ;

%LET FLAG = 0 ;
%LET CTR = 1 ;

%DO %WHILE (&FLAG = 0 AND &CTR NE &VCTR99) ;
  %LET ARRAY = %SCAN(&VARLAB,&CTR,/) ;
  %IF &ARRAY = %QUOTE( )
    %THEN
      FLAG = 1 ;
    %ELSE
      %DO ;

```

```

                                LABEL VAL&CTR = &ARRAY ;
                                %LET CTR = %EVAL(&CTR + 1) ;
                                %END ;
                                %END ;
                                RUN ;

                                PROC PRINT DATA = TM99999 LABEL NOOBS ;
                                VAR VAL1 - VAL&DIM1_ ;
                                ID NAMEVAR ;

                                FOOTNOTE9  "* significant at alpha = 0.05" ;
                                FOOTNOTE10 "** significant at alpha = 0.01" ;

                                RUN ;

                                %END ;

                                FOOTNOTE9  ' ' ;
                                FOOTNOTE10  ' ' ;

                                RUN ;

                                %MEND ;

```

```

LIBNAME HBI 'P:\HBI\SAS' ;
LIBNAME LIBRARY 'P:\HBI\SAS' ;

OPTIONS MAUTOSOURCE SASAUTOS = (CMACRO)
        NODATE
        NONUMBER
        PS = 57
        LS = 210 ;

FILENAME CMACRO 'M:\SASMACRO' ;

TITLE1 '%Macro Corr Output' ;
TITLE2 'Correlations of Certain Variables with Other Variables' ;

%CORR(DATA = HBI.TM_DLU.

    _VAR = PARM26 PARM27 PARM28 PARM29 PARM30 PARM31 PARM32 PARM33
           PARM34 PARM35 PARM36 PARM37.

    _WTH = PARM1 PARM2 PARM3 PARM4 PARM5 PARM6 PARM7 PARM8 PARM9
           PARM10 PARM11 PARM12 PARM13 PARM14 PARM15 PARM16 PARM17
           PARM18 PARM19 PARM20 PARM21 PARM22 PARM23 PARM24 PARM25.

    VARLAB = "Variable 1"/ "Variable 2"/ "Variable 3"/"Variable 4"/
             "Variable 5"/ "Variable 6" / 'Variable 7' / 'Variable 8' /
             "Variable 9"/ "Variable 10" / "Variable 11" / "Variable 12".

    WTHLAB = "Label 1"/ "Label 2"/ "Label 3"/ "Label 4"/ "Label 5"/
             "Label 6"/ 'Label 7' / "Label 8"/ "Label 9"/ "Label 10"/
             "Label 11"/ "Label 12"/ "Label 13"/ "Label 14"/ "Label 15"/
             "Label 16"/ "Label 17"/ "Label 18"/ "Label 19"/ "Label 20"/
             "Label 21"/ "Label 22"/ "Label 23"/ "Label 24"/ "Label 25") ;

TITLE1 '%Macro Corr Output' ;
TITLE2 'Correlations of Variables with Themselves' ;

%CORR(DATA = HBI.TM_DLU.

    _VAR = PARM26 PARM27 PARM28 PARM29 PARM30 PARM31 PARM32 PARM33
           PARM34 PARM35 PARM36 PARM37.

    VARLAB = "Variable 1"/ "Variable 2"/ "Variable 3"/"Variable 4"/
             "Variable 5"/ "Variable 6" / 'Variable 7' / 'Variable 8' /
             "Variable 9"/ "Variable 10" / "Variable 11" / "Variable 12") ;

DATA TM_DLU ;
SET HBI.TM_DLU ;

LABEL    PARM1 = 'Label 1' PARM2 = 'Label 2' PARM3 = 'Label 3'
        PARM4 = 'Label 4' PARM5 = 'Label 5' PARM6 = 'Label 6'
        PARM7 = 'Label 7' PARM8 = 'Label 8' PARM9 = 'Label 9'
        PARM10 = 'Label 10' PARM11 = 'Label 11'
        PARM12 = 'Label 12' PARM13 = 'Label 13'
        PARM14 = 'Label 14' PARM15 = 'Label 15'
        PARM16 = 'Label 16' PARM17 = 'Label 17'
        PARM18 = 'Label 18' PARM19 = 'Label 19'
        PARM20 = 'Label 20' PARM21 = 'Label 21'
        PARM22 = 'Label 22' PARM23 = 'Label 23'
        PARM24 = 'Label 24' PARM25 = 'Label 25'
        PARM26 = 'Variable 1' PARM27 = 'Variable 2'
        PARM28 = 'Variable 3' PARM29 = 'Variable 4'
        PARM30 = 'Variable 5' PARM31 = 'Variable 6'
        PARM32 = 'Variable 7' PARM33 = 'Variable 8'
        PARM34 = 'Variable 9' PARM35 = 'Variable 10'
        PARM36 = 'Variable 11' PARM37 = 'Variable 12' ;

```

RUN ;

