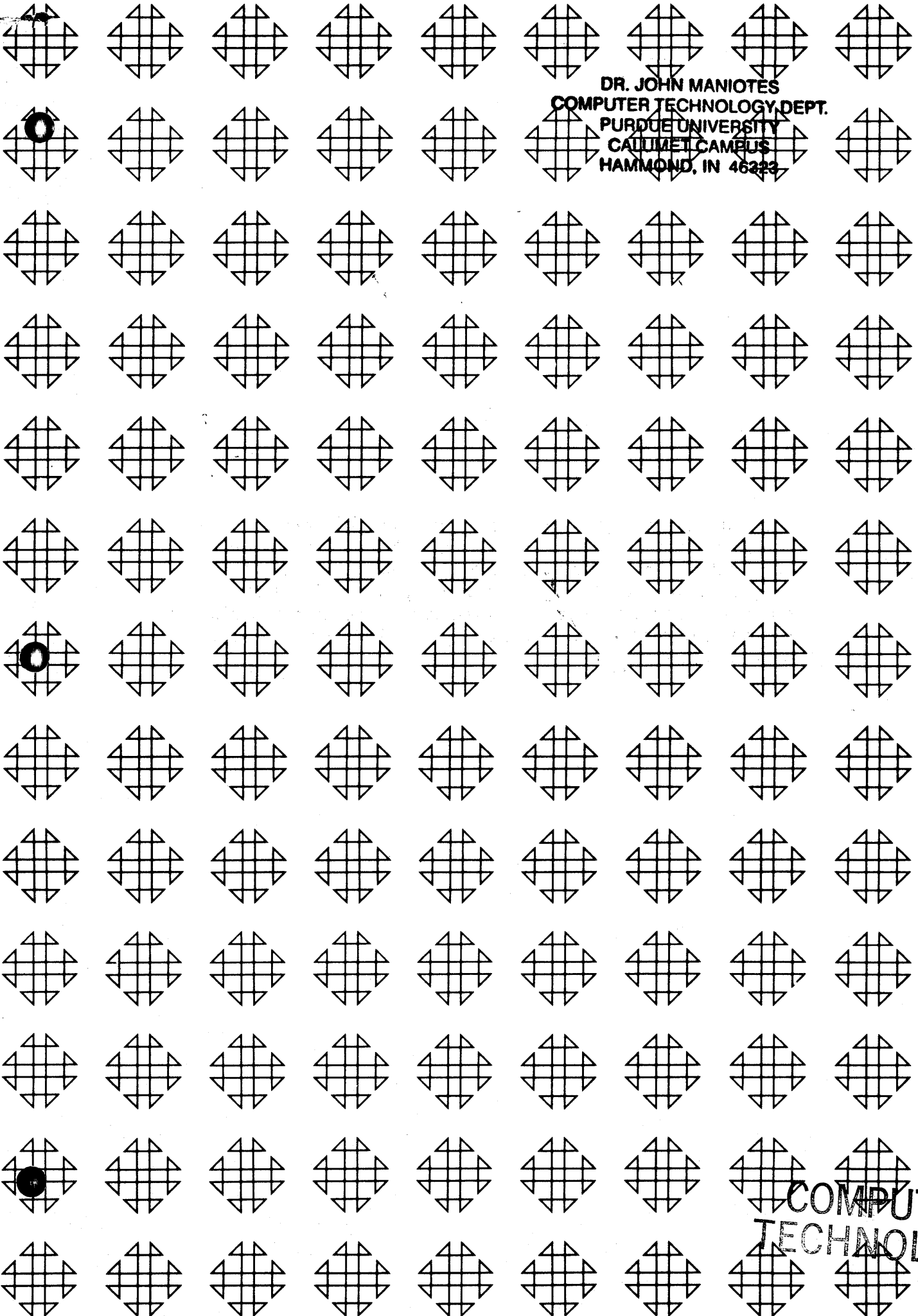


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1620 GENERAL PROGRAM LIBRARY

Simple Correlation Coefficient Matrix



COMPUTER
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69-0529

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1620 USERS GROUP PROGRAM REVIEW AND EVALUATION

(fill out in typewriter or pencil, do not use ink)

