

UNIVERSITY OF ILLINOIS
DIGITAL COMPUTER LABORATORY
STATISTICAL LIBRARY

KSL 5.57 - 255

TITLE: Page Output Correlations

TYPE: Entire Program

SYMBOLS: n Order of the correlation matrix
d Decimal places in the correlations

DURATION: $.025 n^2 (d + 1)$ seconds

LIMITATIONS: $2 \leq n \leq 148$; $3 \leq d \leq 9$ (See Note 1)

METHOD OF USE: 1. Master tape Stops
2. Data tape 3401K
24056
Raise the black switch if complete data has been read.
Raise the white switch to continue reading data.
After the results are punched, routine will stop on 2401K. To begin a new problem, insert next data tape, and raise black switch.

DATA TAPE: The data tape consists of the output from routines K-8, K-9, KSL 2.40, or any other triangular matrix of correlations. These are fractions, scaled by 10^{-1} , punched in the following order: $r_{00}, r_{10}, r_{11}, \dots, r_{n-1, n-1}$. The machine records the number of fifth-hole characters after the first diagonal entry. Whenever the number of fifth-hole characters on subsequent diagonal entries exceeds the number after the first, the machine will stop on 24056. If the black switch is raised, the machine will punch the results. If the complete matrix has not been read, raising the white switch will direct the machine to continue reading the tape until the next time an extra fifth-hole character is encountered.

PURPOSE: The purpose of this routine is to read a triangular matrix of correlations, and to punch these back onto the tape, unscaled, and in page form, with the columns and rows correctly labeled with column and row numbers running from 1 through n.

NOTE 1: In the special case when $d = 3$ and n exceeds 99, for column headings greater than 99, not enough space on the page is available to print three-place column headings. Consequently the column headings will be out of line with the columns. Otherwise, the results will be punched correctly.

NOTE 2:

In reading the master tape, a sum check failure is indicated by an FF stop from location OJ7.

NOTE 3:

Tests are made in the diagonal entries to determine if the first characters are a positive sign followed by a 1. A stop on FF has the following meanings:

<u>Location</u>	<u>Meaning</u>
O1F	No + for first diagonal entry
O21	No 1 for first diagonal entry
O49	No + for subsequent diagonal entry
O4N	No 1 for subsequent diagonal entry

Raising the white switch for any of these stops, will cause the computer to continue to read.

DATE	February 18, 1959
SUBMITTED BY	<i>Karl W. Dickman</i>
APPROVED BY	<i>J. Snyder</i>

lgr

LOCATION			ORDER	NOTES	PAGE 1
Abs.	Rel.	Sym.			
			003K		
3			00F 00220F		Store of triangular matrix
4		(I)	00F 00F		Row
5		(J)	00F 00F		Column
6		(K)	00F 00F		
7		(L)	00F 00F		
8		(R)	00F 00F		Temporary Storage row
9		(C)	00F 00F		Temporary Storage column
10		(R-C)	00F 00F		Temporary r - c
11		(JB)	00F 00F		Initial column for page
12		(JE)	00F 00F		Final column for page
13		(X)	00F 00F	by 18(RD)	Number of columns per page
14		(N)	00F 00F		Order of matrix
15		(5)	00F 00F	by 10(RD)	Number of 5th-hole ch., 1st diagonal
16		(O)	00F 00F		
17		(961)	00961F 00961F		
18		(D)	00F 00F	by 8(RD)	Digits per no., after + 1
19		(10)	00F 0010F		
20		(70)	00F 0067F		Maximum digits allowed per page
21		(W1)	50(0) 401S3		To preset 3(RS)
22		(W2)	L0(W3) 3611(RS)		To preset 5(RS)
23		(W3)	50(0) 401024F		Test for drum store
24		(W4)	8611F 002560F		Initial drum order
25		(W5)	266(RS) 00F		To set 5(RS) for drum store
			00K		Begin!
26	0	(RD)	41(N) 41(5)		To read first diagonal and preset addresses
	1		41(D) 814F		
	2		L0(10) 40F		
	3		L3F 324L		Test for first positive sign
	4		FFF 814F		
	5		FO(0) 40F		
	6		L3F 327L		Test for 1 after 1st positive sign
	7		FFF 814F		
	8		F5(D) 42(D)		Tally remaining digits at (D)

LOCATION			ORDER	NOTES	PAGE 2
Abs.	Rel.	Sym.			
	9		914F 368L		
	10		F5(5) 42(5)		Tally 5th-hole char. at (5)
	11		914F 3212L		
	12		2610L 401F		
	13		F5(N) 40(N)		Increase order
	14		F5(D) 14(0)		
	15		50(0) 0020F		
	16		40(K) 15(70)		
	17		66(K) S5F		
	18		1019F 40(X)		Calculate number of cols. at (X)
	19		L5(W1) 403(RS)		Preset (RS)
	20		L5(W2) 405(RS)		Preset (RS), (CP), (AD)
	21		50(0) L5(D)		
	22		002F 4219(RS)		
	23		4221(AD) 0020F		
	24		4610(RS) 14(961)		
	25		4613(AD) F5(D)		
	26		0022F 462(RS)		
	27		L5(10) F0(D)		
	28		002F 422(RS)		
	29		L5(D) 0020F		
	30		462(CP) 26(RS)		
			00K		
57	0	(RS)	41(J) L51F		Read matrix and store
	1		F0(10) 369L		
	2		81F 00F	by 26(RD), 28(RD)	
	3		50(0) 40F	by 19(RD), 11L	Store / place on drum
	4		F53L 403L		
	5		L0(W3) 3611L	by 20(RD), 12L	Test for drum address
	6		F5(J) 42(J)		
	7		L0(N) 3213L		Test for diagonal
	8		814F 261L		
	9		814F F5(10)		It is a negative number