```
PROC CORR DATA = TM_DLU :  
  VAR PARM1-PARM25 :  
  WITH PARM26-PARM37 :  
  
  TITLE1 'Proc Corr Output' :  
  TITLE2 'Correlations of Certain Variables with Other Variables' ;
```

```
RUN ;
```

```
PROC CORR DATA = TM_DLU :  
  VAR PARM26-PARM37 :  
  
  TITLE1 'Proc Corr Output' :  
  TITLE2 'Correlations of Variables with Themselves' ;
```

```
RUN ;
```

```
QUIT ;
```

XMacro Corr Output
Correlations of Certain Variables with Other Variables

Variable	Label 1	Label 2	Label 3	Label 4	Label 5	Label 6	Label 7	Label 8	Label 9	Label 10	Label 11	Label 12
Variable 1	-0.0071	-0.0523	-0.0362	0.1053	0.0175	0.0092	-0.1156 *	-0.0639	-0.1056	-0.0949	-0.0647	-0.0841
Variable 2	-0.1945 **	-0.2768 **	-0.2794 **	-0.1411 *	-0.2955 **	-0.2930 **	-0.1475 *	-0.2877 **	-0.3647 **	-0.3509 **	-0.2438 **	-0.3326 **
Variable 3	0.0030	-0.0932	-0.1209 *	0.1483 *	0.0175	0.0130	0.0156	-0.0882	-0.1782 **	-0.2294 **	0.0497	-0.1221 *
Variable 4	0.0278	-0.0680	-0.0733	0.1633 **	0.0425	0.0305	0.0082	-0.0347	-0.1230 *	-0.1440 *	0.0803	-0.0477
Variable 5	0.0289	-0.0473	-0.0485	0.1606 **	0.0476	0.0446	0.0225	-0.0077	-0.0871	-0.1082	0.0981	-0.0180
Variable 6	-0.1382 *	-0.1497 *	-0.1975 **	0.0149	-0.0268	-0.0294	0.0302	-0.1498 *	-0.1450 *	-0.1782 **	-0.0652	-0.1006
Variable 7	-0.1045	-0.1578 *	-0.2373 **	0.0408	-0.0904	-0.1482 *	-0.0693	-0.1884 **	-0.2302 **	-0.2561 **	-0.1210	-0.1900 **
Variable 8	-0.1109	-0.1145	-0.1667 **	-0.0171	-0.0535	-0.0784	0.0505	-0.1451 *	-0.1540 *	-0.1991 **	-0.1056	-0.1485 *
Variable 9	-0.1064	-0.1481 *	-0.2205 **	0.0097	-0.0513	-0.0835	0.0216	-0.1571 *	-0.1809 **	-0.2362 **	-0.0915	-0.1588 *
Variable 10	-0.2076 **	-0.2306 **	-0.1853 **	-0.1679 **	-0.2334 **	-0.2223 **	-0.0777	-0.2308 **	-0.3018 **	-0.2822 **	-0.2302 **	-0.3157 **
Variable 11	-0.2045 **	-0.2950 **	-0.3144 **	-0.1041	-0.2653 **	-0.3026 **	-0.1580 *	-0.2927 **	-0.3847 **	-0.3919 **	-0.2424 **	-0.3822 **
Variable 12	-0.2142 **	-0.2969 **	-0.2866 **	-0.1581 *	-0.2819 **	-0.2869 **	-0.0843	-0.2977 **	-0.3799 **	-0.3683 **	-0.2690 **	-0.3469 **

Variable	Label 13	Label 14	Label 15	Label 16	Label 17	Label 18	Label 19	Label 20	Label 21	Label 22	Label 23	Label 24	Label 25
Variable 1	-0.0894	-0.1404 *	0.0827	0.0871	0.1230 *	0.0497	0.1042	-0.1680 **	0.0738	0.0006	0.0959	0.0106	0.0917
Variable 2	-0.3518 **	-0.0811	0.1691 **	0.1919 **	0.2648 **	0.1848 **	0.2472 **	-0.0423	0.0718	0.1299 *	0.2094 **	0.1057	0.2247 **
Variable 3	-0.1683 **	-0.0770	0.1326 *	0.1831 **	0.2238 **	0.2048 **	0.2723 **	-0.2194 **	-0.0610	-0.0318	0.1557 **	-0.0220	0.1891 **
Variable 4	-0.0813	-0.1087	0.0821	0.1788 **	0.1762 **	0.1617 **	0.1911 **	-0.2093 **	-0.0740	-0.0284	0.0865	-0.0098	0.1119
Variable 5	-0.0550	-0.0882	0.0462	0.1412 *	0.1343 *	0.1221 *	0.1516 *	-0.2038 **	-0.0943	-0.0321	0.0521	-0.0240	0.0850
