DECUS

PROGRAM LIBRARY

DECUS NO.	FOCAL8-166A and B
TITLE	FIRST AND SECOND ORDER PARTIAL CORRELATIONS
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DATE	June 1971
SOURCE LANGUAGE	FOCAL '69

ATTENTION

FIRST ORDER PARTIAL CORRELATIONS

ABSTRACT

This program computes the three first order partial correlations for three variables. User supplies the zero-order correlations between the three variables.

The program is in FOCAL8 and runs on the basic PDP-8 equipment. The generic formula for the calculation of the first order partial correlation can be found on page 334 of Hubert Blalock's Social Statistics (McGraw-Hill, 1960).

Users should be cautioned to be aware of which variable is being controlled in each operation. Some of the printout may be inapplicable for particular purposes.

C-FOCAL,1969

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01.01 C    A PROGRAM TO COMPUTE FIRST ORDER PARTIAL CORRELATIONS
01.02 C     FROM THE ZERO ORDER CORRELATIONS BETWEEN THREE VARIABLES.
01.03 C     WRITTEN BY BILL WILMOT, 4/26/71
01.10 E
01.20 A "CORR. BETWEEN 1 & 2"X !
01.22 A "CORR. BETWEEN 1 & 3"Y !
01.24 A "CORR. BETWEEN 2 & 3"Z !; DO 3
01.25 T "PARTIAL CORR. 1 & 2, CONTROLLING FOR 3"%5.03PR, !
01.27 S X1=X; S X=Y; S Y=X1; DO 3
01.28 T "PARTIAL CORR. 1 & 3, CONTROLLING FOR 2"%5.03PR, !
01.30 S X1=X; S X=Z; S Z=X1; DO 3
01.32 T "PARTIAL CORR. 2 & 3, CONTROLLING FOR 1"%5.03PR, !!!!
01.34 Q

03.01 S PS=(FSQT(1-Y↑2)* FSQT(1-Z↑2)); S PR=(X-(Y*Z))/PS
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 G
CORR. BETWEEN 1 & 2:.9
CORR. BETWEEN 1 & 3:.2
CORR. BETWEEN 2 & 3:.3
PARTIAL CORR. 1 & 2, CONTROLLING FOR 3=  0.899
PARTIAL CORR. 1 & 3, CONTROLLING FOR 2=- 0.168
PARTIAL CORR. 2 & 3, CONTROLLING FOR 1=  0.281


*G
CORR. BETWEEN 1 & 2:.5
CORR. BETWEEN 1 & 3:.7
CORR. BETWEEN 2 & 3:.8
PARTIAL CORR. 1 & 2, CONTROLLING FOR 3=- 0.140
PARTIAL CORR. 1 & 3, CONTROLLING FOR 2=  0.577
PARTIAL CORR. 2 & 3, CONTROLLING FOR 1=  0.728


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SECOND ORDER PARTIAL CORRELATIONS

DECUS Program Library Write-up   DECUS NO. FOCAL8-166B

This program computes the second order partial correlations between four variables from their zero order correlations.