Program No. _____

Date _____

Program Name: _____

1. Does the abstract adequately describe what the program is and what it does? Yes ___ No ___
Comment _____
2. Does the program do what the abstract says? Yes ___ No ___
Comment _____
3. Is the Description clear, understandable, and adequate? Yes ___ No ___
Comment _____
4. Are the Operating Instructions understandable and in sufficient detail? Yes ___ No ___
Comment _____
Are the Sense Switch options adequately described (if applicable)? Yes ___ No ___
Are the mnemonic labels identified or sufficiently understandable? Yes ___ No ___
Comment _____
5. Does the source program compile satisfactorily (if applicable)? Yes ___ No ___
Comment _____
6. Does the object program run satisfactorily? Yes ___ No ___
Comment _____
7. Number of test cases run _____. Are any restrictions as to data, size, range, etc. covered adequately in description? Yes ___ No ___
Comment _____
8. Does the Program Meet the minimal standards of the 1620 Users Group? Yes ___ No ___
Comment _____
9. Were all necessary parts of the program received? Yes ___ No ___
Comment _____
10. Please list on the back any suggestions to improve the usefulness of the program. These will be passed onto the author for his consideration.

Please return to:

Mr. Richard L. Pratt
Data Corporation
7500 Old Xenia Pike
Dayton, Ohio 45432

Your Name _____

Company _____

Address _____

User Group Code _____

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11/09/64

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Simple Correlation Coefficient

Matrix

William E. Milner

North Texas State University

May 10, 1962

6.0 Statistical Program

Modifications or revisions to this program, as they occur, will be announced in the appropriate Catalog of Programs for IBM Data Processing Systems. When such an announcement occurs, users should order a complete new program from the Program Information Department.

Program Manual

I. Title: Simple Correlation Coefficient-NT0005

II. Description of Program

A. Results

The output of this routine is the simple correlation coefficient matrix on the typewriter and on punched card. It should be noted that the punched card output is ready as input to the Factor Analysis routine by the same author.

B. Method of Computation

The standard form for r is used, i.e.,

$$r_{ij} = \frac{N \sum X_i X_j - \sum X_i \sum X_j}{\sqrt{N \sum X_i^2 - (\sum X_i)^2} \sqrt{N \sum X_j^2 - (\sum X_j)^2}}$$

where N = number of observations

III. Input / Output

A. Input Format

Card 1: N1 blank N2

where N1= the number of observed variables

N2= the number of observations

Card 2: 01V1 blank 02V2 blank 01V3 ... 01V15

where 01V1 indicates observation 1 variable 1.

This data can overflow to subsequent cards if needed, then followed on the same card or on a new one with 02V1 02V2 02V3...

B. Output Format

Typewriter: The format is I J R_{IJ}

WHERE the notation is obvious.

Card: R_{IJ} for cards 2 on.

N1 N2 for card 1

IV. Sample Problem

4

Input

4 15
 1. 2. 3.57 4.12
 2. 4. 2.5 3.7
 3. 6. 2.59 8.30
 4. 8. 5.69 9.24
 5. 10. 2.0 3.1
 6. 12. 15. 27.5
 7. 14. 23. 2.4
 8. 16. 45. 54.
 9. 18. 22. 2.2
 10. 20. 20. 20.
 11. 22. 33. 44.
 12. 24. 45.5 1234.
 13. 26. 32. 23.
 14. 28. 1.0 2.0
 15. 30. 30. 30.

OUTPUT
 TYPEWRITER

5

1	1	.00000000
1	2	1.00000005
1	3	.59229011
1	4	.26647283
2	1	1.00000005
2	2	.00000000
2	3	.59228991
2	4	.26647288
3	1	.59229011
3	2	.59228991
3	3	.00000000
3	4	.50432403
4	1	.26647283
4	2	.26647288
4	3	.50432403
4	4	.00000000

Punched Card

4	15
.00000000	
1.00000005	
.59229011	
.26647283	
1.00000005	
.00000000	
.59228991	
.26647288	
.59229011	
.59228991	
.00000000	
.50432403	
.26647283	
.26647288	
.50432403	
.00000000	

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V. Operating Instructions

- 1) Set tabs and margin as for standard FORTRAN
- 2) Ready card reader with program deck followed by data cards.
- 3) Ready punch with blank cards.
- 4) Depress Reset and Read and Punch Start when the "Load Data " message is typed depress start on the 1620.

VI. Sense switch 4 is the only one used

- SS4 on the program punches the output as well as typing.
- SS4 off the program types the output only.