Variable 6	-0.1028	0.0998	0.0482	0.0500	0.0554	0.1302 *	0.0973	-0.1978 **	-0.0760	-0.1546 *	-0.0133	-0.1333 *	0.0016
Variable 7	-0.2158 **	-0.0479	0.1302 *	0.1226	0.1796 **	0.2451 **	0.2080 **	-0.1946 **	0.0188	-0.0320	0.1191	0.0359	0.1439 *
Variable 8	-0.1600 *	0.1353 *	0.0791	0.0293	0.0942	0.1178	0.1477 *	-0.1161	0.0106	-0.0831	0.0773	-0.0458	0.0898
Variable 9	-0.1781 **	0.0958	0.0947	0.1013	0.1260	0.2146 **	0.1903 **	-0.1497 *	-0.0100	-0.0820	0.0879	-0.0368	0.1084
Variable 10	-0.2875 **	-0.0389	0.0724	0.0817	0.1762 **	0.0111	0.1557 *	-0.0191	0.0422	0.0421	0.1769 **	0.0203	0.1443 *
Variable 11	-0.4086 **	-0.0822	0.1617 *	0.2092 **	0.2785 **	0.2283 **	0.2859 **	-0.1112	0.0565	0.0751	0.2597 **	0.1044	0.2781 **
Variable 12	-0.3574 **	-0.0296	0.1662 *	0.1962 **	0.2706 **	0.1688 **	0.2560 **	-0.0425	0.0869	0.0872	0.2127 **	0.0775	0.2193 **

* significant at alpha = 0.05
** significant at alpha = 0.01

%Macro Corr Output
Correlations of Variables with Themselves

Variable	Variable 1	Variable 2	Variable 3	Variable 4	Variable 5	Variable 6	Variable 7	Variable 8	Variable 9	Variable 10	Variable 11
Variable 2	-0.0394										
Variable 3	0.1209 *	0.1741 **									
Variable 4	0.1980 **	0.0699	0.8278 **								
Variable 5	0.1886 **	0.0898	0.7677 **	0.9412 **							
Variable 6	-0.1204	0.5205 **	0.2256 **	0.1216	0.1176						
Variable 7	0.1306 *	0.3908 **	0.2451 **	0.2004 **	0.1861 **	0.5744 **					
Variable 8	-0.0567	0.6073 **	0.1464 *	0.0740	0.0823	0.7672 **	0.5641 **				
Variable 9	-0.0894	0.6272 **	0.2077 **	0.1098	0.1087	0.8731 **	0.6183 **	0.9142 **			
Variable 10	-0.0885	0.4917 **	0.1938 **	0.1198	0.1178	0.2281 **	0.0743	0.1849 **	0.1953 **		
Variable 11	-0.0630	0.9018 **	0.2014 **	0.0567	0.0745	0.6077 **	0.4000 **	0.6425 **	0.6602 **	0.4945 **	
Variable 12	-0.0678	0.9318 **	0.1441 *	0.0573	0.0755	0.5388 **	0.3901 **	0.6462 **	0.6442 **	0.5636 **	0.8550 **

* significant at alpha = 0.05
** significant at alpha = 0.01

Proc Corr Output
Correlations of Certain Variables with Other Variables

Correlation Analysis

12 'WITH' Variables:	PARM26	PARM27	PARM28	PARM29	PARM30	PARM31	PARM32	PARM33	PARM34	PARM35	PARM36	PARM37								
25 'VAR' Variables:	PARM1	PARM2	PARM3	PARM4	PARM5	PARM6	PARM7	PARM8	PARM9	PARM10	PARM11	PARM12	PARM13	PARM14	PARM15	PARM16	PARM17	PARM18	PARM19	PARM20
	PARM21	PARM22	PARM23	PARM24	PARM25															

Proc Corr Output
Correlations of Certain Variables with Other Variables

Correlation Analysis

Simple Statistics

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum	Label
PARM26	326	3.650307	2.277742	1190.000000	1.000000	11.000000	Variable 1
PARM27	245	0.132886	0.163196	32.557142	0.000885	1.150220	Variable 2
PARM28	476	0.684874	0.918501	326.000000	0	4.000000	Variable 3
PARM29	474	8.432489	16.825453	3997.000000	0	100.000000	Variable 4