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C-FOCAL, 1969

01.10 E
01.20 A "CORR. BETWEEN 1&2"A(1) !; A "CORR. BETWEEN 1&3"A(2) !
01.21 A "CORR. BETWEEN 1&4"A(3) !; A "CORR. BETWEEN 2&3"A(4) !
01.22 A "CORR. BETWEEN 2&4"A(5) !; A "CORR. BETWEEN 3&4"A(6) !
01.23 S X=A(1); S Y=A(2); S Z=A(4); DO 3
01.26 S A(7)=PR; S X=A(3); S Z=A(6); DO 3
01.28 S A(8)=PR; S X=A(5); S Y=A(4); DO 3
01.30 S A(9)=PR;; S X=A(1); S Y=A(3); S Z=A(5); DO 3
01.32 S A(10)=PR; S X=A(2); S Z=A(6); DO 3
01.34 S A(11)=PR; S X=A(4); S Y=A(5); DO 3
01.36 S A(12)=PR; S X=A(4); S Y=A(1); S Z=A(2); DO 3
01.38 S A(13)=PR; S X=A(5); S Z=A(3); DO 3
01.40 S A(14)=PR; S X=A(6); S Y=A(2); DO 3
01.42 S A(15)=PR; S X=A(2); S Y=A(1); S Z=A(4); DO 3
01.44 S A(16)=PR; S X=A(3); S Z=A(5); DO 3
01.46 S A(17)=PR; S X=A(6); S Y=A(4); DO 3
01.48 S A(18)=PR; S X=A(7); S Y=A(8); S Z=A(9); DO 3
01.50 T ! "2ND ORDER PARTIAL 1&2, CONTROLLING 3&4"%5.03PR, !
01.51 S C(1)=PR; S X=A(16); S Y=A(17); S Z=A(18); DO 3
01.52 T "2ND ORDER PARTIAL 1&3, CONTROLLING 2&4"PR, !
01.53 S C(2)=PR; S X=A(17); S Y=A(16); S Z=A(18); DO 3
01.55 T "2ND ORDER PARITAL 1&4, CONTROLLING 2&3"PR, !
01.56 S C(3)=PR; S X=A(13); S Y=A(14); S Z=A(15); DO 3
01.58 T "2ND ORDER PARTIAL 2&3, CONTROLLING 1&4"PR, !
01.59 S C(4)=PR; S X=A(14); S Y=A(13); S Z=A(15); DO 3
01.61 T "2ND ORDER PARTIAL 2&4, CONTROLLING 1&3"PR, !
01.63 S C(5)=PR; S X=A(15); S Y=A(13); S Z=A(14); DO 3
01.65 T "2ND ORDER PARTIAL 3&4, CONTROLLING 1&2"PR, !; S C(6)=PR
01.70 T !!!!, "                  CORRELATION MATRICES",!!!
01.71 T "ORIGINAL MATRIX--ZERO ORDER CORRELATIONS", !!
01.72 T "              1          2          3", !
01.73 T "     2",A(1), !
01.74 T "     3",A(2), A(4), !
01.75 T "     4",A(3), A(5), A(6), !!!
01.77 T "2ND ORDER PARTIAL CORRELATION MATRIX", !!
01.81 T "              1          2          3", !
01.83 T "     2",C(1), !
01.84 T "     3",C(2), C(4), !
01.85 T "     4",C(3), C(5), C(6), !!!

03.01 S PR(1)=(FSQT(1-Y↑2)* FSQT(1-Z↑2)); S PR=(X-(Y*Z))/PR(1)
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G
CORR. BETWEEN 1&2: .45
CORR. BETWEEN 1&3: .234
CORR. BETWEEN 1&4: .567
CORR. BETWEEN 2&3: .61
CORR. BETWEEN 2&4: .2
CORR. BETWEEN 3&4: .39

2ND ORDER PARTIAL 1&2, CONTROLLING 3&4=   0.504
2ND ORDER PARTIAL 1&3, CONTROLLING 2&4=- 0.312
2ND ORDER PARITAL 1&4, CONTROLLING 2&3=   0.603
2ND ORDER PARTIAL 2&3, CONTROLLING 1&4=   0.641
2ND ORDER PARTIAL 2&4, CONTROLLING 1&3=- 0.340
2ND ORDER PARTIAL 3&4, CONTROLLING 1&2=   0.450

CORRELATION MATRICES

ORIGINAL MATRIX--ZERO ORDER CORRELATIONS

            1   2   3
    2=   0.450
    3=   0.234=   0.610
    4=   0.567=   0.200=   0.390

2ND ORDER PARTIAL CORRELATION MATRIX

            1   2   3
    2=   0.504
    3=- 0.312=   0.641
    4=   0.603=- 0.340=   0.450

*

5

G
CORR. BETWEEN 1&2: .45
CORR. BETWEEN 1&3: .387
CORR. BETWEEN 1&4: .51
CORR. BETWEEN 2&3: .712
CORR. BETWEEN 2&4: .31
CORR. BETWEEN 3&4: .109

2ND ORDER PARTIAL 1&2, CONTROLLING 3&4=   0.123
2ND ORDER PARTIAL 1&3, CONTROLLING 2&4=   0.202.
2ND ORDER PARITAL 1&4, CONTROLLING 2&3=   0.463
2ND ORDER PARTIAL 2&3, CONTROLLING 1&4=   0.673
2ND ORDER PARTIAL 2&4, CONTROLLING 1&3=   0.236
2ND ORDER PARTIAL 3&4, CONTROLLING 1&2=- 0.239

CORRELATION MATRICES

ORIGINAL MATRIX--ZERO ORDER CORRELATIONS

	1	2	3
2=	0.450		
3=	0.387=	0.712	
4=	0.510=	0.310=	0.109

2ND ORDER PARTIAL CORRELATION MATRIX

	1	2	3
2=	0.123		
3=	0.202=	0.673	
4=	0.463=	0.236=-	0.239

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