LOCATION			ORDER	NOTES	PAGE 3
Abs.	Rel.	Sym.			
	10		80F 222L	by 24(RD)	
	11		L5(W4) 403L		Rewrite 3(RS) and
	12		L5(W5) 405L		5(RS) for drum storage
	13		266L 814F	from 7L	It is a diagonal
	14		L0(10) 40F		
	15		L3F 3216L		Test for sign
	16		FFF 814F		
	17		FO(0) 40F		
	18		L3F 3219L		Test for 1
	19		FFF 81F	by 22(RD)	
	20		41(K) F5(N)		Increase order
	21		42(N) 914F		
	22		3625L F5(K)		
	23		42(K) FO(5)		Test for 5th-hole delays
	24		3627L 2221L		
	25		401F F53L		
	26		403L 26L		
	27		24(PR) 814F		Stop: to continue reading raise
	28		2625L 00F		white switch
			00K		
86	0	(PR)	9259F 92143F	from 27(RS)	Print: CORRELATIONS
	1		92259F 92965F		
	2		92835F 92578F		
	3		92262F 92194F		
	4		92962F 92387F		
	5		92322F 92514F		
	6		92578F 92770F		
	7		92706F 92707F		
	8		92135F 92519F		
	9		26(PRT) 00F		
			00K	from 5, 9(PRT)	
96	0	(PG)	K5F 4214L		Subroutine to print a page
	1		41(I) L5(JB)		

LOCATION			ORDER	NOTES	PAGE 4
Abs.	Rel.	Sym.			
	2		40(J) F5(I)		
	3		J23F 503L		
	4		26(P16) 92965F		Print row heading
	5		50(O) 505L		
	6		26(AD) F5(J)		Print correlation
	7		42(J) LO(JE)		
	8		369L 225L		Test for end of row
	9		92131F 92519F		
	10		F5(I) 42(I)		
	11		LO(N) 3212L		Test for end of page
	12		221L L5(JE)		
	13		40(JB) 9259F		
	14		92139F 22F		
111		(P16)	00K		Print routine
			00K	from 9(FR)	
167	0	(PRT)	41(JB) L5(JB)		Main routine
	1		40(C) L4(X)		
	2		40(JE) LO(N)		Set end col. number
	3		366L 503L		
	4		26(CP) 504L		Print col. headings
	5		26(PG) 22L		Print a page
	6		L5(N) 40(JE)		It is the last page
	7		50(O) 507L		
	8		26(CP) 508L		Print col. headings for final page
	9		26(PG) 921001F		Print final page
	10		92135F 24(RD)		Stop: black for new problem
			00K	from 4,8(PRT)	Subroutine to print col. headings
178	0	(CP)	K5F 427L		
	1		92981F F5(C)		
	2		J2F 502L	by 30(RD)	
	3		26(P16) F5(C)		
	4		42(C) LO(JE)		
	5		366L 221L		

LOCATION			ORDER	NOTES	PAGE 5
Abs.	Rel.	Sym.			
	6		92135F 92515F		
	7		50(O) 22F		
186	0	(AD)	OOK K5F 4222L	from 6(PG)	Subroutine to calculate addresses and print r.
	1		L5(J) 40(C)		
	2		L5(I) 40(R)		
	3		L0(C) 40(R-C)		
	4		3211L L5(J)		Exchange I and J
	5		40(R) L5(I)		
	6		40(C) 41(L)		
	7		41(K) L0(R)		
	8		3614L F5(K)		
	9		42(K) L4(L)		Calculate address at L
	10		40(L) L5(K)		
	11		227L L3(R-C)		Test for diagonal
	12		3613L 226L		
	13		92F 2222L	by 25(RD)	Print spaces
	14		L5(L) L4(C)		
	15		L43F 4217L		
	16		L023L 3625L		Test for drum address
	17		001F L5F	by 15L	
	18		401F 3620L		
	19		92706F 2220L		r is negative
	20		92961F L51F		r is positive
	21		004F 82F	by 23(RD)	
	22		41(L) 22F		
	23		00F 001024F		
	24		8511F 002560F		Initial drum address
	25		L424L 4026L		
	26		00F 00F		Read from drum
	27		2618L 00F OOK		Sum check
	0		L3F 34(RD)		
	1		FFF 26(RD)		
	2		L80307F 133774F 26L261N		