PARM30	474	0.743122	2.052762	352.240000	0	16.000000	Variable 5
PARM31	254	40.564961	21.785649	10304	0	100.000000	Variable 6
PARM32	257	0.517510	0.494343	133.000000	0	3.333333	Variable 7
PARM33	260	1.418590	0.736305	368.833333	0	4.000000	Variable 8
PARM34	252	2.755284	2.266762	694.331667	0	13.183333	Variable 9
PARM35	245	0.596730	0.368351	146.198785	0.026996	1.622290	Variable 10
PARM36	245	17.472505	10.514611	4280.763830	1.306870	67.660000	Variable 11
PARM37	245	0.414956	0.281534	101.664332	0.030000	1.360000	Variable 12
PARM1	287	11.642509	2.233253	3341.400000	4.000000	15.600000	Label 1
PARM2	287	9.363066	2.415197	2687.200000	0	14.400000	Label 2
PARM3	287	7.768641	2.562886	2229.600000	0	13.400000	Label 3
PARM4	287	14.124042	2.551336	4053.600000	4.800000	19.200000	Label 4
PARM5	286	11.429371	2.267198	3268.800000	1.200000	16.800000	Label 5
PARM6	286	9.591608	2.261237	2743.200000	0	15.600000	Label 6
PARM7	309	12.972492	1.325879	4008.500000	6.500000	15.200000	Label 7
PARM8	281	10.853381	2.612360	3049.800000	0	16.000000	Label 8
PARM9	281	8.168683	2.965109	2295.400000	0	13.400000	Label 9
PARM10	281	6.355160	3.025248	1785.800000	0	12.000000	Label 10
PARM11	282	13.336170	2.423764	3760.800000	3.600000	19.200000	Label 11
PARM12	282	10.212766	2.644294	2880.000000	2.400000	15.600000	Label 12
PARM13	282	8.068085	2.878100	2275.200000	0	13.200000	Label 13
PARM14	283	12.738587	1.329645	3605.020000	4.000000	15.200000	Label 14
PARM15	280	0.776429	1.776514	217.400000	-4.800000	8.400000	Label 15
PARM16	287	2.279443	1.266277	654.200000	-1.000000	8.400000	Label 16
PARM17	280	3.451429	2.361989	966.400000	-2.800000	11.800000	Label 17
PARM18	287	3.873868	1.545616	1111.800000	0	10.400000	Label 18
PARM19	280	5.271429	2.556664	1476.000000	0	13.000000	Label 19
PARM20	287	-2.481533	1.694141	-712.200000	-10.000000	1.800000	Label 20
PARM21	281	-1.698932	1.859886	-477.400000	-7.800000	5.400000	Label 21
PARM22	286	0.232867	1.606709	66.600000	-5.200000	4.200000	Label 22
PARM23	281	1.414235	2.096002	397.400000	-5.200000	9.000000	Label 23
PARM24	286	2.070629	1.855606	592.200000	-4.000000	10.000000	Label 24
PARM25	281	3.562278	2.583602	1001.000000	-5.000000	13.000000	Label 25

Proc Corr Output
Correlations of Certain Variables with Other Variables

Correlation Analysis

Pearson Correlation Coefficients / Prob > |R| under Ho: Rho=0 / Number of Observations

	PARM1	PARM2	PARM3	PARM4	PARM5	PARM6	PARM7	PARM8	PARM9	PARM10	PARM11	PARM12	PARM13
PARM26 Variable 1	-0.00715 0.9040 287	-0.05225 0.3778 287	-0.03621 0.5412 287	0.10533 0.0748 287	0.01746 0.7688 286	0.00923 0.8765 286	-0.11562 0.0423 309	-0.06386 0.2869 280	-0.10557 0.0778 280	-0.09488 0.1132 280	-0.06466 0.2800 281	-0.08407 0.1599 281	-0.08940 0.1349 281