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```

C   SIMPLE CORRELATION COEFFICIENT
C   STANDARD APPROACH WITH ALL DATA NEEDED
C   GENE MILNER
C   NORTH TEXAS STATE UNIVERSITY

      DIMENSION SUM(15),SUM2(15),PROD(15,15),X(15),R(15,15)
1  READ,N1,N2
      N3=N1-1
      Y2=N2
      DO 5 I=1,N1
      SUM(I)=0.
      SUM2(I)=0.
      DO 5 J=1,N1
5  PROD(I,J)=0.
      DO 7 M=1,N2
      DO 6 I=1,N1
      READ,X(I)
      SUM(I)=SUM(I)+X(I)
6  SUM2(I)=SUM2(I)+X(I)*X(I)
      DO 7 J=1,N3
      L=J+1
      DO 7 K=L,N1
7  PROD(J,K)=PROD(J,K)+X(J)*X(K)
      DO 8 I=1,N3
      L=I+1
      DO 8 J=L,N1
      XNUM=(Y2*PROD(I,J)-SUM(I)*SUM(J))
      DEN=(SQR((Y2*SUM2(I)-SUM(I)*SUM(I))*(Y2*SUM2(J)-SUM(J)
      R(I,J)=XNUM/DEN
8  R(J,I)=R(I,J)
      DO 9 I=1,N1
9  R(I,I)=0.
      IF(SENSE SWITCH 4)11,12
11 PUNCH,N1,N2
12 DO 10 I=1,N1
      DO 10 J=1,N1
      IF ( SENSE SWITCH 4)13,10
13 PUNCH,R(I,J)
10 TYPE,I,J,R(I,J)
      PAUSE
      GO TO 1
      END
C   THE OUTPUT FROM THIS ROUTINE IS READY AS
C   INPUT TO THE FACTOR ANALYSIS ROUTINE BY THE SAME AUTHOR

```

Note: The entire matrix is output with R_{II} set equal to zero. This is necessary for the Factor Analysis Routine.

NT0005

12-14-61
CARDS

9

LOAD SOURCE DECK
THEN PUSH START

```

07500 C $042275
07500 C SIMPLE CORRELATION MATRIX ROUTINE
07500 C PROGRAM NO. 042275
07500 DIMENSION SUM(15),SUM2(15),PROD(15,15),X(15),R(15,15)
07500 1 READ,N1,N2
07524 N3 = N1 -1
07560 Y2 = N2
07596 DO 5 I = 1,N1
07608 SUM(I) = 0.0
07656 SUM2(I) = 0.0
07704 DO 5 J = 1,N1
07716 5 PROD(I,J) = 0.0
07872 DO 7 M = 1,N2
07884 DO 6 I = 1,N1
07896 READ,X(I)
07932 SUM(I) = SUM(I) + X(I)
08040 6 SUM2(I) = SUM2(I) + X(I) * X(I)
08220 DO 7 J = 1,N3
08232 L = J + 1
08268 DO 7 K = L,N1
08280 7 PROD(J,K) = PROD(J,K) + X(J) * X(K)
08604 DO 8 I = 1,N3
08616 L = I + 1
08652 DO 8 J = L,N1
08664 XNUM = (Y2*PROD(I,J) - SUM(I) * SUM(J))
08868 DEN = (SQR((Y2*SUM2(I) - SUM(I)*SUM(I))*(Y2*SUM2(J) - SUM(J)*SUM(J))))
09204 R(I,J) = XNUM / DEN
09300 8 R(J,I) = R(I,J)
09516 DO 9 I = 1,N1
09528 9 R(I,I) = 0.0
09648 PUNCH N1,N2
09684 DO 10 I = 1,N1
09696 DO 10 J = I,N1
09708 PUNCH R(I,J)
09792 10 TYPE,I,J,R(I,J)
09972 PAUSE
09984 GO TO 1
09992 END

```

*N1 = NO of observed variables
N2 = NO of observations*

```

14789 I
14779 000000000
14769 J
14749 M
14729 L
14719 K
14699 XNUM
14669 DEN

```

PROCESSING COMPLETE
TO EXECUTE PROGRAM
LOAD OBJECT DECK
THEN PUSH START

END OF COMPILATION
LOAD SUBROUTINE DECK
THEN PUSH START

SW1 ON FOR SYMBOL TABLE
THEN PUSH START

```

19859 ABS
19849 ABSF
19839 CWT
19829 CWTF
19819 SUM 19679
19669 SUM2 19529
19519 PROD 17279
17269 X 17129
17119 R 14879
14859 N1
14849 N2
14839 N3
14829 0001
14809 Y2

```