PARM27 Variable 2	-0.19447 0.0026 238	-0.27681 0.0001 238	-0.27941 0.0001 238	-0.14107 0.0296 238	-0.29549 0.0001 237	-0.29303 0.0001 237	-0.14754 0.0231 237	-0.28771 0.0001 233	-0.36466 0.0001 233	-0.35088 0.0001 233	-0.24383 0.0002 234	-0.33265 0.0001 234	-0.35183 0.0001 234
PARM28 Variable 3	0.00301 0.9596 287	-0.09324 0.1150 287	-0.12087 0.0407 287	0.14833 0.0119 287	0.01751 0.7682 286	0.01295 0.8273 286	0.01557 0.7869 304	-0.08820 0.1410 280	-0.17818 0.0028 280	-0.22940 0.0001 280	0.04969 0.4067 281	-0.12207 0.0409 281	-0.16834 0.0047 281
PARM29 Variable 4	0.02782 0.6388 287	-0.06800 0.2508 287	-0.07330 0.2157 287	0.16331 0.0056 287	0.04248 0.4743 286	0.03051 0.6073 286	0.00820 0.8870 303	-0.03472 0.5629 280	-0.12305 0.0396 280	-0.14399 0.0159 280	0.08031 0.1795 281	-0.04768 0.4260 281	-0.08128 0.1742 281
PARM30 Variable 5	0.02887 0.6262 287	-0.04734 0.4244 287	-0.04851 0.4130 287	0.16058 0.0064 287	0.04761 0.4225 286	0.04460 0.4525 286	0.02254 0.6959 303	-0.00767 0.8983 280	-0.08705 0.1463 280	-0.10824 0.0705 280	0.09814 0.1006 281	-0.01799 0.7640 281	-0.05500 0.3583 281
PARM31 Variable 6	-0.13820 0.0299 247	-0.14967 0.0186 247	-0.19753 0.0018 247	0.01485 0.8163 247	-0.02676 0.6762 246	-0.02945 0.6458 246	0.03023 0.6370 246	-0.14981 0.0197 242	-0.14499 0.0241 242	-0.17821 0.0054 242	-0.06521 0.3114 243	-0.10060 0.1178 243	-0.10282 0.1099 243
PARM32 Variable 7	-0.10455 0.0991 250	-0.15778 0.0125 250	-0.23729 0.0002 250	0.04080 0.5208 250	-0.09042 0.1549 249	-0.14818 0.0193 249	-0.06933 0.2758 249	-0.18835 0.0031 245	-0.23017 0.0003 245	-0.25613 0.0001 245	-0.12098 0.0581 246	-0.18997 0.0028 246	-0.21577 0.0007 246
PARM33 Variable 8	-0.11090 0.0789 252	-0.11453 0.0695 252	-0.16667 0.0080 252	-0.01706 0.7876 252	-0.05355 0.3982 251	-0.07840 0.2158 251	0.05045 0.4261 251	-0.14509 0.0226 247	-0.15405 0.0154 247	-0.19908 0.0017 247	-0.10555 0.0972 248	-0.14849 0.0193 248	-0.16002 0.0116 248
PARM34 Variable 9	-0.10644 0.0964 245	-0.14812 0.0204 245	-0.22050 0.0005 245	0.00969 0.8801 245	-0.05133 0.4247 244	-0.08353 0.1935 244	0.02161 0.7370 244	-0.15713 0.0148 240	-0.18088 0.0049 240	-0.23624 0.0002 240	-0.09150 0.1568 241	-0.15879 0.0136 241	-0.17810 0.0056 241

Proc Corr Output
Correlations of Certain Variables with Other Variables

Correlation Analysis

Pearson Correlation Coefficients / Prob > |R| under Ho: Rho=0 / Number of Observations

	PARM1	PARM2	PARM3	PARM4	PARM5	PARM6	PARM7	PARM8	PARM9	PARM10	PARM11	PARM12	PARM13
PARM35 Variable 10	-0.20764 0.0013 238	-0.23061 0.0003 238	-0.18526 0.0041 238	-0.16793 0.0094 238	-0.23343 0.0003 237	-0.22232 0.0006 237	-0.07770 0.2334 237	-0.23082 0.0004 233	-0.30183 0.0001 233	-0.28221 0.0001 233	-0.23021 0.0004 234	-0.31568 0.0001 234	-0.28748 0.0001 234
PARM36 Variable 11	-0.20449 0.0015 238	-0.29499 0.0001 238	-0.31442 0.0001 238	-0.10409 0.1092 238	-0.26535 0.0001 237	-0.30256 0.0001 237	-0.15799 0.0149 237	-0.29269 0.0001 233	-0.38468 0.0001 233	-0.39193 0.0001 233	-0.24241 0.0002 234	-0.38222 0.0001 234	-0.40855 0.0001 234
PARM37 Variable 12	-0.21416 0.0009 238	-0.29689 0.0001 238	-0.28660 0.0001 238	-0.15811 0.0146 238	-0.28190 0.0001 237	-0.28691 0.0001 237	-0.08430 0.1959 237	-0.29770 0.0001 233	-0.37986 0.0001 233	-0.36827 0.0001 233	-0.26895 0.0001 234	-0.34692 0.0001 234	-0.35745 0.0001 234

Proc Corr Output
Correlations of Certain Variables with Other Variables

Correlation Analysis

Pearson Correlation Coefficients / Prob > |R| under Ho: Rho=0 / Number of Observations

	PARM14	PARM15	PARM16	PARM17	PARM18	PARM19	PARM20	PARM21	PARM22	PARM23	PARM24	PARM25
PARM26 Variable 1	-0.14039 0.0185 281	0.08271 0.1675 280	0.08705 0.1413 287	0.12295 0.0398 280	0.04971 0.4015 287	0.10419 0.0818 280	-0.16804 0.0043 287	0.07379 0.2175 281	0.00065 0.9913 286	0.09594 0.1085 281	0.01065 0.8577 286	0.09169 0.1252 281
PARM27 Variable 2	-0.08108 0.2166 234	0.16907 0.0097 233	0.19186 0.0030 238	0.26482 0.0001 233	0.18483 0.0042 238	0.24725 0.0081 233	-0.04231 0.5160 238	0.07179 0.2741 234	0.12986 0.0458 237	0.20937 0.0013 234	0.10573 0.1044 237	0.22467 0.0005 234
PARM28 Variable 3	-0.07699 0.1974 282	0.13256 0.0266 280	0.18314 0.0018 287	0.22375 0.0002 280	0.20477 0.0005 287	0.27231 0.0001 280	-0.21942 0.0002 287	-0.06104 0.3079 281	-0.03184 0.5917 286	0.15570 0.0089 281	-0.02197 0.7114 286	0.18911 0.0014 281
PARM29 Variable 4	-0.10870 0.0683 282	0.08213 0.1706 280	0.17877 0.0024 287	0.17622 0.0031 280	0.16174 0.0060 287	0.19113 0.0013 280	-0.20926 0.0004 287	-0.07404 0.2159 281	-0.02836 0.6329 286	0.08651 0.1481 281	-0.00984 0.8684 286	0.11193 0.0610 281
PARM30 Variable 5	-0.08818 0.1397 282	0.04619 0.4414 280	0.14120 0.0167 287	0.13428 0.0246 280	0.12215 0.0386 287	0.15160 0.0111 280	-0.20377 0.0005 287	-0.09425 0.1149 281	-0.03213 0.5884 286	0.05206 0.3846 281	-0.02400 0.6861 286	0.08495 0.1555 281
PARM31 Variable 6	0.09976 0.1209 243	0.04819 0.4556 242	0.04998 0.4342 247	0.05541 0.3908 242	0.13024 0.0408 247	0.09731 0.1312 242	-0.19781 0.0018 247	-0.07597 0.2381 243	-0.15458 0.0152 246	-0.01325 0.8372 243	-0.13328 0.0367 246	0.00159 0.9803 243
PARM32 Variable 7	-0.04786 0.4549 246	0.13023 0.0417 245	0.12257 0.0529 250	0.17964 0.0048 245	0.24506 0.0801 250	0.20799 0.0011 245	-0.19461 0.0020 250	0.01877 0.7695 246	-0.03197 0.6156 249	0.11911 0.0621 246	0.03587 0.5732 249	0.14389 0.0240 246
PARM33 Variable 8	0.13532 0.0332 248	0.07913 0.2152 247	0.02928 0.6437 252	0.09416 0.1400 247	0.11777 0.0619 252	0.14766 0.0203 247	-0.11614 0.0657 252	0.01059 0.8683 248	-0.08308 0.1895 251	0.07728 0.2253 248	-0.04580 0.4700 251	0.08979 0.1586 248
PARM34 Variable 9	0.09580 0.1381 241	0.09474 0.1434 240	0.10128 0.1138 245	0.12597 0.0513 240	0.21455 0.0007 245	0.19034 0.0031 240	-0.14965 0.0191 245	-0.00999 0.8773 241	-0.08204 0.2016 244	0.08793 0.1736 241	-0.03678 0.5675 244	0.10836 0.0933 241

Proc Corr Output
Correlations of Certain Variables with Other Variables

Correlation Analysis

Pearson Correlation Coefficients / Prob > |R| under Ho: Rho=0 / Number of Observations

	PARM14	PARM15	PARM16	PARM17	PARM18	PARM19	PARM20	PARM21	PARM22	PARM23	PARM24	PARM25
PARM35 Variable 10	-0.03890 0.5538 234	0.07242 0.2709 233	0.08168 0.2093 238	0.17617 0.0070 233	0.01107 0.8651 238	0.15565 0.0174 233	-0.01909 0.7696 238	0.04218 0.5209 234	0.04207 0.5192 237	0.17690 0.0067 234	0.02030 0.7558 237	0.14428 0.0273 234
PARM36 Variable 11	-0.08217 0.2104 234	0.16170 0.0135 233	0.20916 0.0012 238	0.27855 0.0001 233	0.22830 0.0004 238	0.28590 0.0001 233	-0.11120 0.0869 238	0.05650 0.3896 234	0.07506 0.2497 237	0.25965 0.0001 234	0.10436 0.1090 237	0.27813 0.0001 234
PARM37 Variable 12	-0.02961 0.6523 234	0.16622 0.0110 233	0.19620 0.0024 238	0.27057 0.0001 233	0.16878 0.0091 238	0.25600 0.0001 233	-0.04245 0.5146 238	0.08695 0.1850 234	0.08725 0.1807 237	0.21272 0.0011 234	0.07751 0.2345 237	0.21929 0.0007 234

Proc Corr Output
Correlations of Variables with Themselves

Correlation Analysis

12 'VAR' Variables: PARM26 PARM27 PARM28 PARM29 PARM30 PARM31 PARM32 PARM33 PARM34 PARM35 PARM36 PARM37

Simple Statistics

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum	Label
PARM26	326	3.650307	2.277742	1190.000000	1.000000	11.000000	Variable 1
PARM27	245	0.132886	0.163196	32.557142	0.000885	1.150220	Variable 2
PARM28	476	0.684874	0.918501	326.000000	0	4.000000	Variable 3
PARM29	474	8.432489	16.825453	3997.000000	0	100.000000	Variable 4
PARM30	474	0.743122	2.052762	352.240000	0	16.000000	Variable 5
PARM31	254	40.564961	21.785649	10304	0	100.000000	Variable 6
PARM32	257	0.517510	0.494343	133.000000	0	3.333333	Variable 7
PARM33	260	1.418590	0.736305	368.833333	0	4.000000	Variable 8
PARM34	252	2.755284	2.266762	694.331667	0	13.183333	Variable 9
PARM35	245	0.596730	0.368351	146.198785	0.026996	1.622290	Variable 10
PARM36	245	17.472505	10.514611	4280.763830	1.306870	67.660000	Variable 11
PARM37	245	0.414956	0.281534	101.664332	0.030000	1.360000	Variable 12

Proc Corr Output
Correlations of Variables with Themselves

Correlation Analysis

Pearson Correlation Coefficients / Prob > |R| under Ho: Rho=0 / Number of Observations

	PARM26	PARM27	PARM28	PARM29	PARM30	PARM31	PARM32	PARM33	PARM34	PARM35	PARM36	PARM37
PARM26 Variable 1	1.00000 0.0 326	-0.03936 0.5431 241	0.12088 0.0312 318	0.19885 0.0004 317	0.18857 0.0007 317	-0.12043 0.0567 251	0.13060 0.0375 254	-0.05671 0.3662 256	-0.08940 0.1596 249	-0.08850 0.1709 241	-0.06298 0.3302 241	-0.06779 0.2946 241
PARM27 Variable 2	-0.03936 0.5431 241	1.00000 0.0 245	0.17414 0.0065 243	0.06990 0.2788 242	0.08979 0.1638 242	0.52047 0.0001 240	0.39083 0.0001 243	0.60734 0.0001 245	0.62721 0.0001 239	0.49168 0.0001 245	0.90176 0.0001 245	0.93181 0.0001 245
PARM28 Variable 3	0.12088 0.0312 318	0.17414 0.0065 243	1.00000 0.0 476	0.82784 0.0001 474	0.76767 0.0001 474	0.22558 0.0003 252	0.24512 0.0001 255	0.14636 0.0187 258	0.20770 0.0010 250	0.19380 0.0024 243	0.20140 0.0016 243	0.14413 0.0246 243
PARM29 Variable 4	0.19885 0.0004 317	0.06990 0.2788 242	0.82784 0.0001 474	1.00000 0.0 474	0.94115 0.0001 474	0.12163 0.0543 251	0.20045 0.0013 254	0.07404 0.2369 257	0.10979 0.0838 249	0.11980 0.0628 242	0.05671 0.3798 242	0.05729 0.3749 242
PARM30 Variable 5	0.18857 0.0007 317	0.08979 0.1638 242	0.76767 0.0001 474	0.94115 0.0001 474	1.00000 0.0 474	0.11762 0.0628 251	0.18611 0.0029 254	0.08230 0.1885 257	0.10873 0.0869 249	0.11784 0.0672 242	0.07445 0.2486 242	0.07547 0.2422 242
PARM31 Variable 6	-0.12043 0.0567 251	0.52047 0.0001 240	0.22558 0.0003 252	0.12163 0.0543 251	0.11762 0.0628 251	1.00000 0.0 254	0.57443 0.0001 252	0.76724 0.0001 254	0.87312 0.0001 252	0.22806 0.0004 240	0.60773 0.0001 240	0.53876 0.0001 240
PARM32 Variable 7	0.13060 0.0375 254	0.39083 0.0001 243	0.24512 0.0001 255	0.20045 0.0013 254	0.18611 0.0029 254	0.57443 0.0001 252	1.00000 0.0 257	0.56410 0.0001 257	0.61834 0.0001 252	0.07426 0.2488 243	0.39998 0.0001 243	0.39007 0.0001 243
PARM33 Variable 8	-0.05671 0.3662 256	0.60734 0.0001 245	0.14636 0.0187 258	0.07404 0.2369 257	0.08230 0.1885 257	0.76724 0.0001 254	0.56410 0.0001 257	1.00000 0.0 260	0.91425 0.0001 252	0.18486 0.0037 245	0.64249 0.0001 245	0.64621 0.0001 245
PARM34 Variable 9	-0.08940 0.1596 249	0.62721 0.0001 239	0.20770 0.0010 250	0.10979 0.0838 249	0.10873 0.0869 249	0.87312 0.0001 252	0.61834 0.0001 252	0.91425 0.0001 252	1.00000 0.0 252	0.19525 0.0024 239	0.66021 0.0001 239	0.64415 0.0001 239

Proc Corr Output
Correlations of Variables with Themselves

Correlation Analysis

Pearson Correlation Coefficients / Prob > |R| under Ho: Rho=0 / Number of Observations

	PARM26	PARM27	PARM28	PARM29	PARM30	PARM31	PARM32	PARM33	PARM34	PARM35	PARM36	PARM37
PARM35 Variable 10	-0.08850 0.1709 241	0.49168 0.0001 245	0.19380 0.0024 243	0.11980 0.0628 242	0.11784 0.0672 242	0.22806 0.0004 240	0.07426 0.2488 243	0.18486 0.0037 245	0.19525 0.0024 239	1.00000 0.0 245	0.49452 0.0001 245	0.56355 0.0001 245
PARM36 Variable 11	-0.06298 0.3302 241	0.90176 0.0001 245	0.20140 0.0016 243	0.05671 0.3798 242	0.07445 0.2486 242	0.60773 0.0001 240	0.39998 0.0001 243	0.64249 0.0001 245	0.66021 0.0001 239	0.49452 0.0001 245	1.00000 0.0 245	0.85502 0.0001 245
PARM37 Variable 12	-0.06779 0.2946 241	0.93181 0.0001 245	0.14413 0.0246 243	0.05729 0.3749 242	0.07547 0.2422 242	0.53876 0.0001 240	0.39007 0.0001 243	0.64621 0.0001 245	0.64415 0.0001 239	0.56355 0.0001 245	0.85502 0.0001 245	1.00000 0.0 245